ISVforce Guide

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@salesforcedocs

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CONTENTS

CHAPTER 1 Welcome to the ISVforce Guide

In this chapter ...

Hello, partner! Welcome to the ISVforce Guide. Learn to plan, build, distribute, market, sell, and support solutions that run on the Salesforce platform. Get your feet wet with the quick start tutorials. Then, dive in for a close look at the concepts, procedures, tools, and resources you need to successfully navigate the stages of the solution lifecycle.

Resources for Partners

The Partner Community, at https://partners.salesforce.com, is the primary resource for all ISVs. To get started, we recommend visiting the Education page, your one-stop shop for all ISV content. In addition, you can use the Partner Community to:

- Collaborate with other partners and salesforce.com using our Chatter community.
- Stay up-to-date on news and events related to the Salesforce Partner Program.
- Log cases for access to partner-specific features and customer support.
- Use enhanced search, integrated with the Trailblazer Community, to quickly find relevant resources.
- Browse the Salesforce Partner Online Training catalog and sign up for courses.

The Partner Community is self-service—the first person to register your partnership becomes your designated administrator and manages the creation of additional users for your company. You can change or add administrators, as required.

Roles in the Solution Lifecycle

This guide covers the entire lifecycle of a solution, so not all topics are relevant for every role. The following list has topic suggestions by role.

An application *architect*

The application architect determines the scope of the solution and the internal structures that support it. Architects need details about the underlying Lightning Platform platform that determine not only the solution's use, but which editions it supports, how it's installed, configured, and upgraded. We strongly recommend that architects review this entire guide, but especially the following chapters:

- Design and Build Your Solution on page 18
- Pass the AppExchange Security Review on page 152

A *developer* creates, packages, and uploads a solution

A developer, or often a team of developers, creates a solution, packages it, and uploads it to AppExchange. Developers also update the solution with bug fixes and new features. As a developer, review the following chapters:

- Design and Build Your Solution on page 18
- Package and Test Your Solution on page 129
- Developing App Documentation on page 58
- Update Your Solution on page 338

A *publisher* distributes, sells, and supports the solution

The publisher of a solution is the person or company who has a profile and one or more listings for the solution on AppExchange. Publisher listings contain a link to a solution they uploaded to AppExchange or to a third-party website. Publishers also set default license settings. As a publisher, review the following chapters:

- Publish Your Solution on AppExchange on page 165
- Provide a Free Trial of Your Solution on page 312
- Support Your AppExchange Customers on page 328

An *administrator* installs the solution

An administrator, or *admin*, downloads your solution from AppExchange and installs it into their organization. Admins can also customize the solution to further suit their business needs. To learn how admins interact with your solution, see the following topic.

- Installing a Package on page 140

How to Sign Up for Test Environments

To sign up for test environments (organizations), use the Environment Hub.

Note: If you're a new Salesforce user, log in to the organization that you received when you signed up for the Partner Program. The Environment Hub is enabled in this organization by default. If you're an existing Salesforce user and are using a different organization to manage development, log a case in the Partner Community to enable the Environment Hub.

1. Log in to the organization where Environment Hub is enabled.
2. Select the Environment Hub tab, then click **Create Organization**.
3. In the Purpose drop-down list, select **Test/Demo**.
4. In the Edition drop-down list, choose the edition you want to test against.
5. Fill in the remaining required fields. Optionally, set up My Domain.
6. Agree to the terms and then click **Create**.
7. You'll receive an email that will prompt you to log in and change your password. Click the link, change your password, and create a password question and answer.

CHAPTER 2 ISVforce Quick Start

In this chapter ...

Get ready to build and sell solutions on AppExchange by completing short tutorials.

Note: Some features in this quick start are available only to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

Tell Me More

If you're new to app development, or if you're a smell-the-roses type, review these resources before you get started.

- For an introduction to the Salesforce platform, complete the Admin Beginner, Admin Intermediate, and Developer Beginner trails.
- For Salesforce developer documentation and other resources, visit Salesforce Developers at https://developer.salesforce.com.
- For a list of useful terms, see the Glossary on page 365.

Tutorial #1: Sign Up for AppExchange

In this tutorial, you set up the tools you need to develop, sell, and support apps and components built on the Lightning Platform platform. You start by signing up for the Partner Program. You then have access to the Partner Community, which allows you to view helpful resources, create support cases, and collaborate with other partners and Salesforce. The Partner Community is also the best source for news and events about the Partner Program. In addition, you can access the Environment Hub, where you can create development and test organizations.

If you're familiar with Salesforce, you know that an organization is a cloud unto itself. If you're new to Salesforce, think of your organization as a separate environment for developing, testing, and publishing your offering.

Step 1: Sign Up for the Partner Program

The first step is to sign up for the Partner Program.

1. In your browser, go to https://partners.salesforce.com and click **Join Now**.

   Note: The signup process varies according to the region or country. Follow the instructions presented.

2. Fill in the fields about you and your company.
3. Select the first option: **Independent Software Vendor (ISV)**.
4. Click **Submit Registration**.

In a moment, you'll receive a confirmation, followed by an email welcoming you to the Partner Program and including login credentials.

Congratulations, you're now part of the Salesforce ISV Partner Program! Click the link to the Partner Community (https://partners.salesforce.com) and log in. Bookmark this page. You'll be using it a lot.

Step 2: Create a Development and Test Environment

To build and sell on the Lightning Platform platform, you need different environments for different tasks. We call these environments *organizations*, or orgs for short. You use the Environment Hub to create these orgs. The first org you need is the Partner Developer Edition, which is where you develop and package your offering. If you already have a Developer Edition org, we recommend signing up for the Partner Developer Edition org because you can have more data storage, licenses, and users.

Note: If you're a new Salesforce user, log in to the organization that you received when you signed up for the Partner Program. The Environment Hub is enabled in this organization by default. If you're an existing Salesforce user and are using a different organization to manage development, log a case in the Partner Community to enable the Environment Hub.

1. Log in to the organization where the Environment Hub is enabled, usually your partner business org.
2. Click the **Environment Hub** tab, and then click **Create Organization**.
3. In the Purpose drop-down list, select **Development**. For simplicity, we refer to this as your *dev org*.
4. Fill in the required fields. Optionally, set up My Domain.
5. Agree to the terms and then click **Create**.
6. In the Purpose drop-down list, select **Test/Demo** and **Partner Enterprise** for the org edition. This process creates a test org, where you test the app or component that your are developing.
7. Shortly, you'll receive emails that prompt you to log in and change your password for your dev and test orgs.

Tell Me More...

The Environment Hub has several types of test orgs available, because different editions of Salesforce have different features. If you plan to distribute your app or component to a particular edition, you want to test your offering and make sure that it works there. Although that's beyond the scope of this quick start. For more information, see Architectural Considerations for Group and Professional Editions on page 65.

Step 3: Get a Business Org

In the previous step, you created orgs for developing and testing your offering. To manage sales and distribution, you need one more org. In this step, you log a case in the Partner Community to have a Partner Business Org (PBO) provisioned for you. Your PBO contains the apps that you use to manage sales and distribution, including the License Management App (LMA) and Channel Order App (COA).

1. In the Partner Community, under the Support tab, click **New Case**.
2. Hover over **Benefits & Tools**, and then click **Create a Case**.
3. From the Subtopic dropdown list, select **Partner Business Org**.
4. In the Description field, tell us if you have an existing org or if you need a new one. If you have an existing Salesforce org, provide the org ID to add two more CRM licenses to that org. If you don't have an existing org, we provide a new one for you. In either case, make sure to enter your business address and then click **Submit Case**.

   Note: It can take 24–48 hours for your case to be closed. You can check the status of your case at any time under the Support tab of the Partner Community.

5. You'll receive an email prompting you to log in and change your password. Do that, and then bookmark the page.

Step 4: Edit Your Publisher Profile

In this step, you log in to the Partner Community and provide information about your company. We display some of this information on AppExchange listings to help customers get to your business.

1. Log in to the Partner Community using the username and password of your business org.
2. On the Publishing page, click **Company Info**.
3. Fill out the information in the Provider Profile, and then click **Save**.

Sign-up Summary

In this first tutorial, you signed up for the Partner Program and all the organizations you need to develop, test, and sell your offering. Let's review what you signed up for and the purpose of each.

Partner Program
The Partner Program gives you access to the Partner Community, where you can get help and training information, log cases for support issues, and collaborate with other partners. You also get access to the Environment Hub, which lets you create and manage new test and development orgs.

Partner Developer Edition
Also known as your *dev org*, this is where you develop your offering and eventually package it for distribution.

Test Organization
Also know as your *test org*, this is where you install and test your offering.

Partner Business Organization
This is where you license and manage your offering.

Tutorial #2: Developing Your App

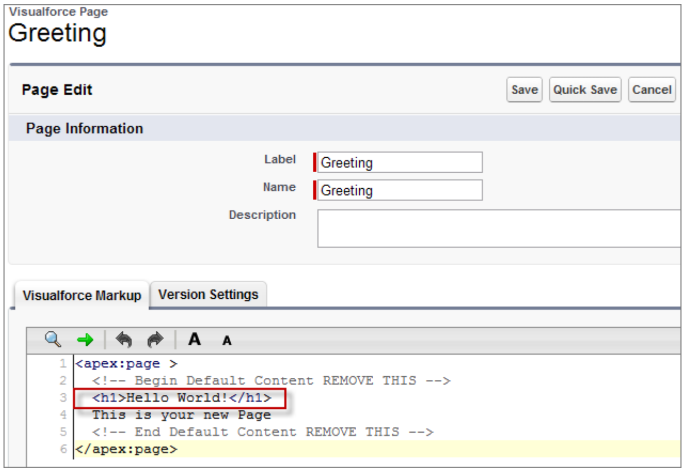
In this tutorial you'll create a very simple "Hello World" application. It won't do much, but it's enough to understand where development takes place in the lifecycle of a packaged application.

Step 1: Create an App

In this step you're going to create an app that contains a page, and a tab to display the page.

1. In your browser, log in to your Partner Developer Edition organization. Hereafter we'll call this your "dev org".
2. From Setup, enter *`Visualforce Pages`* in the `Quick Find` box, then select **Visualforce Pages**.
3. In the Visualforce list, click **New**.
4. In the `Label` field enter *`Greeting`*.
5. In the Visualforce Markup area, replace the contents of the `<h1>` tag with *`Hello World`*.

Visualforce Page Editor



Label: Greeting

Name: Greeting

Description:

```
<apex:page >
  <!-- Begin Default Content REMOVE THIS -->
  <h1>Hello World!</h1>
  This is your new Page
  <!-- End Default Content REMOVE THIS -->
</apex:page>
```

6. Click **Save**.

Now you'll associate the page with a tab.

1. In the sidebar menu, enter *`Tabs`* in the `Quick Find` box, then select **Tabs**.
2. In the Visualforce Tabs list, click **New**.
3. In the New Visualforce Tab wizard, click the drop-down box and select the Hello World page you just created.
4. For the Tab Label, enter *`Hello`*.
5. Click the Tab Style field and choose any icon to represent your tab.
6. Click **Next**, then **Next** again, and **Save** on the final page.

Now you'll create a new app that contains your tab and page.

1. In the sidebar menu, enter *`Apps`* in the `Quick Find` box, then select **Apps**.
2. Click **New**.
3. In the App Label field enter Hello World and then click **Next** and **Next** again on the following page.

4. On the Choose the Tabs page, scroll to the bottom of the Available Tabs list, find your Hello tab, and add it to the Selected Tabs list. Click **Next**.
5. Select the **Visible** checkbox to make this app visible to all profiles and then click **Save**.

Tell Me More....

If it seems like you just created a page within a container, within another container, you did. And you're about to put all of that in another container! What's with all these containers and what do they do?

- A *tab* is a container for things you want to display on the same page, such as a chart, a table, or the Visualforce page your created.
- An *app* is a container for tabs that appear next to each other. When you create an app, it's available in the app picker in the upper right hand corner of the screen.
- A *package* is a container for things you upload to the AppExchange. Usually a package contains an app your customers can install in their org, but you can also upload packages that extend existing apps. You haven't created a package yet, you'll do that in the next step.

Step 2: Package Your App

In this step you'll package the app so you can distribute it on the AppExchange. A package is simply a container for components. In this case it's your app, tab, and page.

1. From Setup, enter *`Packages`* in the `Quick Find` box, select **Packages**, and then click **New**.
2. In the Package Name field enter *`Hello World`* and then click **Save**.
3. On the Package Detail page click **Add Components**.
4. Select your Hello World app and then click **Add to Package**.

Tell Me More....

When you clicked **Add to Package**, did you notice that your Hello tab and Greeting page were automatically added to the package? When you create a package, the framework automatically detects dependent components and adds them to the package.

Step 3: Assign a Namespace

In this step you'll choose a unique identifier called a namespace. A namespace differentiates your components from other components and allows you to do things such as upgrade the app after it's been installed. Choose your namespace carefully as it can't be changed later.

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. In the Developer Settings list, click **Edit** and on the following page click **Continue**.
3. In the Namespace Prefix field, enter a 1-15 character alphanumeric ID and then click **Check Availability**. Repeat this step until you have a unique namespace.
4. In the `Package to be managed` field choose your Hello World package and then click **Review Your Selections**.
5. Review the information on the page and then click **Save**.

Tell Me More....

Within the underlying code, your namespace is prepended to all components that are packaged from your dev org. This allows your package and its contents to be distinguished from those of other developers, and ensures your exclusive control of all packaged components.

Step 4: Upload a Beta

Before you upload a production version of your app, it's a common practice to upload a beta version for testing.

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. On the Packages page, click your **Hello World** package and then click **Upload**.
3. On the Upload Package page, enter a version name and number.
4. For the Release Type, make sure to choose **Managed — Beta**.
5. Scroll to the bottom and click **Upload**. It may take a moment for the upload to complete.

Congratulations, you've uploaded an app to the AppExchange! Your app isn't available to the public, but you can access it through an install link. You'll do that in the next step.

Tell Me More....

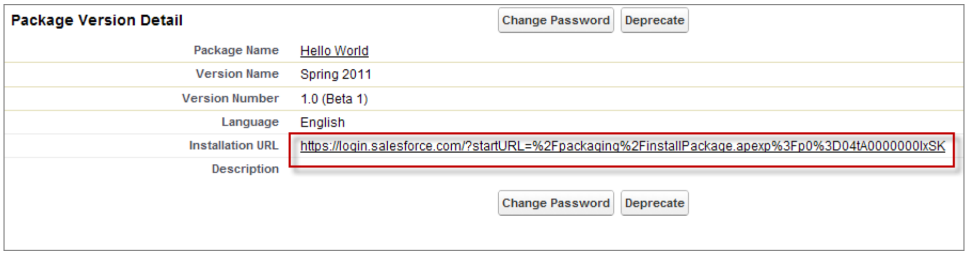
The purpose of a beta is for testing only. Therefore, a beta can only be installed in a test org, Developer Edition, or sandbox (more on that later). Next you'll install the beta in the test org you created in Step 2: Create a Development and Test Environment.

Step 5: Install and Test the Beta

Installing the beta is easy, just click the link and provide the username and password you use for your test org.

1. Click the Installation URL now.

Installation URL Link

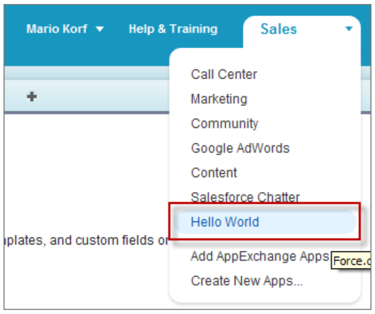


Package Version Detail

Package Name	Hello World
Version Name	Spring 2011
Version Number	1.0 (Beta 1)
Language	English
Installation URL	https://login.salesforce.com/?startURL=%2Fpackaging%2FinstallPackage.apexp%3Fp0%3D04tA0000000IxSK
Description	

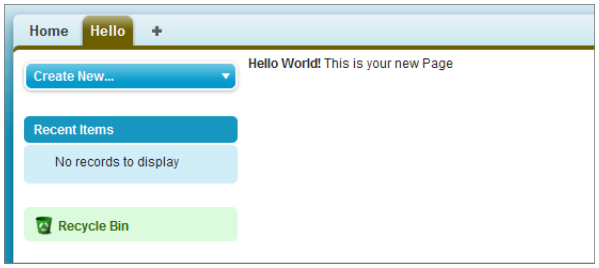
2. On the login page, enter the Username and Password of your test org.
3. On the Package Installation Details page, click **Continue**.
4. Click **Next**.
5. On the Security Level page, **Grant access to all users** and click **Next**.
6. Click **Install**.
7. Once the installation completes, you can select your app from the app picker in the upper right corner.

Hello World App



8. You should see your Hello tab, and the greeting text on your page.

Hello World Tab and Page



Hello World! This is your new Page

At this point you would normally test the application and make sure it works as designed. Your app installs easily and displays what you want, so let's move on.

Tell Me More....

Beta packages can also be installed in sandboxes. A sandbox is a replica of your customer's org that allows them to develop, test, or install apps, and verify the changes they want to commit. None of the orgs you've signed up for in this workbook have a sandbox, but if you have a sandbox in another org and want to install your app in it, you must replace the initial portion of the **Installation URL** with `http://test.salesforce.com`.

Development Summary

Congratulations, you just completed an essential part of the software development lifecycle! Further changes to your app will follow the same procedure:

1. Modify the existing app in your dev org.
2. Package the app.
3. Upload as a beta package.
4. Install the beta in a test org.
5. Test the installed app.

Tutorial #3: Publishing and Licensing

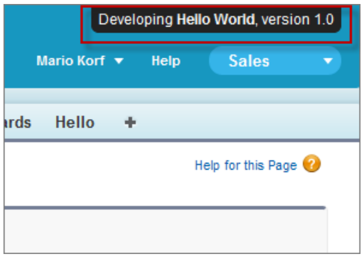
Imagine you've been through a few development cycles with your beta and you're ready to publish a public app. The next step is to upload a production app, or what we call a *managed released* version of your app. Then you can create a listing so that other people can find your app and know what it does. Finally, you want to connect your app to your business org so you manage the licenses for people that install your app.

Step 1: Uploading to the AppExchange

This step will seem familiar, it's similar to uploading a beta.

1. If you've been following along non-stop, you're probably still logged in to your test org. Go ahead and log in to your dev org now.
2. Notice in the upper right corner there's a link that says **Developing Hello World, version 1.0**. Click that link to go directly to the Package Detail page.

Developing Hello World, version 1.0

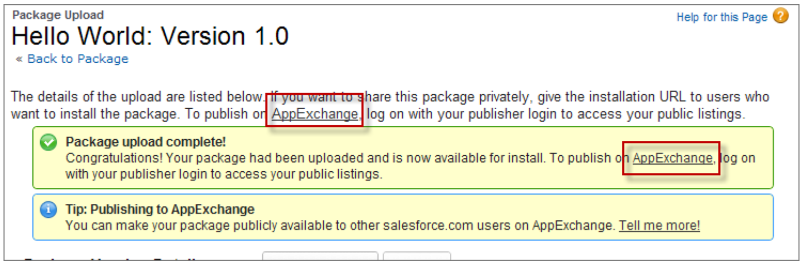


3. On the Package Detail page, click **Upload**.
4. For the Release Type, choose **Managed — Released**.
5. Scroll to the bottom and click **Upload**.
6. Click **OK** on the popup.

Step 2: Create an AppExchange Listing

In this step, you create an AppExchange listing, which is the primary way customers discover apps, components, and services to enhance their Salesforce experience.

1. After your package uploads, click the link to publish on the AppExchange. You are directed to the Listings tab on the Publishing page.



Package Upload

Hello World: Version 1.0

« Back to Package

Help for this Page

The details of the upload are listed below. If you want to share this package privately, give the installation URL to users who want to install the package. To publish on AppExchange, log on with your publisher login to access your public listings.

Package upload complete!
Congratulations! Your package had been uploaded and is now available for install. To publish on AppExchange, log on with your publisher login to access your public listings.

Tip: Publishing to AppExchange
You can make your package publicly available to other salesforce.com users on AppExchange. Tell me more!

2. If prompted, enter your login credentials for the Partner Community.

3. Read and agree to the terms and conditions, and then click **I Agree**.
4. The first question asks if you've already listed on the AppExchange. You did that in Tutorial 1, Step 4: Edit Your Publisher Profile on page 6, so select **Yes** and click **Continue**.
5. Click **Link New Organization**.
6. You're prompted for your username and password. Enter the values for your development org.
7. Click the **Publishing** tab.
8. Click **New Listing**.
9. Enter a listing title, such as `Hello World App by <your name>`. Adding your name helps ensure that your listing title is unique.
10. Choose **App**, and then click **Save & Next** to open the AppExchange publishing console.
11. On the Text tab, fill in the required fields, and then click **Save & Next** again.

Tell Me More...

Don't be concerned with making your listing perfect, because it's not public yet, and you can change the listing at any time.

Step 3: Complete the AppExchange Listing

Many customers like to see and experience a product before they decide to purchase. We give you several ways to show off your app or component in an AppExchange listing. For example, you can add screenshots and videos to draw attention to key features, or add white papers to help demonstrate business value. You can also let customers try your offering in their own organizations or set up a test environment that you've customized.

1. If you're not already there, click the Media tab in the AppExchange publishing console.
2. Add an app logo, tile image, and screenshot. Because your listing isn't used outside of this tutorial, use any image file that you have available.
3. Click the **App** tab, and then select **An app that includes a package (entirely or in part)**.
4. Click **Select Package** and choose the package that you uploaded in the previous step.
5. For the installation method, select **Directly from the AppExchange**.
6. Choose whether you want the app to be installed for every user in the customer's organization or just system administrators. For this tutorial, either option is fine.
7. For app specifications, select editions and languages. For this tutorial, you can select any available edition and language.
8. Click **Save & Next**.
9. Click **Save & Next** twice, because you don't want to configure a free trial or set up lead collection for this app.
10. For pricing, select **Free**. Use the default values for all other fields.
11. Agree to the terms and conditions, and then click **Save**.

Congratulations—you've completed your first listing! Like everything else you've done so far, you can go back and change it later if you want.

Step 4: Manage Licenses for Your App

The License Management App (LMA) helps you manage sales, licensing, and support for your offering. The LMA comes preinstalled in your business organization. In this step, you connect your app to the LMA.

Note: This feature is available to eligible partners. For more information on the Partner Program, including eligibility requirements, visit www.salesforce.com/partners.

1. If you haven't done so already, log in to the Partner Community.
2. On the Publishing page, click the **Packages** tab.
3. Find the package that you want to link, and then click **Manage Licenses**.
4. Click **Register**.
5. Enter the login credentials of your partner business org, and then click **Submit**.
6. For the default license type, choose free trial.
7. Enter a trial length in days.
8. For the number of seats, choose the site-wide license.
9. Click **Save**.

It can take up to 30 minutes for your app to be connected to the LMA. Take a break; you've earned it!

Publishing and Licensing Summary

In this tutorial, you uploaded your managed-released package to AppExchange and created a listing for your solution. You also linked your solution to the License Management App, available in your business org. You can use the LMA to manage and renew licenses and to set default license settings. For example, you can license your solution as a free trial that expires after a specified number of days. For more information, see Manage Licenses on page 290.

Right now your solution has a private listing on AppExchange. You can share the listing with potential customers, but the public doesn't see it unless they have the link. Before you can list the solution publicly, it must pass a security review, which is beyond the scope of this quick start. For more information, see Pass the AppExchange Security Review on page 152.

Tutorial #4: Updating Your App

If you're familiar with Salesforce, you know we do weekly patch releases to fix bugs, and a few times a year we have a major release to introduce new features. As an ISV, you can do the same thing by delivering a patch release to fix bugs and a major release for new features.

- For new features, the process is the same as you've experienced. You start by modifying your app, package it, upload a beta, test the beta, and then upload a managed-released version. Major releases increment the version to the next whole number, from 1.0 to 2.0, for example, and minor releases to the first dot from 1.0 to 1.1. There are no hard rules for what constitutes a major or minor release. That's up to you.
- For bug fixes, the process is slightly different. You start by creating a patch org, a special environment which has limited functionality and can only be used to develop a patch for a specific package. After you upload the patch, you have the option of pushing the patch to your customers, so they get your bug fixes the next time they log in. Minor releases increment the version number to the second decimal, from 1.0 to 1.0.1, for example.
- Major or minor releases must be installed by customers (pulled). However, you can push patch releases directly to customer orgs. This feature is only available to registered ISVforce/OEM partners. For more information on the Partner Program, including eligibility requirements, please visit us at www.salesforce.com/partners.

Since the process for developing a major release is already familiar, let's do a patch release and then deliver it by pushing the patch to our customers.

Step 1: Creating a Patch Organization

In order to create a patch, you need to generate a new patch development organization.

To create a patch version:

1. From Setup, enter *`Packages`* in the Quick Find box, then select **Packages**.
2. Click the name of your managed package.
3. On the Patch Organization tab, click **New**.
4. Select the package version that you want to create a patch for in the Patching Major Release dropdown. The release type must be Managed - Released.
5. Enter a username for a login to your patch org.
6. Enter an email address associated with your login.
7. Click **Save**.

> Note: If you ever lose your login information, click **Reset** on the package detail page under Patch Development Organizations to reset the login to your patch development org.

If the main development org from which you created the patch org has My Domain enabled, the patch org also has My Domain enabled. The name of the patch development org's custom subdomain is randomly generated.

In a moment you receive an email with your login credentials. After you log in and change your password, proceed to the next step.

Tell Me More

Development in a patch development org is restricted.

- You can't add package components.
- You can't delete existing package components.
- API and dynamic Apex access controls can't change for the package.
- No deprecation of any Apex code.
- You can't add new Apex class relationships, such as `extends`.
- You can't add Apex access modifiers, such as `virtual` or `global`.
- You can't add new web services.
- You can't add feature dependencies.

Step 2: Developing a Patch

We're going to make a simple change to your app. Instead of displaying just Hello World, you'll add today's date.

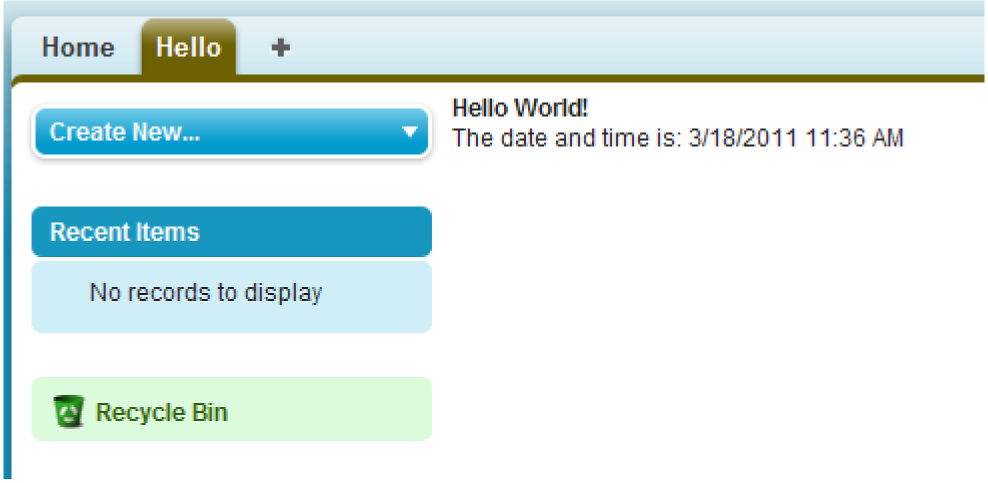
1. In your patch org, from Setup, enter *`Packages`* in the `Quick Find` box, select **Packages**, then click your **Hello World** package.
2. In the list of Package Components, click your **Greeting** page.
3. Click **Edit**.
4. Right after the closing `</h1>` tag, enter the following:

```
<br/>
<apex:outputText value="The date and time is: {!NOW()}"/>
```

5. Click **Save**.

6. To see the output, click the **Hello** tab and you'll notice that today's time and date are displayed.

Display the date and time



Hello World!
The date and time is: 3/18/2011 11:36 AM

That's as much as we need to do in this patch. Let's move on.

Tell Me More....

The `!NOW` function returns the date in a standard format. There are many more built-in functions and ways to format the output. For more information, see the *Visualforce Developer's Guide*.

Step 3: Uploading the Patch

Typically the next step is to upload a beta patch and install that in a test organization. Since this is very similar to Step 4: Upload a Beta and Step 5: Install and Test the Beta, that you completed in Tutorial #2: Developing Your App, we won't make you do that again.

1. In your patch org, from Setup, enter *`Packages`* in the `Quick Find` box, select **Packages**, and click your **Hello World** package.
2. On the Upload Package page, click **Upload**.
3. Enter a version name, such as today's date.
4. Notice that the `Version Number` has had its `patchNumber` incremented.
5. Select **Managed — Released**.
6. Optionally, enter and confirm a password to share the package privately with anyone who has the password. Don't enter a password if you want to make the package available to anyone on AppExchange and share your package publicly.
7. Salesforce automatically selects the requirements it finds. In addition, select any other required components from the `Package Requirements` and `Object Requirements` sections to notify installers of any requirements for this package.
8. Click **Upload**.

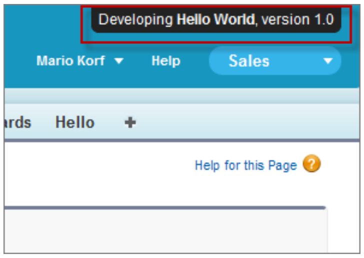
Congratulations, you've uploaded a patch release. You'll want to share that patch with others, and you'll do that next.

Step 4: Installing or Pushing a Patch

There are two ways to deliver a patch, you can have your customers install it, or you can *push* it to them. Push upgrades happen automatically, that is, the next time your customer logs in, they have the updates. Let's try that.

1. Log in to your dev org.
2. In the upper right corner, click **Developing Hello World, version 1.0**.

Developing Hello World, version 1.0



3. On the Package Detail page, click **Push Upgrades**.
4. Click **Schedule Push Upgrades**.
5. From the Patch Version drop-down list, select the patch version to push.
6. In the **Scheduled Start Date** field, enter today's date.
7. In the Select Target Organizations section, select your test org.
8. Click **Schedule**.

And you've done it! You pushed a patch release to your subscriber so that they automatically get your updates. You should verify that your customers received the patch to ensure it was installed successfully.

Tell Me More....

Beta versions aren't eligible for push upgrades. You must uninstall a beta and then install a new one.

You can also exclude specific subscriber orgs from the push upgrade by entering the org IDs, separated by a comma, in the Push Upgrade Exclusion List.

Updating Your App Summary

In this tutorial you learned how to update your app in a patch org and push that update to your customers. You started by creating a patch organization that was specific to a released package version. Then you modified your app, uploaded it, and scheduled the push upgrade to your customers.

Congratulations, you're done! Or have you really just begun? You can modify your existing app to be anything you want it to be, or create a new dev org in the Environment Hub and build another app. You can use the same sales and test orgs and everything else you've configured to publish and manage many more apps. You're on your way to ISVforce success!

CHAPTER 3 Grow Your AppExchange Business

Track your company's growth throughout the partner journey with the AppExchange Partner Trailblazer Score. Get a comprehensive view of your contributions across three pillars: customer success, innovation, and engagement. Explore detailed metrics within each pillar to see your company's progress as a Salesforce partner.

SEE ALSO:

Salesforce AppExchange Partner Program

CHAPTER 4 Design and Build Your Solution

In this chapter ...

Discover the architectural concepts that influence AppExchange solution design. Learn how to plan, build, and package your solution for customers.

Create a Secure Solution

Learn about practices and resources that help you develop a solution that resists common security threats. Designate a security expert on your development team. Review the AppExchange Security Requirements Checklist sections and Open Web Application Security Project (OWASP) guidelines that apply to your solution.

Designate a Security Expert

Protecting your solution from security threats is easier when you integrate security considerations into all stages of development. One of the best ways to ensure that your solution follows security guidelines is to designate a security expert on your development team.

Have your entire development team collaborate with the security expert through all stages of development: design, implementation, and testing. If your team postpones security considerations until the final stages of development, it increases the likelihood that the team unknowingly propagates security violations as they code.

You don’t want the number and complexity of embedded security violations to needlessly accumulate. When you’re in such a scenario, you encounter delays in preparing a successful AppExchange security review submission.

Learn How to Develop Secure Web Apps

Learn the basics of developing secure code for an AppExchange solution in the Develop Secure Web Apps trail on Trailhead. Discover how to identify, prevent, and remediate the security violations you’re most likely to encounter when developing a solution on the Salesforce platform.

Salesforce wrote the Develop Secure Web Apps trail with a focus on securing solutions built with the Lightning Platform architecture. In the trail, you get hands-on training on how to produce secure code.

Pay particular attention to the Data Leak Prevention module. The violations detailed in this module are among the most common security violations.

Review the AppExchange Security Requirements

The AppExchange Security Requirements Checklist is our most comprehensive information resource for evaluating the security of your solution. To understand our baseline technical security requirements, review this checklist as you develop your solution and identify the security requirements that apply to your code.

Be sure to parse through the entire AppExchange Security Requirements Checklist document. Requirements that apply to your solution can be spread out in various sections. However, the Best Practices for Security section applies to all solutions.

Note: In the checklist, *composite submission* refers to any solution that involves a third-party, non-Salesforce endpoint, system, or API.

Follow Open Web Application Security Project Guidance

The Open Web Application Security Project (OWASP) website provides comprehensive information about web app security risks. It includes detailed guidance on how to test for, prevent, and resolve security issues. Familiarize yourself with the key resources on the OWASP website.

We recommend that you use the OWASP Top Ten Project as a primary reference for securing your solution. This section of the OWASP site documents the 10 most prominent security risks that appear in web apps. The guidelines are especially pertinent to web apps and services that aren’t hosted on the Salesforce platform.

Aim to follow development practices and security guidelines that conform as closely as possible to the OWASP Secure Coding Practices - Quick Reference Guide.

SEE ALSO:

- Develop Secure Web Apps Trailhead trail
- AppExchange Security Review Trailhead module
- Secure Coding Guide
- OWASP site
- OWASP Top Ten
- OWASP Secure Coding Practices-Quick Reference Guide

Overview of Packages

A *package* is a container for something as small as an individual component or as large as a set of related apps. After creating a package, you can distribute it to other Salesforce users and organizations, including those outside your company.

Packages come in two forms—unmanaged and managed:

Unmanaged packages

Unmanaged packages are typically used to distribute open-source projects or application templates to provide developers with the basic building blocks for an application. Once the components are installed from an unmanaged package, the components can be edited in the organization they are installed in. The developer who created and uploaded the unmanaged package has no control over the installed components, and can't change or upgrade them. Unmanaged packages should not be used to migrate components from a sandbox to production organization. Instead, use Change Sets.

As a best practice, install an unmanaged package only if the org used to upload the package still exists. If that org is deleted, you may not be able to install the unmanaged package.

Managed packages

Note: Salesforce has two ways that you can build managed packages, first-generation packaging (1GP) and second-generation packaging (2GP). This guide describes 1GP. For new solutions, use 2GP as described in the Second-Generation Managed Packages section of the Salesforce DX Developer Guide.

Managed packages are typically used by Salesforce partners to distribute and sell applications to customers. These packages must be created from a Developer Edition organization. Using the AppExchange and the License Management Application (LMA), developers can sell and manage user-based licenses to the app. Managed packages are also fully upgradeable. To ensure seamless upgrades, certain destructive changes, like removing objects or fields, can not be performed.

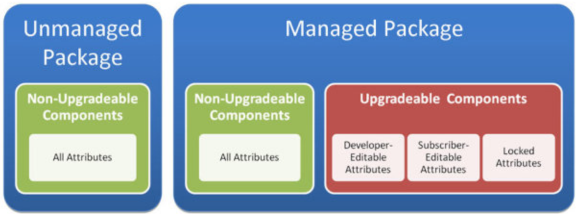
Managed packages also offer the following benefits:

- Intellectual property protection for Apex
- Built-in versioning support for API accessible components
- The ability to branch and patch a previous version
- The ability to seamlessly push patch updates to subscribers
- Unique naming of all components to ensure conflict-free installs

Packages consist of one or more Salesforce components, which, in turn, consist of one or more attributes. Components and their attributes behave differently in managed and unmanaged packages.

The following definitions illustrate these concepts:

Unmanaged and Managed Packages


Unmanaged Package
Non-Upgradeable Components
All Attributes
Managed Package
Non-Upgradeable Components
All Attributes
Upgradeable Components
Developer-Editable Attributes
Subscriber-Editable Attributes
Locked Attributes

Components

A *component* is one constituent part of a package. It defines an item, such as a custom object or a custom field. You can combine components in a package to produce powerful features or applications. In an unmanaged package, components are not upgradeable. In a managed package, some components can be upgraded while others can't.

Attributes

An *attribute* is a field on a component, such as the name of an email template or the `Allow Reports` checkbox on a custom object. On a non-upgradeable component in either an unmanaged or managed package, attributes are editable by both the developer (the one who created the package) and the subscriber (the one who installed the package). On an upgradeable component in a managed package, some attributes can be edited by the developer, some can be edited by the subscriber, and some are locked, meaning they can't be edited by either the developer or subscriber.

Planning the Release of Managed Packages

Releasing an AppExchange package is similar to releasing any other program in software development. You may want to roll it out in iterations to ensure each component functions as planned. You may even have beta testers who have offered to install an early version of your package and provide feedback.

Once you release a package by publishing it on AppExchange, anyone can install it. So, plan your release carefully. Review the states defined below to familiarize yourself with the release process. Salesforce automatically applies the appropriate state to your package and components depending on the upload settings you choose and where it is in the release process.

State	Description
Unmanaged	The package has not been converted into a managed package or the component has not been added to a managed package. Note that a component that is "Managed - Beta" can become "Unmanaged" if it is removed from a managed package. All packages are unmanaged unless otherwise indicated by one of the managed icons below.
Managed - Beta	The package or component was created in the current Salesforce organization and is managed, but it is not released because of one of these reasons: • It has not been uploaded. • It has been uploaded with `Managed - Beta` option selected. This option prevents it from being published, publicly available on AppExchange. The developer can still edit any component but the installer may not be able to depending on which components were packaged. Note: Don't install a Managed - Beta package over a Managed - Released package. If you do, the package is no longer upgradeable and your only option is to uninstall and reinstall it.

State	Description
✓ Managed - Released	The package or component was created in the current Salesforce organization and is managed. It is also uploaded with the `Managed - Released` option selected, indicating that it can be published on AppExchange and is publicly available. Note that once you have moved a package to this state, some properties of the components are no longer editable for both the developer and installer. This type of release is considered a major release on page 339.
Patch	If you need to provide a minor upgrade to a managed package, consider creating a patch instead of a new major release. A patch enables a developer to change the functionality of existing components in a managed package. Subscribers experience no visible changes to the package. This type of release is considered a patch release on page 339.
Managed - Installed	The package or component was installed from another Salesforce organization but is managed.

A developer can refine the functionality in a managed package over time, uploading and releasing new versions as the requirements evolve. This might involve redesigning some of the components in the managed package. Developers can delete some, but not all, types of components in a Managed - Released package when upgrading it. For details, see Delete Components in Managed Packages on page 345.

Create a Package

Packages are containers for distributing custom functionality between Salesforce orgs. Create a package to upload your app or Lightning component to the AppExchange or to deploy changes between orgs.

Tip: Before you begin, determine if you want to create and upload a managed or unmanaged package.

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. Click **New**.
3. Enter a name for your package. You can use a different name than what appears on AppExchange.
4. From the dropdown menu, select the default language of all component labels in the package.
5. Optionally, choose a custom link from the `Configure Custom Link` field to display configuration information to installers of your app. You can select a predefined custom link to a URL or s-control that you have created for your home page layouts; see the Configure Option on page 58. The custom link displays as a **Configure** link within Salesforce on the Salesforce AppExchange Downloads page and app detail page of the installer's organization.
6. Optionally, in the `Notify on Apex Error` field, enter the username of the person to notify if an uncaught exception occurs in the Apex code. If you do not specify a username, all uncaught exceptions generate an email notification that is sent to Salesforce. This option is only available for managed packages. For more information, see *Handling Apex Exceptions in Managed Packages*.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To create packages:
- Create AppExchange Packages

> Note: Apex can only be packaged from Developer, Enterprise, Unlimited, and Performance Edition organizations.

7. Optionally, in the `Notify on Packaging Error` field, enter the email address of the person who receives an email notification if an error occurs when a subscriber's attempt to install, upgrade, or uninstall a packaged app fails. This field appears only if packaging error notifications are enabled. To enable notifications, contact your Salesforce representative.
8. Optionally, enter a description that describes the package. You can change this description before you upload it to AppExchange.
9. Optionally, specify a post install script. You can run an Apex script in the subscriber organization after the package is installed or upgraded. For more information, see Running Apex on Package Install/Upgrade.
10. Optionally, specify an uninstall script. You can run an Apex script in the subscriber organization after the package is uninstalled. For more information, see Running Apex on Package Uninstall.
11. Click **Save**.

Developing and Distributing Unmanaged Packages

Unmanaged packages are traditionally used for distributing open-source projects to developers, or as a one time drop of applications that require customization after installation. You should never use unmanaged packages for sandbox to production migration. Instead, use the Salesforce Extensions for Visual Studio Code or the Ant Migration Tool. If you're using Enterprise, Unlimited, or Performance Edition, see Change Sets.

SEE ALSO:

Components Available in Unmanaged Packages

Create and Upload an Unmanaged Package

Use the following procedure to upload an unmanaged package through the UI. (You can also upload a package using the Tooling API. For sample code and more details, see the PackageUploadRequest object in the *Tooling API Developer Guide*.)

1. Create the package:
   a. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
   b. Click **New**.
   c. Fill in the details of the package.
   d. Click **Save**.

2. Add the necessary components for your app.
   a. Click **Add Components**.
   b. From the drop-down list, choose the type of component.
   c. Select the components you want to add.

      > Note: Some components cannot be added to Managed - Released packages. For a list of packageable components, see Components Available in Managed Packages on page 24. If you add S-Controls and documents, keep in mind that their combined size must be less than 10 MB. Also, S-controls cannot be added to packages with restricted API access.

   d. Click **Add To Package**.
   e. Repeat these steps until you have added all the components you want in your package.

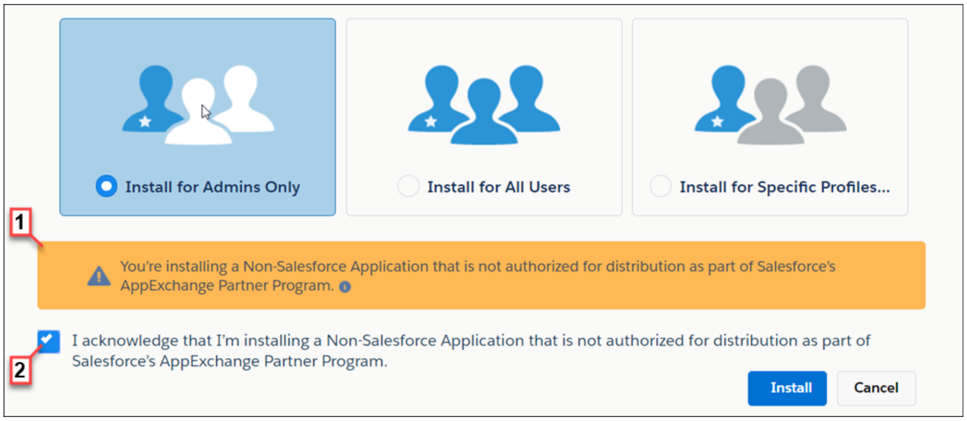
Note: Some related components are automatically included in the package even though they might not display in the Package Components list. For example, when you add a custom object to a package, its custom fields, page layouts, and relationships with standard objects are automatically included. For a complete list of components, see Components Automatically Added to Packages on page 39.

3. Click **Upload**.

You will receive an email that includes an installation link when your package has been uploaded successfully. Wait a few moments before clicking the installation link or distributing it to others, as it might take a few minutes for it to become active.

Install Notifications for Unauthorized Managed Packages

When you distribute a managed package that the AppExchange Partner Program hasn't authorized, we notify customers during the installation process. The notification is removed after the package is approved.



You're installing a Non-Salesforce Application that is not authorized for distribution as part of Salesforce's AppExchange Partner Program.

☑ I acknowledge that I'm installing a Non-Salesforce Application that is not authorized for distribution as part of Salesforce's AppExchange Partner Program.

The notification appears when customers configure the package installation settings (1). Before customers install the package, they must confirm that they understand that the package isn't authorized for distribution (2).

The notification displays when a managed package:

- Has never been through security review or is under review
- Didn't pass the security review
- Isn't authorized by the AppExchange Partner Program for another reason

If the AppExchange Partner Program approves the package, it's authorized for distribution, and the notification is removed. When you publish a new version of the package, it's automatically authorized for distribution.

For information about the AppExchange Partner Program and its requirements, visit the Salesforce Partner Community.

Components Available in Managed Packages

A component is part of a managed package, such as custom objects and custom fields. You can combine components in a package to produce powerful features or applications. In managed packages, you can upgrade some components.

Not all components can be packaged for distribution. If you create an app with components that aren't packageable, your subscribers must create and configure the components after they install your app. Keep packageable components in mind as you develop.

The following components are available in a managed package.

Upgradeable

Some components are updated to a newer version when a package is upgraded.

- **No**: The component isn't upgraded.
- **Yes**: The component is upgraded.

Subscriber Deletable

A subscriber or installer of a package can delete the component.

- **No**: The subscriber can't delete the component.
- **Yes**: The subscriber can delete the component.

Developer Deletable

A developer can delete some components after the package is uploaded as Managed - Released. Deleted components aren't removed from Salesforce during a package upgrade. The Protectable attribute contains more details on deleting components.

- **No**: The developer can't delete a Managed - Released component.
- **Yes**: The developer can delete a Managed - Released component.

Protectable

Developers can mark certain components as protected. Protected components can't be linked to or referenced by components created in a subscriber org. A developer can delete a protected component in a future release without worrying about failing installations. However, once a component is marked as unprotected and is released globally, the developer can't delete it. When the subscriber upgrades to a version of the package where the component is deleted, the component is removed from Salesforce.

- **No**: The component can't be marked protected.
- **Yes**: The component can be marked protected.

IP Protection

Certain components automatically include intellectual property protection, such as obfuscating Apex code. The exceptions are Apex methods declared as global, meaning that the subscriber can view the method signatures. Users on AppExchange can view information in the components that you package and publish. Use caution when adding your code to a custom s-control, formula, Visualforce page, or any other component that you can't hide in your app.

- **No**: The component doesn't support intellectual property protection.
- **Yes**: The component supports intellectual property protection.

Component	Upgradeable	Subscriber Deletable	Developer Deletable	Protectable	IP Protection
Action	Yes	No	No	No	No
Analytics Application	No	No	No	No	No
Analytics Dashboard	No	No	No	No	No
Analytics Dataflow	Yes	No	No	No	No
Analytics Dataset	No	No	No	No	No
Analytics Dataset Metadata	No	No	No	No	No
Analytics Lens	No	No	No	No	No

Component	Upgradeable	Subscriber Deletable	Developer Deletable	Protectable	IP Protection
Analytics Recipe	No	No	No	No	No
Workflow Email Alert	Yes	No	Yes, if protected	Yes	No
Apex Class	Yes	No	Yes (if not set to `global` access)	No	Yes
Apex Sharing Reason	Yes	No	No	No	No
Apex Sharing Recalculation	No	Yes	Yes	No	No
Apex Trigger	Yes	No	Yes	No	Yes
Application	Yes	Yes	Yes	No	No
Article Type	Yes	No	No	No	No
Call Center	No	Yes	No	No	No
Compact Layout	Yes	No	No	No	No
Connected App[1]	Yes	Yes	Yes	No	No
Custom Button or Link	Yes	Yes[2]	Yes[3]	No, except custom links (for Home page only)	No
Custom Console Components [1]	Yes	Yes[2]	Yes[3]	No	No
Custom Field on Standard or Custom Object	Yes	Yes[2]	Yes[3]	No	No
Custom Field on Custom Metadata Type	Yes	No	No	No	No
Custom Help Menu Section	Yes	No	No	No	No
Custom Label	Yes	No	Yes, if protected	Yes	No
Custom Metadata Records	Yes	No	Yes, if protected	Yes	Yes
Custom Metadata Types	Yes	No	No	Yes	Yes
Custom Object	Yes	Yes[2]	Yes[3]	No	No

[1] Requires a Service Cloud license.

Component	Upgradeable	Subscriber Deletable	Developer Deletable	Protectable	IP Protection
Custom Permission	Yes	No	No	Yes	No
Custom Report Type	Yes	No	No	No	No
Custom Setting	Yes	Yes[2]	Yes[3]	No	Yes
Dashboard	No	Yes	Yes	No	No
Data Classification on Custom Fields	No	Yes	Yes	No	No
Document[7] (10-MB limit)	No	Yes	Yes	No	No
Email Template	No	Yes	Yes	No	No
External Data Source	Yes	No	No	No	No
External Services[5]	Yes	No	Yes	No	No
Field Set	Yes	Yes[2]	Yes[3]	No	No
Lightning page	Yes	No	No	No	No
Flow	Yes	No	No	No	Yes, except templates
Folder	No	Yes	Yes	No	No
Global Picklist	Yes	Yes	Yes	No	No
Home Page Component	Yes	No	No	No	No
Home Page Layout	No	Yes	Yes	No	No
Letterhead	No	Yes	Yes	No	No
Lightning Application	Yes	No	No	No	No
Lightning Component	Yes	No	No	No	No
Lightning Event	Yes	No	No	No	No
Lightning Interface	Yes	No	No	No	No
Lightning Web Component	Yes	No	No	No	No
List View	No	Yes	Yes	No	No
Named Credential[5]	Yes	No	No	No	No

Component	Upgradeable	Subscriber Deletable	Developer Deletable	Protectable	IP Protection
Next Best Action Recommendation Strategy	Yes	No	No	No	Yes, except templates
Page Layout	No	Yes	Yes	No	No
Path Assistant	Yes	Yes	Yes	No	No
Permission Set	Yes	Yes[2]	Yes[3]	No	No
Platform Cache	No	No	No	No	No
Platform Event Channel	No	No	No	No	No
Platform Event Channel Member	No	No	No	No	No
Process	See Flow				
Prompts (In-App Guidance)	Yes	No	No	No	No
Record Type	Yes	Yes[2]	Yes[3]	No	No
Remote Site Setting	No	Yes	Yes	No	No
Report	No	Yes	Yes	No	No
Reporting Snapshot	No	Yes	Yes	No	No
Salesforce IoT	Yes	No	No	No	No
S-Control[7] (10-MB limit-)	Yes	Yes[2]	Yes[3]	No	No
Static Resource	Yes	Yes[2]	Yes[3]	No	No
Embedded Service Deployment[6][2]	No	No	No	No	No
Tab	Yes	Yes[2]	Yes[3]	No	No
TimeSheetTemplate	Yes	Yes[2]	Yes[3]	No	No
Translation	Yes	No	No	No	No
Validation Rule	Yes	Yes[2]	Yes[2]	No	No
Visualforce Component	Yes	Yes[4]	Yes[3]	No	Yes

[2] Requires a Service Cloud license.

Component	Upgradeable	Subscriber Deletable	Developer Deletable	Protectable	IP Protection
Visualforce Page	Yes	Yes[2]	Yes[3]	No	No
Workflow Field Update	Yes	No	Yes, if protected	Yes	No
Workflow Outbound Message	Yes	No	Yes, if protected	Yes	No
Workflow Rule	Yes	No	No	No	No
Workflow Task	Yes	No	Yes, if protected	Yes	No

[1] When you remove a connected app that is a component of a package, the app remains available until you update the package. But if you delete the connected app, it's permanently deleted. Any version of the package that contains the deleted connected app is invalidated and can't be installed. You can update a version of the package that *doesn't* contain the connected app as a component. Never delete a connected app that Salesforce distributes, such as the Salesforce app.

[2] If you remove this component type from a new version of your package, the administrator of the subscriber org can delete the component when a subscriber upgrades.

[3] If the ability to remove components is enabled for your packaging org, you can delete these component types, even if they are in a Managed - Released package.

[4] If you remove a public Visualforce component from a new version of your package, the component is removed from the subscriber's org upon upgrade. If the Visualforce component is global, it remains in the subscriber org until the administrator deletes it.

[5] Package developers must add named credential components to the External Services registration package. A subscriber can also create a named credential in Salesforce. However, the subscriber must use the same name as the named credential specified in the External Services registration that references it. Create named credentials manually or with Apex. Be sure to add the named credential to a package so that subscriber orgs can install it. When a subscriber org installs a named credential, it can use the Apex callouts generated by the External Services registration process.

[6] The Salesforce site object isn't packageable. Make sure that the destination org has a site with the same developer name as the site in the source org where the package is created.

Component Attributes and Behaviors

Only some attributes of a component are upgradeable. Many components also behave differently or include other restrictions in a managed package. Consider these behaviors when designing your package.

If you register your namespace after you referenced a flow in a Visualforce page or Apex code, don't forget to add the namespace to the flow name. Otherwise, the package will fail to install.

Deleting Visualforce Pages and Global Visualforce Components

Before you delete Visualforce pages or global Visualforce components from your package, remove all references to public Apex classes and public Visualforce components from the pages or components that you're deleting. After removing the references, upgrade your subscribers to an interim package version before you delete the page or global component.

[7] The combined size of S-Controls and documents must be less than 10 MB.

SEE ALSO:

Editing Components and Attributes After Installation

Components Automatically Added to Packages

Delete Components in Managed Packages

Components Available in Unmanaged Packages

Not all components can be packaged for distribution. The following table lists the components that are available in an unmanaged package, how the component is included in the package, and whether the component supports automatic renaming.

Packaged Explicitly or Implicitly

Components can be added either explicitly or implicitly. Explicit components must be included directly in the package, while implicit components are automatically added. For example, if you create a custom field on a standard object, you must explicitly add the custom field to your package. However, if you create a custom object and add a custom field to it, the field is implicitly added to the package when you add the custom object.

- **Explicitly**: The component must be manually added to the package.
- **Implicitly**: The component is automatically added to the package when another dependent component, usually a custom object, is added.

Automatic Renaming

Salesforce can resolve naming conflicts automatically on install.

- **No**: If a naming conflict occurs the install is blocked.
- **Yes**: If a naming conflict occurs Salesforce can optionally change the name of the component being installed.

Component	Packaged Explicitly or Implicitly	Automatic Renaming
Reporting Snapshot	Explicitly	Yes
Apex Class	Explicitly	No
Apex Sharing Reason	Implicitly On an extension: Explicitly	No
Apex Sharing Recalculation	Implicitly	No
Apex Trigger	On a standard or extension object: Explicitly On an object in the package: Implicitly	No
Application	Explicitly	No
Custom Button or Link	On a standard object: Explicitly On a custom object: Implicitly	No
Custom Field	On a standard object: Explicitly On a custom object: Implicitly	No
Custom Label	Implicitly	No

Component	Packaged Explicitly or Implicitly	Automatic Renaming
Custom Object	Explicitly	No
Custom Permission	Implicitly With required custom permissions: Explicitly	No
Custom Report Type	Explicitly	No
Custom Setting	Explicitly	No
Dashboard	Explicitly In a folder: Implicitly	Yes
Document* (10 MB limit)	Explicitly In a folder: Implicitly	Yes
Email Template	Explicitly In a folder: Implicitly	Yes
External Data Source	Explicitly Referenced by an external object: Implicitly Assigned by a permission set: Implicitly	No
Flow Definition	Implicitly	No
Folder	Explicitly	Yes
Home Page Component	Explicitly	No
Home Page Layout	Explicitly	No
Letterhead	Explicitly	Yes
Lightning Application	Explicitly	No
Lightning Component	Explicitly	No
Lightning Event	Explicitly	No
Lightning Interface	Explicitly	No
List View	On a standard object: Explicitly On a custom object: Implicitly	Yes
Named Credential	Explicitly	No
Page Layout	On a standard object: Explicitly On a custom object: Implicitly	No
Record Type	On a standard object: Explicitly On a custom object: Implicitly	No

Component	Packaged Explicitly or Implicitly	Automatic Renaming
Report	Explicitly In a folder: Implicitly	Yes
S-Control[*] (10 MB limit)	Explicitly	No
Static Resource	Explicitly	No
Tab	Explicitly	No
Translation	Explicitly	No
Validation Rule	On a standard object: Explicitly On a custom object: Implicitly	No
Visualforce Component	Explicitly	No
Visualforce Page	Explicitly	No
Workflow Email Alert	Explicitly	No
Workflow Field Update	Explicitly	No
Workflow Outbound Message	Explicitly	No
Workflow Rule	Explicitly	No
Workflow Task	Explicitly	No

[*] The combined size of S-Controls and documents must be less than 10 MB.

SEE ALSO:

Components Automatically Added to Packages

Editing Components and Attributes After Installation

The following table shows which components and attributes are editable after installation from a managed package.

Developer Editable

The developer can edit the component attributes in this column. These attributes are locked in the subscriber's organization.

Subscriber and Developer Editable

The subscriber and developer can edit the component attributes in this column. However, these attributes aren't upgradeable. Only new subscribers receive the latest changes.

Locked

After a package is Managed - Released, the developer and subscriber can't edit the component attributes in this column.

Component	Developer Editable	Subscriber and Developer Editable	Locked
Action		- Action layout - Predefined values for action fields	- All fields
Apex Class	- API Version - Code		- Name
Apex Sharing Reason	- Reason Label		- Reason Name
Apex Sharing Recalculation		- Apex Class	
Apex Trigger	- API Version - Code		- Name
Application	- Show in Lightning Experience (SalesforceClassic only) - Selected Items (Lightning Experience only) - Utility Bar (Lightning Experience only)	- All attributes, except App Name and Show in Lightning Experience (Salesforce Classic only) - All attributes, except Developer Name, Selected Items, and Utility Bar (Lightning Experience only)	- App Name (SalesforceClassic only) - Developer Name (Lightning Experience only)
Article Types	- Description - Label - Plural Label - Starts with a Vowel Sound	- Available for Customer Portal - Channel Displays - Default Sharing Model - Development Status - Enable Divisions - Grant Access Using Hierarchy - Search Layouts	- Name
Compact Layout	- All attributes		
Connected App	- Access Method - Canvas App URL - Callback URL - Connected App Name - Contact Email	- ACS URL - Entity ID - IP Relaxation - Manage Permission Sets - Manage Profiles	- API Name - Created Date/By - Consumer Key - Consumer Secret - Installed By

Component	Developer Editable	Subscriber and Developer Editable	Locked
	- Contact Phone - Description - Icon URL - Info URL - Trusted IP Range - Locations - Logo Image URL - OAuth Scopes	- Mobile Start URL - Permitted Users - Refresh Token Policy - SAML Attributes - Service Provider Certificate - Start URL - Subject Type	- Installed Date - Last Modified Date/By - Version
Custom Button or Link	- Behavior - Button or Link URL - Content Source - Description - Display Checkboxes - Label - Link Encoding	- Height - Resizeable - Show Address Bar - Show Menu Bar - Show Scrollbars - Show Status Bar - Show Toolbars - Width - Window Position	- Display Type - Name
Custom Field	- Auto-Number Display Format - Decimal Places - Description - Default Value - Field Label - Formula - Length - Lookup Filter - Related List Label - Required - Roll-Up Summary Filter Criteria	- Chatter Feed Tracking - Help Text - Mask Type - Mask Character - Sharing Setting - Sort Picklist Values - Track Field History	- Child Relationship Name - Data Type - External ID - Field Name - Roll-Up Summary Field - Roll-Up Summary Object - Roll-Up Summary Type - Unique
Custom Label	- Category - Short Description - Value		- Name
Custom Object	- Description - Label	- Allow Activities - Allow Reports	- Object Name - Record Name Data Type

Component	Developer Editable	Subscriber and Developer Editable	Locked
	- Plural Label - Record Name - Starts with a Vowel Sound	- Available for Customer Portal - Context-Sensitive Help Setting - Default Sharing Model - Development Status - Enable Divisions - Enhanced Lookup - Grant Access Using Hierarchy - Search Layouts - Track Field History	- Record Name Display Format
Custom Permission	- Connected App - Description - Label - Name		
Custom Report Type	- All attributes except Development Status and Report Type Name	- Development Status	- Report Type Name
Custom Setting	- Description - Label		- Object Name - Setting Type - Visibility
Dashboard		- All attributes except Dashboard Unique Name	- Dashboard Unique Name
Document		- All attributes except Document Unique Name	- Document Unique Name
Email Template		- All attributes except Email Template Name	- Email Template Name
External Data Source	- Type	- Auth Provider - Certificate - Custom Configuration - Endpoint - Identity Type	- Name

Component	Developer Editable	Subscriber and Developer Editable	Locked
		- OAuth Scope - Password - Protocol - Username	
Field Set	- Description - Label - Available fields	- Selected fields (only subscriber controlled)	- Name
Flow	- Entire flow	- Flow Label - Description - Status	- Flow API Name - URL
Folder		- All attributes except Folder Unique Name	- Folder Unique Name
Home Page Component	- Body - Component Position		- Name - Type
Home Page Layout		- All attributes except Layout Name	- Layout Name
Letterhead		- All attributes except Letterhead Name	- Letterhead Name
Lightning Application	- API Version - Description - Label - Markup		Name
Lightning Component	- API Version - Description - Label - Markup		Name
Lightning Event	- API Version - Description - Label - Markup		Name

Component	Developer Editable	Subscriber and Developer Editable	Locked
Lightning Interface	• API Version • Description • Label • Markup		Name
Lightning Page	• Lightning page		
Lightning Web Component	• API Version • Description • Label • Markup		Name
List View		• All attributes except View Unique Name	• View Unique Name
Named Credential	• Endpoint • Label	• All attributes except Endpoint, Label, and Name	• Name
Page Layout		• All attributes except Page Layout Name	• Page Layout Name
Path Assistant		IsActive field	SobjectType, SobjectProcessField, and RecordType
Permission Set	• Description • Label • Custom object permissions • Custom field permissions • Apex class access settings • Visualforce page access settings		• Name
Platform Cache			• All attributes
Record Type	• Description • Record Type Label	• Active • Business Process	• Name
Remote Site Setting		All attributes except Remote Site Name	• Remote Site Name

Component	Developer Editable	Subscriber and Developer Editable	Locked
Report		• All attributes except Report Unique Name	• Report Unique Name
Reporting Snapshot		• All attributes except Reporting Snapshot Unique Name	• Reporting Snapshot Unique Name
S-Control	• Content • Description • Encoding • Filename • Label	• Prebuild in Page	• S-Control Name • Type
Static Resource	• Description • File		• Name
Tab	• Description • Encoding • Has Sidebar • Height • Label • S-control • Splash Page Custom Link • Type • URL • Width	• Tab Style	• Tab Name
Translation	• All attributes		
Validation Rule	• Description • Error Condition Formula • Error Location • Error Message	• Active	• Rule Name
Visualforce Component	• API Version • Description • Label • Markup		• Name

Component	Developer Editable	Subscriber and Developer Editable	Locked
Visualforce Page	• API Version • Description • Label • Markup		• Name
Workflow Email Alert		• Additional Emails • Email Template • From Email Address • Recipients	• Description
Workflow Field Update	• Description • Field Value • Formula Value	• Lookup	• Name
Workflow Outbound Message	• Description • Endpoint URL • Fields to Send • Send Session ID	• User to Send As	• Name
Workflow Rule	• Description • Evaluation Criteria • Rule Criteria	• Active	• Rule Name
Workflow Task		• Assign To • Comments • Due Date • Priority • Record Type • Status	• Subject

Components Automatically Added to Packages

When adding components to your package, some related components are automatically added, if necessary. For example, if you add a Visualforce page to a package that references a custom controller, that Apex class is also added.

To understand what components are automatically included, review the following list:

When you add this component:	The related components that are automatically added:
Action	Action target object (if it's a custom object), action target field, action record type, predefined field values, action layout; and any custom fields that the action layout or predefined values refer to on the target object
Reporting Snapshot	Reports
Apex class	Custom fields, custom objects, and other explicitly referenced Apex classes, as well as anything else that the Apex class references directly Note: If an Apex class references a custom label, and that label has translations, you must explicitly package the individual languages desired in order for those translations to be included.
Apex trigger	Custom fields, custom objects, and any explicitly referenced Apex classes, as well as anything else that the Apex trigger references directly
Article type	Custom fields, the default page layout
Compact layout	Custom fields
Custom app	Custom tabs (including web tabs), documents (stored as images on the tab), documents folder, asset files
Custom button or link	Custom fields and custom objects
Custom field	Custom objects
Custom home page layouts	Custom home page components on the layout
Custom settings	Apex sharing reasons, Apex sharing recalculations, Apex triggers, custom buttons or links, custom fields, list views, page layouts, record types, validation rules
Custom object	Custom fields, validation rules, page layouts, list views, custom buttons, custom links, record types, Apex sharing reasons, Apex sharing recalculations, and Apex triggers Note: • Apex sharing reasons are unavailable in extensions. • When packaged and installed, only public list views from an app are installed. If a custom object has any custom list views that you want to include in your package, ensure that the list view is accessible by all users.
Custom object (as an external object)	External data source, custom fields, page layouts, list views, custom buttons, and custom links Note: • When packaged and installed, only public list views from an app are installed. If an external object has any custom list views that you want to include in your package, ensure that the list view is accessible by all users. • In managed and unmanaged packages, external objects are included in the custom object component.
Custom tab	Custom objects (including all of its components), s-controls, and Visualforce pages

When you add this component:	The related components that are automatically added:
Dashboard	Folders, reports (including all of its components), s-controls, and Visualforce pages
Document	Folder
Email template	Folder, letterhead, custom fields, and documents (stored as images on the letterhead or template)
Field set	Any referenced fields
Lightning page	Any associated actions
Lightning page tab	Lightning page
Flow	Custom objects, custom fields, Apex classes, and Visualforce pages
Folder	Everything in the folder
Lightning application	All Lightning resources referenced by the application, such as components, events, and interfaces. Custom fields, custom objects, list views, page layouts, and Apex classes referenced by the application.
Lightning component	All Lightning resources referenced by the component, such as nested components, events, and interfaces. Custom fields, custom objects, list views, page layouts, and Apex classes referenced by the component.
Lightning event	Custom fields, custom objects, list views, and page layouts
Lightning interface	Custom fields, custom objects, list views, and page layouts
Lightning web component	All Lightning web component resources referenced by the component, such as nested components and modules. Custom fields, custom objects, list views, page layouts, and Apex classes referenced by the component.
Page layout	Actions, custom buttons, custom links, s-controls, and Visualforce pages
Permission set	Any custom permissions, external data sources, Visualforce pages, record types, and Apex classes that are assigned in the permission set
Record type	Record type mappings, compact layout
Report	Folder, custom fields, custom objects, custom report types, and custom s-controls
S-control	Custom fields and custom objects
Translation	Translated terms for the selected language on any component in the package
Validation rule	Custom fields (referenced in the formula)
Visualforce home page component	Associated Visualforce page
Visualforce pages	Apex classes that are used as custom controllers, Visualforce custom components, and referenced field sets
Workflow rule	All associated workflow alerts, field updates, outbound messages, and tasks; also, if the workflow rule is designed for a custom object, the custom object is automatically included

Note: Some package components, such as validation rules or record types, don't appear in the list of package components, but are included and install with the other components.

Special Behavior of Components in Packages

Building an app for distribution has special considerations and it's important to factor in how packaging affects your app and its components. Use the following information to help you determine what to include in your packages, how to design your app, and how to distribute your managed or unmanaged packages.

Note:

- For more information on the properties of each component in packages, see the packaged components properties table.
- For more information on the attributes of each component in packages, see the component attributes table.
- Component names must be unique within an org. To ensure that your component names don't conflict with those in an installer's org, use a managed package so that all your component names contain your namespace prefix.

Apex Classes or Triggers

Any Apex that is included as part of a package must have at least 75% cumulative test coverage. Each trigger must also have some test coverage. When you upload your package to AppExchange, all tests are run to ensure that they run without errors. In addition, all tests are run when the package is installed in the installer's org. If any test fails, the installer can decide whether to install the package.

Tip: To prevent naming conflicts, Salesforce recommends using managed packages for all packages that contain Apex to ensure that all Apex objects contain your namespace prefix. For example, if an Apex class is called `MyHelloWorld` and your org's namespace is `OneTruCode`, the class is referenced as `OneTruCode.MyHelloWorld`.

Keep the following considerations in mind when including Apex in your package.

- Managed packages receive a unique namespace. This namespace is prepended to your class names, methods, variables, and so on, which helps prevent duplicate names in the installer's org.
- In a single transaction, you can only reference 10 unique namespaces. For example, suppose that you have an object that executes a class in a managed package when the object is updated. Then that class updates a second object, which in turn executes a different class in a different package. Even though the first package didn't access the second package directly, the access occurs in the same transaction. It's therefore included in the number of namespaces accessed in a single transaction.
- If you are exposing any methods as Web services, include detailed documentation so that subscribers can write external code that calls your Web service.
- If an Apex class references a custom label and that label has translations, explicitly package the individual languages desired to include those translations in the package.
- If you reference a custom object's sharing object (such as MyCustomObject__share) in Apex, you add a sharing model dependency to your package. Set the default org-wide access level for the custom object to Private so other orgs can install your package successfully.
- The code contained in an Apex class, trigger, or Visualforce component that's part of a managed package is obfuscated and can't be viewed in an installing org. The only exceptions are methods declared as global. You can view global method signatures in an installing org. In addition, License Management Org users with the View and Debug Managed Apex permission can view their packages' obfuscated Apex classes when logged in to subscriber orgs via the Subscriber Support Console.
- You can use the `deprecated` annotation in Apex to identify `global` methods, classes, exceptions, enums, interfaces, and variables that can't be referenced in later releases of a managed package. So you can refactor code in managed packages as the requirements evolve. After you upload another package version as Managed - Released, new subscribers that install the latest package version cannot see the deprecated elements, while the elements continue to function for existing subscribers and API integrations.

- Any Apex contained in an unmanaged package that explicitly references a namespace cannot be uploaded.
- Apex code that refers to Data Categories can't be uploaded.
- Before you delete Visualforce pages or global Visualforce components from your package, remove all references to public Apex classes and public Visualforce components from the pages or components that you're deleting. After removing the references, upgrade your subscribers to an interim package version before you delete the page or global component.

Apex Sharing Reasons

Apex sharing reasons can be added directly to a package, but are only available for custom objects.

Connected Apps

- Connected apps can be added to managed packages, only. Connected apps are not supported for unmanaged packages.
- Subscribers or installers of a package can't delete a connected app by itself; they can only uninstall its package. A developer can delete a connected app after a package is uploaded as Managed - Released. The connected app will be deleted in the subscriber's org during a package upgrade.
- If you update a connected app and include it in a new package version, upgrading that package in a customer org updates the existing connected app.
- If you push upgrade a package containing a connected app whose OAuth scope or IP ranges have changed from the previous version, the upgrade fails. This security feature blocks unauthorized users from gaining broad access to a customer org by upgrading an installed package. A customer can still perform a pull upgrade of the same package. This upgrade is allowed because it's with the customer's knowledge and consent.
- You can add an existing connected app (one created before Summer '13) to a managed package. You can also combine new and existing connected apps in the same managed package.
- For connected apps created before Summer '13, the existing install URL is valid until you package and upload a new version. After you upload a new version of the package with an updated connected app, the install URL no longer works.

Custom Console

A package that has a custom console component can only be installed in an org with the Service Cloud license or Sales Console permission enabled.

Custom Fields

- When explicitly referencing a picklist value in code, keep in mind that subscribers can add, edit, and delete picklist field values for custom fields. Carefully consider this possibility when explicitly referencing a picklist value in code. Developers can add and delete picklist values, but new picklist values are not installed into the subscriber's org for existing fields during a package upgrade. Picklist values deleted by the developer are still available in the subscriber's org.
- Package upgrades remove dependent picklist values that are saved in a managed custom field.
- Developers can add required and universally required custom fields to managed packages as long as they have default values.
- Auto-number type fields and required fields cannot be added after the object is uploaded in a Managed - Released package.
- Subscriber orgs can't install roll-up summary fields that summarize detail fields set to *protected*.

Custom Labels

If a label is translated, the language must be explicitly included in the package in order for the translations to be included in the package. Subscribers can override the default translation for a custom label.

Custom Objects

- If a developer enables the `Allow Reports` or `Allow Activities` attributes on a packaged custom object, the subscriber's org also has these features enabled during an upgrade. Once enabled in a Managed - Released package, the developer and the subscriber cannot disable these attributes.
- Standard button and link overrides are also packageable.

- In your extension package, if you want to access history information for custom objects contained in the base package, work with the base package owner to:

  1. Enable history tracking in the release org of the base package.
  2. Upload a new version of the base package.
  3. Install the new version of the base package in the release org of the extension package to access the history tracking info.

  As a best practice, don't enable history tracking for custom objects contained in the base package directly in the extension package's release org. Doing so can result in an error when you install the package and when you create patch orgs for the extension package.

Custom Permissions

If you deploy a change set with a custom permission that includes a connected app, the connected app must already be installed in the destination org.

Custom Report Types

A developer can edit a custom report type in a managed package after it's released, and can add new fields. Subscribers automatically receive these changes when they install a new version of the managed package. However, developers can't remove objects from the report type after the package is released. If you delete a field in a custom report type that's part of a managed package, and the deleted field is part of bucketing or used in grouping, you receive an error message.

Custom Settings

- If a custom setting is contained in a managed package, and the `Visibility` is specified as Protected, the custom setting isn't contained in the list of components for the package on the subscriber's org. All data for the custom setting is hidden from the subscriber.

Custom Tabs

- The tab style for a custom tab must be unique within your app. However, it does not need to be unique within the org where it's installed. A custom tab style doesn't conflict with an existing custom tab in the installer's environment.
- To provide custom tab names in different languages, from Setup, enter `Rename Tabs and Labels` in the Quick Find box, then select **Rename Tabs and Labels**.
- Subscribers cannot edit custom tabs in a managed package.

Customer Portal and Partner Portal

Packages referring to Customer Portal or partner portal fields are supported. The subscriber installing the package must have the respective portal enabled to install the package.

Dashboard Components

Developers of managed packages must consider the implications of introducing dashboard components that reference reports released in a previous version of the package. If the subscriber deleted the report or moved the report to a personal folder, the dashboard component referencing the report is dropped during the installation. Also, if the subscriber has modified the report, the report results can impact what displays in the dashboard component. As a best practice, release a dashboard and the related reports in the same version.

Divisions

- When divisions are enabled on a custom object in a package, the subscribing org must have the divisions feature enabled to install the package.
- Setting the division filter on a report does not cause a dependency. The setting is dropped when installed into the subscriber's org.
- Summarizing by the object's division field—for example, Account Division—in a report causes a dependency.
- If the object's division field in a report is included as a column, and the subscriber's org does not support divisions on the object, the column is dropped during installation.

- If you install a custom report type that includes an object's division field as a column, that column is dropped if the org does not support divisions.

External Data Sources

- After installing an external data source from a managed or unmanaged package, the subscriber must reauthenticate to the external system.
  - For password authentication, the subscriber must re-enter the password in the external data source definition.
  - For OAuth, the subscriber must update the callback URL in the client configuration for the authentication provider, then reauthenticate by selecting `Start Authentication Flow on Save` on the external data source.
- Certificates aren't packageable. If you package an external data source that specifies a certificate, make sure that the subscriber org has a valid certificate with the same name.

External Objects

- In managed and unmanaged packages, external objects are included in the custom object component.
- Include External Change Data Tracking components in a managed package by selecting your test from the Apex Class Component Type list. The trigger, test, external data source, external object, and other related assets are brought into the package for distribution.

Field Dependencies

- Developers and subscribers can add, change, or remove field dependencies.
- If the developer adds a field dependency, it is added during installation unless the subscriber has already specified a dependency for the same field.
- If a developer removes a dependency, this change is not reflected in the subscriber's org during an upgrade.
- If the developer introduces a new picklist value mapping between the dependent and controlling fields, the mapping is added during an upgrade.
- If a developer removes a picklist value mapping, the change is not reflected in the subscriber's org during an upgrade.

Field Sets

Field sets in installed packages perform different merge behaviors during a package upgrade:

If a package developer:	Then in the package upgrade:
Changes a field from **Unavailable** to **Available for the Field Set** or **In the Field Set**	The modified field is placed at the end of the upgraded field set in whichever column it was added to.
Adds a field	The new field is placed at the end of the upgraded field set in whichever column it was added to.
Changes a field from **Available for the Field Set** or **In the Field Set** to **Unavailable**	The field is removed from the upgraded field set.
Changes a field from **In the Field Set** to **Available for the Field Set** (or vice versa)	The change is not reflected in the upgraded field set.

Note: Subscribers aren't notified of changes to their installed field sets. The developer must notify users ——of changes to released field sets through the package release notes or other documentation. Merging has the potential to remove fields in your field set.

When a field set is installed, a subscriber can add or remove any field.

Flows

- When you upload a package or package version, the active flow version is included. If the flow has no active version, the latest version is packaged.
- To update a managed package with a different flow version, activate that version and upload the package again. Or deactivate all versions of the flow, make sure the latest flow version is the one to distribute, and then upload the package.
- In a development org, you can't delete a flow or flow version after you upload it to a released or beta managed package.
- You can't delete flows from Managed - Beta package installations in development org.
- You can't delete a flow from an installed package. To remove a packaged flow from your org, deactivate it and then uninstall the package.
- If you have multiple versions of a flow installed from multiple unmanaged packages, you can't remove only one version by uninstalling its package. Uninstalling a package—managed or unmanaged—that contains a single version of the flow removes the entire flow, including all versions.
- You can't include flows in package patches.
- An active flow in a package is active after it's installed. The previous active version of the flow in the destination org is deactivated in favor of the newly installed version. Any in-progress flows based on the now-deactivated version continue to run without interruption but reflect the previous version of the flow.
- Upgrading a managed package in your org installs a new flow version only if there's a newer flow version from the developer. After several upgrades, you can end up with multiple flow versions.
- If you install a managed package that contains multiple flow versions in a fresh destination org, only the latest flow version is deployed.
- If you install a flow from an unmanaged package that has the same name but a different version number as a flow in your org, the newly installed flow becomes the latest version of the existing flow. However, if the packaged flow has the same name and version number as a flow already in your org, the package install fails. You can't overwrite a flow.
- Flow Builder can't open flows that are installed from managed packages, unless they're templates.
- You can't create a package that contains flows invoked by both managed and unmanaged package pages. As a workaround, create two packages, one for each type of component. For example, suppose that you want to package a customizable flow invoked by a managed package page. Create one unmanaged package with the flow that users can customize. Then create another managed package with the Visualforce page referencing the flow (including namespace) from the first package.
- If you're translating a flow from a managed package, the flow's Master Definition Name doesn't appear on the Translate page or the Override page. To update the translation for the Master Definition Name, edit the flow label and then update the translation from the Translate page.
- If any of the following elements are used in a flow, packageable components that they reference aren't included in the package automatically. To deploy the package successfully, manually add those referenced components to the package.
  - Post to Chatter
  - Send Email
  - Submit for Approval
- If a flow references a Lightning component that depends on a CSP Trusted Site, the trusted site isn't included in the package or change set automatically.

Folders

- Components that Salesforce stores in folders, such as documents, cannot be added to packages when stored in personal and unfiled folders. Put documents, reports, and other components that Salesforce stores in folders in one of your publicly accessible folders.

- Components such as documents, email templates, reports, or dashboards are stored in new folders in the installer's org using the publisher's folder names. Give these folders names that indicate they are part of the package.
- If a new report, dashboard, document, or email template is installed during an upgrade, and the folder containing the component was deleted by the subscriber, the folder is re-created. Any components in the folder that were previously deleted are not restored.
- The name of a component contained in a folder must be unique across all folders of the same component type, excluding personal folders. Components contained in a personal folder must be unique within the personal folder only.

Home Page Components

When you package a custom home page layout, all the custom home page components included on the page layout are automatically added. Standard components such as Messages & Alerts are not included in the package and do not overwrite the installer's Messages & Alerts. To include a message in your custom home page layout, create an HTML Area type custom Home tab component containing your message. From Setup, enter `Home Page Components` in the `Quick Find` box, then select **Home Page Components**. Then add the message to your custom home page layout.

Home Page Layouts

Once installed, your custom home page layouts are listed with all the subscriber's home page layouts. Distinguish them by including the name of your app in the page layout name.

List Views

List views associated with queues cannot be included in a package.

Multi-Currency

- If a subscriber installs a report or custom report type that includes an object's currency field as a column, that column is dropped if the subscriber's org is not enabled for multiple currencies.
- Referencing an object's currency field in a report's criteria—for example, `Account Currency`—causes a dependency.
- Summarizing by an object's currency field in a report causes a dependency.
- Using a currency designation in a report criteria value—for example, "Annual Revenue equals GBP 100"—does not cause a dependency. The report generates an error when run in the installers org if it does not support the currency.
- If an object's currency field in a report is included as a column and the subscriber's org is not enabled for multiple currencies, that column is dropped during installation.
- If a subscriber installs a custom report type that includes an object's currency field as a column, that column is dropped if the org is not enabled for multiple currencies.

Named Credentials

- After installing a named credential from a managed or unmanaged package, the subscriber must reauthenticate to the external system.
  - For password authentication, the subscriber reenters the password in the named credential definition.
  - For OAuth, the subscriber updates the callback URL in the client configuration for the authentication provider and then reauthenticates by selecting **Start Authentication Flow on Save** on the named credential.
- Named credentials aren't automatically added to packages. If you package an external data source or Apex code that specifies a named credential as a callout endpoint, add the named credential to the package. Alternatively, make sure that the subscriber org has a valid named credential with the same name.

  If you have multiple orgs, you can create a named credential with the same name but with a different endpoint URL in each org. You can then package and deploy—on all the orgs—one callout definition that references the shared name of those named credentials. For example, the named credential in each org can have a different endpoint URL to accommodate differences in development and production environments. If an Apex callout specifies the shared name of those named credentials, the Apex class that defines the callout can be packaged and deployed on all those orgs without programmatically checking the environment.

- Certificates aren't packageable. If you package a named credential that specifies a certificate, make sure that the subscriber org has a valid certificate with the same name.

Page Layouts

The page layout of the person uploading a package is the layout used for Group and Professional Edition orgs and becomes the default page layout for Enterprise, Unlimited, Performance, and Developer Edition orgs.

Package page layouts alongside complimentary record types if the layout is being installed on an existing object. Otherwise, manually apply the installed page layouts to profiles.

If a page layout and a record type are created as a result of installing a package, the uploading user's page layout assignment for that record type is assigned to that record type for all profiles in the subscriber org, unless a profile is mapped during an install or upgrade.

Permission Sets

You can include permission sets as components in a package, with the following permissions and access settings:

- Assigned custom apps
- Custom object permissions
- External object permissions
- Custom field permissions
- Custom permissions
- Custom tab visibility settings
- Apex class access
- Visualforce page access
- External data source access

Note: Standard tab visibility settings aren't included in permission set components.

Use permission sets to install or upgrade a collection of permissions. In contrast to profile settings, permission sets don't overwrite profiles.

Picklist Values

- Subscribers can rename or delete picklist field values. Keep this in mind when explicitly referencing a picklist field value in Apex.
- Picklist field values can be added or deleted in the developer's organization. Upon upgrade, no new values are installed. Any values deleted by the developer are still available in the subscriber's organization until the subscriber deletes them.
- Global value sets can be added to developer and subscriber orgs. Global value sets have the following behavior during a package upgrade:
  - Label and API names for field values don't change in subscriber orgs.
  - New field values aren't added to the subscriber orgs.
  - Active and inactive value settings in subscriber orgs don't change.
  - Default values in subscriber orgs don't change.
  - Global value set label names change if the package upgrade includes a global value set label change.

Profile Settings

Profile settings include the following for components in the package:

- Assigned custom apps
- Assigned connected apps
- Tab settings

- Page layout assignments
- Record type assignments
- Custom field permissions
- Custom metadata type permissions
- Custom object permissions
- Custom permissions
- Custom settings permissions
- External object permissions
- Apex class access
- Visualforce page access
- External data source access

Profile settings overwrite existing profiles in the installer's org with specific permission and setting changes. Profile Settings get applied only if the package is installed in the target org for specific profiles and not if it is installed for all profiles.

Record Types

- If record types are included in the package, the subscriber's org must support record types to install the package.
- When a new picklist value is installed, it is associated with all installed record types according to the mappings specified by the developer. A subscriber can change this association.
- Referencing an object's record type field in a report's criteria—for example, `Account Record Type`—causes a dependency.
- Summarizing by an object's record type field in a report's criteria—for example, `Account Record Type`—causes a dependency.
- If an object's record type field is included as a column in a report, and the subscriber's org is not using record types on the object or does not support record types, the column is dropped during installation.
- If you install a custom report type that includes an object's record type field as a column, that column is dropped if the org does not support record types or the object does not have record types defined.

Reporting Snapshots

Developers of managed packages must consider the implications of introducing reporting snapshots that reference reports released in a previous version of the package. If the subscriber deleted the report or moved the report to a personal folder, the reporting snapshot referencing the report isn't installed, even though the Package Installation page indicates that it will be. Also, if the subscriber has modified the report, the report can return results impacting the information displayed by the reporting snapshot. As a best practice, the developer releases the reporting snapshot and the related reports in the same version.

Because the subscriber selects the running use, some reporting snapshot field mappings could become invalid if the running user doesn't have access to source or target fields.

Reports

If a report includes elements that cannot be packaged, those elements are dropped or downgraded, or the package upload fails. For example:

- Hierarchy drill-downs are dropped from activity and opportunities reports.
- Filters on unpackageable fields are automatically dropped (for example, in filters on standard object record types).
- Package upload fails if a report includes filter logic on an unpackageable field (for example, in filters on standard object record types).
- Lookup values on the `Select Campaign` field of standard campaign reports are dropped.
- Reports are dropped from packages if they have been moved to a private folder or to the Unfiled Public Reports folder.
- When a package is installed into an org that does not have Chart Analytics 2.0:

  - Combination charts are downgraded instead of dropped. For example, a combination vertical column chart with a line added is downgraded to a simple vertical column chart; a combination bar chart with additional bars is downgraded to a simple bar chart.
  - Unsupported chart types, such as donut and funnel, are dropped.

S-Controls

Only s-controls in unmanaged packages created before January 2010 can be installed by subscribers.

S-controls have been deprecated and are superseded by Visualforce pages.

Translation Workbench

- If you have enabled the translation workbench and added a language to your package, any associated translated values are automatically packaged for the appropriate components in your package. Make sure that you have provided translations for all possible components.
- An installer of your package can see which languages are supported on the package detail page. The installer does not need to enable anything to have the packaged language translations appear. The only reasons installers might want to enable the translation workbench are to change translations for unmanaged components after installation, override custom label translations in a managed package, or translate into more languages.
- If you are designing a package extension, you can include translations for the extension components but not translations for components in the base package.

Validation Rules

For custom objects that are packaged, any associated validation rules are implicitly packaged as well.

Analytics

Analytics components include Analytics applications, dashboards, dataflows, datasets, lenses, recipes, and user XMD. As you package Analytics components, keep these tips and best practices in mind.

- Analytics unmanaged packages, as opposed to managed packages, are considered a developer-only feature and are not supported for general-purpose distribution. While Analytics unmanaged packages work as expected within the constraints of Salesforce unmanaged packages, they aren't subject to the same level of testing as managed packages. Unmanaged packages come without many of the safeguards of managed packages, and are intended for developers familiar with their limitations. Also refer to the relevant topic in the ISV Guide.
- Before a recipe is available for packaging, you must create a dataset with the recipe. The related dataflow must be added to the package along with the recipe for deployment to succeed.
- Connected objects in a recipe aren't included in a managed package. If you deploy a recipe that references a connected object, the recipe in the destination environment points to a randomly selected connected object. To fix the incorrect reference, edit the recipe in the destination environment and select the right connected object.
- Analytics Admin permissions are required to create a package but not for deployment, which requires only Salesforce admin permissions.
- There is no spidering between datasets and dataflows, meaning there is no dependency following. When packaging both, they must be added manually. If they are not, an error appears during deployment. The same is true for change sets—when packaging both datasets and dataflows, add them manually.
- Sharing source and security predicates and aren't included when you package a dataflow.
- Because views are user-specific, they aren't included when you package the dashboard.
- To migrate dashboards with conditional formatting, use change sets. If you migrate manually using JSON copy/paste, the conditional formatting is lost.
- The Winter '18 release contains a beta version of Apex steps, which lets developers include custom Apex functionality in a dashboard to access Salesforce platform features that aren't inherently supported in Analytics. If you include dashboards in a package, Apex steps are not included—migrate Apex classes separately.

- Before the Spring '17 release, images didn't render when deploying a dashboard that used an image widget that referenced image files not available on the target org. There were two workarounds: Manually upload the images, or add a folder containing the images to the package. As of the Spring '17 release, images are packaged with the dashboard, and references between dashboards are maintained. You can't delete a dashboard that is referenced in a link. Either re-create the image, or link the widgets in the dashboard in the source org. Then repackage or fix the link issues in the target org.
- Take care when packaging dataflows. Invalid schema overrides and unsupported or illegal parameters are removed. For example, `Type = dim` is no longer supported. Use `Type = text` instead. Comments in JSON are removed. Nodes can appear in a different order.

Workflow

- Salesforce prevents you from uploading workflow alerts that have a public group, partner user, or role recipient. Change the recipient to a user before uploading your app. During installation, Salesforce replaces that user with the user installing the app, and the installer can customize it as necessary.
- Salesforce prevents you from uploading workflow field updates that change an `Owner` field to a queue. Change the updated field value to a user before uploading your app. During installation, Salesforce replaces that user with the user installing the app, and the installer can customize it as necessary.
- Salesforce prevents you from uploading workflow rules, field updates, and outbound messages that reference a record type on a standard or managed-installed object.
- Salesforce prevents you from uploading workflow tasks that are assigned to a role. Change the `Assigned To` field to a user before uploading your app. During installation, Salesforce replaces that user with the user installing the app, and the installer can customize it as necessary.
- You can package workflow rules and associated workflow actions, such as email alerts and field updates. However, any time-based triggers aren't included in the package. Notify your installers to set up any time-based triggers that are essential to your app.

  Flow triggers aren't packageable. The pilot program for flow trigger workflow actions is closed. If you've already enabled the pilot in your org, you can continue to create and edit flow trigger workflow actions. If you didn't enable the pilot in your org, use the Flows action in Process Builder instead.
- Developers can protect some workflow actions.
- Developers can associate or disassociate workflow actions with a workflow rule at any time. These changes, including disassociation, are reflected in the subscriber's org upon install. In managed packages, a subscriber cannot disassociate workflow actions from a workflow rule if it was associated by the developer.
- References to a specific user in workflow actions, such as the email recipient of a workflow email alert, are replaced by the user installing the package. Workflow actions referencing roles, public groups, account team, opportunity team, or case team roles may not be uploaded.
- References to an org-wide address, such as the `From email address` of a workflow email alert, are reset to Current User during installation.
- On install, all workflow rules newly created in the installed or upgraded package, have the same activation status as in the uploaded package.

Protected Components

Developers can mark certain components as *protected*. Protected components can't be linked to or referenced by components created in a subscriber org. A developer can delete a protected component in a future release without worrying about failing installations. However, once a component is marked as unprotected and is released globally, the developer can't delete it.

The developer can mark the following components as protected in managed packages.

- Custom labels

- Custom links (for Home page only)
- Custom permissions
- Workflow alerts
- Workflow field updates
- Workflow outbound messages
- Workflow tasks
- Workflow flow triggers

  The pilot program for flow trigger workflow actions is closed. If you've already enabled the pilot in your org, you can continue to create and edit flow trigger workflow actions. If you didn't enable the pilot in your org, use the Flows action in Process Builder instead.

Understanding Dependencies

Package dependencies are created when one component references another component, permission, or preference that is required for the component to be valid. Lightning Platform tracks certain dependencies, including:

- Organizational dependencies, such as whether multicurrency or campaigns are enabled
- Component-specific dependencies, such as whether particular record types or divisions exist
- References to both standard and custom objects or fields

Packages, Apex classes, Apex triggers, Visualforce components, and Visualforce pages can have dependencies on components within an organization. These dependencies are recorded on the Show Dependencies page.

Dependencies are important for packaging because any dependency in a component of a package is considered a dependency of the package as a whole.

Note: An installer’s organization must meet all dependency requirements listed on the Show Dependencies page or else the installation will fail. For example, the installer's organization must have divisions enabled to install a package that references divisions.

Dependencies are important for Apex classes or triggers. Any component on which a class or trigger depends must be included with the class or trigger when the code is deployed or packaged.

In addition to dependencies, the *operational scope* is also displayed on the Show Dependencies page. The operational scope is a table that lists any data manipulation language (DML) operations (such as `insert` or `merge`) that Apex executes on a specified object. The operational scope can be used when installing an application to determine the full extent of the application’s database operations.

To view the dependencies and operational scope for a package, Apex class, Apex trigger, or Visualforce page:

1. Navigate to the appropriate component from Setup:
   - For packages, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
   - For Apex classes, enter *`Apex Classes`* in the `Quick Find` box, then select **Apex Classes**.
   - For Apex triggers, from the management settings for the appropriate object, go to Triggers.
   - For Visualforce pages, enter *`Visualforce Pages`* in the `Quick Find` box, then select **Visualforce Pages**.
2. Select the name of the component.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

AppExchange packages and Visualforce are available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Apex available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To upload packages:
- Upload AppExchange Packages

To view Visualforce dependencies:
- Developer Mode

3. Click **View Dependencies** for a package, or **Show Dependencies** for all other components, to see a list of objects that depend upon the selected component.

If a list of dependent objects displays, click **Fields** to access the field-level detail of the operational scope. The field-level detail includes information, such as whether Apex updates a field. For more information, see Field Operational Scope.

Packages, Apex code, and Visualforce pages can depend many components, including but not limited to:

- Custom field definitions
- Validation formulas
- Reports
- Record types
- Apex
- Visualforce pages and components

For example, if a Visualforce page includes a reference to a multicurrency field, such as `{!contract.ISO_code}`, that Visualforce page has a dependency on multicurrency. If a package contains this Visualforce page, it also has a dependency on multicurrency. Any organization that wants to install this package must have multicurrency enabled.

Metadata Access in Apex Code

Use the `Metadata` namespace in Apex to access metadata in your package.

Your package may need to retrieve or modify metadata during installation or update. The `Metadata` namespace in Apex provides classes that represent metadata types, as well as classes that let you retrieve and deploy metadata components to the subscriber org. These considerations apply to metadata in Apex:

- You can create, retrieve, and update metadata components in Apex code, but you can't delete components.
- You can currently access records of custom metadata types and page layouts in Apex.
- Managed packages not approved by Salesforce can't access metadata in the subscriber org, unless the subscriber org enables the **Allow metadata deploy by Apex from non-certified Apex package version** org preference. Use this org preference when doing test or beta releases of your managed packages.

If your package accesses metadata during installation or update, or contains a custom setup interface that accesses metadata, you must notify the user. For installs that access metadata, notify the user in the description of your package. The notice should let customers know that your package has the ability to modify the subscriber org's metadata.

You can write your own notice, or use this sample:

This package can access and change metadata outside its namespace in the Salesforce org where it's installed.

Salesforce verifies the notice during the security review.

For more information, see Metadata in the *Apex Developer Guide*.

About Permission Sets and Profile Settings

Developers can use permission sets or profile settings to grant permissions and other access settings to a package. When deciding to use permission sets or profile settings alone or in combination, consider the similarities and differences.

Behavior	Permission Sets	Profile Settings
What permissions and settings are included?	• Assigned custom apps	• Assigned custom apps

Behavior	Permission Sets	Profile Settings
	• Custom object permissions • External object permissions • Custom field permissions • Custom metadata types permissions • Custom permissions • Custom settings permissions • Custom tab visibility settings • Apex class access • Visualforce page access • External data source access • Record types Note: Although permission sets include standard tab visibility settings, these settings can't be packaged as permission set components. If a permission set includes an assigned custom app, it's possible that a subscriber can delete the app. In that case, when the package is later upgraded, the assigned custom app is removed from the permission set.	• Assigned connected apps • Tab settings • Page layout assignments • Record type assignments • Custom field permissions • Custom metadata type permissions • Custom object permissions • Custom permissions • Custom settings permissions • External object permissions • Apex class access • Visualforce page access • External data source access
Can they be upgraded in managed packages?	Yes.	Profile settings are applied to existing profiles in the subscriber's org on install or upgrade. Only permissions related to new components created as part of the install or upgrade are applied.
Can subscribers edit them?	Subscribers can edit permission sets in unmanaged packages, but not in managed packages.	Yes.
Can you clone or create them?	Yes. However, if a subscriber clones a permission set or creates one that's based on a packaged permission set, it isn't updated in subsequent upgrades. Only the permission sets included in a package are upgraded.	Yes. Subscribers can clone any profile that includes permissions and settings related to packaged components.
Do they include standard object permissions?	No. Also, you can't include object permissions for a custom object in a master-detail relationship where the master is a standard object.	No.

Behavior	Permission Sets	Profile Settings
Do they include user permissions?	No.	No.
Are they included in the installation wizard?	No. Subscribers must assign permission sets after installation.	Yes. Profile settings are applied to existing profiles in the subscriber's org on install or upgrade. Only permissions related to new components created as part of the install or upgrade are applied.
What are the user license requirements?	A permission set is only installed if the subscriber org has at least one user license that matches the permission set. For example, permission sets with the Salesforce Platform user license aren't installed in an org that has no Salesforce Platform user licenses. If a subscriber later acquires a license, the subscriber must reinstall the package to get the permission sets associated with the newly acquired license. Permission sets with no user license are always installed. If you assign a permission set that doesn't include a user license, the user's existing license must allow its enabled settings and permissions. Otherwise, the assignment fails.	None. In a subscriber org, the installation overrides the profile settings, not their user licenses.
How are they assigned to users?	Subscribers must assign packaged permission sets after installing the package.	Profile settings are applied to existing profiles.

Best Practices

- Use permission sets in addition to packaged profiles so your subscribers can easily add new permissions for existing app users.
- If users need access to apps, standard tabs, page layouts, and record types, don't use permission sets as the sole permission-granting model for your app.
- Create packaged permission sets that grant access to the custom components in a package, but not standard Salesforce components.

Custom Profile Settings

When building your AppExchange app, create profiles to define how users access objects and data, and what they can do within your app. For example, profiles specify custom object permissions and the tab visibility for your app. When installing or upgrading your app, admins can associate your custom profiles with existing non-standard profiles. Permissions in your custom profile that are related to new components created as part of the install or upgrade are added to the existing profile. The security settings associated with standard objects and existing custom objects in an installer's organization are unaffected.

Consider these tips when creating custom profiles for apps you want to publish.

- Give each custom profile a name that identifies the profile as belonging to the app. For example, if you're creating a Human Resources app named "HR2GO," a good profile name would be "HR2GO Approving Manager."

- If your custom profiles have a hierarchy, use a name that indicates the profile's location in the hierarchy. For example, name a senior-level manager's profile "HR2GO Level 2 Approving Manager."
- Avoid custom profile names that can be interpreted differently in other organizations. For example, the profile name "HR2GO Level 2 Approving Manager" is open to less interpretation than "Sr. Manager."
- Provide a meaningful description for each profile. The description displays to the user installing your app.

Alternatively, you can use permission sets to maintain control of permission settings through the upgrade process. Permission sets contain a subset of profile access settings, including object permissions, field permissions, Apex class access, and Visualforce page access. These permissions are the same as those available on profiles. You can add a permission set as a component in a package.

Note: In packages, assigned apps and tab settings aren't included in permission set components.

Protecting Your Intellectual Property

The details of your custom objects, custom links, reports, and other installed items are revealed to installers so that they can check for malicious content. However, revealing an app's components prevents developers from protecting some intellectual property.

The following information is important when considering your intellectual property and its protection.

- Only publish package components that are your intellectual property and that you have the rights to share.
- After your components are available on AppExchange, you cannot recall them from anyone who has installed them.
- The information in the components that you package and publish might be visible to customers. Use caution when adding your code to a formula, Visualforce page, or other component that you cannot hide in your app.
- The code contained in an Apex class, trigger, or Visualforce component that's part of a managed package is obfuscated and can't be viewed in an installing org. The only exceptions are methods declared as global. You can view global method signatures in an installing org. In addition, License Management Org users with the View and Debug Managed Apex permission can view their packages' obfuscated Apex classes when logged in to subscriber orgs via the Subscriber Support Console.
- If a custom setting is contained in a managed package, and the `Visibility` is specified as Protected, the custom setting isn't contained in the list of components for the package on the subscriber's org. All data for the custom setting is hidden from the subscriber.

Creating Packaged Applications with Chatter

The objects, field settings, and field settings history of Chatter are packageable. However, an object's field is only tracked if the object itself is tracked. For example, you can create a new custom field on the Account standard object, but the field will only be tracked if you have enabled feed tracking on Accounts.

When developing applications that use Chatter, it's important to be aware that some organizations might not have Chatter enabled. By default, when you upload Chatter applications, the package is only available to organizations that have Chatter enabled. You can change this behavior and allow organizations to install the package even if they don't have Chatter. Note the following:

- You must use a managed package. Unmanaged packages that include Chatter functionality can only be installed in organizations that have Chatter enabled.
- DML operations and SOSL, and SOQL calls will throw a runtime exception if the subscriber organization does not have Chatter enabled. You must catch and handle any Apex exceptions that are thrown as a result of the missing Chatter feature. These exceptions are of the type `REQUIRED_FEATURE_MISSING_EXCEPTION` for SOSL and SOQL calls. For DML calls, you must check for the specific `REQUIRED_FEATURE_MISSING` status code on a DML Exception.
- When you upload the package, deselect the Chatter required checkbox (this is automatically selected if you have an Apex reference to Chatter).

Note: If the Chatter required checkbox can't be deselected, then some component in the package has a special requirement for Chatter. This can happen, for example, if you package a custom report type that relies on Chatter. If the Chatter-required checkbox can't be disabled, then the package can only be installed in organizations that have Chatter enabled.

The following example tries to post to feeds and get a user's feed. If Chatter is not enabled in the organization, the code catches the `REQUIRED_FEATURE_MISSING` exception. Note that this is an incomplete code example and does not run.

```
public void addFeedItem(String post, Id objId) {
   FeedItem fpost = new FeedItem();
   // Get the parent ID of the feed
   fpost.ParentId = objId;
   fpost.Body = post;
   try{
      insert fpost;
   } catch (System.DmlException e) {
         for (Integer i = 0; i < e.getNumDml(); i++) {
         // Chatter not endabled, do not insert record
            System.assertEquals(StatusCode.REQUIRED_FEATURE_MISSING, e.getDmlType(i));
           System.Debug('Chatter not enabled in this organization:' + e.getDMLMessage());

        }
   }
}

  public List<NewsFeed> getMyFeed() {
    List<NewsFeed> myfeed;
     try{
         myfeed = [SELECT Id, Type, CreatedById, CreatedBy.FirstName,CreatedBy.LastName,
                   CreatedDate, ParentId, Parent.Name,FeedItemId, Body,
                   Title, CreatedById, LinkUrl,
                    (SELECT Id, FieldName, OldValue, NewValue
                     FROM FeedTrackedChanges ORDER BY Id DESC),
                       (SELECT Id, CommentBody, CreatedDate, CreatedById,
                        CreatedBy.FirstName, CreatedBy.LastName
                        FROM FeedComments ORDER BY CreatedDate DESC, ID DESC LIMIT 10)
                   FROM NewsFeed
                   ORDER BY CreatedDate DESC, ID DESC LIMIT 20];
     } catch(System.RequiredFeatureMissingException e){
        // The above has returned an empty NewsFeed
        // Chatter is not enabled in this organization
        myfeed = new List<NewsFeed>{};
              System.Debug('Chatter not enabled in organization:' + e.getMessage());
     }
     return myfeed;
   }
```

Matching the Salesforce Look and Feel

Apps that resemble the Salesforce user interface look and feel are instantly more familiar to users and easy to use. The easiest way to model the design of your app after the Salesforce user interface look and feel is to use Visualforce. When you use a standard controller with a Visualforce page, your new page takes on the style of the associated object’s standard tab in Salesforce. For more information, see Using Salesforce Styles in the *Visualforce Developer's Guide*.

Maintaining My Domain URLs

Build packages that support both instance and instanceless My Domain URLs. As a best practice, replace hard-coded references that contain the instance name in the URL with relative URLs, which are non-instance specific.

A critical update in Spring '18 removed instance names from My Domain URLs for Visualforce, Experience Builder, Site.com Studio, and content files. Update existing packages to support instanceless URLs before the critical update's auto-activation date on March 16, 2019. Otherwise, users will have page functionality issues when using outdated packages.

This URL is a hard-coded reference: `<MyDomain>--<PackageName>.<instance>.visual.force.com/{Case.Id}`

When the critical update is enabled, the URL becomes `<MyDomain>--<PackageName>.visualforce.com/{Case.Id}`

We recommend using relative URLs to avoid any issues with domain names. To make this hard-coded reference a relative URL, remove "`<MyDomain>--<PackageName>.<instance>.visual.force.com`" so that the URL becomes `/{Case.Id}`

For more information, see My Domain URL Changes in the *Identity Implementation Guide*.

Developing App Documentation

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Salesforce recommends publishing your app on AppExchange with the following types of documentation:

Configure Option

You can include a **Configure** option for installers. This option can link to installation and configuration details, such as:

- Provisioning the external service of a composite app
- Custom app settings

The **Configure** option is included in your package as a custom link. You can create a custom link for your home page layouts and add it to your package.

1. Create a custom link to a URL that contains configuration information or a Visualforce page that implements configuration. When you create your custom link, set the display properties to `Open in separate popup window` so that the user returns to the same Salesforce page when done.
2. When you create the package, choose this custom link in the `Configure Custom Link` field of your package detail.

Data Sheet

Give installers the fundamental information they need to know about your app before they install.

Customization and Enhancement Guide

Let installers know what they must customize after installation as part of their implementation.

Custom Help

You can provide custom help for your custom object records and custom fields.

About API and Dynamic Apex Access in Packages

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Contact Manager**, **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Apex Package components have access via dynamic Apex and the API to standard and custom objects in the organization where they are installed.

`API Access` is a package setting that controls the dynamic Apex and API access that s-controls and other package components have to standard and custom objects. The setting displays for both the developer and installer on the package detail page. With this setting:

- The developer of an AppExchange package can restrict API access for a package before uploading it to Salesforce AppExchange. Once restricted, the package components receive Apex and API sessions that are restricted to the custom objects in the package. The developer can also enable access to specific standard objects, and any custom objects in other packages that this package depends on.
- The installer of a package can accept or reject package access privileges when installing the package to his or her organization.
- After installation, an administrator can change Apex and API access for a package at any time. The installer can also enable access on additional objects such as custom objects created in the installer's organization or objects installed by unrelated packages.

There are two possible options for the `API Access` setting:

- The default `Unrestricted`, which gives the package components the same API access to standard objects as the user who is logged in when the component sends a request to the API. Apex runs in system mode. Unrestricted access gives Apex read access to all standard and custom objects.
- `Restricted`, which allows the administrator to select which standard objects the components in the package can access. Further, the components in restricted packages can only access custom objects in the current package if the user has the object permissions that provide access to them.

Considerations for API and Dynamic Apex Access in Packages

By default, dynamic Apex can only access the components with which the code is packaged. To provide access to standard objects not included in the package, the developer must set the `API Access`.

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. Select the package that contains a dynamic Apex that needs access to standard objects in the installing organization.
3. In the Package Detail related list, click **Enable Restrictions** or `Restricted`, whichever is available.
4. Set the access level (Read, Create, Edit, Delete) for the standard objects that the dynamic Apex can access.
5. Click **Save**.

Choosing `Restricted` for the `API Access` setting in a package affects the following:

- API access in a package overrides the following user permissions:
  - Author Apex
  - Customize Application
  - Edit HTML Templates
  - Edit Read Only Fields
  - Manage Billing
  - Manage Call Centers
  - Manage Categories

  - Manage Custom Report Types
  - Manage Dashboards
  - Manage Letterheads
  - Manage Package Licenses
  - Manage Public Documents
  - Manage Public List Views
  - Manage Public Reports
  - Manage Public Templates
  - Manage Users
  - Transfer Record
  - Use Team Reassignment Wizards
  - View Setup and Configuration
  - Weekly Export Data
- If `Read`, `Create`, `Edit`, and `Delete` access are not selected in the API access setting for objects, users do not have access to those objects from the package components, even if the user has the "Modify All Data" and "View All Data" permissions.
- A package with `Restricted` API access can't create new users.
- Salesforce denies access to Web service and `executeanonymous` requests from an AppExchange package that has `Restricted` access.

The following considerations also apply to API access in packages:

- Workflow rules and Apex triggers fire regardless of API access in a package.
- If a component is in more than one package in an organization, API access is unrestricted for that component in all packages in the organization regardless of the access setting.
- If Salesforce introduces a new standard object after you select restricted access for a package, access to the new standard object is not granted by default. You must modify the restricted access setting to include the new standard object.
- When you upgrade a package, changes to the API access are ignored even if the developer specified them. This ensures that the administrator installing the upgrade has full control. Installers should carefully examine the changes in package access in each upgrade during installation and note all acceptable changes. Then, because those changes are ignored, the admintrator should manually apply any acceptable changes after installing an upgrade.
- S-controls are served by Salesforce and rendered inline in Salesforce. Because of this tight integration, there are several means by which an s-control in an installed package could escalate its privileges to the user's full privileges. In order to protect the security of organizations that install packages, s-controls have the following limitations:
  - For packages you are developing (that is, not installed from AppExchange), you can only add s-controls to packages with the default `Unrestricted` API access. Once a package has an s-control, you cannot enable `Restricted` API access.
  - For packages you have installed, you can enable access restrictions even if the package contains s-controls. However, access restrictions provide only limited protection for s-controls. Salesforce recommends that you understand the JavaScript in an s-control before relying on access restriction for s-control security.
  - If an installed package has `Restricted` API access, upgrades will be successful only if the upgraded version does not contain any s-controls. If s-controls are present in the upgraded version, you must change the currently installed package to `Unrestricted` API access.

Manage API and Dynamic Apex Access in Packages

API Access is a package setting that controls the dynamic Apex and API access that s-controls and other package components have to standard and custom objects. The setting displays for both the developer and installer on the package detail page. With this setting:

- The developer of an AppExchange package can restrict API access for a package before uploading it to Salesforce AppExchange. Once restricted, the package components receive Apex and API sessions that are restricted to the custom objects in the package. The developer can also enable access to specific standard objects, and any custom objects in other packages that this package depends on.
- The installer of a package can accept or reject package access privileges when installing the package to his or her organization.
- After installation, an administrator can change Apex and API access for a package at any time. The installer can also enable access on additional objects such as custom objects created in the installer's organization or objects installed by unrelated packages.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To edit API and dynamic Apex access for a package you have created or installed:

- Create AppExchange packages

To accept or reject package API and dynamic Apex access for a package as part of installation:

- Download AppExchange packages

Setting API and Dynamic Apex Access in Packages

To change package access privileges in a package you or someone in your organization has created:

1. From Setup, enter *Packages* in the Quick Find box, then select **Packages**.
2. Select a package.
3. The API Access field displays the current setting, Restricted or Unrestricted, and a link to either **Enable Restrictions** or **Disable Restrictions**. If Read, Create, Edit, and Delete access are not selected in the API access setting for objects, users do not have access to those objects from the package components, even if the user has the "Modify All Data" and "View All Data" permissions.

   Use the API Access field to:

   Enable Restrictions

   This option is available only if the current setting is Unrestricted. Select this option if you want to specify the dynamic Apex and API access that package components have to standard objects in the installer's organization. When you select this option, the Extended Object Permissions list is displayed. Select the Read, Create, Edit, or Delete checkboxes to enable access for each object in the list. This selection is disabled in some situations. Click **Save** when finished. For more information about choosing the Restricted option, including information about when it is disabled, see Considerations for API and Dynamic Apex Access in Packages on page 59.

   Disable Restrictions

   This option is available only if the current setting is Restricted. Select this option if you do not want to restrict the Apex and API access privileges that the components in the package have to standard and custom objects. This option gives all the components in the package the same API access as the user who is logged in. For example, if a user can access accounts, an Apex class in the package that accesses accounts would succeed when triggered by that user.

   Restricted

   Click this link if you have already restricted API access and wish to edit the restrictions.

Accepting or Rejecting API and Dynamic Apex Access Privileges During Installation

To accept or reject the API and dynamic Apex access privileges for a package you are installing:

- Start the installation process on Salesforce AppExchange.
- In **Approve API Access**, either accept by clicking **Next**, or reject by clicking **Cancel**. Complete the installation steps if you have not canceled.

Changing API and Dynamic Apex Access Privileges After Installation

To edit the package API and dynamic Apex access privileges after you have installed a package:

1. From Setup, enter *`Installed Packages`* in the `Quick Find` box, then select **Installed Packages**.
2. Click the name of the package you wish to edit.
3. The `API Access` field displays the current setting, `Restricted` or `Unrestricted`, and a link to either **Enable Restrictions** or **Disable Restrictions**. If `Read`, `Create`, `Edit`, and `Delete` access are not selected in the API access setting for objects, users do not have access to those objects from the package components, even if the user has the "Modify All Data" and "View All Data" permissions.

   Use the `API Access` field to:

   Enable Restrictions

   This option is available only if the current setting is `Unrestricted`. Select this option if you want to specify the dynamic Apex and API access that package components have to standard objects in the installer's organization. When you select this option, the Extended Object Permissions list is displayed. Select the `Read`, `Create`, `Edit`, or `Delete` checkboxes to enable access for each object in the list. This selection is disabled in some situations. Click **Save** when finished. For more information about choosing the `Restricted` option, including information about when it is disabled, see Considerations for API and Dynamic Apex Access in Packages on page 59.

   Disable Restrictions

   This option is available only if the current setting is `Restricted`. Select this option if you do not want to restrict the Apex and API access privileges that the components in the package have to standard and custom objects. This option gives all the components in the package the same API access as the user who is logged in. For example, if a user can access accounts, an Apex class in the package that accesses accounts would succeed when triggered by that user.

   Restricted

   Click this link if you have already restricted API access and wish to edit the restrictions.

Configuring Default Package Versions for API Calls

A package version is a number that identifies the set of components uploaded in a package. The version number has the format *`majorNumber.minorNumber.patchNumber`* (for example, 2.1.3). The major and minor numbers increase to a chosen value during every major release. The *`patchNumber`* is generated and updated only for a patch release. Publishers can use package versions to evolve the components in their managed packages gracefully by releasing subsequent package versions without breaking existing customer integrations using the package.

Default package versions for API calls provide fallback settings if package versions are not provided by an API call. Many API clients do not include package version information, so the default settings maintain existing behavior for these clients.

You can specify the default package versions for enterprise API and partner API calls. The enterprise WSDL is for customers who want to build an integration with their Salesforce organization only. It is strongly typed, which means that calls operate on objects and fields with specific data types, such as `int` and `string`. The partner WSDL is for customers, partners, and ISVs who want to build an integration that can work across multiple Salesforce organizations, regardless of their

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer**, Editions

USER PERMISSIONS

To configure default package versions for API calls:

- Customize Application

custom objects or fields. It is loosely typed, which means that calls operate on name-value pairs of field names and values instead of specific data types.

You must associate the enterprise WSDL with specific package versions to maintain existing behavior for clients. There are options for setting the package version bindings for an API call from client applications using either the enterprise or partner WSDL. The package version information for API calls issued from a client application based on the enterprise WSDL is determined by the first match in the following settings.

1. The PackageVersionHeader SOAP header.
2. The SOAP endpoint contains a URL with a format of `serverName/services/Soap/c/api_version/ID` where `api_version` is the version of the API, such as 48.0, and `ID` encodes your package version selections when the enterprise WSDL was generated.
3. The default enterprise package version settings.

The partner WSDL is more flexible as it is used for integration with multiple organizations. If you choose the Not Specified option for a package version when configuring the default partner package versions, the behavior is defined by the latest installed package version. This means that behavior of package components, such as an Apex trigger, could change when a package is upgraded and that change would immediately impact the integration. Subscribers may want to select a specific version for an installed package for all partner API calls from client applications to ensure that subsequent installations of package versions do not affect their existing integrations.

The package version information for partner API calls is determined by the first match in the following settings.

1. The PackageVersionHeader SOAP header.
2. An API call from a Visualforce page uses the package versions set for the Visualforce page.
3. The default partner package version settings.

To configure default package versions for API calls:

1. From Setup, enter `API` in the `Quick Find` box, then select **API**.
2. Click **Configure Enterprise Package Version Settings** or **Configure Partner Package Version Settings**. These links are only available if you have at least one managed package installed in your organization.
3. Select a `Package Version` for each of your installed managed packages. If you are unsure which package version to select, you should leave the default selection.
4. Click **Save**.

Note: Installing a new version of a package in your organization does not affect the current default settings.

About the Partner WSDL

The Partner Web Services WSDL is used for client applications that are metadata-driven and dynamic in nature. It is particularly—but not exclusively—useful to Salesforce partners who are building client applications for multiple organizations. As a loosely typed representation of the Salesforce data model that works with name-value pairs of field names and values instead of specific data types, it can be used to access data within any organization. This WSDL is most appropriate for developers of clients that can issue a query call to get information about an object before the client acts on the object. The partner WSDL document needs to be downloaded and consumed only once per version of the API.

For more information about the Partner WSDL, see Using the Partner WSDL in the *SOAP API Developer Guide*.

Generating an Enterprise WSDL with Managed Packages

If you are downloading an enterprise WSDL and you have managed packages installed in your organization, you need to take an extra step to select the version of each installed package to include in the generated WSDL. The enterprise WSDL is strongly typed, which means that it contains objects and fields with specific data types, such as `int` and `string`.

A package version is a number that identifies the set of components uploaded in a package. The version number has the format *`majorNumber.minorNumber.patchNumber`* (for example, 2.1.3). The major and minor numbers increase to a chosen value during every major release. The *`patchNumber`* is generated and updated only for a patch release. Publishers can use package versions to evolve the components in their managed packages gracefully by releasing subsequent package versions without breaking existing customer integrations using the package. A subscriber can select a package version for each installed managed package to allow their API client to continue to function with specific, known behavior even when they install subsequent versions of a package. Each package version can have variations in the composition of its objects and fields, so you must select a specific version when you generate the strongly typed WSDL.

EDITIONS

Available in: Salesforce Classic

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer**, Editions

USER PERMISSIONS

To download a WSDL:

- Customize Application

To download an enterprise WSDL when you have managed packages installed:

1. From Setup, enter *`API`* in the `Quick Find` box, then select **API**.
2. Click **Generate Enterprise WSDL**.
3. Select the `Package Version` for each of your installed managed packages. If you are unsure which package version to select, you should leave the default, which is the latest package version.
4. Click **Generate**.
5. Use the **File** menu in your browser to save the WSDL to your computer.
6. On your computer, import the local copy of the WSDL document into your development environment.

Note the following in your generated enterprise WSDL:

- Each of your managed package version selections is included in a comment at the top of the WSDL.
- The generated WSDL contains the objects and fields in your organization, including those available in the selected versions of each installed package. If a field or object is added in a later package version, you must generate the enterprise WSDL with that package version to work with the object or field in your API integration.
- The SOAP endpoint at the end of the WSDL contains a URL with a format of *`serverName`*`/services/Soap/c/`*`api_version`*`/`*`ID`* where *`api_version`* is the version of the API, such as 48.0, and *`ID`* encodes your package version selections when you communicate with Salesforce.

You can also select the default package versions for the enterprise WSDL without downloading a WSDL from the API page in Setup. Default package versions for API calls provide fallback settings if package versions are not provided by an API call. Many API clients do not include package version information, so the default settings maintain existing behavior for these clients.

Work with Services Outside of Salesforce

You might want to update your Salesforce data when changes occur in another service. Likewise, you might also want to update the data in a service outside of Salesforce based on changes to your Salesforce data. For example, you might want to send a mass email to more contacts and leads than Salesforce allows. You can use an external mail service that allows users to build a recipient list of names and email addresses using the contact and lead information in your Salesforce organization.

An app built on the Lightning Platform platform can connect with a service outside of Salesforce in many ways. For example, you can:

- create a custom link or custom formula field that passes information to an external service.

- use the Lightning Platform API to transfer data in and out of Salesforce.
- use an Apex class that contains a Web service method.

Before any Visualforce page, Apex callout, or JavaScript code using XmlHttpRequest in an s-control or custom button can call an external site, that site must be registered in the Remote Site Settings page, or the call fails. For information on registering components, see Configure Remote Site Settings.

Warning: Do not store usernames and passwords within any external service.

Provisioning a Service External to Salesforce

If your app links to an external service, users who install the app must be signed up to use the service. Provide access in one of two ways:

- Access by all active users in an organization with no real need to identify an individual
- Access on a per user basis where identification of the individual is important

The Salesforce service provides two globally unique IDs to support these options. The user ID identifies an individual and is unique across all organizations. User IDs are never reused. Likewise, the organization ID uniquely identifies the organization.

Avoid using email addresses, company names, and Salesforce usernames when providing access to an external service. Usernames can change over time and email addresses and company names can be duplicated.

If you are providing access to an external service, we recommend the following:

- Use Single Sign-On (SSO) techniques to identify new users when they use your service.
- For each point of entry to your app, such as a custom link or web tab, include the user ID in the parameter string. Have your service examine the user ID to verify that the user ID belongs to a known user. Include a session ID in the parameter string so that your service can read back through the Lightning Platform API and validate that this user has an active session and is authenticated.
- Offer the external service for any known users. For new users, display an alternative page to collect the required information.
- Do not store passwords for individual users. Besides the obvious security risks, many organizations reset passwords on a regular basis, which requires the user to update the password on your system as well. We recommend designing your external service to use the user ID and session ID to authenticate and identify users.
- If your application requires asynchronous updates after a user session has expired, dedicate a distinct administrator user license for this.

Architectural Considerations for Group and Professional Editions

Salesforce CRM is offered in five tiers, or editions:

- Group Edition (GE)*
- Professional Edition (PE)
- Enterprise Edition (EE)
- Unlimited Edition (UE)
- Performance Edition (PXE)*

Note: Group and Performance Editions are no longer sold. For a comparison chart of editions and their features, see the Salesforce Pricing and Editions page.

If you plan to sell your app to existing Salesforce customers, it’s important to understand the differences between these editions because they will affect the design of your app. It’s convenient to think about them in clusters, GE/PE and EE/UE/PXE, as the editions in each cluster have similar functionality. For example, you might only want to support EE/UE/PXE if your app requires certain objects and features that aren't available in GE/PE. Also, instead of a single solution that supports all editions, you can have a tiered offering. This would consist of a basic solution for GE/PE and an advanced one for EE/UE/PXE customers that takes advantage of the additional features.

EE/UE/PXE have the most robust functionality. They support Lightning Platform platform licenses in addition to Salesforce CRM licenses. If your app doesn’t require Salesforce CRM features (such as Leads, Opportunities, Cases, etc.), Lightning Platform platform licenses provide you with the most flexibility in deploying your app to users who might not normally be Salesforce users. Your app is still subject to the edition limits and packaging rules.

GE/PE don't contain all of the functionality that you can build in a Developer Edition (DE). Therefore, an application developed in your DE organization might not install in a GE/PE organization. If you’re designing an application to work specifically in GE/PE, you must be aware of how these editions differ.

There are a number of other considerations to keep in mind when deciding whether to support these editions. Lightning Platform platform licenses cannot be provisioned in GE/PE organizations. This means that only existing Salesforce CRM users can use your app. There are some features that aren't available in GE/PE. There are several special permissions available to eligible partner apps that overcome these limitations.

See the following sections for available features, limits, and other design considerations.

- Features in Group and Professional Editions
- Limits for Group and Professional Editions
- Access Control in Group and Professional Editions
- Using Apex in Group and Professional Editions
- API Access in Group and Professional Editions
- Designing Your App to Support Multiple Editions
- Sample Design Scenarios

Features in Group and Professional Editions

The easiest way to determine which features and objects are available in a particular edition is by reviewing the Edition Comparison Table. You can also look up which editions support a specific feature or object by searching the online help. It’s important that you check these resources before you start designing your app to make an informed decision on which editions to target. When you’re finished building your app, we recommend that you test it by installing your package in GE and PE test orgs to ensure that everything functions properly.

The following table shows the key differences between GE and PE.

Feature	Group Edition	Professional Edition
Assets	No	Yes
Campaigns	No	Yes
Contracts	No	Yes (with the Sales Cloud)
Forecasts	No	Yes (no Opportunity Splits or Custom Field forecasts)
Ideas	No	Yes
Products	No	Yes
Solutions	No	Yes
Record types	No	Yes

Feature	Group Edition	Professional Edition
Permission sets	Yes	Yes
Custom profiles	No	Yes
Custom report types	No	Yes
Workflow and approvals	No	No (See note.)
Apex code	See note.	See note.
Sharing rules	No	Yes (for some features)
API	See note.	See note.
Sites	No	No

Note:

- All listed features are available in DE.
- As a partner, workflows within your application run in a Professional Edition org. However, customers can't create their own workflows. They must purchase the feature directly from Salesforce.
- A client ID allows your app to use the API for integration to composite apps. For more information, see Using Apex in Group and Professional Editions and API Access in Group and Professional Editions.

Limits for Group and Professional Editions

All Salesforce editions have limits that restrict the number of apps, objects, and tabs that can be used. For details on the limits for various editions, see the Edition Limits Table.

For partners who are enrolled in the ISV Program, any managed package publicly posted on the AppExchange no longer counts against the apps/objects/tabs limits for your Salesforce Edition. This effectively means that ISV partners no longer have to worry about package installation failures because of apps/objects/tabs limits being exceeded. This feature is automatically enabled after your app passes the security review.

Access Control in Group and Professional Editions

Group Edition doesn't support field-level security or custom profiles. You can manage field-level security by using the page layout for each object instead. When customers install your app, they can't define which profiles have access to what. Ensure that your design works for the Standard User Profile. Permission sets can be installed but not updated in Group and Professional Edition orgs.

Because the page layout handles field level security, add any fields you want to be visible to the page layout. For fields to be accessible via the API or Visualforce, add them to the page layout.

Using Apex in Group and Professional Editions

Your app can contain business logic such as classes, triggers, email services, etc. written in Apex. As a general rule, Apex is not supported in GE/PE, so it will not run in these editions. However, Apex developed as part of an ISV app and included in a managed package can run in GE/PE, even though those editions do not support Apex by default.

You must be an eligible partner with salesforce.com and your app has to pass the security review. The appropriate permissions will automatically be enabled after you pass the security review.

Here are some important considerations for using Apex in GE/PE.

- GE/PE customers can't create or modify Apex in your app; they can only run the existing Apex.
- Your Apex code should not depend on features and functionality that exist only in DE, EE, UE, or PXE, or your app will fail to install.
- Make sure to use REST if you plan to expose an Apex method as a Web service. Apex classes that have been exposed as a SOAP Web service can't be invoked from an external web app in GE/PE.
- Using Apex to make Web service callouts is allowed in GE/PE. For instance, if you're planning to make a Web service callout to an external Web service, as long as the managed package is authorized, these classes will function in GE/PE.

API Access in Group and Professional Editions

API access is not normally supported in GE and PE orgs. However, after your app passes the security review, you're eligible to use some APIs for building composite applications.

- Currently, the standard Data SOAP and REST APIs are supported for GE and PE apps, and Metadata API is supported in PE apps. To request API access, see How do I get an API token for my app? You can also contact Salesforce to request that a connected app be whitelisted to use the REST API in GE or PE orgs.
- Other APIs, such as the Bulk API and Apex methods exposed as SOAP Web services, remain unavailable.
- You can enable REST-based Web services using connected app consumer whitelisting.
- You can enable SOAP-based Web services, including Metadata API, using an API token called a Client ID, which is appended to your SOAP headers in integration calls. This special key enables your app to make calls to GE and PE orgs for Data API and PE orgs for Metadata API, even if the customer does not have API access.

The Client ID has these properties.

- You can't use the Client ID with the AJAX Toolkit in custom JavaScript, S-controls, or anywhere in your app where its value would be exposed to the end customer.
- For development purposes, GE and PE orgs created via the Environment Hub already have the Metadata API and SOAP API (Data API) enabled. You can then develop and test your app before the security review. After your app passes the security review and you obtain an API token, test your app again to ensure that it's working correctly.
- The Client ID grants GE and PE access to the SOAP API, and PE access to the Metadata API. With the Metadata API, you can dynamically create various components that you typically create in Setup. For instance, you can create a custom field dynamically in a PE organization with the API token.

This table shows which APIs are accessible when using GE and PE and the method of access.

API	Access to GE and PE
Web Services (SOAP)	Yes, with token
Apex methods exposed as Web services (SOAP)	No
Web services (REST)	Yes, with connected app consumer whitelisting
Apex methods exposed as Web services (REST)	Yes, with connected app consumer whitelisting
Chatter REST API	Yes
Metadata API	Yes, with token
Bulk API	No

API	Access to GE and PE
Data Loader tool (uses SOAP Web services)	No, can't set the token

Accessing the REST API in Group and Professional Editions

The Lightning Platform REST API provides you a powerful, convenient, and simple API for interacting with Lightning Platform. Qualified partners can request salesforce.com to enable your application for REST API calls to GE/PE organizations. To get access to the REST API, you must meet these conditions.

- Access to the Partner Community – If you're new, please learn about and join one of the ISV Partner Programs.
- Pass the security review – All applications enrolled in the AppExchange and/or OEM Program must go through a periodic security review.
- Access to Salesforce Developer Edition – If you don't already have access to a DE organization, you can get the Partner Developer Edition from the Environment Hub.

To request the REST API token:

1. Create a new connected app from your DE organization. Log in to salesforce.com with your developer account. From Setup, enter *`Apps`* in the `Quick Find` box, then select **Apps**, and click **New** in the Connected Apps section.

   Note: We strongly recommend that you do this in an organization you will continue using for a long time, such as the one where you build your managed package or your Trialforce management organization (TMO).

2. Enter the information requested and click **Save**. Saving your app gives you the Consumer Key and Consumer Secret the app uses to communicate with Salesforce.
3. Submit a case from the Partner Community and provide your DE Org ID and the credentials for your connected app.

We'll evaluate your request and enable the appropriate permission. Once this is done, you'll receive a case notification from us. Please wait 24 hours to make sure the permission is completely activated. Your client_id (or Consumer Key) and client_secret (or Consumer Secret) will be checked against the information you submit via the case during the OAuth authentication. If it matches, the system will allow you to communicate with GE/PE.

Note:

- This permission is intended solely for REST API. It does not enable your application to use SOAP API, Bulk API, Metadata API, etc. for GE/PE.
- This permission is applied only to your application. We do not turn on the API in the GE/PE organization.

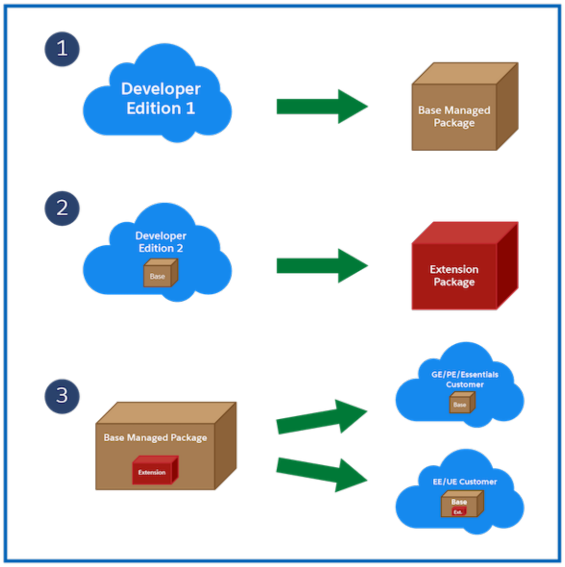
Designing Your App to Support Multiple Editions

Supporting multiple editions provides the opportunity to release richer versions of your app that can support more advanced features found in EE, UE, and PXE. There are two technologies that can be leveraged to support multiple editions. The first approach uses extension packages and the second leverages Dynamic Apex. There are benefits to both, so be sure to review both strategies before designing your app.

Supporting Multiple Editions Using an Extension Package

This approach uses a base-managed package that contains core app functionality. The base package only contains features supported in Group and Professional Editions. You then use a second managed package, or extension package, that extends and enhances the base package. The extension package adds more features supported in Enterprise, Unlimited, and Performance Editions. For example, you have a warehouse application that tracks inventory and an extension to this app includes workflow (which isn't available in Group). Your Group and Professional Edition customers can install the base warehouse application, while your other customers install the base package and then the extension package with workflow components.

Using a Base and Extension Package to Support Multiple Editions



Using extension packages enables you to avoid multiple code sets and to upsell your customers. Upgrading a customer only requires installing the extension package.

Here is the process for creating an extension package.

1. Create your base-managed package that uses features supported by Group and Professional Editions.
2. Install your base-managed package in a separate Developer Edition org.
3. In this org, create your extension package that includes more functionality supported in Group and Professional Editions. You can reference the base-managed package to avoid duplicating functionality. Any component that references the base-managed package automatically triggers this package to be an extension package.

Since your extension package depends on your base package, it's important to spend time designing your app and the interfaces between the packages. For example, if the extension package calls an Apex class in the base package, you must make sure that the desired Apex class is made global.

It's also important to consider the entire application life cycle. For example, If you want to add new features, include them in the appropriate package. Ensure that updates to the base package do not break the extension package.

Note: To access history information for custom objects in your extension package, work with the base package owner to enable history tracking in the org for the base package. Enabling history tracking in a base package can result in an error when you install the package and create patch orgs for the extension package.

Supporting Multiple Editions using Dynamic Apex

Using dynamic Apex, dynamic SOQL, and dynamic DML, it's possible to create one managed package for all editions you plan to support without having to use extension packages. Your app behavior can change dynamically based on the features available in your customer's edition. This is useful when designing an app with the intent to support multiple editions.

Make sure that Apex, workflows, etc. in your package do not contain any strongly-typed reference to a feature that isn't supported by GE/PE. This can include adding a custom field on an unsupported standard object, such as Campaigns, or making an Apex reference to features like multi-currency or territory management. When you reference a feature in your package not supported by GE/PE, this package dependency will cause the installation to fail.

Instead, if you use dynamic Apex to first check if these features are available before referencing them, you can install your managed package in GE/PE. The important piece to consider is you must code your Dynamic Apex in a way that can support both use cases. This ensures that if your customer doesn't have a specific feature or object, your app will still function.

Sample Design Scenarios for Group and Professional Editions

Here are some scenarios to help you understand when and how to build for Group and Professional Editions.

Scenario 1: You want to build an app that uses record types

Since record types aren't available in Group Edition, decide if you want to support this edition. Assuming you do, you can build a base-managed package that doesn't include record types. After uploading this managed package in a released state, you can install it into another Developer Edition org to start building the extension. Your extension can add record types that your Professional, Enterprise, Unlimited, and Performance Edition customers can install and use.

Scenario 2: You want to build an app with 80 custom objects

Typically this scenario presents a problem for Group and Professional Edition orgs because of their custom objects limit. However, if you make your app available on the AppExchange, it doesn't count toward custom objects, tabs, and apps limits. So even if your app has 80 custom objects, it installs and works in Group and Professional Edition orgs.

Scenario 3: You want to build an app that makes Apex callouts to a web service

Apex doesn't normally run in Group and Professional Editions. If you get your managed package authorized during the security review, your Apex executes as expected. For this scenario, you build your Apex callout to invoke your external service and then include this class in your package.

Scenario 4: You want to build an app that uses Campaigns

Campaigns are supported by default in Group Edition. For this scenario, you have two options.

- Option 1 - Build a based-managed package that doesn't reference Campaigns. in it's complete, upload, and install it into another Developer Edition org. Build the Campaign functionality as an extension package. Now your Group Edition customers can install the base, while the rest can also install the extension to get extra features.
- Option 2 - This option requires only one package if you use Dynamic Apex as the only reference to Campaigns (as described earlier) and do not include a custom field on the Campaign. Your app can then be installed in Group Edition orgs and higher. If Campaigns is in your customer's edition, then your Dynamic Apex can manipulate Campaigns as expected.

Scenario 5: You want to build a composite app where your receive inbound API calls

You have a separate hosted app that you want to integrate with Salesforce, so you must make API calls to Group and Professional Edition customers. Such calls aren't possible by default. However, if you're an eligible partner, request a special API token that allows your SOAP calls to integrate with Group and Professional Edition orgs. Be sure to embed the Client ID in the SOAP header of your external code.

Connected Apps

A connected app is a framework that enables an external application to integrate with Salesforce using APIs and standard protocols, such as SAML, OAuth, and OpenID Connect. Connected apps use these protocols to authenticate, authorize, and provide single sign-on (SSO) for external apps. The external apps that are integrated with Salesforce can run on the customer success platform, other platforms, devices, or SaaS subscriptions. For example, when you log in to your Salesforce mobile app and see your data from your Salesforce org, you're using a connected app.

By capturing metadata about an external app, a connected app tells Salesforce which authentication protocol—SAML, OAuth, and OpenID Connect—the external app uses, and where the external app runs. Salesforce can then grant the external app access to its data, and attach policies that define access restrictions, such as when the app's access expires. Salesforce can also audit connected app usage.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Create a Connected App

When you create a connected app, make sure that you understand how it's going to be used so you can configure the appropriate settings. For example, if you're creating a connected app to integrate an external application with your Salesforce API, configure the connected app with OAuth authorization settings. Or if you're creating a connected app to act as a service provider in a SAML single sign-on (SSO) flow, configure SAML settings.

Depending on your connected app use case, use these instructions to build your connected app.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Configure Basic Connected App Settings

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

For all connected apps, define the basics, which include the app's name, logo, and contact information.

1. From Setup, enter `Apps` in the Quick Find box, and select **App Manager**.
2. Click **New Connected App**.
3. Enter the connected app's name, which displays in the App Manager and on its App Launcher tile.

   The connected app name must be unique within your org. If the connected app was created in the Spring '14 release or later, you can reuse the name of a deleted connected app.
4. Enter the API name used when referring to your app from a program. It defaults to a version of the name without spaces. Only letters, numbers, and underscores are allowed, so if the original app name contains any other characters, edit the default name.
5. Enter the contact email for Salesforce to use in case we want to contact you or your support team. This address isn't given to Salesforce admins who install the app.
6. Enter the contact phone for Salesforce to use in case we want to contact you or your support team. This number isn't given to Salesforce admins who install the app.
7. To display your logo with the connected app on the App Launcher tile, enter a logo image URL. Your logo also displays on the consent page that users see when approving the app.

   The logo URL must use HTTPS. The logo image must be a GIF, JPG, or PNG file with a file size that's preferably under 20 KB and no more than 100 KB. We resize the image to 128 pixels by 128 pixels, so be sure that you like how it looks. If you don't supply a logo, Salesforce generates one for you using the app's initials.

   - To upload your logo image, click **Upload logo image**. Select an image from your local file system that meets the size requirements. When your upload is successful, the URL to the logo appears in the Logo Image URL field.
   - To upload a Salesforce sample logo, click **Choose one of our sample logos**. The sample logos include Salesforce apps, third-party apps, and standards bodies. Click the logo you want, and then copy and paste the appropriate URLs into the Logo Image URL field and Icon URL field.

- To use a logo hosted publicly on Salesforce servers, upload an image as a document from the Documents tab. To get the URL, view the image, copy the URL, and paste the URL in the Logo Image URL field.

8. If you have a web page with more information about your app, provide an info URL.
9. To display a description on the connected app's App Launcher tile, enter up to 256 characters. If you don't supply a description, only the connected app's name displays on the tile.
10. Configure the connected app depending on its use case. See Create a Connected App.

Enable OAuth Settings for API Integration

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS
Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience
Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions Connected Apps can be installed in: **All** Editions

You can use a connected app to request access to Salesforce data on the behalf of an external application. For a connected app to request access, it must be integrated with the Salesforce API using the OAuth 2.0 protocol. OAuth 2.0 is an open protocol that authorizes secure data sharing between applications through the exchange of tokens. When developers or independent software vendors (ISV) want to integrate their app with Salesforce, they use OAuth APIs. These OAuth APIs enable a user to work in one app but see the data from another.

1. Create your connected app, and complete its basic information.
2. In the API (Enable OAuth Settings) area of the page, select **Enable OAuth Settings**.
3. If you're setting up a connected app for an external application on a device with limited input or display capabilities, such as TVs, appliances, or command-line applications, select **Enable for Device Flow**.

   A callback URL isn't used in the device flow. However, when this flow is enabled, the value for the callback URL defaults to a placeholder. You can specify a callback URL if needed, such as when this same client is being used for a different flow.

4. Enter the callback URL (endpoint) that Salesforce calls back to your application during OAuth. It's the same as the OAuth redirect URI.

   Depending on which OAuth flow you use, the URL is typically the one that a user's browser is redirected to after successful authorization.

   Because this URL is used for some OAuth flows to pass an access token, the URL must use secure HTTPS or a custom URI scheme.

If you enter multiple callback URLs, at run time Salesforce matches the callback URL value specified by the app with one of the values in Callback URL. It must match one of the values to pass validation. Separate multiple callback URLs with line breaks. The callback URL field has a limit of 2000 characters, cumulatively. If you enter several URLs and they exceed this limit, create another connected app to manage more callback URLs.

5. If you're using the JWT OAuth flow, select **Use Digital Signatures**. If the app uses a certificate, click **Choose File**, and select the certificate on your system to upload for the JWT OAuth flow.
6. Select the OAuth scopes to apply to the connected app. OAuth scopes define permissions for the connected app, which are granted as tokens after the app is authorized. The OAuth token name is in parentheses.

Value	Description
Access and manage your Chatter feed (chatter_api)	Allows access to Chatter REST API resources only.
Access and manage your data (api)	Allows access to the current, logged-in user's account using APIs, such as REST API and Bulk API. This value also includes `chatter_api`, which allows access to Chatter REST API resources.
Access your basic information (id, profile, email, address, phone)	Allows access to the identity URL service. You can request `profile`, `email`, `address`, or `phone`, individually to get the same result as using `id`; they are all synonymous.
Access custom permissions (custom_permissions)	Allows access to the custom permissions in an organization associated with the connected app, and shows whether the current user has each permission enabled.
Allow access to your unique identifier (openid)	Allows access to the current, logged in user's unique identifier for OpenID Connect apps. In the OAuth 2.0 user-agent flow and the OAuth 2.0 web server flow, use the `openid` scope. This scope enables you to receive a signed ID token that conforms to the OpenID Connect specifications in addition to the access token.
Full access (full)	Allows access to all data accessible by the logged-in user, and encompasses all other scopes. `full` does not return a refresh token. You must explicitly request the `refresh_token` scope to get a refresh token.
Perform requests on your behalf at any time (refresh_token, offline_access)	If the app is eligible to receive a refresh token, allows one to be returned. This scope lets the app interact with the user's data while the user is offline. The `refresh_token`scope is synonymous with `offline_access`.
Provide access to custom applications (visualforce)	Allows access to customer-created Visualforce pages. Doesn't allow access to standard Salesforce UIs.
Provide access to your data via the Web (web)	Allows the ability to use the `access_token` on the web, and includes `visualforce`, allowing access to customer-created Visualforce pages.

7. Select **Require Secret for the Web Server Flow** to require the app's client secret in exchange for an access token.

Important: If the client app can't keep the client secret confidential and it must use the web server flow, deselect **Require Secret for Web Server Flow**. We still generate a client secret for your app, but this setting instructs the web server flow not to require the `client_secret` parameter in the access token request. We recommend user agent as a more secure option than web server flow without the secret.

8. To authorize a single connected app to introspect all access and refresh tokens within the entire org, select **Introspect all tokens**.

   By default, all connected apps can introspect their own tokens. In addition, an OAuth client that directly registers OAuth 2.0 connected apps through the dynamic client registration endpoint can check the tokens for itself and its registered apps. See OpenID Connect Token Introspection.

9. To control how the OAuth request handles the ID token, select **Configure ID token**.

   If the OAuth request includes the **Allow access to your unique identifier (openid)** scope, the returned token can include the ID token.

   - The ID token is always included in access token responses.
   - With the primary ID token setting enabled, configure the secondary settings that control the ID token contents in both access and refresh token responses. Specify these settings.

Setting	Description
Token Valid for	The length of time that the ID token is valid for after it's issued. The period can be from 1 to 720 minutes. The default is 2 minutes.
ID Token Audiences	The intended consumers of the ID token. For example, the target service where you use the ID token, such as `https://`*`your_service`*`.com`.
Include Standard Claims	Include the standard claims that contain information about the user, such as the user's name, profile, phone number, and address. The OpenID Connect specifications define a set of standard claims to be returned in the ID token.
Include Custom Attributes	If your app has specified custom attributes, include them in the ID token.
Include Custom Permissions	If your app has specified custom permissions, include them in the ID token.

10. If you're setting up the app to issue asset tokens for connected devices, select **Enable Asset Tokens**.

    - Specify these settings.

Setting	Description
Token Valid for	The length of time that the asset token is valid after it's issued.
Asset Signing Certificate	The self-signed certificate that you've already created for signing asset tokens.
Asset Audiences	The intended consumers of the asset token. For example, the back-end service for your connected device, such as `https://`*`your_device_backend`*`.com`.
Include Custom Attributes	If your app has specified custom attributes, include them in the asset token.
Include Custom Permissions	If your app has specified custom permissions, include them in the asset token.

    - Make sure to specify the callback URL (endpoint). For example, `https://`*`your_device_backend`*`.com/callback`.
    - Select these OAuth scopes, which are required for asset tokens.
      - **Access and manage your data (api)**
      - **Allow access to your unique identifier (openid)**

11. To automatically log users out of the connected app service provider when they log out of Salesforce, select **Enable Single Logout**.
12. If you selected **Enable Single Logout**, enter a single logout URL. Salesforce sends logout requests to this URL when users log out of Salesforce. The single logout URL must be an absolute URL starting with `https://`.

    If your org had the **No user approval required for users in this organization** option selected on your remote access before the Spring '12 release, users in the org are approved for the app. This option is selected to indicate the approval.

    For connected apps, after you've created an app, we recommend that admins install the app, and then set Permitted Users to **Admin-approved users are pre-authorized** on the app's Edit Policies page. If the remote access option wasn't originally selected, the option doesn't show up.

13. When you've configured all settings for your connected app, click **Save**.

Integrate Service Providers as Connected Apps with SAML 2.0

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

To integrate a service provider with your Salesforce org, you can use a connected app that implements SAML 2.0 for user authentication. Salesforce supports SAML single sign-on (SSO) when the service provider or the identity provider initiates the flow. To use this option, configure a connected app with SAML 2.0 enabled for your service provider. Define your Salesforce org as the SAML identity provider.

For example, you build a custom Your Benefits web app that implements SAML 2.0 for user authentication. You want your users to be able to log in to this app with their Salesforce credentials. To set up this SSO flow, configure the Your Benefits web app as a connected app. Define your Salesforce org as the SAML identity provider for the connected app. Your users can now log in to the Your Benefits web app with their Salesforce credentials.

1. Complete the prerequisites listed in Prerequisites for Defining Service Providers.
2. To direct users to a specific location after they authenticated, enter your app's start URL.

    The Start URL can be an absolute URL, such as `https://na1.salesforce.com/001/o`, or it can be the link for the application name, such as `https://customer.goodApp.com` for GoodApp. Specifying a Start URL makes the application available in the app menu and in App Launcher.

    If the connected app that you're creating is a canvas app, skip this field. The Canvas App URL field contains the URL that gets called for the connected app.

3. Create your connected app, and complete its basic information.
4. In the Web App Settings section, select **Enable SAML**, and enter the following information, which is available from your service provider.
   a. **Entity Id**—The globally unique ID of the service provider. If you're accessing multiple apps from your service provider, define the service provider. Then use the `RelayState` parameter to append the URL values to direct the user to the correct app after signing in.

   b. **ACS URL**—(Assertion Consumer Service) The service provider's endpoint that receives SAML assertions.

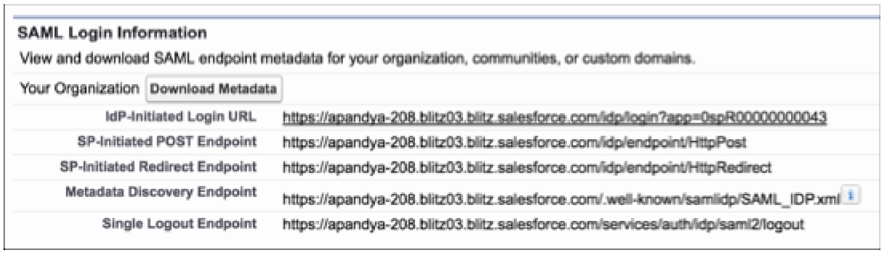
   c. **Subject Type**—Specifies which field defines the user's identity for the app. Options include the user's username, federation ID, user ID, a custom attribute, or an algorithmically calculated persistent ID. A custom attribute can be any custom field added to the User object in the organization, as long as it is one of the following data types: Email, Text, URL, or Formula (with Text Return Type). After you select **Custom Attribute** for the subject type, Salesforce displays a Custom Attribute field with a list of the available User object custom fields in the organization.

   d. **Name ID Format**—Specifies the format attribute sent in SAML messages. The default selection is **Unspecified**. Depending on your SAML service provider, you can set this format to email address, persistent, or transient.

   e. **Issuer**—By default, your organization's My Domain is the standard issuer for your identity provider. If your SAML service provider requires a different value, specify it here.

5. To automatically log users out of the connected app service provider when they log out of Salesforce, select **Enable Single Logout**. Then take these steps.
   a. Enter the single logout endpoint of the service provider. Salesforce sends logout requests to this URL when users log out of Salesforce. The single logout URL must be an absolute URL starting with `https://`.

   b. Provide your service provider with the Salesforce IdP SLO endpoint. The endpoint is listed in your SAML Login Information as the Single Logout Endpoint. It's also listed in the SAML Metadata file as the Discovery Endpoint. The format for the endpoint is *`https://<domain>.my.salesforce.com/services/auth/idp/saml2/logout`*, where *`<domain>`* is your org's My Domain name.



SAML Login Information

View and download SAML endpoint metadata for your organization, communities, or custom domains.

Your Organization

IdP-Initiated Login URL	https://apandya-208.blitz03.blitz.salesforce.com/idp/login?app=0spR0000000043
SP-Initiated POST Endpoint	https://apandya-208.blitz03.blitz.salesforce.com/idp/endpoint/HttpPost
SP-Initiated Redirect Endpoint	https://apandya-208.blitz03.blitz.salesforce.com/idp/endpoint/HttpRedirect
Metadata Discovery Endpoint	https://apandya-208.blitz03.blitz.salesforce.com/.well-known/samlidp/SAML_IDP.xml
Single Logout Endpoint	https://apandya-208.blitz03.blitz.salesforce.com/services/auth/idp/saml2/logout

   c. Select the HTTP binding type for single logout provided by your service provider.

6. If your service provider requires a unique certificate to validate SAML requests from Salesforce, upload the certificate from your system. Otherwise, leave this setting as Default IdP Certificate.
7. If the service provider gave you a security certificate, select **Verify Request Signatures**. Browse your system for the certificate and upload it. The certificate is only necessary if you plan to initiate logging in to Salesforce from the service provider and the service provider signs its SAML requests.

   Important: If you upload a certificate, all SAML requests must be signed. If no certificate is uploaded, all SAML requests are accepted.

8. Optionally, select **Encrypt SAML Response** to browse your system for the certificate and upload it. Select an encryption method for encrypting the assertion. Valid encryption algorithm values are AES–128 (128–bit key), AES–256 (256–bit key), and Triple-DES (Triple Data Encryption Algorithm).
9. When you've configured all settings for your connected app, click **Save**.

Create a Connected App for Mobile App Integration

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

A connected app is a primary means by which a mobile app connects to Salesforce. Although not required, you can use Salesforce Mobile SDK to build mobile applications as connected apps. These connected apps can access Salesforce OAuth services and call Salesforce REST APIs.

For more information about Salesforce Mobile SDK, see Mobile SDK Development Guide.

1. Create your connected app, and complete its basic information on page 73.
2. Enable these OAuth Settings on page 74:
   a. Enter a callback URL. Mobile SDK uses this URL to call back to your application during authorization. For Mobile SDK, this value must match the OAuth redirect URI specified in your app's project configuration.
   b. Select the following OAuth scopes: **Access and manage you data (api)**, **Perform requests on your behalf at any time (refresh_token, offline_access)**, and **Provide access to your data via the Web (web)**.
   c. Deselect **Require Secret for Web Server Flow** if the Mobile SDK app performs authorization through the device's native browser.
3. Enter the mobile start URL to direct users to a specific location when the app is accessed from a mobile device.

   If you don't enter a mobile start URL, users are sent to the start URL defined under Web App Settings.

   If the connected app you're creating is a canvas app, you can skip this field. The Canvas App URL field contains the URL that gets called for the connected app.
4. Select **PIN Protect** if your app supports PIN protection. This setting allows the admin to set the session timeout and PIN length for mobile applications after installing the connected app.

Salesforce Mobile SDK supports PIN protection. You can also implement it manually by reading the `mobile_policy` object from the user's Identity URL.

5. For App Platform, specify the app platform, such as iOS.
6. For Restrict to Device Type, specify the supported device form factors for the mobile app. If the app supports all form factors, don't choose a value.
7. For App Version, enter the version number of the mobile app.
8. For Minimum OS version, enter the version required for the app.
9. To confirm that this app is only for internal (non-public) distribution, select **Private App** . This setting is required because Apple doesn't allow distribution of public mobile apps outside of its App Store.
10. If the mobile app is private, specify the location of the Mobile App Binary file. The format of the file is IPA for iOS, and APK for Android.
11. For iOS apps only:
    a. Specify the location of the Application Icon that is displayed while the app is being downloaded and installed on an iOS device.
    b. Specify the iOS Bundle Identifier.

       For iOS 7 and later, use the same bundle identifier that you used when developing the app in XCode. If you don't, users see two app icons during installation.
12. If the mobile connected app is a public app and you haven't uploaded its binary file to Salesforce, enter the app binary URL.

    Note: If you remove mobile integration from a new version of an existing connected app, mobile integration is removed from all versions of the app. For example, you publish a package containing version 1.0 of your connected app with mobile integration. You then remove mobile integration from the app, repackage it, and publish it as version 1.1. If a customer installs the earlier package with version 1.0, the connected app doesn't contain mobile integration.
13. Enable push notifications, as needed. See Mobile Push Notifications.
14. When you've configured all settings for your connected app, click **Save**.

Create a Custom Connected App Handler

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS
Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience
Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions Connected Apps can be installed in: **All** Editions

Write a custom connected app handler in Apex to customize how the connected app is invoked. The custom handler can support new protocols or respond to user attributes in a way that benefits a business process.

1. Create a class that extends the `ConnectedAppPlugin` Apex class, and associate it with the connected app. See the `ConnectedAppPlugin` class in the Apex Code Developer's Guide.
2. Create your connected app, and complete its basic information.
3. For Apex Plugin Class, enter the name of the Apex class you created to customize the behavior of the connected app.
4. For Run As, select the user account that the plug-in runs on behalf of.

   If the user isn't authorized for the connected app, use the `authorize` method. See the `ConnectedAppPlugin` class in the Apex Code Developer's Guide.
5. When you've configured all settings for your connected app, click **Save**.

Expose Your Connected App as a Canvas App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You can expose your connected app as a canvas app. Canvas apps are available as apps that your org's Salesforce admin install or as personal apps that users install across orgs. Users access a canvas personal app from the Chatter tab, and are prompted to allow the app to connect to their Salesforce data. Users can choose to make an app a canvas personal app.

For more information about canvas apps, see the Canvas Developer Guide.

1. Create your connected app, and complete its basic information.
2. In the Canvas App Setting section, select **Canvas** to expose your connected app as a canvas app.
3. Enter the canvas app URL to the third-party app. The user is directed to this URL when clicking the link to your canvas app.
4. Select an access method to specify how the canvas app initiates the OAuth authorization flow.
   - Signed Request (POST)—OAuth authorization is used, but when Salesforce admins install the canvas app, they implicitly allow access for users. Users aren't prompted to allow apps to access their user information. When you use this access method, authorization is posted directly to the canvas app URL.

If your canvas app uses signed request authorization, don't select **Perform requests on your behalf at any time** for the Selected OAuth Scopes.

- OAuth Webflow (GET)—OAuth authorization is used, and the user is prompted to allow apps to access their information. When you use this access method, the canvas app must initiate the OAuth authorization flow.

5. If you're using SAML single sign-on (SSO) for canvas app authentication, select the **SAML Initiation Method** field. The options for this field include the following.
   - Identity Provider Initiated—Salesforce makes the initial request to start the SSO flow.
   - Service Provider Initiated—Canvas app starts the SSO flow after the app is invoked.

   Note: You must select **Enable SAML** in the Web App Settings section to enable this field.

6. Under Locations, select where the canvas app appears to users.
   - Chatter Feed—Canvas app displays in the feed. If selected, create a CanvasPost feed item and ensure that the current user has access to the canvas app.
   - Chatter Tab—Canvas app displays in the app navigation list on the Chatter tab automatically.
   - Console—Canvas app displays in the footer or sidebars of the Salesforce console. If selected, you must choose where the canvas app displays in a console by adding it as a custom console component.
   - Layouts and Mobile Cards—Canvas app can display on a page layout or a mobile card. If selected, choose where the canvas app displays by adding it to the page layout.
   - Mobile Nav—Canvas app is accessible from the navigation menu in the Salesforce app.

     Note: Canvas apps don't appear in the app navigation menu in Salesforce for Android. To see canvas apps in the navigation menu, log in to Salesforce mobile web.

   - Open CTI—Canvas app displays in the call control tool. If selected, specify the canvas app in your call center's definition file for it to display.
   - Publisher—Canvas app displays in the publisher. If selected, create a canvas custom quick action and add it to the global layout or to an object layout.
   - Visualforce Page—Canvas app can display on a Visualforce page. If you add an `<apex:canvasApp>` component to expose a canvas app on a Visualforce page, be sure to select this location for the canvas app. If you don't, you receive an error.

7. To create a global action for your canvas app, select **Create Actions Automatically**. Under Location, select **Publisher**.

   If you don't use this option, global actions aren't created. You can also create the action later.

8. If you implement your own `Canvas.CanvasLifecycleHandler` Apex class, enter the class name in Lifecycle Class.

   Providing a `Canvas.CanvasLifecycleHandler` Apex class lets you customize context information and add custom behavior to your canvas app.

9. To let users install your app, select **Enable as a Canvas Personal App**. Chatter Tab is the only location that supports canvas personal apps.

   Note: If you don't see the **Enable as a Canvas Personal App** setting, the admin for the app's destination org hasn't enabled canvas personal apps. For details, see "Enabling Canvas Personal Apps within an Organization" in the *Canvas Developer Guide*.

10. When you've configured all settings for your connected app, click **Save**.

Test Push Notifications

To run a quick test of your push notification setup, use the Send Test Notification page. Troubleshoot round-trip push notifications in a synchronous mechanism without having to configure Apex or REST calls. You can also gain insights into what's going on behind the scenes in the asynchronous environment of real-world push notifications.

The Send Test Notification page uses information from your Apple Push Notification Service (APNS) or Google Cloud Messaging for Android (GCM) setup to configure a synchronous push mechanism. You select a device to receive the push notification by entering a connection token string. If you don't know the token string, you can use the Search tool to select from the list of devices that are registered for your connected app. The Search tool automatically displays the five most recently registered devices. You can also enter a user's name to search for devices that are registered to that user.

Note: Before attempting to send test push notifications, verify that the mobile settings in your connected app are properly configured. See Create a Connected App.

Push notifications aren't available in the console in Professional Edition.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

For Android GCM push notifications, you can select the Dry Run option to test your GCM setup. This option sends the notification to the GCM server but does not forward it to a device.

Each push attempt returns a status message that indicates success or failure. See Error Messages for Push Notifications for explanations of messages. For additional information, see:

- developer.apple.com for information on Apple APNS push notifications.
- developer.android.com for information on GCM for Android push notifications.

Push Notification Limits

The maximum push notifications allowed for each mobile app associated with your Salesforce org depends on the type of app.

Mobile application type	Maximum notifications per app per day
Provided by Salesforce (for example, Salesforce for iOS)	50,000
Developed by your company for internal employee use	35,000
Installed from the AppExchange	5,000

Only *deliverable* notifications count toward this limit. For example, consider the scenario where a notification is sent to 1,000 employees in your company, but 100 employees haven't installed the mobile application yet. Only the notifications sent to the 900 employees who have installed the mobile application count toward this limit.

Each test push notification that is generated through the Test Push Notification page is limited to a single recipient. Test push notifications count toward an application's daily push notification limit.

Send Test Push Notifications to APNS

To run a quick test of your push notification setup for Apple Push Notification Service (APNS), use the Send Test Notification page.

Send Test Push Notifications to GCM for Android

To run a quick test of your push notification setup for Google Cloud Messaging for Android (GCM), use the Test Push Notifications page.

Error Messages for Push Notifications

If you get an error message while sending a push notification from the Send Test Notification page, check the following table for suggestions on how to fix the error.

Send Test Push Notifications to APNS

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

To run a quick test of your push notification setup for Apple Push Notification Service (APNS), use the Send Test Notification page.

1. In Setup, enter *Apps* in the `Quick Find` box, then select **Apps**.
2. Click the name of your connected app.
3. Click **Send test notification** next to Supported Push Platform. This link appears only if you've configured your connected app to support mobile push notifications.
4. Enter a connection token string in the **Recipient** field, OR search for a recipient by clicking Search 🔍, and then select one of the search results. By default, the Search results list displays the five devices most recently registered for your connected app.
   a. To find other devices, enter a user name in the Search text box.
   b. Click **Go** to generate a list of all devices currently registered under that user name.
5. Optionally, for Alert, enter an alert message or dictionary per Apple's specifications.
6. For Badge, enter a badge number or *0* for no badge.
7. For Sound, enter the name of a sound file in the application bundle, or enter *default* to use the system default alert sound.
8. Optionally, to use a custom payload, enter your payload's JSON value in the Custom Payload field.
9. Click **Send** to send the test push notification, or click **Clear** to reset the form.

Send Test Push Notifications to GCM for Android

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

To run a quick test of your push notification setup for Google Cloud Messaging for Android (GCM), use the Test Push Notifications page.

1. In Setup, enter *Apps* in the `Quick Find` box, then select **Apps**.
2. Click the name of your connected app.
3. Click **Send test notification** next to Supported Push Platform. This link appears only if you've configured your connected app to support mobile push notifications.
4. Enter a connection token string in the **Recipient** field, OR search for a recipient by clicking Search 🔍, and then select one of the search results. By default, the Search results list displays the five devices most recently registered for your connected app.
   a. To find other devices, enter a user name in the Search text box.
   b. Click **Go** to generate a list of all devices currently registered under that user name.
5. For Payload, enter a JSON value that contains your message.
6. To send the push notification to the GCM server only, select **Dry Run**.
7. Click **Send** to send the test push notification, or click **Clear** to reset the form.

Error Messages for Push Notifications

If you get an error message while sending a push notification from the Send Test Notification page, check the following table for suggestions on how to fix the error.

Message	Suggested Resolution
Daily push rate limit has been exceeded for this connected application	Because the daily limit is nonnegotiable, no resolution is available.
Certificate is not accepted by Apple Push Notification service	Replace the certificate with a valid type.

Message	Suggested Resolution
Certificate is revoked	Supply valid certificate.
Certificate expired	Renew certificate.
Certificate not valid yet	Retry later.
Invalid certificate or password	Replace the certificate with a valid type.
Invalid recipient or payload	Check your input for errors.
Payload exceeds maximum size	Reduce size of payload.
Unable to load push notifications settings	Confirm that settings are present on connected app.
Recipient field contains invalid device token	Provide valid device token.
Invalid device token length	Token was entered incorrectly or is corrupt. Re-enter token.
Error while sending notification. Confirm certificate is for the correct Apple environment.	Confirm that correct certificate is being used (for example, sandbox versus production).
Apple Push Notification service is unavailable.	Retry later.
Unable to connect to Apple Push Notification service	Retry later.
Unable to connect to Salesforce proxy. Contact Salesforce support if issue persists.	Retry later.
Request blocked by Salesforce proxy. Contact Salesforce support if issue persists.	Retry later.
Apple Push Notification service returned unknown error	Contact Apple or retry later.
Badge must be a number	Re-enter the badge value as an integer.
Payload must be in a valid JSON format	Format payload correctly.
You must enter a value for at least one of the following fields: Alert, Badge, Sound, or Custom Payload	Enter a valid value for one of the fields.
Recipient is required	Provide device token.
Google Cloud Messaging authentication error	Consult the GCM documentation at developer.android.com. Possible causes: • Authorization header is missing or contains invalid syntax. • Invalid project number was sent as key. • Key is valid, but GCM service is disabled. • Request originated from a server that is not white-listed in the server key IP addresses.
Internal error in the Google Cloud Messaging server, or the server is temporarily unavailable	Retry later.
Registration ID in the Recipient field is formatted incorrectly	Verify that mobile app is providing valid registration ID, or manually enter valid registration ID.

Message	Suggested Resolution
Payload exceeds maximum size	Reduce size of payload.
Recipient field contains registration ID that is not valid for the connected application's API server key	Provide correct server key for the app.
Recipient is required	Select recipient or provide registration ID.
Recipient field contains invalid registration ID	Update recipient's device registration ID.
GCM server returned an unexpected error. Please contact the SFDC support team.	Contact salesforce.com.
An unexpected error occurred. Please contact the SFDC support team.	Contact salesforce.com.

Edit a Connected App

After you create a connected app, you can make changes to it's configuration. The actions that you can perform depend on the type of connected app. Use the App Manager to get a list of apps available in your org, including connected apps. From here, you can edit, reconfigure, or delete the connected app.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Reconfigure a Connected App

You can reconfigure a connected app at any time to change the app's description, logo, icon, or callback URL. You can update settings for OAuth, web apps, mobile apps, or canvas apps.

Restrict Access to Trusted IP Ranges for a Connected App

After you create a connected app, you can specify the trusted IP ranges from which a user can log in. In addition, you can apply IP relaxation to all OAuth client apps, including apps that use OAuth and SAML for single sign-on.

Add Custom Attributes to a Connected App

After you've created the connected app, you can add custom attributes. With custom attributes, you can get more information about a user's identity like an address or job title. Custom attributes specify SAML metadata or specify OAuth parameters that are read at OAuth runtime.

Delete a Connected App

You can delete a connected app that you've created. For connected apps created in Spring '14 or later, you can reuse the name of a deleted connected app.

Reconfigure a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You can reconfigure a connected app at any time to change the app's description, logo, icon, or callback URL. You can update settings for OAuth, web apps, mobile apps, or canvas apps.

1. Open the list of apps. From Setup, enter `Apps` in the Quick Find box, then select **App Manager**.
2. Locate the connected app, click ▾, and then select **Edit**.
3. Make your changes and click **Save**.

> Important: For your convenience, you can update some fields in a connected app and the changes apply immediately to all installed versions of the app. For example, connected app descriptions are immediately updated in each version of the connected app. The following version-independent fields bypass the packaging or installation lifecycle.
>
> - Description
> - Info URL
> - Logo Image URL
> - Callback URL

Restrict Access to Trusted IP Ranges for a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

After you create a connected app, you can specify the trusted IP ranges from which a user can log in. In addition, you can apply IP relaxation to all OAuth client apps, including apps that use OAuth and SAML for single sign-on.

For more information about IP Relaxation, see Manage OAuth Access Policies for a Connected App.

1. From Setup, enter `Apps` in the Quick Find box, then select **App Manager**.
2. Locate the connected app, click ▾, and then select **View**.
3. In the Trusted IP Range for OAuth Web server flow section, click **New**.
4. For the start IP address, enter a valid IP address. For the end IP address, enter the same or higher IP address.

   Enter multiple, discontinuous ranges by clicking **New**.

Add Custom Attributes to a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

After you've created the connected app, you can add custom attributes. With custom attributes, you can get more information about a user's identity like an address or job title. Custom attributes specify SAML metadata or specify OAuth parameters that are read at OAuth runtime.

1. Open the list of apps. From Setup, enter `Apps` in the Quick Find box, then select **App Manager**.
2. Locate the connected app, click ▾, and then select **View**.
3. Under Custom Attributes, click **New**.

   Each custom attribute must have a unique key and must use fields available from the Insert Field menu. For example, assign a key name, such as `country` and insert the field `$Organization.Country`. When using SAML, attributes are sent as SAML attribute statements. When using OAuth, attributes are available as a `custom_attributes` object in the user's Identity URL.

Delete a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You can delete a connected app that you've created. For connected apps created in Spring '14 or later, you can reuse the name of a deleted connected app.

When you remove a connected app that is a component of a package, the app remains available until you update the package with a new version. But if you delete the connected app, it's permanently deleted. Any version of the package that contains the deleted connected app is invalidated and can't be installed. You can update a version of the package that *doesn't* contain the connected app as a component. Never delete a connected app that Salesforce distributes, such as the Salesforce app.

1. From Setup, enter `Apps` in the Quick Find box, then select **App Manager**.
2. Locate the connected app, click ▾, and then select **View**.

3. Click **Delete**, and click **Delete** again to confirm.

Manage Access to a Connected App

After a connected app is installed in your org, you can manage access to it. Configure permissions and policies for the app, explicitly defining who can use the connected app and where they can access the app from. These permissions and policies, which include user-access, IP range restrictions, and two-factor authentication, provide extra security for your org.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Manage Third-Party Connected Apps

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

If your org uses third-party apps, such as those installed from the AppExchange, you can set security policies to control what data the third-party app can access from your org. You can also define who can use the third-party app. In addition to setting security policies to manage third-party apps, you can uninstall, and—when necessary—block these apps from the Salesforce org.

As a third-party connected app consumer, you're org installed the app from the AppExchange Marketplace or as a managed package from Salesforce or a third-party vendor's website. You can only edit the app's access policies, such as determining who can use the app and whether the app can access data from a remote location.

Example: For example, you install a third-party app that allows your org's users to make travel reservations. By selecting the option Admin approved users are pre-authorized for the connected app, you can assign specific user profiles to the app. Only the users with this user profile can access the app. You can also set a refresh token policy to revoke the travel reservation app's access to your Salesforce data after a set amount of time.

Connected Apps Installed by Salesforce

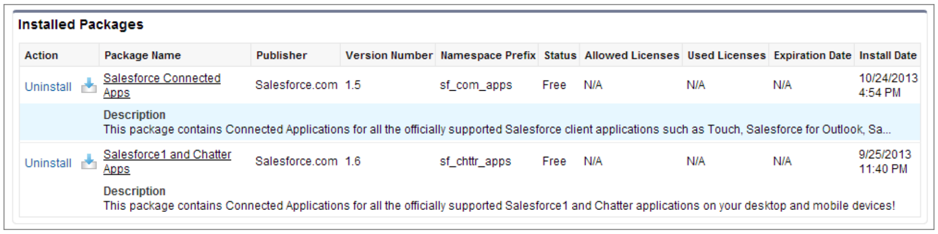
Some Salesforce client apps, such as the Salesforce app and Salesforce for Outlook, are implemented as connected apps. Salesforce automatically installs them in your org.

Salesforce distributes these client-type connected apps in two managed packages:

- Salesforce for Android and Salesforce for iOS
- Salesforce for other mobile apps

The connected apps included in the package change with each release. Salesforce installs the package the first time a user accesses one of the apps.

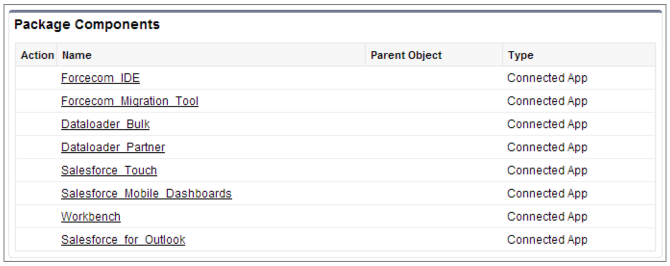
Salesforce packages appear in Setup under the Installed Packages List. See Installed Packages.



Installed Packages

Action	Package Name	Publisher	Version Number	Namespace Prefix	Status	Allowed Licenses	Used Licenses	Expiration Date	Install Date
Uninstall	Salesforce Connected Apps	Salesforce.com	1.5	sf_com_apps	Free	N/A	N/A	N/A	10/24/2013 4:54 PM
	Description This package contains Connected Applications for all the officially supported Salesforce client applications such as Touch, Salesforce for Outlook, Sa...								
Uninstall	Salesforce1 and Chatter Apps	Salesforce.com	1.6	sf_chttr_apps	Free	N/A	N/A	N/A	9/25/2013 11:40 PM
	Description This package contains Connected Applications for all the officially supported Salesforce1 and Chatter applications on your desktop and mobile devices!								

Click a package name to see the list of components. The following are some components in the Salesforce Connected Apps package.

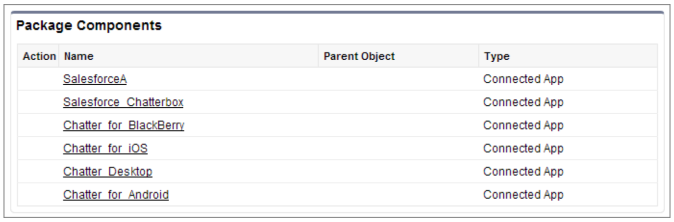


Package Components

Action	Name	Parent Object	Type
	Forcecom_IDE		Connected App
	Forcecom_Migration_Tool		Connected App
	Dataloader_Bulk		Connected App
	Dataloader_Partner		Connected App
	Salesforce_Touch		Connected App
	Salesforce_Mobile_Dashboards		Connected App
	Workbench		Connected App
	Salesforce_for_Outlook		Connected App

Note: The Ant Migration Tool is a "wrapper" connected app that uses SOAP API to integrate with Salesforce. It still uses the connected apps framework to allow or deny users access to the apps in an org.

The following are examples of components for the Salesforce app and Chatter app packages.

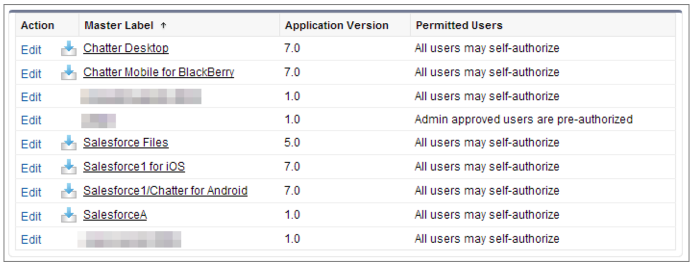


Package Components

Action	Name	Parent Object	Type
	SalesforceA		Connected App
	Salesforce_Chatterbox		Connected App
	Chatter_for_BlackBerry		Connected App
	Chatter_for_iOS		Connected App
	Chatter_Desktop		Connected App
	Chatter_for_Android		Connected App

To install or reinstall the Salesforce app package for connected apps, you can install it from App Exchange.

You can manage installed connected apps from the Connected Apps page. The connected apps that Salesforce installs appear in the list as installed by a managed package. They appear along with your other installed connected apps.



Action	Master Label ↑	Application Version	Permitted Users
Edit	Chatter Desktop	7.0	All users may self-authorize
Edit	Chatter Mobile for BlackBerry	7.0	All users may self-authorize
Edit	[redacted]	1.0	All users may self-authorize
Edit	[redacted]	1.0	Admin approved users are pre-authorized
Edit	Salesforce Files	5.0	All users may self-authorize
Edit	Salesforce1 for iOS	7.0	All users may self-authorize
Edit	Salesforce1/Chatter for Android	7.0	All users may self-authorize
Edit	SalesforceA	1.0	All users may self-authorize
Edit	[redacted]	1.0	All users may self-authorize

Install a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You install a connected app by installing a managed package that includes the connected app as a component. For example, ISVs package connected apps to make them available on AppExchange. You can also install an OAuth connected app from the Connected Apps OAuth Usage page. This page lists all OAuth connected apps that users in your org are connecting to currently—including apps that developers created in other Salesforce orgs.

When an Install button appears next to a connected app, users in your org are connecting to the app but it isn't installed in your org. To manage an app's security policies, such as which users can access the app and for how long, you must install the connected app in your org.

1. From Setup, enter `OAuth` in the Quick Find box, then select **Connected Apps OAuth Usage**.
2. Select an app and click **Install**.

3. Click **Manage App Policies** to get details about the app.
4. Click **Edit Policies** to control the app's access policies. See Manage Access to a Connected App.

Uninstall a Third-Party Connected App

USER PERMISSIONS	
To view the OAuth Connected Apps Usage page:	View Setup and Configuration AND Manage Users
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You can uninstall a third-party connected app from your org. However, uninstalling an app doesn't delete the connected app. Instead it removes the OAuth policies that you set for the app in your org. Because you're removing the policies for apps that users can still access, you're actually loosening your security measures. We recommend uninstalling a connected app only when the original developer deletes the app from their org. To make a connected app inaccessible to your org's users, block the app. This action ends all current user sessions with the connected app and prevents all new sessions until you unblock the app.

For more information about blocking connected apps, see Manage Current OAuth Connected App Sessions.

You can uninstall third-party connected apps from the Connected Apps OAuth Usage page. Uninstall connected apps that are part of managed packages by uninstalling the package.

Important: Don't uninstall connected app packages owned and distributed by Salesforce, such as the Salesforce app. Salesforce installs and manages these packages.

1. From Setup, enter `OAuth` in the Quick Find box, then select **Connected Apps OAuth Usage**.
2. Click **Uninstall** to remove the local copy of the connected app from your org.

Manage Start URL Settings for a Connected App

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

A start URL defines the page where users are directed to when they run the connected app. If you don't configure a start URL, users are sent to the app's default start page after authorization completes. Start URL settings apply to all connected apps, except canvas apps. If your app is a canvas app, the connected app ignores the start URL fields. Instead, it uses the canvas app URL specified when the connected app was created.

Each start URL can be an absolute URL, such as `https://na1.salesforce.com/001/o`, or it can be the link for the app's name, such as `https://customer.goodApp.com` for the GoodApp app.

1. From Setup, enter *`Connected Apps`* in the Quick Find box, then select **Manage Connected Apps**.
2. Click **Edit** next to the connected app that you are configuring access for.
3. Under Basic Information, define start URL settings, as needed.
    - **Start URL**—Direct users to a specific location when the app is run. This URL also appears in the app menu.
    - **Mobile Start URL**—Direct users to a specific location when the app is accessed from a mobile device.

Manage OAuth Access Policies for a Connected App

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Configure OAuth access policies for OAuth-enabled connected apps. These policies include defining which users can access a connected app, what IP restrictions apply to the connected app, and how long a refresh token is valid for.

1. From Setup, enter `Connected Apps` in the Quick Find box, then select **Manage Connected Apps**.
2. Click **Edit** next to the connected app that you are configuring access for.
3. Under OAuth Policies, click the **Permitted Users** dropdown menu and select one of the following options.
   - All users may self-authorize—Default. Allows all users in the org to authorize the app after successfully signing in. Users must approve the app the first time they access it.
   - Admin approved users are pre-authorized—Allows only users with the associated profile or permission set to access the app without first authorizing it. After selecting this option, manage profiles for the app by editing each profile's Connected App Access list. Or manage permission sets for the app by editing each permission set's Assigned Connected App list.

     Note: In a Group Edition org, you can't manage individual user access with profiles. However, you can manage all users' access when you edit a connected app's OAuth settings.

     Warning: If you switch from All Users may self-authorize to Admin-approved users are pre-authorized, anyone using the app loses access, unless a user's permission authorizes the connected app specifically. In addition, if users have the Use Any API Client permission, they can access any connected app—even if its Permitted Users setting is set to Admin-approved users are pre-authorized. Be careful when using the Use Any API Client permission. As the name implies, you're giving up your control over authorization.

4. Click the **IP Relaxation** dropdown menu, and select one of the following options to determine whether a user's access to the app is restricted by IP ranges.
   - Enforce IP restrictions—Default. Enforces the IP restrictions configured for the org, such as the IP ranges assigned to a user profile.
   - Enforce IP restrictions, but relax for refresh tokens—Enforces the IP restrictions configured for the org, such as the IP ranges assigned to a user profile. However, this option bypasses these restrictions when the connected app uses refresh tokens to get access tokens.

- Relax IP restrictions for activated devices—Allows a user running the app to bypass the org's IP restrictions when either of these conditions is true.
  - The app has a whitelist of IP ranges and is using the web server authentication flow. Only requests coming from the whitelisted IPs are allowed.
  - The app doesn't have an IP-range whitelist, but it uses the web server authentication flow, and the user successfully completes identity verification if accessing Salesforce from a new browser or device.
- Relax IP restrictions—Allows a user to run this app without org IP restrictions.

Note: If you relax IP restrictions for your connected app and your org has Enforce login IP ranges on every request enabled, the access to your connected app can change. See Connected App IP Relaxation and Continuous IP Enforcement. Also, IP restrictions are enforced only if they are configured on a user's profile. The SAML bearer assertion and JWT bearer token flows always enforce IP restrictions regardless of the connected app policy.

5. Select **Enable Single Logout** to automatically log users out of the connected app service provider when they log out of Salesforce.
6. If you selected **Enable Single Logout**, enter a single logout URL. Salesforce sends logout requests to this URL when users log out of Salesforce. The single logout URL must be an absolute URL starting with `https://`.
7. Select a **Refresh Token Policy** to determine how long a refresh token is valid for.

   If refresh tokens are provided, users can continue to access the OAuth-enabled connected app without having to reauthorize when the access token expires (defined by the session timeout value). The connected app exchanges the refresh token with an access token to start a new session. The Refresh Token policy is evaluated only during usage of the issued refresh token and doesn't affect a user's current session. Refresh tokens are required only when a user's session has expired or isn't available.

   For example, you set a refresh token policy to expire the token after 1 hour. If a user uses the app for 2 hours, the user isn't forced to reauthenticate after 1 hour. However, the user is required to authenticate again when the session expires and the client attempts to exchange its refresh token for a new session.

   - **Refresh token is valid until revoked**—Default. The refresh token is used indefinitely, unless revoked by the user or Salesforce admin.

     Revoke tokens on a user's detail page under OAuth Connected Apps or on the OAuth Connected Apps Usage Setup page.

   - **Immediately expire refresh token**—The refresh token is invalid immediately. The user can use the current session (access token) already issued, but can't obtain a new session when the access token expires.
   - **Expire refresh token if not used for** `n`—The refresh token is valid as long as it's been used within the specified amount of time. For example, if set to seven days, and the refresh token isn't exchanged for a new session within seven days, the next attempt to use the token fails. The expired token can't generate new sessions. If the refresh token is exchanged within seven days, the token is valid for another seven days. The monitoring period of inactivity also resets.
   - **Expire refresh token after** `n`—The refresh token is valid for a fixed amount of time. For example, if the policy states one day, the user can obtain new sessions only for 24 hours.

If your connected app is a canvas app that uses signed request authentication:

- Set Permitted Users to **Admin-approved users are pre-authorized**.
- Set Expire Refresh Tokens to **Immediately expire refresh token**.
- Give users access via profiles and permission sets.

Connected App IP Relaxation and Continuous IP Enforcement

For security reasons, if you relax IP restrictions for your connected app, and your org has enabled **Enforce login IP ranges on every request**, users can't access the app in some circumstances. This access restriction applies to all OAuth-enabled connected apps, including mobile devices.

SAML-enabled connected apps aren't affected, unless they are also OAuth-enabled for single sign-on.

Note: IP restrictions are enforced only when they're configured on a user's profile. SAML bearer assertion and JWT bearer token flows always enforce IP restrictions regardless of the connected app policy.

Table 1: Connected App IP Relaxation Settings and Continuous IP Enforcement

IP Relaxation	When Continuous IP Enforcement Is Disabled (Default)	When Continuous IP Enforcement Is Enabled
`Enforce IP restrictions`	A user running this app is subject to the org's IP restrictions, such as IP ranges set in the user's profile.	A user running this app is subject to the org's IP restrictions, such as IP ranges set in the user's profile.
`Enforce IP restrictions, but relax for refresh tokens`	A user running this app is subject to the org's IP restrictions, such as IP ranges set in the user's profile, during initial login. These restrictions are relaxed when the app later uses a refresh token to obtain a new access token.	A user running this app is subject to the org's IP restrictions, such as IP ranges set in the user's profile, during initial login. These restrictions are relaxed when the app later uses a refresh token to obtain a new access token. However, for security reasons, users can't: • Change their password • Register a verification method • Access pages in a login flow
`Relax IP restrictions for activated devices`	A user running this app bypasses the org's IP restrictions when either of these conditions is true. • The app has IP ranges whitelisted and is using the web server OAuth authorization flow. Only requests coming from the whitelisted IPs are allowed. • The app has no IP range whitelist and is using the web server or user-agent OAuth authorization flow. Also, the user successfully completed identity verification when the user accessed Salesforce from a new browser or device.	A user running this app bypasses the org's IP restrictions when either of the OAuth conditions in the previous column is true. However, for security reasons, users can't: • Change their password • Register a verification method • Access pages in a login flow

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

IP Relaxation	When Continuous IP Enforcement Is Disabled (Default)	When Continuous IP Enforcement Is Enabled
`Relax IP restrictions`	A user running this connected app is not subject to any IP restrictions.	A user running this connected app is not subject to any IP restrictions. However, for security reasons, users can't: • Change their password • Register a verification method • Access pages in a login flow

Manage Session Policies for a Connected App

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Configure a connected app's session policies to define how long a user's session can last before reauthenticating. You can also use session policies to block user access to the connected app, or to require two-factor authentication to access the app.

1. From Setup, enter `Connected Apps` in the Quick Find box, then select **Manage Connected Apps**.
2. Click **Edit** next to the connected app that you are configuring access for.
3. Under Session Policies, click the **Timeout Value** dropdown menu and select when access tokens expire for a user's connected app session.

   You can control how long a user's session lasts by setting the timeout value for the connected app, user profile, or org's session settings (in that order). If you don't set a value or you select **None** (the default), Salesforce uses the timeout value in the user's profile. If the user's profile doesn't specify a timeout value, Salesforce uses the timeout value in the org's Session Settings. The current permissions for the connected app are also listed in the org's Session Settings.

4. Select **High assurance session required** to require users to verify their identity with two-factor authentication when they log in to the connected app.
   - Select **Block this application** to make the connected app inaccessible to your org's users. Blocking an app ends all current user sessions with the connected app and prevents all new sessions.

- Select **Raise the session level to high assurance** to require users to verify their identity with two-factor authentication when they log in to the connected app. Only authorization flows that include a user approval step support using API logins with the High Assurance session security level. These flows are the OAuth 2.0 refresh token flow, web server flow, and user-agent flow. All other flows, such as the JSON Web Token (JWT) bearer token flow, don't include a user approval step. For flows without a user approval step, API logins with the High Assurance session security level are blocked.

Manage Mobile Policies for a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Configure policies for mobile connected apps that enforce PIN protection. These policies include setting the length of the connected app's PIN, and defining how long a session can be idle before requiring re-entry of the PIN.

1. From Setup, enter `Connected Apps` in the Quick Find box, then select **Manage Connected Apps**.
2. Click **Edit** next to the connected app that you are configuring access for.
3. Under Mobile Integration, select a time value for **Require Pin after**. This value specifies how long the app can be idle before requiring re-entry of the PIN. The time can be none (no locking), 1, 5, 10, and 30 minutes. This policy is only enforced if a corresponding pin length is configured.

   The connected app is responsible for enforcing this policy. Apps written using the Salesforce Mobile SDK can enforce this policy, or the app can read the policy from the UserInfo service and enforce the policy.

   This policy doesn't invalidate a user's session. When the session expires due to inactivity, this policy only requires the user to enter a PIN to continue using the current session.

4. Select a value for **Pin Length**. This value sets the length of the identification number sent for authentication confirmation. The length can be from 4 to 8 digits, inclusive.

Manage Access Through a Custom Connected App Handler

USER PERMISSIONS	
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

Write a custom connected app handler in Apex to customize how the connected app is invoked. The custom handler can support new protocols or respond to user attributes in a way that benefits a business process.

1. From Setup, enter *`Connected Apps`* in the Quick Find box, then select **Manage Connected Apps**.
2. Click **Edit** next to the connected app that you are configuring access for.
3. Under Custom Connected App Handler, enter the name of the Apex Plugin class you created to customize the behavior of the connected app.
4. For Run As, select the user account that the plug-in runs on behalf of.

   If the user isn’t authorized for the connected app, use the `authorize` method. See the `ConnectedAppPlugin` class in the Apex Code Developer's Guide.

Manage Other Access Settings for a Connected App

USER PERMISSIONS

To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data AND Manage Profiles and Permission Sets
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

The Connected App Detail page provides an overview of access settings assigned to the connected app, including OAuth policies and session policies. From this page, you can click **Edit Policies** to manage access to the connected app. You can also manage profiles, permission sets, custom attributes, and custom scopes associated with the connected app.

1. From Setup, enter `Connected Apps` in the Quick Find box, then select **Manage Connected Apps**.
2. Click a connected app to view on the Connected App Detail page.
3. For connected apps that use SAML and if your org is an Identity Provider, click **Download Metadata**. The downloaded metadata includes the service provider SAML login URLs and endpoints that are specific to your community or custom domain configuration.

   This button displays only if your org is enabled as an Identity Provider, and only with connected apps that use SAML. You can access this metadata via a URL in Metadata Discovery Endpoint. Your service provider uses this URL to configure single sign-on to connect to Salesforce.
4. In the OAuth Policies section, click **View OAuth Usage** to see which OAuth connected apps users are actively connecting to. These apps have an active access or refresh token.
5. If user provisioning is enabled, you can click **Launch User Provisioning Wizard** to configure user provisioning for the connected app. See User Provisioning for Connected Apps.
6. Click **Manage Profiles** to select profiles to assign to the app from the Application Profile Assignment page. Assign profiles that you want to be able access the app (except in Group Edition).

   Tip: This option won't appear if the OAuth policy for **Permitted Users** is set to `All users may self-authorize` because this option isn't needed when users can authorize themselves.
7. Click **Manage Permission Sets** to select the permission sets to assign to the app from the Application Permission Set Assignment page. Assign permission sets that you want to be able to access to app.

   Tip: This option won't appear if the OAuth policy for **Permitted Users** is set to `All users may self-authorize` because this option isn't needed when users can authorize themselves.

8. To assign custom attributes to the connected app, click **New**.

   Each custom attribute must have a unique key and must use fields available from the Insert Field menu. For example, assign a key name, such as `country` and insert the field `$Organization.Country`. When using SAML, attributes are sent as SAML attribute statements. When using OAuth, attributes are available as a `custom_attributes` object in the user's Identity URL.

9. For OAuth-enabled connected apps, click Manage OAuth Custom Scopes to assign custom scopes to the connected app. See OAuth Custom Scopes.

User Provisioning for Connected Apps

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

You can use a connected app to link your users with a third-party app. User provisioning for a connected app simplifies account creation and links your Salesforce users' accounts to their third-party accounts. After the accounts are linked, you can configure the App Launcher to display the connected app as a tile. With a single click, users get instant access to the third-party app.

Here's a user provisioning scenario. You configure user provisioning for a G Suite connected app in your org. Then you assign the Employees profile to that connected app. When you create a user in your org and assign the user to the Employees profile, the user is provisioned in G Suite. When the user is deactivated, or the profile assignment changes, the user is deprovisioned from G Suite.

User provisioning applies only to users with a profile or permission set that grants them access to the connected app.

Salesforce provides a wizard to guide you through the user provisioning settings for each connected app. You can also run reports to see who has access to specific third-party apps. These reports give you a centralized view of all user accounts across all connected apps.

User Provisioning Requests

After you configure user provisioning, Salesforce manages requests for updates on the third-party system. Salesforce sends user provisioning requests to the third-party system based on specific events in your org, either through the UI or API calls. This table shows the events that trigger user provisioning requests and their associated operations.

Event	Operation	Object
Create user	Create	User
Update user (for selected attributes)	Update	User
Disable user	Deactivate	User
Enable user	Activate	User
Freeze user	Freeze	UserLogin
Unfreeze user	Unfreeze	UserLogin
Reactivate user	Reactivate	User
Change user profile	Create or Deactivate	User
Assign or unassign a permission set to a user	Create or Deactivate	PermissionSetAssignment
Assign or unassign a profile to the connected app	Create or Deactivate	SetupEntityAccess

Event	Operation	Object
Assign or unassign a permission set to the connected app	Create or Deactivate	SetupEntityAccess

The operation value is stored in the UserProvisioningRequest object. Salesforce can either process the request immediately or wait for an approval process to complete (if you requested approvals when running the wizard). To process the request, Salesforce uses a flow of the type *`User Provisioning`*, which includes a reference to the Apex `UserProvisioningPlugin` class. The flow calls the third-party service's API to manage user account provisioning on that system.

To send user provisioning requests based on events in Active Directory (AD), use Salesforce Identity Connect to capture AD events, and synchronize them into Salesforce. Then, Salesforce sends the user provisioning requests to the third-party system to provision or deprovision users.

Considerations

Entitlements

Roles and permissions for the service provider can't be managed or stored in the Salesforce org. So specific entitlements to resources at the service provider aren't included when a user requests access to a third-party app that has user provisioning enabled. With user provisioning, you can create a user account for a service provider. However, the service provider must manage any additional roles or permissions for the user.

Scheduled account reconciliation

Run the User Provisioning wizard each time you want to collect and analyze users in the third-party system. You can't configure an interval for an automatic collection and analysis.

Access recertification

After an account is created for the user, validation of the user's access to resources at the service provider must be performed at the service provider.

Configure User Provisioning for Connected Apps

USER PERMISSIONS

To configure user provisioning for connected apps:	View Setup and Configuration AND Manage Users
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

Configure a connected app to save time when provisioning users for third-party apps. Salesforce provides a wizard that guides you through the user provisioning settings for each connected app.

Salesforce provides a step-by-step wizard to guide you through the user provisioning process for each connected app.

Before you use the wizard, you must have the following.

A connected app for the third-party service to provision

Any connected app can support user provisioning, including a “bookmark” connected app, which is a connected app that hasn’t been configured beyond its basic settings. See Configure Basic Connected App Settings.

Named credentials

Named credentials identify the third-party system and its authentication settings. Calls to the third-party system, such as creating, editing, or deleting accounts, use the third-party authentication settings in the named credential. For the named credential, you specify a Named Principal. The Named Principal can be an account on the third-party system or an OAuth authorization for an existing Auth Provider in your org. The User Provisioning Wizard prompts for this named credential.

A flow to manage provisioning requests to the third-party service or app

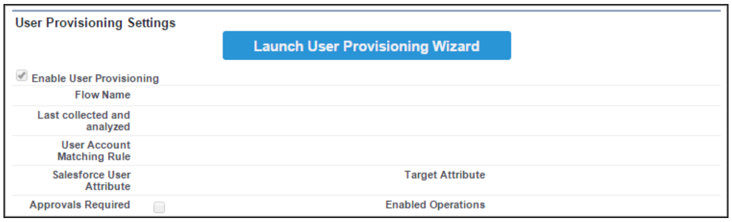
Salesforce provides preconfigured flows to simplify your user-provisioning setup process. From AppExchange, install the Salesforce Identity User Provisioning Connectors package and the Salesforce Identity User Provisioning Utils packages. You associate one of these flows with the connected app using the User Provisioning Wizard.

Optionally, you can create your own flow. For more information, see Create Your Own User Provisioning Flow.

Run the User Provisioning Wizard

If user provisioning is enabled for your org, use these steps to start the User Provisioning wizard for your connected app.

1. From Setup, enter `Connected Apps` in the Quick Find box, then select **Manage Connected Apps**.
2. Click the name of the connected app.
3. On the connected app detail page, click **Edit Policies**.
4. Under User Provisioning Settings, select **Enable User Provisioning**.
5. Click **Save**.
6. Under User Provisioning Settings, click **Launch User Provisioning Wizard**.


User Provisioning Settings
Launch User Provisioning Wizard
☑ Enable User Provisioning
Flow Name
Last collected and analyzed
User Account Matching Rule
Salesforce User Attribute
Target Attribute
Approvals Required ☐
Enabled Operations

After you provision users for your connected app, you can update a user’s account information from the connected app detail page. All users provisioned for the app appear under User Accounts.

You can also rerun the wizard to collect and analyze the accounts on the third-party system, change the provisioning configuration, and process all accounts.

Create Your Own User Provisioning Flow

If the packaged flows don't support the third-party system that you want to provision, or if you want to customize the user provisioning process, you can create your own flow. Creating a flow requires you to be familiar with Flow Builder and Apex triggers.

Use the `UserProvisioningPlugin` legacy Apex action and the UserProvisioningRequest and UserProvAccount standard objects to create a flow of type *`User Provisioning`*. Include these items in the flow.

- Legacy Apex action using the `UserProvisioningPlugin` class with these input and output variables:
  - Input: *`User`*, *`UserProvisioningRequest`*, *`UserProvAccount`*
  - Output: *`ExternalUserId`*, *`ExternalUsername`*, *`ExternalFirstName`*, *`ExternalLastName`*, *`ExternalEmail`*, *`Details`*, *`Status`*
- At least one legacy Apex action with these input and output parameters:
  - Input: *`userProvisioningRequestId`*, *`userId`*, *`namedCredDevName`*, *`reconFilter`*, *`reconOffset`*
  - Output: *`ExternalUserId`*, *`ExternalUsername`*, *`ExternalFirstName`*, *`ExternalLastName`*, *`ExternalEmail`*, *`Details`*, *`Status`*, *`reconState`*, *`nextReconOffset`*
- A "Look Up User" Get Records element to modify during user account linking between Salesforce users and users on the third-party system

Manage User Provisioning Requests

USER PERMISSIONS	
To manage user provisioning requests for connected apps:	View Setup and Configuration AND Manage Users
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields, except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS
Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience
Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions Connected Apps can be installed in: **All** Editions

After you configure user provisioning for a connected app with the User Provisioning wizard, you can manage individual provisioning requests from the User Provisioning Requests tab and from the connected app's detail page. If you included an approval process, you can set up user provisioning request sharing rules.

User Provisioning Requests Tab

From the User Provisioning Requests tab, you can view details and manage approvals for an individual user provisioning request. Each provisioning request details the status of the request and the status of an approval, if you chose to require approvals when you ran the User Provisioning Wizard.

Click the name of a recent user provisioning request to see these details.

Operation

The action for the current request, which can be one of these values:

- Create
- Read
- Update
- Deactivate
- Activate
- Freeze
- Unfreeze
- Reconcile (compares the Salesforce account to the account on the third-party system)
- Linking (changes the current Link State)

State

Current state of the user provisioning request. The User Provisioning wizard invokes a reconciliation process to gather user accounts on the third-party system and compare them to Salesforce user accounts. State reports the progress of the reconciliation process. Typically, when it's created, a user provisioning request state is New. During the collection process, the state is set to Collecting. When the process finishes, the state is Collected.

If the reconciliation process discovers a difference between accounts, an analyze process is triggered, and the state is set to Analyzing. When the process finishes, the state is set to Analyzed.

If a process commits the request based on the linkage settings, the state is set to Committing, and Salesforce updates the user account properties, accordingly. When the update process finishes, the state is set to Completed.

However, some requests don't start with the New state. For example, if a custom process initiates a request to reconcile accounts, an entry can start with the Analyzing state.

If the active process fails, the state changes to Failed.

Click the User Provisioning Account value to see these details about the user's account.

Status

The status of the account in the third-party system, which can be one of these values:

- Active
- Deactivated
- Deleted

Link State

The state of the current connection between the user account in the Salesforce org and the associated user account in the third-party system. The link state can be one of these values:

- Linked—Changes to the account in the Salesforce org are queued for updating the associated user account in the third-party system
- Duplicate—An associated account in the third-party system exists
- Orphaned—No associated account exists in the third-party system
- Ignored—Changes to the account in the Salesforce org have no effect on the associated user account in the third-party system

User Accounts Section of a Connected App's Detail Page

The User Accounts section in a connected app's detail page lists all the accounts discovered and linked to the third-party service. Normally, you let Salesforce manage the Link State to the user account on the third-party system. Salesforce can discover and associate user accounts between a Salesforce org and a third-party system during a reconciliation process. The association is based on attributes that you specify in the User Provisioning wizard.

Select **Let me manage the account linkage** *only* if you want to control the Link State instead of letting Salesforce do it for you.

User Provisioning Request Sharing Rules

If you've added approval processes to your user provisioning configuration, set sharing rules so that another user or manager can see and approve a user provisioning request. From Setup, enter *`Sharing Settings`* in the Quick Find box, then select **Sharing Settings**.

Create User Provisioning for Connected Apps Custom Reports

Salesforce orgs with user provisioning for connected apps can run reports that show provisioning accounts, requests, and other information using custom report types.

1. Make sure you're familiar with custom report types and the general steps for creating and maintaining them.
2. Create custom report types relating these objects and configuring them as necessary. Make all fields available for reporting. Add each report to the User Provisioning report type category. Provide a clear name and description for each report type so users who create reports can understand which one to use for their needs.

Primary Object	Description
User Provisioning Accounts	Contains information that links a Salesforce user account with an account in a third-party system, such as G Suite, for users of connected apps with Salesforce user provisioning enabled.
User Provisioning Logs	Contains messages generated during the process of provisioning users for third-party applications.
User Provisioning Mock Targets	Contains user data for testing before committing the data to a third-party system for user provisioning.
User Provisioning Requests	Contains information about individual provisioning requests for each user.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

USER PERMISSIONS

To create or update custom report types:

- Manage Custom Report Types

To delete custom report types:

- Modify All Data

Manage Current OAuth Connected App Sessions

USER PERMISSIONS

To view the OAuth Connected Apps Usage page:	View Setup and Configuration AND Manage Users
To read, create, update, or delete connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update all fields except Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND either Modify All Data OR Manage Connected Apps
To update Profiles, Permission Sets, and Service Provider SAML Attributes:	Customize Application AND Modify All Data
To install and uninstall connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps
To install and uninstall packaged connected apps:	Customize Application AND either Modify All Data OR Manage Connected Apps AND Download AppExchange Packages

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Connected Apps can be created in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Connected Apps can be installed in: **All** Editions

The Connected Apps OAuth Usage page displays all current OAuth app connections to the org. These apps have an active access or refresh token. Apps without a current access or refresh token are not shown. From this page, you can install or uninstall third-party connected apps, revoke an app's active sessions, and block or unblock org-wide access to the app.

1. From Setup, enter *OAuth* in the Quick Find box, then select **Connected Apps OAuth Usage**.

   The resulting list of apps can be long because it contains all Salesforce and custom OAuth apps available to your users, not just the ones installed in your org. For example, it lists third-party apps from AppExchange and Salesforce partners.

2. Click **Manage App Policies** to open the detail page for the connected app. From the detail page, you can click **Edit Policies** to manage the app's access policies. See Manage Access to a Connected App.
3. Click a user count number to open the Connected Apps User's Usage page to see information about users, which includes:
   - When they first used the app
   - Most recent time they used the app
   - Total number of times they used the app

   From this page, you can end a user's access to the current session by clicking **Revoke**. At the top of the page, click **Revoke All** to end all current sessions for the app.

4. Click **Install** to install a third-party app in your org so that you can manage its access policies See Install a Connected App.
5. Click **Uninstall** to remove the local copy of the connected app from your org. Prior to uninstalling a connected app, see Uninstall a Third-Party Connected App recommendations and considerations.
6. Click **Block** to make the OAuth connected app inaccessible to your org's users. Blocking an app ends all current user sessions and prevents future sessions until you click **Unblock**.
7. Click **Unblock** to give users access to the connected app. By unblocking the app, users can log in and run the app.

If Unblock is disabled, the app is blocked org-wide because it's not whitelisted. To whitelist the app, click **Install**, then click **Edit Policies**. Under the app's OAuth settings, set Permitted Users to **Admin approved users are pre-authorized**. You can whitelist apps only if you've asked Salesforce Customer Support to enable the API client whitelisting feature.

Manage OAuth-Enabled Connected Apps Access to Your Data

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **All** Editions

USER PERMISSIONS

To manage, create, edit, and delete OAuth apps:

- Manage Connected Apps

All users can manage a OAuth-enabled connected app's access to their Salesforce data from their personal settings. The apps that have permission to access Salesforce data are listed under advanced user details. Users can get information about each app and revoke the app's access.

OAuth-enabled connected apps are integrated with Salesforce, so they can access a subset of your Salesforce data after you explicitly grant each app permission.

Go to your personal settings to see which connected apps have permission to access your Salesforce data. Then revoke a connected app's access, as needed.

1. From your personal settings, enter `Advanced User Details` in the Quick Find box, then select **Advanced User Details**. No results? Enter `Personal Information` in the Quick Find box, then select **Personal Information**.
2. In the OAuth Connected Apps section, you can:
   - View information about each connected app that you've granted access to, the number of times, and the last time the app attempted to access your information.

     Note:

     - A connected app can be listed more than once. Each time you grant access to an app, it obtains a new access token. Requests for refresh tokens increase the use count. Also, if an OAuth 2.0 connected app requests multiple tokens with different scopes, you see the same app multiple times.
     - Even if the connected app failed to access your information because it couldn't log in, the Use Count and Last Used fields are updated.
     - Each connected app allows five unique approvals per user. After a fifth approval is made, the oldest approval is revoked. For OAuth 1.x, each issued access token counts as an approval and is listed as a separate entry in the table. For OAuth 2.0, the table lists each refresh token that counts as an approval. Other flows, such as user-agent flows, might also count as approvals. For consumers that use connected apps, avoid requesting OAuth 1.x access tokens or OAuth 2.0 refresh tokens more than once for each device. That way the limit of five unique approvals doesn't impact your org.
   - Click **Revoke** to revoke the app's access. After you revoke the app, it can no longer access your Salesforce data.

     Important: Revoke all access tokens for a particular app to prevent it from accessing your Salesforce data.

Environment Hub

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

The Environment Hub lets you connect, create, view, and log in to Salesforce orgs from one location. If your company has multiple environments for development, testing, and trials, the Environment Hub lets you streamline your approach to org management.

From the Environment Hub, you can:

- Connect existing orgs to the hub with automatic discovery of related orgs.
- Create standard and partner edition orgs for development, testing, and trials.
- View and filter hub members according to criteria that you choose, like edition, creation date, instance, origin, and SSO status.
- Create single sign-on (SSO) user mappings for easy login access to hub members.

Each hub member org corresponds to an EnvironmentHubMember object. EnvironmentHubMember is a standard object, similar to Accounts or Contacts, so you can use the platform to extend or modify the Environment Hub programmatically. For example, you can create custom fields, set up workflow rules, or define user mappings and enable SSO using the API for any hub member org.

Get Started with the Environment Hub

Configure the Environment Hub so that users at your company can access the app to create and manage member orgs. Then enable My Domain so that you can connect existing orgs to the hub and create SSO user mappings.

Manage Orgs in the Environment Hub

You can manage all your existing Salesforce orgs from one location by connecting them to the Environment Hub. You can also create orgs using Salesforce templates for development, testing, and trial purposes.

Single Sign-on in the Environment Hub

Developing, testing, and deploying apps means switching between multiple Salesforce environments and providing login credentials each time. Single sign-on (SSO) simplifies this process by letting an Environment Hub user log in to member orgs without reauthenticating. You can set up SSO by defining user mappings manually, using Federation IDs, or creating a formula.

Environment Hub Best Practices

Follow these guidelines and best practices when you use the Environment Hub.

Environment Hub FAQ

Answers to common questions about the Environment Hub.

Considerations for the Environment Hub in Lightning Experience

Be aware of these considerations when creating and managing orgs in the Environment Hub.

Get Started with the Environment Hub

Configure the Environment Hub so that users at your company can access the app to create and manage member orgs. Then enable My Domain so that you can connect existing orgs to the hub and create SSO user mappings.

Configure the Environment Hub
Enable the Environment Hub in your org, and then configure it to give other users access.

Enable My Domain for the Environment Hub
My Domain is required to connect existing orgs to the Environment Hub and create SSO user mappings. Enable My Domain in the org where the Environment Hub is installed.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Configure the Environment Hub

Enable the Environment Hub in your org, and then configure it to give other users access.

USER PERMISSIONS

To set up and configure the Environment Hub:
- Manage Environment Hub

1. Contact Salesforce to enable the Environment Hub in your org. If you're an ISV partner, you can skip this step. The Environment Hub is already installed in your Partner Business Org.
2. Log in to the org where the Environment Hub is enabled, and then go to Setup.
3. Assign users access to features in the Environment Hub.
   a. From Setup, enter `Profiles` in the `Quick Find` box, then select **Profiles**.
   b. Create a profile, or edit an existing one.
   c. Edit the profile's settings.

Profile Section	Environment Hub Settings
Custom App Settings	Enable the Environment Hub custom app to make it available in the App Launcher in Lightning Experience or App Menu in Salesforce Classic.
Connected App Access	Unless advised by Salesforce, don't adjust settings in this section of the profile.
Service Provider Access	If you enable single sign-on (SSO) in a member org, new entries appear in this section of the profile. Entries appear in the format *Service Provider [Organization ID]*, where *Organization ID* is the ID of the member org. Users who don't have access to the service provider sometimes see this message when attempting to log in via SSO: "User '[UserID]' does not have access to sp '[Service Provider ID]'." When configuring the Environment Hub in a new org, this section is empty.
Administrative Permissions	Enable "Manage Environment Hub" to allow users to: • Create orgs for development, testing, and trials. • Configure SSO for member orgs.

Profile Section	Environment Hub Settings
General User Permissions	Enable "Connect Organization to Environment Hub" to allow users to connect existing orgs to the Environment Hub.
Standard Object Permissions	Grant object permissions based on the level of access required by the Environment Hub user. Hub Members object: • "Read"—View existing Hub Member records. • "Create"—This permission has no impact on the ability to create Hub Member records. That's because record creation is handled either by connecting an existing org or creating an org from the Environment Hub. • "Edit"—Edit fields on existing Hub Member records. • "Delete"—Disconnect an org from the Environment Hub and delete its corresponding Hub Member record and Service Provider record (if SSO was enabled for the member). • "View All"—Read all Hub Member records, regardless of who created them. • "Modify All"—Read, edit, and delete all Hub Member records, regardless of who created them. Hub Invitations object: • If you enable the "Connect Organization to Environment Hub" permission, enable "Create", "Read", "Update, and "Delete" for Hub Invitations. Signup Request object: • If you enable the "Manage Environment Hub" permission, enable "Create" and "Read" for Signup Requests to allow users to create orgs. Optionally, enable "Delete" to allow users to remove orgs from the hub.

d. Select **Save**.

Enable My Domain for the Environment Hub

My Domain is required to connect existing orgs to the Environment Hub and create SSO user mappings. Enable My Domain in the org where the Environment Hub is installed.

1. Find an available domain name and sign up for it.
   a. From Setup, enter `My Domain` in the `Quick Find` box, then select **My Domain**.
   b. Enter the subdomain name you want to use within the sample URL.
   c. Select **Check Availability**. If your name is already taken, choose a different one.

USER PERMISSIONS

To set up a domain name:
- Customize Application

d. Select **Register Domain**.
You receive a confirmation email from Salesforce when your new domain is ready for testing.

2. Test your domain name and deploy it to your org.

a. Click the URL in the confirmation email to log in to Salesforce using your new domain. Alternatively, from Setup, enter *`My Domain`* in the `Quick Find` box, select **My Domain**, and then select **Click here to login**.

b. Test the new domain by clicking tabs and links within your org. Notice that all pages show your new domain name.

> Tip: If you use custom buttons or Visualforce pages in your org, test them before deploying the new domain name. If you used instance-based URLs in your customizations, your links are broken.

c. To roll out the new domain name to your org, from Setup, enter *`My Domain`* in the `Quick Find` box, select **My Domain**, and then select **Deploy to Users**.
The domain is activated immediately, and your users are redirected to pages with the new domain.

3. Set the domain login policy for users accessing your pages.

a. From Setup, enter *`My Domain`* in the `Quick Find` box, then select **My Domain**.

b. Under My Domain Settings, select **Edit**.

c. To turn off authentication for users who do not use your domain-specific login page, select the login policy. This option enhances security by preventing login attempts by anyone who doesn't know your domain name.

d. Choose a redirect policy based on the level of security that you want. You have these 3 options, in order of increasing security.

- Redirect users to the same page within the domain.
- Redirect users with a warning.
- Prevent redirecting by having users enter the new domain name.

Manage Orgs in the Environment Hub

You can manage all your existing Salesforce orgs from one location by connecting them to the Environment Hub. You can also create orgs using Salesforce templates for development, testing, and trial purposes.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Connect an Org to the Environment Hub

You can connect existing Salesforce orgs to the Environment Hub, allowing you to manage all your development, test, and trial environments (except scratch orgs) from one location. When you connect an org to the hub, related orgs are automatically discovered so you don't have to manually connect them.

Create an Org from the Environment Hub

You can create orgs from the Environment Hub for development, testing, and trial purposes. If you're an ISV partner, you can also create partner edition orgs with increased limits, more storage, and other customizations to support app development. When you create an org from the Environment Hub, it becomes a hub member and its default language is set by the user's locale.

Connect an Org to the Environment Hub

You can connect existing Salesforce orgs to the Environment Hub, allowing you to manage all your development, test, and trial environments (except scratch orgs) from one location. When you connect an org to the hub, related orgs are automatically discovered so you don't have to manually connect them.

The following types of related orgs are automatically discovered.

- For any organization, all sandbox orgs created from it
- For a release org, all its related patch orgs
- For a Trialforce Management Org, all Trialforce Source Orgs created from it
- For an org with the License Management App (LMA) installed, any release org with a managed package registered in the LMA

USER PERMISSIONS

To connect or disconnect an org to or from the Environment Hub:

- Connect Organization to Environment Hub

Note: You can't connect a sandbox org to the Environment Hub directly. If you want to connect a sandbox, first connect the org used to create the sandbox to the Environment Hub. Then, refresh the sandbox org. The refresh automatically adds it as a hub member.

1. Log in to the Environment Hub, and then select **Connect Org**.
2. Enter the admin username for the org that you want to connect and, optionally, a short description. A description makes it easier to find the org later, especially if your hub has many members.
3. By default, single sign-on (SSO) is enabled for the org you connected. To disable SSO, deselect **Auto-enable SSO for this org**.
4. Select **Connect Org** again.
5. In the pop-up window, enter the org's admin username and password. If you don't see the pop-up, temporarily disable your browser's ad blocking software and try again.
6. Select **Log In**, and then select **Allow**.

To disconnect an org, locate the listing for the org, and select **Remove** from the dropdown menu on the far right.

Orgs removed from the Environment Hub aren't deleted, so you can still access the org after you remove it.

Create an Org from the Environment Hub

You can create orgs from the Environment Hub for development, testing, and trial purposes. If you're an ISV partner, you can also create partner edition orgs with increased limits, more storage, and other customizations to support app development. When you create an org from the Environment Hub, it becomes a hub member and its default language is set by the user's locale.

USER PERMISSIONS

To set up and configure the Environment Hub:

- Manage Environment Hub

Note: You can create up to 20 member orgs per day. To create more orgs, log a case in the Partner Community.

1. Log in to the Environment Hub, and then select **Create Org**.
2. Choose an org purpose.

Purpose	Lets You Create:
Development	Developer Edition orgs for building and packaging apps.
Test/Demo	Trial versions of standard Salesforce orgs for testing and demos. These orgs are similar to the ones customers create at www.salesforce.com/trial. When you create a Test/Demo org, you can specify a Trialforce template if you want the org to include your customizations.

Purpose	Lets You Create:
Trialforce Source Organization	Trialforce Source Organizations (TSOs) as an alternative to using a Trialforce Management Organization (TMO). Unless you need custom branding on your login page or emails, use the Environment Hub to create TSOs. If you're creating a TSO from an Environment Hub that is also a TMO, you can't set a My Domain subdomain

3. Enter the required information for the org type you selected.
4. Read the Master Subscription Agreement, and then select the checkbox.
5. Select **Create**.

When your org is ready, you receive an email confirmation, and the org appears in your list of hub members.

Single Sign-on in the Environment Hub

Developing, testing, and deploying apps means switching between multiple Salesforce environments and providing login credentials each time. Single sign-on (SSO) simplifies this process by letting an Environment Hub user log in to member orgs without reauthenticating. You can set up SSO by defining user mappings manually, using Federation IDs, or creating a formula.

The Environment Hub supports these SSO methods for matching users.

SSO Method	Description
Mapped Users	Match users in the Environment Hub to users in a member org manually. Mapped Users is the default method for SSO user mappings defined from the member detail page.
Federation ID	Match users who have the same Federation ID in both the Environment Hub and a member org.
User Name Formula	Match users in the Environment Hub and a member org according to a formula that you define.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

If you specify multiple SSO methods, they're evaluated in this order: (1) Mapped Users, (2) Federation ID, and (3) User Name Formula. The first method that results in a match is used to log in the user, and the other methods are ignored. If a matching user can't be identified, the Environment Hub directs the user to the standard Salesforce login page.

Note: SSO doesn't work for newly added users or for user mappings defined in a sandbox org. Only add users, edit user information, or define SSO user mappings in the parent org for the sandbox.

Enable SSO for a Member Org
You can enable single sign-on (SSO) to let an Environment Hub user log in to a member org without reauthenticating.

Define an SSO User Mapping
You can manually define a single-sign on (SSO) user mapping between a user in the Environment Hub and a user in a member org. Before you define a user mapping, enable SSO in the hub member org.

Use a Federation ID or Formula for SSO

You can match an Environment Hub user with a user in a member org using a Federation ID or a user name formula. For either method, enable SSO in the hub member org first.

Disable SSO for a Member Org

If you want Environment Hub users to reauthenticate when they log in to a member org, you can disable SSO. Disabling SSO doesn't remove the user mappings that you've defined, so you can always re-enable SSO later.

Enable SSO for a Member Org

USER PERMISSIONS

To set up and configure the Environment Hub:

- Manage Environment Hub

You can enable single sign-on (SSO) to let an Environment Hub user log in to a member org without reauthenticating.

1. Log in to the Environment Hub, and then select a member org. If you don't see any member orgs, check your list view.
2. Select **Enable SSO**.
3. Confirm that you want to enable SSO for this org, and then select **Enable SSO** again.

Define an SSO User Mapping

USER PERMISSIONS

To set up and configure the Environment Hub:

- Manage Environment Hub

You can manually define a single-sign on (SSO) user mapping between a user in the Environment Hub and a user in a member org. Before you define a user mapping, enable SSO in the hub member org.

User mappings can be many-to-one but not one-to-many. In other words, you can associate multiple users in the Environment Hub to one user in a member org. For example, if you wanted members of your QA team to log in to a test org as the same user, you could define user mappings.

1. Log in to the Environment Hub, and then select a member org. If you don't see any member orgs, check your list view.
2. Go to the Single Sign-On User Mappings related list, and then select **New SSO User Mapping**.
3. Enter the username of the user that you want to map in the member org, and then look up a user in the Environment Hub.
4. Select **Save**.

Use a Federation ID or Formula for SSO

USER PERMISSIONS

To set up and configure the Environment Hub:

- Manage Environment Hub

You can match an Environment Hub user with a user in a member org using a Federation ID or a user name formula. For either method, enable SSO in the hub member org first.

1. Log in to the Environment Hub, and then select a member org. If you don't see any member orgs, check your list view.
2. Go to SSO Settings, and then choose a method.

Method	Steps
`SSO Method 2 - Federation ID`	Select the checkbox.
`SSO Method 3 - User Name Formula`	Select the checkbox, and then define a formula. For example, to match the first part of the username (the

Method	Steps
	part before the "@" sign) with an explicit domain name, enter: `LEFT($User.Username, FIND("@", $User.Username)) & ("mydev.org")`

3. Select **Save**.

Disable SSO for a Member Org

If you want Environment Hub users to reauthenticate when they log in to a member org, you can disable SSO. Disabling SSO doesn't remove the user mappings that you've defined, so you can always re-enable SSO later.

1. Log in to the Environment Hub, and then select a member org. If you don't see any member orgs, check your list view.
2. Select **Disable SSO**.
3. Confirm that you want to disable SSO for this org, and then select **Disable SSO** again.

USER PERMISSIONS

To set up and configure the Environment Hub:

- Manage Environment Hub

Environment Hub Best Practices

Follow these guidelines and best practices when you use the Environment Hub.

- If you're an admin or developer, choose the org that your team uses most frequently as your hub org. If you're an ISV partner, the Environment Hub is already installed in your Partner Business Org.
- Set up My Domain for each member org, in addition to the hub org. Because each My Domain includes a unique domain URL, it's easier to distinguish between the member orgs that you use for development, testing, and trials.

  Note: My Domain subdomains are not available for Trialforce Source Organizations created from an Environment Hub that's also a Trialforce Management Organization.

- Because each member org is a standard object (of type EnvironmentHubMember), you can modify its behavior or access it programmatically. For example, you can create custom fields, set up workflow rules, or define user mappings and enable single sign-on using the API for any member org.
- Decide on a strategy for enabling SSO access based on your company's security requirements. Then choose the SSO method (explicit mapping, Federation ID, or custom formula) that meets your needs.
- SSO doesn't work for newly added users or for user mappings defined in a sandbox org. Only add users, edit user information, or define SSO user mappings in the parent org for the sandbox.
- The Environment Hub connected app is for internal use only. Don't enable it for any profiles. Unless advised by Salesforce, don't delete the connected app or adjust its settings.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Environment Hub FAQ

Answers to common questions about the Environment Hub.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

No, My Domain isn't required. But if you don't set up My Domain, you can't connect existing orgs to the Environment Hub or use single sign-on to log in to member orgs. Salesforce recommends setting up My Domain when you configure the Environment Hub.

Can I use the Environment Hub in Lightning Experience?

Yes, both Salesforce Classic and Lightning Experience support the Environment Hub.

Where do I install the Environment Hub?

If you're an ISV partner, the Environment Hub is already installed in your Partner Business Org.

Otherwise, install the Environment Hub in an org that all your users can access, such as your CRM org. Do not install the Environment Hub in a Developer Edition org that contains your managed package. Doing so can cause problems when you upload a new package version or push an upgrade to customers.

Is My Domain required to use the Environment Hub?

No, My Domain isn't required. But if you don't set up My Domain, you can't connect existing orgs to the Environment Hub or use single sign-on to log in to member orgs. Salesforce recommends setting up My Domain when you configure the Environment Hub.

Note: My Domain subdomains are not available for Trialforce Source Organizations created from an Environment Hub that's also a Trialforce Management Organization.

Can I install the Environment Hub in more than one org?

Yes, but you must manage each Environment Hub independently. Although Salesforce recommends one Environment Hub per company, several hubs could make sense for your company. For example, if you want to keep orgs that are associated with product lines separate.

Can I enable the Environment Hub in a sandbox org?

No, you can't enable the Environment Hub in a sandbox org. Enable the Environment Hub in a production org that all your users can access.

What kinds of orgs can I create in the Environment Hub?

You can create orgs for development, testing, and trials. ISV partners can also create partner edition orgs with increased limits, more storage, and other customizations to support app development. If you're a partner but don't see partner edition orgs in the Environment Hub, log a case in the Partner Community.

Org Type	Best Used For	Expires After
Group Edition	Testing	30 days
Enterprise Edition	Testing	30 days
Professional Edition	Testing	30 days
Partner Developer Edition	Developing apps and Lightning components	Never
Partner Group Edition	Robust testing and customer demos	1 year, unless you request an extension
Partner Enterprise Edition	Robust testing and customer demos	1 year, unless you request an extension
Partner Professional Edition	Robust testing and customer demos	1 year, unless you request an extension
Trialforce Source Org	Creating Trialforce templates	1 year, unless you request an extension
Consulting Partner Edition	Customer demos	1 year, unless you request an extension

How is locale determined for the orgs I create in the Environment Hub?

Your Salesforce user locale determines the default locale of orgs that you create. For example, if your user locale is set to `English (United Kingdom)`, that is the default locale for the orgs you create. In this way, the orgs you create are already customized for the regions where they reside.

Are the orgs that I create in the Environment Hub the same as the ones I created in the Partner Portal?

Yes, the orgs are identical to the ones that you created in the Partner Portal. The Environment Hub uses the same templates, so the orgs come with the same customizations, such as higher limits and more licenses. You can also use the Environment Hub to create the same Group, Professional, and Enterprise Edition orgs that customers use. That way, you can test your app against realistic customer implementations.

Can an org be a member of multiple Environment Hubs?

No, an org can be a member of only one Environment Hub at a time. To remove an org from an Environment Hub so you can associate it with a different one:

1. Go to the Environment Hub tab.
2. Find the org, from the drop-down select **Remove**.

3. Once removed, connect the org to the desired Environment Hub:
   a. In the Environment Hub tab, click **Connect Org**.
   b. Enter the admin username for the org.
   c. Click **Connect Org**.
   d. Enter the org's password, then click **Allow** to allow the Environment Hub to access org information.

Can I disable the Environment Hub?

After you install the Environment Hub in an org, you can't disable it. However, you can hide the Environment Hub from users. Go to Setup and enter `App Menu` in to the Quick Find box, and then select **App Menu**. From the App Menu, you can choose whether to hide an app or make it visible.

Considerations for the Environment Hub in Lightning Experience

Be aware of these considerations when creating and managing orgs in the Environment Hub.

List View Limitations

You can't filter hub members by org expiration date when creating or updating list views in Lightning Experience. If you have an existing list view that includes org expiration date in its filter criteria, that list view won't work in Lightning Experience. To filter hub members by org expiration date, switch to Salesforce Classic and then use the list view.

EDITIONS

Available in: both Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Developer Hub

The Developer Hub (Dev Hub) lets you create and manage scratch orgs. The scratch org is a source-driven and disposable deployment of Salesforce code and metadata, made for developers and automation. A scratch org is fully configurable, allowing developers to emulate different Salesforce editions with different features and preferences. Scratch orgs are a central feature of Salesforce DX, an open developer experience for developing and managing Salesforce apps across their entire lifecycle.

To work with scratch orgs, you must first enable the Developer Hub (Dev Hub) in your production or business org. You then use the Salesforce command-line interface (CLI) to create scratch orgs.

Note: Use the Dev Hub to manage scratch orgs. Continue using the Environment Hub to manage other types of orgs, including production and trial orgs.

EDITIONS

Available in: Lightning Experience

Available in: **Developer**,**Enterprise**, **Performance**, and **Unlimited** Editions

SEE ALSO:

Salesforce DX Setup Guide

Salesforce DX Developer Guide

Scratch Org Allocations for Partners

To ensure optimal performance when using Salesforce DX, partners are allocated a set number of scratch orgs in your business org. These allocations determine how many scratch orgs you can create daily, and how many can be active at a given point.

By default, Salesforce deletes scratch orgs and their associated ActiveScratchOrg records from your Dev Hub when a scratch org expires. All partners get 100 Salesforce Limited Access - Free user licenses.

Platinum and Gold Partners

- 150 active
- 300 daily

Other Partners

- 40 active
- 80 daily

Partner Trials

- 20 active
- 40 daily

Enable Dev Hub in Your Org

Enable Dev Hub in your Salesforce org so you can create and manage scratch orgs, create and manage second-generation packages, and use Einstein features. Scratch orgs are disposable Salesforce orgs to support development and testing.

Note: It’s not necessary to enable Dev Hub if you plan to use Salesforce CLI with only sandboxes unless you plan to create second-generation (2GP) packages. The 2GP packages use a scratch org during the package generation process.

Enabling Dev Hub in a production or business org is safe and doesn’t cause any performance or customer issues. Dev Hub comprises objects with permissions that allow admins to control the level of access available to a user and an org.

Consider these factors if you select a trial or Developer Edition org as your Dev Hub.

- You can create up to six scratch orgs and package versions per day, with a maximum of three active scratch orgs.
- Trial orgs expire on their expiration date.
- Developer Edition orgs that are inactive for 365 days are deactivated.
- You can define a namespace in a Developer Edition org that isn’t your Dev Hub, and you can enable Dev Hub in a Developer Edition org that doesn’t contain a namespace.
- If you plan to create package versions or run continuous integration jobs, it’s better to use a production or business org as your Dev Hub because of higher scratch org and package version limits. Package versions are associated with your Dev Hub org. When a trial or Developer Edition org expires, you lose access to the package versions.

EDITIONS

Available in: Salesforce Classic and Lightning Experience

Dev Hub available in: **Developer**, **Enterprise**, **Performance**, and **Unlimited** Editions

Scratch orgs available in: **Developer**, **Enterprise**, **Group**, and **Professional** Editions

Note: Partner trial orgs signed up from the partner community have different scratch org limits. See Scratch Org Allocations for Partners. Partners can create partner edition scratch orgs: Partner Developer, Partner Enterprise, Partner Group, and Partner Professional. This feature is available only if creating scratch orgs from a Dev Hub in a partner business org. See Supported Scratch Org Editions for Partners in the *ISVforce Guide* for details.

The Dev Hub org instance determines where scratch orgs are created.

- Scratch orgs created from a Dev Hub org in Government Cloud are created on a Government Cloud instance.
- Scratch orgs created from a Dev Hub org in Public Cloud are created on a Public Cloud instance.

Note: If you update the `salesforcedx` plug-in to the pre-release version, you see an error when pushing source between your local Salesforce DX project and scratch orgs: `ERROR running force:source:push: The configured apiVersion 48.0 is not supported for this org. The max apiVersion is 47.0`. To resolve the error for a specific project, set the `apiVersion` locally: `sfdx force:config:set apiVersion=47.0`. To resolve for all Salesforce DX projects, set the `apiVersion` globally: `sfdx force:config:set apiVersion=47.0 -g`. After you uninstall the pre-release version, update `salesforcedx` plug-in to the latest version and reset the global API version.

To enable Dev Hub in an org:

1. Log in as System Administrator to your Developer Edition, trial, or production org (for customers), or your business org (for ISVs).
2. From Setup, enter *`Dev Hub`* in the Quick Find box and select **Dev Hub**.

   If you don't see Dev Hub in the Setup menu, make sure that your org is one of the supported editions.

3. To enable Dev Hub, click **Enable**.

   After you enable Dev Hub, you can't disable it.

Add Salesforce DX Users

System administrators can access the Dev Hub org by default. You can enable more users to access the Dev Hub org so that they can create scratch orgs and use other developer-specific features.

You can use Salesforce DX with these standard user licenses: Salesforce, Salesforce Platform, and Developer.

If your org has Developer licenses, you can add users with the Developer profile and assign them the provided Developer permission set. Alternatively, you can add users with the Standard User or System Administrator profiles. For a standard user, you must create a permission set with the required Salesforce DX permissions. We recommend that you avoid adding users as system administrators unless their work requires that level of authority and not just Dev Hub org access.

SEE ALSO:

Salesforce Help: User Licenses

Free Limited Access License

Looking to use Dev Hub in your production or business org but don't have a Salesforce user license? Look no further. The Salesforce Limited Access - Free license lets developers access Dev Hub to create and manage scratch orgs. In addition to this functionality, you can access Chatter to collaborate with other users.

The main purpose of this license is to enable developers to create scratch orgs. Your Salesforce admin has to grant appropriate permissions to the Dev Hub objects (ScratchOrgInfo, ActiveScratchOrg, and NamespaceRegistry) to get you started. However, Salesforce objects such as Accounts, Contacts, and Opportunities are not accessible via this license.

To give full access to the Dev Hub org, create a permission set that contains these permissions.

- Object Settings > Scratch Org Info > Read, Create, and Delete
- Object Settings > Active Scratch Org > Read and Delete
- Object Settings > Namespace Registry > Read (to use a linked namespace in a scratch org)

For more information, see Add Salesforce DX Users. Contact your Salesforce account representative to request the Free Limited Access License. Salesforce administrators can upgrade a Salesforce Limited Access - Free license to a standard Salesforce license at any time.

Manage Scratch Orgs from Dev Hub

You can view and delete your scratch orgs and their associated requests from the Dev Hub.

In Dev Hub, ActiveScratchOrgs represent the scratch orgs that are currently in use. ScratchOrgInfos represent the requests that were used to create scratch orgs and provide historical context.

1. Log in to Dev Hub org as the System Administrator or as a user with the Salesforce DX permissions.
2. From the App Launcher, select **Active Scratch Org** to see a list of all active scratch orgs.

   To view more details about a scratch org, click the link in the Number column.

3. To delete an active scratch org from the Active Scratch Org list view, choose **Delete** from the dropdown.

   Deleting an active scratch org does not delete the request (ScratchOrgInfo) that created it, but it does free up a scratch org so that it doesn't count against your allocations.

4. To view the requests that created the scratch orgs, select **Scratch Org Info** from the App Launcher.

   To view more details about a request, click the link in the Number column. The details of a scratch org request include whether it's active, expired, or deleted.

5. To delete the request that was used to create a scratch org, choose **Delete** from the dropdown.

   Deleting the request (ScratchOrgInfo) also deletes the active scratch org.

Link a Namespace to a Dev Hub Org

To use a namespace with a scratch org, you must link the Developer Edition org where the namespace is registered to a Dev Hub org.

Complete these tasks before you link a namespace.

- If you don't have an org with a registered namespace, create a Developer Edition org that is separate from the Dev Hub or scratch orgs. If you already have an org with a registered namespace, go to Step 1.
- In the Developer Edition org, create and register the namespace.

  Important: Choose namespaces carefully. If you're trying out this feature or need a namespace for testing purposes, choose a disposable namespace. Don't choose a namespace that you want to use in the future for a production org or some other real use case. Once you associate a namespace with an org, you can't change it or reuse it.

1. Log in to your Dev Hub org as the System Administrator or as a user with the Salesforce DX Namespace Registry permissions.

   Tip: Make sure your browser allows pop-ups from your Dev Hub org.

2. (Required) If you have not already done so, define and deploy a My Domain name.

   Tip: Why do you need a My Domain? A My Domain adds a subdomain to your Salesforce org URL so that it's unique. As part of the Namespace Registry linking process, you'll be logging into two distinct orgs simultaneously (your Dev Hub org and your Developer Edition org), and your browser can't reliably distinguish between the two without a My Domain.

You receive an email when your domain name is ready for testing. It can take a few minutes.

3. From the App Launcher menu, select **Namespace Registries**.
4. Click **Link Namespace**.

   If you don't see the **Link Namespace** button, make sure your My Domain is deployed to users.

   a. From Setup, enter `My Domain` in the Quick Find box, then select **My Domain**.

   b. Do you see the status as **Domain Deployed to Users**? If not, click **Deploy to Users**.

      Log out of your Dev Hub org, then open it again.

5. Log in to the Developer Edition org in which your namespace is registered using the org's System Administrator's credentials.

   You cannot link orgs without a namespace, sandboxes, scratch orgs, patch orgs, and branch orgs to the Namespace Registry.

To view all the namespaces linked to the Namespace Registry, select the **All Namespace Registries** view.

Supported Scratch Org Editions for Partners

Create partner edition scratch orgs from a Dev Hub partner business org.

Supported partner scratch org editions include:

- Partner Developer
- Partner Enterprise
- Partner Group
- Partner Professional

Indicate the partner edition in the scratch org definition file.

```
"edition": "Partner Enterprise",
```

If you attempt to create a partner scratch org and see this error, confirm that you're using an active partner business org. Contact the Partner Community for further assistance.

```
ERROR:  You don't have permission to create Partner Edition organizations.
To enable this functionality, please log a case in the Partner Community.
```

License limits for partner scratch orgs are similar to partner edition orgs created in Environment Hub. Get the details on the Partner Community.

Notifications for Package Errors

Accurately track failed package installations, upgrades, and uninstallations in subscriber orgs with the Notifications for Package Errors feature. Proactively address issues with managed and unmanaged packages and provide support to subscribers so that they can successfully install and upgrade your apps.

EDITIONS

Available in: Salesforce Classic

You can choose to send a notification to an email address in your org when a subscriber's attempt to install, upgrade, or uninstall a packaged app fails. To enable this feature, contact your Salesforce representative.

Errors can happen with these package operations:

- Installation

- Upgrade
- Push upgrade
- Uninstallation

When an installation fails, an email is sent to the specified address with the following details:

- Reason for the failure
- Subscriber org information
- Metadata of the package that wasn't installed properly
- Who attempted to install the package

This example email is for a package installation that failed because the base package wasn't installed before the subscriber tried to install an extension.

```
On Mon, Jul 13, 2015 at 11:51 AM, NO REPLY <no-reply@salesforce.com> wrote:
The install of your package failed. Here are the details:

Error Message: 00DD00000007uJp: VALIDATION_FAILED [DB 0710 DE1 Pkg1 1.2: A required package
 is missing: Package "DB 0710 DE1 Pkg1", Version 1.2 or later must be installed first.]
Date/Time of Occurrence = Mon Jul 13 18:51:20 GMT 2015

Subscriber Org Name = DB 071015 EE 1
Subscriber Org ID = 00DD00000007uJp
Subscriber Org Status = TRIAL
Subscriber Org Edition = Enterprise Edition

Package Name = DB 0710 DE2 Pkg1
Package ID = 033D000000060EE
Package Namespace = DB_0710_DE2
Package Type = MANAGED
Package Version Name = 1.2
Package Version Number = 1.2
Package Version Id = 04tD00000006QoF

Installer Name = Admin User
Installer Email Address = dburki@salesforce.com
```

Set the Notification Email Address

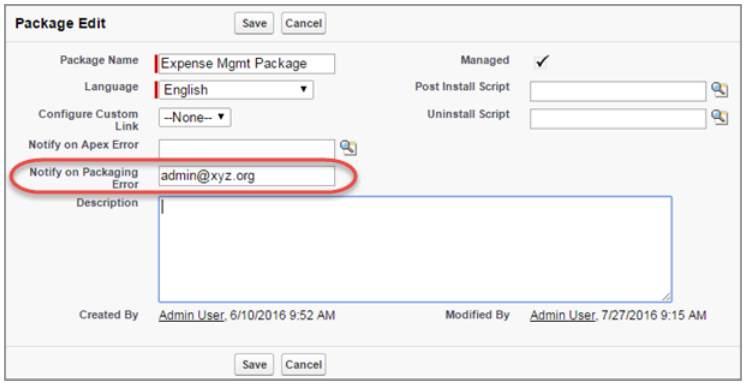
Specify which address to email when a package installation, upgrade, or uninstallation fails.

Notifications are sent only for package versions that are uploaded after the address is added. For example, if you upload package version 1.0 and then set the notification address, notifications aren't sent for failures related to version 1.0. Notifications start when version 2.0 is uploaded.

Also, you can't change or remove the notification email address for the package after it's been uploaded.

1. To enable this feature, contact your Salesforce representative.
2. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
3. Click the package name, and then click **Edit** on the package detail page.
4. Enter the email address to send notifications to, and click **Save**.

Notifications for Package Errors Configured in a Partner Org



Package Name	Expense Mgmt Package	Managed	✓
Language	English	Post Install Script	
Configure Custom Link	--None--	Uninstall Script	
Notify on Apex Error			
Notify on Packaging Error	admin@xyz.org		
Description			
Created By	Admin User, 6/10/2016 9:52 AM	Modified By	Admin User, 7/27/2016 9:15 AM

CHAPTER 5 Package and Test Your Solution

In this chapter ...

Learn how to package, upload, and install a beta version of your solution as part an iterative development approach. After your beta is up and running, learn how to test, fix, extend, and uninstall the solution.

About Managed Packages

Note: Salesforce has two ways that you can build managed packages, first-generation packaging (1GP) and second-generation packaging (2GP). This guide describes 1GP. For new solutions, use 2GP as described in the Second-Generation Managed Packages section of the Salesforce DX Developer Guide.

A managed package is a collection of application components that are posted as a unit on AppExchange, and are associated with a namespace and a License Management Organization.

- You must use a Developer Edition organization to create and work with a managed package.
- Managed packages are depicted by the following icons:
  - Managed - Beta
  - Managed - Released
  - Managed - Installed

Tip: To prevent naming conflicts, Salesforce recommends using managed packages for all packages that contain Apex to ensure that all Apex objects contain your namespace prefix. For example, if an Apex class is called `MyHelloWorld` and your org’s namespace is `OneTruCode`, the class is referenced as `OneTruCode.MyHelloWorld`.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Configure Your Developer Settings

The developer settings in a Developer Edition organization allow you to create a single managed package, upload that package to the AppExchange, allowing other users to install and upgrade the package in their organization. After configuring your developer settings the first time, you can no longer modify them. Regardless of the developer settings, you can always create an unlimited number of unmanaged packages.

To configure your developer settings:

1. From Setup, enter `Packages` in the `Quick Find` box, then select **Packages**.
2. Click **Edit**.

   Note: This button doesn't appear if you've already configured your developer settings.

3. Review the selections necessary to configure developer settings, and click **Continue**.
4. Register a namespace prefix.
5. Choose the package you want to convert to a managed package. If you do not yet have a package to convert, leave this selection blank and update it later.
6. Click **Review My Selections**.
7. Click **Save**.

Tip: You may want to specify a License Management Organization (LMO) for your managed package; to find out more, go to http://sites.force.com/appexchange/publisherHome.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To configure developer settings:
- Customize Application

To create packages:
- Create AppExchange Packages

To upload packages:
- Upload AppExchange Packages

Register a Namespace Prefix

In a packaging context, a namespace prefix is a one to 15-character alphanumeric identifier that distinguishes your package and its contents from packages of other developers on AppExchange. Namespace prefixes are case-insensitive. For example, ABC and abc are not recognized as unique. Your namespace prefix must be globally unique across all Salesforce organizations. It keeps your managed package under your control exclusively.

Important: When creating a namespace, use something that's useful and informative to users. However, don't name a namespace after a person (for example, by using a person's name, nickname, or private information.)

Salesforce automatically prepends your namespace prefix, followed by two underscores ("__"), to all unique component names in your Salesforce organization. A unique package component is one that requires a name that no other component has within Salesforce, such as custom objects, custom fields, custom links, s-controls, and validation rules. For example, if your namespace prefix is abc and your managed package contains a custom object with the API name, Expense__c, use the API name abc__Expense__c to access this object using the API. The namespace prefix is displayed on all component detail pages.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Warning: S-controls stored in the s-control library or the Documents tab that do not use the Lightning Platform API still function properly after you register a namespace prefix. However, s-controls stored outside of your organization or s-controls that use the Lightning Platform API to call Salesforce may require some fine-tuning. For more information, see S-control in the *Object Reference*.

Your namespace prefix must:

- Begin with a letter
- Contain one to 15 alphanumeric characters
- Not contain two consecutive underscores

For example, `myNp123` and `my_np` are valid namespaces, but `123Company` and `my__np` aren't.

To register a namespace prefix:

1. From Setup, enter *`Packages`* in the Quick Find box and select **Package Manager** or **Packages**, depending on your Setup menu.
2. In the Developer Settings panel, click **Edit**.

   Note: This button doesn't appear if you've already configured your developer settings.

3. Review the selections that are required for configuring developer settings, and then click **Continue**.
4. Enter the namespace prefix you want to register.
5. Click **Check Availability** to determine if the namespace prefix is already in use.
6. If the namespace prefix that you entered isn't available, repeat the previous two steps.
7. Click **Review My Selections**.
8. Click **Save**.

Specifying a License Management Organization

A license management organization is a Salesforce organization that you use to track all Salesforce users who install your managed package. The license management organization receives notification (in the form of a lead record) when a user installs or uninstalls your package and tracks each package upload on Salesforce AppExchange.

Your license management organization can be any Salesforce Enterprise, Unlimited, Performance, or Developer Edition organization that has installed the free License Management Application (LMA) from AppExchange. To specify a License Management Organization, go to http://sites.force.com/appexchange/publisherHome.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

What are Beta Versions of Managed Packages?

A beta package is an early version of a managed package that is uploaded in a Managed - Beta state. The purpose of a Managed - Beta package is to allow the developer to test their application in different Salesforce organizations and to share the app with a pilot set of users for evaluation and feedback.

Before installing a beta version of a managed package, review the following notes:

- Beta packages can be installed in sandbox or Developer Edition organizations, or test organizations furnished through the Environment Hub only.
- The components of a beta package are editable by the developer's organization until a Managed - Released package is uploaded.
- Beta versions aren't considered major releases, so the package version number doesn't change.

- Beta packages are not upgradeable. Because developers can still edit the components of a beta package, the Managed - Released version might not be compatible with the beta package installed. Uninstall the beta package and install a new beta package or released version. For more information, see Uninstalling a Package on page 143 and Installing a Package on page 140.

Creating and Uploading a Beta Package

USER PERMISSIONS

To create packages:

- Create AppExchange Packages

To upload packages:

- Upload AppExchange Packages

Use the following procedure to create and upload a beta package through the UI. (You can also upload a package using the Tooling API. For sample code and more details, see the PackageUploadRequest object in the *Tooling API Developer Guide*.)

1. Create a package:
   a. From Setup, enter `Packages` in the `Quick Find` box, then select **Packages**.
   b. Click **New**.
   c. Enter a name for your package. You can use a different name than what appears on AppExchange.
   d. From the dropdown menu, select the default language of all component labels in the package.
   e. Optionally, in the `Notify on Apex Error` field, enter the username of the person who should receive an email notification if an exception occurs in Apex code that is not caught by the code. If you don't specify a username, all uncaught exceptions generate an email notification that is sent to Salesforce.
   f. Optionally, in the `Notify on Packaging Error` field, enter the email address of the person who receives an email notification if an error occurs when a subscriber's attempt to install, upgrade, or uninstall a packaged app fails. This field appears only if packaging error notifications are enabled. To enable notifications, contact your Salesforce representative.
   g. Optionally, choose a custom link from the `Configure Custom Link` field to display configuration information to installers. The custom link displays as a **Configure** link within Salesforce on the Installed Packages page and package detail page of the subscriber's organization.
   h. Optionally, enter a description that describes the package. You can change this description before you upload it to AppExchange.
   i. Optionally, specify a post install script. This is an Apex script that runs in the subscriber organization after the package is installed or upgraded. For more information, see Running Apex on Package Install/Upgrade on page 145.
   j. Optionally, specify an uninstall script. This is an Apex script that runs in the subscriber organization after the package is uninstalled. For more information, see Running Apex on Package Uninstall on page 149.
   k. On the right side of the screen, select the **Managed** checkbox.
   l. Click **Save**.
2. Optionally, change the API access privileges. By default, API access is set to `Unrestricted`, but you can change this setting to further restrict API access of the components in the package.
3. Add the necessary components for your app.
   a. Click **Add Components**.
   b. From the drop-down list, choose the type of component.
   c. Select the components you want to add.

      Note: Some components cannot be added to Managed - Released packages. For a list of packageable components, see Components Available in Managed Packages on page 24. If you add S-Controls and documents, keep in mind that their combined size must be less than 10 MB. Also, S-controls cannot be added to packages with restricted API access.

   d. Click **Add To Package**.

e. Repeat these steps until you have added all the components you want in your package.

> Note: Some related components are automatically included in the package even though they might not display in the Package Components list. For example, when you add a custom object to a package, its custom fields, page layouts, and relationships with standard objects are automatically included. For a complete list of components, see Components Automatically Added to Packages on page 39.

4. Optionally, click **View Dependencies** and review a list of components that rely on other components, permissions, or preferences within the package. For more information on dependencies, see About Dependencies on page 52. Click **Done** to return to the Package detail page.
5. Click **Upload**.
6. On the Upload Package page, do the following:

   a. Enter a `Version Name`, such as *`Spring 11 — Beta`*.

   b. Enter a `Version Number`, such as *`1.0`*. All beta packages use the same version number until you upload a Managed - Released package.

   c. Select a `Release Type` of Managed - Beta.

   > Note: Beta packages can only be installed in Developer Edition, sandbox, or test organizations requested through the Environment Hub, and thus can't be pushed to customer organizations.

   d. Optionally, enter and confirm a password to share the package privately with anyone who has the password. Don't enter a password if you want to make the package available to anyone on AppExchange and share your package publicly.

   e. Salesforce automatically selects the requirements it finds. In addition, select any other required components from the `Package Requirements` and `Object Requirements` sections to notify installers of any requirements for this package.

   f. Click **Upload**.

You will receive an email that includes an installation link when your package has been uploaded successfully.

Create and Upload a Managed Package

Note: Salesforce has two ways that you can build managed packages, first-generation packaging (1GP) and second-generation packaging (2GP). This guide describes 1GP. For new solutions, use 2GP as described in the Second-Generation Managed Packages section of the Salesforce DX Developer Guide.

Creating a managed package is just as easy as creating an unmanaged package. The only requirement to create a managed package is that you're using a Developer Edition organization.

Before creating a managed package:

- Determine if you want to create and upload a managed or unmanaged package.
- Optionally, install the License Management Application (LMA) from http://sites.force.com/appexchange. Search for *License Management App* to locate it. The License Management Application (LMA) tracks information about each user who installs your app. It allows you to track what users have which version, giving you a means of distributing information about upgrades.

  The License Management Application (LMA) can be installed in any Salesforce organization except a Personal, Group, or Professional Edition organization and does not need to be the same Salesforce organization that you use to create or upload the package, although it can be. You can also use the same License Management Application (LMA) to manage an unlimited number of your managed packages in different Developer Edition organizations.
- Configure your developer settings on page 131. Your developer settings specify your namespace prefix on page 131, the Salesforce organization where you install the License Management Application (LMA), and the unmanaged package you want to convert into a managed package.

Use the following procedure to create and upload a managed package through the UI. (You can also upload a package using the Tooling API. For sample code and more details, see the PackageUploadRequest object in the *Tooling API Developer Guide*.)

This procedure assumes you have already created a namespace and beta package. If you're uploading a beta package for testing, see Creating and Uploading a Beta Package on page 133.

1. Create a package:
   a. From Setup, enter *Packages* in the `Quick Find` box, then select **Packages**.
   b. Click **New**.
   c. Enter a name for your package. You can use a different name than what appears on AppExchange.
   d. From the dropdown menu, select the default language of all component labels in the package.
   e. Optionally, in the `Notify on Apex Error` field, enter the username of the person who should receive an email notification if an exception occurs in Apex code that is not caught by the code. If you don't specify a username, all uncaught exceptions generate an email notification that is sent to Salesforce.
   f. Optionally, in the `Notify on Packaging Error` field, enter the email address of the person who receives an email notification if an error occurs when a subscriber's attempt to install, upgrade, or uninstall a packaged app fails. This field appears only if packaging error notifications are enabled. To enable notifications, contact your Salesforce representative.
   g. Optionally, choose a custom link from the `Configure Custom Link` field to display configuration information to installers. The custom link displays as a **Configure** link within Salesforce on the Installed Packages page and package detail page of the subscriber's organization.
   h. Optionally, enter a description that describes the package. You can change this description before you upload it to AppExchange.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To enable managed packages:
- Customize Application

To create packages:
- Create AppExchange packages

To upload packages:
- Download AppExchange packages

i. Optionally, specify a post install script. This is an Apex script that runs in the subscriber organization after the package is installed or upgraded. For more information, see Running Apex on Package Install/Upgrade on page 145.

j. Optionally, specify an uninstall script. This is an Apex script that runs in the subscriber organization after the package is uninstalled. For more information, see Running Apex on Package Uninstall on page 149.

k. On the right side of the screen, select the **Managed** checkbox.

l. Click **Save**.

2. Optionally, change the API access privileges. By default, API access is set to `Unrestricted`, but you can change this setting to further restrict API access of the components in the package.
3. Add the necessary components for your app.

a. Click **Add Components**.

b. From the drop-down list, choose the type of component.

c. Select the components you want to add.

> Note: Some components cannot be added to Managed - Released packages. For a list of packageable components, see Components Available in Managed Packages on page 24. If you add S-Controls and documents, keep in mind that their combined size must be less than 10 MB. Also, S-controls cannot be added to packages with restricted API access.

d. Click **Add To Package**.

e. Repeat these steps until you have added all the components you want in your package.

> Note: Some related components are automatically included in the package even though they might not display in the Package Components list. For example, when you add a custom object to a package, its custom fields, page layouts, and relationships with standard objects are automatically included. For a complete list of components, see Components Automatically Added to Packages on page 39.

4. Optionally, click **View Dependencies** and review a list of components that rely on other components, permissions, or preferences within the package. For more information on dependencies, see About Dependencies on page 52. Click **Done** to return to the Package detail page.
5. Click **Upload**.
6. On the Upload Package page, do the following:

a. Enter a `Version Name`, such as *`Spring 12`*. The version name is the marketing name for a specific release of a package and allows you to create a more descriptive title for the version than just a number.

b. Enter a `Version Number`, such as *`1.0`*. For more information on versions, see Update Your Solution on page 338.

c. Select a `Release Type` of Managed - Released.

d. Change the `Description`, if necessary.

e. Optionally, specify a link to post install instructions for the package. Click **URL** or **Visualforce page** and enter the details in the text field that appears. This link will be displayed on the Package Details page after installation.

> Note: As a best practice, point to an external URL, so you can update the information independently of the package.

f. Optionally, enter and confirm a password to share the package privately with anyone who has the password. Don't enter a password if you want to make the package available to anyone on AppExchange and share your package publicly.

g. Salesforce automatically selects the requirements it finds. In addition, select any other required components from the `Package Requirements` and `Object Requirements` sections to notify installers of any requirements for this package.

h. Click **Upload**.

7. Once your upload is complete, you can do any of the following.
   - Click **Change Password** link to change the password option.
   - Click **Deprecate** to prevent new installations of this package while allowing existing installations to continue operating.

     Note: You cannot deprecate the most recent version of a managed package.

     When you deprecate a package, remember to remove it from AppExchange as well. See "Removing Apps from AppExchange" in the AppExchange online help.
   - Click **Undeprecate** to make a deprecated version available for installation again.

You receive an email that includes an installation link when your package has been uploaded successfully.

Note:
- When using the install URL, the old installer is displayed by default. You can customize the installation behavior by modifying the installation URL you provide your customers.
  - To access the new installer, append the text `&newui=1` to the installation URL.
  - To access the new installer with the "All Users" option selected by default, append the additional text `&p1=full` to the installation URL.
- If you uploaded from your Salesforce production org, notify installers who want to install it in a sandbox org to replace the "login.salesforce.com" portion of the installation URL with "test.salesforce.com."

View Package Details

From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**. Click the name of a package to view its details, including added components, whether it's a managed package, whether the package has been uploaded, and so on.

The detail page has the following sections:

- Package Details on page 137
- Components on page 139
- Versions on page 139
- Patch Organizations on page 140

From the Package Detail page, you can do any of the following:

- Click **Edit** to change the package name, custom link that displays when users click Configure, or description.
- Click **Delete** to delete the package. This does not delete the components contained in the package but the components are no longer bundled together within this package.
- Click **Upload** to upload the package. You are notified by email when the upload is complete.
- You can enable, disable, or change the dynamic Apex and API access that components in the package have to standard objects in the installing organization by using the links next to `API Access`.

Viewing Package Details

For package developers, the package detail section displays the following package attributes (in alphabetical order):

Attribute	Description
`API Access`	The type of access that the API and dynamic Apex that package components have. The default setting is **Unrestricted**, which means that all package components that access the API have the same access as the user who is logged in. Click **Enable Restrictions** or **Disable Restrictions** to change the API and dynamic Apex access permissions for a package.
`Created By`	The name of the developer that created this package, including the date and time.
`Description`	A detailed description of the package.
`Language`	The language used for the labels on components. The default value is your user language.
`Last Modified By`	The name of the last user to modify this package, including the date and time.
`Notify on Apex Error`	The username of the person who should receive an email notification if an exception occurs in Apex that is not caught by the code. If you don't specify a username, all uncaught exceptions generate an email notification that is sent to Salesforce. This is only available for managed packages. Note: Apex can only be packaged from Developer, Enterprise, Unlimited, and Performance Edition organizations.
`Notify on Packaging Error`	The email address of the person who receives an email notification if an error occurs when a subscriber's attempt to install, upgrade, or uninstall a packaged app fails. This field appears only if packaging error notifications are enabled. To enable notifications, contact your Salesforce representative.
`Package Name`	The name of the package, given by the publisher.
`Push Upgrade Exclusion List`	A comma-separated list of org IDs to exclude when you push a package upgrade to subscribers.
`Post Install Script`	The Apex code that runs after this package is installed or upgraded. For more information, see Running Apex on Package Install/Upgrade on page 145.
`Type`	Indicates whether this is a managed or unmanaged package.
`Uninstall Script`	The Apex code that runs after this package is uninstalled. For more information, see Running Apex on Package Uninstall on page 149.

Viewing Package Components

For package developers, the Components tab lists every package component contained in the package, including the name and type of each component.

Click **Add** to add components to the package.

Note: Some related components are automatically included in the package even though they might not display in the Package Components list. For example, when you add a custom object to a package, its custom fields, page layouts, and relationships with standard objects are automatically included. For a complete list of components Salesforce automatically includes, see Components Automatically Added on page 39.

Package components frequently depend on other components that aren't always added to the package explicitly. Each time you change a package, Salesforce checks for dependencies and displays the components as package members. Package Manager automatically checks for dependencies and shows the component relationship to the package in the Include By column of the Package Details.

When your package contains 1,000 or more components, you can decide when to refresh the components list in the Package Details and avoid a long wait while this page loads. The components list refreshes automatically for packages with less than 1,000 components. Click **Refresh Components** if the package has new or changed components and wait for the list to refresh.

Click **View Dependencies** to review a list of components that rely on other components, permissions, or preferences within the package. An entity might include such things as an s-control, a standard or custom field, or an organization-wide setting like multicurrency. Your package cannot be installed unless the installer has the listed components enabled or installed. For more information on dependencies, see Understanding Dependencies on page 52. Click **Back to Package** to return to the Package detail page.

Click **View Deleted Components** to see which components were deleted from the package across all its versions.

Viewing Version History

For package developers, the Versions tab lists all the previous uploads of a package.

Click **Push Upgrades** to automatically upgrade subscribers to a specific version. Orgs entered in the **Push Upgrade Exclusion List** are omitted from the upgrade. The orgs can still install the upgrade when you publish the new version.

Click the Version Number of any listed uploads to manage that upload. For more information, see Managing Versions on page 348.

Note: **Push Upgrades** is available for patches and major upgrades. Registered ISV partners can request Push Major Upgrade functionality by logging a case in the Partner Community.

The versions table displays the following package attributes (in alphabetical order):

Attribute	Description
`Action`	Lists the actions you can perform on the package. The possible actions are: • **Deprecate**: Deprecates a package version. Warning: Users can no longer download or install this package. However, existing installations continue to work. • **Undeprecate**: Enables a previously deprecated package version to be installed again.
`Status`	The status of the package. The possible statuses are: • Released: The package is Managed - Released.

Attribute	Description
	- Beta: The package is Managed - Beta. - Deprecated: The package version is deprecated.
`Version Name`	The version name for this package version. The version name is the marketing name for a specific release of a package. It is more descriptive than the `Version Number`.
`Version Number`	The version number for the latest installed package version. The format is *`majorNumber.minorNumber.patchNumber`*, such as 2.1.3. The version number represents a release of a package. The `Version Name` is a more descriptive name for the release. The `patchNumber` is generated only when you create a patch. If there is no `patchNumber`, it is assumed to be zero (0).

Viewing Patch Development Organizations

Every patch is developed in a *patch development organization*, which is the organization where patch versions are developed, maintained, and uploaded. To start developing a patch, first create a patch development organization. See Creating and Uploading Patches on page 340. Patch development organizations permit developers to change existing components without causing incompatibilities between existing subscriber installations. Click **New** to create a patch for this package.

The Patch Organizations table lists all the patch development organizations created. It lists the following attributes (in alphabetical order):

Attribute	Description
`Action`	Lists the actions you can perform on a patch development organization. The possible actions are: - **Login**: Log in to your patch development organization. - **Reset**: Emails a new temporary password for your patch development organization.
`Administrator Username`	The login associated with the patch organization.
`Patching Major Release`	The package version number that you are patching.

Installing a Package

During the development and testing cycle, you might need to periodically install and uninstall packages before you install the next beta. Follow these steps to install a package.

Pre-Installation

1. In a browser, type in the installation URL you received when you uploaded the package.
2. Enter your username and password for the Salesforce organization in which you want to install the package, and then click **Log In**.
3. If the package is password-protected, enter the password you received from the publisher.

Default Installation

Click **Install**. You'll see a message that describes the progress and a confirmation message after the installation is complete.

Custom Installation

Follow these steps if you need to modify the default settings, as an administrator.

1. Choose one or more of these options, as appropriate.
   - Click **View Components**. You'll see an overlay with a list of components in the package. For managed packages, the screen also contains a list of connected apps (trusted applications that are granted access to a user's Salesforce data after the user and the application are verified). Review the list to confirm that the components and any connected apps shown are acceptable, and then close the overlay.

     Note: Some package items, such as validation rules, record types, or custom settings might not appear in the Package Components list but are included in the package and installed with the other items. If there are no items in the Package Components list, the package might contain only minor changes.

   - If the package contains a remote site setting, you must approve access to websites outside of Salesforce. The dialog box lists all the websites that the package communicates with. We recommend that a website uses SSL (secure sockets layer) for transmitting data. After you verify that the websites are safe, select **Yes, grant access to these third-party websites** and click **Continue**, or click **Cancel** to cancel the installation of the package.

     Warning: By installing remote site settings, you're allowing the package to transmit data to and from a third-party website. Before using the package, contact the publisher to understand what data is transmitted and how it's used. If you have an internal security contact, ask the contact to review the application so that you understand its impact before use.

   - Click **API Access**. You'll see an overlay with a list of the API access settings that package components have been granted. Review the settings to verify they're acceptable, and then close the overlay to return to the installer screen.
   - In Enterprise, Performance, Unlimited, and Developer Editions, choose one of the following security options.

     Note: Depending on the type of installation, you might not see this option. For example, in Group and Professional Editions, or if the package doesn't contain a custom object, Salesforce skips this option, which gives all users full access.

     Install for Admins Only

     Specifies the following settings on the installing administrator's profile and any profile with the "Customize Application" permission.

     - Object permissions—"Read," "Create," "Edit," "Delete," "View All," and "Modify All" enabled
     - Field-level security—set to visible and editable for all fields
     - Apex classes—enabled
     - Visualforce pages—enabled
     - App settings—enabled
     - Tab settings—determined by the package creator
     - Page layout settings—determined by the package creator
     - Record Type settings—determined by the package creator

     After installation, if you have Enterprise, Performance, Unlimited, or Developer Edition, set the appropriate user and object permissions on custom profiles as needed.

     Install for All Users

     Specifies the following settings on all internal custom profiles.

- Object permissions—"Read," "Create," "Edit," and "Delete" enabled
- Field-level security—set to visible and editable for all fields
- Apex classes—enabled
- Visualforce pages—enabled
- App settings—enabled
- Tab settings—determined by the package creator
- Page layout settings—determined by the package creator
- Record Type settings—copied from admin profile

Note: The Customer Portal User, Customer Portal Manager, High Volume Customer Portal, Authenticated Website, Partner User, and standard profiles receive no access.

Install for Specific Profiles...

Enables you to choose the usage access for all custom profiles in your organization. You can set each profile to have full access or no access for the new package and all its components.

- Full Access—Specifies the following settings for each profile.
  - Object permissions—"Read," "Create," "Edit," "Delete," "View All," and "Modify All" enabled
  - Field-level security—set to visible and editable for all fields
  - Apex classes—enabled
  - Visualforce pages—enabled
  - App settings—enabled
  - Tab settings—determined by the package creator
  - Page layout settings—determined by the package creator
  - Record Type settings—determined by the package creator
- No Access—Specifies the same settings as Full Access, *except* all object permissions are disabled.

You might see other options if the publisher has included settings for custom profiles. You can incorporate the settings of the publisher's custom profiles into your profiles without affecting your settings. Choose the name of the profile settings in the drop-down list next to the profile that you need to apply them to. The current settings in that profile remain intact.

Alternatively, click **Set All** next to an access level to give this setting to all user profiles.

2. Click **Install**. You'll see a message that describes the progress and a confirmation message after the installation is complete.

Post-Installation Steps

If the package includes post-installation instructions, they're displayed after the installation is completed. Review and follow the instructions provided. In addition, before you deploy the package to your users, make any necessary changes for your implementation. Depending on the contents of the package, you might need to perform some of the following customization steps.

- If the package includes permission sets, assign the included permission sets to your users who need them. In managed packages, you can't make changes to permission sets that are included in the package, but subsequent upgrades happen automatically. If you clone a permission set that comes with a managed package or create your own, you can make changes to the permission set, but subsequent upgrades won't affect it.
- If you're re-installing a package and need to re-import the package data by using the export file that you received after uninstalling, see Importing Package Data.
- If you installed a managed package, click **Manage Licenses** to assign licenses to users.

Note: You can't assign licenses in Lightning Experience. If you need to assign a license, switch to Salesforce Classic.

- Configure components in the package as required. For more information, see Configuring Installed Packages.

Component Availability After Deployment

Many components have an **Is Deployed** attribute that controls whether they are available for end users. After installation, all components are immediately available if they were available in the developer's organization.

For tips on customizing the installed package and components, see Configuring Installed Packages. Installed packages are available to users in your organization with the appropriate permissions and page layout settings.

Uninstalling a Package

1. From Setup, enter `Installed Packages` in the Quick Find box, then select **Installed Packages**.
2. Click **Uninstall** next to the package that you want to remove.
3. Select **Yes, I want to uninstall** and click **Uninstall**.
4. After an uninstall, Salesforce automatically creates an export file containing the package data, associated notes, and any attachments. When the uninstall is complete, Salesforce sends an email containing a link to the export file to the user performing the uninstall. The export file and related notes and attachments are listed below the list of installed packages. We recommend storing the file elsewhere because it's available for only two days after the uninstall completes, then it's deleted from the server.

   Tip: If you reinstall the package later and want to reimport the package data, see Importing Package Data.

When you uninstall packages, consider the following:

- If you're uninstalling a package that includes a custom object, all components on that custom object are also deleted. Deleted items include custom fields, validation rules, s-controls, custom buttons and links, workflow rules, and approval processes.
- You can't uninstall a package whenever a component not included in the uninstall references any component in the package. For example:
  - When an installed package includes any component on a standard object that another component references, Salesforce prevents you from uninstalling the package. An example is a package that includes a custom user field with a workflow rule that gets triggered when the value of that field is a specific value. Uninstalling the package would prevent your workflow from working.
  - When you have installed two unrelated packages that each include a custom object and one custom object component references a component in the other, you can't uninstall the package. An example is if you install an expense report app that includes a custom user field and create a validation rule on another installed custom object that references that custom user field. However, uninstalling the expense report app prevents the validation rule from working.
  - When an installed folder contains components you added after installation, Salesforce prevents you from uninstalling the package.
  - When an installed letterhead is used for an email template you added after installation, Salesforce prevents you from uninstalling the package.
  - When an installed package includes a custom field that's referenced by Einstein Prediction Builder or Case Classification, Salesforce prevents you from uninstalling the package. Before uninstalling the package, edit the prediction in Prediction Builder or Case Classification so that it no longer references the custom field.
- You can't uninstall a package that removes all active business and person account record types. Activate at least one other business or person account record type, and try again.

- You can't uninstall a package if a background job is updating a field added by the package, such as an update to a roll-up summary field. Wait until the background job finishes, and try again.
- Uninstall export files contain custom app data for your package, excluding some components, such as documents and formula field values.
- For some package types, you can also uninstall them with the Salesforce command-line interface (CLI).

Installing Managed Packages Using the API

You can install, upgrade, and uninstall managed packages using the API, instead of the user interface. Automating these repeated tasks can help you can work more efficiently and to speed up application development.

To install, upgrade, or uninstall a package, use the standard Metadata API `deploy()` call with the `InstalledPackage` metadata type. The following operations are supported.

- Deploying an `InstalledPackage` installs the package in the deploying organization.
- Deploying a newer version of a currently installed package upgrades the package.
- Deploying an `InstalledPackage` using a manifest called `destructiveChanges.xml`, instead of `package.xml`, uninstalls it from the organization.

Note: You can't deploy a package along with other metadata types. Hence, `InstalledPackage` must be the only metadata type specified in the manifest file.

The following is a typical project manifest (`package.xml`) for installing a package. The manifest must not contain a `fullName` or `namespacePrefix` element.

```
<?xml version="1.0" encoding="UTF-8"?>
  <Package xmlns="http://soap.sforce.com/2006/04/metadata">
    <types>
      <members>*</members>
       <name>InstalledPackage</name>
     </types>
    <version>28.0</version>
  </Package>
```

The package is specified in a file called ***`MyNamespace`***`.installedPackage`, where ***`MyNamespace`*** is the namespace prefix of the package. The file must be in a directory called `installedPackages`, and its contents must have this format.

```
<?xml version="1.0" encoding="UTF-8"?>
  <InstalledPackage xmlns="http://soap.sforce.com/2006/04/metadata">
    <versionNumber>1.0</versionNumber>
    <password>optional_password</password>
  </InstalledPackage>
```

InstalledPackage in API version 43.0 and later must include the `activateRSS` field set to either of these values.

true

Keep the isActive state of any Remote Site Settings(RSS) or Content Security Policies(CSP) in the package.

false

Override the isActive state of any RSS or CSP in the package and set it to `false`.

The default value is `false`.

Note: Regardless of what `activateRSS` is set to, a retrieve of `InstalledPackage` always returns `<activateRSS xsi:nil=”true”/>`. Therefore, before you deploy a package, inspect the information you have retrieved from `InstalledPackage` and set `activateRSS` to the desired value.

To uninstall a package, deploy this `destructiveChanges.xml` manifest file in addition to the `package.xml` file.

```
<?xml version="1.0" encoding="UTF-8"?>
  <Package xmlns="http://soap.sforce.com/2006/04/metadata">
    <types>
      <members>MyNamespace</members>
      <name>InstalledPackage</name>
     </types>
  </Package>
```

Retrieving an `InstalledPackage`, using the `retrieve()` call creates an XML representation of the package installed in an organization. If the installed package has a password, the password isn't retrieved. Deploying the retrieved file in a different organization installs the package in that organization.

For more information on the `deploy()` and `retrieve()` commands, see the *Metadata API Developer's Guide*.

Resolving Apex Test Failures

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Developer** Edition

Package installs or upgrades may fail for not passing Apex test coverage. However, some of these failures can be ignored. For example, a developer might write an Apex test that makes assumptions about a subscriber's data.

If you're a subscriber whose installation is failing due to an Apex test, contact the developer of the package for help.

If you're a developer and an install fails due to an Apex test failure, check for the following:

- Make sure that you are staging all necessary data required for your Apex test, instead of relying on subscriber data that exists.
- If a subscriber creates a validation rule, required field, or trigger on an object referenced by your package, your test might fail if it performs DML on this object. If this object is created only for testing purposes and never at runtime, and the creation fails due to these conflicts, you might be safe to ignore the error and continue the test. Otherwise, contact the customer and determine the impact.

Running Apex on Package Install/Upgrade

App developers can specify an Apex script to run automatically after a subscriber installs or upgrades a managed package. This makes it possible to customize the package install or upgrade, based on details of the subscriber's organization. For instance, you can use the script to populate custom settings, create sample data, send an email to the installer, notify an external system, or kick off a batch operation to populate a new field across a large set of data. For simplicity, you can only specify one post install script. It must be an Apex class that is a member of the package.

The post install script is invoked after tests have been run, and is subject to default governor limits. It runs as a special system user that represents your package, so all operations performed by the script appear to be done by your package. You can access this user by using UserInfo. You will only see this user at runtime, not while running tests.

If the script fails, the install/upgrade is aborted. Any errors in the script are emailed to the user specified in the **Notify on Apex Error** field of the package. If no user is specified, the install/upgrade details will be unavailable.

The post install script has the following additional properties.

- It can initiate batch, scheduled, and future jobs.
- It can't access Session IDs.
- It can only perform callouts using an async operation. The callout occurs after the script is run and the install is complete and committed.
- It can't call another Apex class in the package if that Apex class uses the `with sharing` keyword. This keyword can prevent the package from successfully installing. See the *Apex Developer Guide* to learn more.

Note: You can't run a post install script in a new trial organization provisioned using Trialforce. The script only runs when a subscriber installs your package in an existing organization.

How does a Post Install Script Work?

Example of a Post Install Script

Specifying a Post Install Script

How does a Post Install Script Work?

A post install script is an Apex class that implements the `InstallHandler` interface. This interface has a single method called `onInstall` that specifies the actions to be performed on installation.

```
global interface InstallHandler {
  void onInstall(InstallContext context)
}
```

The `onInstall` method takes a context object as its argument, which provides the following information.

- The org ID of the organization in which the installation takes place.
- The user ID of the user who initiated the installation.
- The version number of the previously installed package (specified using the `Version` class). This is always a three-part number, such as 1.2.0.
- Whether the installation is an upgrade.
- Whether the installation is a push.

The context argument is an object whose type is the `InstallContext` interface. This interface is automatically implemented by the system. The following definition of the `InstallContext` interface shows the methods you can call on the context argument.

```
global interface InstallContext {
  ID organizationId();
  ID installerId();
  Boolean isUpgrade();
  Boolean isPush();
  Version previousVersion();
}
```

Version Methods and Class

You can use the methods in the `System.Version` class to get the version of a managed package and to compare package versions. A package version is a number that identifies the set of components uploaded in a package. The version number has the format *`majorNumber.minorNumber.patchNumber`* (for example, 2.1.3). The major and minor numbers increase to a chosen value during every non-patch release. Major and minor number increases will always use a patch number of 0.

The following are instance methods for the `System.Version` class.

Method	Arguments	Return Type	Description
`compareTo`	System.Version *`version`*	Integer	Compares the current version with the specified version and returns one of the following values: • Zero if the current package version is equal to the specified package version • An Integer value greater than zero if the current package version is greater than the specified package version • An Integer value less than zero if the current package version is less than the specified package version If a two-part version is being compared to a three-part version, the patch number is ignored and the comparison is based only on the major and minor numbers.
`major`		Integer	Returns the major package version of the calling code.
`minor`		Integer	Returns the minor package version of the calling code.
`patch`		Integer	Returns the patch package version of the calling code or `null` if there is no patch version.

The `System` class contains two methods that you can use to specify conditional logic, so different package versions exhibit different behavior.

- `System.requestVersion`: Returns a two-part version that contains the major and minor version numbers of a package. Using this method, you can determine the version of an installed instance of your package from which the calling code is referencing your package. Based on the version that the calling code has, you can customize the behavior of your package code.
- `System.runAs(System.Version)`: Changes the current package version to the package version specified in the argument.

When a subscriber has installed multiple versions of your package and writes code that references Apex classes or triggers in your package, they must select the version they are referencing. You can execute different code paths in your package's Apex code based on the version setting of the calling Apex code making the reference. You can determine the calling code's package version setting by calling the `System.requestVersion` method in the package code.

Example of a Post Install Script

The following sample post install script performs these actions on package install/upgrade.

- If the previous version is null, that is, the package is being installed for the first time, the script:
  - Creates a new Account called "Newco" and verifies that it was created.
  - Creates a new instance of the custom object Survey, called "Client Satisfaction Survey".
  - Sends an email message to the subscriber confirming installation of the package.
- If the previous version is 1.0, the script creates a new instance of Survey called "Upgrading from Version 1.0".

- If the package is an upgrade, the script creates a new instance of Survey called “Sample Survey during Upgrade”.
- If the upgrade is being pushed, the script creates a new instance of Survey called “Sample Survey during Push”.

```
global class PostInstallClass implements InstallHandler {
  global void onInstall(InstallContext context) {
    if(context.previousVersion() == null) {
      Account a = new Account(name='Newco');
      insert(a);

      Survey__c obj = new Survey__c(name='Client Satisfaction Survey');
      insert obj;

      User u = [Select Id, Email from User where Id =:context.installerID()];
      String toAddress= u.Email;
      String[] toAddresses = new String[]{toAddress};
      Messaging.SingleEmailMessage mail =
        new Messaging.SingleEmailMessage();
      mail.setToAddresses(toAddresses);
      mail.setReplyTo('support@package.dev');
      mail.setSenderDisplayName('My Package Support');
      mail.setSubject('Package install successful');
      mail.setPlainTextBody('Thanks for installing the package.');
      Messaging.sendEmail(new Messaging.Email[] { mail });
      }
    else
      if(context.previousVersion().compareTo(new Version(1,0)) == 0) {
      Survey__c obj = new Survey__c(name='Upgrading from Version 1.0');
      insert(obj);
      }
    if(context.isUpgrade()) {
      Survey__c obj = new Survey__c(name='Sample Survey during Upgrade');
      insert obj;
      }
    if(context.isPush()) {
      Survey__c obj = new Survey__c(name='Sample Survey during Push');
      insert obj;
      }
    }
  }
```

You can test a post install script using the new `testInstall` method of the `Test` class. This method takes the following arguments.

- A class that implements the `InstallHandler` interface.
- A `Version` object that specifies the version number of the existing package.
- An optional Boolean value that is `true` if the installation is a push. The default is `false`.

This sample shows how to test a post install script implemented in the `PostInstallClass` Apex class.

```
@isTest
static void testInstallScript() {
  PostInstallClass postinstall = new PostInstallClass();
    Test.testInstall(postinstall, null);
    Test.testInstall(postinstall, new Version(1,0), true);
    List<Account> a = [Select id, name from Account where name ='Newco'];
    System.assertEquals(a.size(), 1, 'Account not found');
  }
```

Specifying a Post Install Script

Once you have created and tested the post install script, you can specify it in the **Post Install Script** lookup field on the Package Detail page. In subsequent patch releases, you can change the contents of the script but not the Apex class.

The class selection is also available via the Metadata API as `Package.postInstallClass`. This is represented in package.xml as a `<postInstallClass>foo</postInstallClass>` element.

Running Apex on Package Uninstall

App developers can specify an Apex script to run automatically after a subscriber uninstalls a managed package. This makes it possible to perform cleanup and notification tasks based on details of the subscriber's organization. For simplicity, you can only specify one uninstall script. It must be an Apex class that is a member of the package.

The uninstall script is subject to default governor limits. It runs as a special system user that represents your package, so all operations performed by the script will appear to be done by your package. You can access this user by using UserInfo. You will only see this user at runtime, not while running tests.

If the script fails, the uninstall continues but none of the changes performed by the script are committed. Any errors in the script are emailed to the user specified in the **Notify on Apex Error** field of the package. If no user is specified, the uninstall details will be unavailable.

The uninstall script has the following restrictions. You can't use it to initiate batch, scheduled, and future jobs, to access Session IDs, or to perform callouts.

How does an Uninstall Script Work?

An uninstall script is an Apex class that implements the `UninstallHandler` interface. This interface has a single method called `onUninstall` that specifies the actions to be performed on uninstall.

```
global interface UninstallHandler {
  void onUninstall(UninstallContext context)
}
```

The `onUninstall` method takes a context object as its argument, which provides the following information.

- The org ID of the organization in which the uninstall takes place.
- The user ID of the user who initiated the uninstall.

The context argument is an object whose type is the `UninstallContext` interface. This interface is automatically implemented by the system. The following definition of the `UninstallContext` interface shows the methods you can call on the context argument.

```
global interface UninstallContext {
  ID organizationId();
  ID uninstallerId();
}
```

Example of an Uninstall Script

The sample uninstall script below performs the following actions on package uninstall.

- Inserts an entry in the feed describing which user did the uninstall and in which organization
- Creates and sends an email message confirming the uninstall to that user

```
global class UninstallClass implements UninstallHandler {
  global void onUninstall(UninstallContext ctx) {
    FeedItem feedPost = new FeedItem();
    feedPost.parentId = ctx.uninstallerID();
    feedPost.body = 'Thank you for using our application!';
    insert feedPost;

    User u = [Select Id, Email from User where Id =:ctx.uninstallerID()];
    String toAddress= u.Email;
    String[] toAddresses = new String[] {toAddress};
    Messaging.SingleEmailMessage mail = new Messaging.SingleEmailMessage();
    mail.setToAddresses(toAddresses);
    mail.setReplyTo('support@package.dev');
    mail.setSenderDisplayName('My Package Support');
    mail.setSubject('Package uninstall successful');
    mail.setPlainTextBody('Thanks for uninstalling the package.');
    Messaging.sendEmail(new Messaging.Email[] { mail });
  }
}
```

You can test an uninstall script using the `testUninstall` method of the `Test` class. This method takes as its argument a class that implements the `UninstallHandler` interface.

This sample shows how to test an uninstall script implemented in the `UninstallClass` Apex class.

```
@isTest
static void testUninstallScript() {
  Id UninstallerId = UserInfo.getUserId();
  List<FeedItem> feedPostsBefore =
    [SELECT Id FROM FeedItem WHERE parentId=:UninstallerId AND CreatedDate=TODAY];
  Test.testUninstall(new UninstallClass());
  List<FeedItem> feedPostsAfter =
    [SELECT Id FROM FeedItem WHERE parentId=:UninstallerId AND CreatedDate=TODAY];
  System.assertEquals(feedPostsBefore.size() + 1, feedPostsAfter.size(),
    'Post to uninstaller failed.');
}
```

Specifying an Uninstall Script

Once you have created and tested the uninstall script and included it as a member of your package, you can specify it in the **Uninstall Script** lookup field on the Package Detail page. In subsequent patch releases, you can change the contents of the script but not the Apex class.

The class selection is also available via the Metadata API as `Package.uninstallClass`. This is represented in package.xml as an `<uninstallClass>foo</uninstallClass>` element.

Publishing Extensions to Managed Packages

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To create packages:

- Create AppExchange Packages

To upload packages:

- Upload AppExchange Packages

An *extension* is any package, component, or set of components that adds to the functionality of a managed package. An extension requires that the base managed package be installed in the organization. For example, if you have built a recruiting app, an extension to this app might include a component for performing background checks on candidates.

The community of developers, users, and visionaries building and publishing apps on Salesforce AppExchange is part of what makes Lightning Platform such a rich development platform. Use this community to build extensions to other apps and encourage them to build extensions to your apps.

To publish extensions to a managed package:

1. Install the base package in the Salesforce organization that you plan to use to upload the extension.
2. Build your extension components.

   Note: To build an extension, install the base package and include a dependency to that base package in your package. The extension attribute will automatically become active.

3. Create a new package and add your extension components. Salesforce automatically includes some related components.
4. Upload the new package that contains the extension components.
5. Proceed with the publishing process as usual. For information on creating a test drive or registering and publishing your app, go to http://sites.force.com/appexchange/publisherHome.

Note: Packages cannot be upgraded to Managed - Beta if they are used within the same organization as an extension.

CHAPTER 6 Pass the AppExchange Security Review

In this chapter ...

At Salesforce, nothing is more important than the trust of our customers. Trust requires security. To distribute a solution on AppExchange, it must pass our comprehensive security review. Learn how to prepare for and pass the security review.

AppExchange Security Review

Before you can publicly list your solution on AppExchange, the solution must pass a security review. The AppExchange security review tests the security posture of your solution, including how well it protects customer data.

The security review helps you identify security vulnerabilities that a hacker, malware, or other threat can exploit. Salesforce security review teams test your solution with threat-modeling profiles that are based on the most common web vulnerabilities. The teams attempt to penetrate the defenses programmed in your solution. Their goal is to extract or modify data that they don't have permission to access, just as security threats attempt to do.

Here is a small sampling of the common security threats that we test for.

- SOQL and SQL injection
- Cross-site scripting
- Nonsecure authentication and access control protocols
- Vulnerabilities specific to the Salesforce platform, such as record-sharing violations

For more information about the most critical web application security risks, read the Open Web Application Security Project (OWASP) Top Ten awareness document. OWASP is a nonprofit foundation that works to improve the security of software.

The scope of cyberthreats is large, and Salesforce upholds high security standards for solutions distributed on AppExchange. The review process is rigorous. Don't get discouraged if your AppExchange submission isn't approved the first time, or if it requires multiple code changes. Many solutions don't pass security review the first time they're submitted.

We give you a report documenting the security vulnerabilities found during the review. We're also available to meet with you and help you address vulnerabilities. Address the issues in the report, then submit the revised solution for a follow-up review. We offer multiple reviews for each submission, which enables you to fine-tune the security of your solution.

Important: To ensure that upgraded solutions safeguard against the latest security vulnerabilities, Salesforce reserves the right to conduct periodic re-reviews of solutions distributed on AppExchange.

View the security review process as enforcement mechanisms paired with personalized advice and tools. You have access to office hours where you can directly connect with a security review team member to get guidance catered to your solution. And, the security review team points you to security-scanning tools that help automate the process of vetting the security of your solution.

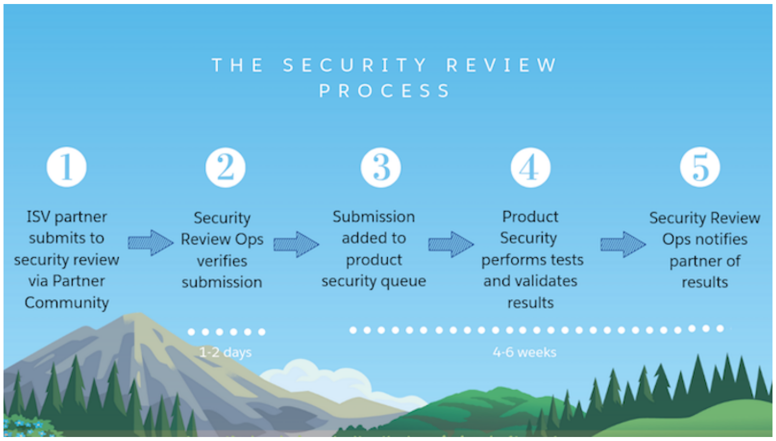
SEE ALSO:

Open Web Application Security Project (OWASP) Top Ten

How Does AppExchange Security Review Work?

Before initiating an AppExchange security review, you perform your own testing and gather supporting materials that help us assess the security of your solution. During a review, our Product Security team attempts to identify security vulnerabilities in your solution. If the team identifies vulnerabilities, you have access to personalized technical guidance to help you address the identified vulnerabilities.

Important: Every version of your managed package that you plan to list publicly on AppExchange must go through a security review. The review for a new version of a package that passed a security review is automated, and typically only takes a few minutes.


THE SECURITY REVIEW PROCESS
1
ISV partner submits to security review via Partner Community
2
Security Review Ops verifies submission
3
Submission added to product security queue
4
Product Security performs tests and validates results
5
Security Review Ops notifies partner of results
1-2 days
4-6 weeks

Ensure That You're Ready to Start

Knowing when you're ready for a security review is as important as how it works. You're ready to submit a solution for security review after you:

- Confirm with a partner recruitment representative that your solution is enrolled in the AppExchange Partner Program, and that you have a distribution agreement.
- Secure your solution according to industry best security standards.
- Certify that your solution is Lightning Ready. All new solutions submitted for security review must be Lightning Ready.
- In the Salesforce Partner Community Publishing Console:
  - Connect your packaging organization to AppExchange.
  - Create a provider profile.
  - Create a solution listing.
  - Submit a business plan for review, and receive Salesforce approval.

Test Your Solution

Run automated scanning tools and manually test your solution throughout the solution development lifecycle. Security scanning tools provide only first-pass, though useful, insights into solution vulnerabilities. To find vulnerabilities that automated scanning tools don't detect, also manually test your solution.

Tip: We strongly recommend that you test your code throughout the development lifecycle. If you defer testing and remediation, you're likely to encounter a larger accumulation of issues and greatly delay your time to market.

After you finish developing your solution, perform another round of manual testing and run the automated scanning tools that Product Security requires. The type of scans that you're required to run depends on the architecture of your solution.

On the Partner Security Portal, you can access the Source Code Scanner, which is also referred to as the Checkmarx scanner, and the Chimera scanner. These two scanning tools meet the test requirements for many AppExchange solutions.

Before you submit your solution for review, address all security issues that you find with your manual testing and the scanning tools. Either fix the code or document how flagged issues are false positives. A false positive is an issue that appears to pose a security risk but does not.

Test your solution before you submit it and you're much more likely to pass the review the first time. Applicants who don't test beforehand rarely pass and must resubmit after addressing security vulnerabilities identified during a review. Resubmitting significantly delays the solution publishing process.

Gather the Required Materials for Security Review Submission

Assemble the materials that enable Product Security to perform a thorough manual review. For most submissions, you're required to provide a Developer Edition org with the version of the solution that you intend to distribute installed and solution documentation. The security review team uses the Developer Edition org as the solution test environment. The org and documentation aren't required for Marketing Cloud apps. Other required materials vary by solution type.

Tip: You are likely to have questions as you prepare for security review and at other points during or after a security review. To discuss your concerns and get answers to your questions, visit the Partner Security Portal and schedule an office hours appointment. For help with submitting your solution for review, schedule an appointment with the Security Review Operations team. To troubleshoot issues in your solution that were identified during a review, make an appointment with the Product Security team.

Submit Your Solution for Review

After you complete testing and gather the materials required for your submission, you're ready to submit your solution for AppExchange security review. Run the security review wizard to submit your solution and the required materials, and pay the security review and annual AppExchange listing fees. If you plan to distribute your solution for free, you don't pay the fees.

After you submit everything in the security review wizard, expect these turnaround times.

Security Review Stage	Typical Time Frame
Security Review Operations verifies that your submission is complete.	1–2 days
Product Security tests your solution for the first time.	4–6 weeks
Product Security tests a resubmission of a package that wasn't approved previously and that shows progress in fixing security vulnerabilities.	2–3 weeks

Follow Up on the Security Review Report

When the security review is complete, you receive a report informing you that your submission is approved or not approved for public listing on AppExchange.

- **Approved**: You can publicly list your solution on AppExchange and distribute it to customers immediately.
- **Not Approved**: The security review team detected security issues in your solution. You can't list your solution on AppExchange or distribute it to customers.

If your solution isn't approved, the report includes information about the types of security issues that we detected. Keep in mind that the security review is a black-box, time-limited process. We can't list every instance of a security issue, and we may not initially detect all issue types. Interpret the security review findings as representative examples of the types of issues you must fix. Then diligently find and fix all instances of each issue across your entire solution.

Address all detected security issues. Rerun the required automated scanning tools to generate reports for your revised solution. Then resubmit your revised solution with the updated scan reports.

SEE ALSO:

- Connect a Packaging Organization to AppExchange
- Create or Edit Your Provider Profile
- Create or Edit an AppExchange Listing
- Add a Business Plan to an AppExchange Listing
- Partner Security Portal
- Partner Security Portal site
- Lightning Ready for AppExchange Partners (ISV)

Partner Security Portal

The Partner Security Portal is the main hub for your security review needs. The portal hosts the Source Code Scanner (Checkmarx) and Chimera automated security scanning tools. Use these tools to identify security vulnerabilities in your solution. The portal is also where you go to schedule office hours appointments with AppExchange security engineers and Security Review Operations team members. Office hours provide a forum for you to ask questions about the security review process and to discuss how to rework code that has security vulnerabilities.

Set Up Your Partner Security Portal Login

Connect your packaging org to your Partner Community account on the Organizations tab of the Salesforce Partner Community publishing console. Then log in to the Partner Security Portal using that org's credentials. Logged in users can access security scanning tools and schedule office hours appointments.

Security Scanners on the Portal

To identify security vulnerabilities, we require that you run security scanning tools on your solution and all external endpoints that run independently of the Salesforce platform. The Partner Security Portal hosts two of the scanners that we recommend, the Source Code Scanner (Checkmarx) and Chimera.

Office Hours Appointments on the Portal

Salesforce security review teams host office hours for AppExchange partners. During office hours, you have direct, scheduled, web conference access to security review team members. Get answers about the submission process from Security Review Operations or troubleshoot security vulnerabilities with Product Security.

Set Up Your Partner Security Portal Login

USER PERMISSIONS

To access Source Code Scanner (Checkmarx) on the Partner Security Portal:

- Author Apex

Connect your packaging org to your Partner Community account on the Organizations tab of the Salesforce Partner Community publishing console. Then log in to the Partner Security Portal using that org's credentials. Logged in users can access security scanning tools and schedule office hours appointments.

Note: Before you set up your Partner Security Portal login, ensure that the packaging org that hosts your development work is a Salesforce Developer Edition org.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.

3. Click **Organizations**.
4. Click **Connect Org**.
5. Enter the credentials that you use for your packaging org, and then log in.
6. Go to the Partner Security Portal.
7. Click **Login**.

Security Scanners on the Portal

To identify security vulnerabilities, we require that you run security scanning tools on your solution and all external endpoints that run independently of the Salesforce platform. The Partner Security Portal hosts two of the scanners that we recommend, the Source Code Scanner (Checkmarx) and Chimera.

Tip: We strongly recommend that you run security scans on your code and any connected endpoints throughout the development lifecycle. Run periodic scans and fix flagged issues as you go to prevent security vulnerabilities from piling up and creating more work for you later.

USER PERMISSIONS

To access Source Code Scanner (Checkmarx) on the Partner Security Portal:

- Author Apex

The Partner Security Portal provides access to two Salesforce-supported scanners: the Source Code Scanner, also referred to as the Checkmarx scanner, and the Chimera scanner service.

The Source Code Scanner (Checkmarx) checks Apex, Visualforce, and Lightning code, but doesn't check external endpoints of a solution.

Chimera checks external endpoints, but requires you to upload a token to the root of the external server. If your solution connects to endpoints on domains that you own, you can use Chimera. If your solution connects to endpoints on domains that you don't own, you can't upload the token and can't use Chimera. Use an alternative tool. For example, download the free OWASP Zed Attack Proxy (ZAP) scanner or purchase a license for Burp Suite.

Just before you submit your solution, except for mobile clients and API solutions, run the Source Code Scanner in the Partner Security Portal. If your solution connects to any non-Salesforce domains, also run Chimera, OWASP ZAP, or Burp Suite on the external endpoints. Include reports from your scans when you submit your solution for security review.

Security Scanner	Scan Targets	Considerations
Source Code Scanner (Checkmarx)	Apex, Visualforce, and Lightning code	• This static scanning tool uses Checkmarx security technology. • Mandatory for any security review submission that includes a Salesforce package or component. Not required for mobile clients or API solutions. • You're provisioned three Source Code Scanner (Checkmarx) runs per solution version with the security review fee. Consider running an alternative tool as you develop, such as the open-source PMD Source Code Analyzer, and the Source Code Scanner as you finalize your submission. • If you want the flexibility and freedom to scan unpackaged code, or bypass scan limits and package linking requirements, purchase a license from Checkmarx.
Chimera	External endpoints on domains that you own	• Checks for security vulnerabilities in external endpoints of a solution. • Scans solutions from a Salesforce IP address. • Doesn't require a download.

Security Scanner	Scan Targets	Considerations
		- Isn't usable with endpoints on domains that you don't own because it requires upload of a token to the root of the external server. - If your solution connects to external endpoints that you don't own, use OWASP ZAP or Burp Suite instead of Chimera.

SEE ALSO:

Test Your Entire Solution

OWASP Zed Attack Proxy (ZAP)

Burp Suite

Office Hours Appointments on the Portal

Salesforce security review teams host office hours for AppExchange partners. During office hours, you have direct, scheduled, web conference access to security review team members. Get answers about the submission process from Security Review Operations or troubleshoot security vulnerabilities with Product Security.

Operations Office Hours

During operations office hours, Security Review Operations team members answer questions about security review logistics and submission requirements. Typical questions include:

- What components of the solution are in scope for the security review?
- What type of reports and scan results am I required to provide?
- What are the fees for posting a paid solution on AppExchange?
- What is the status of my security review?
- When do I receive the results for my submission?
- What happens if the solution that I submit doesn't pass the review?

Technical Office Hours

Technical office hours are available when you need specific security-related technical assistance from the Product Security team. Typical questions include:

- How do I navigate the AppExchange security requirements?
- What is a secure way to design and implement a specific aspect of my solution?
- How do I address issues that the automated security scanning tools detect?
- What does a finding in my security review report mean?
- What security scan results can I regard as false positives?
- How do I resolve the issues in my security review report that I think are false positives?
- Does my reworking of the code fix the security vulnerabilities identified in the security review?

Test Your Entire Solution

Test the full scope of your solution using manual testing and automated security scanner tools. When you perform security scans, include all external endpoints that run independently of the Salesforce platform. Document false positive security violations and fix all code that doesn't meet Salesforce security guidelines.

Testing Scope

Test all pieces of the solution that you submit for security review. Ensure that the solution architecture is secure, including endpoints that aren't hosted on the Salesforce platform. Your attention to all components and layers of your solution helps minimize the risk of hackers or malware exploiting potential entry points.

The full scope of your solution is subject to security review testing. For example, we can perform penetration tests that attack your Development Edition test org and attempt to access sensitive data or authenticate with false credentials.

To determine testing scope, use a follow-the-data approach. Wherever the customer or data goes is in scope. For example, your Salesforce customer is required to log in to your company website, or data is synced to a third-party server. Test these pieces to ensure that they're securely transferring credentials and data.

When either of the following criteria is true, external endpoints are within the scope of the security review and a required part of your security testing.

- The endpoint plays a role in authenticating the end user as part of buying, getting support for, or using your solution. This definition includes a connected app that doesn't require manual credential entry.
- Salesforce data is transferred to or from the endpoint.

Important: Before you perform security testing on external endpoints that you don't own, complete two actions. First, obtain any necessary permission to perform security testing from the third parties that own the external endpoints. Second, follow the guidelines in What are the Salesforce IP Addresses & Domains to Whitelist?.

Automated Scanning Tools

To identify security vulnerabilities in your solution and external endpoints, we require that you run specific automated security scanning tools.

Tip: We strongly recommend that you run security scans on your code and any connected endpoints throughout the development lifecycle. Run periodic scans and fix flagged issues as you go to prevent security vulnerabilities from piling up and creating more work for you later.

On the Partner Security Portal, you can access two Salesforce-supported security scanners: the Source Code Scanner, also referred to as the Checkmarx scanner, and the Chimera scanner. You can, and sometimes are required to, use scanners that aren't on the Partner Security Portal.

This table summarizes the automated security scanner tools that we require or recommend.

Security Scanner Tool	Scan Targets	Considerations	Results Accepted with Submission	Hosted on the Partner Security Portal
Source Code Scanner (Checkmarx)	Apex, Visualforce, and Lightning code	• This static scanning tool uses Checkmarx security technology.	Yes	Yes

Security Scanner Tool	Scan Targets	Considerations	Results Accepted with Submission	Hosted on the Partner Security Portal
		- Mandatory for any security review submission that includes a Salesforce package or component. Not required for mobile clients or API solutions. - You're provisioned three Source Code Scanner runs per solution version with the security review fee. - If you want the flexibility and freedom to scan unpackaged code, or bypass the three scan limit and package linking requirements, purchase a license from Checkmarx.		
PMD Source Code Analyzer	Apex code	- The PMD scanner is a free, open-source tool. - This tool is an alternative to the Source Code Scanner for solutions that contain Apex code. - Run PMD scans an unlimited number of times as you prepare your solution for security review and as a supplement to the Source Code scanner. - PMD typically reports more false positives than Source Code Scanner tool.	No	No
Chimera	External endpoints on domains that you own	- Checks external endpoints of a solution. - Scans solutions from a Salesforce IP address. - Doesn't require a download. - Isn't usable with endpoints on domains that you don't own because it requires upload of a token to the root of the external server. - If your solution connects to external endpoints that you don't own, use OWASP ZAP or Burp Suite.	Yes	Yes
OWASP Zed Attack Proxy (ZAP)	External endpoints	- The ZAP Scanner is a free, community-driven proxy for web app security testing. - Requires a download. - Setting Up ZAP for Browser provides guidance for initiating security scans with this tool.	Yes	No

Security Scanner Tool	Scan Targets	Considerations	Results Accepted with Submission	Hosted on the Partner Security Portal
Burp Suite	External endpoints	• Salesforce doesn't provision Burp Suite licenses for security review. Purchase a license independently. • Requires a download.	Yes	No

SEE ALSO:

Security Scanners on the Portal

False Positives

PMD Source Code Analyzer Project Apex Rules

OWASP Zed Attack Proxy (ZAP)

Burp Suite

False Positives

As you navigate the AppExchange security review process, you're likely to encounter *false positive* issues with your solution. A false positive occurs when a security-scanning tool or code reviewer flags code that appears to pose a security vulnerability but actually doesn't. Instead, the flagged vulnerability is nonexistent, nonexploitable, or not required to support a valid use case or functionality.

Improve your likelihood of passing an initial or follow-up security review by addressing false positives in your submission. Include a document that explains why each flagged false positive doesn't pose a security risk.

Document Your Responses to False Positives

Most often, false positives appear in Source Code Scanner (Checkmarx), Chimera, ZAP, or Burp Suite scanner results. False positives occasionally show up in Salesforce security review failure reports. In either case, you can improve your likelihood of passing security review by including a false-positive explanatory document when you submit your code.

Example Responses to False Positives in Checkmarx Scan Results

The following example shows how to document your responses to false positives resulting from a Checkmarx scan. The example is in tabular format, but you can use whatever format suits the reporting of your information.

Example Responses to False Positives in a Security Review Failure Report

The following example shows how to document your responses to false positives listed in a Salesforce security review failure report. It's written to support a retest submission.

Document Your Responses to False Positives

Most often, false positives appear in Source Code Scanner (Checkmarx), Chimera, ZAP, or Burp Suite scanner results. False positives occasionally show up in Salesforce security review failure reports. In either case, you can improve your likelihood of passing security review by including a false-positive explanatory document when you submit your code.

You can use any format to document a false-positive response. For each flagged issue, include:

- Location—State the code location of the reported vulnerability.

- Explanation—Explain why the flagged code doesn't pose a vulnerability.

In addition to providing rationales for false positives, include in your documentation explanations that clarify special use cases, circumstances, or exceptions.

Some categories of security scan results are false positives that don't require documentation or code reworking. These categories exist in most of the security scanners that we accept for security review. Other scan results fall into severity categories that require attention because they highlight known security vulnerabilities. If you can't submit justifiable false positive documentation, rework the flagged code to meet security standards.

Scanner	Scan Results Requiring Attention for Security Review	Scan Results Not Requiring Attention
Source Code Scanner (Checkmarx)	All issues regardless of severity level that aren't labeled "Code Quality"	Issues labeled "Code Quality"
ZAP and Burp Suite	Issues categorized as high severity	Action on low and medium severity issues isn't required, but investigation into whether they pose a security threat is encouraged.
Chimera	All issues regardless of severity level that aren't labeled "Informational/Other"	Issues labeled "Informational/Other"

Example Responses to False Positives in Checkmarx Scan Results

The following example shows how to document your responses to false positives resulting from a Checkmarx scan. The example is in tabular format, but you can use whatever format suits the reporting of your information.

Reported Vulnerability	Location	Response
FLS Update	Paths 1–17	We implemented and called the AuthManager class to check these paths for us or throw an error. You can see that in `ControllerFile.cls` on lines 241, 245, and 249.
FLS Update	Paths 18–24	Have been fixed and are valid.
FLS Update	Paths 25, 26, and 30	Are against our custom object UsageLog__c and not intended for user consumption. They are never exposed to users directly.
FLS Update	Paths 27–29	Must update the Account.NumberRelatedIssues__c field to appropriately count the new object created, irrespective of user input.
Sharing Violation	BatchCleanData.cls	We minimized the functions that this class calls to only the minimum set that requires `without sharing`.
Sharing Violation	LightningController.cls	Changed declaration to `with sharing`.

Reported Vulnerability	Location	Response
Sharing Violation	GlobalIssueReporting.cls	Changed to use`inherited sharing` because we don't know which context our calling class requires.
Stored XSS	Issue.page file: paths 1–3	reportIssueList is a list of objectID + ' ' + integers. It poses no XSS risk.
Stored XSS	Issue.page file: path 4	Fixed by removing `escape=”false”`.
Stored XSS	Issue.page	We sanitized usageLog in JavaScript using the Salesforce SecureFilters library.

Example Responses to False Positives in a Security Review Failure Report

The following example shows how to document your responses to false positives listed in a Salesforce security review failure report. It's written to support a retest submission.

Reported Vulnerability	Location	Response
Insecure Software Version	jQueries	Updated.
Insecure Software Version	moment.js	No user input flows into moment parsing. User input flows only to Salesforce Date fields.
Insecure Storage of Sensitive Data	UserConfig_c.object	The apiKey__c field is encrypted before setting with the encryption key, which is stored in a protected custom setting.
Insecure Storage of Sensitive Data	IssueInvite_c.object	The password__c field is a support-agent selected password to share resources publicly with the internet. It's not a user-owned secret.
Insecure Storage of Sensitive Data	APIManagement_c.object	We deprecated this custom setting, but it's impossible to delete custom setting definitions from managed packages.
Insecure Storage of Sensitive Data	AuthManager.cls	The credentials in comments are only example credentials. They do not authenticate to any development or production system.
Stored XSS	https://content.saslesforce.partner.com	We spoke to Jane Doe at Salesforce during office hours on Feb. 1, 2020. This URL is linked to a nonsensitive content domain. The URL has no session data to access back-end information. We were told that this finding could be a false positive.

Security Review Resources

These resources can help you prepare for the AppExchange security review.

- AppExchange Security Review on page 153
- Security Review Requirements Checklist
- Secure Cloud Development Resources
- Secure Coding Guide
- Open Web Application Security Project (OWASP)
- OWASP Top 10 Issues
- OWASP Testing Guide
- OWASP Secure Coding Guide
- OWASP Secure Coding Practices Quick Reference

CHAPTER 7 Publish Your Solution on AppExchange

In this chapter ...

You turned an idea into a solution and are ready to get it in front of customers. To publish your solution on AppExchange, use the AppExchange publishing console. The publishing console is where you create a listing for your solution, connect orgs, manage license settings, and view analytics for your published listings.

What Is the AppExchange?

The AppExchange is an online marketplace for Salesforce apps, components, and consulting services. If you're a Lightning Platform developer or consultant, the AppExchange is the gateway for connecting customers to your business solution. If you're a Salesforce administrator or user, visit the AppExchange to find tools and talent to unleash your company's productivity.

How Does the AppExchange Work?

An AppExchange listing is your primary marketing tool for promoting your app or component. In the listing, you can describe your solution, pricing, support, and other details so that customers can determine if your offering is right for them. You also have a chance to upload videos, white papers, and other content to help customers understand what you are delivering. Based on the information you provide, an AppExchange curator categorizes the listing into one or more business areas, like sales, marketing, or analytics.

After you've created a provider profile and uploaded your package, you can create a listing. You can create only one listing per app or component. This approach has several advantages. As the provider, it's easier to maintain and upgrade your offering over its lifecycle. Having one listing also helps you achieve a higher ranking, because the metrics that the AppExchange uses to rank apps and components, like page views, aren't diluted across multiple listings. Customers benefit, too, because your offering is easier to find, all your reviews are in one place, and there aren't several similar listings to cause confusion.

Who Can Use the AppExchange?

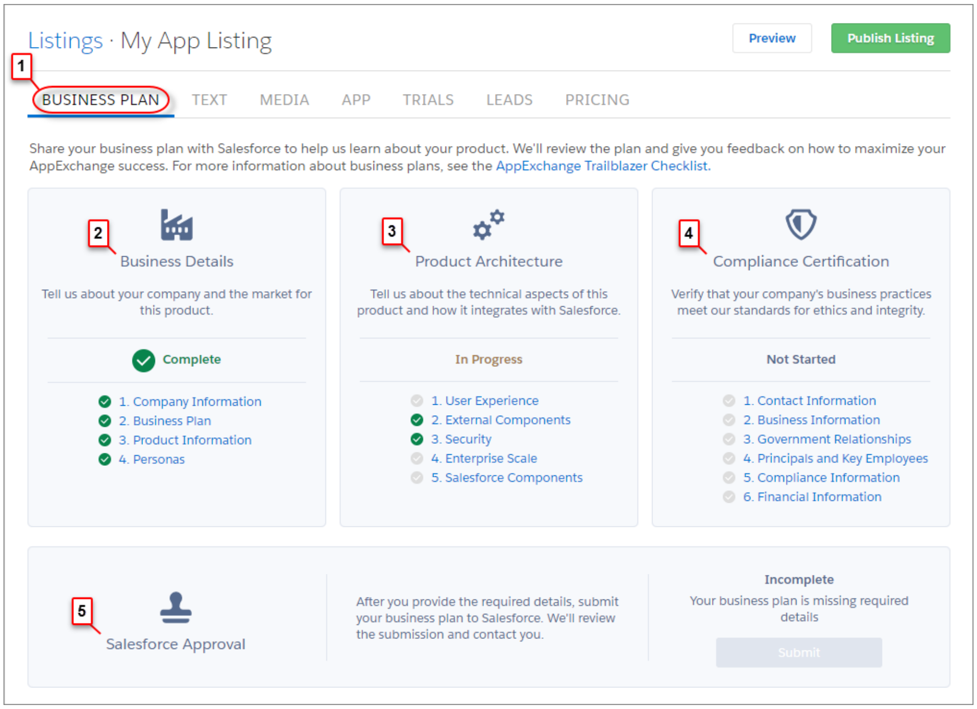
Anyone can browse listings and test-drive apps or components. You need the "Download Packages" permission to install apps or components. To create a package and upload it to the Partner Community, you must have "Create Packages" and "Upload Packages" permissions. To create and publish a listing, you must have the "Manage Listings" permission.

Business Plans for AppExchange Listings

To publish a listing on AppExchange, we ask you to provide a business plan for your app, Lightning component, or other product. A business plan tells us about your company and the product you're building. It helps us verify that you meet our standards for ethics and integrity. Salesforce must approve your business plan before you can submit your product for security review. If you recently joined the AppExchange Partner Program, you can sign your partnership agreement after we approve your business plan.

You can create and manage the business plan for your listing on the Business Plan tab (1) in the AppExchange publishing console. A business plan has these sections.

Section	Purpose
Business Details (2)	Share information about your company, the market for your product, and its target users. We use this information to understand how your company fits into the Salesforce product ecosystem.
Product Architecture (3)	Share technical information about your product, such as how it stores credentials, passwords, and other sensitive data. We use this information to verify that your product follows Salesforce best practices for architecture and design.
Compliance Certification (4)	Share information about your company's business practices. We use this information to verify that you meet our standards for ethics and integrity. Note: We ask you to provide compliance information only for paid AppExchange listings.



Share your business plan with Salesforce to help us learn about your product. We'll review the plan and give you feedback on how to maximize your AppExchange success. For more information about business plans, see the AppExchange Trailblazer Checklist.

Business Details

Tell us about your company and the market for this product.

✓ Complete

- ✓ 1. Company Information
- ✓ 2. Business Plan
- ✓ 3. Product Information
- ✓ 4. Personas

Product Architecture

Tell us about the technical aspects of this product and how it integrates with Salesforce.

In Progress

- 1. User Experience
- ✓ 2. External Components
- ✓ 3. Security
- 4. Enterprise Scale
- 5. Salesforce Components

Compliance Certification

Verify that your company's business practices meet our standards for ethics and integrity.

Not Started

- 1. Contact Information
- 2. Business Information
- 3. Government Relationships
- 4. Principals and Key Employees
- 5. Compliance Information
- 6. Financial Information

Salesforce Approval

After you provide the required details, submit your business plan to Salesforce. We'll review the submission and contact you.

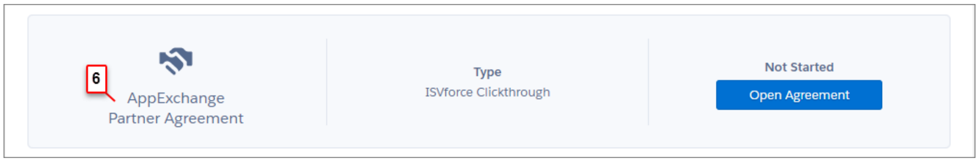
Incomplete

Your business plan is missing required details

Submit

After you finish your business plan, submit it for review. We contact you to discuss your partnership and then either approve the plan or return it to you with comments. If your plan is returned, you can resubmit it when you've addressed our comments. To check the status of your plan, go the Salesforce Approval section (5).

After your business plan is approved, we contact you with instructions for signing your partnership agreement. To check the status of the agreement, go to the AppExchange Partner Agreement section (6). If you're an existing partner, you've already signed an agreement, so this section doesn't display.



AppExchange Partner Agreement

Type

ISVforce Clickthrough

Not Started

Submit a Due Diligence and Compliance Certification

If you're starting a Salesforce consulting practice, submit a Due Diligence and Compliance Certification on behalf of your company. In the certification, you share details about your company and its business practices and relationships. We review these details to ensure that your company meets our standards for ethics and integrity.

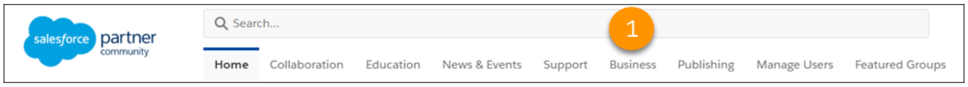
Tip: At many companies, filling out the certification is a team effort. To allow other people to edit your company's certification, assign the Manage Partnership permission.

1. Join the Salesforce Partner Community.
2. If prompted, click **Go to Certification**. Otherwise, click the **Business** tab (1).

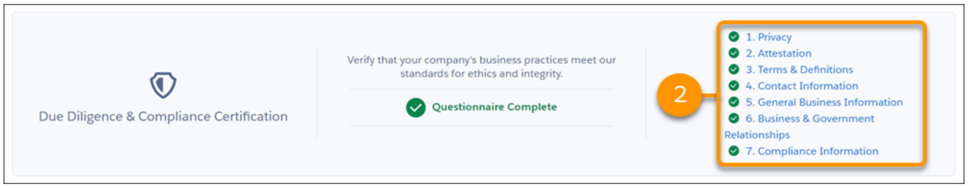
USER PERMISSIONS

To edit the Due Diligence and Compliance Certification:

- Manage Partnership



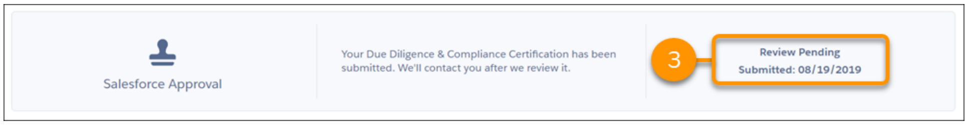
3. For Due Diligence & Compliance Certification, click a questionnaire section (2) to provide the related details.


Due Diligence & Compliance Certification
Questionnaire Complete
2
1. Privacy
2. Attestation
3. Terms & Definitions
4. Contact Information
5. General Business Information
6. Business & Government Relationships
7. Compliance Information

Verify that your company's business practices meet our standards for ethics and integrity.

4. After you've provided all the required information, submit your certification for review.

To check the status of the review (3), go to the Salesforce Approval section. If we approve your certification, you're a step closer to launching your Salesforce consulting practice. Approved practices get access to tools and features for consulting partners, such as the ability to log completed implementation projects.



Your Due Diligence & Compliance Certification has been submitted. We'll contact you after we review it.

Review Pending
Submitted: 08/19/2019

Publish on AppExchange

To publish a solution or consulting service on AppExchange, follow these high-level steps.

1. If your listing is a solution, connect your packaging organization to AppExchange.
2. Create a provider profile.
3. Review tips for creating a listing that excites and engages customers.
4. Create the listing.
5. If your listing is a solution, submit a business plan for review.
6. If your listing is a solution, submit the package for security review.
7. After your solution is approved, publish the listing on AppExchange.
8. To see how your listing is performing, review the analytics.

Connect a Packaging Organization to AppExchange

To publish a listing on AppExchange, first connect the packaging organization, which is the organization that contains your packaged solution.

1. Log in to the Partner Community.
2. On the Publishing page, click the **Organizations** tab.

3. Click **Connect Organization**.
4. Enter the login credentials for the organization that contains the package you want to list.
5. Click **Submit**.

If AppExchange finds any packages, they appear on the **Packages** tab on the Publishing page. From the **Packages** tab, create a solution listing, or begin the security review.

Create or Edit Your Provider Profile

A polished, accurate provider profile is a key part of establishing customer trust in your app, component, or consulting service. On your profile, you can share a mission statement and tell customers where you're located, how many employees you have, and so on. People browsing listings see this information on the Provider tab.

To create or edit your profile, open the Publishing page in the Partner Community, and then go to the **Company Info** tab.

Create or Edit an AppExchange Listing

Market your app, component, or consulting service with an AppExchange listing. Create a listing or edit an existing one in the AppExchange publishing console, which guides you through the process.

To create or edit a listing, open the Publishing page in the Partner Community, and click the **Listings** tab.

Here are the tabs you navigate when creating or editing a listing.

Tab	What you do:	Available on these listings types:
Business Plan	• Add a business plan for your offering • If you're a standard ISVforce partner, sign your Salesforce partnership agreement	App, Component
Text	• Describe your offering • Provide contact information so that customers and Salesforce can get in touch	App, Component, Consulting Service
Media	• Add branding • Upload images, videos, and other resources to help customers understand your offering	App, Component, Consulting Service
App	• Upload the package that contains your app (or the link to your app if you're only using the Salesforce API)	App
Component	• Upload the package that contains your component	Component
Trials	• Set up a test drive or free trial so that customers can see your offering in action	App, Component
Leads	• Choose how Salesforce collects leads when customers interact with the listing	App, Component, Consulting Service

Tab	What you do:	Available on these listings types:
Pricing	• Choose whether your offering is free or paid and provide pricing information	App, Component
Service Offering	• Choose listing categories, like services offered and industry focus	Consulting Service

Add a Business Plan to an AppExchange Listing

USER PERMISSIONS

To edit AppExchange listings:

- Manage Listings

Before submitting your product for security review, add a business plan to your AppExchange listing. The business plan includes details about your company and its operations, your product architecture, and compliance information. To add a business plan, go to your product listing in the AppExchange publishing console.

If your listing is paid, provide pricing details before you add a business plan. Otherwise, you can't provide compliance information. If your listing is free, we don't collect compliance information.

1. Log in to the Partner Community.
2. Click **Publishing**.
3. On the Listings tab, click a listing tile.
4. On the Business Plan tab, provide details about your company and product architecture.
5. If your listing is paid, provide compliance information.

   Note: If you're an existing partner with another published paid listing, we already have your compliance information, so this section is marked as complete.

6. Click **Submit for Approval**.

After you submit your business plan, we contact you to discuss your partnership. You can check the plan's approval status on the Business Plan tab.

Make Your AppExchange Listing Effective

A great app, component, or consulting service deserves a listing to match. We gathered feedback from customers and Salesforce marketing experts to provide a list of tips to make your listing stand out.

Tell Customers, Then Show Them

An effective listing combines concise, customer-oriented writing with compelling visuals. As you craft your listing, keep the following tips in mind.

- **Emphasize a use case**—When customers read your listing, they want to understand the problem you're solving, whether they're part of the target audience, and what makes your offering different. As you explain your solution, put things in terms the customer cares about. For example, if your component helps support reps resolve cases 10% faster, say so.
- **Add screenshots, videos, and demos**—Customers are more likely to interact with listings that have visuals. Most people like to at least see how something works before making a purchase.

- **Make the listing easy to read**—Like you, the typical AppExchange customer is busy. Help customers understand what's important by making your listing easy to read. Keep sentences short and use formatting, like bullets, to draw attention to key points. If you've added screenshots or a video, use zooming and annotations to highlight features.

Aim for Clean and Simple Design

An effective listing tends to have a clean and simple design. When making design decisions, keep the following tips in mind.

- **Find a design reference**—Before you create a logo, banner, or other graphic, find a design that you like and think about what it does well. For example, does it use a visually pleasing font? Keep these ideas in mind as you begin designing.
- **Preview before publishing**—The AppExchange lets you preview your listing before publishing, and you can see exactly how your offering will appear to customers. Put yourself in the customer's shoes and ask, "If I saw this listing, would I feel comfortable buying this app or component?"

For more tips, see *Partner Logo and Branding Usage Guidelines* in the Education section of the Partner Community.

Choose an Installation Option

The easier it is for people to install your offering, the more likely it is they will become paying customers. Choose the installation option that gives customers the best experience.

Option	When to choose this:
`Directly from the AppExchange`	If your offering is packaged, this option provides the simplest installation experience. It allows people to install your offering into their Salesforce sandbox or production environment through the AppExchange installation sequence without assistance from you. This option is required for components and recommended for apps.
`From your website`	If your app is a downloadable client or needs additional information to be installed, this option is the best. After users click **Get It Now** on your listing and agree to the terms and conditions, they are directed to your website to complete the installation process. Make sure that you've provided clear download instructions and performed the required setup or configuration.
`They should contact us to install it`	If your installation or selection process requires your assistance, you must choose this option. After agreeing to terms and conditions, the customer is told that you'll be in touch shortly to help with installation. Make sure that your company has the resources to assist potential customers.

Register Your Package and Choose License Settings

If you register a package and set up the License Management App (LMA), you receive a license record each time a customer installs your app or component. Licenses let you track who is using your app or component and for how long.

Note: Before you register a package, make sure that:

- Your app or component is in a managed package.

- You have installed the LMA. In most cases, the LMA is installed in your partner business organization.

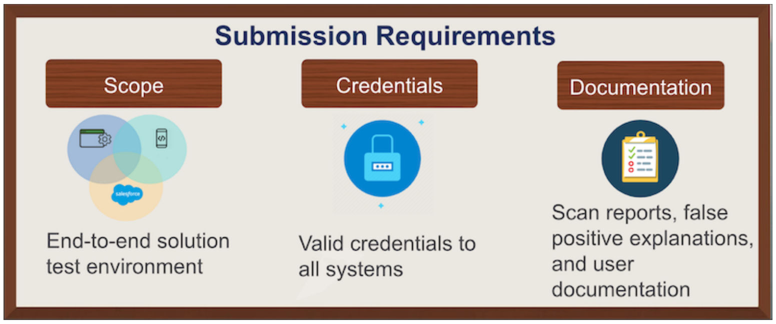
1. Log in to the Partner Community.
2. On the Publishing page, click the **Packages** tab.
3. Click **Manage Licenses** next to the package that you want to register.
4. Click **Register**. Enter the login credentials for the organization where the LMA is installed. Usually, the organization is your partner business organization.
5. Select whether your default license is Free Trial or Active.
6. If you selected a free-trial license, enter the length of the trial, up to 90 days.
7. Enter the number of seats associated with your default license, or select **License is site-wide** to offer the license to all users in the installer's organization.
8. Click **Save**.

Complete the Security Review Cycle

To distribute a solution on AppExchange, it must pass our comprehensive security review. Use the security review wizard on the Salesforce Partner Community site to submit your solution for review. Resubmit a solution you revised to correct security issues detected in a previous review. Manage payment of review fees and AppExchange listing fees.

Required Materials for Security Review Submission

Learn about the materials that you must provide, such as test environments and documentation, when submitting your solution for an AppExchange security review. Mobile apps have platform-specific submission requirements. Extension packages undergo security review and Salesforce requires the same materials for them as for a standalone solution.


Submission Requirements
Scope
Credentials
Documentation
salesforce
End-to-end solution test environment
Valid credentials to all systems
Scan reports, false positive explanations, and user documentation

During a security review, Product Security tests the required and optional parts of your solution. To determine testing scope, we typically use a follow-the-data approach. Wherever the customer goes, we go. For example, to use your solution, your Salesforce customer needs an account on your company website, or data is synced to a third-party server. Our review team tests these pieces to ensure that they're securely transferring Salesforce credentials and data.

Provide access to all environments, packages, and external components that your solution uses, including:

- External web applications or services.
- Client or mobile applications that are required or optional.
- All Apex and Visualforce that is included in your solution.

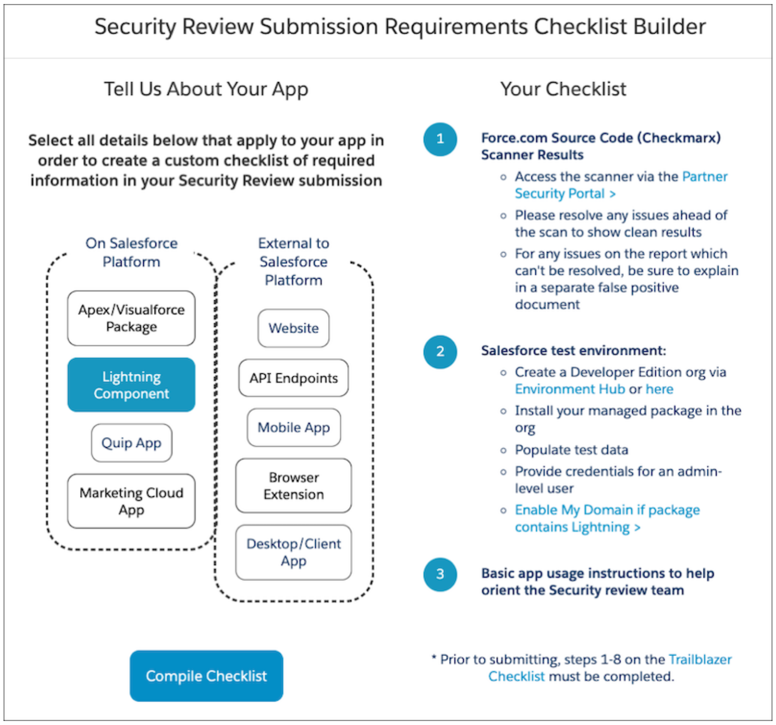
Note: Be sure that your submission is a Managed—Released package. We can't accept an unmanaged or beta package.

If you're not sure whether to include part of your solution, include it anyway. The review team doesn't test parts that are out of scope, but omitting a required part delays your review.

We like to see that you did your due diligence to ensure that your solution meets enterprise security standards. Include security scan reports along with explanations of any false positives that appear in your test results.

We also ask for detailed solution user documentation and your company's information security policies. We understand that providing extensive documentation isn't practicable for smaller or newer companies, so we factor in company size and maturity when reviewing submitted documents.

To generate a checklist that is customized to your solution, use the Security Review Submission Requirements Checklist Builder in the Salesforce Partner Community. Here's the checklist for a Lightning Component.



Security Review Submission Requirements Checklist Builder

Tell Us About Your App

Select all details below that apply to your app in order to create a custom checklist of required information in your Security Review submission

Your Checklist

1. Force.com Source Code (Checkmarx) Scanner Results
   - Access the scanner via the Partner Security Portal >
   - Please resolve any issues ahead of the scan to show clean results
   - For any issues on the report which can't be resolved, be sure to explain in a separate false positive document
2. Salesforce test environment:
   - Create a Developer Edition org via Environment Hub or here
   - Install your managed package in the org
   - Populate test data
   - Provide credentials for an admin-level user
   - Enable My Domain if package contains Lightning >
3. Basic app usage instructions to help orient the Security review team

* Prior to submitting, steps 1-8 on the Trailblazer Checklist must be completed.

The following table summarizes what to submit based on the scope of your architecture.

Material for Submission	Salesforce Native Solution	Salesforce Native Solution with Lightning Components	Solution with External Web App or Service	Solution with a Mobile Client	API Only	Marketing Cloud App
Salesforce Developer Edition org	X	X	X	X	X	
Managed package installed	X	X	X	X		

Material for Submission	Salesforce Native Solution	Salesforce Native Solution with Lightning Components	Solution with External Web App or Service	Solution with a Mobile Client	API Only	Marketing Cloud App
a in Developer Edition org						
URLs and login credentials for external components requiring authentication			X	X	X	
Checkmarx report	X	X	X	X		
Zap or Chimera scan report			X	X	X	X
False positives documentation (if applicable)	X	X	X	X	X	X
Solution documentation	X	X	X	X	X	
Platform with installation link or file				X		
Credentials to Marketing Cloud environment						X

Mobile Apps

For mobile app testing, provision the app for all the platforms that you plan to distribute on. For iOS, we accept a test flight or an ad hoc deployment. For other platforms, we accept the app in a file, such as an Android Packaging (.apk) file.

Extension Packages

An extension package is a package that is an add-on to a solution or that integrates the functionality of two solutions. Before you can publicly list an extension package on AppExchange, it and the solutions it extends must pass security review.

If your extension package is an add-on to, or integrates with, base solutions that *have passed* the security review, submit only your extension package for review. However, if the base solutions *haven't passed* the security review, submit your extension package plus the unreviewed solutions.

The security review submission requirements for an extension package are the same as for a solution that has a similar architecture. For example, if you have an extension package with external callouts, attach separate web scan results for the packages with the callouts.

The Product Security team reviews the solution as a whole. Install a complete solution in the Development Edition org that you submit with your security review. Include your extension package. Also install all base and dependent packages for the solutions that your package extends or integrates. That's required whether the base solutions have already passed the security review or not.

It's important that the Salesforce security team reviews every extension package. Even small packages can introduce security vulnerabilities.

SEE ALSO:

False Positives

Security Review Requirements Checklist Builder

Security Review and AppExchange Listing Fees

When you submit your solution for an initial security review, you pay security review and AppExchange listing fees. We waive the fees for solutions that are distributed for free on AppExchange. If we find security vulnerabilities in your solution, you can fix and resubmit it a limited number of times at no extra charge.

Expect to pay a one-time, upfront total of $2,700 USD to initiate the security review process for most solutions. This payment includes a $2,550 security review fee and $150 first-year AppExchange listing fee. Also expect to pay the $150 AppExchange listing fee annually after the first year. The annual listing fee includes reviews for updates to solutions already listed on AppExchange.

Fees are refundable. Refund requests must be made within 180 days of payment.

If you have questions about security review or listing fees, contact your Partner Account Manager.

Here's a detailed breakdown of the fees.

Review Type	Security Review Fee	Annual Listing Fee
Initial review of a paid solution	$2,550 USD	• $150—first-year fee is added to the security review fee and due upon submission • $150 charged annually after the first year of listing
All reviews of free solutions	No charge	• No charge
Follow-up review of a paid solution resubmitted after addressing issues detected in a previous security review	No extra fee—a limited number of follow-up reviews are included in the security review fee paid at original submission of solution	• First-year listing fee paid at initial review submission • $150 fee charged annually after first year of listing
Periodic review of a previously approved, listed, paid solution	No extra fee—cost included in the security review fee paid at original submission of solution	• First-year listing fee paid at initial review submission • $150 fee charged annually after first year of listing

Be prepared to pay the fees when you submit your solution in the security review wizard for the first time. In the wizard, you can also indicate that you plan to distribute your solution for free. We don't charge fees for solutions that are distributed for free on AppExchange.

When you submit a solution for review using the wizard, you're always prompted to confirm your credit card information. However, you're not always charged.

Often, the initial security review and annual listing fees include follow-up and periodic reviews. For example:

- **You resubmit a solution that fixes security issues discovered in an initial review.** Your resubmission exclusively fixes issues discovered in an initial security review, and you fix the code in the existing package. We conduct a follow-up review. If you make other revisions, such as functionality changes, we require that the revised solution go through an initial security review. That's also true if you spin up a new package for the revised code.
- **You list a new version of a package that we previously approved.**. You upload the new version to AppExchange and associate it with your listing. To identify security vulnerabilities, we run a source code scan. This scan is included in the annual listing fee.
- **You create a managed package to upgrade your offering.** You develop the new version in a package that we previously approved. The upgrade is automatically approved when you submit it for review. You can immediately associate the new version to your listing. We review the new version 6 months to 2 years after the solution is listed, depending on potential risk of the solution. The review is included in the security review fee.

Update Your Credit Card Information

Use the security review wizard on the Salesforce Partner Community to update the credit card information that's on file for your AppExchange listings.

USER PERMISSIONS

To access the Salesforce Partner Community Publishing Console:

- Manage Listings

1. Log in to the Salesforce Partner Community.
2. Click the **Publishing** tab.
3. Click any listing that you submitted for security review.
4. Click **Submitted** or **Passed** in the listing's security review status field to launch the security review wizard.
5. On Step 8 - Payment of the security review wizard, enter and save your updated credit card information.

Submit Your Solution for Security Review

Use the security review wizard on the Partner Community website to submit your solution for security review. The wizard collects your solution, scan reports, false positives and user documentation, and applicable fees.

USER PERMISSIONS

To access the Salesforce Partner Community Publishing Console:

- Manage Listings

Before you submit your solution for security review, make sure that you:

- Receive Salesforce approval of your business plan.
- Have a partner recruitment representative confirm that your solution is enrolled in the AppExchange Partner Program, and that you have a distribution agreement.
- Create your AppExchange solution listing in the Partner Community Publishing Console.
- Configure a Developer Edition test environment with your solution installed. We use the environment to test your solution.
- Certify that your solution is Lightning Ready. All new solutions submitted for security review must be Lightning Ready.

1. Log in to the Salesforce Partner Community.
2. Navigate to your solution listing in the Publishing Console.
   a. Click the **Publishing** tab.
   b. Click your solution's tile and view your business plan summary page.
3. Verify that your business plan is approved.

4. If your plan is approved, click the **App** tab.
5. Provide solution details.
    a. Select the type of solution, either one that only includes a package or one that uses the Salesforce API and doesn't include a package.
    b. If your solution includes a package, link the package to your listing. Click **Select Package**, then find and select the managed package version that you plan to list.

        If you can't find the package to associate with your listing, check that the packaging org is connected to your Partner Community account. You can connect your packaging org to your Partner Community account on the Organizations tab of the Publishing Console.

    c. Indicate how customers install your solution and which Salesforce editions and languages your solution supports.
    d. Optionally identify the features that your solution supports.
    e. If your solution has other requirements, such as browser or operating system versions, enter the details in `Additional Requirements`.
6. Save your changes.
7. To launch the security review wizard, click **Start Review**.

    The wizard guides you through the options and settings that require your input, based on the type of solution that you submit.

8. On Step 4 - Components and Step 5 - Test Environments, specify the components, technologies, and services that your solution requires or optionally include. If your solution connects to external endpoints, list the resources that aren't hosted on the Salesforce platform.
    a. Select the option for an offering including a web application or web service. The offering requires or optionally includes a web application or web service.
    b. Enter the external endpoints information, including login credentials.
9. On Step 8 - Payment, select an option for Pricing of Offering.
    a. If you plan to sell your solution on AppExchange, select **Paid** and enter payment information.
    b. If you plan to distribute your offering for free, select **Free**. We don't charge fees for solutions that are distributed for free on AppExchange.
10. Click **Submit**.

If anything is missing from your submission, the security review team contacts you. When everything is in place, we send you an email confirming that your submission is complete and your solution is in line for a security review. The initial security review of your solution lasts 4–6 weeks. You can expect to receive a report from us soon after the review is completed.

Tip: Schedule a technical office hours appointment right when you receive your confirmation email. Visit the Partner Security Portal and choose a date 4–6 weeks away. If your solution doesn't pass, you have an appointment booked.

Act on Security Review Results

Approximately 4–6 weeks after you submit a solution for an initial review, your security review report arrives in your inbox. Check the report to learn if your solution is or isn't approved. Learn how to request a follow-up review for a solution that isn't approved and how to publicly list an approved solution.

Submit Your Solution for a Follow-Up Review

The security review of your solution is complete, but the Product Security team found security vulnerabilities. Your solution isn't approved for distribution on AppExchange. It's not the result you hoped for, but you're in good company. Most solutions don't pass on the first try. Fix the vulnerabilities, generate updated scan reports, and submit your solution for a follow-up review.

A security review report for a solution that didn't pass lists the types of security vulnerabilities that Product Security found. For each vulnerability type, the report includes:

- A specific example from your solution.
- Steps to reproduce the issue.
- Links to documentation or comments about how to fix the issue.

Our goal is to find as many different types of vulnerabilities as possible, but keep in mind that the security review is a black-box, time-limited process. We can't always list every instance of a security vulnerability, and we may not initially detect all issue types. Interpret the security review findings as representative examples of the types of issues you must fix. Unless otherwise noted in the report, you're required to fix all classes of issues across the entire solution.

We're available to help you analyze the findings and troubleshoot security vulnerabilities. Schedule a technical office hours appointment on the Partner Security Portal.

As you revise your solution, exclusively fix security issues discovered in a previous review, and fix the code in the existing package. If you make other revisions, such as functionality changes, we require that the revised solution go through an initial security review. That's also true if you spin up a new package for the revised code.

Important: If the package ID and namespace don't change, your resubmission qualifies for a follow-up review.

After you fix the solution, collect the materials necessary for us to complete a follow-up review. Rerun the required scanner tools on your revised solution and generate updated scan reports. If you fixed issues in your managed package, provide updated Source Scanner results. If you fixed issues detected on an external endpoint, provide updated ZAP or Chimera scan reports. If applicable, document your responses to false positives on page 161.

For more details about what to submit, see Required Materials for Security Review Submission on page 172.

The process to request a follow-up review depends on the scope of changes.

- **New Package Version**: You fixed code that runs on the Salesforce platform. Create and upload a new version of your managed package to your AppExchange listing. Then start a review for the new version. If you also made changes external to the package, be prepared to provide details about those changes in the security review wizard.
- **External Code or API-Only Solution**: You only changed code that runs externally to Salesforce. Edit your existing security review submission. Provide details about the changes in the security review wizard. Log a security review case so that Product Security knows you're resubmitting your solution.

SEE ALSO:

Document Your Responses to False Positives

Required Materials for Security Review Submission

Request a Follow-Up Review for a New Package Version

USER PERMISSIONS

To access the Salesforce Partner Community Publishing Console:

- Manage Listings

To fix security vulnerabilities discovered in a previous review, you changed code that runs on the Salesforce platform. Upload a new version of your managed package to your AppExchange listing and request a follow-up review. If you also made changes external to the package, provide details of those changes when prompted in the security review wizard.

1. Log in to the Salesforce Partner Community.
2. Click the **Publishing** tab.
3. Click your solution's tile.
4. Click **Select Package**, then find and select the new managed package version.
5. Upload the new version of your managed package to your listing.
6. To launch the security review wizard, click **Start Review**.

   The wizard guides you through the options and settings that require your input. Update information as needed.

7. On Step 8 - Payment of the wizard, if you're resubmitting a paid solution, your stored payment information displays in the wizard. A limited number of follow-up reviews are included in the security review fee paid with your initial submission. If you're within the limit, you aren't charged for the follow-up review. If you have questions about security review fees, contact your Partner Account Manager.
8. Save your changes.

If anything is missing from your submission, the security review team contacts you. Once everything is in place, we send you an email confirming that your solution is queued for review. A follow-up review lasts 2–3 weeks. You can expect to receive a report from us soon after the review is completed.

Request a Follow-Up Review for External Code or an API-Only Solution

USER PERMISSIONS

To access the Salesforce Partner Community Publishing Console:

- Manage Listings

To fix security issues discovered in a previous review, you only changed code that runs externally to Salesforce or you changed an API-only solution. To request a follow-up review, edit your existing security review submission and log a case in the Salesforce Partner Community.

1. Log in to the Salesforce Partner Community.
2. Click the **Publishing** tab.
3. To request a follow-up review for external code:
   a. Click the **Packages** tab.
   b. Find the solution version that you want to submit.
4. To request a follow-up review for an API-only solution:
   a. Click the **Listings** tab.
   b. Click the **App** tab.
5. To launch the security review wizard, click **Submitted**.

   The wizard guides you through the options and settings that require your input. Update information as needed.

6. On Step 8 - Payment of the wizard, if you're resubmitting a paid solution, your stored payment information displays in the wizard. A limited number of follow-up reviews are included in the security review fee paid with your initial submission. If you're within the limit, you aren't charged for the follow-up review. If you have questions about reviews limits and security review fees, contact your Partner Account Manager.
7. Click **Submit**.

8. Log a security review case in the Salesforce Partner Community. Logging a case lets Product Security know that you're resubmitting your solution. Include your package name, ID, and version in the comments.

If anything is missing from your submission, the security review team contacts you on the open case. Once everything is in place, we send you an email confirming that your solution is queued for review. A follow-up review lasts 2–3 weeks. You can expect to receive a report from us soon after the review is completed.

List Your Solution on AppExchange

USER PERMISSIONS

To access the Publishing Console:

- Manage Listings

Your security review is complete and your solution passed. Congratulations! Publicly list and distribute your solution on AppExchange.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Listings**.
4. Click your solution's tile and edit your listing as needed.
5. Click **Publish Listing**.
6. To confirm, click **Publish Listing** again.

Salesforce validates that your listing is ready to publish. For example, we check that you uploaded a tile image and that your solution passed the security review. After successful validation, your listing is published and visible to anyone visiting AppExchange.

SEE ALSO:

How to Build a Perfect AppExchange Listing

Create or Edit an AppExchange Listing

Periodic Reviews

We conduct periodic reviews for all solutions listed on AppExchange. Periodic reviews ensure that solutions continue to safeguard against the latest security vulnerabilities.

When you upgrade a managed package version of a solution that passed security review, you don't have to go through the full review process again. Submit the upgrade for review and it's automatically approved. You can immediately associate the new version to your AppExchange listing.

The automated review isn't the only security review of your upgraded solution. 6 months to 2 years after the solution is listed, we review the new version. This periodic review includes automated and manual tests. The actual timing depends on the potential risk of the solution.

To determine which listed solutions are due for review, we run risk-factor reports. If your solution shows significant change, it's likely that we conduct a periodic review. When the time comes, we contact you to make arrangements. We also reserve the right to conduct random security penetration tests on your solution throughout the year.

There's no additional cost for periodic reviews. These reviews are included in the security review fee paid at original submission of your solution.

If we find that your solution no longer meets our enterprise security standards, we notify you and provide a timeline to remedy the issues. In extreme cases, we pull the AppExchange listing from public viewing. Before you can relist it for distribution, you must fix the security issues and submit it for a follow-up review.

Email Notifications

Installation Notification Emails

Salesforce emails your subscribers 30 days after they install your app or component. The email thanks subscribers and encourages them to share their experiences with others by writing a review. We only send emails when:

- The subscriber has a valid email address.
- The subscriber hasn't already received a notification.
- The subscriber hasn't yet posted a review.

Review Notification Emails

When subscribers post reviews and comments on your listings, Salesforce emails parties who are likely to be interested. The notification that subscribers receive depends on their role in the conversation (provider, author, or commenter).

Type of Email Notification	Sent to	Details
New Review on Your Listing	You, the provider	Sent whenever someone posts a review of your listing.
New Comment on Your Review	The review author	Sent only if someone other than the review author comments on the review and if the author has opted to receive email notifications on their profile. If the author replies to the notification, the reply is posted as a new comment on the review.
Also Commented on the Review	The people who commented on the review	Sent to people who have commented on a review, are not the review author or the author of this comment, and have opted to receive email notifications on their profiles. At most, one email notification is sent to each commenter for each new comment. If the person replies to the notification, the reply is posted as a new comment on the review.
New Comment on the Review of Your Listing	You, the provider	Sent whenever someone writes a new comment on a review of your listing.

Work with AppExchange Leads

When a customer interacts with your listing, the AppExchange collects contact information that can be delivered to you as a lead.

You can collect leads when a customer:

- Installs your app or component
- Takes a test drive
- Watches a demo or video
- Signs up for a free trial
- Clicks the **Learn More** link

Before you enable lead collection on a listing, make sure that you've set up Web-to-Lead in the organization where you want to receive leads.

AppExchange Leads FAQ

This section contains a list of frequently asked questions about AppExchange Leads.

How do I receive leads from the AppExchange?

To receive leads from the AppExchange, edit your AppExchange listing and click the **Leads** tab. Specify the actions you want to receive leads for and to which Salesforce organization to send the leads. This organization must have Web-to-Lead enabled and be a standard Salesforce organization, not a Developer Edition organization. We recommend using your partner business org so that you can manage leads and licenses from a single, convenient location.

Can I choose to receive leads for one listing but not others?

Yes, you can enable lead collection for one listing but not others. Lead collection is enabled on a per listing basis. If you don't want to collect leads for a particular listing, don't choose that option in the publishing console.

How will I know this lead came from the AppExchange?

The lead source codes give you information about how the lead was created and can help you determine how to proceed. The lead source code always takes the form of `SFDC-XX|Listing Name` or `SFDC-dup-XX|Listing Name`. If the source code contains `-dup-`, AppExchange already sent you a lead for this user, listing, or action within the last 180 days. The `XX` identifies the action the user took to generate the lead.

Can Salesforce de-duplicate leads before they are sent to me?

A majority of the partners we polled requested that we send them all the leads. We designate duplicate AppExchange leads as follows: `SFDC-dup-XX|Listing Name`.

If the source code contains `-dup-`, then AppExchange already sent you a lead for this user, listing, or action within the last 180 days. For example, `SFDC-dup-DM|VerticalResponse for AppExchange` indicates a duplicate lead from a user who clicked to view the demo video on the VerticalResponse for AppExchange listing.

What do the lead source codes from my listing mean?

The lead source codes give you information about how the lead was created and can help you determine how to proceed. The lead source code always takes the form of `SFDC-XX|Listing Name` or `SFDC-dup-XX|Listing Name`. If the source code contains `-dup-`, AppExchange already sent you a lead for this user, listing, or action within the last 180 days. The `XX` identifies the action the user took to generate the lead.

Here's a table of the action codes and what they mean.

Lead Source Code	Description
IN	The user started the install process for your app or component by clicking **Get It Now** on your listing, agreeing to the terms and conditions, and clicking the install button on the confirmation page. The user might not have completed the installation or might have uninstalled the app or component. Use the License Management Application (LMA) to track who has the package installed.
DM	The user watched some or all of your demo.
LM	The user clicked **Learn More** on your listing. Note: Listings that previously had Learn More buttons now have Get It Now buttons and receive lead source codes with IN actions.
TS	The user clicked **Get It Now** on your listing and chose to start a new 30-day free trial of Salesforce and your app or component. These users might be preexisting Salesforce customers.
TD	The user took your test drive by clicking **Test Drive** on your listing.

How can I see more information in the lead record?

At this time, providers can’t modify the lead form that customers are asked to fill out when they view a demo, access the test drive, install an app, or click to Learn More. Please indicate any improvements you wish to see on the IdeaExchange.

What’s the difference between the leads and license records my listing generates?

Leads and license records are generated by specific actions that a customer takes on your listing. If you’ve set up Web-to-Lead and enabled lead collection on your listing, leads are generated when a customer does any of the following: views a video or demo, clicks **Learn More**, takes a test drive, or installs your app or component. By contrast, license records are generated only when a customer installs your app or component. You must also have the License Management App enabled in your partner business org to receive licenses.

What happens to my listing if I chose not to receive AppExchange leads?

If you don’t select a scenario for collecting leads, customers aren’t prompted to fill out the lead sign-up form, and no leads are sent. Regardless of the lead settings, customers can still view the demo, take a test drive, click the **Learn More** link, and install your app or component.

Analytics Reports for Publishers

AppExchange analytics reports are powerful visual tools for understanding how your app, component, or consulting partner listing is performing. These reports provide metrics related to the web traffic, number of installations, and other user activities over time. By looking at the reports, you can quickly gain insights about the aspects of your listing that resonate with customers and which areas need refinement.

- To access a report for your listing, open the Publishing page in the Partner Community, and then click the **Analytics** tab.

Report Types

For app and component listings, the available reports are:

- Installs (Get It Now)
- Leads
- Resources & Promotions
- Test Drives, Demos & Screenshots
- Web Analytics

For a consulting partner listing, the available reports are:

- Leads
- Learn Mores, Videos & Screenshots
- Web Analytics

Report Attributes

All the reports share these common attributes.

Listing Name
The title of the listing shown at the top of every report.

Back to Publishing Home link
Returns you to the Publishing Home page.

Show Menu
Allows you to choose from one of the available reports. The reports are sorted alphabetically.

Date Range Menu
Allows you to choose the date range. Last 30 Days is selected by default.

Metrics

Report	Metrics
Installs (Get It Now)	Get it Now, Installs, Click-to-Install Ratio
Leads	Unique Leads, Duplicate Leads, Total Leads
Resources & Promotions	Case Studies, Data Sheets, Promotions, Customer Testimonials, Webinars, Customization Guides, Whitepapers
Test Drives, Demos & Screenshots	Test Drives, Demos, Screenshots

Report	Metrics
Learn Mores, Videos & Screenshots	Learn Mores, Videos, Screenshots
Web Analytics	Page Views, SEO Searches, Visits, Internal Searches, Unique Visitors

Line Graph

Shows one or more lines for each metric you've selected for display. Select the checkboxes beneath the graph for the metrics you want to see. By default, all metrics are included in the graph. The reports show metrics over time grouped by created date. When you click the graph, the date and selected metrics for that date display. Next to each metric, the number of items in the metric over the selected date range displays regardless of whether you have chosen to include the graph of that metric.

Table

Each report includes a table. The first column on all reports is the Date, and the rest of the columns correspond to the metrics associated with the report. The table shows 30 rows at a time. Click **Next** to see more data. By default, the table is sorted by date from oldest to newest. Change the sort order by clicking the column headers. Clicking the selected sort column a second time sorts the data in the opposite direction. The small triangle pointing up or down next to a column header indicates the sort direction and marks that column as the sort column.

Update the Package in an AppExchange Listing

If you add features to a published solution, update your AppExchange listing so that new customers get access to the latest version. You can only associate an approved package version with your public listing. If your solution passed the security review within the last year, the new version is auto-approved. The package version must share the same namespace as the version that passed the review.

Note: If the last security review was completed more than a year ago, the security review team may contact you to arrange a new review. Until then, you can continue to list the newer version.

1. Upload the new version of your package to the AppExchange.
2. Log in to the Salesforce Partner Community.
3. On the Publishing page, click the **Packages** tab. If you developed the new package in the same organization as the previous version, the new package displays automatically. If you developed it in a different organization, first connect the organization that contains the new package on the **Organizations** tab.
4. Find the new package, and then click **Start Review**.
5. Fill out the self-evaluation questionnaire and click **Submit**. If your solution passed the security review within the last year, the new package is auto-approved, and its status changes to Passed. The status change can take up to 24 hours.
6. After your solution is approved, navigate to the Listings tab and select the listing that you want to edit. The AppExchange publishing console opens.
7. To update an app, click the **App** tab. To update a component, click the **Component** tab.
8. Click **Select Package**, and then find the new package you want to associate with the listing.
9. Save your changes.

AppExchange FAQ

The following is a list of frequently asked questions about selling on the AppExchange.

- Can I add more industries?

- Do I need an APO to publish my app or component on the AppExchange?
- Can I change my company name?
- Can I create my app or component on a Salesforce sandbox and upload it to the AppExchange?
- Can I edit a review?
- Can I keep the same listing but change the package it provides?
- Can I Update My Solution with a New Version or Patch?
- How Do Customers Find My Listing?
- How do I edit a package after I've created a listing?
- How do I get an API token for my app?
- How do I increase my listing's popularity?
- How do I offer a free trial of my app or component?
- How do I see listings that Salesforce removed?
- How do I upgrade my customers to a new version?
- What's the difference between a free trial and test drive?
- Where can I share my ideas?
- Where can I write a review?

Can I add more industries?

No. To prevent abuse, you can only specify two industries for each listing. If you cover more industries, mention them in the full or brief description of your listing.

Do I need an APO to publish my app or component on the AppExchange?

No, you no longer need an AppExchange Publishing Organization (APO) to publish your app or component on the AppExchange. You can now connect the organization where you developed the app or component directly to the AppExchange publishing console. To connect an organization, open the Publishing page in the Partner Community, and click the **Organizations** tab. Before connecting an organization, make sure that you have the "Manage Listings" permission in the Partner Community.

Can I change my company name?

Yes, you can change your company name and other aspects of your company profile. Open the Publishing page in the Partner Community, and navigate to the **Company Info** tab. You can change the company name, upload a logo, and modify other details on your company profile.

Can I create my app or component on a Salesforce sandbox and upload it to the AppExchange?

No. You can use a sandbox to install and test your app or component, but you must create and upload it using a Developer edition organization.

Can I edit a review?

You can edit reviews that you authored. You can comment on reviews that you did not write.

Can I keep the same listing but change the package it provides?

Yes, you can change the packages that are linked to your listing. First, make sure that you've uploaded the new package and, if the listing is public, that the package has passed the security review.

On the Publishing page in the Partner Community, navigate to the **Packages** tab and find the package associated with the listing that you want to update. Click **Edit Listing** to open the publishing console. If you're updating an app, you can add a package on the **App** tab. If you're updating a component, add it on the **Component** tab.

Can I Update My Solution with a New Version or Patch?

Yes, but you must submit the new package for an AppExchange Security Review and register the package with your License Management App (LMA).

How Do Customers Find My Listing?

Customers can find your app, component, or consulting service in several ways. On the AppExchange, they can search using keywords or browse using categories. They can also find your listing via an external search provider, such as Google. Knowing how your listing is ranked in each of these scenarios helps you get the most visibility with potential customers.

- Most of the time, people look for apps, components, and consulting services by searching for a term (keyword) on the AppExchange home page. The AppExchange returns matching results and sorts them based on keyword relevance. Here are some tips on how this works.
  - If you include a keyword anywhere in your listing, your listing appears in the search results for that keyword.
  - Generally, a keyword's relevance is increased by appearing earlier in the listing.
  - Generally, a keyword's relevance is increased by appearing more than once in the listing. Note that listing a keyword multiple times in a row does not improve the listing's ranking.
  - When two or more keywords are searched, only listings with all keywords in the same order are returned. In addition, searches for multiple keywords also match camel-cased words (for example, a search for "Great App" matches "GreatApp").
  - Listings at the top of a search are the most relevant from both a keyword and popularity perspective.
- When people look for apps, components, or consulting services by browsing categories, the listings in a category are sorted based on popularity during the past 30 days. Popularity is based on the actions customers can take, such as installing an app or component, taking a test drive, watching a demo or other resources, and clicking the **Learn More** link. Activities that show greater commitment, such as installing an app or component, are weighted more heavily than activities showing less commitment, such as clicking screenshots. The number of reviews and the average rating on a listing do not contribute to the popularity of the listing.
- People can also sort results by rating, release date, name, or provider name. Search results ranked by rating are sorted first by the number of stars and then by the number of reviews. For example, a listing with 1 review and five stars is ranked above a listing with 20 four-star reviews.
- Because the AppExchange is a public website, search engines index your listing pages and return them in their search results. To improve your ranking with external search providers, make sure that you cross reference your listing URL on your website, blog, Facebook, and Twitter pages.

How do I edit a package after I've created a listing?

Log in to the Partner Community and navigate to the AppExchange Publishing page. Click the **Packages** tab to view a list of all packages uploaded to the AppExchange. From this list you can:

- Search for a package by keyword.

- Select **Unlisted Packages** from the drop-down list to see only the packages that haven't yet been linked to a listing.
- Click **Start Review** to begin the security review process.
- For a listed package, click **Edit Listing** to edit listing details, such as pricing information, banners, and logos.
- For an app or component in a managed package, click **Manage Licenses** to update the license settings for this package version, such as whether your offering is free or for sale, if and when it expires, and how many people in the installer's organization can access it.

How do I get an API token for my app?

You can request an API token for your app after it passes the AppExchange security review. To request a token, log a case in the Partner Community under the **AppExchange and Feature Requests** > **API Token Request** category. Specify the type of token (SOAP) and if you're using OAuth.

Note: This feature is available to eligible partners. For more information on the Partner Program, including eligibility requirements, visit www.salesforce.com/partners.

How do I increase my listing's popularity?

Popularity is based on customer activity. The AppExchange measures everything users do on your listing: install, learn more, test drive, demo, view screenshots, white papers, or data sheets, and more. The AppExchange weighs the activity according to its level of importance as indications of interest and filters out attempts to abuse the system.

The AppExchange recalculates popularity daily and then summarizes and evaluates results over 30 days. When you browse by category, you see listings sorted by their relative popularity over the past 30 days.

How customers have reviewed or rated the listing does not affect popularity. AppExchange visitors can sort by rating if they're interested.

Here are a few hints on improving rankings.

- Include a test drive. People like being able to try out an app or component. The number of test drives influences popularity. You also get the added benefit of being able to collect leads.
- Add images. One of the first things that visitors do is click the **View Screenshots** button. Many people don't even look at a listing that doesn't have screenshots.
- Add resources that demonstrate how your app or component affects the customer's bottom line. For example, if you have research showing that a component helps support representatives resolve cases faster, include that information in a data sheet.
- Be up front with your pricing. If you don't include pricing on your listing, people become disinterested quickly.

How do I offer a free trial of my app or component?

When you're creating or editing a listing, the **Trials** tab asks whether you want to offer a free trial or test drive. A free trial lets customers try your app in an interactive organization that you've customized. A test drive lets customers try a read-only version of your app without logging in to Salesforce. For more information, see Provide a Free Trial of Your Solution on page 312.

How do I see listings that Salesforce removed?

The AppExchange doesn't allow you to view listings that Salesforce removed. However, you can view private listings, which can include listings removed by Salesforce, usually because of problems discovered during the periodic security review. To view your private listings, on the Publishing page, navigate to the **Listings** tab. Click **Private Listings** from the drop-down list.

How do I upgrade my customers to a new version?

Create a new version of your managed package and upload it in the released state. After you upload, you can share the Install URL with your existing customers so that they can upgrade. If you're deploying only a bug fix to your customers and want to upgrade them automatically, see "Scheduling Push Upgrades" in the Salesforce online help. You can use the License Management App (LMA) to find out which customers need to upgrade.

Customers can also check whether an upgrade is available by logging in to the AppExchange and viewing the My Account page. If a new version of the app or component is available, it appears on this page.

What's the difference between a free trial and test drive?

When you're creating or editing a listing, the **Trials** tab asks whether you want to offer a free trial of Salesforce and your app or component. The free trial is a non-production Salesforce organization that includes your package and sample data. If a customer chooses to purchase the app or component instead of letting the trial expire, the organization becomes a production version. We recommend that you write a data cleanup script and include a button in your app or component that gives customers the option to remove sample data.

You can also choose to offer a test drive, which is a read-only version of your app or component that all customers taking the test drive log in to. Like a free trial, a test drive uses Developer Edition organizations that include sample data and whatever configuration options you choose.

Where can I share my ideas?

You can share your ideas on how to improve the AppExchange or Salesforce partner programs in the Collaboration section of the Partner Community. These ideas are only seen by Salesforce and other partners. To share ideas more publicly, please post them on the IdeaExchange.

Where can I write a review?

On the listing page, click the number of reviews or **Write the first**. If there are already reviews, you are directed to the review page where you can click **Write a review**. Each user can write only one review per listing.

Important: You cannot write a review for your own listing. Please review the Terms of Use for AppExchange for additional legal information.

Can I have multiple listings for an app or component?

No, you can associate an app or component with only one listing. In addition, you can't duplicate a package (or create a new package version) just to list the app or component in a new listing. This behavior is to your advantage, because it's easier for you to maintain and upgrade the app or component over its lifecycle. It also helps your listing achieve a higher ranking in the AppExchange, because the metrics that Salesforce uses to rank apps and components, like page views, aren't diluted across multiple listings.

CHAPTER 8 Sell on AppExchange with Checkout

In this chapter ...

Bring a modern online shopping experience to your AppExchange listing with Checkout. Transform your Checkout data into insights and actions with the Checkout Management App (CMA).

AppExchange Checkout

Checkout is AppExchange's integrated payments platform. With Checkout, customers can buy your AppExchange solution directly from your listing with a credit card or bank payment. Checkout is also ready to use with the License Management App (LMA) and the Checkout Management App (CMA).

Note: AppExchange Checkout is available in English only to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

Here's how Checkout makes it easier to sell a solution on AppExchange.

You're interested in:	Checkout:
A modern and flexible payment experience.	Is built on Stripe, the industry leader in online payments. You can accept credit cards, bank payments, or both. You can also offer coupons, trials, and collect value-added tax (VAT).
Automated licensing for your solution.	Is ready to use with the License Management App. When a customer purchases your solution using Checkout, a license record is automatically provisioned in the LMA. If a customer upgrades, renews, or cancels their subscription, Checkout updates the license.
Insights about your customers.	Is ready to use with the Checkout Management App. The CMA brings the power of Salesforce CRM to Checkout. Use the CMA's dashboards to explore revenue, subscription status, and other key data. Send customizable notifications to customers and team members for trial expirations, declined payments, and other events.

Tip: Just getting started with Checkout? Head to Trailhead and earn the AppExchange Checkout badge.

How Is Revenue Shared in AppExchange Checkout?

The revenue that you share with Salesforce depends on the payment type. If the customer pays with a bank transfer, the revenue share is 15%. If the customer pays with a credit card, the revenue share is 15%, plus a 30 cents per transaction fee charged by our payment partner, Stripe. Regardless of the payment type, there's no minimum revenue share. We also don't charge setup fees, monthly service charges, or card storage fees.

Payment Plans in AppExchange Checkout

Checkout supports two types of payment plans: one-time and subscription. For either type of plan, you can charge customers on a per user or per company basis. If you charge on a per user basis, your customer buys an individual license for every user in their org who uses your solution. If you charge on a per company basis, your customer buys an org-wide license. An org-wide license means that every user in their org can use your solution. To provide customers with flexible payment options, you can combine multiple plans on your listing.

Payment Methods in AppExchange Checkout

Checkout supports two payment methods: credit cards and bank account transfers. You can accept one or both payment methods on your listing.

Get Started with AppExchange Checkout

To begin accepting payments with Checkout, first create a Stripe account. If you plan to offer a subscription for your solution, configure a product and pricing plan in Stripe. Then, enable Checkout on your AppExchange listing and choose payment plans and methods.

Support International Payments in AppExchange Checkout

In a few steps, you can get Checkout ready to accept payments from customers in the European Union (EU) and other regions. First, verify that your company is based in a country that's supported by our payment partner, Stripe. Then, if your country's tax authority requires you to collect Value Added Tax (VAT), enable VAT in the Publishing Console.

Manage AppExchange Checkout Subscriptions

Handle common customer requests related to Checkout subscriptions, such as viewing payment history, adding or removing licenses, and canceling subscriptions.

AppExchange Checkout FAQs

Find answers to common questions about Checkout.

AppExchange Checkout Considerations

Keep these considerations in mind when using Checkout.

How Is Revenue Shared in AppExchange Checkout?

The revenue that you share with Salesforce depends on the payment type. If the customer pays with a bank transfer, the revenue share is 15%. If the customer pays with a credit card, the revenue share is 15%, plus a 30 cents per transaction fee charged by our payment partner, Stripe. Regardless of the payment type, there's no minimum revenue share. We also don't charge setup fees, monthly service charges, or card storage fees.

To see how revenue sharing works, let's look at some examples.

Payment Type	Example
Bank transfer	You sell an app for $50 per user per month. If a customer buys 10 licenses with a bank transfer, here's how revenue is shared. • The overall transaction amount is $500 per month ($50 per user per month x 10 users). • The amount shared with Salesforce is $75 per month (15% x $500 per month).
Credit card	You sell an app for $1,000 per user per year. If a customer buys 5 licenses with a credit card, here's how revenue is shared. • The overall transaction amount is $5,000 per year ($1,000 per user per year x 5 users). • The amount shared with Salesforce is $750.00 per year (15% x $5,000 per year). • The amount shared with Stripe is $0.30 (1 credit card transaction x 30 cents per transaction fee).

Payment Plans in AppExchange Checkout

Checkout supports two types of payment plans: one-time and subscription. For either type of plan, you can charge customers on a per user or per company basis. If you charge on a per user basis, your customer buys an individual license for every user in their org who uses your solution. If you charge on a per company basis, your customer buys an org-wide license. An org-wide license means that every user in their org can use your solution. To provide customers with flexible payment options, you can combine multiple plans on your listing.

Here's a breakdown of the payment plans that you can offer.

Plan	Pricing Options	Customer is billed:	Set up the plan in:
One-time	• Per User • Per Company	Once, at the time of purchase	The Publishing Console on the Salesforce Partner Community
Subscription	• Per User • Per Company	On a recurring basis, either monthly or annually	The Stripe dashboard

To provide customers with the most flexibility, we recommend offering several payment options on a listing.

Payment Methods in AppExchange Checkout

Checkout supports two payment methods: credit cards and bank account transfers. You can accept one or both payment methods on your listing.

Payment Method	Customers pay with:	Notes
Credit card	Visa, MasterCard, American Express, JCB, Discover, or Diners Club credit cards.	Payments are processed immediately.
US bank account	Checking, savings, or money market accounts from banks based in the United States. Payments are processed using the Automated Clearing House (ACH) network.	• Payments can take up to 5 days to process. • Your pricing plan in Stripe must be in US dollars (USD). • Customers must pay with a business bank account. Checkout doesn't support ACH payments from personal bank accounts. • Customers must have a US billing address.
European bank account	Checking, savings, or money market accounts from banks based in the European Union. Payments are processed using the Single Euro Payment Area (SEPA) framework.	• Payments are processed immediately. • Your pricing plan in Stripe must be in euros (EUR). • Customers must have an EU billing address.

Note: Your business address in Stripe determines the type of bank transfers that you can accept. To accept ACH payments, your company must be based in the United States. To accept SEPA payments, your company must be based in the European Union. You can't accept both ACH and SEPA payments.

Get Started with AppExchange Checkout

To begin accepting payments with Checkout, first create a Stripe account. If you plan to offer a subscription for your solution, configure a product and pricing plan in Stripe. Then, enable Checkout on your AppExchange listing and choose payment plans and methods.

Create a Stripe Account for AppExchange Checkout

Before you enable Checkout on a listing, create an account with our payment partner, Stripe.

Create a Stripe Product and Pricing Plan for AppExchange Checkout

To offer a subscription of your solution in Checkout, first create a product and pricing plan in your Stripe dashboard. A product represents the solution or service that you sell. A pricing plan sets the product's cost, currency, and billing frequency.

Activate Bank Payments for AppExchange Checkout

To let customers pay for your solution with a bank transfer, request this payment method in Stripe. After Stripe reviews and approves your request, you're eligible to receive bank payments. Depending on your location, you can accept payments through the Automated Clearing House (ACH) network or the Single Euro Payment Area (SEPA) framework.

Enable Checkout on an AppExchange Listing

After you create a Stripe account and set up pricing plans for your solution, you can enable Checkout on an AppExchange listing. When you enable Checkout, you choose the payment plans and methods that you support.

Send Email Receipts for AppExchange Checkout Purchases

To send customers receipts for Checkout purchases, set up email receipts in your Stripe dashboard.

Preview the AppExchange Checkout Experience

If you've enabled Checkout on your listing, you can preview the customer purchase experience by modifying the AppExchange listing URL.

Convert a Free Listing to Use AppExchange Checkout

If the solution associated with your free AppExchange listing passed security review, you can convert the listing to accept payments using Checkout. First, enable Checkout for the listing in the Publishing Console. Then, log a case in the Partner Community to pay the security review fee. The fee is waived for free listings, but is collected when you charge for your solution.

Create a Stripe Account for AppExchange Checkout

USER PERMISSIONS

To manage AppExchange listings:

- Manage Listings

Before you enable Checkout on a listing, create an account with our payment partner, Stripe.

Before you create your account, have the following information available.

- A short description of your business, such as the products you sell
- Basic information about your business, like its physical address
- Login information for an external identity provider, such as Google, Facebook, or LinkedIn
- Account and routing numbers for the bank account where you want to receive payments

After you've gathered this information, you're ready to go.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Create a listing or edit an existing one.
4. On the Pricing tab, select **Paid, Using Checkout**.
5. Click **Set Up Stripe**.
6. Complete your Stripe account application and submit. If you already have a Stripe account, sign in instead.

After you create the account, you can manage it on the Stripe website. To learn more about Stripe, go to https://stripe.com/docs/dashboard.

Create a Stripe Product and Pricing Plan for AppExchange Checkout

To offer a subscription of your solution in Checkout, first create a product and pricing plan in your Stripe dashboard. A product represents the solution or service that you sell. A pricing plan sets the product's cost, currency, and billing frequency.

You can create multiple pricing plans for your product. For example, you can create one plan that uses monthly billing and another plan that uses annual billing.

1. Log in to Stripe.
2. From your Stripe dashboard, click **Billing** > **Products**.
3. Click **New**.
4. Provide a name for your product, and then click **Create product**.
5. If prompted, enter your Stripe password, and then click **Authenticate**.
6. Provide a nickname for your plan.

   Tip: Include the billing frequency, such as *Annual*, in your plan's nickname.

7. Select a currency.

   Note: To let customers pay with US bank accounts, use US dollars (USD) for the plan. To let customers pay with European bank accounts, use euros (EUR) for the plan.

8. Set a unit price.

   In the Publishing Console, you specify whether to apply this unit price per user or per company (org-wide).

9. Specify a monthly or yearly billing interval.
10. Click **Add pricing plan**.

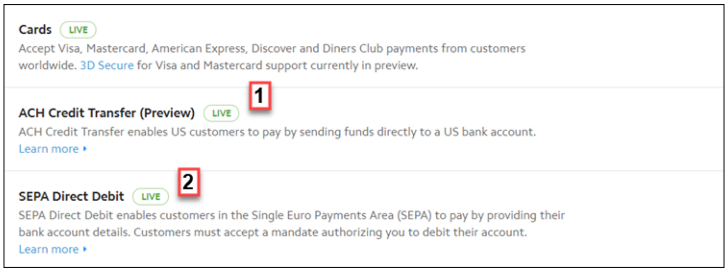
If you've connected your Stripe account to the Publishing Console, your pricing plans are ready to add to your listing.

Activate Bank Payments for AppExchange Checkout

To let customers pay for your solution with a bank transfer, request this payment method in Stripe. After Stripe reviews and approves your request, you're eligible to receive bank payments. Depending on your location, you can accept payments through the Automated Clearing House (ACH) network or the Single Euro Payment Area (SEPA) framework.

Note: Your business address in Stripe determines the type of bank transfers that you can accept. To accept ACH payments, your company must be based in the United States. To accept SEPA payments, your company must be based in the European Union. You can't accept both ACH and SEPA payments.

1. Go to the Stripe website.
2. Log in to your Stripe account.
3. Click **Settings**.
4. Under Payments and Payouts, click **Payment methods**.
5. Request ACH Credit Transfer (1) or SEPA Direct Debit (2) for your account.



Cards LIVE

Accept Visa, Mastercard, American Express, Discover and Diners Club payments from customers worldwide. 3D Secure for Visa and Mastercard support currently in preview.

ACH Credit Transfer (Preview) LIVE

ACH Credit Transfer enables US customers to pay by sending funds directly to a US bank account.

Learn more ▸

SEPA Direct Debit LIVE

SEPA Direct Debit enables customers in the Single Euro Payments Area (SEPA) to pay by providing their bank account details. Customers must accept a mandate authorizing you to debit their account.

Learn more ▸

Your activation request is sent to Stripe for processing. You receive an email when your request is approved.

6. If you requested ACH Credit Transfer, verify that the activation succeeded.
   a. Go to the Stripe website again.
   b. Log in to your Stripe account.
   c. Go to Stripe's ACH Guide.
   d. Click **Enable ACH**. If you don't see an option to enable ACH, ACH Credit Transfer is already active for your account.

Enable Checkout on an AppExchange Listing

After you create a Stripe account and set up pricing plans for your solution, you can enable Checkout on an AppExchange listing. When you enable Checkout, you choose the payment plans and methods that you support.

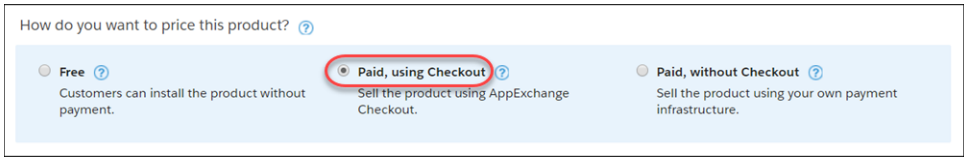
Before you enable Checkout on a listing, verify that Salesforce approved your business plan.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Create a listing, or edit an existing one.
4. On the Pricing tab, select **Paid, using Checkout**.

USER PERMISSIONS

To manage AppExchange listings:

- Manage Listings



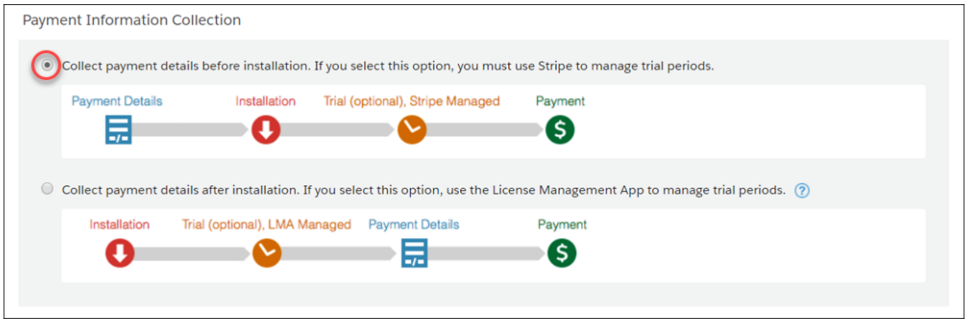
How do you want to price this product?

○ Free
Customers can install the product without payment.

● Paid, using Checkout
Sell the product using AppExchange Checkout.

○ Paid, without Checkout
Sell the product using your own payment infrastructure.

5. Select when to collect payment details from the customer.

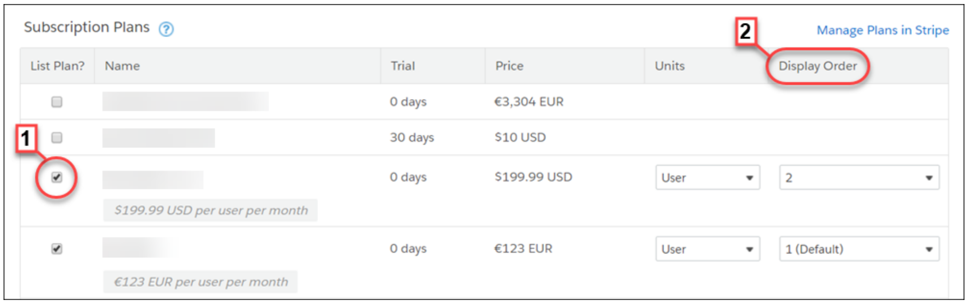


Payment Information Collection

● Collect payment details before installation. If you select this option, you must use Stripe to manage trial periods.

○ Collect payment details after installation. If you select this option, use the License Management App to manage trial periods.

6. Select payment plans (1) and adjust the display order (2).



Subscription Plans ?

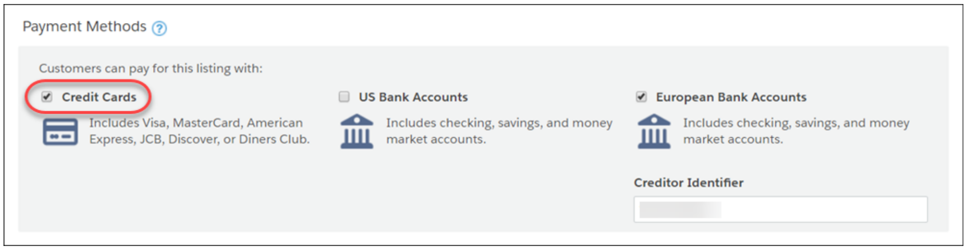
Manage Plans in Stripe

List Plan?	Name	Trial	Price	Units	Display Order
☐		0 days	€3,304 EUR		
☐		30 days	$10 USD		
☑	 $199.99 USD per user per month	0 days	$199.99 USD	User	2
☑	 €123 EUR per user per month	0 days	€123 EUR	User	1 (Default)

Tip: You can offer multiple payment plans on a listing. For example, you can offer a one-time payment option and a monthly subscription.

Payment Plan	Steps
Subscription	**a.** Select one of the pricing plans that you created in Stripe. **b.** Select company or per-user pricing.
One-time payment	**a.** Click **Add One Time Price Option**. **b.** Provide a name for the plan. **c.** Select a price and currency. **d.** Select company or per-user pricing.

7. Select the payment methods that you accept.



Payment Methods ?

Customers can pay for this listing with:

☑ Credit Cards
Includes Visa, MasterCard, American Express, JCB, Discover, or Diners Club.

☐ US Bank Accounts
Includes checking, savings, and money market accounts.

☑ European Bank Accounts
Includes checking, savings, and money market accounts.

Creditor Identifier

Note: Your billing address in Stripe determines the type of bank payments that you can accept. Before you enable bank payments, verify that you activated ACH Credit Transfer (for US bank accounts) or SEPA Direct Debit (for European bank accounts) in Stripe. You receive an email from Stripe when your account is ready to receive bank payments.

8. Click **Save**.

SEE ALSO:

Create a Stripe Product and Pricing Plan for AppExchange Checkout

Enable Checkout on an AppExchange Listing

Send Email Receipts for AppExchange Checkout Purchases

To send customers receipts for Checkout purchases, set up email receipts in your Stripe dashboard.

1. Log in to Stripe.
2. From your Stripe dashboard, click **Settings**.
3. Under Payments and Payouts, click **Email receipts**.
4. Enable the setting for successful payments.
5. Click **Save**.

Preview the AppExchange Checkout Experience

If you've enabled Checkout on your listing, you can preview the customer purchase experience by modifying the AppExchange listing URL.

1. Go to your solution's AppExchange listing.
2. Append `&modal=appx_getitnow_buyform_modal` to the listing URL, and then refresh the page.

Convert a Free Listing to Use AppExchange Checkout

USER PERMISSIONS

To manage AppExchange listings:

- Manage Listings

If the solution associated with your free AppExchange listing passed security review, you can convert the listing to accept payments using Checkout. First, enable Checkout for the listing in the Publishing Console. Then, log a case in the Partner Community to pay the security review fee. The fee is waived for free listings, but is collected when you charge for your solution.

1. Log in to the Salesforce Partner Community.
2. Enable Checkout for the listing.
   a. Click **Publishing**.
   b. Click **Listings**.
   c. Find the listing you want to update, and then click the tile.
   d. On the Pricing tab, select **Paid, using Checkout** and configure pricing details.
   e. Click **Save**.
3. Log a support case in the Partner Community.
   a. Click **Support**.
   b. Click **New Case**.
   c. For topic, choose Security Review and click **Create a Case**.
   d. In the case description, explain that you're converting a free listing to paid using AppExchange Checkout. Include your listing's URL.

e. Click **Submit Case**.

Salesforce will contact you to arrange for payment of the security review fee.

Support International Payments in AppExchange Checkout

In a few steps, you can get Checkout ready to accept payments from customers in the European Union (EU) and other regions. First, verify that your company is based in a country that's supported by our payment partner, Stripe. Then, if your country's tax authority requires you to collect Value Added Tax (VAT), enable VAT in the Publishing Console.

Verify AppExchange Checkout Is Supported in Your Country
To accept payments with Checkout, your company must be based in a country that's supported by our payment partner, Stripe.

Collect VAT for AppExchange Checkout Transactions
If your country's tax authority requires you to collect Value-Added Tax (VAT), you can include VAT in Checkout transactions. After you enable this option, VAT is applied to invoices in Stripe. You're responsible for VAT registration, maintaining required data, and distributing the taxes that you collect.

Strong Customer Authentication for AppExchange Checkout
Strong customer authentication (SCA) enhances the security of online payments with an identity verification step. Learn how SCA works, which regions require it, and how it affects Checkout payments. Then get your company and customers ready for SCA.

Verify AppExchange Checkout Is Supported in Your Country

To accept payments with Checkout, your company must be based in a country that's supported by our payment partner, Stripe.

1. To see a list of supported countries, go to https://stripe.com/global.
   If your country is listed, you're eligible to use Checkout.
2. If Stripe isn't supported in the country where your company is based, sign up to get notified when it's available.

Collect VAT for AppExchange Checkout Transactions

USER PERMISSIONS

To manage AppExchange listings:
- Manage Listings

If your country's tax authority requires you to collect Value-Added Tax (VAT), you can include VAT in Checkout transactions. After you enable this option, VAT is applied to invoices in Stripe. You're responsible for VAT registration, maintaining required data, and distributing the taxes that you collect.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Company Info**.
4. Select the option to collect VAT on purchases.

   Note: VAT isn't supported for one-time purchases.

5. Enter a VAT number and country. Use the same country that you provided to Stripe in your billing address.
6. Click **Save**.

If you manage Checkout data with the Checkout Management App, you can use the app to view information for VAT reporting.

Strong Customer Authentication for AppExchange Checkout

Strong customer authentication (SCA) enhances the security of online payments with an identity verification step. Learn how SCA works, which regions require it, and how it affects Checkout payments. Then get your company and customers ready for SCA.

What Is Strong Customer Authentication?

Strong customer authentication (SCA) enhances the security of online payments with an identity verification step. SCA is required for online payments in the European Economic Area, including AppExchange Checkout payments.

SCA is mandated by the Second Payment Services Directive (PSD2), which introduces laws to enhance the security of online payments in the European Economic Area. Starting on September 14, 2019, customers who live in this region may be asked to perform an identity verification step to make purchases online.

A customer can verify their identity with a password, a code delivered to a mobile device, or using biometric data, such as a fingerprint. This verification step applies to one-time purchases and recurring payments, such as subscriptions. The customer's bank or credit card issuer determines when to request that the customer authorize the purchase by verifying their identity.

Starting on September 14, 2019, Checkout automatically integrates SCA into the payment experience for European customers. To learn more about SCA, go to https://stripe.com/docs/strong-customer-authentication.

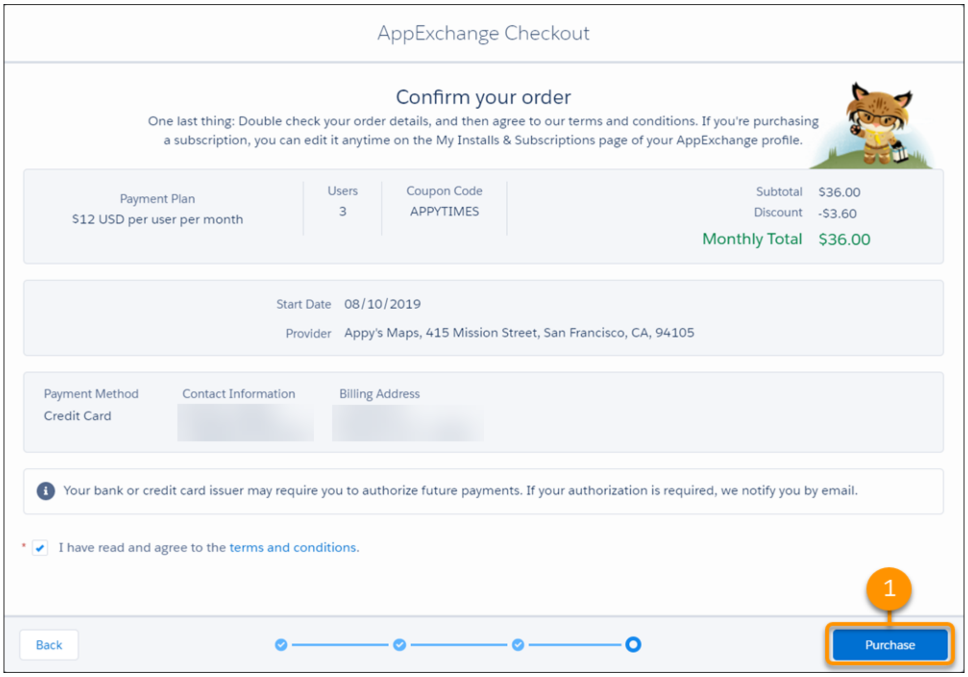
How Strong Customer Authentication Affects AppExchange Checkout

Strong customer authentication (SCA) is automatically integrated into the Checkout payment experience for European customers. Learn how SCA affects the initial purchase and recurring payments.

Initial Purchase

The initial purchase is your customer's first Checkout transaction. In the initial purchase, the customer uses the Checkout wizard to select a payment plan and method, provide billing and contact information, and confirm the payment. In regions that require SCA, the Checkout wizard adds an identity verification step.

After the customer clicks **Purchase** (1), Checkout may prompt the customer to verify their identity. For example, the customer might be asked to enter a verification code that's sent to the mobile device associated with their payment method. This verification step uses the 3D Secure 2 protocol and is managed by Checkout's payment partner, Stripe. After the customer verifies their identity, Stripe processes the payment.



AppExchange Checkout

Confirm your order

One last thing: Double check your order details, and then agree to our terms and conditions. If you're purchasing a subscription, you can edit it anytime on the My Installs & Subscriptions page of your AppExchange profile.

Payment Plan	Users	Coupon Code		
$12 USD per user per month	3	APPYTIMES	Subtotal	$36.00
			Discount	-$3.60
			Monthly Total	$36.00

Start Date 08/10/2019

Provider Appy's Maps, 415 Mission Street, San Francisco, CA, 94105

Payment Method	Contact Information	Billing Address
Credit Card		

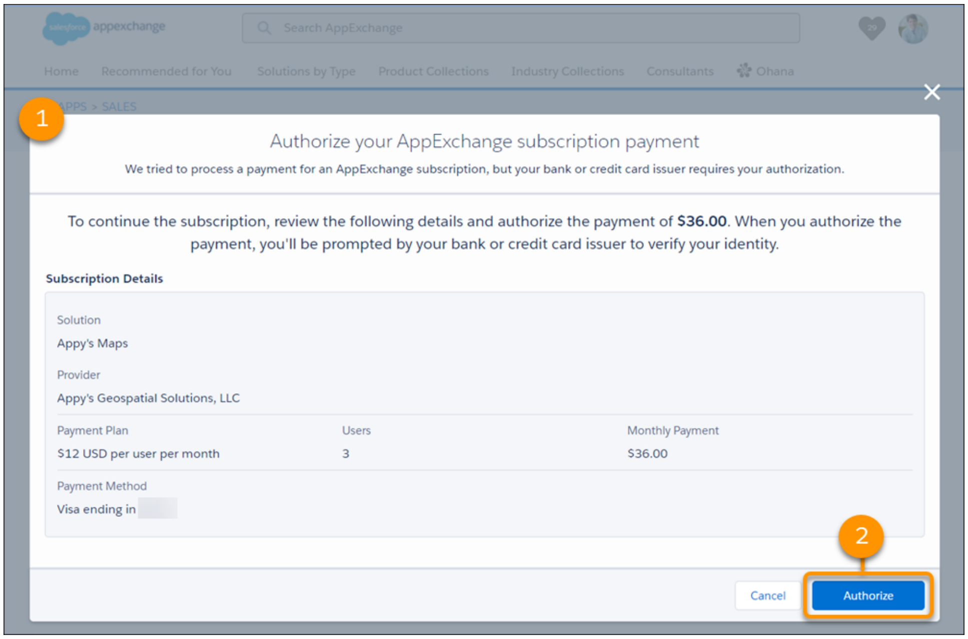
Your bank or credit card issuer may require you to authorize future payments. If your authorization is required, we notify you by email.

* ☑ I have read and agree to the terms and conditions.

Recurring Payments

Customers can also make recurring payments, either monthly or annually. In regions that require SCA, the first payment is the initial purchase, and the customer may be asked to verify their identity to complete the transaction. Checkout attempts to process subsequent payments with the billing details provided in the initial purchase, per the terms and conditions of the subscription. In regions that require SCA, the customer's bank or credit card issuer reviews the payment attempt and determines whether to request customer authorization.

If customer authorization is required, Stripe marks the payment as failed. The next time the customer logs in to AppExchange, Checkout prompts the customer to authorize the payment (1). After the customer clicks **Authorize** (2), the customer verifies their identity using the same process as the initial purchase. After the customer verifies their identity, Stripe processes the payment.



Authorize your AppExchange subscription payment

We tried to process a payment for an AppExchange subscription, but your bank or credit card issuer requires your authorization.

To continue the subscription, review the following details and authorize the payment of **$36.00**. When you authorize the payment, you'll be prompted by your bank or credit card issuer to verify your identity.

Subscription Details

Solution
Appy's Maps

Provider
Appy's Geospatial Solutions, LLC

Payment Plan	Users	Monthly Payment
$12 USD per user per month	3	$36.00

Payment Method
Visa ending in

Strong Customer Authentication Best Practices for AppExchange Checkout

If you sell an AppExchange solution in a region that requires strong customer authentication (SCA), follow these Checkout best practices.

1. Prepare Your Customers for Strong Customer Authentication

   If you serve customers in the European Economic Area, communicate how strong customer authentication (SCA) affects online payments, including payments for your AppExchange solution.

2. Manage AppExchange Checkout Subscription Payments That Require Customer Authorization

   If a Checkout subscription payment fails because it requires customer authorization, determine how Stripe handles the related subscription. For example, you can configure Stripe to cancel the subscription, mark the subscription as unpaid, or take no action.

3. View AppExchange Checkout Subscription Payments That Require Customer Authorization

   If a Checkout subscription payment can't be processed because it requires customer authorization, Stripe marks the payment as failed. View these payments in the Stripe dashboard to see transaction details, including customer contact information. You can use this information to follow up with the customer and provide instructions for authorizing the payment on AppExchange.

4. Authorize an AppExchange Checkout Subscription Payment

   In regions that require strong customer authentication (SCA), a customer's bank or credit card issuer may require the customer to authorize Checkout subscription payments periodically. To see payments that require customer authorization, check your Stripe dashboard. If authorization is required, we prompt the customer when they log in to AppExchange. However, you can also provide customers with self-service instructions for authorizing a payment.

Prepare Your Customers for Strong Customer Authentication

If you serve customers in the European Economic Area, communicate how strong customer authentication (SCA) affects online payments, including payments for your AppExchange solution.

In your communication, we recommend that you:

- Define SCA and explain how SCA changes the online payment experience.
- Note that SCA impacts many types of online payments in the European Economic Area, including AppExchange payments.
- Explain that the customer may be asked to authorize AppExchange payments periodically, which includes an identity verification step.
- Explain that if authorization is required, we prompt the customer when they log in to AppExchange.
- Provide self-service steps for authorizing an AppExchange subscription payment.

SEE ALSO:

Manage AppExchange Checkout Subscription Payments That Require Customer Authorization

View AppExchange Checkout Subscription Payments That Require Customer Authorization

Authorize an AppExchange Checkout Subscription Payment

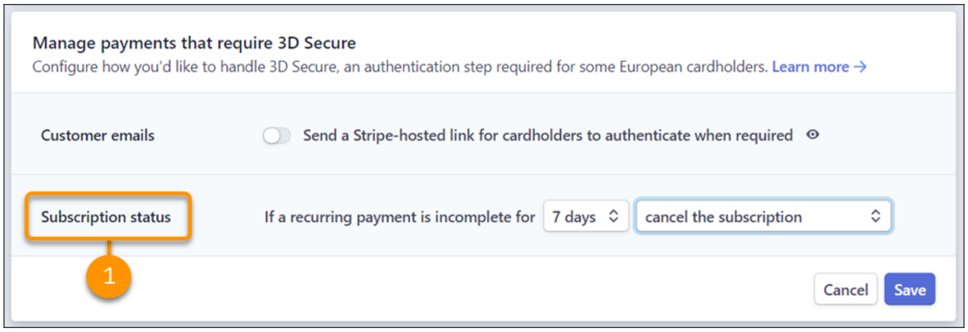
Manage AppExchange Checkout Subscription Payments That Require Customer Authorization

If a Checkout subscription payment fails because it requires customer authorization, determine how Stripe handles the related subscription. For example, you can configure Stripe to cancel the subscription, mark the subscription as unpaid, or take no action.

1. Log in to Stripe.
2. From your Stripe dashboard, click **Settings**.
3. Under Billing, click **Subscriptions and emails**.

4. Go to Manage payments that require 3D Secure, and then configure `Subscription status` (1).

   Important: Don't enable the `Customer emails` setting. To authorize payments, customers must log in to AppExchange.



Manage payments that require 3D Secure

Configure how you'd like to handle 3D Secure, an authentication step required for some European cardholders. Learn more →

Customer emails: Send a Stripe-hosted link for cardholders to authenticate when required

Subscription status: If a recurring payment is incomplete for 7 days, cancel the subscription

View AppExchange Checkout Subscription Payments That Require Customer Authorization

If a Checkout subscription payment can't be processed because it requires customer authorization, Stripe marks the payment as failed. View these payments in the Stripe dashboard to see transaction details, including customer contact information. You can use this information to follow up with the customer and provide instructions for authorizing the payment on AppExchange.

1. Log in to Stripe.
2. From your Stripe dashboard, click **Payments**.
3. Configure the payment filters as follows.

Filter	Value
Status	`Incomplete`

4. Click **Done**.
5. Click a payment to view details about the transaction.

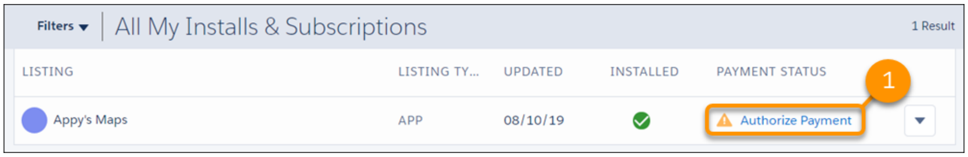
Authorize an AppExchange Checkout Subscription Payment

USER PERMISSIONS

To manage AppExchange subscriptions:
- Manage Billing

In regions that require strong customer authentication (SCA), a customer's bank or credit card issuer may require the customer to authorize Checkout subscription payments periodically. To see payments that require customer authorization, check your Stripe dashboard. If authorization is required, we prompt the customer when they log in to AppExchange. However, you can also provide customers with self-service instructions for authorizing a payment.

1. Log in to AppExchange.
2. From the user profile menu, click **My Installs & Subscriptions**.
3. Find the subscription that requires authorization.
4. Click **Authorize Payment** (1).



Filters ▾ All My Installs & Subscriptions 1 Result

LISTING	LISTING TY...	UPDATED	INSTALLED	PAYMENT STATUS
Appy's Maps	APP	08/10/19	✓	⚠ Authorize Payment

5. Review the subscription details, and then click **Authorize**.

SEE ALSO:

View AppExchange Checkout Subscription Payments That Require Customer Authorization

Manage AppExchange Checkout Subscriptions

Handle common customer requests related to Checkout subscriptions, such as viewing payment history, adding or removing licenses, and canceling subscriptions.

View AppExchange Checkout Receipts

If a customer requests a receipt for a previous Checkout payment, you can share self-service steps for viewing payment history on AppExchange.

Add or Remove Licenses from an AppExchange Checkout Subscription

If a customer requests that you add or remove licenses from a Checkout subscription, you can share self-service steps for updating the subscription on AppExchange. After the customer updates the subscription, the changes are applied immediately. If licenses are added or removed during the current billing period, Checkout charges the customer a prorated amount the next billing period.

Cancel an AppExchange Checkout Subscription

If a customer wants to end a Checkout subscription, you can share self-service steps for canceling the subscription on AppExchange. The cancellation takes effect at the end of the contract term.

View AppExchange Checkout Receipts

If a customer requests a receipt for a previous Checkout payment, you can share self-service steps for viewing payment history on AppExchange.

USER PERMISSIONS

To manage AppExchange subscriptions:

- Manage Billing

1. Log in to AppExchange.
2. From the user profile menu, click **My Installs & Subscriptions**.
3. Find the subscription whose payment history you want to view.
4. From the dropdown list, select **Manage Subscription**.
5. Go to Payment History, and then click an invoice to view details about the purchase.

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USER PERMISSIONS

To manage AppExchange subscriptions:

- Manage Billing

1. Log in to AppExchange.

2. From the user profile menu, click **My Installs & Subscriptions**.
3. Find the subscription that you want to update.
4. From the dropdown list, select **Manage Subscription**.
5. Click **Edit**.
6. Go to Payment Details, and then edit the number of licenses associated with the subscription.
7. Click **Review Changes**.
8. Agree to the terms and conditions, and then click **Save**.

Cancel an AppExchange Checkout Subscription

If a customer wants to end a Checkout subscription, you can share self-service steps for canceling the subscription on AppExchange. The cancellation takes effect at the end of the contract term.

1. Log in to AppExchange.
2. From the user profile menu, click **My Installs & Subscriptions**.
3. Find the subscription that you want to cancel.
4. From the dropdown list, select **Manage Subscription**.
5. Click **End Subscription**, and then confirm the cancellation.

USER PERMISSIONS

To manage AppExchange subscriptions:

- Manage Billing

AppExchange Checkout FAQs

Find answers to common questions about Checkout.

Does AppExchange Checkout replace the License Management App?

No, Checkout works with the LMA to support the licensing process. When a customer purchases your solution, Checkout creates a license record in the LMA. If a customer edits their subscription on AppExchange, such as by adding seats, the license record in the LMA automatically updates to reflect those changes.

How does AppExchange Checkout affect Trialforce and lead management?

Checkout doesn't affect your Trialforce configuration or how you manage leads. However, when a customer signs up for a trial using Checkout, the corresponding trial user is listed as `Active` in the License Management App (LMA).

Should I collect payment details from AppExchange Checkout customers before or after installation?

Both approaches have advantages. We recommend thinking about your target customers and existing business processes, and then deciding.

Does AppExchange Checkout support multiple currencies?

Yes. To offer another currency on your listing, first create a pricing plan in Stripe that uses this currency. Then, go to the Publishing Console and add the plan to your listing. When a customer purchases your solution, Checkout charges them in the currency that you specified on the plan. When Stripe transfers the payment to you, it's converted to the currency used by your bank account.

If I use AppExchange Checkout to sell my solution, do customers have to purchase from AppExchange?

Yes, purchases must occur on AppExchange and are subject to revenue sharing per your Salesforce partnership agreement. Also, if the transaction is processed another way, Checkout can't associate the purchase with your solution or provision licenses with the License Management App (LMA).

Can my customer switch to another AppExchange Checkout payment plan?

Yes, you can switch the customer to another plan in Stripe. The new plan takes effect at the start of the next billing period. If you want the change to take effect immediately, cancel the current plan in Stripe and ask the customer to purchase the new plan from your listing.

If a customer's credit card payment is declined in AppExchange Checkout, does their license become inactive?

In your Stripe settings, you determine what happens when a credit card is declined. You can retry the payment or deactivate the subscription. If you deactivate the subscription, the license becomes inactive.

How does billing work when AppExchange Checkout customers add or remove licenses during the current billing period?

If licenses are added or removed during the current billing period, Checkout charges the customer a prorated amount for the next billing period.

If an admin purchases and installs a solution with AppExchange Checkout, can another user edit the subscription on AppExchange?

Yes, provided the user has the “Manage Billing” permission in the Salesforce org associated with the subscription.

Does AppExchange Checkout support price tiers in Stripe?

No. If you add multiple price tiers to a pricing plan in Stripe, Checkout can’t import the plan to the Publishing Console. If you're interested in providing discounted pricing for your solution, create a coupon in Stripe and share it with your customers.

Why can't my customer make an AppExchange Checkout purchase?

If a customer clicks **Get It Now** on your listing, but can't make a Checkout purchase, verify that the customer is logged in to AppExchange with a supported Salesforce org. Checkout supports only paid orgs whose status is `Active`. Trial orgs, sandbox orgs, and Developer Edition orgs aren't supported.

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Both approaches have advantages. We recommend thinking about your target customers and existing business processes, and then deciding.

Here's a table that you can use to guide your decision.

Collect payment details:	Best if your customers value:	Best if your company:
Before installation	A seamless purchase experience at the end of a trial.	Prefers to manage trials in Stripe.
After installation	The ability to quickly try out your solution.	Prefers to manage trials using the License Management App (LMA).

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Create a Stripe Product and Pricing Plan for AppExchange Checkout

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Yes, provided the user has the "Manage Billing" permission in the Salesforce org associated with the subscription.

Does AppExchange Checkout support price tiers in Stripe?

No. If you add multiple price tiers to a pricing plan in Stripe, Checkout can't import the plan to the Publishing Console. If you're interested in providing discounted pricing for your solution, create a coupon in Stripe and share it with your customers.

Why can't my customer make an AppExchange Checkout purchase?

If a customer clicks **Get It Now** on your listing, but can't make a Checkout purchase, verify that the customer is logged in to AppExchange with a supported Salesforce org. Checkout supports only paid orgs whose status is `Active`. Trial orgs, sandbox orgs, and Developer Edition orgs aren't supported.

AppExchange Checkout Considerations

Keep these considerations in mind when using Checkout.

- You must distribute your product as a managed package.
- You can’t use Checkout with OEM apps.

Checkout Management App

The Checkout Management App (CMA) brings the power of Salesforce to AppExchange Checkout. A beautiful dashboard visually displays AppExchange Checkout data, so it’s easy to see how your offerings are performing. Automated email notifications keep customers and team members in the loop whenever activity occurs on your offerings.

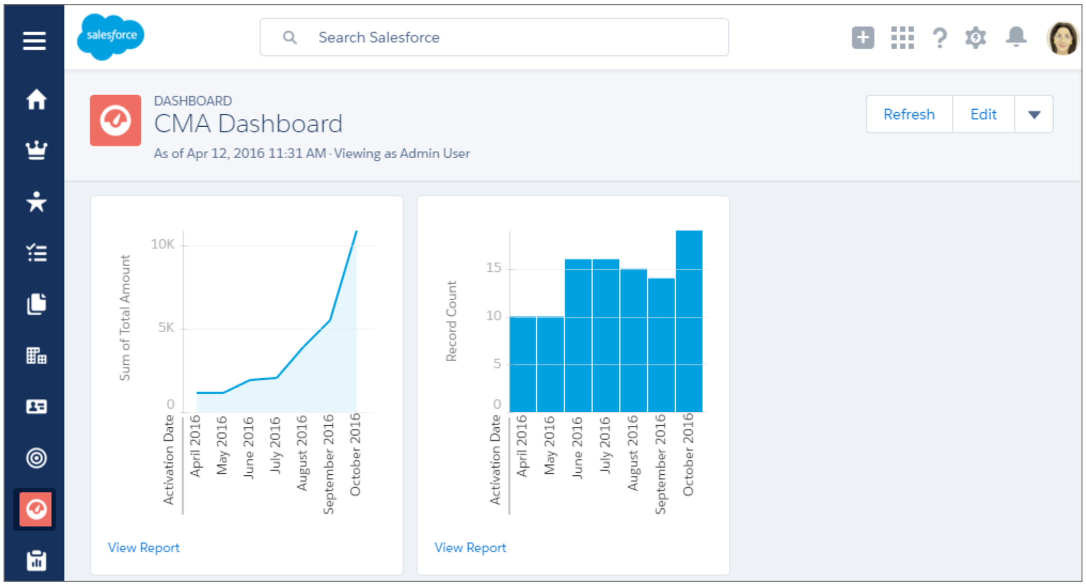
Note: The CMA is available in English and Japanese to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

Start with the dashboard to get a big picture view of your AppExchange Checkout data.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions



DASHBOARD

CMA Dashboard

As of Apr 12, 2016 11:31 AM · Viewing as Admin User

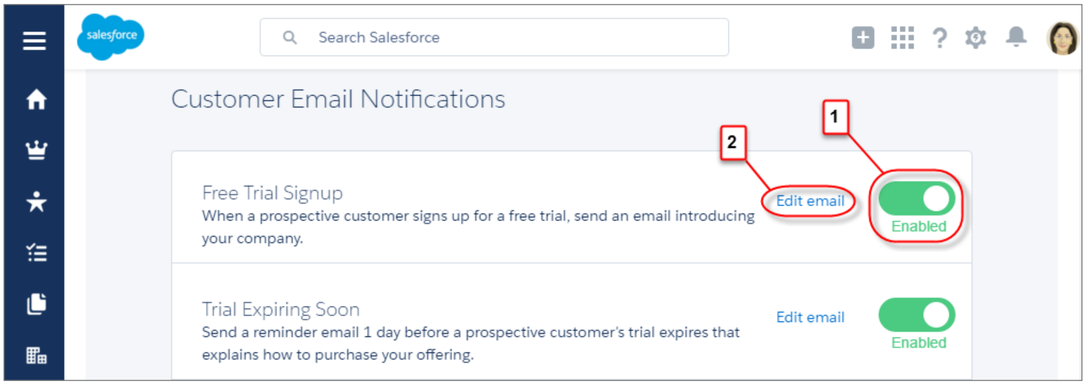
The dashboard is preconfigured to show:

- Revenue by month, so financial performance is always front and center
- New subscribers by month, so it’s easy to see where growth is occurring
- Subscription plan by unit, so you know which configurations are popular with customers

- Subscription status by month, so you can stay on top of trials, purchases, and renewals

You can customize the dashboard using standard Salesforce tools. For a detailed look at your data, view individual customer, subscription plan, subscription, invoice, invoice item, and transaction records.

To save time communicating with stakeholders, the CMA can send email notifications for situations that you often encounter as a partner, like renewal notices. Enable email notifications as needed (1) and then customize them to reflect your company's identity (2). Not in the mood to customize anything? No worries—the templates provide friendly and informative default content.



Customer Email Notifications

Free Trial Signup
When a prospective customer signs up for a free trial, send an email introducing your company.
Edit email
Enabled

Trial Expiring Soon
Send a reminder email 1 day before a prospective customer's trial expires that explains how to purchase your offering.
Edit email
Enabled

Checkout Management App Best Practices
Follow these guidelines and best practices when you use the Checkout Management App (CMA).

Checkout Management App Objects
Subscription plan, subscription, invoice, invoice item, and transaction objects are the foundation of the Checkout Management App (CMA). To get the most out of the CMA, understand what these objects represent and how they relate to each other.

Get Started with the Checkout Management App
Install the Checkout Management App (CMA) into a Salesforce org, and then configure the app so that users get the right level of access to data. Enable email notifications to simplify communication with customers and team members. You can also customize the notification templates to meet your company's needs.

Sample Checkout Management App Customizations
The Checkout Management App (CMA) is a powerful tool out of the box, but gets even better when you customize it. These examples show how you can modify dashboards and email notifications to delight customers and team members.

Update Settings in the Checkout Management App
Control when customers and team members receive emails from the Checkout Management App (CMA). You can also change the Stripe account associated with the CMA and manually reimport your data into your Salesforce org. Only admin users can update settings in the CMA.

View Checkout Management App Logs
The Checkout Management App (CMA) creates logs when connecting to Stripe or syncing your data. If you experience issues with the CMA, view logs to help diagnose their cause.

Checkout Management App Best Practices

Follow these guidelines and best practices when you use the Checkout Management App (CMA).

- Install the CMA in a Salesforce org where the License Management App (LMA) is already installed. Usually, this is your partner business org. If the LMA isn't installed in your org, you can't install the CMA.
- Don't edit data in managed fields on the subscription plan, subscription, invoice, or transaction object records. The CMA syncs Stripe data in a one-way, read-only manner, so changes that you make aren't reflected in Stripe. To update subscription plan, subscription, invoice, invoice item, or transaction data, use the Stripe dashboard or API.
- Review and customize notification templates before enabling them. By adding your logo and tailoring template content to reflect your company's identity, you set yourself apart from other offerings on the AppExchange. Customizing takes only a couple of minutes and doesn't require any coding.

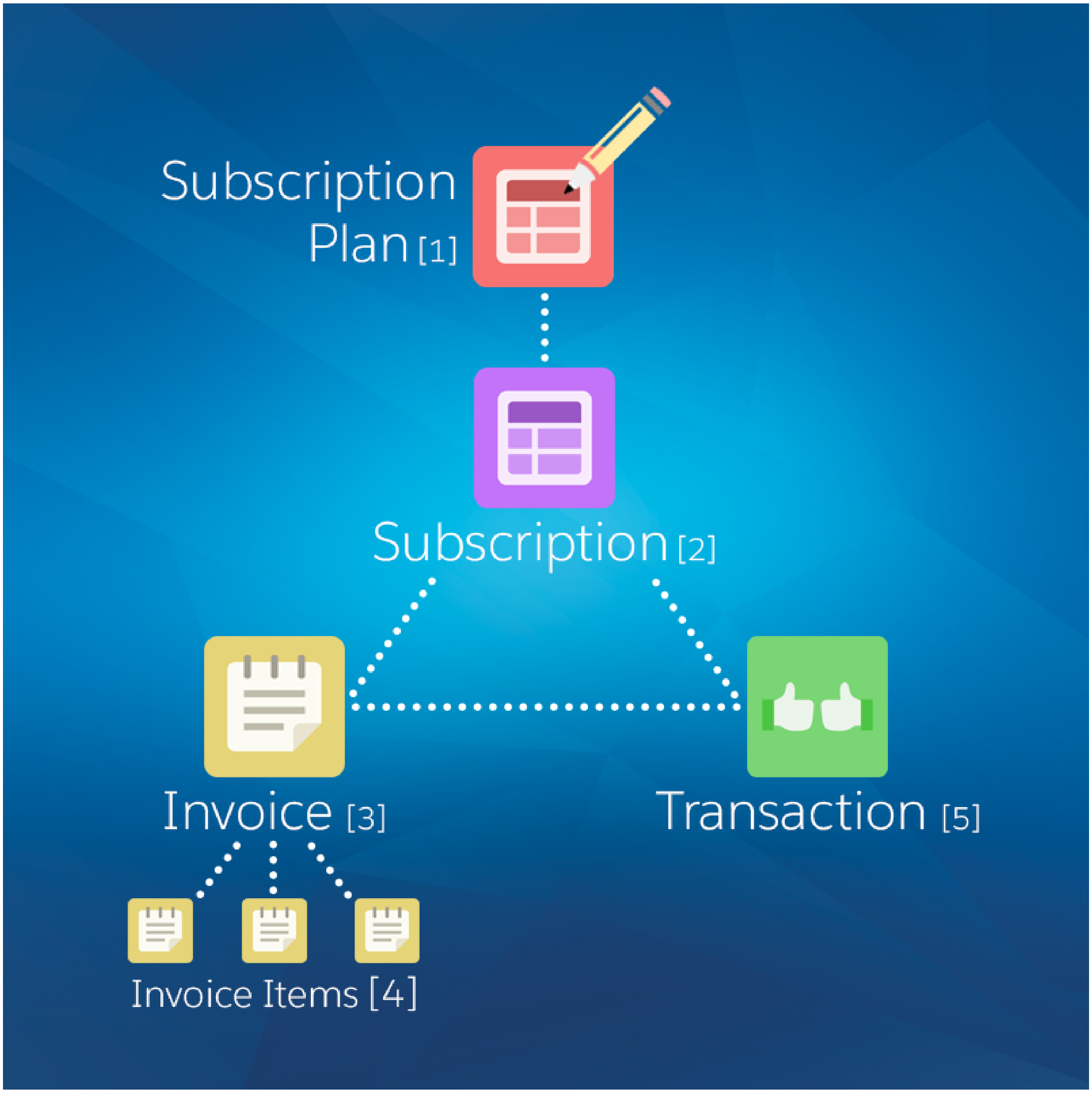
SEE ALSO:

Modify a Notification Template in the Checkout Management App

Checkout Management App Objects

Subscription plan, subscription, invoice, invoice item, and transaction objects are the foundation of the Checkout Management App (CMA). To get the most out of the CMA, understand what these objects represent and how they relate to each other.

The CMA pulls in data from AppExchange Checkout's payment partner, Stripe, to populate the subscription plan, subscription, invoice, invoice item, and transaction objects. Here's a high-level overview of these objects and how they fit together.



Object	Purpose	Relationships
Subscription plan (1)	Contains information about the pricing model of an offering. For example, site-wide or per user, billed monthly.	Parent object of: • Subscription
Subscription (2)	Contains information about the customer’s history and usage of an offering. For example, when the subscription started.	Child object of: • Subscription plan Parent object of: • Invoice

Object	Purpose	Relationships
		- Transaction
Invoice (3)	Contains billing and payment information for a subscription for a specific time period. For example, the total amount owed by the customer.	Child object of: - Subscription Sibling object of: - Transaction
Invoice item (4)	Contains information about a particular billing and payment event for a specific time period. For example, a one-time credit. Multiple invoice items can be associated with an invoice.	Child object of: - Invoice
Transaction (5)	Contains information about a customer payment attempt. For example, method of payment and whether it was successful.	Child object of: - Subscription Sibling object of: - Invoice

We haven't listed it in the table, but there's one more object to be aware of: customer. The customer object contains information about the subscriber and draws from the other objects in the CMA, including subscription, invoice, and transaction.

The CMA automatically syncs new data from Stripe, updating object records as necessary. Just remember: syncing is one way and read only, so changes that you make to object records aren't reflected in Stripe. To update subscription plan, subscription, invoice, invoice item, or transaction data, use the Stripe dashboard or API.

Get Started with the Checkout Management App

Install the Checkout Management App (CMA) into a Salesforce org, and then configure the app so that users get the right level of access to data. Enable email notifications to simplify communication with customers and team members. You can also customize the notification templates to meet your company's needs.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Install the Checkout Management App

Install the Checkout Management App (CMA) in the Salesforce org where you manage licenses, usually your Partner Business Org. The License Management App (LMA) is required to use the CMA, so make sure that you install the LMA in this org first.

Set Up the Checkout Management App

Use the Checkout Management App (CMA) setup tool to connect your Stripe account and import data into your Salesforce org. Then get familiar with your dashboard and choose when customers and team members receive email notifications from the CMA.

Assign Access to the Checkout Management App

Use permission sets to give team members the right level of access to the Checkout Management App (CMA). You can assign the CMA Standard User permission set or CMA Admin User permission set, depending on the features team members must access.

Modify a Notification Template in the Checkout Management App

The Checkout Management App (CMA) can send email notifications in response to trial installations, purchases, and other subscription changes. We created default notifications to get you started, but you can tailor templates to your company's needs.

Configure Logs in the Checkout Management App

The Checkout Management App (CMA) creates debug logs to help you troubleshoot issues. By default, all logs are saved, but you can configure the CMA to delete logs that you no longer need. Delete logs regularly to stay within the data storage limits for your Salesforce edition.

Install the Checkout Management App

USER PERMISSIONS

To install packages:

- Download AppExchange Packages

Install the Checkout Management App (CMA) in the Salesforce org where you manage licenses, usually your Partner Business Org. The License Management App (LMA) is required to use the CMA, so make sure that you install the LMA in this org first.

Note: If you received a Partner Business Org when you joined the Partner Community, the CMA is preinstalled there. To check if the CMA is installed in your org, go to the App Launcher and look for the CMA in the list of available apps.

1. If you haven't already, log in to the AppExchange using the credentials of the org where you want to install the CMA.
2. Go to the AppExchange listing for the CMA: https://appexchange.salesforce.com/listingDetail?listingId=a0N3A000000rMcIUAE.
3. Click **Get It Now**.
4. Click **Install in production**.
5. Agree to the Terms & Conditions, and then click **Confirm and Install**.
6. Log in to the org where you want to install the CMA.
7. Review the package installation details, and then click **Continue**.
8. Approve access by third-party websites, and then click **Continue**.
9. Review the API access requirements for the package, and then click **Next**.
10. Grant access to package contents, and then click **Next**.

    Note: Salesforce recommends granting access to admins only and assigning access to other users as needed after the app is installed.

11. Click **Install**.
12. After the installation completes, go to the App Launcher and confirm that the CMA appears in the list of available apps.

SEE ALSO:

Assign Access to the Checkout Management App

Set Up the Checkout Management App

USER PERMISSIONS

To configure the Checkout Management App:

- CMA Admin User

Use the Checkout Management App (CMA) setup tool to connect your Stripe account and import data into your Salesforce org. Then get familiar with your dashboard and choose when customers and team members receive email notifications from the CMA.

Watch a Demo: Set Up the Checkout Management App

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Checkout Setup**.
4. Connect your Stripe account.

   a. In the Connect Stripe Account section, click **Do It**.
   b. Click **Get API Key from Stripe**.
      The Stripe dashboard opens in a new tab.
   c. In the Stripe dashboard, copy your live secret API key.
   d. In the CMA, paste the key into `Live Secret API Key`, and then click **Connect Stripe Account**.

5. Set up data syncing by creating and configuring a site. After you set up data syncing, new Stripe data syncs to your org automatically.
   a. Click **Set Up Data Syncing**.
   b. Click **Register a Force.com Domain**, and then follow the setup instructions in the CMA.
   c. Click **Create a Force.com Site**, and then follow the setup instructions in the CMA.
   d. Click **Configure Site Access**, and then follow the setup instructions in the CMA.
   e. Click **Connect the Site to Stripe**, and then follow the setup instructions in the CMA.

6. Import your Stripe data. If you haven't sold an offering using AppExchange Checkout before, you don't have any Stripe data, so you can skip this step.
   a. Click **Import Existing Data**.
   b. Click **Import Data**.

      Importing Stripe data can take awhile depending on how much data you have. Don't use CMA reports or dashboards while data is being imported.
   c. After the import finishes, close the dialog to return to the setup wizard.

7. Configure email notifications.

   Tip: Before you enable a notification, review the default content we provide. That way, you know exactly what customers and team members receive, and you can tailor it to reflect your company's identity.

   a. In the Configure Notification Settings section, click **Do It**.
   b. Enable customer notifications as desired.
   c. To add the email addresses of team members, click **View/Edit**, and then click **Save**.
   d. Enable partner notifications as desired.
   e. Go back to the setup wizard.

8. Say hello to your dashboard.
   a. In the Meet Your Dashboard section, click **Do It**.
   b. View the dashboards we've created for you, or go to Trailhead to learn how to customize dashboards.

You're all set! To update configuration details later, return to Checkout Setup.

SEE ALSO:

Sample Checkout Management App Customizations

Assign Access to the Checkout Management App

USER PERMISSIONS

To assign a permissions set:

- Assign Permission Sets

Use permission sets to give team members the right level of access to the Checkout Management App (CMA). You can assign the CMA Standard User permission set or CMA Admin User permission set, depending on the features team members must access.

Standard users have read-only access to the dashboard and object records and can't view or update notification settings. System Admins or users with the CMA Admin User permission set have full access to the dashboard, notifications, and objects, including the ability to edit objects. Assign the CMA Admin User permission set only to users who administer or manage the CMA.

1. Log in to the org where the CMA is installed.
2. From Setup, enter `Users` in the `Quick Find` box, and then click **Users**.
3. Select a user.
4. In the Permission Set Assignments related list, click **Edit Assignments**.
5. Select the CMA Standard User or CMA Admin User permission set, and then click **Add**.
6. Click **Save**.

Modify a Notification Template in the Checkout Management App

USER PERMISSIONS

To enable, disable, or customize notifications:

- CMA Admin User

To create or change Visualforce email templates:

- Customize Application

The Checkout Management App (CMA) can send email notifications in response to trial installations, purchases, and other subscription changes. We created default notifications to get you started, but you can tailor templates to your company's needs.

Notification templates in the CMA are based on Visualforce email templates. The templates support advanced customizations, like merge fields and formulas.

Note: Notification templates in the CMA also include custom components that affect email styling. You can't modify these components, but you can remove them.

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Checkout Notification Settings**.
4. Find the template that you want to customize, and then select **Edit**.
5. Click **Edit Template** and modify as needed, and then click **Save**.

SEE ALSO:

Use an Organization-Wide Address on a Notification

Include a Link in a Notification

Configure Logs in the Checkout Management App

The Checkout Management App (CMA) creates debug logs to help you troubleshoot issues. By default, all logs are saved, but you can configure the CMA to delete logs that you no longer need. Delete logs regularly to stay within the data storage limits for your Salesforce edition.

USER PERMISSIONS

To manage, create, edit, and delete custom settings:

- Customize Application

To save changes to Apex classes and triggers:

- Author Apex

1. Log in to the org where the CMA is installed.
2. Configure how long to save CMA logs.
   a. From Setup, enter `Custom Settings` in the `Quick Find` box, and then click **Custom Settings**.
   b. For CMALogSettings, click **Manage**.
   c. Click **New**.
   d. Enter a name. For example, `CMA Log Settings`.
   e. For CMALogLifeSpan, enter how many days to save logs. For example, enter `30` to save all logs created in the past 30 days.

   Note: To change how long CMA logs are saved, edit the value configured in this step. Don't add more values to CMALogSettings.

3. Schedule an Apex job to delete old CMA logs.
   a. From Setup, enter `Apex Classes` in the `Quick Find` box, and then click **Apex Classes**.
   b. Click **Schedule Apex**.
   c. Configure the job as follows.

Field	Value
`Job Name`	CMA Log Cleanup
`Apex Class`	ScheduledDeleteCMALogs Note: Namespace prefix: `sfcma`
`Frequency`	Specify a weekly or monthly interval—we recommend running the job at least once per week
`Start Date`	Today's date
`End Date`	A future date—we recommend specifying a date that's at least several years in the future
Preferred Start Time	Any value—we recommend choosing a time when your org is not under heavy load

   d. Click **Save**.

Sample Checkout Management App Customizations

The Checkout Management App (CMA) is a powerful tool out of the box, but gets even better when you customize it. These examples show how you can modify dashboards and email notifications to delight customers and team members.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Use an Organization-Wide Address on a Notification

By default, notifications sent by the Checkout Management App (CMA) include a generic email address in the From field. But what if you want to include contact information for a specific team at your company, like support or billing? You can specify an organization-wide address on a notification so that customer replies are directed to the right people at your company.

Include a Link in a Notification

When a customer installs your offering, you often want to provide information that doesn't fit in the notification, such as setup documentation. You can point customers to this information by including links in a Checkout Management App (CMA) notification.

Customize a Report to Show Annual Revenue for an Offering

If the Checkout Management App (CMA) dashboard doesn't show what you need out of the box, try modifying a report. This example steps you through how to display annual revenue for an offering instead of monthly revenue across all offerings.

Use an Organization-Wide Address on a Notification

By default, notifications sent by the Checkout Management App (CMA) include a generic email address in the From field. But what if you want to include contact information for a specific team at your company, like support or billing? You can specify an organization-wide address on a notification so that customer replies are directed to the right people at your company.

USER PERMISSIONS

To enable, disable, or customize notifications:

- CMA Admin User

To configure organization-wide addresses:

- Modify All Data

Suppose that your company's refund inquiries are fielded by a billing specialist whose email address is `billing@example.com`. Let's step through how to add this email address to the Refund Notification template so that customers know who to contact if they have questions.

1. Log in to the org where the CMA is installed.
2. Create an organization-wide email address.
   a. From Setup, enter *`Organization-Wide Addresses`* in the `Quick Find` box, and then click **Organization-Wide Addresses**.
   b. Click **Add**.
   c. For the display name, enter a word or phrase that users who receive the email see as the sender. For this example, enter *`Billing Support`*.
   d. Enter an email address. For this example, enter *`billing@example.com`*.
   e. Choose which profiles can use the address. For this example, enable the address for all profiles.
   f. Click **Save**.
3. Add the organization-wide email address to the notification template.
   a. From Setup, enter *`Email Alerts`* in the `Quick Find` box, and then click **Email Alerts**.
   b. Find the notification template that you want to update, and then click **Edit**. For this example, choose the Refund Customer Notification template.
   c. For `From Email Address`, choose an organization-wide email address. For this example, choose *`"Billing Support" <billing@example.com>`*.

4. Click **Save**.

Include a Link in a Notification

When a customer installs your offering, you often want to provide information that doesn't fit in the notification, such as setup documentation. You can point customers to this information by including links in a Checkout Management App (CMA) notification.

Suppose that you sell a product that requires configuration after it's installed. To help customers get off on the right foot, direct them to a page on your website that offers configuration tips. Let's step through how to add a link to the Free Trial Signup template.

USER PERMISSIONS

To enable, disable, or customize notifications:

- CMA Admin User

To create or change Visualforce email templates:

- Customize Application

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Checkout Notification Settings**.
4. Find the template that you want to use, and then click **Edit**. For this example, choose the Free Trial Signup template.
5. Click **Edit Template**.
6. Modify the email template to include the `<apex:outputLink>` component, which lets you point to an external URL. For this example, add this component after the last sentence in the message body.

   ```
   <apex:outputLink value="https://example.com/getstarted" target="_blank">Check out our
   website for configuration tips.</apex:outputLink>
   ```

   Note: The `target` attribute is set to blank, which opens the URL in a new page.

7. Click **Save**.

Customize a Report to Show Annual Revenue for an Offering

If the Checkout Management App (CMA) dashboard doesn't show what you need out of the box, try modifying a report. This example steps you through how to display annual revenue for an offering instead of monthly revenue across all offerings.

USER PERMISSIONS

To customize CMA reports:

- CMA Admin User

To create, edit, and delete reports:

- Create and Customize Reports

  AND

  Report Builder

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Dashboards**, and then click **CMA Dashboard**.
4. For the Revenue Per Month chart, click **View Report**.
5. From the Edit drop-down list, select **Clone**.
6. Specify field values as follows, and then click **Create**.

Field Name	Value
`Name`	*`Revenue Per Year`* To keep your dashboard organized, include the name of your offering. For example, Revenue Per Year (Sample App).
`Folder`	CMA Reports

7. Click **Edit**.
8. Add a filter to display revenue for a specific offering.
   a. From the Add drop-down list, select **Field Filter**.
   b. Enter filter criteria. To display revenue only for listings named Sample App, create the filter `Listing Name equals Sample App`.
   c. Click **OK**.
9. In the Preview section, from the Activation Date drop-down list, select **Group Dates By** > **Calendar Year**.
   Now the report is set up to show annual revenue instead of revenue by month.
10. Click **Save**, and then click **Run Report**.

Update Settings in the Checkout Management App

Control when customers and team members receive emails from the Checkout Management App (CMA). You can also change the Stripe account associated with the CMA and manually reimport your data into your Salesforce org. Only admin users can update settings in the CMA.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Change Notification Settings in the Checkout Management App
You can enable or disable individual Checkout Management App (CMA) email notifications depending on your customers' and team members' needs.

Change the Stripe Account Associated with the Checkout Management App
If you start managing subscriptions from another Stripe account, update your account settings in the Checkout Management App (CMA) to keep Stripe data in sync.

Reimport Stripe Data into the Checkout Management App
The Checkout Management App (CMA) automatically pulls new Stripe data into your org, so usually you don't need to import anything manually. However, if data in the CMA is missing or incorrect, you can manually reimport Stripe data.

Change Notification Settings in the Checkout Management App

You can enable or disable individual Checkout Management App (CMA) email notifications depending on your customers' and team members' needs.

USER PERMISSIONS

To enable, disable, or customize notifications:
- CMA Admin User

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Notification Settings**.
4. Enable or disable a customer or partner notification.

SEE ALSO:

Modify a Notification Template in the Checkout Management App

Change the Stripe Account Associated with the Checkout Management App

If you start managing subscriptions from another Stripe account, update your account settings in the Checkout Management App (CMA) to keep Stripe data in sync.

USER PERMISSIONS

To configure the Checkout Management App:

- CMA Admin User

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Checkout Setup**.
4. In the Connect Stripe Account section, click **Change**.
5. Note: If you change or disconnect the current Stripe account, existing Stripe data in your org remains.

   To associate a new Stripe account, click **Change Stripe Account**, and then enter a new live secret API key.

Reimport Stripe Data into the Checkout Management App

The Checkout Management App (CMA) automatically pulls new Stripe data into your org, so usually you don't need to import anything manually. However, if data in the CMA is missing or incorrect, you can manually reimport Stripe data.

Warning: The reimport process overwrites existing Stripe data in your org. Changes you've made to existing data are lost. Report and dashboard customizations and notification settings aren't affected.

USER PERMISSIONS

To configure the Checkout Management App:

- CMA Admin User

1. Log in to the org where the CMA is installed.
2. Open the App Launcher, and then click **Checkout Management App**.
3. Click **Checkout Setup**.
4. In the Import Existing Data section, select **Re-import Data**.
5. Confirm that you want to overwrite the existing Stripe data, and then click **Yes, Reimport Data**.

View Checkout Management App Logs

The Checkout Management App (CMA) creates logs when connecting to Stripe or syncing your data. If you experience issues with the CMA, view logs to help diagnose their cause.

USER PERMISSIONS

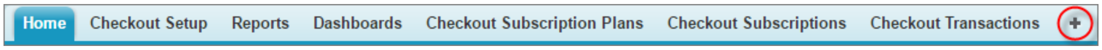
To manage apps:

- Customize Application

To view CMA logs:

- CMA Admin User

1. Log in to the org where the CMA is installed.
2. To view CMA logs in Lightning Experience:
   a. Open the App Launcher, and click **Other Items**.
   b. Click **Checkout Logs**.
3. To view CMA logs in Salesforce Classic:
   a. Open the App Launcher, and click **Checkout Management App**.
   b. Click the plus icon (+) next to the main tabs.



   c. Click **Checkout Logs**.

CHAPTER 9 Monitor Performance with Analytics for AppExchange Partners

In this chapter ...

Discover how customers find and interact with your AppExchange listing in the Marketplace Analytics dashboard. Learn how subscribers use your managed package by exploring App Analytics data.

Monitor Your AppExchange Performance with Marketplace Analytics

Use Marketplace Analytics to discover how customers find and interact with your AppExchange listings.

Marketplace Analytics Dashboard

The Marketplace Analytics dashboard uses activity metrics, trends, and visualizations to show how customers find and interact with your AppExchange listing.

Get Started with the Marketplace Analytics Dashboard

View the Marketplace Analytics dashboard to see how your AppExchange listing is performing. To allow team members to view the dashboard, assign them permission in the Partner Community. To explore data outside of the dashboard, export it. To give feedback about the dashboard, use the Marketplace Analytics feedback tool.

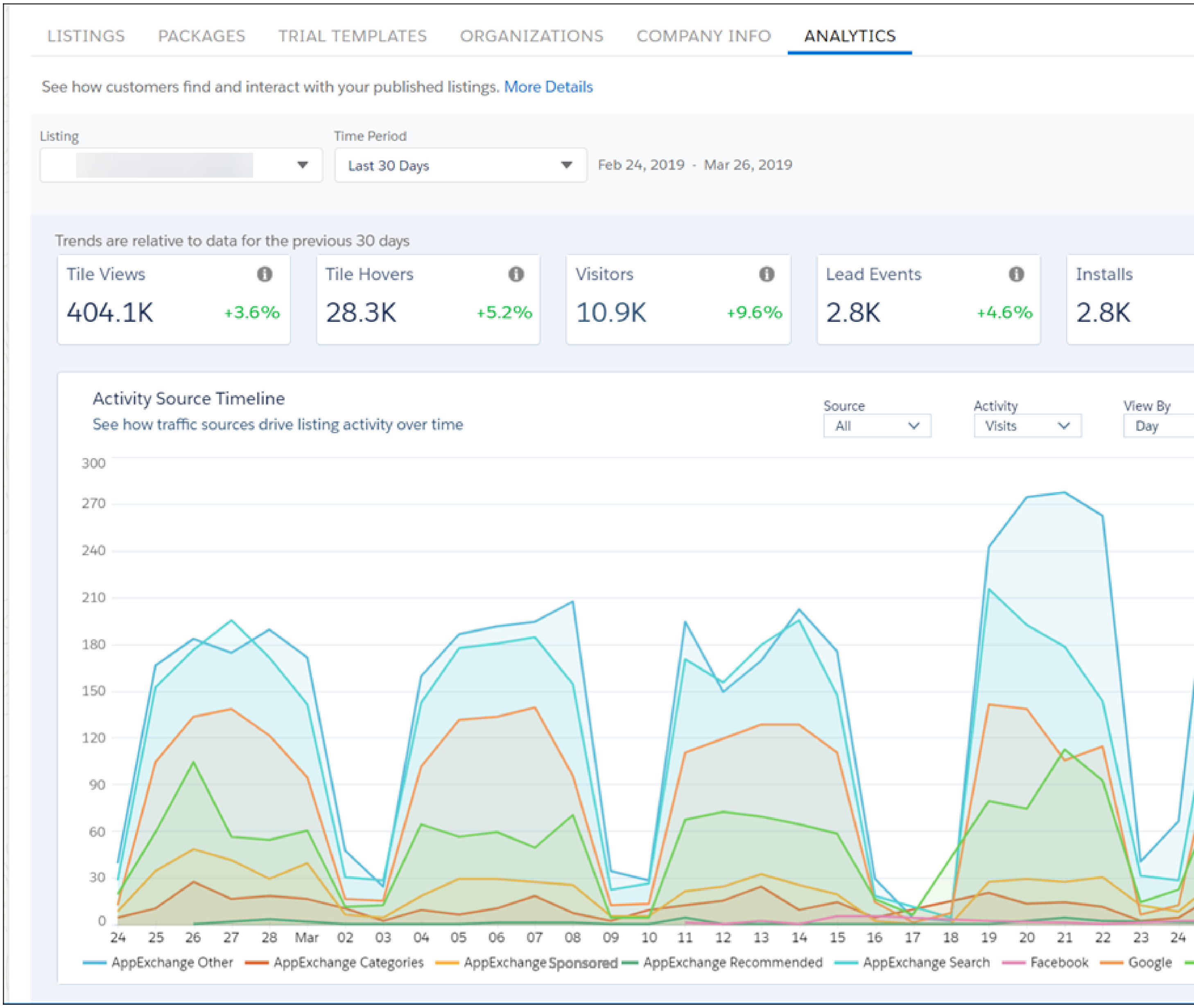
Marketplace Analytics FAQs

Here are some answers to frequently asked questions about Marketplace Analytics.

Marketplace Analytics Dashboard

The Marketplace Analytics dashboard uses activity metrics, trends, and visualizations to show how customers find and interact with your AppExchange listing.

Note: Marketplace Analytics is available to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.



See how customers find and interact with your published listings. More Details

Listing: [redacted]

Time Period: Last 30 Days

Feb 24, 2019 - Mar 26, 2019

Trends are relative to data for the previous 30 days

Tile Views	Tile Hovers	Visitors	Lead Events	Installs
404.1K +3.6%	28.3K +5.2%	10.9K +9.6%	2.8K +4.6%	2.8K

Activity Source Timeline

See how traffic sources drive listing activity over time

Source: All

Activity: Visits

View By: Day

Check the dashboard to discover:

- How often customers view or hover over your listing
- How traffic sources, such as Google Ads, contribute to activity on your listing
- The AppExchange search terms that customers use to find your listing
- Which resources, such as screenshots, customers click or view as they explore your listing

Use these details to shape your AppExchange strategy and drive more visits, installs, and purchases.

Activity Summary in the Marketplace Analytics Dashboard

Use the activity summary to check your AppExchange listing's key metrics: tile views, tile hovers, visitors, lead events, and installs. Each activity metric includes a trend indicator to compare how your listing is performing relative to previous time periods.

Filters in the Marketplace Analytics Dashboard

Use filters to focus on the AppExchange listing data that interests you. Global filters, such as the time period, affect all components in the dashboard. Local filters, such as the source, affect individual visualizations.

Visualizations in the Marketplace Analytics Dashboard

Use visualizations to explore your AppExchange listing's data. Activity Source Timeline and Customer Engagement show how customers interact with your listing and its resources over time. Activity Sources and Top AppExchange Searches show total activity over a time period.

Marketplace Analytics CSV Files

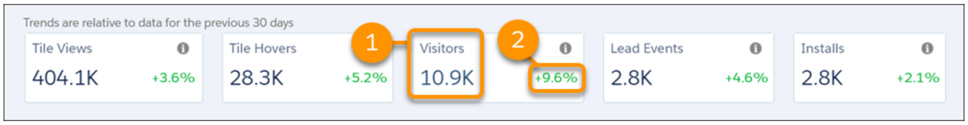
You can export data from the Marketplace Analytics dashboard in comma-separated value (.csv) format. When you export data, Marketplace Analytics creates a separate .csv file for each dashboard visualization and packages all the files in a .zip file.

Lead Events in Marketplace Analytics

Learn how we define lead events for your AppExchange listing and how they differ from the leads that appear in your Salesforce org.

Activity Summary in the Marketplace Analytics Dashboard

Use the activity summary to check your AppExchange listing's key metrics: tile views, tile hovers, visitors, lead events, and installs. Each activity metric includes a trend indicator to compare how your listing is performing relative to previous time periods.



Trends are relative to data for the previous 30 days

Tile Views 404.1K +3.6%

Tile Hovers 28.3K +5.2%

Visitors 10.9K +9.6%

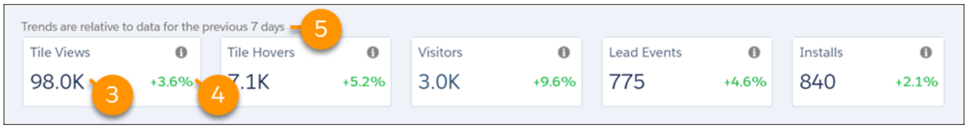
Lead Events 2.8K +4.6%

Installs 2.8K +2.1%

Element	Description
Activity Metric (1)	Number of times that an event or interaction occurred during a time period. For values over 1,000, the dashboard shows a rounded number. To view the exact number, hover over the metric.
Trend Indicator (2)	Percentage change relative to a previous time period. A positive value represents a period-over-period increase, and a negative value represents a period-over-period decrease.

The default time period is 30 days, but you can choose another fixed time period or define a custom one.

Example:



Trends are relative to data for the previous 7 days

Tile Views 98.0K +3.6%

Tile Hovers 7.1K +5.2%

Visitors 3.0K +9.6%

Lead Events 775 +4.6%

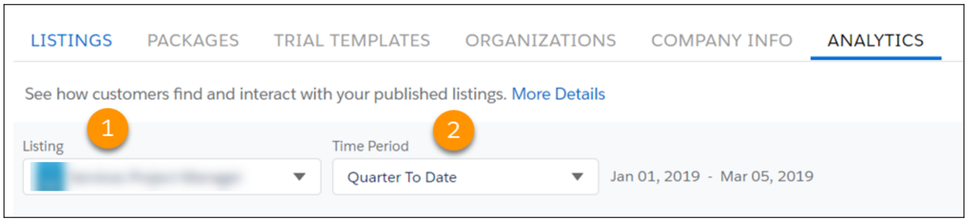
Installs 840 +2.1%

This summary of the example solution called Appy's Maps shows that it received 98,000 tile views (3) in the past 7 days, which is a 3.6% increase (4) compared to the previous 7-day period (5).

Filters in the Marketplace Analytics Dashboard

Use filters to focus on the AppExchange listing data that interests you. Global filters, such as the time period, affect all components in the dashboard. Local filters, such as the source, affect individual visualizations.

Global Filters



See how customers find and interact with your published listings. More Details

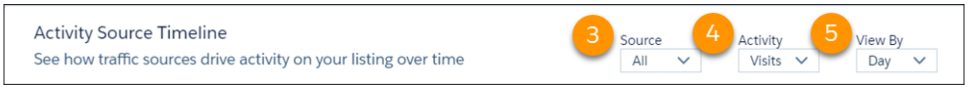
Listing

Time Period: Quarter To Date

Jan 01, 2019 - Mar 05, 2019

Global Filter	Description
Listing (1)	Select an AppExchange listing to view. You can view only your company's published listings in the dashboard.
Time Period (2)	Select the time period that you want to explore. You can select one of the fixed time periods, such as the last quarter, or you can define a custom period. The time period's start and end dates appear next to the filter.

Local Filters



Activity Source Timeline

See how traffic sources drive activity on your listing over time

Source: All

Activity: Visits

View By: Day

Local Filter	Description	Visualization
Source (3)	Select the traffic sources to show in the visualization. Traffic sources help you understand where an activity on your AppExchange listing originated, such as an AppExchange search or a Facebook ad.	• Activity Source Timeline
Activity (4)	Select the activity metrics to show in the visualization. An activity metric tells you how often an event or interaction occurred on your AppExchange listing.	• Activity Source Timeline • Activity Sources • Customer Engagement • Top AppExchange Searches

Local Filter	Description	Visualization
View By (5)	Adjust the time scale of the visualization, such as days, weeks, months, or quarters. In the x-axis of a visualization, weeks are formatted as W*n*, where *n* is a week number. For example, W1 represents the first week of the year. Likewise, quarters are formatted as Q*n*, where *n* is a quarter number. For example, Q4 represents the fourth quarter of the year. For both weeks and quarters, the year starts on January 1.	• Activity Source Timeline • Customer Engagement

Visualizations in the Marketplace Analytics Dashboard

Use visualizations to explore your AppExchange listing's data. Activity Source Timeline and Customer Engagement show how customers interact with your listing and its resources over time. Activity Sources and Top AppExchange Searches show total activity over a time period.

Activity Source Timeline
See how internal and external traffic sources contribute to activity on your AppExchange listing over a specific time period. Internal traffic originates on the AppExchange website, such as a customer who clicks a personalized recommendation to reach your listing. External traffic originates outside of AppExchange, such as a customer who clicks a Facebook ad to reach your listing.

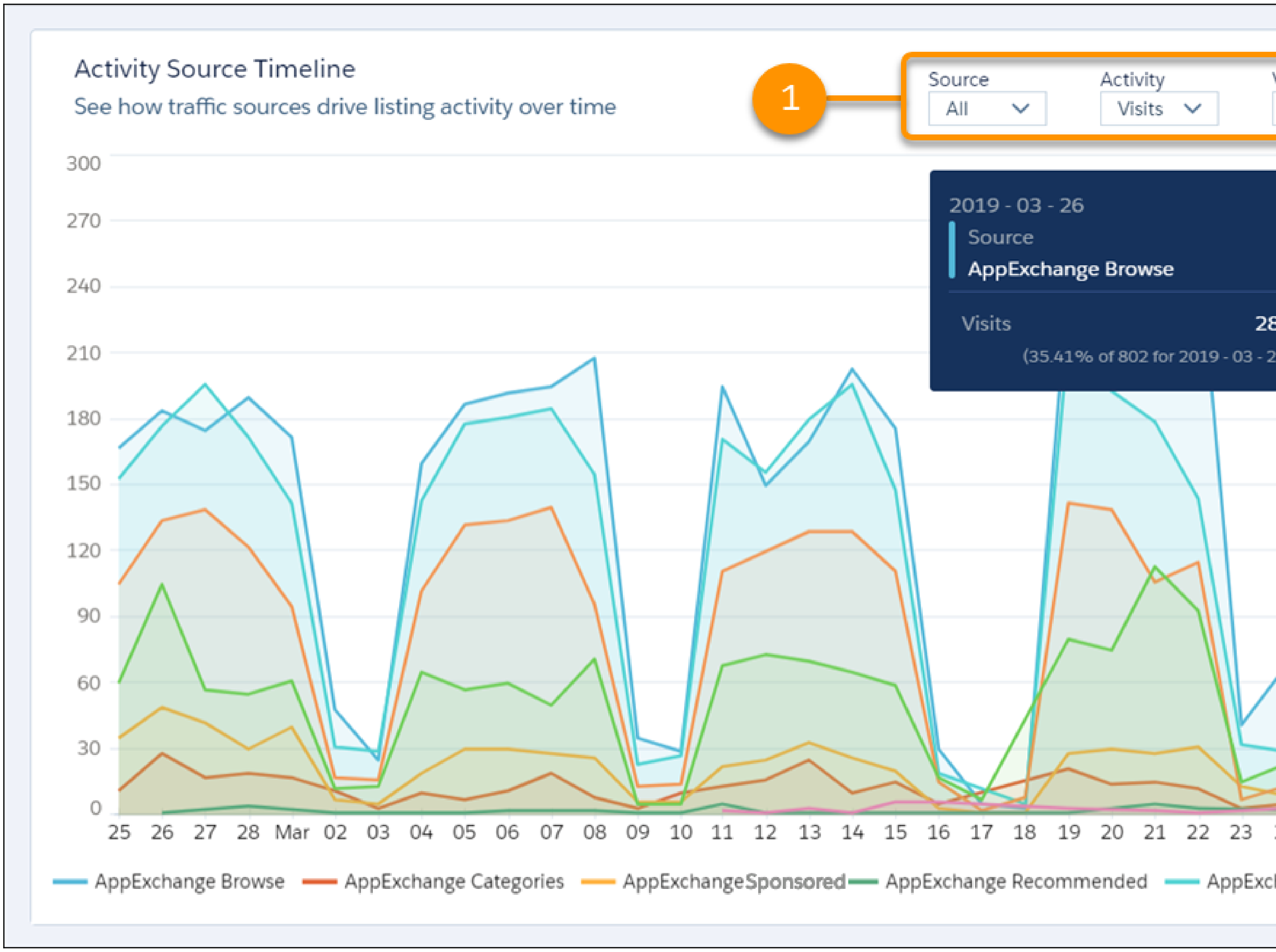
Activity Sources
See how traffic sources contribute to an activity on your AppExchange listing. Metric values are summed over a time period. If you want to see the number of activities during a specific day, week, month, or quarter, use the Activity Source Timeline instead.

Customer Engagement
See how customers interact with your listing and its resources over time. Resources include screenshots, demos, test drives, and other items that you've added to your listing in the Publishing Console.

Top AppExchange Searches
See the 10 search terms that result in the most activity on your listing. Only searches performed with the search bar on the AppExchange website are included. Search terms from external search engines aren't available.

Activity Source Timeline

See how internal and external traffic sources contribute to activity on your AppExchange listing over a specific time period. Internal traffic originates on the AppExchange website, such as a customer who clicks a personalized recommendation to reach your listing. External traffic originates outside of AppExchange, such as a customer who clicks a Facebook ad to reach your listing.



To change traffic sources, activities, and time scale, adjust the local filters (1). The visualization's y-axis resizes based on the traffic sources and activities that you select. To resize the x-axis, change the View By filter. To see the exact value of a metric, hover over a line in the chart (2).

If the visualization doesn't display data, try filtering by different metrics, or change the time period.

Definitions

Here's how we define the activity metrics.

Activity Metric	Description
Installs	Installs of your solution initiated on AppExchange, your website, or from a code repository. For AppExchange installs, we count the number of successful completions of the Get It Now installation flow. Includes installs in production and sandbox orgs.
Lead Events	Lead events on your listing, which include demos, test drives, and Get It Now clicks or installs. A customer who clicks Get It Now and installs your solution is counted as a single lead event.

Activity Metric	Description
Tile Hovers	Hovers over your listing tile. To qualify as a hover, the customer must pause long enough over the tile to display the listing detail popover. The count includes repeat hovers by the customer.
Tile Views	Views of your listing tile. To qualify as a view, the entire tile must be visible in the customer's browser. Includes any repeat views by the customer.
Visits	Visits to your listing. Includes repeat visits by the customer.

These internal traffic sources are associated with activities.

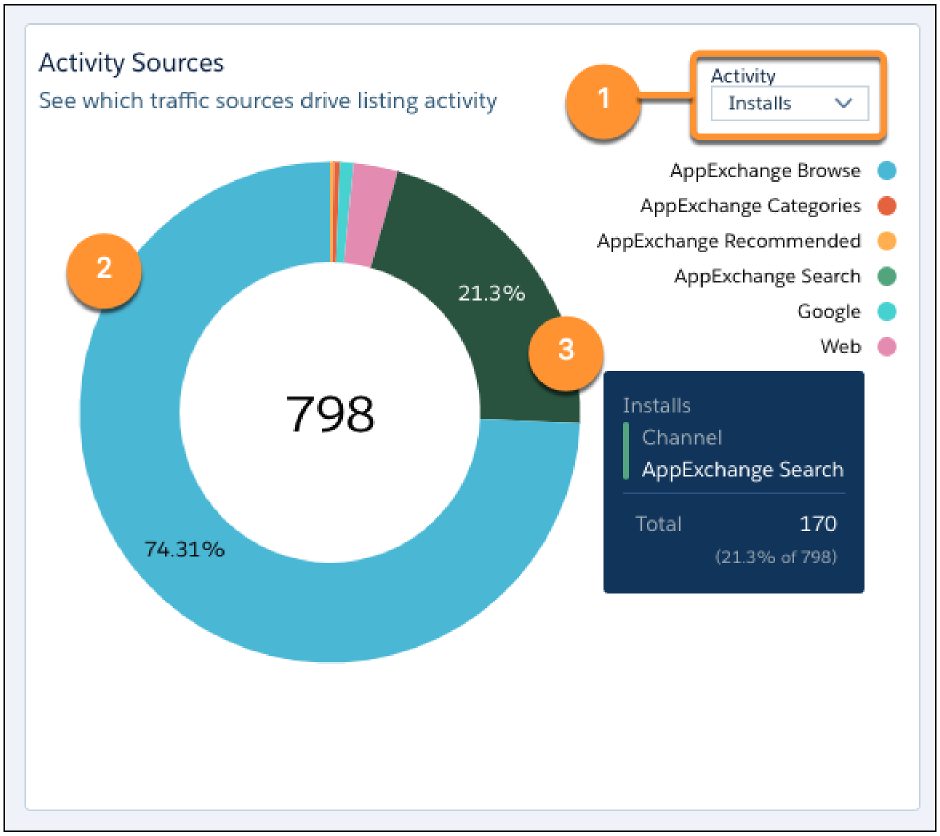
Internal Traffic Source	Description
AppExchange Browse	Activity by customers who reached your listing from areas of AppExchange that aren't included in other sources. For example, a customer who browses a Product Collection, an Industry Collection, or the AppExchange home page.
AppExchange Categories	Activity by customers who reached your listing from one of AppExchange's Solutions by Type categories.
AppExchange Sponsored	Activity by customers who reached your listing from AppExchange's Sponsored Solutions section.
AppExchange Recommended	Activity by customers who reached your listing from an AppExchange personalized recommendation. Includes Recommended for You and Appy's Picks for You.
AppExchange Search	Activity by customers who reached your listing from a search made using the AppExchange search bar.

These external traffic sources are associated with activities.

External Traffic Source	Description
Facebook	Activity by customers who reached your listing from a Facebook page or ad. Includes organic traffic and traffic from ads shown on the Facebook site or Facebook's Audience Network.
Google	Activity by customers who reached your listing from a Google search or ad. Includes organic search traffic and traffic from ads shown on the Google Search Network or Google Display Network.
Web	Activity by customers who reached your listing from a web source that isn't affiliated with Facebook or Google. Includes traffic from your company's website.

Activity Sources

See how traffic sources contribute to an activity on your AppExchange listing. Metric values are summed over a time period. If you want to see the number of activities during a specific day, week, month, or quarter, use the Activity Source Timeline instead.



Activity Sources

See which traffic sources drive listing activity

Activity: Installs

Installs
Channel
AppExchange Search
Total 170
(21.3% of 798)

To change activities, change the local filter (1). The percentage (2) within a chart segment represents the contribution of the traffic source to the activity's total. To see the exact value of a metric, hover over the chart segment (3).

If the visualization doesn't display data, try filtering by different metrics, or change the time period.

Definitions

Here's how we define the activity metrics.

Activity Metric	Description
Demos	Demo button clicks associated with the search term.
Installs	Installs associated with the search term. Qualifying installs include those initiated on AppExchange, your website, or from a code repository. For AppExchange installs, the number represents successful completions of the Get It Now installation flow, and includes installs in production and sandbox orgs.
Lead Events	Lead events associated with the search term. Lead events include demos, test drives, and Get It Now clicks or installs. A customer who clicks Get It Now and installs your solution is counted as a single lead event.
Test Drives	Test drive button clicks associated with the search term.
Visits	Unique listing visits associated with the search term.

These internal traffic sources are associated with activities.

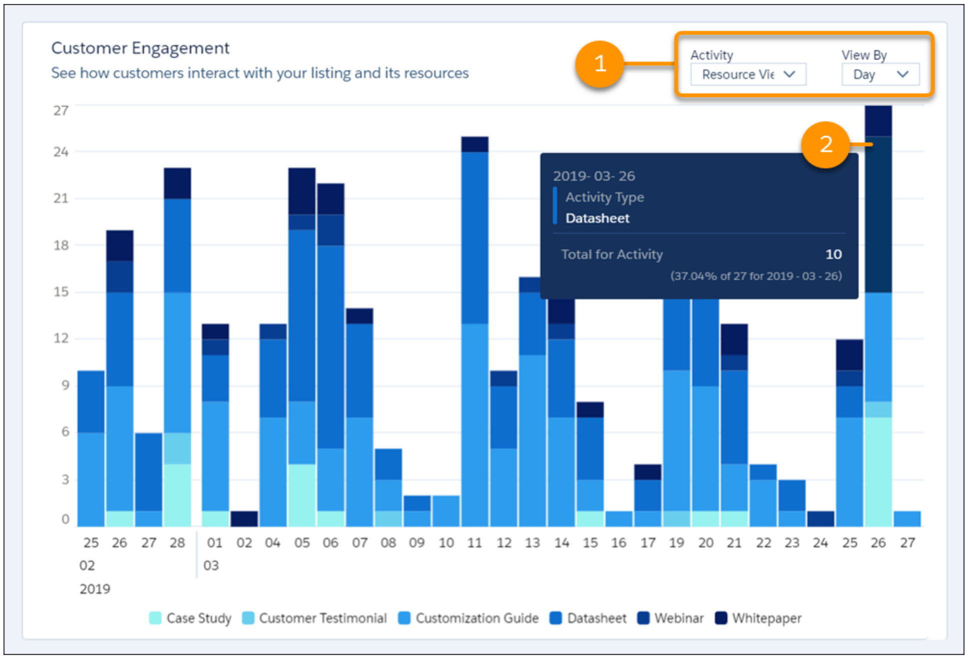
Internal Traffic Source	Description
AppExchange Browse	Activity by customers who reached your listing from areas of AppExchange that aren't included in other sources. For example, a customer who browses a Product Collection, an Industry Collection, or the AppExchange home page.
AppExchange Categories	Activity by customers who reached your listing from one of AppExchange's Solutions by Type categories.
AppExchange Sponsored	Activity by customers who reached your listing from AppExchange's Sponsored Solutions section.
AppExchange Recommended	Activity by customers who reached your listing from an AppExchange personalized recommendation. Includes Recommended for You and Appy's Picks for You.
AppExchange Search	Activity by customers who reached your listing from a search made using the AppExchange search bar.

These external traffic sources are associated with activities.

External Traffic Source	Description
Facebook	Activity by customers who reached your listing from a Facebook page or ad. Includes organic traffic and traffic from ads shown on the Facebook site or Facebook's Audience Network.
Google	Activity by customers who reached your listing from a Google search or ad. Includes organic search traffic and traffic from ads shown on the Google Search Network or Google Display Network.
Web	Activity by customers who reached your listing from any web source that isn't affiliated with Facebook or Google. Includes traffic from your company's website.

Customer Engagement

See how customers interact with your listing and its resources over time. Resources include screenshots, demos, test drives, and other items that you’ve added to your listing in the Publishing Console.



2019- 03- 26
Activity Type
Datasheet

Total for Activity 10
(37.04% of 27 for 2019 - 03 - 26)

To change activities and the time scale, change the filters (1). The visualization's y-axis resizes based on the activities that you select. To resize the x-axis, change the View By filter. To see the exact value of a metric, hover over a chart segment (2).

If the visualization doesn't display data, try filtering by different metrics, or change the time period.

Definitions

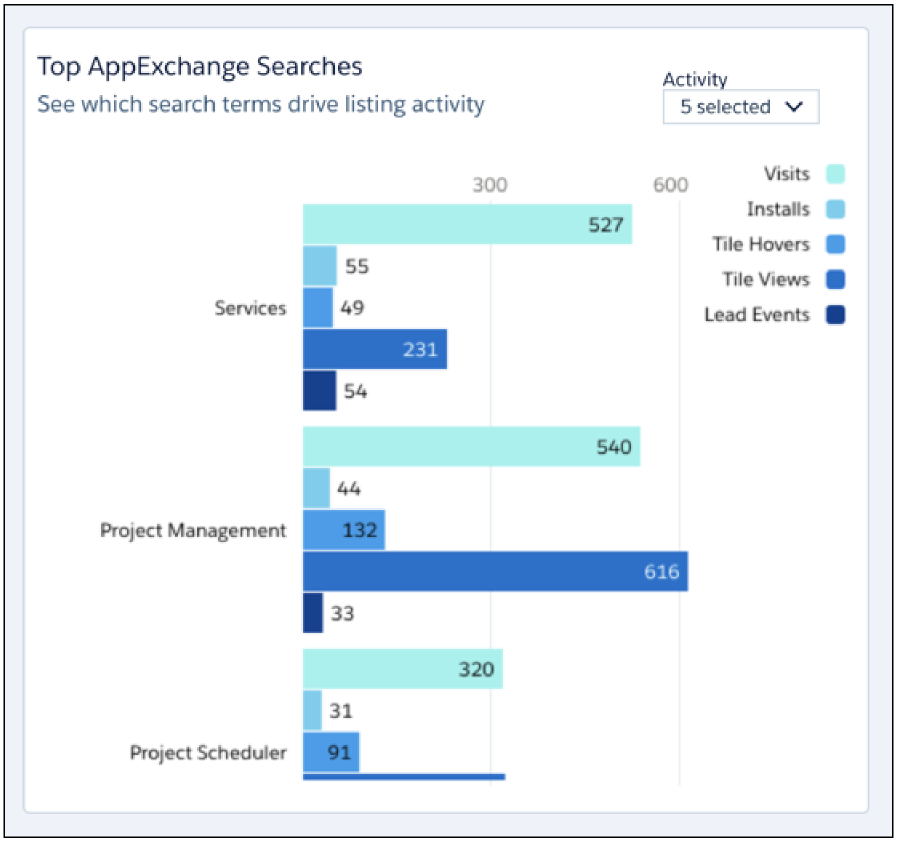
Here's how we define the activity metrics.

Activity Metric	Description
Case Studies	Views of your listing's case studies.
Customization Guides	Views of your listing's customization guides.
Data Sheets	Views of your listing's data sheets.
Demos	Clicks on your listing's Watch Demo button.
Get It Nows	Clicks on your listing's Get It Now button. Customers who click the button start the Get It Now installation flow, but might not complete it.
Tile Hovers	Hovers over your listing tile. To qualify as a hover, the customer must pause long enough over the tile to display the listing detail popover. Includes repeat hovers by the customer.
Installs	Installs of your solution initiated on AppExchange, your website, or from a code repository. For AppExchange installs, we count the number of successful completions of the Get It Now installation flow. Includes installs in production and sandbox orgs.
Lead Events	Lead events on your listing, which include demos, test drives, and Get It Now clicks or installs. A customer who clicks Get It Now and installs your solution is counted as a single lead event.
Saves	Clicks on your listing's Save button.

Activity Metric	Description
Screenshot *n*	Views of screenshot number *n*. This number corresponds to the number shown in the image carousel on your listing.
Test Drives	Clicks on your listing's Test Drive button.
Testimonials	Views of your listing's testimonials.
Tile Views	Views of your listing tile. To qualify as a view, the entire tile must be visible in the customer's browser. Includes repeat views by the customer.
Webinars	Views of your listing's webinars.
White Papers	Views of your listing's white papers.
Visits	Visits to your listing. Includes repeat visits by the customer.

Top AppExchange Searches

See the 10 search terms that result in the most activity on your listing. Only searches performed with the search bar on the AppExchange website are included. Search terms from external search engines aren't available.



Top AppExchange Searches

See which search terms drive listing activity

Activity: 5 selected

Select the activities that you want to view (1). The search term (2) associated with the activities appears on the left of the chart. Activity metric values appear on the right (3).

Depending on your filter selections, some search terms might not be visible. To see all available search terms, position your pointer over the visualization and scroll down.

If the visualization doesn’t display data, try filtering by different metrics, or change the time period.

Definitions

Here’s how we define the activity metrics.

Activity Metric	Description
Installs	Installs of your solution initiated on AppExchange, your website, or from a code repository. For AppExchange installs, we count the number of successful completions of the Get It Now installation flow. Includes installs in production and sandbox orgs.
Lead Events	Lead events on your listing, which include demos, test drives, and Get It Now clicks or installs. A customer who clicks Get It Now and installs your solution is counted as a single lead event.
Tile Hovers	Hovers over your listing tile. To qualify as a hover, the customer must pause long enough over the tile to display the listing detail popover. Includes any repeat hovers by the customer.
Tile Views	Views of your listing tile. To qualify as a view, the entire tile must be visible in the customer's browser. Includes any repeat views by the customer.
Visitors	Unique listing visitors. If a customer visits your listing more than once in a 30-day period, only a single visitor is counted.

Marketplace Analytics CSV Files

You can export data from the Marketplace Analytics dashboard in comma-separated value (.csv) format. When you export data, Marketplace Analytics creates a separate .csv file for each dashboard visualization and packages all the files in a .zip file.

We format .csv files as follows.

- The first row is the header and provides column names. Subsequent rows represent records.
- Within rows, values are separated by commas.
- Negative values are prefixed with a minus sign.

Activity Source Timeline File

Provides data from the Activity Source Timeline visualization with your global and local filter selections applied.

Example: This example shows the header row and four rows of sample data. The following filters were applied.

- Global filter set to show data for the last 30 days.
- Local filters set to show visits by day for these traffic sources: AppExchange Featured and AppExchange Search.

```
Date,Source,Activity,Count of Activity
2019-01-01,AppExchange Featured,Visits,25
2019-01-01,AppExchange Search,Visits,50
2019-01-02,AppExchange Featured,Visits,30
2019-01-02,AppExchange Search,Visits,60
```

Customer Engagement File

Provides data from the Customer Engagement visualization with your global and local filter selections applied.

Example: This example shows the header row and 4 rows of sample data. The following filters were applied.

- Global filter set to show data for the last 30 days.
- Local filters set to show resource views by day.

```
Date,Activity,Count of Activity
2019-01-01,Customization Guide,10
2019-01-01,Datasheet,20
2019-01-02,Customization Guide,20
2019-01-02,Datasheet,40
```

Activity Sources File

Provides data from the Activity Sources visualization with your global and local filter selections applied.

Example: This example shows the header row and four rows of sample data. The following filters were applied.

- Global filter set to show data for the last 30 days.
- Local filter set to show visits.

```
Source,Activity,Count of Activity,Percentage of Total Activity,Rank
AppExchange Browse,Visits,500,20.41,1
AppExchange Categories,Visits,450,18.37,2
AppExchange Search,Visits,400,16.33,3
AppExchange Recommended,350,14.29,4
```

Note: For brevity, this sample shows only four traffic sources: AppExchange Browse, AppExchange Categories, AppExchange Search, and AppExchanged Recommended. The file that you export from your dashboard provides all traffic sources.

Top AppExchange Searches File

Provides data from the Top AppExchange Searches visualization with your global and local filter selections applied.

Example: This example shows the header row and four rows of sample data. The following filters were applied.

- Global filter set to show data for the last 30 days.
- Local filters set to show the top search terms associated with visits and demos.

```
Search Term,Activity,Count of Activity
Geolocation,Visits,50
Geolocation,Demos,40
Maps,Visits,30
Maps,Demos,20
```

Lead Events in Marketplace Analytics

Learn how we define lead events for your AppExchange listing and how they differ from the leads that appear in your Salesforce org.

Marketplace Analytics records a lead event when a customer visits your listing and:

- Watches a demo.

- Takes a test drive.
- Clicks Get It Now and installs your solution.

If you've configured Web-to-Lead and enabled lead collection for the listing, each of these activities also creates a lead in your org. However, custom lead routing rules that you set up can cause the number of leads in your org to differ from the number of lead events shown in Marketplace Analytics. Typically, these rules are designed to prevent duplicate or unwanted leads from reaching your sales team. Here are some common examples.

Lead Routing Rule	Example
Domain Restriction You filter leads from customers whose email address includes your company's domain.	An employee at your company watches your listing's demo video and uses a company email address when AppExchange asks for contact information. In this scenario, Marketplace Analytics records a lead event, but the lead routing rule filters the lead in your org.
Duplicate Email Addresses You filter leads associated with an email address that's been captured in an existing lead.	A new customer goes to your listing and watches a video, takes a test drive, and installs your solution. For each activity, the customer provides the same email address. In this scenario, Marketplace Analytics records three lead events: one for each activity. In your org, the lead routing rule creates a lead for the first activity. The others are marked as duplicates because they're associated with the same email address.

Get Started with the Marketplace Analytics Dashboard

View the Marketplace Analytics dashboard to see how your AppExchange listing is performing. To allow team members to view the dashboard, assign them permission in the Partner Community. To explore data outside of the dashboard, export it. To give feedback about the dashboard, use the Marketplace Analytics feedback tool.

Grant Access to the Marketplace Analytics Dashboard

The Manage Listings permission provides access to the Marketplace Analytics dashboard. Assign this permission to the people on your team who monitor the performance of your AppExchange solution.

View an AppExchange Listing in the Marketplace Analytics Dashboard

You can check how an AppExchange listing is performing in the Marketplace Analytics dashboard.

View the Marketplace Analytics Glossary

To see definitions for activity metrics and traffic sources, open the Marketplace Analytics glossary.

Export Data from the Marketplace Analytics Dashboard

To explore Marketplace Analytics data outside of the dashboard, export it. Data is exported in comma-separated value (.csv) format with your global and local filter selections applied.

Give Feedback About Marketplace Analytics

To give feedback about Marketplace Analytics, use the dashboard's feedback tool. Tell us what's working well, what we can improve, or anything else you'd like to share about your experience.

Grant Access to the Marketplace Analytics Dashboard

The Manage Listings permission provides access to the Marketplace Analytics dashboard. Assign this permission to the people on your team who monitor the performance of your AppExchange solution.

Note: The Manage Listings permission provides access to all Publishing Console features, including the ability to create, edit, and publish listings. We suggest assigning the permission to the people on your team who also manage your company's AppExchange listing.

1. Log in to the Salesforce Partner Community.
2. Click **Manage Users**.
3. Search for a user at your company.
4. Under Listings, select the checkbox.

USER PERMISSIONS

To assign permissions to Partner Community users:

- Manage Users

View an AppExchange Listing in the Marketplace Analytics Dashboard

You can check how an AppExchange listing is performing in the Marketplace Analytics dashboard.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Analytics**.
4. Select the listing to view.

USER PERMISSIONS

To view Marketplace Analytics:

- Manage Listings

View the Marketplace Analytics Glossary

To see definitions for activity metrics and traffic sources, open the Marketplace Analytics glossary.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Analytics**.
4. Click ?.

USER PERMISSIONS

To view Marketplace Analytics:

- Manage Listings

Export Data from the Marketplace Analytics Dashboard

To explore Marketplace Analytics data outside of the dashboard, export it. Data is exported in comma-separated value (.csv) format with your global and local filter selections applied.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Analytics**.
4. Select a listing, and choose the time period.
5. For each visualization, select activity metrics and, if available, change the time scale.
6. Click ⤓, and then click **Export**.

USER PERMISSIONS

To view Marketplace Analytics:

- Manage Listings

Give Feedback About Marketplace Analytics

USER PERMISSIONS

To view Marketplace Analytics:

- Manage Listings

To give feedback about Marketplace Analytics, use the dashboard's feedback tool. Tell us what's working well, what we can improve, or anything else you'd like to share about your experience.

1. Log in to the Salesforce Partner Community.
2. Click **Publishing**.
3. Click **Analytics**.
4. Click **Feedback**.
5. Share your feedback about the dashboard, and then click **Give Feedback**.

Marketplace Analytics FAQs

Here are some answers to frequently asked questions about Marketplace Analytics.

Can I grant access to the Marketplace Analytics dashboard but not other publishing features?

No. The Manage Listings permission provides access to all features in the Publishing Console. We suggest assigning this permission to the people on your team who also manage your company's AppExchange listing.

What's the earliest date that Marketplace Analytics data is available for?

Marketplace Analytics data dates back to August 2019.

Is aggregate data for all AppExchange listings available in Marketplace Analytics?

No. You can view only the data that's associated with your published AppExchange listings.

Is there a Marketplace Analytics API?

No. However, you can export data from the Marketplace Analytics dashboard. To export data, go to the dashboard and click ⤓.

Why doesn't data appear in my Marketplace Analytics activity summary or visualization?

Typically, this happens when Marketplace Analytics can't find data for the selected time period or activity metric. Try filtering by different metrics, or change the time period.

Can I view my consulting service listing in the Marketplace Analytics dashboard?

Yes. Marketplace Analytics supports all listing types, including consulting service listings. If your listing doesn't have a managed package, some activity metrics, such as installs, won't have data.

How often is Marketplace Analytics data updated?

Marketplace Analytics data is updated once per day.

Can I switch to the classic version of the Marketplace Analytics dashboard?

No. We've retired the classic version of the dashboard. To share feedback with us about the latest version of the dashboard, use the Marketplace Analytics feedback tool.

Can I customize Marketplace Analytics visualizations?

From the global filter menu, you can adjust the time period shown in visualizations. Within a visualization, you can choose the activity metrics that display and, for certain visualizations, time period scale. You can't modify the layout of the dashboard or change the appearance of individual visualizations.

Can I import data into the Marketplace Analytics dashboard?

No. To use Marketplace Analytics data with an external dataset, use the dashboard's export tool. To export your data, go to the dashboard and click ⤓.

Does Marketplace Analytics change how customers experience my listing?

No. Marketplace Analytics doesn't affect how customers browse, search for, or interact with listings on AppExchange.

Why doesn't the sum of installs, demos, and test drives match the number of leads in Marketplace Analytics?

Typically, this happens when Web-to-Lead isn't set up in your org or when Web-to-Lead isn't configured correctly. To learn more about Web-to-Lead, search for "Generate Leads from Your Website for Your Sales Teams" in Salesforce Help.

What's the difference between a Get It Now click and an install?

The AppExchange installation process has several steps. To start the installation process, a customer clicks **Get It Now** on a listing. Marketplace Analytics records this interaction as a Get It Now click. Next, the customer chooses a destination for the package and agrees to our terms and conditions. Then, the customer clicks **Confirm and Install**. Marketplace Analytics records this interaction as an install.

AppExchange App Analytics

AppExchange App Analytics provides usage data about how subscribers interact with your AppExchange solutions. You can use these details to identify attrition risks, inform feature development decisions, and improve user experience.

Note: AppExchange App Analytics is subject to certain usage restrictions as described in the AppExchange Program Policies.

Consistent with Salesforce's commitment to customer trust, AppExchange App Analytics doesn't expose customer data to AppExchange Partners. App Analytics data is exclusively usage-related data. Any potentially sensitive data is tokenized or redacted.

App Analytics is available for managed packages that have passed security review and are registered to a License Management App. Usage data is provided as log files or month-based usage summaries. Both log files and monthly summaries are downloadable comma-separated value (.csv) files. To view the data in dashboard or visualization format, use Einstein Analytics or a third-party analytics tool.

Request AppExchange App Analytics

To request access to AppExchange App Analytics, log a case in the Salesforce Partner Community.

Download Package Log Files and Usage Summaries

To request package log files and monthly usage summaries, use AppAnalyticsQueryRequest in SOAP API. Log files and usage summaries are downloadable comma-separated value (.csv) files.

Managed Package Usage Summaries

Managed package usage summaries provide high-level metrics per calendar month. Use the custom object usage summary to discover how many users are accessing your custom object and which operations they're performing.

Managed Package Log Files

Analyze adoption, user behavior, and inform feature development decisions using data from managed package log files. AppExchange App Analytics tracks UI and API-based operations and logs each CRUD operation on custom objects in managed packages. Events from sandbox and developer orgs aren't tracked.

Request AppExchange App Analytics

To request access to AppExchange App Analytics, log a case in the Salesforce Partner Community.

Note: AppExchange App Analytics is subject to certain usage restrictions as described in the AppExchange Program Policies.

1. Log in to the Salesforce Partner Community.
2. Click **Support**.
3. Click **New Case**.
4. Select **Other AppExchange Topics** > **Create a Case**.
5. Select **Enable App Analytics**.
6. Specify the package IDs that you want to track analytics data for.

We review your case and notify you when App Analytics is enabled.

Download Package Log Files and Usage Summaries

To request package log files and monthly usage summaries, use AppAnalyticsQueryRequest in SOAP API. Log files and usage summaries are downloadable comma-separated value (.csv) files.

To request access to AppExchange App Analytics, log a case in the Salesforce Partner Community.

Then determine which team members need CRUD access to the AppAnalyticsQueryRequest object, and consider creating a permission set for them. By default, admins have the permissions required to request package log files and usage summaries using the AppAnalyticsQueryRequest object.

Note: AppExchange App Analytics is subject to certain usage restrictions as described in theAppExchange Program Policies.

1. Log into the License Management Org (LMO) that the managed package is registered to.
2. From the LMO, complete the required fields in the AppAnalyticsQueryRequest in SOAP API.
3. Retrieve the App Analytics Query Request object created in the API request. The `DownloadURL` field populates once the request is completed.
4. Click the URL in the `DownloadURL` field in the App Analytics Query Request object, and download the .csv file.

   Note: The download URL expires after 15 minutes.

Managed Package Usage Summaries

Managed package usage summaries provide high-level metrics per calendar month. Use the custom object usage summary to discover how many users are accessing your custom object and which operations they're performing.

Note: AppExchange App Analytics is subject to certain usage restrictions as described in the AppExchange Program Policies.

AppExchange App Analytics tracks UI and API-based operations and logs each CRUD operation on custom objects in managed packages. Events from sandbox and developer orgs aren't tracked. Events from trial orgs aren't included in managed package usage summaries.

Managed package usage data is available to both partners and subscribers. Usage summaries become available at the beginning of the subsequent month. For example, the usage summary for May is available in the beginning of June.

- AppExchange Partners can request monthly usage summaries using the AppAnalyticsQueryRequest in SOAP API from the license management org that owns the package.
- Subscribers can download usage summaries from Setup for any managed package that they've installed that passed security review.

Custom Object Usage Summary
Use the custom object usage summary to discover how many users are accessing your custom object and which operation they're performing.

Custom Object Usage Summary

Use the custom object usage summary to discover how many users are accessing your custom object and which operation they're performing.

Field	Description
custom_entity	The developer name of the custom object.
custom_entity_type	The type of managed element or custom object that the user viewed or manipulated. Examples: • `CustomObject` • `LightningPage` • `LightningComponent` • `VisualforcePage`
managed_package_namespace	Namespace of the managed package.
month	The month that this usage summary applies to in YYYY-MM format. Example: `2019-03`.
num_creates	The number of new records created from the custom object.
num_deletes	The number of deleted records associated with the custom object.
num_reads	The number of records associated with the custom object that were read.
num_updates	The number of records associated with the custom object that were updated.
num_views	The count of times the managed element or page has been viewed.
organization_id	The 15-character ID of the subscriber org.
package_id	The ID of the managed package.
user_id_token	The hashed token representing the ID of the user who accessed the custom object. The ID persists over time, and across any packages that the user interacts with. The user ID token starts with the prefix 005-.
user_type	The user license category of the user accessing Salesforce services through the UI or API. Examples: • `Guest` • `Partner` • `Standard`

Managed Package Log Files

Analyze adoption, user behavior, and inform feature development decisions using data from managed package log files. AppExchange App Analytics tracks UI and API-based operations and logs each CRUD operation on custom objects in managed packages. Events from sandbox and developer orgs aren't tracked.

Note: AppExchange App Analytics is subject to certain usage restrictions as described in the AppExchange Program Policies.

In a 24-hour period, you can request a maximum of 7 days of log files.

Custom Object Usage Logs

Inform feature development decisions using data from custom object usage log files. Analyze adoption, user behavior, company information, and Lightning app and page usage data. Usage logs list activity during a 24-hour period, between 12:00 AM to 11:59 PM UTC time.

Custom Object Usage Logs

Inform feature development decisions using data from custom object usage log files. Analyze adoption, user behavior, company information, and Lightning app and page usage data. Usage logs list activity during a 24-hour period, between 12:00 AM to 11:59 PM UTC time.

Field	Description
`api_type`	The type of API request. Examples: • `E`: SOAP Enterprise • `O`: Old SOAP • `P`: SOAP Partner • `X`: XmlRPC • `REST`: REST
`api_version`	The version of the API that's being used. Example: `45.0`.
`app_name`	The name of the Lightning application the user accessed. Examples: • `one:one` • `FieldServiceApp` • `Chatter`
`custom_entity`	The developer name of the custom object.
`custom_entity_type`	The type of managed element or custom object that the user viewed or manipulated. Examples: • `CustomObject` • `LightningComponent` • `LightningPage` • `VisualforcePage`
`http_method`	The type of HTTP request method. Example: `GET`.
`http_status_code`	The HTTP response status code. Example: 404.
`login_key`	The hashed string that ties together all events in a given user's login session. The session starts with a login event and ends with either a logout event or the session expiring. All log lines with the same login key occurred during the same user login session.

Field	Description
`log_record_type`	Type of log record. Examples: - `API` - `RestAPI` - `URI` - `VisualforceRequest`
`managed_package_namespace`	Namespace of the managed package.
`num_fields`	Number of fields accessed by the user in this transaction.
`operation_count`	The number of records accessed by the user in this transaction.
`operation_type`	The operation performed on the custom object. Examples: - `INSERT` - `READ` - `UPDATE` - `DELETE`
`organization_country_code`	The ISO-3166 two character country code corresponding to the subscriber org's address at the time of sign-up. Examples: - `US` - `CA` - `FR`
`organization_edition`	The name of the Salesforce edition the subscriber org is using. Examples: - `Developer Edition` - `Enterprise Edition` - `Unlimited Edition`
`organization_id`	The 15-character ID of the subscriber org.
`organization_instance`	The name of the subscriber org's instance. Examples: - `AP2` - `EU7` - `NA44`

Field	Description
`organization_language_locale`	The two to five character code that represents the language and locale ISO-639 code of the subscriber org. This code controls the language for the labels displayed in an application. Examples: - `de-DE` - `en-US` - `fr-CA`
`organization_status`	The paid status of the subscriber org. Examples: - `Active` - `Demo` - `Trial`
`organization_time_zone`	The default time zone of the subscriber org. Examples: - `America/New York` - `America/Los Angeles` - `Europe/Paris`
`package_id`	The ID of the managed package.
`package_version_id`	The ID of the managed package version.
`page_app_name`	The internal name of the Lightning application that the user accessed from the App Launcher. Examples: - `LightningSales` - `Chatter`
`page_context`	The context of the Lightning page where the event occurred. Example: `clients:cardContainer`.
`page_entity_type`	The Lightning entity type of the event. Examples: - `Contact` - `Task`
`page_url`	The relative URL of the top-level Lightning Experience or Salesforce mobile app page that the user accessed. The page can contain one or more Lightning components. Multiple record IDs can be associated with page_url. Example: `/sObject/0064100000JXITSASS/view`

Field	Description
`parent_ui_element`	The parent scope of the Lightning page element where the event occurred. Example: `ChatterFeed`.
`prevpage_url`	The relative URL of the previous Lightning Experience or Salesforce mobile app page that the user opened. Example: `/sObject/0064100000`
`referrer_uri`	The referring URI from the HTTP request. URIs are redacted in the following ways. • Query strings are removed. • User IDs display as hashed tokens. • Subscriber-created URIs, such as VisualForce pages, are removed.
`related_list`	A section of a record or other detail page that lists items related to that record. Examples • Open Activities • Stage History
`request_id`	The ID of the HTTP request made to the server by the browser. If multiple log lines have the same request ID, they all occurred as part of the same user interaction.
`request_size`	The size of the callout request body, in bytes.
`request_status`	The status of the HTTP request for the page or action that accesses a custom object in a managed package. Examples: • `A` = Auth Error • `F` = Failure • `N` = 404 error • `R` = Redirect • `S` = Success • `U` = Undefined
`response_size`	The size of the callout response, in bytes.
`rows_processed`	The number of rows that were processed in the request.
`session_key`	The HTTP session ID for the HTTP request to access a custom object in a managed package. The session ID is hashed.
`target_ui_element`	The Lightning target page element where the event occurred. Examples: • `label body truncate` • `tabitem-link`
`timestamp_derived`	The access time of a custom object in a managed package in ISO8601-compatible format (YYYY-MM-DDTHH:MM:SS.sssZ). Example: `2018-07-27T11:32:59.555Z`.

Field	Description
ui_event_sequence_num	An auto-incremented sequence number of the current Lightning event since the session started.
ui_event_source	The user action on the Lightning record or records. This value indicates whether the user's action was on a single record or multiple records. For example, read indicates that one record was read (such as on a record detail page). On the other hand, reads indicates that multiple records were read (such as in a list view). Examples: • click • create • delete • hover • read • update
ui_event_type	The type of Lightning event. Examples: • crud • system • user
url	The redacted URL of the request to access a custom object in a managed package. URLs are redacted in the following ways. • Query strings are removed. • User IDs display as hashed tokens. • Subscriber-created URIs, such as VisualForce pages, are removed. For Lightning-based URLs, only "/aura" is displayed. For Visualforce-based URLs that aren't pages owned by the managed package, either "/apex" or "/apexrest" is displayed.
user_agent	The browser and operating system of the device used to make the request. Examples: • Mozilla/5.0 (iPhone; CPU iPhone OS 12_0 like Mac OS X) AppleWebKit/605.1.15 (KHTML, like Gecko) CriOS/69.0.3497.105 Mobile/15E148 Safari/605.1 • Mozilla/5.0 (Linux; Android 8.0.0; SM-G960F Build/R16NW) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/62.0.3202.84 Mobile Safari/537.36
user_id_token	The hashed token representing the ID of the user who accessed the custom object. The ID persists over time and across any packages that user interacts with. The user ID token starts with the prefix 005-.
user_type	The user license category of the user accessing Salesforce services through the UI or API. Examples:

Field	Description
	- `Guest` - `Partner` - `Standard`

CHAPTER 10 Manage Orders

In this chapter ...

Create, manage, and submit orders to the Partner Operations team with the Channel Order App (COA). If you're an OEM partner, you can use the COA to provision Salesforce licenses and for revenue sharing. If you're an ISVforce partner, you can use the COA for revenue sharing.

The COA is pre-installed in your Partner Business Org, but before you use it, you must complete the training offered by the Partner Operations team. Acquire your Partner Business Org, pass the solution security review, and then sign up for COA training.

To sign up, log a case in the Partner Community. For the case topic, select **Channel Order Application (COA)**, and then select **Create a Case**.

Note: Submit orders based on the sales and licensing of your solutions to customers, as required by your partner agreement.

Channel Order App

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

When a customer buys your AppExchange product or requests changes to a subscription, submit an order with the Channel Order App (COA). After Salesforce receives your order, we activate or provision the product in the customer's org and invoice you based on the terms of your partnership agreement.

Note: The COA is available in English to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

With the COA, you can:

- Submit initial orders for new customers
- Submit add-on, upgrade, renewal, reduction, and cancellation orders for existing customers
- Edit, recall, and clone orders that you've submitted
- Delete order drafts
- View details about your customers, such as order history

To comply with your revenue-sharing agreement, submit an order after every customer transaction. The information that you provide keeps our records up-to-date and ensures that the invoices you receive are accurate. For questions about your agreement, log a case in the Partner Community.

Tip: If you're a new AppExchange partner, stop by Trailhead and earn the Channel Order App Basics badge before you get started with the COA. You'll learn how order submission fits into the partnership experience and have an opportunity to test your knowledge.

Channel Order App Objects

Before you start working with the Channel Order App (COA), learn about the app's objects. Understanding what the objects contain makes it easier to create accurate orders that are processed quickly by Salesforce.

Name	Description
Customer	Contains details about a customer who's purchased your product, such as the billing address and Salesforce org ID.

Name	Description
	When you create an initial order in the order submission wizard, the COA creates a customer record using the customer information that you provide.
Partner Product Catalog	Contains a product in your catalog that you can sell to customers. For example, more API calls or an increase in storage in the customer's org. Salesforce configures the products in your catalog based on your partnership agreement. During setup, you import your catalog to the COA. Unless permitted by your agreement, you can't edit your product catalog.
Partner Contract Terms	Contains the contract terms that apply to a product. For example, the default length of a contract and how often a customer is billed. Salesforce configures contract terms based on your partnership agreement. During setup, you import the terms to the COA. Unless permitted by your agreement, you can't edit your contract terms.
Service Order	Contains information about an order that you're submitting to Salesforce. For example, the date the customer signed the Salesforce agreement. When you create an order in the order submission wizard, the COA creates a service order automatically.
Service Order Detail	Contains deal-specific information about a product line item on an order. For example, the number of licenses the customer is buying and the price per license. When you add products to an order in the order submission wizard, the COA configures service order details automatically. You can't access service order detail records directly unless you submit orders with the Channel Order Apex API.

To understand how these objects fit together, let's look at an example.

You sell a human resources app on AppExchange, and a new customer decides to buy some licenses. After you work out the terms of the purchase with the customer, you use the License Management App (LMA) to provision the licenses in their org. Then you submit an order in the COA to tell Salesforce about the sale.

1. On the Service Orders tab, you launch the order submission wizard. The COA creates a service order record.
2. You provide details about the customer, like the billing address. The COA uses these details to create a customer record. In the future, if the customer requests changes to the subscription, you can look up and reuse the details that you provided.
3. You select the contract terms that apply to the order. The COA looks up the corresponding partner contract terms record.
4. You select the product from your catalog that you sold. The COA looks up the corresponding partner product catalog record.
5. You tell us how many licenses you sold and for how much. The COA configures the service order details for the order.
6. You select a start date, review the order, and submit it to Salesforce for invoicing. The COA adds the service order record to the list of existing orders.

Other Channel Order App Objects

Salesforce uses other objects to help process and manage your orders or to assist with debugging. Most of the time, you don't see or interact with these objects.

Name	Description
Customer Order Product History	Contains deal-specific information about an active product on an order, along with the corresponding customer details. After Salesforce activates or provisions an order, we create a customer order product history record for each product on the order. These records become part of the customer's order history, which includes all active products associated with the customer. You can't access customer order product history records directly. To see a customer's order history, open the customer record in the COA and go the Products related list.
Partner Pricebook Entry	Contains one or more products from a catalog. Salesforce uses partner pricebook entries to organize your product catalog. Unless you receive instructions from us, don't modify the partner pricebook entries in your org.
Service Order Log	Stores information about the performance of the COA for debugging purposes. Salesforce uses service order logs to troubleshoot issues with the COA. Unless you receive instructions from us, don't modify the service order logs in your org.

Order Types

When you create an order in the Channel Order App (COA), you choose an order type that tells Salesforce how to process the products on the order. Learn how to select the correct type based on your customer's needs.

Note: Your agreement with Salesforce determines the order types available to you. You might not be able to submit every order type.

Order type reflects the stage of your relationship with the customer: beginning, middle, or end. Order type also determines when we activate or provision the order for the customer.

Type	Stage	Use To	Effective Date
Initial	Beginning	Submit a first order for a new customer.	The service start date you specify on the order.
Add On	Middle	Add products or increase the number of licenses on a customer contract.	The service start date you specify on the order.
Upgrade	Middle	Increase the quantity and price of licenses mid-contract, or upgrade a customer to a higher-priced product mid-contract.	The service start date you specify on the order.
Reduction	Middle	Remove products, or decrease the number of licenses on a customer contract.	The customer's contract renewal date. Notify Salesforce of the reduction according to the terms of your partnership agreement,

Type	Stage	Use To	Effective Date
			usually at least 30 days before a contract renews. You can't submit a reduction order within 5 days of a contract renewal date.
Renewal	Middle	Renew a contract that isn't set to auto-renew, or change the price of existing products on contract renewal.	The customer's contract renewal date.
Cancellation	End	End a contract with a customer and cancel all products. A cancellation order permanently removes your products from the customer's org.	The customer's contract renewal date. Notify Salesforce of the cancellation according to the terms of your partnership agreement, usually at least 30 days before a contract renews. You can't submit a cancellation order within 5 days of a contract renewal date.

Order Status

After you create an order in the Channel Order App (COA), Salesforce assigns an order status to help you track progress and, if needed, resolve issues. Order status also determines the actions you can perform on an order, like editing or cloning.

Here's how we assign order status.

Status	Assigned When
Draft	You save your order, but don't submit it to Salesforce. After you create, clone, or recall an order, its status is Draft by default.
Received	Salesforce receives your order, but hasn't started processing it. You have 2 hours from the time Salesforce receives the order to recall it and edit products, license quantities, and pricing.
In Process	Salesforce is reviewing and processing your order.
Activated	Salesforce has processed your order and is ready to invoice you for revenue sharing. This status applies to: • ISVforce orders that don't provision licenses in a customer's org • Processed OEM orders that have a future start date • All OEM and ISVforce cancellation and reduction orders
Provisioned	Salesforce has processed your order, provisioned licenses in the customer's org, and is ready to invoice you for revenue sharing. This status applies only to OEM orders that provision licenses in the customer's org.

Status	Assigned When
Error	Salesforce encounters an issue that prevents us from processing your order. We return the order and ask you to fix the issue before resubmitting.

Order status determines what you can do with the order. Here are the actions that you can perform for each order status.

	Possible Actions				
Order Status	**Edit**	**Recall**	**Delete**	**Submit**	**Clone**
Draft	*		*	*	*
Received	*	*			*
In Process					*
Activated					*
Provisioned					*
Error					*

Channel Order App Permission Sets

You control access to the Channel Order App (COA) with the COA User and COA Admin user permission sets. The permission sets determine how users can interact with objects and features in the COA. Learn how to assign the correct permission set based on a user's role on your team.

Permission Set	Users Can	Assign To
COA User	Create and manage customers. Submit, edit, recall, and clone orders, and delete order drafts. View COA custom objects.	Team members who submit and manage customer orders.
COA Admin User	Create and manage customers. Submit, edit, recall, and clone orders, and delete order drafts. Configure whether orders are sent to Salesforce or a test environment. Modify COA custom objects.	Team members who administer the COA and whose role includes these tasks: • Setting up the COA • Assigning access to the COA • Building custom integrations using COA objects • Serving as the context user for the COA email service

Set Up the Channel Order App

Install the Channel Order App (COA) and get it ready to sync your product data from Salesforce. After the app is configured, provide access to the right people on your team by assigning permission sets. Then configure a tab to display customer information, such as order history and related products.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

1. Install the Channel Order App

   Install the Channel Order App (COA) in the Salesforce org where you manage licenses for your products, usually your Partner Business Org. If you're an existing partner and the COA is already installed in your org, you don't need to reinstall the app to receive upgrades. Salesforce pushes new versions of the app to your org.

2. Assign Permission Sets to Channel Order App Users

   Assign a Channel Order App (COA) permission set to give team members access to the app. Assign the COA User permission set to users who submit and manage customer orders. Assign the COA Admin User permission to users who need full access to the app's objects and features, including the ability to set up a connection to Salesforce.

3. Define a Channel Order App Email Service

   After you assign Channel Order App (COA) permission sets, define an email service to make your org ready to sync your product catalog.

4. Connect the Channel Order App to Salesforce

   After you install the Channel Order App (COA), connect the app to Salesforce and import your product catalog. Your product catalog includes the products that you can sell and the contract terms that apply to your orders. After the connection is configured, Salesforce pushes catalog updates to your org.

5. Display Customers in the Channel Order App

   After you install the Channel Order App (COA), create a custom tab to display customer information.

6. Assign Page Layouts in the Channel Order App

   After you install the Channel Order App (COA), assign a custom page layout to the customer object.

Install the Channel Order App

Install the Channel Order App (COA) in the Salesforce org where you manage licenses for your products, usually your Partner Business Org. If you're an existing partner and the COA is already installed in your org, you don't need to reinstall the app to receive upgrades. Salesforce pushes new versions of the app to your org.

USER PERMISSIONS

To install packages:

- Download AppExchange Packages

1. Log in to AppExchange using the credentials of the org where you want to install the COA.
2. Go to the AppExchange listing for the COA: https://appexchange.salesforce.com/listingDetail?listingId=a0N300000055ailEAA.
3. Click **Get It Now**.
4. Click **Install in Production**.
5. Agree to the Terms & Conditions, and click **Confirm and Install**.
6. Log in to the org where you want to install the COA.
7. Review the package installation details, and click **Continue**.
8. Approve access by third-party websites, and click **Continue**.

9. Review the API access requirements for the package, and click **Next**.
10. Grant access to package contents, and click **Next**.

> Note: Salesforce recommends granting access only to admins and assigning access to other users as needed after the app is installed.

11. Click **Install**.
12. After the installation completes, go to the App Launcher and confirm that Partner Order appears in the list of available apps.

Assign Permission Sets to Channel Order App Users

USER PERMISSIONS

To assign a permission set:

- Assign Permissions Sets

Assign a Channel Order App (COA) permission set to give team members access to the app. Assign the COA User permission set to users who submit and manage customer orders. Assign the COA Admin User permission to users who need full access to the app's objects and features, including the ability to set up a connection to Salesforce.

1. Log in to the org where the COA is installed.
2. From Setup, enter *Users* in the Quick Find box, then click **Users**.
3. Select a user.
4. In the Permission Set Assignments related list, click **Edit Assignments**.
5. Select the COA User or COA Admin User permission set, and click **Add**.
6. Click **Save**.

Define a Channel Order App Email Service

USER PERMISSIONS

To configure Apex email services and email service addresses:

- Modify All Data

After you assign Channel Order App (COA) permission sets, define an email service to make your org ready to sync your product catalog.

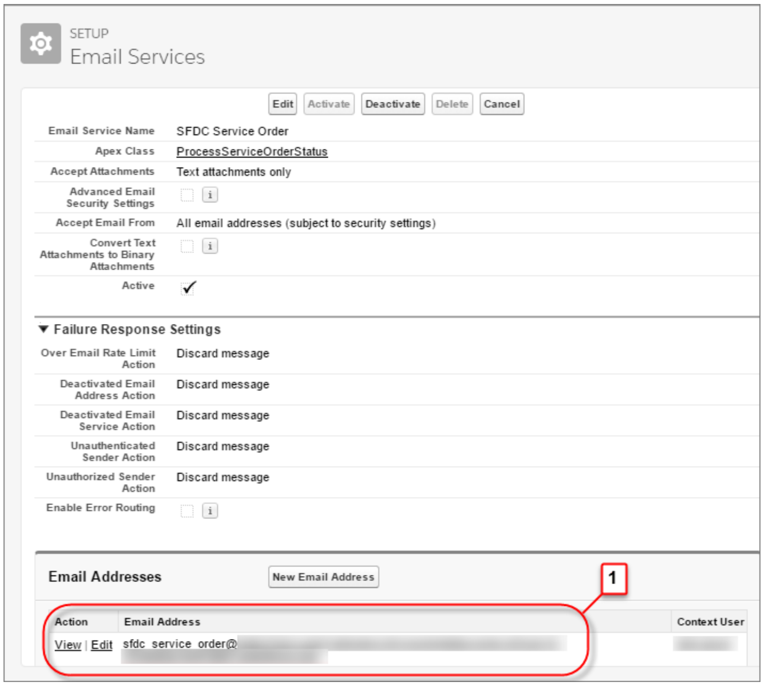
1. Log in to the org where the COA is installed.
2. From Setup, enter *Email Services* in the Quick Find box, then click **Email Services**.
3. Click **New Email Service**.
4. Specify values for the following fields. Leave the other fields as is.

Field	Value
Email Service Name	*SFDC Service Order*
Apex Class	*ProcessServiceOrderStatus*
Accept Attachments	**Text attachments only**
Active	Select to enable

5. Click **Save and New Email Address**.
6. Specify values for the following fields. Leave the other fields as is.

Field	Value
Email Service Name	*`SFDC_Service_Order`*
Active	Select to enable
Context User	Select a Salesforce admin in your org

7. For **Accept Email From**, remove the autopopulated email address. This field must be blank. Otherwise, the email service can't connect to Salesforce.
8. Click **Save**. Salesforce generates a unique address for the email service (1), which the COA uses to sync your product data.



Email Service Name	SFDC Service Order
Apex Class	ProcessServiceOrderStatus
Accept Attachments	Text attachments only
Advanced Email Security Settings	□
Accept Email From	All email addresses (subject to security settings)
Convert Text Attachments to Binary Attachments	□
Active	✓

Failure Response Settings

Over Email Rate Limit Action	Discard message
Deactivated Email Address Action	Discard message
Deactivated Email Service Action	Discard message
Unauthenticated Sender Action	Discard message
Unauthorized Sender Action	Discard message
Enable Error Routing	□

Email Addresses

Action	Email Address	Context User
View | Edit	sfdc service order@[redacted]	[redacted]

9. Confirm that the COA Admin User permission set is assigned to the email service's context user. If the context user doesn't have this permission set, assign it to them.

Connect the Channel Order App to Salesforce

After you install the Channel Order App (COA), connect the app to Salesforce and import your product catalog. Your product catalog includes the products that you can sell and the contract terms that apply to your orders. After the connection is configured, Salesforce pushes catalog updates to your org.

Tip: Before you configure your connection, make sure that you have credentials for your COA production connection. These credentials are unique to your company and are provided to you by Salesforce. If you don't have credentials, log a case in the Partner Community.

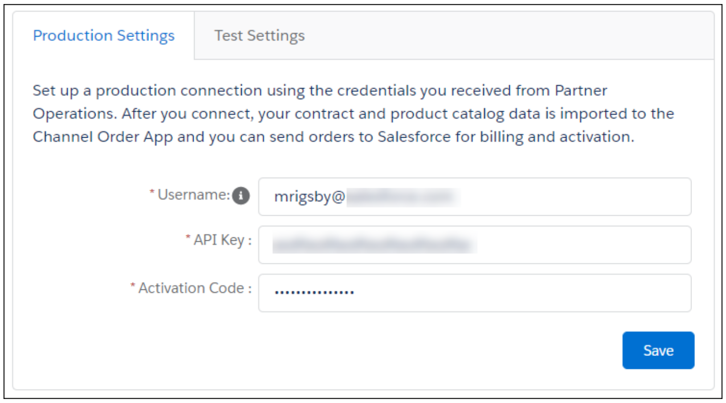
USER PERMISSIONS

To manage custom apps:
- Customize Application

To import product data:
- COA Admin User

1. Log in to the org where the COA is installed.
2. Open the App Launcher.

3. Under All Items, click **COA Setup**.
4. Go to Production Settings, and provide your username, API key, and activation code.



Set up a production connection using the credentials you received from Partner Operations. After you connect, your contract and product catalog data is imported to the Channel Order App and you can send orders to Salesforce for billing and activation.

* Username:	mrigsby@[redacted]
* API Key :	[redacted]
* Activation Code :	....

5. Click **Save**.
   The COA imports your product catalog and contract terms.

Display Customers in the Channel Order App

USER PERMISSIONS

To create and edit custom tabs:

- Customize Application

After you install the Channel Order App (COA), create a custom tab to display customer information.

1. Log in to the org where the COA is installed.
2. From Setup, enter `Tabs` in the Quick Find box, then click **Tabs**.
3. In the Custom Object Tabs related list, click **New**.
4. Specify values for the following fields. Leave the other fields as is.

Field	Value
`Object`	**Customer**
`Tab Style`	Select your preferred tab style

5. Click **Next**.
6. Select the user profiles for which the tab is available, and click **Next**.
7. Add the tab to the Partner Order custom app.
8. Click **Save**.

Assign Page Layouts in the Channel Order App

USER PERMISSIONS

To create and edit custom objects:

- Customize Application

After you install the Channel Order App (COA), assign a custom page layout to the customer object.

1. Log in to the org where the COA is installed.
2. From Setup, enter `Object Manager` in the Quick Find box, then click **Object Manager**.
3. Click **Customer**.

4. Click **Page Layouts**.
5. Click **Page Layout Assignment**.
6. Click **Edit Assignment**.
7. Select at least one profile.
8. From the list of available layouts, choose **COA Customer Layout**.
9. Click **Save**.

Upgrade the Channel Order App

If you've installed a previous version of the Channel Order App (COA), Salesforce pushes new versions to your org as they become available. Before you install an upgrade, review the considerations to understand how customizations in your org could be affected. Depending on the COA version you use, some additional configuration might be required after upgrading.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Channel Order App Upgrade Considerations

Before you install a new version of the Channel Order App (COA), understand what's changed in the app and how the changes can affect your customizations.

Upgrade the Channel Order App

Follow these steps to upgrade an earlier version of the Channel Order App (COA) to v2 and later.

Field Mapping in Channel Order App v2 and Later

In Channel Order App (COA) v2, we retired some fields on the service order detail object. If you're upgrading from v1.39 or earlier to v2 or later, the table shows how the retired fields map to new ones.

Channel Order App Upgrade Considerations

Before you install a new version of the Channel Order App (COA), understand what's changed in the app and how the changes can affect your customizations.

Upgrades from v1.39 or Earlier to v2

If you're using COA v1.39 or earlier, the following considerations apply when upgrading to v2 or later.

Replaced Service Order Credentials Page

In v2 and later, the COA Setup page replaces the Service Order Credentials page. After you upgrade, go to the setup page and refresh your connection to Salesforce. If the connection isn't refreshed, Salesforce can't receive your orders.

New Permission Sets for Accessing the COA

In v1.39 and earlier, a custom profile controls access to the COA. In v2 and later, you control access with permission sets. After you upgrade, assign a permission set to the people on your team who use the COA, including those who accessed the app using the custom profile. Without a permission set, your users can't access the COA.

New Customers Tab

In v2 and later, the new Customers tab shows you customer information, including order history and related products. After you upgrade, you must create this tab and configure it to display in the app.

Replaced Orders Tab

In v2 and later, the Service Orders tab replaces the Orders tab. After you upgrade, remove the Orders tab from the app and configure the Service Orders tab.

Updated Page Layouts

In v2 and later, the customer, service order, partner contract terms, and partner product catalog objects have updated page layouts. After you upgrade, assign the updated layouts to each object.

Replaced Partner Order Submit API

In v2 and later, the Channel Order API replaces the Partner Order Submit API. When you upgrade, you can still submit orders using the Partner Order Submit API, and your existing integrations continue to function. However, the Partner Order Submit API doesn't include features introduced in the Channel Order Apex API, such as the ability to edit, recall, and clone orders.

Other Changes to the API

We changed how the API sets the status of submitted orders. In v1.39 and earlier, the Partner Order API automatically updated the `Service_Order_Status__c` field of a submitted order. In v2 and later, the Channel Order API provides a response that reports if the submit operation succeeded, but doesn't update `Service_Order_Status__c` field.

Upgrade the Channel Order App

Follow these steps to upgrade an earlier version of the Channel Order App (COA) to v2 and later.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

1. Assign Permission Sets to Channel Order App Users

   If you're upgrading to Channel Order App (COA) v2 and later, assign permission sets to give team members access to the app. Assign the COA User permission set to users who submit and manage customer orders. Assign the COA Admin User permission to users who need full access to the app's objects and features, including the ability to set up a connection to Salesforce.

2. Display Customers in the Channel Order App

   If you're upgrading to Channel Order App (COA) v2 and later, create a custom tab to display customer information in the app.

3. Display Service Orders in the Channel Order App

   If you're upgrading to Channel Order App (COA) v2 and later, remove the existing Orders tab and replace it with the new Service Orders tab.

4. Update Page Layouts in the Channel Order App

   If you're upgrading to Channel Order App (COA) v2 and later, assign updated page layouts to the customer, service order, partner contract terms, and partner product catalog objects.

5. Refresh the Channel Order App's Connection to Salesforce

   If you're upgrading the Channel Order App (COA) to v2 or later, refresh your production connection to Salesforce. After your connection refreshes, you can submit orders to Salesforce.

Assign Permission Sets to Channel Order App Users

If you're upgrading to Channel Order App (COA) v2 and later, assign permission sets to give team members access to the app. Assign the COA User permission set to users who submit and manage customer orders. Assign the COA Admin User permission to users who need full access to the app's objects and features, including the ability to set up a connection to Salesforce.

USER PERMISSIONS

To assign a permission set:
- Assign Permissions Sets

1. Log in to the org where the COA is installed.

2. From Setup, enter `Users` in the Quick Find box, then click **Users**.
3. Select a user.
4. In the Permission Set Assignments related list, click **Edit Assignments**.
5. Select the COA User or COA Admin User permission set, and click **Add**.
6. Click **Save**.

Display Customers in the Channel Order App

If you're upgrading to Channel Order App (COA) v2 and later, create a custom tab to display customer information in the app.

1. Log in to the org where the COA is installed.
2. From Setup, enter `Tabs` in the Quick Find box, then click **Tabs**.
3. In the Custom Object Tabs related list, click **New**.
4. Specify values for the following fields. Leave the other fields as is.

Field	Value
`Object`	**Customer**
`Tab Style`	Select your preferred tab style

5. Click **Next**.
6. Select the user profiles for which the tab is available, and click **Next**.
7. Add the tab to the Partner Order custom app.
8. Click **Save**.

USER PERMISSIONS

To create and edit custom tabs:

- Customize Application

Display Service Orders in the Channel Order App

If you're upgrading to Channel Order App (COA) v2 and later, remove the existing Orders tab and replace it with the new Service Orders tab.

1. Log in to the org where the COA is installed.
2. From Setup, enter `App Manager` in the Quick Find box, then click **App Manager**.
3. For Partner Order, click (▼) and select **Edit**.
4. From the Selected Tabs list, remove **Orders**.
5. Add **Service Orders** to the Selected Tabs list.
6. Click **Save**.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

USER PERMISSIONS

To manage custom apps:

- Customize Application

Update Page Layouts in the Channel Order App

If you're upgrading to Channel Order App (COA) v2 and later, assign updated page layouts to the customer, service order, partner contract terms, and partner product catalog objects.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

USER PERMISSIONS

To create and edit custom objects:

- Customize Application

1. Log in to the org where the COA is installed.
2. From Setup, enter `Object Manager` in the Quick Find box, then click **Object Manager**.
3. Assign the updated page layout to the customer object.
   a. Click **Customer**.
   b. Click **Page Layouts**.
   c. Click **Page Layout Assignment**.
   d. Click **Edit Assignment**.
   e. Select at least one profile.
   f. From the list of available layouts, choose **COA Customer Layout**.
   g. Click **Save**.
4. Repeat these steps for service order, partner contract terms, and partner product catalog. These objects use the following page layout names.

Object	Page Layout Name
Service Order	Service Order Layout
Partner Contract Terms	Partner Contract Terms Layout
Partner Product Catalog	Partner Product Catalog Layout

Refresh the Channel Order App's Connection to Salesforce

If you're upgrading the Channel Order App (COA) to v2 or later, refresh your production connection to Salesforce. After your connection refreshes, you can submit orders to Salesforce.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

USER PERMISSIONS

To manage custom apps:

- Customize Application

To import product data:

- COA Admin User

1. Log in to the org where the COA is installed.
2. Open the App Launcher.
3. Under All Items, click **COA Setup**.
4. Go to Production Settings, and click **Refresh Connection**.
   After you refresh the connection, your order history is imported to the app.

Field Mapping in Channel Order App v2 and Later

In Channel Order App (COA) v2, we retired some fields on the service order detail object. If you're upgrading from v1.39 or earlier to v2 or later, the table shows how the retired fields map to new ones.

Note: Field names are prefixed with `CHANNEL_ORDERS__` unless otherwise noted.

Fields

Old Field (Retired)	New Field	Notes
`Application__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`Customer_Price__c`	`Customer_Price_Per_Month__c`	Represents the product price per unit per month.
`Fixed_Price__c`	`pc_Fixed_Price__c`	Represents the fixed price of the product at the time the order was created.
`Floor_Price__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`Estimated_SFDC_Price_Per_Month__c`	`SFDC_Price__c`	Represents the total amount due to Salesforce based on the estimated value of the product.
`Number_Of_Users_ISVforce__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`pc_Floor_Price__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`pc_PNR__c`	`PNR__c`	Represents the percent net revenue of the product at the time the order was created.
`pc_Pricing_Unit__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`pc_Product_ID__c`	`Product_ID__c`	Represents the ID of the product.
`Pricing_Type__c`	`pc_Pricing_Type__c`	Represents the pricing model of the product.
`Product_Line_Desc_Overridden__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.
`Special_Instructions__c`	None	Field retired. This field doesn't populate with data for orders created in COA v2 and later.

Manage Orders in the Channel Order App

When a customer purchases your AppExchange product or requests changes to a subscription, submit an order to Salesforce. After you create the order, you can edit, recall, or clone it. If the order is a draft, you can delete it.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, and **Unlimited** Editions

Submit an Order
Submit an order to Salesforce when a customer purchases new products or requests changes to a subscription. If you're ordering products for a new customer, verify that you have the customer's Salesforce org ID before you create the order.

Edit an Order
You can edit the product, quantity, and pricing details of an order within 2 hours of submitting it to Salesforce. After 2 hours, the order is processed and can't be edited. To change customer details or order type, you must recall the order and create a new one.

Clone an Order
When creating an order that's similar to one you've submitted previously, you can save time by cloning the original order.

Recall an Order
If you don't want Salesforce to process an order you've submitted, recall it. After you recall an order, it becomes read-only, and you can't edit or resubmit it. You can recall an order within 2 hours of submitting it to Salesforce.

Delete a Draft Order
You can delete draft orders that you don't want to submit, like duplicate orders. After you delete a draft order, you can't recover it.

Fix Errors on Returned Orders
If you submit an order that Salesforce can't process, we return the order and ask you to fix the errors that we identified. You can resolve the errors by reading the comments we provide, cloning the returned order, and then submitting the new order with the changes applied.

Submit an Order

Submit an order to Salesforce when a customer purchases new products or requests changes to a subscription. If you're ordering products for a new customer, verify that you have the customer's Salesforce org ID before you create the order.

USER PERMISSIONS

To submit orders:
- COA User

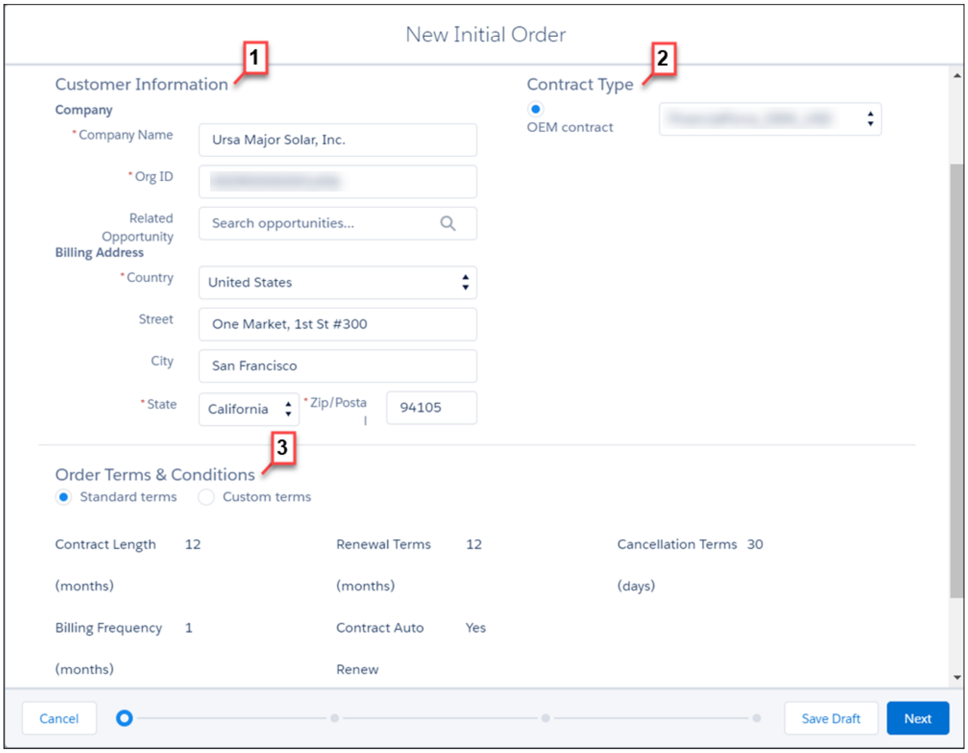
  OR

  COA Admin User

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, click **New** to open the order submission wizard.
4. Choose **New customer** to create an initial order. Otherwise, choose **Existing customer** and select an order type.

   Tip: If a customer is buying your product for the first time, create an initial order.

5. Specify customer details (1), contract type (2), and the terms and conditions (3), and then click **Next**.



New Initial Order

Customer Information

Company

* Company Name	Ursa Major Solar, Inc.
* Org ID	[redacted]
Related Opportunity	Search opportunities...

Billing Address

* Country	United States
Street	One Market, 1st St #300
City	San Francisco
* State	California
* Zip/Postal	94105

Contract Type

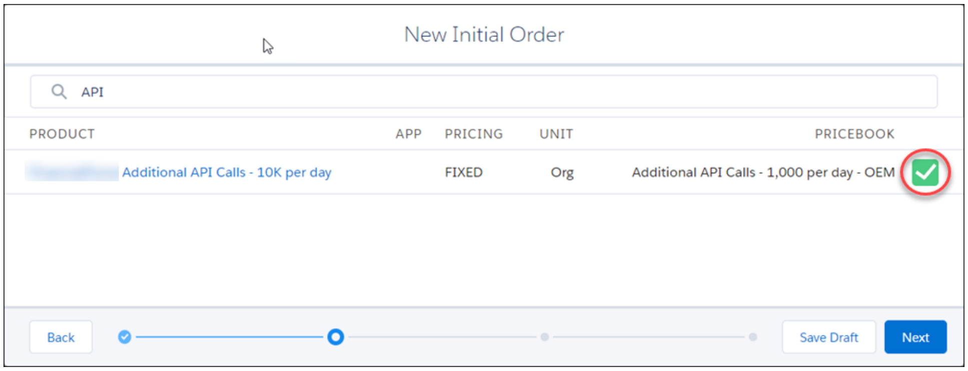
● OEM contract [redacted]

Order Terms & Conditions

● Standard terms ○ Custom terms

Contract Length (months)	12	Renewal Terms (months)	12	Cancellation Terms (days)	30
Billing Frequency (months)	1	Contract Auto Renew	Yes		

6. Select products for the order, and click **Next**.

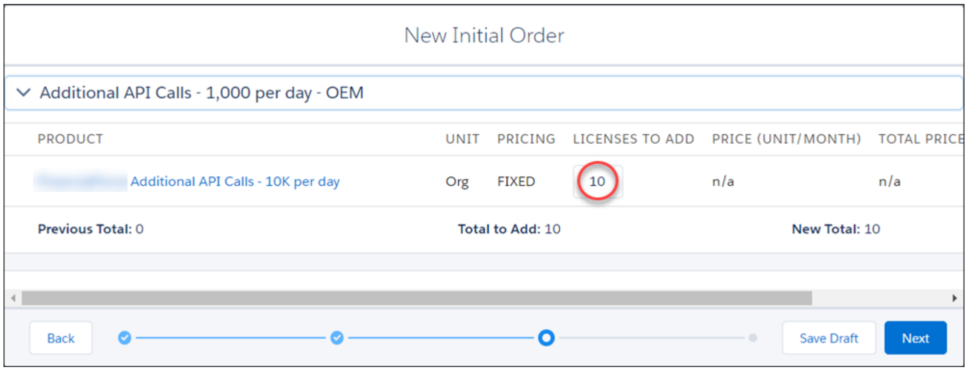


New Initial Order

API

PRODUCT	APP	PRICING	UNIT	PRICEBOOK	
[redacted] Additional API Calls - 10K per day		FIXED	Org	Additional API Calls - 1,000 per day - OEM	✓

7. Adjust the license quantities and, optionally, pricing, and then click **Next**.



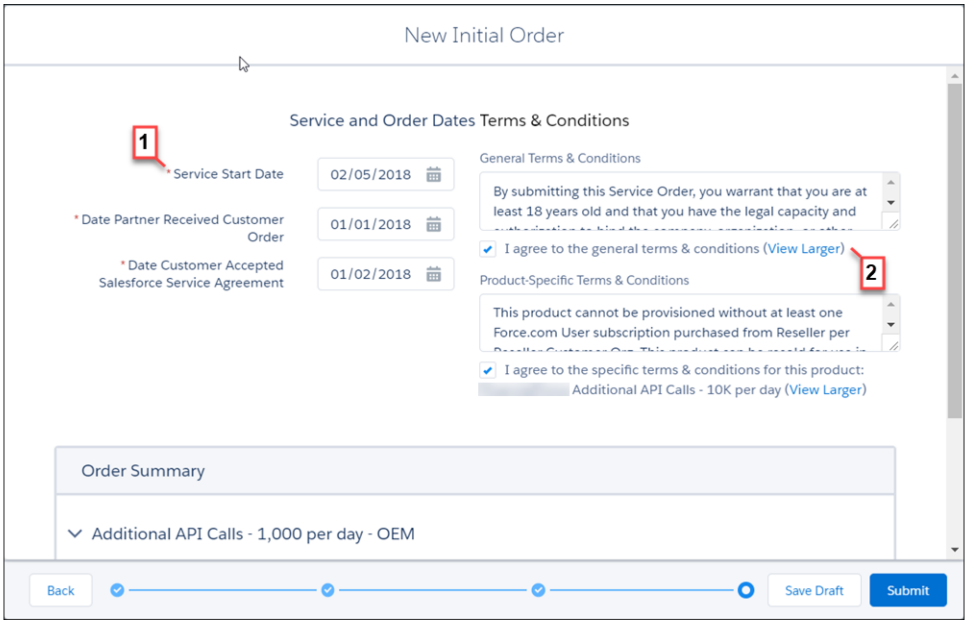
New Initial Order

Additional API Calls - 1,000 per day - OEM

PRODUCT	UNIT	PRICING	LICENSES TO ADD	PRICE (UNIT/MONTH)	TOTAL PRICE
[redacted] Additional API Calls - 10K per day	Org	FIXED	10	n/a	n/a

Previous Total: 0 **Total to Add:** 10 **New Total:** 10

8. Enter the service and order dates (1), and then review and accept the terms and conditions (2).



New Initial Order

Service and Order Dates Terms & Conditions

* Service Start Date: 02/05/2018

* Date Partner Received Customer Order: 01/01/2018

* Date Customer Accepted Salesforce Service Agreement: 01/02/2018

General Terms & Conditions

By submitting this Service Order, you warrant that you are at least 18 years old and that you have the legal capacity and

☑ I agree to the general terms & conditions (View Larger)

Product-Specific Terms & Conditions

This product cannot be provisioned without at least one Force.com User subscription purchased from Reseller per

☑ I agree to the specific terms & conditions for this product: [redacted] Additional API Calls - 10K per day (View Larger)

Order Summary

Additional API Calls - 1,000 per day - OEM

9. Click **Submit**, or save the order as a draft and submit it later.

After you submit an order, it's sent to Salesforce for processing and activation or provisioning. To check the status of an order, go the Service Orders tab.

Edit an Order

You can edit the product, quantity, and pricing details of an order within 2 hours of submitting it to Salesforce. After 2 hours, the order is processed and can't be edited. To change customer details or order type, you must recall the order and create a new one.

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, find the order you want to edit.

   If you can't find the order, verify that you selected the correct list view.

USER PERMISSIONS

To edit orders:

- COA User

  OR

  COA Admin User

4. Click (▼) and select **Edit**.
5. Update the order's products, quantities, and pricing details, and then click **Resubmit**.

Clone an Order

When creating an order that's similar to one you've submitted previously, you can save time by cloning the original order.

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, find the order you want to clone.

   If you can't find the order, verify that you selected the correct list view.
4. In the Custom Actions column, click **Clone**.
5. Confirm that you want to clone the order, and click **Continue**.
6. Edit the order as needed, and then click **Save Draft**.

USER PERMISSIONS

To clone orders:

- COA User

  OR

  COA Admin User

Recall an Order

If you don't want Salesforce to process an order you've submitted, recall it. After you recall an order, it becomes read-only, and you can't edit or resubmit it. You can recall an order within 2 hours of submitting it to Salesforce.

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, find the order that you want to recall.

   If you can't find the order, verify that you selected the correct list view.
4. In the Custom Actions column, click **Recall**.
5. Confirm that you want to recall the order, and click **Continue**.

USER PERMISSIONS

To recall orders:

- COA User

  OR

  COA Admin User

Delete a Draft Order

You can delete draft orders that you don't want to submit, like duplicate orders. After you delete a draft order, you can't recover it.

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, find the order that you want to delete.

   If you can't find the order, verify that you selected the correct list view.
4. Click (▼) and select **Delete**.
5. Click **Delete** again to confirm.

USER PERMISSIONS

To delete orders:

- COA User

  OR

  COA Admin User

Fix Errors on Returned Orders

If you submit an order that Salesforce can't process, we return the order and ask you to fix the errors that we identified. You can resolve the errors by reading the comments we provide, cloning the returned order, and then submitting the new order with the changes applied.

1. Log in to the org where the COA is installed.
2. Open the App Launcher, and click **Partner Order**.
3. On the Service Orders tab, find the returned order.

   If you can't find the order, verify that you selected the correct list view.
4. Click the order, and go to Error Comment to see details about the error.
5. Click **Clone Order**.
6. Apply the requested changes, and then click **Submit**.

If you have trouble resolving the errors, log a case in the Partner Community.

USER PERMISSIONS

To clone orders:

- COA User

  OR

  COA Admin User

Channel Order Apex API

You can submit orders to Salesforce programmatically using the Channel Order Apex API. To submit an order, use one of the classes provided in the `CHANNEL_ORDERS` namespace.

CHANNEL_ORDERS Namespace
The `CHANNEL_ORDERS` namespace provides classes for submitting orders to Salesforce Partner Operations. After you send an order, you can use other classes in the namespace to edit, recall, or clone the order.

Service Order
Represents an order that you're submitting to Salesforce Partner Operations for processing and activation.

Service Order Detail
Represents an instance of a product on a service order.

Partner Order Submit API
(No longer supported and available only in version 1.39 and earlier of the Channel Order App.) Send orders to Salesforce immediately or asynchronously using the Partner Order Submit API.

CHANNEL_ORDERS Namespace

The `CHANNEL_ORDERS` namespace provides classes for submitting orders to Salesforce Partner Operations. After you send an order, you can use other classes in the namespace to edit, recall, or clone the order.

To use `CHANNEL_ORDERS` namespace classes, you must have Channel Order App v2 or later installed in your Salesforce org. For information on how to invoke methods defined in managed packages, refer to the *Apex Developer Guide*.

The following classes are in the `CHANNEL_ORDERS` namespace.

COA_ServiceOrderSubmit Class
Submit orders to Salesforce Partner Operations for processing and activation.

COA_ServiceOrderEdit Class
Edit orders that you've submitted to Salesforce Partner Operations.

COA_ServiceOrderRecall Class
Recall orders that you’ve submitted to Salesforce Partner Operations.

COA_ServiceOrderClone Class
Clone an existing order in the org where the Channel Order App (COA) is installed.

COA_ServiceOrderSubmit Class

Submit orders to Salesforce Partner Operations for processing and activation.

Namespace

CHANNEL_ORDERS

Usage

The COA_ServiceOrderSubmit class contains a single `@InvocableMethod` for submitting orders to Salesforce Partner Operations. When invoking a method defined in this class, include the `CHANNEL_ORDERS` namespace prefix:

```
CHANNEL_ORDERS.class.method(args)
```

For details about namespace prefixes or the `@InvocableMethod` annotation, see the *Apex Developer Guide*.

Example

This example receives a list of service orders, submits them, and returns a list of outputs from the submit operation.

Note: For brevity, the methods invoked in this example omit the `CHANNEL_ORDERS` namespace prefix. If you use this code in your implementation, you must include the namespace prefix.

```
public static void submitOrders(List<Service_Order__c> serviceOrders){
   List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput> serviceOrderSubmitInput = new
 List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput>();

    for(Service_Order__c serviceOrder: serviceOrders){
        COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput input = new
COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput();
        input.serviceOrderId = serviceOrder.Id;
        serviceOrderSubmitInput.add(input);
    }

    List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitOutput> serviceOrderSubmitOutputs =
 COA_ServiceOrderSubmit.submit(serviceOrderSubmitInput);

    for(COA_ServiceOrderSubmit.COA_ServiceOrderSubmitOutput serviceOrderSubmitOutput:
serviceOrderSubmitOutputs){
        System.debug('Service Order Id: '+serviceOrderSubmitOutput.serviceOrderId);
        System.debug('Success?: '+serviceOrderSubmitOutput.isSuccess);
        System.debug('Response Messages: '+serviceOrderSubmitOutput.responseMessages);
    }
}
```

Order Status

When you submit a draft order using the COA_ServiceOrderSubmit class, the response tells you if the operation succeeded. The response doesn't set the status of the related service order record, so the `Service_Order_Status__c` field remains `Draft`. If you build an implementation to set the status of submitted orders, we suggest the following logic: if the response includes a success code, set the order status to `Received`. Otherwise, set the status to `Error`. For orders with errors, you can store notes from Salesforce Partner Operations in the `Error_Comment__c` field.

COA_ServiceOrderSubmit Methods

COA_ServiceOrderSubmitInput Class
Wrapper class for input parameters passed to the submit operation.

COA_ServiceOrderSubmitOutput Class
Wrapper class for output parameters returned from the submit operation.

COA_ServiceOrderSubmit Methods

The following are methods for `COA_ServiceOrderSubmit`.

submit(serviceOrderSubmitInput)
Provides an entry point for submitting orders to Salesforce Partner Operations.

`submit(serviceOrderSubmitInput)`

Provides an entry point for submitting orders to Salesforce Partner Operations.

Signature

```
global static List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitOutput>
submit(List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput> serviceOrderSubmitInput)
```

Parameters

`serviceOrderSubmitInput`
Type: List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitInput>

List of wrapper classes to pass as input for the submit operation

Return Value

Type: List<COA_ServiceOrderSubmit.COA_ServiceOrderSubmitOutput>

COA_ServiceOrderSubmitInput Class

Wrapper class for input parameters passed to the submit operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderSubmitInput Properties

COA_ServiceOrderSubmitInput Properties

The following are properties for `COA_ServiceOrderSubmitInput`.

serviceOrderId
Specifies the ID of the order you are submitting. This field is required.

`serviceOrderId`

Specifies the ID of the order you are submitting. This field is required.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderSubmitOutput Class

Wrapper class for output parameters returned from the submit operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderSubmitOutput Properties

COA_ServiceOrderSubmitOutput Properties

The following are properties for `COA__ServiceOrderSubmitOutput`.

isSuccess
Indicates the success of the submit operation. If true, the order was successfully submitted.

responseMessages
Holds response messages generated by the submit operation.

serviceOrderId
References the order ID passed in by the submit operation.

`isSuccess`

Indicates the success of the submit operation. If true, the order was successfully submitted.

Signature

```
global Boolean isSuccess;
```

Property Value

Type: Boolean

`responseMessages`

Holds response messages generated by the submit operation.

Signature

```
global List<String> responseMessages;
```

Property Value

Type: List<String>

`serviceOrderId`

References the order ID passed in by the submit operation.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderEdit Class

Edit orders that you've submitted to Salesforce Partner Operations.

Namespace

CHANNEL_ORDERS

Usage

The COA_ServiceOrderEdit class contains a single `@InvocableMethod` for editing orders that have been submitted to Salesforce Partner Operations but haven't been processed. When invoking a method defined in this class, include the `CHANNEL_ORDERS` namespace prefix:

```
CHANNEL_ORDERS.class.method(args)
```

For details about namespace prefixes or the `@InvocableMethod` annotation, see the *Apex Developer Guide*.

Example

This example receives a list of service orders that have been edited, submits them, and returns a list of outputs from the edit operation.

Note: For brevity, the methods invoked in this example omit the `CHANNEL_ORDERS` namespace prefix. If you use this code in your implementation, you must include the namespace prefix.

```
public static void editOrders(List<Service_Order__c> serviceOrders){
    List<COA_ServiceOrderEdit.COA_ServiceOrderEditInput> serviceOrderEditInput = new
List<COA_ServiceOrderEdit.COA_ServiceOrderEditInput>();

    for(Service_Order__c serviceOrder: serviceOrders){
        COA_ServiceOrderEdit.COA_ServiceOrderEditInput input = new
COA_ServiceOrderEdit.COA_ServiceOrderEditInput();
        input.serviceOrderId = serviceOrder.Id;
        serviceOrderEditInput.add(input);
    }

    List<COA_ServiceOrderEdit.COA_ServiceOrderEditOutput> serviceOrderEditOutputs =
COA_ServiceOrderEdit.edit(serviceOrderEditInput);

    for(COA_ServiceOrderEdit.COA_ServiceOrderEditOutput serviceOrderEditOutput:
serviceOrderEditOutputs){
        System.debug('Service Order Id: '+serviceOrderEditOutput.serviceOrderId);
        System.debug('Success?: '+serviceOrderEditOutput.isSuccess);
        System.debug('Response Messages: '+serviceOrderEditOutput.responseMessages);
    }
}
```

COA_ServiceOrderEdit Methods

COA_ServiceOrderEditInput Class
Wrapper class for input parameters passed to the edit operation.

COA_ServiceOrderEditOutput Class
Wrapper class for output parameters returned from the edit operation.

COA_ServiceOrderEdit Methods

The following are methods for `COA_ServiceOrderEdit`.

edit(serviceOrderEditInput)
Provides an entry point to edit orders that you've submitted to Salesforce Partner Operations. You can edit only orders that haven't been processed.

`edit(serviceOrderEditInput)`

Provides an entry point to edit orders that you've submitted to Salesforce Partner Operations. You can edit only orders that haven't been processed.

Signature

```
global static List<COA_ServiceOrderEdit.COA_ServiceOrderEditOutput>
edit(List<COA_ServiceOrderEdit.COA_ServiceOrderEditInput> serviceOrderEditInput)
```

Parameters

serviceOrderEditInput
: Type: List<COA_ServiceOrderEdit.COA_ServiceOrderEditInput>

  List of wrapper classes to pass as input for the edit operation

Return Value

Type: List<COA_ServiceOrderEdit.COA_ServiceOrderEditOutput>

COA_ServiceOrderEditInput Class

Wrapper class for input parameters passed to the edit operation.

Namespace

CHANNEL_ORDERS

- COA_ServiceOrderEditInput Properties

COA_ServiceOrderEditInput Properties

The following are properties for `COA_ServiceOrderEditInput`.

serviceOrderId
: Specifies the ID of the order you are editing. This field is required.

`serviceOrderId`

Specifies the ID of the order you are editing. This field is required.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderEditOutput Class

Wrapper class for output parameters returned from the edit operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderEditOutput Properties

The following are properties for `COA_ServiceOrderEditOutput`.

isSuccess

Indicates the success of the edit operation. If true, the order was successfully edited.

Signature

```
global Boolean isSuccess;
```

Property Value

Type: Boolean

responseMessages

Holds response messages generated by the edit operation.

Signature

```
global List<String> responseMessages;
```

Property Value

Type: List<String>

serviceOrderId

References the order ID passed in by the edit operation.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderRecall Class

Recall orders that you've submitted to Salesforce Partner Operations.

Namespace

CHANNEL_ORDERS

Usage

The COA_ServiceOrderRecall class contains a single `@InvocableMethod` for recalling orders that have been submitted to Salesforce Partner Operations but haven't yet been processed. When you recall an order, it's removed from the processing queue and isn't activated. When invoking a method defined in this class, include the `CHANNEL_ORDERS` namespace prefix:

```
CHANNEL_ORDERS.class.method(args)
```

For details about namespace prefixes or the `@InvocableMethod` annotation, see the *Apex Developer Guide*.

Example

This example receives a list of service orders, recalls them, and returns a list of outputs from the recall operation.

Note: For brevity, the methods invoked in this example omit the `CHANNEL_ORDERS` namespace prefix. If you use this code in your implementation, you must include the namespace prefix.

```
public static void recallOrders(List<Service_Order__c> serviceOrders){
        List<COA_ServiceOrderRecall.COA_ServiceOrderRecallInput> serviceOrderRecallInput
= new List<COA_ServiceOrderRecall.COA_ServiceOrderRecallInput>();

        for(Service_Order__c serviceOrder: serviceOrders){
            COA_ServiceOrderRecall.COA_ServiceOrderRecallInput input = new
COA_ServiceOrderRecall.COA_ServiceOrderRecallInput();
            input.serviceOrderId = serviceOrder.Id;
            serviceOrderRecallInput.add(input);
        }

       List<COA_ServiceOrderRecall.COA_ServiceOrderRecallOutput> serviceOrderRecallOutputs
 = COA_ServiceOrderRecall.recall(serviceOrderRecallInput);

    for(COA_ServiceOrderRecall.COA_ServiceOrderRecallOutput serviceOrderRecallOutput:
serviceOrderRecallOutputs){
        System.debug('Service Order Id: '+serviceOrderRecallOutput.serviceOrderId);
        System.debug('Success?: '+serviceOrderRecallOutput.isSuccess);
        System.debug('Response Messages: '+serviceOrderRecallOutput.responseMessages);
    }
}
```

COA_ServiceOrderRecall Methods

COA_ServiceOrderRecallInput Class

Wrapper class for input parameters passed to the recall operation.

COA_ServiceOrderRecallOutput Class

Wrapper class for output parameters returned from the recall operation.

COA_ServiceOrderRecall Methods

The following are methods for `COA_ServiceOrderRecall`.

recall(serviceOrderRecallInput)

Provides an entry point to recall orders that you've submitted to Salesforce Partner Operations. You can recall only orders that haven't been processed.

`recall(serviceOrderRecallInput)`

Provides an entry point to recall orders that you've submitted to Salesforce Partner Operations. You can recall only orders that haven't been processed.

Signature

```
global static List<COA_ServiceOrderRecall.COA_ServiceOrderRecallOutput>
recall(List<COA_ServiceOrderRecall.COA_ServiceOrderRecallInput> serviceOrderRecallInput)
```

Parameters

`serviceOrderRecallInput`

Type: List<COA_ServiceOrderRecall.COA_ServiceOrderRecallInput>

List of wrapper classes to pass as input for the recall operation

Return Value

Type: List<COA__ServiceOrderRecall.COA__ServiceOrderRecallOutput>

COA_ServiceOrderRecallInput Class

Wrapper class for input parameters passed to the recall operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderRecallInput Properties

COA_ServiceOrderRecallInput Properties

The following are properties for `COA_ServiceOrderRecallInput`.

serviceOrderId
Specifies the ID of the order you are recalling. This field is required.

`serviceOrderId`

Specifies the ID of the order you are recalling. This field is required.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderRecallOutput Class

Wrapper class for output parameters returned from the recall operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderRecallOutput Properties

COA_ServiceOrderRecallOutput Properties

The following are properties for `COA_ServiceOrderRecallOutput`.

isSuccess
Indicates the success of the recall operation. If true, the order was successfully recalled.

responseMessages
Holds response messages generated by the recall operation.

serviceOrderId
References the order ID passed in by the recall operation.

`isSuccess`

Indicates the success of the recall operation. If true, the order was successfully recalled.

Signature

```
global Boolean isSuccess;
```

Property Value

Type: Boolean

`responseMessages`

Holds response messages generated by the recall operation.

Signature

```
global List<String> responseMessages;
```

Property Value

Type: List<String>

`serviceOrderId`

References the order ID passed in by the recall operation.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

COA_ServiceOrderClone Class

Clone an existing order in the org where the Channel Order App (COA) is installed.

Note: Only fields that you have permission to create are cloned. DML errors can occur if you don't have sufficient privileges.

Namespace

CHANNEL_ORDERS

Usage

The COA_ServiceOrderClone class contains a single `@InvocableMethod` to clone orders and, optionally, associated line items. When invoking a method defined in this class, include the `CHANNEL_ORDERS` namespace prefix:

```
CHANNEL_ORDERS.class.method(args)
```

For details about namespace prefixes or the `@InvocableMethod` annotation, see the *Apex Developer Guide*.

Example

This example receives a list of service orders, clones them, and returns a list of outputs from the clone operation.

Note: For brevity, the methods invoked in this example omit the `CHANNEL_ORDERS` namespace prefix. If you use this code in your implementation, you must include the namespace prefix.

```
public static void cloneOrders(List<Service_Order__c> serviceOrders){
        List<COA_ServiceOrderClone.COA_ServiceOrderCloneInput> serviceOrderCloneInput =
new List<COA_ServiceOrderClone.COA_ServiceOrderCloneInput>();

        for(Service_Order__c serviceOrder: serviceOrders){
            COA_ServiceOrderClone.COA_ServiceOrderCloneInput input = new
COA_ServiceOrderClone.COA_ServiceOrderCloneInput();
            input.serviceOrderId = serviceOrder.Id;
            input.cloneProducts = true;
            serviceOrderCloneInput.add(input);
        }

        List<COA_ServiceOrderClone.COA_ServiceOrderCloneOutput> serviceOrderCloneOutputs
= COA_ServiceOrderClone.clone(serviceOrderCloneInput);
        //Further processing of serviceOrderCloneOutputs
    }
```

COA_ServiceOrderClone Methods

COA_ServiceOrderCloneInput Class

Wrapper class for input parameters passed to the clone operation.

COA_ServiceOrderCloneOutput Class

Wrapper class for output parameters returned from the clone operation.

COA_ServiceOrderClone Methods

The following are methods for `COA_ServiceOrderClone`.

clone(serviceOrderCloneInput)

Provides an entry point to clone orders in your org and, optionally, associated line items.

`clone(serviceOrderCloneInput)`

Provides an entry point to clone orders in your org and, optionally, associated line items.

Signature

```
global static List<COA_ServiceOrderClone.COA_ServiceOrderCloneOutput>
edit(List<COA_ServiceOrderClone.COA_ServiceOrderCloneInput> serviceOrderCloneInput)
```

Parameters

`serviceOrderCloneInput`

Type: List<COA_ServiceOrderClone.COA_ServiceOrderCloneInput>

List of wrapper classes to pass as input for the clone operation

Return Value

Type: List<COA__ServiceOrderClone.COA__ServiceOrderCloneOutput>

COA_ServiceOrderCloneInput Class

Wrapper class for input parameters passed to the clone operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderCloneInput Properties

COA_ServiceOrderCloneInput Properties

The following are properties for `COA_ServiceOrderCloneInput`.

serviceOrderId
Specifies the ID of the order you are cloning. This field is required.

cloneProducts
Indicates whether to clone the original order's line items. If true, the line items are cloned. This field is required.

`serviceOrderId`

Specifies the ID of the order you are cloning. This field is required.

Signature

```
global Id serviceOrderId;
```

Property Value

Type: Id

`cloneProducts`

Indicates whether to clone the original order's line items. If true, the line items are cloned. This field is required.

Signature

```
global Boolean cloneProducts;
```

Property Value

Type: Boolean

COA_ServiceOrderCloneOutput Class

Wrapper class for output parameters returned from the clone operation.

Namespace

CHANNEL_ORDERS

COA_ServiceOrderCloneOutput Properties

The following are properties for `COA__ServiceOrderClone.COA__ServiceOrderCloneOutput`.

`isSuccess`

Indicates the success of the clone operation. If true, the order was successfully recalled.

Signature

```
global Boolean isSuccess;
```

Property Value

Type: Boolean

`responseMessages`

Holds response messages generated by the clone operation.

Signature

```
global List<String> responseMessages;
```

Property Value

Type: List<String>

`originalServiceOrderId`

Specifies the ID of the original order that you cloned.

Signature

```
global Id originalServiceOrderId;
```

Property Value

Type: Id

`cloneServiceOrderId`

Specifies the ID of the newly created clone order.

Signature

```
global Id cloneServiceOrderId;
```

Property Value

Type: Id

Service Order

Represents an order that you're submitting to Salesforce Partner Operations for processing and activation.

Note: Field names are prefixed with `CHANNEL_ORDERS__` unless otherwise noted.

When you submit an order with the Channel Order App API, include the following fields.

Fields

Field	Details
Label Created with New COA **Name** `Created_with_new_COA__c`	**Type** boolean **Properties** Create, Defaulted on create, Filter, Group, Sort, Update **Description** Indicates that you're using the latest version of the Channel Order App (COA). To ensure that your order is processed, check this field.
Label Contract **Name** `Partner_Contract_Rules__c`	**Type** reference **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Lookup to the related contract terms record. This field is required.
Label Customer Name **Name** `Customer__c`	**Type** reference **Properties** Create, Filter, Group, Nillable, Sort, Update

Field	Details
	Description Lookup to a customer record. Specify an existing customer record. You can't populate customer details using the API. This field is required.
Label Date Partner Received Customer Order **Name** `Date_Partner_Received_Customer_Order__c`	**Type** date **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Date you received the order from the customer. This field is required.
Label Date Customer Accepted SFDC Service Agreement **Name** `Date_Customer_Accepted_SFDC_Svc_Agmnt__c`	**Type** date **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Date the customer accepted the Salesforce service agreement. This field is required for OEM contracts.
Label Error Comment **Name** `Error_Comment__c`	**Type** textarea **Properties** Create, Nillable, Sort, Update **Description** Stores comments or instructions from Salesforce Partner Operations when a submitted order can't be processed.
Label I Certify a Corresponding Order is Rec'd **Name** `I_certify__c`	**Type** picklist **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Confirmation that the order was received. Possible values are `Yes` and `No`. This field is required.
Label Order Type **Name** `Order_Type__c`	**Type** picklist **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** The type of order that you're submitting for processing and activation. Possible values are `Initial`, `Add-On`, `Reduction`, `Cancellation Order`, `Upgrade`

Field	Details
	`- Partner App`, and `Upgrade - Org Edition`. Specify `Upgrade - Partner App` for a renewal order. Specify `Upgrade - Org Edition` for an upgrade order. This field is required.
Label Service Order Status **Name** `Service_Order_Status__c`	**Type** picklist **Properties** Create, Defaulted on create, Filter, Group, Nillable, Sort, Update **Description** Status of the order. Possible values are `Draft`, `Submitted`, `Received`, `In Process`, `Error`, `Activated`, and `Provisioned`. You can submit only orders with a status of `Draft`.
Label Service Start Date **Name** `Service_Start_Date__c`	**Type** date **Properties** Create, Filter, Group, Sort, Update **Description** Date to activate or provision the customer's order. You can specify today's date or a date in the future. This field is required.

Service Order Detail

Represents an instance of a product on a service order.

Note: Field names are prefixed with `CHANNEL_ORDERS__` unless otherwise noted.

When you submit an order with the Channel Order App API, include the following fields.

Fields

Field Name	Details
Label App **Name** `Application__c`	**Type** string **Properties** Create, Filter, Group, Nillable, Sort **Description** Name of the app associated with the product.
Label Billing Frequency	**Type** double

Field Name	Details
Name `pc_Billing_Frequency__c`	**Properties** Create, Filter, Nillable, Sort, Update **Description** How often the customer is billed per year. This value must match your Salesforce contract, unless you've been granted override permissions.
Label Cancellation Terms (days) **Name** `pc_Cancellation_Terms__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Number of days the customer has to cancel the contract. This value must match your Salesforce contract, unless you've been granted override permissions.
Label Contract Auto Renew **Name** `pc_Contract_Auto_Renew__c`	**Type** picklist **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Whether the contract automatically renews at the end of the term. Possible values are `Yes` and `No`. This value must match your Salesforce contract, unless you've been granted override permissions.
Label Contract Length **Name** `pc_Contract_Length__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Length of the contract in months. This value must match your Salesforce contract, unless you've been granted override permissions.
Label Currency **Name** `Currency__c`	**Type** string **Properties** Filter, Nillable, Sort **Description** The default contract currency from the contract terms associated with this order. Read-only.
Label Customer Price **Name** `Customer_Price_Per_Month__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update

Field Name	Details
	Description Price per unit per month. This field is required for PNR products.
Label Fixed Price **Name** `pc_Fixed_Price__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Fixed price of the product at the time the order was created. This field must be explicitly set when using the API.
Label Partner Contract Term **Name** `pc_Partner_Contract_Term__c`	**Type** reference **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Lookup to the related contract terms record.
Label PNR % **Name** `pc_PNR__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Percent net revenue of the product at the time the order was created. This field must be explicitly set when using the API.
Label Pricing **Name** `pc_Pricing_Type__c`	**Type** picklist **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Pricing model of the product. Possible values are `Fixed` and `PNR`. This field must be explicitly set when using the API.
Label Product **Name** `Product_Name__c`	**Type** reference **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Lookup to the related product catalog record.

Field Name	Details
Label Product ID **Name** `pc_Product_ID__c`	**Type** string **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** ID of the product. This field must be explicitly set when using the API.
Label Renewal Terms (months) **Name** `pc_Renewal_Terms__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Renewal term in months. This value must match your Salesforce contract, unless you've been granted override permissions.
Label Service Order **Name** `Partner_Order__c`	**Type** reference **Properties** Create, Filter, Group, Sort **Description** Lookup to the related service order record.
Label SFDC Invoice Description **Name** `Product_Line_Description__c`	**Type** string **Properties** Create, Filter, Group, Nillable, Sort, Update **Description** Contains additional invoice details for the product or order. This field is optional.
Label Total Quantity **Name** `Quantity__c`	**Type** double **Properties** Create, Filter, Nillable, Sort, Update **Description** Number of product catalogs on the service order.

Partner Order Submit API

(No longer supported and available only in version 1.39 and earlier of the Channel Order App.) Send orders to Salesforce immediately or asynchronously using the Partner Order Submit API.

Important: In Channel Order App (COA) v2.0 and later, the Channel Order Apex API replaces the Partner Order Submit API. If you have any existing integrations with the Partner Order Submit API, migrate them to the Channel Order Apex API.

Syntax

```
channel_orders.ServiceOrderProcessor.sendOrder()
channel_orders.ServiceOrderProcessor.sendOrderAsync()
```

Note: When you submit an order using `sendOrder` or `sendOrderAsync`, include an order ID or set of order IDs as the argument. For example, `channel_orders.ServiceOrderProcessor.sendOrder(orderId)`.

Usage

Use `sendOrderAsync` when you want to create or update multiple orders and send them in the same transaction. See the example in this section for more details.

Rules and Guidelines

This is an Apex implementation, so all Apex usage rules and limits apply. Salesforce supports only one order per call.

Use the Partner Submit API to send an order after it has been created using a valid Service Order ID. You can create Service Order and Service Order Detail records using the Channel Order App, data loading, or automated processing.

Each order must include the fields listed on the Service Order and Service Order Detail objects.

Methods

The ServiceOrderProcessor object supports the following methods.

Name	Arguments	Description
`sendOrder`	ID	Submit an order with a single ID immediately.
`sendOrder`	Set of IDs	Submit an order with a set of IDs immediately.
`sendOrderAsync`	ID	Submit an order with a single ID asynchronously (`@future`).
`sendOrderAsync`	Set of IDs	Submit an order with a set of IDs asynchronously (`@future`).

Example: Batching on the Partner Order Submit API

You can only invoke ServiceOrderProcessor once per Apex transaction. If you pass a set of IDs to `sendOrder` or `sendOrderAsync`, the maximum set size is 5. This example uses a batch job to work around this limitation.

In this example, if you have 100 orders in Draft status, the code creates one batch job with 100 executions, because only one record is processed per execution.

```
//Batch Apex class
global class COABatchClass implements Database.batchable<sObject>, Database.AllowsCallouts,
 Database.Stateful{
   final String DRAFT_STATUS = 'Draft';
   global final String query =
      'select Id, CHANNEL_ORDERS__Service_Order_Status__c ' +
     ' from CHANNEL_ORDERS__Service_Order__c where CHANNEL_ORDERS__Service_Order_Status__c
 =: DRAFT_STATUS';

   global Database.QueryLocator start(Database.BatchableContext BC){
      return Database.getQueryLocator(query);
   }

  global void execute(Database.BatchableContext info, List<CHANNEL_ORDERS__Service_Order__c>
 scope){
       for(CHANNEL_ORDERS__Service_Order__c s : scope){
         CHANNEL_ORDERS.ServiceOrderProcessor.sendOrder(s.Id);
         }
   }
   global void finish(Database.BatchableContext BC){}
}

//Batch call
Id batchInstanceId = Database.executeBatch(new COABatchClass(), 1);
```

CHAPTER 11 Manage Licenses

In this chapter ...

Learn how to use the License Management App (LMA) to manage leads and licenses for your AppExchange solutions, and how to provide administrative support for your customers.

License Management App

The License Management App (LMA) lets you manage leads and licenses for your AppExchange offerings. By integrating the LMA into your sales and marketing processes, you can better engage with prospects, retain existing customers, and grow your ISV business.

Note: The LMA is available in English only.

The LMA is available to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

How Does the License Management App Work?

Each time a customer installs your packaged offering, the License Management App (LMA) creates lead and license records. To use the LMA effectively, it's important to understand how that process works.

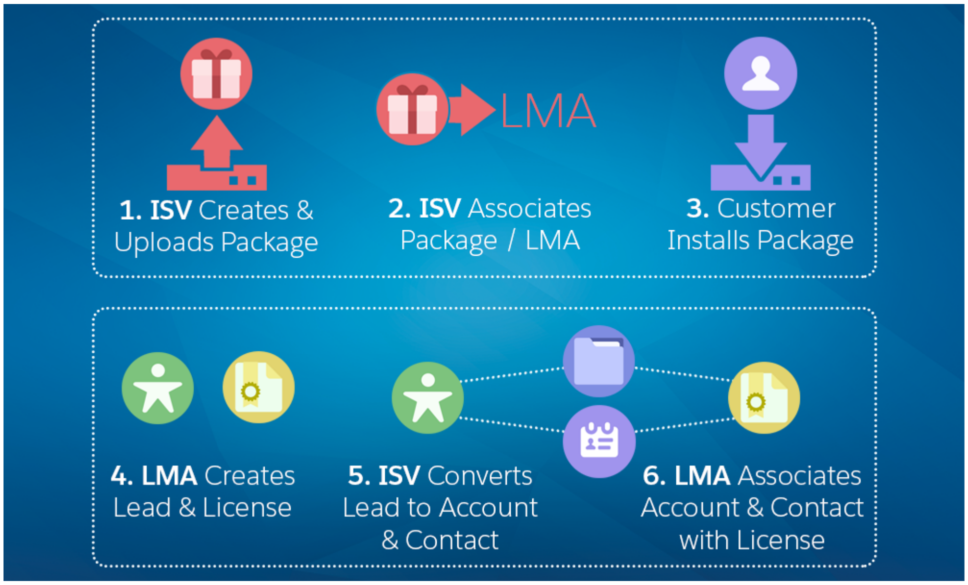
Packages, Leads, and Licenses

The key objects in the LMA are packages, leads, and licenses.

- *Packages* are container for apps or Lightning components and can be either managed or unmanaged. In the LMA, packages refer to managed packages that have been uploaded to AppExchange. Packages can have one or more versions, and each package version can have multiple licenses.
- *Leads* give you details about who installed your offering, such as the installer's name, company, and email address. Leads generated by the LMA are just like the ones you use elsewhere in Salesforce, except the lead source is Package Installation. When you set up the LMA, you designate a *lead manager* in your org to receive the new leads. You can manually convert leads into accounts and contacts in the LMA. The license is then associated with the converted account and contact.
- *Licenses* give you control over how many users in the customer's org can access your offering and for how long. Licenses are unique to the LMA, and each license has a direct relationship with a lead.

How Leads and Licenses Are Created

Lead and license records are the end result of a process that involves, you, the customer, and the LMA. Here's how the process unfolds, starting with the creation of your package.


LMA
1. ISV Creates & Uploads Package
2. ISV Associates Package / LMA
3. Customer Installs Package
4. LMA Creates Lead & License
5. ISV Converts Lead to Account & Contact
6. LMA Associates Account & Contact with License

Step	Who Does This	Where This Happens
[1] Your offering is packaged, and a version is uploaded to the AppExchange.	You (ISV partner)	Your Developer Edition org
[2] Your package version is associated with the LMA, and default license values are set.	You (ISV partner)	The Partner Community
[3] Your offering is installed as part of a purchase or trial.	Customer or prospect	Any compatible org
[4] A lead record is created with the customer's name, company, and email address.	The LMA	Your business org
[4] License records are created according to the default values you specified.	The LMA	Your business org The customer's org
[5] The lead record is converted to account and contact records.	You (ISV partner)	Your business org
[6] Account and contact records are associated with the license record.	The LMA	Your business org

LMA Packages

In the LMA, packages refer to managed packages that have been uploaded to the AppExchange for distribution. Packages can have one or more versions, and each package version can have multiple licenses. Package version has a master-detail relationship with a package. The package object is the root object for all information in the LMA.

LMA Licenses

Licenses give you control over how many users in the customer's org can access your offering and for how long. Licenses are unique to the LMA, and each license has a direct relationship with a lead. Licenses have lookup relationships with leads and package versions.

LMA Packages

In the LMA, packages refer to managed packages that have been uploaded to the AppExchange for distribution. Packages can have one or more versions, and each package version can have multiple licenses. Package version has a master-detail relationship with a package. The package object is the root object for all information in the LMA.

In the LMA, from **Packages**, select a package name to view its details, including information about the org where you developed it. In the Package Version related list, you can see all the uploaded and registered package versions on the AppExchange

Important: Don't edit, delete, clone, or create packages, package versions, or licenses. These records are automatically created and contain important information for tracking the licenses and packages in the License Management App. They can't be repopulated.

Package Details

A package contains the following information.

Field	Description
`Created By`	Defaults to the License Manager.
`Developer Name`	The name of the org where you developed the package.
`Developer Org ID`	The 18-character ID of the org where you developed the package.
`Last Modified By`	The name of the last user to modify this record, along with the date and time it was updated.
`Latest Version`	The most recent uploaded and registered version of the package. You enter this information when uploading the package.
`Lead Manager`	The owner of leads created when customers install your package. `Lead Manager` is blank when the package record is created. If you don't assign a lead manager, the License Management App owns the lead.
`Owner`	The License Management App. Don't change this value.
`Package ID`	The 18-character GUID (Globally Unique ID) that identifies the package.
`Package Name`	The name you specified when you created the package.
`Release Date`	The date you uploaded this package to the AppExchange.

Package Version Details

A package version contains the following information.

Field	Description
`Beta`	Indicates an early version of a managed package for testing by your customers. You specify beta status when you upload the package to the AppExchange
`Created By`	Defaults to the License Management App.
`Last Modified By`	The name of the last user to modify this record, along with the date and time it was updated.
`Package`	The package for which this is a package version.
`Package Version Name`	The name you specified when you created the package.
`Release Date`	The date you uploaded this package to the AppExchange.
`Version`	The version, as specified during upload to the AppExchange.
`Version ID`	The 18-character ID of this package version.

LMA Licenses

Licenses give you control over how many users in the customer's org can access your offering and for how long. Licenses are unique to the LMA, and each license has a direct relationship with a lead. Licenses have lookup relationships with leads and package versions.

In the LMA, from **Licenses**, select a license record to view details including status, package version, owner, and install date.

Important: Don't edit, delete, clone, or create packages, package versions, or licenses. These records are automatically created and contain important information for tracking the licenses and packages in the License Management App. They can't be repopulated.

License Details

A license contains the following information.

Field	Description
`Account`	The account for a converted lead.
`Contact`	The contact for a converted lead.
`Created By`	Defaults to the License Manager.
`Expiration Date`	Displays the expiration date or `Does not expire` if the license does not expire. The default is `Does not expire`.
`Information Current As Of`	The last time Salesforce retrieved information about the installer's org.
`Install Date`	The date the customer installed this package version.
`Instance`	The Salesforce instance where the installer's org resides.
`Last Modified By`	The name of the last user to modify this record, along with the date and time it was updated.
`Lead`	The lead that the LMA created when the app was installed. A lead represents the user who owns the license. If you convert the lead into an opportunity, the lead name is retained but the lead record no longer exists. If you click the link, a page states that the lead has been converted.
`License Name`	A number that represents an instance of a license. The number is incremented by one for each new license.
`Licensed Seats`	Displays the number of licenses or `Site License`. The default is `Site License`.
`License Status`	Indicates the type of license. Available values are Trial, Active, Suspended, and Uninstalled.
`License Type`	Indicates whether the license is editable.
`Org Edition`	The edition of the installer's org.
`Org Expiration Date`	If the installer is using a trial org, the date when the trial expires.
`Org Status`	The status of the installer's org. Possible values include Trial or Active.
`Owner`	Always the License Management App. Don't change this value.
`Package Version`	Links to the package version that is the parent of this license.
`Package Version Number`	The version number of the installed package.

Field	Description
`Sandbox`	Indicates whether the license is for a package installed in a sandbox org.
`Subscriber Org ID`	A globally unique 15-character ID representing the installer's org.
`Used Licenses`	Displays the number of users who have a license to the package. This field is blank if: • A customer uninstalled the package. • `Licensed Seats` is set to Site License.

Limits

You can allocate up to 99,000,000 seats per subscriber license.

Integrate the License Management App into Your Business Processes

Our most successful partners don't just use the License Management App (LMA) to manage leads and licenses. Instead, they integrate the LMA into their existing business processes and with other Salesforce tools. Here are some examples of how you can use the LMA to grow your business and retain customers.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Alert Sales Reps Before a License Expires

If you're managing licenses for several offerings, it can be difficult to keep track of what expires and when. If a license expires accidentally, you could even lose a customer. To help your customers with renewals, set up a workflow rule to email a sales rep on your team before the license expires.

To automatically email the sales rep, follow these high level steps.

1. Create an email template for the notification.
2. Create a workflow rule with a filter that specifies enough time before the expiration date to discuss renewal options.
3. Associate the workflow rule with a workflow alert that sends an email to the appropriate team member or sales rep.

Notify Customer-Retention Specialists When an Offering Is Uninstalled

If a customer uninstalls your offering, find out why. By speaking to the customer, you have an opportunity to restore the business relationship or receive feedback that helps you improve your offering.

To notify a customer-retention specialist on your team,follow these high level steps.

1. Create an email template for the notification.
2. Create a workflow rule with a filter that specifies that the `License Status` equals *`Uninstalled`*.
3. Associate the workflow rule with a workflow alert that sends an email to the retention specialist.

Best Practices for the License Management App

Follow these guidelines and best practices when you use the License Management App (LMA).

- Set up My Domain in the Salesforce org where the LMA is installed. A custom domain prevents you from being logged out of your org when you use the Subscriber Support Console to help customers troubleshoot issues. For more information, see "My Domain" in the Salesforce online help.
- Create a list view filter for leads created by installed packages. The filter helps your team separate subscriber-based leads from leads coming from other sources.
- Use the API to find licensed users. The `isCurrentUserLicensed` method determines if a user has a license to a managed package. For more information, see the *Lightning Platform Apex Code Developer's Guide*.
- Don't create workflow rules, triggers, or validation rules that require custom fields on the license or lead objects. Likewise, don't impose conditions on updating or creating license or lead records. These kinds of customizations prevent the LMA from working.
- Don't create required custom fields on lead, license, package and package version objects.
- Don't define `before-create` triggers or validation rules on lead, license, package, or package version objects.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Get Started with the License Management App

To start managing leads and licenses with the License Management App (LMA), install the LMA in your Salesforce org. Then associate at least one package that you've uploaded to the AppExchange and configure the LMA.

Install the License Management App
Install the License Management App (LMA) in the production Salesforce environment where you manage sales, billing, and marketing at your company. If you received a Partner Business Org when you joined the Partner Program, the LMA is pre-installed there, so you can skip this step.

Associate a Package with the License Management App
To receive lead and license records for an offering, you associate a package with the Salesforce org in which the License Management App (LMA) is installed. Before you associate a package with the LMA, upload the package to the AppExchange. You can only manage licenses for managed packages.

Configure the License Management App
After you associate a managed package with the LMA, assign a lead manager and set object permissions so that people on your team can use the LMA.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Install the License Management App

Install the License Management App (LMA) in the production Salesforce environment where you manage sales, billing, and marketing at your company. If you received a Partner Business Org when you joined the Partner Program, the LMA is pre-installed there, so you can skip this step.

Important: Don't install the LMA in the Developer Edition org where you created a managed package.

1. Log a case in the Partner Community requesting the LMA.

USER PERMISSIONS

To install packages:

- Download AppExchange Packages

a. Log in to the Partner Community and go to the Support tab.

b. Select **New Case**.

c. Select **License Management Application**, and then select **Create a Case**.

d. For Subtopic, select **Request LMA**.

e. Enter the required information in the `Description` field, and then select **Submit Case**.
After Partner Operations reviews the case, you receive an email with an installation URL.

2. Log in to the org where you want to install the LMA, and then select the installation URL.
3. Choose which users can access the LMA, and then select **Install**.
4. Confirm that you have installed the LMA by opening the app launcher in Lightning Experience or app menu in Salesforce Classic. If the installation was successful, License Management App appears in the list of available apps.

Associate a Package with the License Management App

To receive lead and license records for an offering, you associate a package with the Salesforce org in which the License Management App (LMA) is installed. Before you associate a package with the LMA, upload the package to the AppExchange. You can only manage licenses for managed packages.

USER PERMISSIONS

To manage licenses in the Partner Community:

- Manage Listings

1. Log in to the Partner Community and go to the Publishing tab.
2. Note: If you've already linked your packaging org, you can skip this step.

   Connect your packaging org to the publishing console.

   a. On the Organizations tab, select **Connect Organization**.

   b. Enter the login credentials for the org in which you created the package, and then select **Submit**.
3. Associate your package with the LMA.

   a. On the Packages tab, select the package you want to associate with the LMA, and then select **Manage Licenses**.

   b. Select **Register**.

   c. Enter the login credentials for the org in which the LMA is installed, and then select **Submit**.

   d. Choose default license values for your offering, and then select **Save**.
   It can take 30 minutes or more to associate a package record with the LMA.

You associate a managed package with the LMA only once. After a package is associated, the new versions that you create are automatically linked to the LMA.

Configure the License Management App

After you associate a managed package with the LMA, assign a lead manager and set object permissions so that people on your team can use the LMA.

USER PERMISSIONS

To configure the LMA:

- System Administrator profile

To edit licenses and packages:

- Read

  AND

  Edit

To view licenses, packages, and package versions:

- Read

1. Assign a lead manager. If you don't assign a lead manager, you don't receive the lead records that are created when customers install your offering.
   a. Select a package in the LMA.
   b. Select **Edit**.
   c. For Lead Manager, search for a user. In most cases, the lead manager is someone from your sales team.
   d. Select **Save**.
2. Set custom object permissions.

   Note: Users with the System Administrator profile can create, modify, and delete these objects by default because they have the "Modify All Data" permission.

Licenses	Most users in your org don't need any permissions. Users who view licenses need the "Read" permission. Users who modify license records need "Read" and "Edit" permissions.
Packages	Only users who assign the lead manager need "Edit" permission. Other users have either "Read" permission or no permissions.
Package Versions	All users have "Read" permission or no permissions, because they don't need to create, modify, or delete these records.

3. Set field-level security in user profiles or permission sets.

Licenses	Your settings depend on how you want to manage these fields for different users in your org.
Packages	Make all fields Read-Only.
Package Versions	Make all fields Read-Only.

4. To use the `Modify License` Visualforce page, override the Edit control on the license record.
5. Add related lists.
   - Add the Licenses related list to the appropriate Lead page layouts. License managers can use this list to view the licenses associated with a particular lead.
   - Add the Licenses related list to the appropriate Account page layouts. Users can view this list and identify the licenses associated with a particular account.
   - Add the Licenses related list to the appropriate Contact page layouts. Users can view this list and identify the licenses associated with a particular contact.

Manage Leads and Licenses for Your Offering

After you configure the LMA, you can change lead manager, modify license records, and refresh licenses.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Modify a License Record in the License Management App

You can change a customer's access to your offering by modifying a license record. For example, increase or decrease the number of seats included with a license or change the expiration date.

Change the Lead Manager in the License Management App

You can change who receives leads created when a customer or prospect installs your offering from the AppExchange. Usually, the lead manager is someone from your sales team. When new leads are created in the License Management App (LMA), the `Lead Owner` field on lead records defaults to the package's lead manager. If you haven't specified a lead manager, the lead owner defaults to the LMA.

Refresh Licenses for an Offering in the License Management App

Refresh licenses to sync license records for a package across all customer installations. Consider refreshing licenses if discrepancies appear between the number of licenses in a customer's org and the License Management App (LMA) or if you installed the LMA in a new org.

Move the License Management App to Another Salesforce Org

By default, the License Management App (LMA) is installed in your Partner Business Org (PBO). Salesforce strongly recommends managing licenses from your PBO. However, if your company chooses to use another org for ISV business processes, you can install the LMA in that org.

Modify a License Record in the License Management App

You can change a customer's access to your offering by modifying a license record. For example, increase or decrease the number of seats included with a license or change the expiration date.

USER PERMISSIONS

To edit licenses and packages:

- Read

  AND

  Edit

1. Go to a license record in the License Management App (LMA).
2. Select **Modify License**. If you don't see Modify License, edit the page layout to add the control.

   Warning: In Salesforce Classic and Lightning Experience, sometimes the license detail page includes an Edit control. Don't use this control—use **Modify License** instead.

3. Update field values as needed.

Field	Description
`Expiration`	Enter the last day that the customer can access your offering, or select **Does not expire** if the license doesn't expire.
`Seats`	Enter the number of licensed seats, or select **Site License** to make your offering available to all users in the customer's org. You can allocate up to 99,000,000 seats.
`Status`	Select a value from the drop-down list. • **Trial**—Allows the customer to try your offering for up to 90 days. After the trial license converts to an active license, it cannot return to a trial state. • **Active**—Allows the customer to use your offering according to the license agreement.

Field	Description
	- **Suspended**—Prohibits the customer from accessing your offering. Note: When your offering is uninstalled, its status is set to Uninstalled, and the license can't be edited.

4. Select **Save**.

Change the Lead Manager in the License Management App

USER PERMISSIONS

To edit licenses and packages:
- Read

  AND

  Edit

You can change who receives leads created when a customer or prospect installs your offering from the AppExchange. Usually, the lead manager is someone from your sales team. When new leads are created in the License Management App (LMA), the `Lead Owner` field on lead records defaults to the package's lead manager. If you haven't specified a lead manager, the lead owner defaults to the LMA.

1. Go to a package in the LMA. If you don't see any packages, check your list view.
2. Select **Edit**, and then locate a user. Make sure that you're selecting someone who has permission to access license records in the LMA.
3. Select **Save**.

Refresh Licenses for an Offering in the License Management App

USER PERMISSIONS

To edit licenses and packages:
- Read

  AND

  Edit

Refresh licenses to sync license records for a package across all customer installations. Consider refreshing licenses if discrepancies appear between the number of licenses in a customer's org and the License Management App (LMA) or if you installed the LMA in a new org.

Note: You can refresh licenses for a package once per week.

1. Go to a package record in the LMA. If you don't see any packages, check your list view.
2. Select **Refresh Licenses**. In Lightning Experience, you might need to select the drop-down list to see this control.
3. Confirm that you want to refresh licenses for this package, and then select **Refresh Licenses** again.

Move the License Management App to Another Salesforce Org

By default, the License Management App (LMA) is installed in your Partner Business Org (PBO). Salesforce strongly recommends managing licenses from your PBO. However, if your company chooses to use another org for ISV business processes, you can install the LMA in that org.

USER PERMISSIONS

To install packages:
- Download AppExchange Packages

To manage licenses in the Partner Community:
- Manage Listings

To edit licenses and packages:
- Read

  AND

  Edit

Important: When you move the LMA to a new org, you must manually re-associate your packages and refresh the licenses. Your package and license records don't move to the new org.

1. Log a case to break the association between the LMA and the org where it's currently installed.
   a. Log in to the Partner Community and go to the Support tab.
   b. Select **New Case**.
   c. Select **License Management Application**, and then select **Create a Case**.
   d. For Subtopic, select **Other**.
   e. Enter the required information in the `Description` field, and then select **Submit Case**.
2. Install the LMA in the new org on page 296.
3. Associate your packages with the new org on page 297.
4. Refresh licenses for your packages on page 300.

Troubleshoot the License Management App

The most frequent problems arise when leads and licenses aren't created or a proxy user is deactivated.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Leads and Licenses Aren't Being Created

When a customer installs your package, leads or licenses are created. If they aren't, check the configuration in the org in which the LMA is installed. If you resolve the issue with one of these recommendations, the licenses usually appear in the LMA after a few days.

Did the customer really install the package?

When a customer selects **Get it Now** on your AppExchange listing, Salesforce counts this as an installation. However, the customer can cancel the installation before it completed, or the installation could have failed. If the installation doesn't finish, a license doesn't appear in the LMA.

Is State and Country picklist validation enabled?

If it is enabled, try disabling it. A known issue prevents leads from being created in the LMA if this feature is enabled. The issue occurs if customers haven't provided state and country values in their user profiles, or those values are incorrect.

Does the lead or license object have a trigger?

Don't use `before_create` or `before_update` triggers on leads and licenses in the LMA. Instead, use `after_` triggers, or remove all triggers. If a trigger fails, it can block license creation.

Does the lead or license record have a required custom field?

If yes, remove the requirement. The LMA doesn't populate required custom field, so it can prevent licenses or leads from being created.

Is the lead manager a valid, active user?

If not, the LMA can't create leads and licenses.

Does the lead or license record have a validation rule?

Validation rules often block the creation of LMA lead or license records because the required field isn't there.

Does the lead or license have a workflow rule?

Workflow rules sometimes prevent leads and licenses from being created. Remove the workflow rule.

Was the lead converted to an account?

When leads are converted to accounts, they are no longer leads.

Proxy User Has Deactivated Message

If a "proxy user has deactivated" message appears when editing a license in the LMA, a subscriber org could be locked, deleted, or disabled. Here's a list of things to check.

Is the org active?

Check to see if the customer deleted the org. If the org has been deleted, delete the corresponding license record.

Has the package been installed?

If the org is locked or the package has been uninstalled, the license record can't be updated. Ask the customer to reinstall the package.

License Management App FAQ

Answers to common questions about the License Management App (LMA).

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Is the LMA compatible with Lightning Experience?

Can I install the LMA in a non-production Salesforce org?

Why can't I see the Modify License button on my license records?

A customer installed my package before I associated it with the LMA. How can I manage the license record?

Can I automate the assignment of licenses to users in the subscriber org?

Why aren't leads and licenses being created in the LMA?

What happens when I decrease the number of available licenses below the current number of licensed users?

Is the LMA compatible with Lightning Experience?

Yes, both Salesforce Classic and Lightning Experience support the LMA.

Can I install the LMA in a non-production Salesforce org?

By default, the LMA is installed in your Partner Business Org, a production environment that includes the ISV tools needed to run your business. When the LMA is part of a production environment, you can fully integrate license management into your sales, billing, and marketing processes. Our most successful partners make use of the LMA in their production orgs.

Additionally, some types of non-production environments, such as trial orgs, eventually expire. If this happens, your mission critical data becomes temporarily inaccessible. For these reasons, Salesforce strongly discourages moving the LMA to a non-production org.

Why can't I see the **Modify License** button on my license records?

You must add the Modify License button to the layout of your license detail page.

A customer installed my package before I associated it with the LMA. How can I manage the license record?

Go to the package's detail page in the LMA, and then select **Refresh Licenses**. A license record for this customer now appears.

Can I automate the assignment of licenses to users in the subscriber org?

Yes, you can use the API to assign or revoke licenses for managed packages installed in your Salesforce org. For more information, see the PackageLicense and UserPackageLicense objects in the *SOAP API Developer Guide*.

Why aren't leads and licenses being created in the LMA?

Common reasons why leads and licenses aren't created in the LMA include:

- You haven't associated the package or package version with the LMA.
- Lead, license, package, or package version custom objects have mandatory custom fields. Try removing the mandatory custom fields.
- The lead manager is not a valid, active user.
- `before_` triggers are preventing lead creation. Try removing the triggers, or use `after_` triggers instead.

What happens when I decrease the number of available licenses below the current number of licensed users?

Users in the customer's org who already have access to your offering continue to have access. Their system administrator must manually revoke the extra licenses. Until the admin revokes access, the license count remains negative.

CHAPTER 12 Manage Features

In this chapter ...

Take the License Management App (LMA) a step further by extending it with the Feature Management App (FMA). The FMA is generally available as of mid-October 2017.

Here at Salesforce, we sometimes run pilot programs, like the one we ran when we introduced Feature Management. Sometimes we dark-launch features to see how they work in production before sharing them with you. Sometimes we make features available to select orgs for limited-time trials. And sometimes we want to track activation metrics for those features.

With feature parameters, we're extending this previously secret functionality to you, our Partner Ohana. Install the FMA in your License Management Org (LMO). The FMA extends the License Management App, and like the LMA, it's distributed as a managed package.

To try out Feature Management in a sample Salesforce DX project, clone our Project Force App on GitHub.

Feature Parameter Metadata Types and Custom Objects

Feature parameters are represented as Metadata API types in your packaging org, as records of custom objects in your LMO, and as hidden records of custom objects in your subscriber's org. The FMA creates the custom objects. Three types of feature parameters store three types of values: boolean, integer, and date. You can reference these values in your code, just like you reference any other value in a customer's org.

Feature Parameter Fields

Feature parameters are represented as Metadata API types that you can work with in your packaging org. The `FeatureParameterBoolean`, `FeatureParameterDate`, and `FeatureParameterInteger` types store three types of values: boolean, integer, and date. You can use these types in managed packages to store these values:

- A `dataFlowDirection` value: `LmoToSubscriber` or `SubscriberToLmo`.
- A `masterLabel` value for each feature parameter.
- A default `value` for each feature parameter. You can reference the values in your code, just like you reference other values in a customer's org.

The first time a subscriber installs your package, a `FeatureParameter__c` record is created in your LMO for each feature parameter. The feature parameter records store values in these fields:

- `FullName__c`
- `DataType__c` (`Boolean`, `Integer`, or `Date`)
- `DataFlowDirection__c`
- `Package__c`
- `IntroducedInPackageVersion__c`
- `Namespace_Prefix__c`

In your LMO and in your subscriber's org, records of custom junction objects represent your feature parameters: records of `FeatureParameterBoolean__c`, `FeatureParameterDate__c`, and `FeatureParameterInteger__c` objects. The FMA creates records of these junction objects in the LMO and in the customer's org when a subscriber installs your package. These records associate your feature parameters with the licenses for your subscribers and set the feature parameters' values. Their values in your LMO and in your subscriber's orgs are linked. Each record stores three values:

- `FeatureParameter__r`
- `License__c`
- `Value__c`

Life Cycle of a Feature Parameter

Let's make all that information about feature parameters and their fields a bit more relevant. Here's a brief overview of how these types and objects work, from start to finish.

1. The ISV defines feature parameters in the packaging org via the Feature Parameters tab on the Package detail page for the org's managed package. Depending on the value of `dataFlowDirection` (`LMO to Subscriber` or `Subscriber to LMO`), the feature parameters alter the associated data in subscriber orgs or collect activation metrics. The ISV then writes other code that interacts with the feature parameters to check access rights or collect usage information.
2. Customers install the package from AppExchange.

3. When the package is installed in a subscriber org, one `FeatureParameter__c` record for each feature parameter is created in the LMO, unless the records already exist.
4. During package installation in a subscriber org, junction object records are created in the LMO and in the subscriber's org. For each feature parameter, a record of a junction object is created in each org to associate the feature parameter with the license for the subscriber org. A junction object is a custom object with two master-detail relationships. In this case, the relationships are with `FeatureParameter__c` and `License__c`. The junction objects are of type `FeatureParameterBoolean__c`, `FeatureParameterDate__c`, or `FeatureParameterInteger__c`. The records store the value of their associated feature parameter for the subscriber org. Initially, their `Value__c` field is populated with the `defaultValue` from the packaging org. Their values in the LMO and in the subscriber org are linked.
5. The ISV uses the junction objects to override the feature parameters' default values or to collect data. Depending on the value of each feature parameter's `DataFlowDirection__c` field, data flows to the subscriber org (from the LMO) or to the LMO (from the subscriber org). That data is stored in the junction object records.

SEE ALSO:

GitHub: Project Force App (sample Salesforce DX project for Feature Management)

Set Up Feature Parameters

You first set up the Feature Management App in your License Management Org. Then you define feature parameters in your packaging org and add them to your package.

Install and Set Up the Feature Management App in Your License Management Org

Install the FMA in your LMO. Then add the Feature Parameters tab to your default view, and adjust your page layout for licenses to display related lists for your feature parameters.

Create Feature Parameters in Your Packaging Org

Create a feature parameter in your packaging org, and set its type, default value, and data flow direction.

Add Feature Parameters to Your Managed Package

After you've created some feature parameters, you can add them to a managed package as components and reference them in your code. Feature parameters aren't available in unmanaged packages.

Install and Set Up the Feature Management App in Your License Management Org

Install the FMA in your LMO. Then add the Feature Parameters tab to your default view, and adjust your page layout for licenses to display related lists for your feature parameters.

1. To request access to the FMA, log a case in the Partner Community. The FMA extends the License Management App, so be sure to install the LMA before requesting access to the FMA.
2. To install the FMA, follow the instructions in your welcome email.
3. Add the Feature Parameters tab to your default view. For details, see "Customize My Tabs" in the Salesforce Help.
4. Update your page layout for licenses.
   a. Navigate to a license record's detail page.
   b. Click **Edit Layout**.

c. In the Related Lists section of the License Page Layout Editor, add these lists.
   - Feature Parameter Booleans
   - Feature Parameter Dates
   - Feature Parameter Integers

d. For each related list, add these columns.
   - Data Flow Direction
   - Feature Parameter Name
   - Full Name
   - Master Label
   - Value

Create Feature Parameters in Your Packaging Org

Create a feature parameter in your packaging org, and set its type, default value, and data flow direction.

1. From Setup, enter `Packages` in the Quick Find box, then select **Packages**.
2. In the Packages section, in the Package Name column, select your managed package.
3. On the Feature Parameters tab, click **New Boolean**, **New Integer**, or **New Date**.
4. Give your feature parameter a developer name that meets the standard criteria for developer names. The name must be unique in your org. It can contain only alphanumeric characters and underscores, and must begin with a letter. It can't include spaces, end with an underscore, nor contain two consecutive underscores.
5. Give the feature parameter a label.
6. Set a default value for the feature parameter. If you're creating a Feature Parameter Boolean, you see only a checkbox for Default Value. If you want your default value to be `true`, select this checkbox.
7. Set a data flow direction. To use this feature parameter to control behavior in your subscriber's org, select **LMO to Subscriber**. To collect activation metrics from your subscriber, select **Subscriber to LMO**.
8. Click **Save**.

Add Feature Parameters to Your Managed Package

After you've created some feature parameters, you can add them to a managed package as components and reference them in your code. Feature parameters aren't available in unmanaged packages.

Complete these steps in your packaging org.

1. From Setup, enter `Packages` in the Quick Find box, then select **Packages**.
2. In the Packages section, in the Package Name column, select your managed package.
3. On the Components tab, click **Add**.
4. From the Component Type dropdown, select **Feature Parameter Boolean**, **Feature Parameter Date**, or **Feature Parameter Integer**.
5. Select your feature parameter, and then click **Add to Package**.

Reference Feature Parameters to Drive App Behavior and Track Activation Metrics

You can reference feature parameters in your code.

How Do Feature Parameters Work?

When a subscriber installs your package, Salesforce creates two junction object records for each feature parameter: one in your LMO, and a hidden one in your subscriber's org. The linked records keep the values of each feature parameter in sync between your LMO and your subscriber's org. This linking is similar to the mechanism that keeps license records in sync between your LMO and your subscriber's org.

Drive App Behavior with LMO-to-Subscriber Feature Parameters

Feature parameters with a Data Flow Direction value of `LMO to Subscriber` are writable at your end and read-only in your subscriber's org. These feature parameters serve as permissions or limits. Use LMO-to-subscriber feature parameters to enable or disable new features or to control how many of a given resource your subscriber can use. Or, enable features for a limited trial period. The sky's the limit. Assign values to LMO-to-subscriber feature parameters by updating junction object records in your LMO, and then check those values in your code.

Track Preferences and Activation Metrics with Subscriber-to-LMO Feature Parameters

Use subscriber-to-LMO feature parameters to track feature activation in your subscriber's org. Parameter values are assigned on the subscriber's end and then sent to your LMO. To collect the values, update the feature parameters in your subscriber's org using Apex code. Check with your legal team before obtaining activation metrics from your customers. Use activation metrics to collect only aggregated data regarding feature activation.

How Do Feature Parameters Work?

When a subscriber installs your package, Salesforce creates two junction object records for each feature parameter: one in your LMO, and a hidden one in your subscriber's org. The linked records keep the values of each feature parameter in sync between your LMO and your subscriber's org. This linking is similar to the mechanism that keeps license records in sync between your LMO and your subscriber's org.

SEE ALSO:

Feature Parameter Metadata Types and Custom Objects

Drive App Behavior with LMO-to-Subscriber Feature Parameters

Feature parameters with a Data Flow Direction value of `LMO to Subscriber` are writable at your end and read-only in your subscriber's org. These feature parameters serve as permissions or limits. Use LMO-to-subscriber feature parameters to enable or disable new features or to control how many of a given resource your subscriber can use. Or, enable features for a limited trial period. The sky's the limit. Assign values to LMO-to-subscriber feature parameters by updating junction object records in your LMO, and then check those values in your code.

Assign Override Values in Your LMO

To override the default value of a feature parameter in a subscriber's org, update the appropriate junction object record in your LMO.

Check LMO-to-Subscriber Values in Your Code

You can reference feature parameters in your code, just like you'd reference any other custom object.

Assign Override Values in Your LMO

To override the default value of a feature parameter in a subscriber's org, update the appropriate junction object record in your LMO.

1. Open the license record for a subscriber's installation of your package.
2. In the related list for Feature Parameter Booleans, Feature Parameter Integers, or Feature Parameter Dates, select the feature parameter whose value you want to update.
3. Click **Edit**.
4. Set a value.
5. Click **Save**.

Check LMO-to-Subscriber Values in Your Code

You can reference feature parameters in your code, just like you'd reference any other custom object.

Use these Apex methods with LMO-to-subscriber feature parameters to check values in your subscriber's org.

- `System.FeatureManagement.checkPackageBooleanValue('YourBooleanFeatureParameter');`
- `System.FeatureManagement.checkPackageDateValue('YourDateFeatureParameter');`
- `System.FeatureManagement.checkPackageIntegerValue('YourIntegerFeatureParameter');`

SEE ALSO:

Apex Developer Guide: FeatureManagement Class

Track Preferences and Activation Metrics with Subscriber-to-LMO Feature Parameters

Use subscriber-to-LMO feature parameters to track feature activation in your subscriber's org. Parameter values are assigned on the subscriber's end and then sent to your LMO. To collect the values, update the feature parameters in your subscriber's org using Apex code. Check with your legal team before obtaining activation metrics from your customers. Use activation metrics to collect only aggregated data regarding feature activation.

- `System.FeatureManagement.setPackageBooleanValue('YourBooleanFeatureParameter', booleanValue);`
- `System.FeatureManagement.setPackageDateValue('YourDateFeatureParameter', datetimeValue);`
- `System.FeatureManagement.setPackageIntegerValue('YourIntegerFeatureParameter', integerValue);`

Warning: The `Value__c` field on subscriber-to-LMO feature parameters is editable in your LMO. But don't change it. The changes don't propagate to your subscriber's org, so your values will be out of sync.

SEE ALSO:

Apex Developer Guide: FeatureManagement Class

Hide Custom Objects and Custom Permissions in Your Subscribers' Orgs

Occasionally, you want to include custom permissions or custom objects in a package but not show them to your subscribers. Check with your company's legal team before releasing hidden functionality, and aggregate results that you collect from unknowing subscribers.

To hide custom objects when creating your package, set the value of their Visibility field to `Protected`.

To hide custom permissions when creating your package, from Setup, enter *`Custom Permissions`* in the Quick Find box. Select **Custom Permissions** > *`Your Custom Permission`* > **Edit**. Enable **Protected Component**, and then click **Save**. After your package is installed, use the `System.FeatureManagement.changeProtection()` Apex method to hide and unhide custom objects and permissions.

Warning: For custom permissions, you can toggle the protected value indefinitely. However, after you've released unprotected objects to subscribers, you can't set the visibility to `Protected`. Be sure to protect custom objects that you want to hide before you release the first package version that contains them.

To hide custom permissions in released packages:

- `System.FeatureManagement.changeProtection('`***`YourCustomPermissionName`***`', 'CustomPermission', 'Protected');`

To unhide custom permissions and custom objects in released packages:

- `System.FeatureManagement.changeProtection('`***`YourCustomPermissionName`***`', 'CustomPermission', 'Unprotected');`
- `System.FeatureManagement.changeProtection('`***`YourCustomObjectName__c`***`', 'CustomObject', 'Unprotected');`

SEE ALSO:

Apex Developer Guide: FeatureManagement Class

Best Practices for Feature Management

We suggest that you follow these best practices when working with feature parameters.

- We strongly recommend that you use this feature set in a test package and a test LMO before using it with your production package. Apply changes to your production package only after fully understanding the product's behavior. To try out Feature Management in a sample Salesforce DX project, clone our Project Force App on GitHub.
- Limit the number of feature parameters in your package. Each package can include up to 25 feature parameters.
- Create LMO-to-subscriber feature parameters to enable features from your LMO for individual subscriber orgs. Don't use the Apex code in your managed package to modify LMO-to-subscriber feature parameters' values in subscriber orgs. You can't send the modified values back to your LMO, and your records will be out of sync.

  Use LMO-to-subscriber feature parameters as read-only fields to manage app behavior. For example, use LMO-to-subscriber feature parameters to track the maximum number of permitted e-signatures or to make enhanced reporting available.
- Create subscriber-to-LMO feature parameters to manage activation metrics. Set these feature parameters' values in subscriber orgs using the Apex code in your managed package. For example, use subscriber-to-LMO feature parameters to track the number of e-signatures consumed or to check whether a customer has activated enhanced reporting.

Considerations for Feature Management

Keep these considerations and known issues in mind when working with feature parameters.

- Technically, feature parameter records are creatable and editable in the LMO. However, don't create or modify them—we're keeping them updated for you. Likewise, although the records of subscriber-to-LMO feature parameters' junction objects are editable in the LMO, don't edit them. Ignore these feature parameter–related buttons in your LMO: New, Clone, Submit for Approval, and Save & New.
- We are still making improvements to the UI, and we have in-progress fit-and-finish work planned across the feature set.
- In the FMA, the Introduced in Package Version field on the `FeatureParameter__c` object displays cryptic information. We'll fix this issue in the future.
- When you publish a push upgrade to your managed package, feature parameters in your LMO and your subscribers' orgs are updated asynchronously. Creating and updating the junction object records can take several minutes.
- When you update LMO-to-subscriber values in your LMO, the values in your subscribers' orgs are updated asynchronously. This process can take several minutes.
- When the Apex code in your package updates subscriber-to-LMO values in your subscriber's org, the changes can take up to 24 hours to reach your LMO.

CHAPTER 13 Provide a Free Trial of Your Solution

In this chapter ...

Maximize customer adoption by offering free trials of your solution on AppExchange. Explore the types of trials available and determine the best type for your solution.

Note: This feature is available to eligible partners. For more information on the Partner Program, including eligibility requirements, visit https://partners.salesforce.com.

Why Use Trialforce?

Trialforce lets you provision a free trial of your offering quickly and easily. Each time a trial is provisioned, Trialforce creates a lead in the License Management App, which helps you track usage and convert prospects into paying customers. With Trialforce, you can:

- Run your own marketing campaign to maximize customer reach and adoption.
- Customize your offering, including branding, functionality, design, data, and trial experience.
- Manage trials for multiple offerings, versions, and editions from one convenient place.
- Let customers, including non-admin users, try your app or component without logging in to their production environment.

Trialforce

A Trialforce setup has several parts: the Trialforce management organization, Trialforce source organizations, and Trialforce templates. Before you set up Trialforce, learn how these parts work together to deliver a trial of your AppExchange solution.

Trialforce Management Organization (TMO)

The TMO is the starting point for setting up Trialforce and the central location for managing Trialforce after it's set up. You must log a case in the Salesforce Partner Community to request a TMO. The two tasks you perform in the TMO are:

- Create Trialforce source organizations.
- Define templates for custom branding.

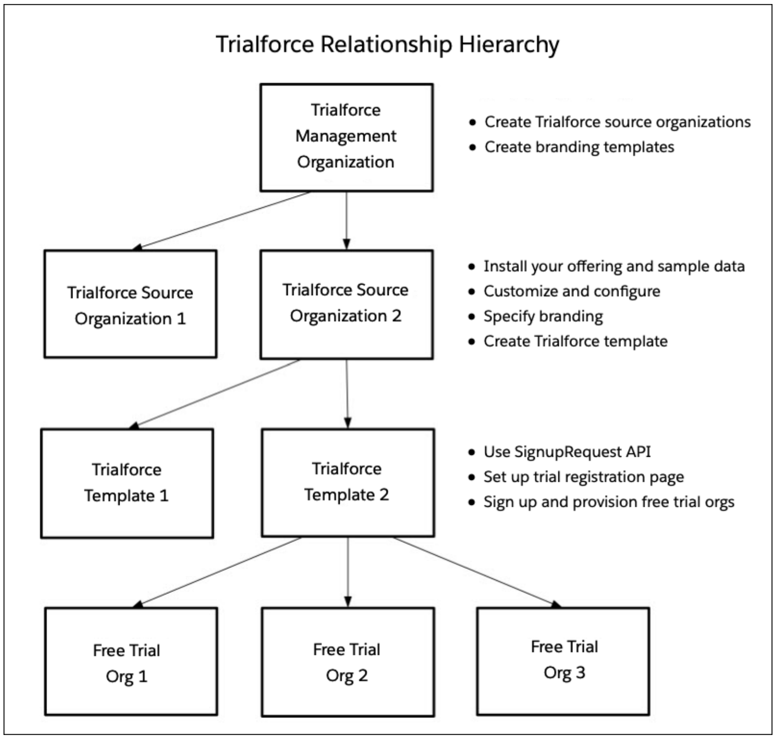
Trialforce Source Organization (TSO)

You use the TSO to create a template for the trial orgs received by your customers. You create the TSO from your TMO. The tasks you perform in a TSO are:

- Install your offering, along with any sample data.
- Configure the TSO to be exactly as you want your customers to experience it.
- Specify branding by choosing from the templates you previously created in the TMO.
- Create a Trialforce template, which becomes the basis for all trial orgs.

Trialforce Template

The template is a snapshot or exact copy of your TSO at a specific instance in time. You create it from a TSO after you've installed your offering and made configuration changes. You specify a Trialforce template when you generate a trial org using the SignupRequest API and when you create a demo org from the Environment Hub. The template defines the trial org that is provisioned each time a customer signs up for a trial of your offering.


Trialforce Relationship Hierarchy
Trialforce Management Organization
• Create Trialforce source organizations
• Create branding templates
Trialforce Source Organization 1
Trialforce Source Organization 2
• Install your offering and sample data
• Customize and configure
• Specify branding
• Create Trialforce template
Trialforce Template 1
Trialforce Template 2
• Use SignupRequest API
• Set up trial registration page
• Sign up and provision free trial orgs
Free Trial Org 1
Free Trial Org 2
Free Trial Org 3

The TMO, TSOs, and Trialforce templates have a hierarchical relationship.

- You can create multiple TSOs from a given TMO. For example, if you want to offer trials for two different apps, you would generate two different TSOs from the same TMO, one for each app. This enables you to use the TMO as a central hub to manage the trials for all Lightning Platform apps or components produced by your company.
- You can create multiple Trialforce templates from the same TSO. For example, you release a new version of your component after you've started using Trialforce. You can install the updated version into the previous TSO and generate a new Trialforce template from it. To request a trial for the new version, use the SignupRequest API with the new Trialforce template ID. All trial orgs created using the new template ID have the new version of the package.

As a best practice, we recommend that you have one unique TMO for your company, one TSO for each offering, and one Trialforce template for each version or edition of your offering. Splitting up the configuration process across these different levels makes it easier to maintain and update your trials. Each time you change something, such as the version, its branding, or a configuration detail of the trial org, you only need to make the change at one level in the hierarchy. This minimizes the configuration steps involved and makes it easy to concurrently manage trials for multiple offerings, versions, and editions.

After you've configured a TMO, TSO, and Trialforce template, choose how to provide trials to prospective customers.

- **Use AppExchange**: Customers begin a trial of your offering directly from an AppExchange listing. This is the quickest, easiest way to make a trial available because it requires only a few steps to configure.
- **Use the API**: You provision a trial of your offering programmatically using the SignupRequest API. This approach is ideal if you want full control of the signup process because it allows for advanced customization.

Set Up Trialforce

After you've built your offering and passed the AppExchange security review, follow these steps to set up Trialforce.

Note: To enable Trialforce, you must first sign the ISVforce/OEM agreement.

1. Create your managed package.
2. Configure a License Management Organization (LMO) to manage customers' access to apps and components. If you're an existing Salesforce user, install the License Management Application (LMA) in your CRM organization (Enterprise Edition is required). If you're new to the Partner Program, the LMA is preinstalled in your partner business org.
3. Link a version with the LMO and set the license defaults. This step ensures that each time a prospect creates a trial, the LMO receives a new lead and license record.
4. Request a Trialforce Management Organization (TMO).
5. Optionally, create a customized branded login page and branded emails in your TMO.
6. Create a Trialforce Source Organization (TSO) from your TMO.
7. Install your managed package in the TSO, and customize it as you want your prospects to experience it. You can apply custom branding, load sample data, create custom profiles, and so on.
8. Create a new Trialforce template from the TSO.
9. Link the Trialforce template to the AppExchange.
10. Submit the Trialforce template for security review and get it approved.

You can now use this template to create free trials. For more information, see:

- Providing a free trial on AppExchange
- Providing a free trial on your website
- Providing a free trial using the API

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:

- Customize Application

Link a Package with Your License Management Organization

To receive lead and license records from customer installs, link a managed package to your License Management Organization (LMO), the organization where the License Management App (LMA) is installed. You also specify default license settings for your offering during this process. Default license values are used to set the Status, Expiration Date, and Seats fields on the license record in the LMA and in the installer's organization.

Note: When you link a package with an LMO, that package's leads and licenses must be permanently managed out of the LMO. You can't migrate licenses to another organization.

1. Log in to the Partner Community.
2. On the Publishing page, click the **Packages** tab.
3. Find the package that you want to link, and click **Manage Licenses**.
4. Click **Register**.
5. Enter the login credentials for your LMO, and click **Submit**.
6. Select whether your default license is a free trial or active.
7. Enter the license length in number of days. If your license is free or doesn't expire, select **License does not expire**.

8. Enter the number of seats associated with your default license, or select **License is site-wide** to offer the license to all users in the installer's organization.
9. Click **Save**.

To verify that you linked the package successfully, log in to the LMO and click the **Package Versions** tab. After you link a package to your LMO, all versions of that package are associated.

Request a Trialforce Management Org

A Trialforce Management Org (TMO) lets you create and manage Trialforce Source Orgs (TSO) and specify custom branding for your login page and emails. To receive a TMO, you must be a qualified ISV partner, and your offering must have passed the AppExchange security review.

Note: The TMO is separate from your Partner Business Org and the Developer Edition org where you built your offering.

1. Log in to the Partner Community and go to the Support tab.
2. Select **New Case**.
3. Select **Trialforce**, and then select **Create a Case**.
4. For Subtopic, select **Trialforce Management Org**.
5. Enter the required information in the `Description` field, and then select **Submit Case**.

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:
- Customize Application

Setting Up Custom Branding for Trialforce

App developers using Trialforce to create new trials of their product can optionally set up a branded login site and system emails. By branding these areas with your company's look and feel, users of your application are immersed in your brand from sign-up to login. Use custom branding for non-CRM apps, not for apps that extend Salesforce CRM and require Salesforce standard objects, such as Leads, Opportunities, and Cases.

A branded login page enables you to specify your login domain and login site.

- A login domain ends with `.cloudforce.com`, so if your company name is "mycompany," your login domain is `mycompany.cloudforce.com`.
- Your custom login site includes your text and company logo and mobile-friendly versions of your login site.

Branded emails allow you to specify fields in system-generated emails so that your company name, address, and other pertinent details are used in email correspondence. You can create multiple branded email sets for different campaigns or customer segments.

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:
- Customize Application

Note: To configure branding, you must be logged in to a Trialforce Management Organization (TMO). To get your TMO, log a case in the Partner Community. Branding is not available for Trialforce Source Orgs created in the Environment Hub.

Creating Branded Emails

You can customize the branding of the emails sent to subscribers of new trial organizations.

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:

- Customize Application

To create a branded email set:

1. Log in to your Trialforce Management Organization.
2. From Setup, enter *`Branding`* in the `Quick Find` box, select **Branding**, then click **Email Sets**.
3. Click **New Email Set** or **Edit** next to an existing email set.
4. Enter a name for the email set and your company information.
5. In the Preview Emails area, click through the different types of generated emails and make sure they read correctly.

   Note: The login URL displayed in the preview will always be http://login.salesforce.com even if you use a branded login page. These two processes are distinct.

6. Click **Save**.
7. If you're ready to make these emails available to your Trialforce Source Organization (TSO), click **Publish**. Otherwise your changes are saved and you can publish later.

To assign a branded email set to your TSO:

1. From Setup, enter *`Source Organizations`* in the `Quick Find` box, then select **Source Organizations**.
2. Click **Edit** next to your TSO.
3. Select the email set.
4. Click **Save**.
5. Click **Login** if you want to see your branded login page in action.

Creating a Branded Login Page

Customers typically log in to your app using the traditional login.salesforce.com site. A branded login page enables you to customize this domain and parts of this login page so you can provide a branded experience for your customers. Your custom login site includes your text and company logo, and mobile-friendly versions of your login site as well.

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:

- Customize Application

To create a branded login page:

1. Log in to your Trialforce Management Organization.
2. From Setup, enter *`Login Site`* in the `Quick Find` box, then select **Login Site**.
3. Click **Set Up Login Site**.
4. Select a subdomain for your login site by providing a name in the field provided. Usually this is the name of your company.

   Note: A login domain ends with `.cloudforce.com`, so if your company name is "mycompany," your login domain is `mycompany.cloudforce.com`.

5. Check the availability of the domain and then accept the terms of use.
6. Click **Save and Launch Editor**.
7. Use the Login Brand Editor to change how your login page looks. For additional help using the editor, click **Help for this Page**.

8. Click **Save and Close**.
9. If you're ready to make these changes available to your TSO, click **Publish**. Otherwise your changes are saved and you can publish later.

Create a Trialforce Source Organization

EDITIONS

Available in: Salesforce Classic

Available in: **Developer** Edition

USER PERMISSIONS

To manage Trialforce:
- Customize Application

A Trialforce Source Organization (TSO) acts as the basis for a new trial org. After you create a TSO, you install your package there. You then add data to give your prospects something to explore when they first log in to the trial org.

You have two options for creating a TSO: You can use a Trialforce Management Organization (TMO) or the Environment Hub. If you plan to brand your emails or login page, use a TMO. When you create the TSO in a TMO, you also get a custom domain (My Domain). Here's how to create a TSO (Enterprise Edition) from a TMO.

Note: If you create a TSO from a TMO, it's always an Enterprise Edition. To create a Professional Edition TSO, create the TSO from the Environment Hub.

1. Log in to your TMO.
2. From Setup, enter `Source Organizations` in the `Quick Find` box, then select **Source Organizations**.
3. Click **New**.
4. Enter a new username and email address for the administrator account.
5. Enter a name for the TSO. Optionally, specify the custom branding by choosing a branded email set or login site.
6. Click **Create**.

You can also create a TSO from the Environment Hub. When you use the Environment Hub, you can create an Enterprise Edition TSO or a Professional Edition TSO.

1. Log in to the Environment Hub.
2. Click **Create Org**.
3. Keep the default, **Purpose as Trialforce**.
4. Keep the default for Create Using, **Standard Edition**.
5. Select **Professional TSO** or **Enterprise TSO**.
6. Enter the org name.
7. (Optional) Enter a unique name for the My Domain custom domain.
8. Enter a username and email address for the admin account.
9. Enter a name for the TSO.
10. Acknowledge that you've read the Master Subscription Agreement.
11. Click **Create**.

The TSO now appears in the Environment Hub.

You receive an email with the login details for your TSO. You can then log in to the TSO and install your package, along with sample data and configurations. Optionally, you can also create:

- Custom profiles
- New users

- Sample records

The goal is to configure the TSO exactly as you want your customers to experience it. You can then create a Trialforce template, which is a snapshot of your TSO at a specific point in time.

Note: Here are some considerations when working with a TSO.

- Always associate a managed package with the License Management Organization (LMO) before installing the offering in your TSO. If you don't follow that order, trial orgs provisioned from the TSO don't generate leads or licenses in the LMO.
- Before creating a Trialforce template, ensure that the TSO admin has a license for the offering installed in the TSO.
- You can create multiple TSOs from your TMO, so you can set up trials for different products, each with its own configuration and branding.
- All TSOs expire after one year. If you want to use the TSO for a longer period, log a case to request an extension.

SEE ALSO:

How do I configure who can use Lightning Experience in my trial org?

Create a Trialforce Template

Create a Trialforce Template

A Trialforce template is a snapshot of your Trialforce Source Organization (TSO) at a given instance in time. For security reasons, however, Personally Identifiable Information (PII) on the User Object, such as that in the address fields, is scrubbed from templates. PII in custom objects and fields is not modified. Before you create the template, make sure that you've installed your package into the TSO. Then, configure it exactly as you want your customers to experience it, with the appropriate sample data, profiles, users, and records.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer**, **Professional**, and **Enterprise** Edition

USER PERMISSIONS

To manage Trialforce:
- Customize Application

Note: You can create a template only if your TSO is less than or equal to 1 GB.

1. Log in to your TSO.
2. From Setup, enter `Trialforce` in the `Quick Find` box, then select **Trialforce**.
3. Click **New Trialforce Template**.
4. Describe the template and any optional features.

   By default, templates are public. To create a private template, select **Mark this template as private so that only authorized orgs can sign up**. You can then indicate which orgs are authorized to sign up new orgs using this template.

   If the template isn't private, the default options are fine for most cases.
5. Click **Save**.
6. (Optional) If you created a private template, enter the org ID of the orgs that can sign up using this template, then click **Save**.

   You can enter up to 51 org IDs, each on a separate line.

You receive an email with the ID of the new template after it's generated. Submit the template for review before you can use it to sign up trial organizations. Remember to generate a new template each time you make updates to your TSO so that your trials always reflect the most recent state.

Each template has a status with one of the following values.

In Progress

When a template is first created, it always has this status. It then moves to either Success or Error status.

Success

The template can be used to create trial organizations.

Error

The template cannot be used because something has gone wrong and debugging is required.

Deleted

The template is no longer available for use. Deleted templates are removed during system updates.

Link a Trialforce Template to the AppExchange

To offer a free trial with your app or component listing, link a Trialforce template to the AppExchange.

1. Log in to the Partner Community.
2. On the Publishing page, click the **Organizations** tab.
3. Click **Connect Organization**.
4. Enter the login credentials for the organization that contains the trial template. If you developed multiple trial templates in this organization, they are all linked to the AppExchange.
5. Click **Submit**.
6. Optionally, click the **Trial Templates** tab to view the linked template and create a listing.

Submit a Trialforce Template for Security Review

To offer a trial on the AppExchange using Trialforce, your template must pass a security review. Before requesting a review, link the organization containing your Trialforce template to the AppExchange.

Note: You can only request a review on a Trialforce template that has at least one package installed. You must own or license the installed packages in the template and it should have already passed the security review.

1. Log in to the Partner Community.
2. On the Publishing page, click the **Trial Templates** tab.
3. Next to the template that you want reviewed, click **Start Review**.

You receive an email confirmation after you initiate the review and another email when the review is completed. The review is free for partners and typically takes 2–3 days.

Provide a Free Trial on the AppExchange

To create trials on the AppExchange, your app or component must:

- Be a managed package
- Be managed via the License Management Application
- Autoprovision—that is, the user must not need to interact with you at any point to get the app or component up and running
- Have passed the security review
- Have passed the Trialforce template review

You can provide a free trial on the AppExchange in three ways.

- Using Trialforce
- By configuring a test drive
- By installing your app or component into an existing organization

Provide a Free Trial on the AppExchange Using Trialforce

Providing a free trial lets potential customers experience your offering before purchasing or subscribing.

Note: You must be an eligible partner to provide free trials. For more information on the Partner Program, including eligibility requirements, visit www.salesforce.com/partners.

1. Create a Trialforce template with your offering installed and configured as you want your prospects to experience it. For details, see Setting up Trialforce.
2. Submit the Trialforce template for security review. This review is free and takes less time than the initial review of your app or component.
3. Link the Trialforce template to your AppExchange listing.
   a. Log in to the Partner Community.
   b. On the Publishing page, click the **Listings** tab.
   c. Find the listing where you want to offer a trial, and click it to open the AppExchange publishing console.
   d. Click the **Trials** tab, and select **Offer a free trial organization**.
   e. Follow the on-screen prompts to add a trial template to the listing.
4. Click **Save**.

Now, when customers visit your listing, they can start a free trial with your offering preinstalled, even if they don't have a Salesforce account. If they decide to start a trial, we collect their contact information and ask them to agree to your terms and conditions and our MSA. After they provide this information, prospects receive an email prompting them to log in to a trial organization.

Offer a Test Drive on AppExchange

A test drive lets customers try your product in a Developer Edition org that's preconfigured with sample data. The test drive org has two types of users: an admin and a read-only evaluator. The admin user configures the org for the test drive. The evaluation role lets customers log in to the org and experience your product.

Use the Publishing Console to create test drive orgs. Otherwise, customers can experience issues when logging in as evaluators.

Note: Salesforce doesn't support test drives orgs created outside of the Publishing Console. However, if you create a test drive using another method and your customers experience login issues, try setting profile-level IP login ranges from `0.0.0.0` to `255.255.255.255`. For more information, see "Restrict Login IP Ranges in the Enhanced Profile User Interface" in the Salesforce Help.

1. Log in to the Partner Community.
2. Click **Publishing**.
3. Click **Listings** and then select the product for which you want to offer a test drive.
4. On the Trials tab, select **Offer a Test Drive**.
5. Click **Create Test Drive**.
6. Give the test drive a customer-friendly name, and associate a package.

7. Click **Submit**. Salesforce creates an org and emails you login credentials for the admin and evaluation users.
8. Log in to the test drive org as the admin user and add sample data.
9. Log out of the org and then log in again as the evaluation user to set a password.
10. In the Publishing Console, go to the Trials tab and click **Connect Organization**.
11. Enter the login credentials for the evaluation user and then click **Submit**.
12. Click **Save**.

Provide a Free Trial on the AppExchange When Your Offering Is Installed

You can provide a free trial of your offering by setting the default license settings on your package. When a customer installs the app or component in an existing Salesforce organization, they can use it for the specified trial period.

Provide Free Trials on Your Website

Use HTML forms to drive traffic to your business and show off your solutions to prospective customers. After a prospect submits your form, Salesforce provisions a trial based on your Trialforce template.

To provide a free trial on your website, first set up Trialforce. Then, complete the following tasks and you're ready to go live.

Enable the SignupRequest API
Log a case in the Partner Community to enable the SignupRequest API in your org.

Choose a Sign-Up Form Hosting Option
The sign-up form serves as the registration page that prospective customers use to sign up for trials. Review and choose a hosting option for your sign-up form.

Create Sign-Ups Using the API
Use API calls to the SignupRequest object to create sign-ups for prospective customers.

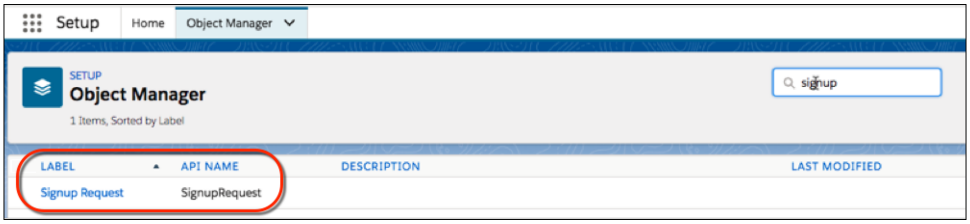
Provision Trial Orgs
Use Trialforce to provision a free trial of your solution for prospective customers.

Enable the SignupRequest API

Log a case in the Partner Community to enable the SignupRequest API in your org.

Tip: Enable the SignupRequest API in your business org. Then, you can easily integrate sign-up data with your existing business processes. For example, create a workflow rule to convert sign-up requests into leads and run reports to track the number of sign-ups in a given period.

1. Check to see if the SignupRequest API is enabled in your business org.
   a. Log in to your business org.
   b. From Setup, enter `Object Manager` in the Quick Find box, then click **Object Manager**.
   c. Verify that the Signup Request object appears. If you don't see this object, log a case to enable the SignupRequest API.



LABEL	API NAME	DESCRIPTION	LAST MODIFIED
Signup Request	SignupRequest		

2. Log a case to enable the SignupRequest API.
   a. Log in to the Partner Community.
   b. Under the Support tab, click **New Case**.
   c. In the AppExchange Partner (ISV) Technology category, hover over Trialforce and then click **Create a Case**.
   d. Select a severity level.
   e. Enter a case subject.
   f. In the Subtopic dropdown list, select **Signup API Feature Request**.
   g. Provide the required case details.
   h. Click **Submit Case**.

Choose a Sign-Up Form Hosting Option

The sign-up form serves as the registration page that prospective customers use to sign up for trials. Review and choose a hosting option for your sign-up form.

The SignupRequest API supports several HTML form hosting options. Choose one of the following:

- Node.js and React app hosted on Heroku
- Lightning component hosted on Salesforce Community
- Visualforce page hosted on Sites
- Web-to-Lead form with Process Builder

Make Unauthenticated Calls to the SignupRequest API

By default, the SignupRequest API is available only to authenticated calls. If you have a use case that requires unauthenticated calls, for example, making your sign-up form available to unauthenticated users, follow the pattern in the code sample.

```
public with sharing class newTrialSignupController {
@auraEnabled
public static void getNewLead(Lead newLead, String templateId, String username, Boolean
createLead, String domain) { }
// SignupCreation is an inner class without sharing. It runs in the system context
// and is used to handle SignupRequest calls for unauthenticated users.
public without sharing class SignupCreation {
public void createNewTrial(Lead newLead, String templateId, String username, String domain)
 {
}}}
```

Create Sign-Ups Using the API

USER PERMISSIONS

To create or view sign-up requests:

- SignupRequest API

Use API calls to the SignupRequest object to create sign-ups for prospective customers.

Using API calls to the SignupRequest object, you can collect and analyze detailed information on all sign-ups from your business organization. You have control over the sign-up process and enhanced visibility into your prospective customers. For example, you can:

- Run reports and collect metrics, such as the number of sign-ups per day or the number of sign-ups in different countries.
- Customize the SignupRequest object to add fields of special interest to your company.
- Create triggers to initiate specific actions, such as send an email notification when a new sign-up request is made.
- Enable sign-ups from a wide range of client applications and devices, so you have more channels for customer acquisition.

For more information on working with objects, see the Object Reference for Salesforce and Lightning Platform.

SEE ALSO:

Provide Free Trials on Your Website

SignupRequest API

Make it Easy for Your Customers to Provision Trials Part 1

Make it Easy for Your Customers to Provision Trials Part 2

Web Form Replacement Code in Nodejs and React

Demo App to Create Trial Orgs Using the SignupRequest API

Provision Trial Orgs

Use Trialforce to provision a free trial of your solution for prospective customers.

Once you've configured Trialforce, you can provision trial orgs two ways.

- Push—You provision a trial on behalf of a prospective customer by filling out the registration form with your prospect's information.
- Pull—A prospect requests a trial on their own by filling out a registration form on your public website.

1. Upload the HTML registration form to your public web servers.
2. Edit and publish the appropriate HTML pages on your company website where you want to include a link to the Trialforce registration form.
3. Navigate to the registration page from your company website.
4. Fill in the required fields and submit the form.

Anyone with access to the form can create a trial on behalf of a prospect without the need to expose the form on the company website. Just launch the registration form HTML file in a browser, fill in the fields on behalf of the customer, and submit the form. Your prospect receives an email, optionally branded with your company information, indicating the new trial is available.

Update Your Trial

If you update your offering or change custom branding, update your trials to reflect the changes.

To update a trial, you must first:

- Create and publish a new version of your managed package or an extension package.

- Have a Trialforce Source Organization (TSO) where you can upload the new package version. You can reuse the TSO that you used to create your original Trialforce template, or use a new one. If you use a new TSO, be sure to link it to AppExchange.

Then complete the following steps.

1. Install your updated managed package or extension package into your TSO.
2. Make any other desired changes in the TSO, such as loading sample data or changing custom branding.
3. Create a Trialforce template for your trial.
4. Submit the template for review.
5. Get the template approved for SignupRequest API use.
   a. Log in to the Salesforce Partner Community.
   b. Click **Support**.
   c. Click **New Case**.
   d. Hover over the **AppExchange (ISV) App Setup & Management** > **Trialforce** category.
   e. Click **Create a Case**.
   f. Provide a case subject, and select a severity level.
   g. For Subtopic, select **Signup API Feature Request**.
   h. For Description provide the TSO ID, the new Trialforce template ID, and the org to use for creating sign ups.
   i. Click **Submit Case**.

Trialforce Best Practices

Here are some guidelines for using Trialforce.

- Create several Trialforce Source Organizations (TSOs) for customized trial experiences, for example, one for each managed package, industry vertical solution, country.
- Load sample data into the TSO.
- Apply custom branding to your trial signup form, log-in page, and emails.
- Update your Trialforce template each time you release a new version of your app.
- Once you've set up Trialforce, go through the signup flow to confirm that everything is working as you expect it to. This testing can help you identify areas to where you can improve the signup process.

Although Trialforce was primarily designed for enabling free trials, it's also useful in other contexts. For example, you can use it to:

- Create trial organizations for sales demos.
- Create test organizations with sample data for internal QA.

Trialforce FAQ

This section contains a list of frequently asked questions about Trialforce.

- How do I upgrade my trial with a new version of my offering?
- Can I distribute my app or component using both Trialforce and the AppExchange?
- How are trials different from Trialforce?
- Is it possible to install another app in a trial organization?

- How do I configure who can use Lightning Experience in my trial org?

How do I upgrade my trial with a new version of my offering?

Install the new version of the package into your Trialforce source organization. After upgrading, create a new Trialforce template and use the template as the basis for your trial.

Can I distribute my app or component using both Trialforce and the AppExchange?

Of course! The most effective way to distribute your offering is by using Trialforce and the AppExchange together. You can even advertise your Trialforce page on your AppExchange listing and vice versa. Generally, the AppExchange is best for engaging existing Salesforce customers, while Trialforce works great with new customers.

How are trials different from Trialforce?

Trials are administered from the AppExchange whereas Trialforce is administered from your own website.

Is it possible to install another app in a trial organization?

Yes. The Trialforce master organization is a fully functioning Salesforce organization. Your customer will have your app installed and can subsequently install additional apps into the same organization as they see fit. It's just like any other free trial of Salesforce.

How do I configure who can use Lightning Experience in my trial org?

The future of the Salesforce user experience and Salesforce platform is Lightning Experience. With Lightning Experience, you can move faster, do more, and be more productive. Going forward, all our new features and innovations will be in Lightning Experience.

You can remove the ability for users with a specific profile to switch back to Salesforce Classic.

1. From Setup, enter `Profiles` in the Quick Find box, then select **Profiles**.
2. Select the profile you want to keep using Lightning Experience.
3. On the profile detail page, click **Edit**.
4. Deselect the **Hide Option to Switch to Salesforce Classic** permission.

By default, new orgs are configured to switch Salesforce Classic users to Lightning Experience once a week. Only users with the Lightning Experience User permission are affected. You can configure or disable automatically switching users to Lightning Experience.

1. From Setup, enter `Lightning` in the Quick Find box, then select **Lightning Experience**.
2. On the Set Up Users tab in the Migration Assistant, turn off **Encourage Users to Stay in Lightning Experience**, or specify how often users are switched to Lightning Experience.

You can disable Lightning Experience for some profiles.

1. From Setup, enter `Profiles` in the Quick Find box, then select **Profiles**.
2. Select the profile you want to change.
3. On the profile detail page, click **Edit**.
4. Deselect the **Lightning Experience User** permission.

You can disable Lightning Experience in a new Trialforce Source org so that new users default to Salesforce Classic.

1. From Setup, enter `Lightning` in the Quick Find box, then select **Lightning Experience**.
2. On the Turn It On tab in the Migration Assistant, click the button to switch it to **Disabled**.

CHAPTER 14 Support Your AppExchange Customers

In this chapter ...

After you publish a solution on AppExchange, you're responsible for the end user support. Even when you've built the best solution the world has ever seen, customers need your help from time to time. Learn about the tools that you can use to attend to your customers' needs, grow your business, and affirm your reputation on AppExchange.

Note: When customers contact Salesforce Customer Support with questions about your solution, we direct them to your AppExchange listing. Make sure the contact information on your listing is accurate and complete.

Subscriber Support Console

Using the Subscriber Support Console, you can easily access information about all your subscribers, such as which Salesforce Edition they are using and if they are over their limits. Subscribers can also grant you login access to troubleshoot issues directly within the app, in the familiar manner that they grant login access to administrators. Once granted access, you can log in to the subscriber's organization and directly view their configuration and data to help troubleshoot problems.

Note: This feature is available to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, please visit us at www.salesforce.com/partners.

Viewing Subscriber Details

The Subscriber Overview page, accessed by clicking the organization's name from the **Subscribers** tab of the LMA, provides detailed information about each subscriber organization. This can give you insight into how a customer is using your app and help you in troubleshooting problems.

Under Organization Details:

- The name and contact information is in Setup, on the Company Information page in the subscriber's organization. This may differ from the information shown in your LMA lead, account, or contact records.
- Organization ID is a unique ID that identifies this customer's Salesforce organization.
- Instance determines which Salesforce data center this customer's organization resides in. It also determines when the customer will get upgraded with a new version of Salesforce. See trust.salesforce.com during the release period to understand which version of Salesforce the customer is using.

The page also includes these related lists.

Limits
Information on the file space, data space, and number of API requests associated with this customer, as a percentage.

Login Access Granted
A list of users who have granted login access and the date when access will expire.

Packages and Licensing
A list of all packages installed in this organization and associated with this LMA. For each package, it shows the version of the app a customer is currently using, the total number of licenses provisioned to the subscriber and the number they've used. This information should match the license record for the subscriber in your LMA.

Request Login Access from a Customer

Before logging in to a subscriber org, first request login access from the customer.

To request login access, ask the user to go to personal settings and click either **Grant Account Login Access** or **Grant Login Access**. If the publisher isn't listed, one of the following applies.

- A system admin disabled the ability for non-admins to grant access.
- The user doesn't have a license for the package.
- The package is licensed to the entire org. Only admins with the "Manage Users" permission can grant access.
- The org preference **Administrators Can Log in as Any User** is enabled.

Note: Unless the org preference **Administrators Can Log in as Any User** is enabled, access is granted for a limited amount of time, and the subscriber can revoke access at any time. Any changes you make while logged in as a subscriber are logged in the audit trail.

Logging In to Subscriber Orgs

Available in: **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To log in to subscriber orgs:

- Log in to Subscriber Org

Note: This feature is only available in orgs with a Salesforce Platform or full Salesforce license. You can't log in to subscriber orgs on Government Cloud instances.

To log in, once a user has granted you access:

1. In the License Management App (LMA), click the **Subscribers** tab.
2. To find a subscriber org quickly, enter a subscriber name or org ID in the search box and click **Search**.
3. Click the name of the subscriber org.
4. On the Org Details page, click **Login** next to a user's name. You have the same permissions as the user you logged in as.
5. When you're finished troubleshooting, from Setup, click **Return to Subscriber Overview** to return to your org.

Note: Only subscribers who have installed at least one managed package that is linked to your LMA appears in this list.

Best Practices

- When you access a subscriber org, you're logged out of your LMO (License Management Organization). You can set up a my domain so that you aren't automatically logged out of your LMO when you log in to a subscriber org. To set up a my domain, from Setup, enter *`My Domain`* in the `Quick Find` box, then select **My Domain**.
- Be careful to allow only trusted support and engineering personnel to log in to a subscriber's org. Since this feature can include full read/write access to customer data and configurations, it's vital to your reputation to preserve their security.
- Control who has access by giving the "Log in to Subscriber Org" user permission to specific support personnel, via a profile or permission set.

Troubleshooting in Subscriber Organizations

When logged in as a user in a subscriber's org, you have access that the subscriber doesn't have. You can view the obfuscated code in your Managed - Released packages, view logs that the subscriber can't see, and initiate ISV Customer Debugger sessions.

Troubleshoot with Debug Logs

The simplest way to debug your code in a subscriber's org is to generate Apex debug logs that contain the output from your managed packages. These logs include log lines that would normally not be exposed to the subscriber. Using this log information, you can troubleshoot issues that are specific to that subscriber.

1. If the user has access, set up a debug log: From Setup, enter *`Debug Logs`* in the `Quick Find` box, then select **Debug Logs**.
2. Launch the Developer Console.
3. Perform the operation and view the debug log with your output.

Subscribers are unable to see the logs you set up or generate since they contain your unobfuscated Apex code.

In addition, you can view and edit data contained in protected custom settings from your managed packages when logged in as a user.

Troubleshoot with the ISV Debugger

Each License Management Org can use one free ISV Debugger session at a time. The ISV Debugger is part of the Salesforce Extensions for Visual Studio Code. The ISV Debugger can be used only in sandbox orgs, so you can initiate debugging sessions only from a customer's sandbox.

For details, see the ISV Debugger documentation.

SEE ALSO:

Salesforce Help: Open the Developer Console

Usage Metrics

EDITIONS

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

Note: Check out AppExchange App Analytics, which also provides usage data about how subscribers interact with your AppExchange solutions. You can use these details to identify attrition risks, inform feature development decisions, and improve user experience.

You can collect detailed usage metrics from each organization in which your managed package is installed. By analyzing this information, you can gain valuable insights into the utilization and performance of your app across your entire customer base. For example, you can identify:

- The features most and least used — this can help you prioritize your development efforts when planning the next version of your app.
- The customers using your app most intensively — these are your most valuable customers.
- The customers whose usage of your app is minimal or declining — these are the customers most at risk of attrition.

You can collect the following daily metrics on two types of components in a managed package.

- **Custom objects** — the total number of records existing per organization in each custom object. This enables you to track how the usage of that custom object is growing with time in any subscriber organization, which is a reliable indicator of how much it's being utilized
- **Visualforce pages** — the number of times per organization each Visualforce page was accessed, the number of unique users who accessed it, and the average loading time (in milliseconds). By comparing the metrics for different Visualforce pages, you can determine the relative popularity of different parts of your app in a specific customer organization, as well as trends across all customers.

The custom objects data is a snapshot that reflects the state of the organization at the time the database was sampled, while the Visualforce data covers usage over a 24-hour period.

The usage metrics data for all production organizations in a given instance is merged and written into a text file, in a specified format, once a day. Currently, no data is collected on packages installed in sandbox organizations or on managed beta packages.

This feature is intended for API access only. You must write a custom process to collect the metrics data from the reporting organization, and export it to a system of your choice for analysis. This gives you the maximum flexibility to monitor and analyze the usage trends most relevant for your app.

Your customers' consent is not required for usage data to be collected, and there's no way for them to opt out. This ensures you receive complete data for your entire customer base. Allowing some users to be excluded would skew the results, making the data less useful.

Note: If any of your customers have concerns about privacy, reassure them any data collected is limited to usage statistics. No customer data is ever exposed to the ISV under any circumstances. This is consistent with salesforce.com's emphasis on trust as a core value.

Setting up Usage Metrics

To set up Usage Metrics for any package, two organizations have special importance.

- **Release organization** — the Development Edition organization used to upload the package.
- **Reporting organization** — the organization to which the usage data is delivered, on a daily basis.

The release organization and reporting organization must be members of the same Environment Hub. This is a security feature, to ensure usage data is only delivered to an organization controlled by the developer of the package. We recommend using the Environment Hub as your reporting organization.

To set up Usage Metrics for a package:

1. Set up Environment Hub, if you haven't already done so.
2. Connect the release organization to the Environment Hub.
3. Connect the reporting organization to the Environment Hub (if they're different).
4. Log a case in the Partner Community to activate Usage Metrics. You'll need to provide the package ID for your app.

Once the feature is activated, you'll receive a confirmation email. From that point on, usage data will automatically be collected from all organizations in which your package is installed, and delivered to the reporting organization on a daily basis. There is no way to get usage data retroactively, that is, for any period prior to the activation of Usage Metrics.

Accessing Usage Metrics Data

The usage data for a package is stored in `MetricsDataFile` records in your reporting organization. Once you activate the Usage Metrics feature, one new record is created for all custom objects and one for all Visualforce pages, per Salesforce instance per day.

Note: To see the number of Salesforce instances currently in use, visit trust.salesforce.com.

The usage data for each day and instance is stored as a text file, encoded in Base 64, in the `MetricsDataFile` field of the record. Other fields in the record identify these properties.

- Namespace prefix of the package
- Salesforce instance
- Start time and date of data collection
- End time and date of data collection
- Size of the data file in bytes
- Type of data, which is either `CustomObject` or `Visualforce`

The custom objects data is a snapshot that reflects the state of the organization at the time the database was sampled, while the Visualforce data covers usage over a 24-hour period.

The custom object count is a snapshot captured once each day. Here's a section of a sample data file for custom objects. It shows there were 3500 and 1500 records in the `Alpha` and `Beta` custom objects, respectively, in the specified customer organization on the specified day.

```
"00Dxx0000001gbk","org1","Enterprise Edition","TRIAL","Alpha", "3500"
"00Dxx0000001gbk","org1","Enterprise Edition","TRIAL","Beta", "1500"
```

In a record for Visualforce pages, each row of the text file contains usage data in the following order.

- Organization ID
- Organization name
- Organization edition

- Organization status
- Package version number
- Name of the Visualforce page
- Number of times the page was accessed
- Number of unique users who accessed the page
- Average loading time of the page, in milliseconds

The Visualforce counts for each organization measure the number of times the page was viewed in the duration between the start and end times. Here's a section of a sample data file for Visualforce pages.

```
"00Dxx0000001gbk","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f1","1","1","66.0"
"00Dxx0000001gbk","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f2","1","1","128.0"
"00Dxx0000001gbk","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f3","1","1","107.0"
"00Dxx0000001gbf","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f1","5","1","73.6"
"00Dxx0000001gbf","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f2","1","1","72.0"
"00Dxx0000001gbf","org1","Enterprise Edition","TRIAL","1.0","/apex/gm12__f3","7","1","50.8"
```

You must write a custom process to query the reporting organization to collect the metrics data, and export it to a system of your choice for analysis. This gives you the maximum flexibility to monitor and analyze the usage trends most relevant for your app.

MetricsDataFile

Represents a data file containing usage metrics on all installations of a managed package in a Salesforce instance.

Supported Calls

`query()`, `delete()`

Fields

Field Name	Details
`MetricsDataFile`	**Type** base64 **Properties** Filter, Query, Sort **Description** A text file containing the usage data encoded in Base 64.
`MetricsDataFileContentType`	**Type** string **Properties** Filter, Query, Sort **Description** The format of the data file. Currently, the only allowed value is `text/csv`.

Field Name	Details
`MetricsDataFileLength`	**Type** int **Properties** Filter, Query, Sort **Description** The size of the data file in bytes.
`MetricsRunDate`	**Type** dateTime **Properties** Filter, Query, Sort **Description** The date when the usage metrics collection job was run.
`MetricsEndDate`	**Type** dateTime **Properties** Filter, Query, Sort **Description** The end time and date for the data collection.
`MetricsStartDate`	**Type** dateTime **Properties** Filter, Query, Sort **Description** The start time and date for the data collection.
`MetricsType`	**Type** picklist **Properties** Filter, Query, Sort **Description** The type of data being collected. The possible values are `CustomObject` and `Visualforce`.
`NamespacePrefix`	**Type** string **Properties** Filter, Query, Sort

Field Name	Details
	Description The namespace prefix of the package for which data is being collected.
`SendingInstance`	**Type** string **Properties** Filter, Query, Sort **Description** The server instance from which this data was collected, for example, “na8.”

Usage

Use this object to access customer usage metrics for a managed package. Each record contains one day’s data, on either custom objects or Visualforce pages, for all organizations in a Salesforce instance that have the package installed. The following data is collected each day.

- **Custom objects** — the number of records stored in each custom object.
- **Visualforce pages** — the number of times each Visualforce page was accessed, the number of unique users who accessed it, and the average loading time (in milliseconds).

Usage Metrics Visualization

The Usage Metrics Visualization app, available from Salesforce Labs on the AppExchange, enables you to visualize trends in usage metrics data for your app. You can use the Usage Metrics Visualization app to generate charts showing changes in various app metrics, over a specified duration, for one or more customer organizations.

The app must be installed in your Usage Metrics reporting organization and requires Usage Metrics to be enabled in advance, so some data is available for analysis. You can analyze data going back a maximum of 30 days. If Usage Metrics wasn’t enabled for the entire time period that you specify, only partial data is plotted.

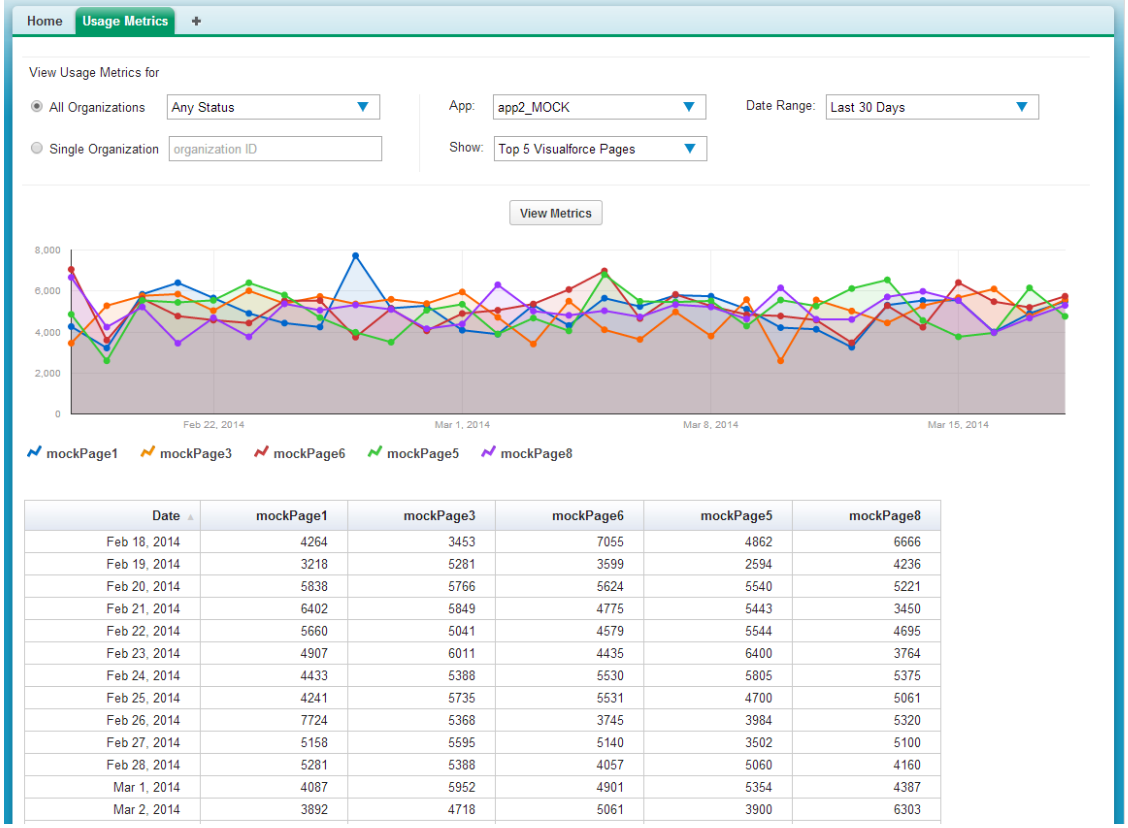
The app is intended as a reference implementation, for illustration purposes only. It’s distributed as an unmanaged package, so you can review its components and extend or customize it to meet your requirements. If your visualization needs are more complex, you can export the raw metrics data from the reporting organization and analyze it by using custom code or a third-party tool .

To install the Usage Metrics Visualization app:

1. Go to the AppExchange and search for the Usage Metrics Visualization app.
2. Click **Get It Now**.
3. Enter the credentials for your reporting organization, and then click the login button.
4. Click **Install**.

You’ll see a message describing the progress and a confirmation message after the installation is complete.

The Usage Metrics Visualization app showing data for the top five Visualforce pages.



View Usage Metrics for

● All Organizations: Any Status

○ Single Organization: organization ID

App: app2_MOCK

Show: Top 5 Visualforce Pages

Date Range: Last 30 Days

Date	mockPage1	mockPage3	mockPage6	mockPage5	mockPage8
Feb 18, 2014	4264	3453	7055	4862	6666
Feb 19, 2014	3218	5281	3599	2594	4236
Feb 20, 2014	5838	5766	5624	5540	5221
Feb 21, 2014	6402	5849	4775	5443	3450
Feb 22, 2014	5660	5041	4579	5544	4695
Feb 23, 2014	4907	6011	4435	6400	3764
Feb 24, 2014	4433	5388	5530	5805	5375
Feb 25, 2014	4241	5735	5531	4700	5061
Feb 26, 2014	7724	5368	3745	3984	5320
Feb 27, 2014	5158	5595	5140	3502	5100
Feb 28, 2014	5281	5388	4057	5060	4160
Mar 1, 2014	4087	5952	4901	5354	4387
Mar 2, 2014	3892	4718	5061	3900	6303

To visualize the usage metrics data:

1. Specify the app whose metrics you want to view by selecting it from the App menu.

   Note: You should have enabled Usage Metrics for your app at least a few days before, so some usage data is available to analyze.

2. Specify the organization(s) that you want to view metrics for by choosing one of these options.
   - For a single organization, enter its Organization ID in the Single Organization field.
   - For a group of organizations, select one of the following from the All Organizations menu.
     - Any Status
     - All Active: These are organizations used by paying customers.
     - All Free: These are Developer Edition (DE) organizations.
     - All Trial: These are trial organizations, which expire after a specified period.

3. Specify the type of metric that you want to visualize by selecting one of these values from the Show menu.
   - Total Visualforce Page Views
   - Top 5 Visualforce Pages
   - Total Record Count
   - Top 5 Objects by Record Count

4. Specify the time period to cover by selecting one of these values from the Date Range menu.

- Last 30 Days
- Last 7 Days
- Last 2 Days

Note: If the volume of usage data is too large, you might get an error message. In that case, choose a smaller date range and try again.

5. Click **View Metrics**.

The data you specified is displayed on the page as a chart and as a table. To visualize a different data set, change the parameters, and then click **View Metrics** again.

CHAPTER 15 Update Your Solution

In this chapter ...

Your packaged solution is ready for an update. Learn how to fix small issues with patches and make major changes with upgrades.

About Package Versions

A package version is a number that identifies the set of components uploaded in a package. The version number has the format `majorNumber.minorNumber.patchNumber` (for example, 2.1.3). The major and minor numbers increase to a chosen value during every major release. The `patchNumber` is generated and updated only for a patch release. Unmanaged packages are not upgradeable, so each package version is simply a set of components for distribution. A package version has more significance for managed packages. Packages can exhibit different behavior for different versions. Publishers can use package versions to evolve the components in their managed packages gracefully by releasing subsequent package versions without breaking existing customer integrations using the package.

Version numbers depend on the package release type, which identifies the way packages are distributed. There are two kinds:

Major Release

A major release denotes a Managed - Released package. During these releases, the major and minor numbers of a package version increase to a chosen value.

Patch Release

A patch release is only for patch versions of a package. During these releases, the patch number of a package version increments.

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

The following table shows a sequence of version numbers for a series of uploads:

Upload Sequence	Type	Version Number	Notes
First upload	Managed - Beta	1.0	The first Managed - Beta upload.
Second upload	Managed - Released	1.0	A Managed - Released upload. Note that the version number does not change.
Third upload	Managed - Released	1.1	Note the change of the minor release number for this Managed - Released upload. If you are uploading a new patch version, you can't change the patch number.
Fourth upload	Managed - Beta	2.0	The first Managed - Beta upload for version number 2.0. Note the major version number update.
Fifth upload	Managed - Released	2.0	A Managed - Released upload. Note that the version number does not change.

When an existing subscriber installs a new package version, there is still only one instance of each component in the package, but the components can emulate older versions. For example, a subscriber may be using a managed package that contains an Apex class. If the publisher decides to deprecate a method in the Apex class and release a new package version, the subscriber still sees only one instance of the Apex class after installing the new version. However, this Apex class can still emulate the previous version for any code that references the deprecated method in the older version.

Package developers can use conditional logic in Apex classes and triggers to exhibit different behavior for different versions. This allows the package developer to continue to support existing behavior in classes and triggers in previous package versions while continuing to evolve the code.

When you are developing client applications using the API, you can specify the version of each package that you use in your integrations.

Create and Upload Patches

Note: Patch versions and push upgrades are only available to Salesforce ISV partners.

To create a patch version:

1. From Setup, enter `Packages` in the Quick Find box, then select **Packages**.
2. Click the name of your managed package.
3. On the Patch Organization tab, click **New**.
4. Select the package version that you want to create a patch for in the Patching Major Release dropdown. The release type must be Managed - Released.
5. Enter a username for a login to your patch org.
6. Enter an email address associated with your login.
7. Click **Save**.

   Note: If you ever lose your login information, click **Reset** on the package detail page under Patch Development Organizations to reset the login to your patch development org.

If the main development org from which you created the patch org has My Domain enabled, the patch org also has My Domain enabled. The name of the patch development org's custom subdomain is randomly generated.

After you receive an email that Salesforce has created your patch development org, you can click **Login** to begin developing your patch version.

Development in a patch development org is restricted.

- You can't add package components.
- You can't delete existing package components.
- API and dynamic Apex access controls can't change for the package.
- No deprecation of any Apex code.
- You can't add new Apex class relationships, such as `extends`.
- You can't add Apex access modifiers, such as `virtual` or `global`.
- You can't add new web services.
- You can't add feature dependencies.

When you finish developing your patch, upload it through the UI in your patch development org. You can also upload a package using the Tooling API. For sample code and more details, see the PackageUploadRequest object in the *Tooling API Developer Guide*.

Note: When you upload a new package in your patch development org, the upload process is asynchronous. Because the time to process the request varies, the package might not be available immediately after the upload. While waiting, you can run SOQL queries on the PackageUploadRequest status field to monitor the request.

1. From Setup, enter `Packages` in the Quick Find box, then select **Packages**.
2. Click the name of the package.
3. On the Upload Package page, click **Upload**.
4. Enter a `Version Name`. As a best practice, it's useful to have a short description and the date.
5. Notice that the `Version Number` has had its `patchNumber` incremented.
6. For managed packages, select a `Release Type`:

- Choose Managed - Released to upload an upgradeable version. After upload, some attributes of Salesforce components are locked.
- Choose Managed - Beta if you want to upload a version of your package to a small sampling of your audience for testing purposes. You can still change the components and upload other beta versions.

  Note: Beta packages can only be installed in Developer Edition or sandbox organizations, and thus can't be pushed to customer organizations.

7. Change the `Description`, if necessary.
8. Optionally, enter and confirm a password to share the package privately with anyone who has the password. Don't enter a password if you want to make the package available to anyone on AppExchange and share your package publicly.
9. Salesforce automatically selects the requirements it finds. In addition, select any other required components from the `Package Requirements` and `Object Requirements` sections to notify installers of any requirements for this package.
10. Click **Upload**.

To distribute your patch, you can either share the upload link or schedule a push upgrade.

Working with Patch Versions

Note: Patch versions and push upgrades are only available to Salesforce ISV partners.

A *patch version* enables a developer to change the functionality of existing components in a managed package. Subscribers experience no visible changes to the package. Patches are minor upgrades to a Managed - Released package and only used for fixing bugs or other errors.

Patch versions can only be created for Major Releases. Subscribers can receive patch upgrades just like any other package version. However, you can also distribute a patch by using push upgrades.

When you create a patch, the *`patchNumber`* on a package's `Version Number` increments by one. For example, suppose that you release a package with the version number 2.0. When you release a patch, the number changes to 2.0.1. This value can't be changed manually.

Patch Development Organizations

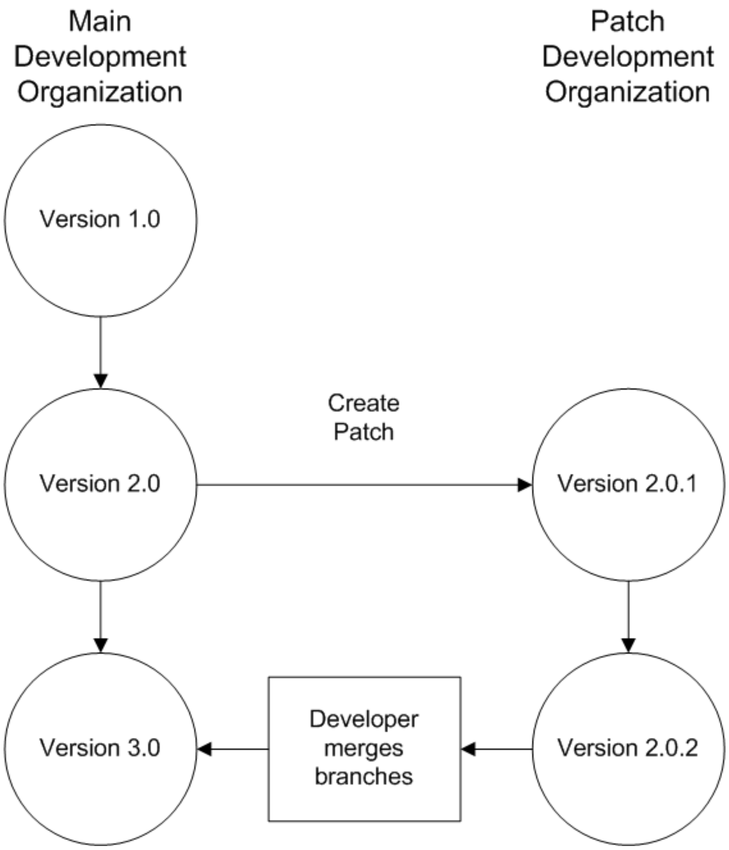
Every patch is developed in a *patch development organization*, which is the organization where patch versions are developed, maintained, and uploaded. To start developing a patch, create a patch development organization. See Create and Upload Patches. Patch development organizations are necessary to permit developers to change existing components without causing incompatibilities between existing subscriber installations.

A patch development organization can upload an unlimited number of patches. Only one patch development organization can exist per major release of your package. A patch development organization for a package with a version number of 4.2 can only work on patches such as 4.2.1, 4.2.2, 4.2.3, and so on. It won't work on version 4.1 or 4.3.

Integrating Patch Development

The following diagram illustrates the workflow of creating a patch and integrating any work into future versions:

Patch Development Workflow


Main Development Organization
Patch Development Organization
Version 1.0
Version 2.0
Create Patch
Version 2.0.1
Version 3.0
Developer merges branches
Version 2.0.2

After version 2.0 is released, the developer creates a patch. The package version number in the patch development organization starts at 2.0.1. As the main development organization moves towards a released version of 3.0, a second patch is created for 2.0.2. Finally, the developer merges the changes between the main development organization, and the patch development organization, and releases the package as version 3.0.

The best way to keep track of your package versions with Git source control. Learn about Git from this trail: https://trailhead.salesforce.com/en/content/learn/modules/git-and-git-hub-basics.

Version control is integrated into Visual Studio Code. See Salesforce Extensions for Visual Studio Code and Version Control in Visual Studio Code for details.

Versioning Apex Code

Package developers can use conditional logic in Apex classes and triggers to exhibit different behavior for different versions. This allows the package developer to continue to support existing behavior in classes and triggers in previous package versions while continuing to evolve the code.

When subscribers install multiple versions of your package and write code that references Apex classes or triggers in your package, they must specify the version that they are referencing. Within the Apex code that is being referenced in your package, you can conditionally execute different code paths based on the version setting of the calling Apex code that is making the reference. The package version setting of the calling code can be determined within the package code by calling the `System.requestVersion` method. In this way, package developers can determine the request context and specify different behavior for different versions of the package.

The following sample shows different behavior in a trigger for different package versions:

```
trigger oppValidation on Opportunity (before insert, before update) {

    for (Opportunity o : Trigger.new){

        // Add a new validation to the package
        // Applies to versions of the managed package greater than 1.0
        if (System.requestVersion().compareTo(new Version(1,0)) > 0) {
            if (o.Probability >= 50 && o.Description == null) {
                o.addError('All deals over 50% require a description');
            }
        }

        // Validation applies to all versions of the managed package.
        if (o.IsWon == true && o.LeadSource == null) {
            o.addError('A lead source must be provided for all Closed Won deals');
        }
    }
}
```

To compare different versions of your Apex classes, click the **Class Definition** tab when viewing the class details.

For more information about the `System.requestVersion` method, see the *Apex Developer Guide*.

Apex Deprecation Effects for Subscribers

This section demonstrates how deprecation of an Apex method affects subscribers that install the managed package. The table shows a typical sequence of actions by a package developer in the first column and actions by a subscriber in the second column. Each row in the table denotes either a package developer or subscriber action.

Package Developer Action	Subscriber Action	Notes
Create a global Apex class, `PackageDevClass`, containing a global method `m1`.		
Upload as Managed - Released version 1.0 of a package that contains `PackageDevClass`.		
	Install version 1.0 of the package.	The `Version Number` for the package is 1.0. The `First Installed Version Number` is 1.0.
	Create an Apex class, `SubscriberClass`, that references `m1` in `PackageDevClass`.	
Deprecate `m1` and create a new method, `m2`.		
Upload as Managed - Released version 2.0 of the package.		
	Install version 2.0 of the package.	The `Version Number` for the package is 2.0. The `First`

Package Developer Action	Subscriber Action	Notes
		`Installed Version Number` is still 1.0. `SubscriberClass` still references version 1.0 of the package and continues to function, as before.
	Edit the version settings for `SubscriberClass` to reference version 2.0 of the package. Save the class. Note an error message indicating that `m1` cannot be referenced in version 2.0 of the package.	
	Change `SubscriberClass` to reference `m2` instead of `m1`. Successfully save the class.	

Publish Upgrades to Managed Packages

As a publisher, first ensure that your app is upgradeable by converting it to a managed package. Any changes you make to the components in a managed package are automatically included in subsequent uploads of that package, with one exception. When you upgrade a package, changes to the API access are ignored even if the developer specified them. This ensures that the administrator installing the upgrade has full control. Installers should carefully examine the changes in package access in each upgrade during installation and note all acceptable changes. Then, because those changes are ignored, the admintrator should manually apply any acceptable changes after installing an upgrade. For more information, see About API and Dynamic Apex Access in Packages on page 59.

To publish upgrades to a managed package:

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. Select the package from the list of available packages.
3. View the list of package components. Changes you have made to components in this package are automatically included in this list. If the changes reference additional components, those components are automatically included as well. To add new components, click **Add** to add them to the package manually.
4. Click **Upload** and upload it as usual.

   Note: After you upload a new version of your Managed - Released package, you can click **Deprecate** so installers cannot install an older version. Deprecation prevents new installations of older versions without affecting existing installations. For more information, see Manage Versions on page 348.

   You cannot deprecate the most recent version of a managed package upload.

5. When you receive an email with the link to the upload on Salesforce AppExchange, notify your installed users that the new version is ready. Use the list of installed users from the License

EDITIONS

Available in: Salesforce Classic (not available in all orgs) and Lightning Experience

Available in: **Developer** Edition

Package uploads and installs are available in **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To configure developer settings:
- Customize Application

To create packages:
- Create AppExchange Packages

To upload packages:
- Upload AppExchange Packages

Management Application (LMA) to distribute this information. The License Management Application (LMA) automatically stores the version number that your installers have in their organizations.

Delete Components in Managed Packages

After you've uploaded a Managed - Released package, you sometimes want to delete a component from your org. The options available for deleting a component depends on the situation in which you are trying to delete the component.

Let's say one of the following situations occurs:

- The component, after being added to a package, can't be deleted.
- The component can be deleted, but can only be undeleted from the Deleted Package Components page.
- The component can be deleted, and can be undeleted from either the Deleted Package Components page or through the Recycle Bin.

Note:

- To enable component deletion in your packaging org, log a case in the Partner Community.
- Because the managed package components behavior differs from the behavior of public Apex classes and public Visualforce components, delete Visualforce pages and global Visualforce components from a managed package using a two-stage process. When you upgrade a package in a subscriber org, the Visualforce pages and global Visualforce components that you deleted aren't removed. Although a Delete button or link is available to org administrators, many orgs continue using obsolete pages and components. However, public Apex classes and public Visualforce components are deleted as part of the upgrade process. If you delete pages and components without performing this two-stage procedure, Salesforce can't warn you when later deletions of public classes and components break your subscribers' obsolete pages and components.

  If you're deleting a Visualforce page or global Visualforce component that refers to or uses public Apex classes or public Visualforce components, perform the deletion steps in this order.

  1. Stage one: Remove references.
     - i. To remove all references to public Apex classes or public Visualforce components, edit your Visualforce page or global Visualforce component.
     - ii. Upload your new package version.
     - iii. Push the stage-one upgrade to your subscribers.
  2. Stage two: Delete your obsolete pages or components.
     - i. Delete your Visualforce page or global Visualforce component.
     - ii. Optionally, delete other related components and classes.
     - iii. Upload your new package version.
     - iv. Push the stage-two upgrade to your subscribers.

Here are some key types of components you can delete when updating a previously released managed package.

- Custom buttons or links
- Custom console
- Custom fields
- Custom objects
- Custom settings
- Custom tabs

- Field sets
- Permission sets
- Record types
- S-Controls
- Static resources
- Validation rules
- Visualforce components
- Visualforce pages

For a complete list, see Available Components on page 24.

When you delete a component, you also permanently delete the data that exists in that component. Delete tracked history data is also deleted, and integrations that rely on the component, such as assignment or escalation rules, are changed. After you delete a component in a managed package, you can't restore it or create another component with the same name.

Note: In a managed package, the API names of fields must be unique and cannot be reused even after you delete the component. This restriction prevents conflicts during package installation and upgrade.

Data and metadata are never deleted in a subscriber org without specific action by the customer. When a subscriber upgrades to the new package version, the deleted components are still available in the subscriber's org. The components are displayed in the Unused Components section of the Package Details page. This section ensures that subscribers have the opportunity to export data and modify custom integrations involving those components before explicitly deleting them. For example, before deleting custom objects or fields, customers can preserve a record of their data from Setup by entering *`Data Export`* in the Quick Find box and then selecting **Data Export**.

Note: It's your responsibility to educate your customers about the potential impact from any components you delete. List all custom components you've deleted and notify customers of any necessary actions, in the Release Notes for your upgraded package.

The following restrictions apply when deleting managed components.

- If a component of any type is referenced by any other metadata, such as workflow rules, validation rules, or Apex classes, it is not deletable.
- A custom object is not deletable if it includes any of the following: Apex Sharing Reason, Apex Sharing Recalculation, Related Lookup Filter, Compact Layout, or Action.
- Salesforce doesn't recommend deleting a custom field that is referenced by a custom report type in the same package. Such a deletion leads to an error when installing the upgraded package.
- When you delete a field that is used for bucketing or grouping in a custom report type that's part of a managed package, you receive an error message.
- When you remove a connected app that is a component of a package, the app remains available until you update the package with a new version. But if you delete the connected app, it's permanently deleted. Any version of the package that contains the deleted connected app is invalidated and cannot be installed. You can update a version of the package that *doesn't* contain the connected app as a component. Never delete a connected app that Salesforce distributes, such as the Salesforce app.

You can delete managed components either declaratively from the user interface or programmatically using Metadata API. With Metadata API, specify the components you want to delete in a `destructiveChanges.xml` manifest file and then use the standard `deploy()` call. The process is identical to deleting components that aren't managed. For more information, see the *Metadata API Developer Guide*.

Viewing Deleted Components

To access the Deleted Package Components page, from Setup, enter `Packages` in the `Quick Find` box, then select **Packages**. Select the package that the component was uploaded to, and then click **View Deleted Components**. You can retrieve components from the Recycle Bin and Deleted Package Components page any time *before* uploading a new version of the package. To do this, click **Undelete** next to the component.

After a package is uploaded with a component marked for deletion, it is deleted forever.

Warning: Although a component is deleted, its **Name** remains within Salesforce. You can never create another component with the same name. The Deleted Package Components page lists which names can no longer be used.

To access the Deleted Package Components page, from Setup, enter `Packages` in the `Quick Find` box, then select **Packages**. Select the package that the component was uploaded to, and then click **View Deleted Components**. If a component can be retrieved through the Recycle Bin, it can also be retrieved through this page. You can retrieve the following types of components from here.

- Apex classes and triggers that don't have `global` access.
- Custom tabs.
- Visualforce components with `public` access. (If the ability to remove components has been enabled for your packaging org then these Visualforce components can't be undeleted. As a result, they don't show up in the Recycle Bin or the Deleted Package Components page after they have been deleted.)
- Protected components, including:
  - Custom labels
  - Custom links (for Home page only)
  - Custom permissions
  - Workflow alerts
  - Workflow field updates
  - Workflow outbound messages
  - Workflow tasks
  - Workflow flow triggers

    The pilot program for flow trigger workflow actions is closed. If you've already enabled the pilot in your org, you can continue to create and edit flow trigger workflow actions. If you didn't enable the pilot in your org, use the Flows action in Process Builder instead.

- Data components, such as Documents, Dashboards, and Reports. These components are the only types that can also be undeleted from the Recycle Bin.

You can retrieve components from the Recycle Bin and Deleted Package Components page any time *before* uploading a new version of the package. To do this, click **Undelete** next to the component.

The Deleted Components displays the following information (in alphabetical order):

Attribute	Description
`Action`	If the Managed - Released package hasn't been uploaded with the component deleted, this contains an **Undelete** link that allows you to retrieve the component.
`Available in Versions`	Displays the version number of the package in which a component exists.

Attribute	Description
`Name`	Displays the name of the component.
`Parent Object`	Displays the name of the parent object a component is associated with. For example, a custom object is the parent of a custom field.
`Type`	Displays the type of the component.

Modifying Custom Fields after a Package is Released

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Developer** Edition

The following changes are allowed to custom fields in a package, after it is released.

- The length of a text field can be increased or decreased.
- The number of digits to the left or right of the decimal point in a number field can be increased or decreased.
- A required field can be made non-required and vice-versa. If a default value was required for a field, that restriction can be removed and vice-versa.

Manage Versions

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

USER PERMISSIONS

To upload packages:
- Upload AppExchange Packages

After you upload a package to the AppExchange, you can still manage it from Salesforce. To manage your versions:

1. From Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**.
2. Select the package that contains the app or components you uploaded.
3. Select the version number listed in the Versions tab.
   - Click **Change Password** link to change the password option.
   - Click **Deprecate** to prevent new installations of this package while allowing existing installations to continue operating.

     Note: You cannot deprecate the most recent version of a managed package.

     When you deprecate a package, remember to remove it from AppExchange as well. See “Removing Apps from AppExchange” in the AppExchange online help.
   - Click **Undeprecate** to make a deprecated version available for installation again.

Note: To create a test drive or choose a License Management Organization (LMO) for what you have uploaded, click **Proceed to AppExchange** from the package upload detail page.

Pushing an Upgrade

A *push upgrade* is a method of automatically upgrading your customers to a newer version of your package. This feature works with managed packages only and can be used to ensure that all your customers are on the same or latest version of your package. You can push an upgrade to any number of organizations that have installed your managed package.

A package subscriber doesn't need to do anything to receive the push upgrade. The only indication a subscriber receives after a successful push upgrade is that the package's `Version Number` on the Package Detail page has a higher value. The developer initiating the push resolves upgrades that fail.

Use the Push Upgrade Exclusion List to exclude specific subscriber orgs from a push upgrade. You can specify up to 500 comma-separated org IDs.

Push upgrades minimize the potential risks and support costs of having multiple subscribers running different versions of your app. You can also automate many post-upgrade configuration steps, further simplifying the upgrade process for your customers.

Note: This feature is available to eligible Salesforce partners. For more information on the Partner Program, including eligibility requirements, visit us at www.salesforce.com/partners.

Push Upgrades

Note: Registered ISV partners can request Push Major Upgrade functionality by logging a case in the Partner Community.

You can push either a patch or a major upgrade. A patch only contains bug fixes and minor enhancements. In contrast, a major upgrade can include major enhancements and new features that add new components. At a high level, pushing an upgrade involves the following steps:

- Upgrade your managed package installed in a customer organization from version X to version Y
- Select one, many, or all customer organizations to upgrade and select a particular version to upgrade to
- Schedule the upgrade to start at a particular date and time
- View progress of upgrades, abort upgrades in progress, or view the result of a push upgrade
- In conjunction with push, you can use a post-install Apex script to automate post-upgrade configurations that your customers have previously performed manually

Warning: When you push an upgrade, you're making changes to a subscriber's org without explicit consent. Therefore, it's important to plan ahead and exercise caution. You can also exclude specific subscriber orgs from a push upgrade by entering the org IDs, separated by a comma, in the Push Upgrade Exclusion List.

Pushing a major upgrade entails a higher degree of risk as it can impact existing functionality in a subscriber's organization. This is because new components in the upgraded package might not be available to existing users of the package, or could overwrite users' customizations. As the app developer, it's your responsibility to protect users from any adverse impact due to upgrading. We strongly recommend you consider all potential consequences of the upgrade and take appropriate steps to prevent any problems.

When pushing a major upgrade, we recommend that you divide changes in your package into two categories:

1. Enhancements to existing features that users already have access to—Use a post install Apex script to automatically assign the relevant components to existing users. This ensures all current users of the package can continue using it without explicit action by administrators.
2. New features you're introducing for the first time—Don't use a post install Apex script to auto-assign components. This ensures your subscribers have the opportunity to decide if and when to use the new features.

Here are some additional guidelines to keep in mind when planning a push upgrade.

- Avoid changes to validation rules, formula fields, and errors thrown from Apex triggers, as they may negatively impact subscribers' integrations.
- Don't make visible changes to a package in a patch. This is because other than a change in the package version number, subscribers aren't notified of push upgrades.
- Test your upgraded package in multiple environments, replicating all relevant features of your customers' organizations, including editions, customizations, other installed packages, and permission sets.

- Schedule push upgrades at your customers' off-peak hours and outside of Salesforce's major release windows, to minimize potential subscriber impact.
- Notify your subscribers in advance about the timing of the upgrade, its potential consequences, and any steps they need to take.

Push Upgrade Best Practices

Push Upgrade is one of the most powerful features we provide to our partners. You have the power to upgrade your customers, but it's imperative that you use that power carefully. Pushing an upgrade without proper planning and preparation can result in significant customer satisfaction issues. Hence, we strongly recommend that you adhere to the best practices documented here.

Plan, Test, and Communicate

- Communicate, communicate, and communicate! Your customers might not even know about the Push Upgrade feature. Some might have strong reservations about changes being pushed to their organizations. Reach out to them and explain how the cloud-computing model works, how they can benefit from seamless upgrades, how you are using best practices to ensure a smooth upgrade, and what your process and commitment is to them regarding the timing and content of an upgrade. Timely and thorough communication is critical for the success of this program.
- Share an upgrade timeline plan with your customers so they know when you will upgrade, and how often.
- Plan when you want to push upgrades to your customers' organizations. Keep in mind that most customers don't want changes around their month-end, quarter-end, and year-end or audit cycles. Do your customers have other critical time periods when they don't want any changes to their organization? For example, there might be certain times when they don't have staff available to verify changes or perform any required post-installation steps.
- Schedule push upgrades during your customers' off-peak hours, such as late evening and night. Have you considered time zone issues? Do you have customers outside the United States who have different off-peak hours? You can schedule push upgrades to any number of customer organizations at a time. Consider grouping organizations by time zone, if business hours vary widely across your customer base.
- Don't schedule push upgrades close to Salesforce-planned maintenance windows. In most cases, it might be better to wait 3-4 weeks after a major Salesforce release before you push major upgrades.
- Test, test, and test! Since you're pushing changes to the organization instead of the customer pulling in changes, there is a higher bar to ensure the new version of your app works well in all customer configurations.

Stagger the Push

- Don't push changes to all customers at once. It's important to ensure that you have sufficient resources to handle support cases if there are issues. Also, it's important that you discover possible issues before your entire customer base is affected.
- Push to your own test organizations first to confirm that the push happens seamlessly. Log in to your test organization after the push upgrade and test to see that everything works as expected.
- When applicable, push to the sandbox organizations of your customers first before pushing to their production organizations. Give them a week or more to test, validate, and fix in the sandbox environment before you push to their production organizations.
- Push upgrades to small batches of customer production organizations initially. For example, if you have 1,000 customers, push upgrades to 50 or 100 customers at a time, at least the first few times. Once you have confidence in the results, you can upgrade customers in larger batches.

Focus on Customer Trust

- You're responsible for ensuring that your customers' organizations are not adversely affected by your upgrade. Avoid making changes to the package, such as changes to validation rules or formula fields, that might break external integrations made by the customer.

If for some reason you do, test and communicate well in advance. Please keep in mind that you can impact customer data, not just metadata, by pushing an upgrade that has bugs.

- Write an Apex test on install to do basic sanity testing to confirm that the upgraded app works as expected.
- If you're enhancing an existing feature, use a post-install script to automatically assign new components to existing users using permission sets.
- If you're adding a new feature, don't auto-assign the feature to existing users. Communicate and work with the administrators of the customer organization so they can determine who should have access to the new feature, and the timing of the roll-out.

Assigning Access to New Components and Fields

If the new version of your package includes new components or new fields in existing components, existing users of the package won't automatically have access to the new components and fields after the upgrade. This can limit them from using the new features you've added or prevent older features from working properly. By default, any new components in your package are assigned only to administrators. You have two options for ensuring that all users of the package have access to the new components and fields.

Notify administrators to assign the appropriate permissions to all users of the package

We recommend this for any new features you're introducing. This ensures administrators have the option of deciding if and when to make the new features available.

Assign the new components to existing users automatically, using a post install Apex script

We recommend this for enhancements to existing features. This ensures all current users of the package can continue using it without explicit action by administrators.

To assign access to new components automatically, you can use the following strategy.

1. Create new permission sets that define the default access settings for all new components and fields.
2. Include the new permission sets in the new package version.
3. Write a post install Apex script to run automatically in the subscriber organization after the package is upgraded. The script must perform these tasks.
   a. For each new permission set, choose an existing component whose user assignment needs to be copied.
   b. Find all profiles that can access that component.
   c. Assign the new permission sets to every user with those profiles.

Note: The default permission sets for all standard profiles aren't editable. Hence, the post install script will trigger an exception if it tries to update one of these permission sets. It's important that you create a new permission set to assign access to the new components in your package.

Sample Post Install Script for a Push Upgrade

This section shows a sample post install script that automates the assignment of new components to existing users of a package. For more information on writing a post install Apex script, see Running Apex on Package Install/Upgrade on page 145.

The sample script covers a scenario in which an ISV is upgrading subscribers to a new package version that contains new Visualforce pages and a new permission set that grants access to those pages. After upgrading, existing users of the package will not have access to the new pages by default. The post install script resolves this problem by identifying which users have access to the Visualforce pages in the old version of the package and granting them access to the new pages. The script performs the following actions.

- Get the Id of the Visualforce pages in the old version of the package
- Get the permission sets that have access to those pages
- Get the list of profiles associated with those permission sets

- Get the list of users who have those profiles assigned
- Assign the permission set in the new package to those users

```
global class PostInstallClass implements InstallHandler {
    global void onInstall(InstallContext context) {

        //Get the Id of the Visualforce pages
        List<ApexPage> pagesList = [SELECT Id FROM ApexPage WHERE NamespacePrefix =
            'TestPackage' AND Name = 'vfpage1'];

        //Get the permission sets that have access to those pages
        List<SetupEntityAccess> setupEntityAccessList = [SELECT Id,
            ParentId, SetupEntityId, SetupEntityType FROM SetupEntityAccess
            WHERE SetupEntityId IN :pagesList];
        Set<ID> PermissionSetList = new Set<ID> ();

        for (SetupEntityAccess sea : setupEntityAccessList) {
            PermissionSetList.add(sea.ParentId);
        }
        List<PermissionSet> PermissionSetWithProfileIdList =
            [SELECT id, Name, IsOwnedByProfile, Profile.Name,
            ProfileId FROM PermissionSet WHERE IsOwnedByProfile = true
            AND Id IN :PermissionSetList];

        //Get the list of profiles associated with those permission sets
        Set<ID> ProfileList = new Set<ID> ();
        for (PermissionSet per : PermissionSetWithProfileIdList) {
            ProfileList.add(per.ProfileId);
        }

        //Get the list of users who have those profiles assigned
        List<User> UserList = [SELECT id FROM User where ProfileId IN :ProfileList];


        //Assign the permission set in the new package to those users
        List<PermissionSet> PermissionSetToAssignList = [SELECT id, Name
            FROM PermissionSet WHERE Name='TestPermSet' AND
            NamespacePrefix = 'TestPackage'];
        PermissionSet PermissionSetToAssign = PermissionSetToAssignList[0];
        List<PermissionSetAssignment> PermissionSetAssignmentList = new
List<PermissionSetAssignment>();
        for (User us : UserList) {
            PermissionSetAssignment psa = new PermissionSetAssignment();
            psa.PermissionSetId = PermissionSetToAssign.id;
            psa.AssigneeId = us.id;
            PermissionSetAssignmentList.add(psa);
        }
        insert PermissionSetAssignmentList;
    }
}
```

```
// Test for the post install class
@isTest
private class PostInstallClassTest {
    @isTest
    public static void test() {
      PostInstallClass myClass = new PostInstallClass();
      Test.testInstall(myClass, null);
    }
}
```

Scheduling Push Upgrades

Note: Patch versions and push upgrades are only available to Salesforce ISV partners.

After you've created a patch version of your package, you can automatically deploy it to customers using a push upgrade.

Tip: Salesforce strongly recommends following this sequence for pushing package upgrades.

1. Push the upgrade to your own organizations so you can run tests and fix any bugs before upgrading subscribers.
2. When you're ready and have coordinated with your customers on their change management process, push to a small number of customer organizations. Try sandbox organizations first, if possible.
3. Once you're comfortable with the initial results, push to your wider customer base, based on your agreements with each customer.
4. Deprecate the previous version of your package in your main development organization. Replace the version on AppExchange if necessary, and update your Trialforce setup.
5. If your upgrade was a patch, after you've successfully distributed the upgrade to subscriber organizations, reintegrate those changes into your main development organization. For more information about combining patches in the main development organization, see Working with Patch Versions on page 341.

Read Best Practices for Push Upgrades and Patch Versions for more information.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Developer** Edition

USER PERMISSIONS

To push an upgrade:

- Upload AppExchange Packages

Schedule a Push Upgrade Using the UI

1. Log in to your main development org (not the patch org you used to upload the new version).
2. From Setup, enter *Packages* in the `Quick Find` box, then select **Packages**.
3. Click the name of the managed package whose upgrade you want to push.
4. On the package detail page, click the **Versions** tab, and then click **Push Upgrades**.
5. Click **Schedule Push Upgrades**.
6. Select a package version to push from the **Patch Version** drop-down list.

   Note: Beta versions aren't eligible for push.

7. For the scheduled start date, enter when you want the push upgrade to begin.
8. In the Select Target Organizations section, select the orgs to receive your push upgrade. If an org already received a push upgrade for the selected package version, it doesn't appear in this list. You can select orgs by:
   - Entering a term that filters based on an org's name or ID. Names can match by partial string, but IDs must match exactly.
   - Choosing between production and sandbox orgs from the **Organizations** dropdown list.

- Choosing orgs that have already installed a particular version.
- Clicking on individual orgs or the **Select All** and **Deselect All** checkboxes.

This section lists the following information about the org (in alphabetical order):

Field	Description
`Current Version`	The current package version an organization has installed.
`Organization ID`	The ID that uniquely identifies the organization to Salesforce.
`Organization Name`	The name of the organization. Clicking this name shows the upgrade history for the organization.
`Primary Contact`	The name of the contact who installed the package.

9. Click **Schedule**. While a push upgrade is in progress, you can click **Abort** to stop it.

Schedule a Push Upgrade Using the Enterprise API

1. Authenticate to your main development org (not the patch org you used to upload the new version) according to the tool you're using.
2. Determine the package version you want to upgrade subscribers to by querying the MetadataPackageVersion object.
3. Gather the list of subscriber orgs that are eligible to be upgraded by querying the PackageSubscriber object.

   Note: If you are retrieving more than 2,000 subscribers, use the SOAP API`queryMore()` call.

4. Create a PackagePushRequest object. PackagePushRequest objects take a PackageVersionId and, optionally, a ScheduledStartTime parameter to specify when the push begins. If you omit the ScheduledStartTime, the push begins when you set the PackagePushRequest's status to `Pending`.
5. Create a PackagePushJob for each eligible subscriber and associate it with the PackagePushRequest you created in the previous step.
6. Schedule the push upgrade by changing the status of the PackagePushRequest to `Pending`.
7. Check the status of the PackagePushRequest and PackagePushJob objects by querying the `Status` fields. If the status is either Created or Pending, you can abort the push upgrade by changing the status of the PackagePushRequest to Canceled. You cannot abort a push upgrade that has a status of Canceled, Succeeded, Failed, or In Progress.

   Note: If you are pushing the upgrade to more than 2,000 subscribers, use the Bulk_API to process the job in batches.

For sample code and more details, see the object descriptions in the *Object Reference for Salesforce and Lightning Platform* or the *SOAP API Developer Guide*.

View Push Upgrade Details

Note: Patch versions and push upgrades are only available to Salesforce ISV partners.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Developer** Edition

USER PERMISSIONS

To view push upgrade details:

- Upload AppExchange Packages

For information about a specific push upgrade that your organization sent, from Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**. Click the name of the package that you want to view, and then click **Push Upgrades**. Clicking the name of a `Target` takes you to the Push Upgrade Details page, which has information for the push job and each organization that it was pushed to.

The Job Details section has the following information about the overall push upgrade (in alphabetical order):

Field	Description
`End Date`	The date and time the push upgrade finished.
`Ignore Apex Test Failures`	Whether Apex test failures that may cause the installed application not to function properly were ignored.
`Scheduled By`	The name of the user who initiated the push upgrade.
`Start Date`	The scheduled start date and time of the push upgrade.
`Status`	The status of the push upgrade, whether scheduled, in progress, completed, aborted, or completed with failures.
`Version`	The package version number that was pushed.

In the Organizations section, you can get a list of all the organizations that received a push upgrade. You can filter organizations by using the search box and entering a term that filters based on an org's name or ID. Names can match by partial string, but IDs must match exactly. From the drop-down list, you can also filter based on the status of the push upgrade.

The list contains the following information specific to each organization (in alphabetical order):

Field	Description
`Duration`	The amount of time the push upgrade took.
`Failure Type`	Lists the type of failure that occurred (if any). If the push upgrade did fail, a possible explanation is provided in the collapsible section. If the push upgrade was unsuccessful, click **Retry** to try it again.
`Organization ID`	The ID that uniquely identifies the organization to Salesforce.
`Organization Name`	The name of the organization. Clicking this name shows the upgrade history for the organization.
`Start`	The scheduled start date and time of the push upgrade.

Field	Description
`Status`	The status of the push upgrade, whether scheduled, in progress, completed, aborted, or completed with failures.

View an Organization’s Upgrade History

Note: Patch versions and push upgrades are only available to Salesforce ISV partners.

For more information about a specific organization that received a push upgrade, from Setup, enter *`Packages`* in the `Quick Find` box, then select **Packages**. Click the name of the package that you want to view, and then click the name of a `Target`. Clicking an organization in the target list provides the following details (in alphabetical order):

Field	Description
`Current Version`	The current package version an organization has installed.
`Organization ID`	The ID that uniquely identifies the organization to Salesforce.
`Organization Name`	The name of the organization.
`Primary Contact`	The name of the contact who installed the package.
`Primary Contact Email`	The email address of the package publisher.
`Status`	The status of the push upgrade, whether scheduled, in progress, completed, aborted, or completed with failures.

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Developer** Edition

USER PERMISSIONS

To view push upgrade history:

- Upload AppExchange Packages

The Push Upgrade History lists the following information (in alphabetical order):

Field	Description
`Action`	Clicking **View Details** returns you to the job details for that upgrade.
`Start Date`	The scheduled start date and time of the push upgrade.
`Status`	The status of the push upgrade, whether scheduled, in progress, completed, aborted, or completed with failures.
`Version`	The package version number that was pushed.

APPENDICES

APPENDIX A ISVforce User License Comparison

Introduction

The following tables compare object access, user permissions and features, and organization limits for these license types.

- Lightning Platform Administrator—A standard Salesforce license with complete customization capabilities. It prohibits Create, Read, Update, and Delete on Leads, Opportunities, Products, Cases, Solutions, and Campaigns.
- Lightning Platform—A standard Salesforce Platform license with access to Accounts, Contacts, and custom objects. Used by non-administrators.

Note: For a complete list of license types, see: https://help.salesforce.com/HTViewHelpDoc?id=users_license_types_available.htm

The following symbols are used in the tables.

- ✓ —Included in license
- $—Available as an add-on for an additional fee
- C—Create access to the object
- R—Read access to the object
- U—Update access to the object
- D—Delete access to the object

Object Accessed

Object Accessed	Lightning Platform Administrator		Lightning Platform	
	EE	UE/PXE	EE	UE/PXE
Accounts	CRUD	CRUD	CRUD	CRUD
Activities, Tasks	CRUD	CRUD	CRUD	CRUD
Assets				
Calendar, Events	CRUD	CRUD	CRUD	CRUD
Campaigns				
Cases				
Contacts	CRUD	CRUD	CRUD	CRUD
Content	CRUD	CRUD	CRUD	CRUD

Object Accessed	Lightning Platform Administrator		Lightning Platform	
	EE	UE/PXE	EE	UE/PXE
Contracts				
Documents	CRUD	CRUD	CRUD	CRUD
Entitlements				
Ideas	CRUD	CRUD	CR	CR
Knowledge	R	R		
Leads				
Opportunities				
Products & Price Books				
Questions and Answers	CRUD	CRUD		
Quotes				
Service Contracts				
Solutions				

User Features

User Features	Lightning Platform Administrator		Lightning Platform	
	EE	UE/PXE	EE	UE/PXE
Company Community	$	$	$	$
Content	✓	✓	✓	✓
Flows	✓	✓	✓	✓
Jigsaw Exports	$	$	$	$
Knowledge	$	$	$	$
Mobile (Full)	$	✓	$	✓
Offline	✓	✓	✓	✓
Send Mass Email	✓	✓	✓	✓
Siteforce Contributor	$	$	$	$
Siteforce Publisher	$	$	$	$

User Permissions

User Permissions	**Lightning Platform Administrator**		**Lightning Platform**	
	EE	**UE/PXE**	**EE**	**UE/PXE**
Customize Reports	✓	✓	✓	✓
Customize Dashboards	✓	✓	✓	✓
View Dashboards*	✓	✓	✓	✓
Chatter (Groups, Files, Profiles)	✓	✓	✓	✓
Create Workflow and Approval Process	✓	✓		
Manage Users and Profiles	✓	✓		
Identity	✓	✓	✓	✓
Identity Connect	$	$	$	$
Write Apex Code	✓	✓		
WDC	$	$	$	$
Custom Apps Limit	10	Unlimited	10	Unlimited
Custom Tabs Limit	25	Unlimited	25	Unlimited
Custom Objects Limit**	200	2,000	200	2,000

* The running user of a dashboard must be a Lightning Platform or a Lightning Platform One App user to view the dashboard. Dashboards using the Lightning Platform administrator as the running user are not viewable by other Lightning Platform license types.

** Restricted limit for Lightning Platform One App and Chatter Plus.

Additional Organization Limits

Additional Organization Limits (Added Per User)	**Lightning Platform Administrator**		**Lightning Platform**	
	EE	**UE/PXE**	**EE**	**UE/PXE**
Data Storage	20 MB	120 MB	20 MB	120 MB
File Storage	2 GB	2 GB	2 GB	2 GB
API Calls (Per Day Per User)	1,000	5,000	1,000	5,000

For data storage, orgs of all editions are automatically allocated 10 GB. For each user added to an org, an extra 20 MB of storage is allocated, though Unlimited Edition and Performance Edition orgs receive more storage capacity. For each user added to an Unlimited Edition or Performance Edition org, an extra 120 MB of storage is allocated.

For file storage, Enterprise, Performance, and Unlimited Editions are allocated a per-user limit multiplied by the number of users in the organization plus an additional per-organization allocation of 11 GB. For example, an Enterprise Edition organization with 600 users receives 1,211 GB of file storage, or 2 GB per user multiplied by 600 users plus an additional 11 GB.

Note: For a complete list of storage limits for each edition, see: https://help.salesforce.com/HTViewHelpDoc?id=limits_storage_allocation.htm

APPENDIX B OEM User License Comparison

Compare object access, user permissions and features, and org limits for the license types available to partners.

License Types and Availability

Note: Starting Spring '16, Partner Community licenses are no longer available for resale. If you're a partner with a customer who requires similar features, consider a Customer Community Plus license instead.

The following licenses are available to new and existing ISV partners.

- OEM Embedded—A full Lightning Platform license with contractual restrictions. It prohibits Create, Read, Update, and Delete on Leads, Opportunities, Cases, Solutions, and Campaigns.
- Customer Community—Similar to a High Volume Customer Portal license. Well suited for business-to-consumer communities with a large number of external users.*
- Customer Community Plus—Similar to the Customer Community license, but adds more storage and access to features like Roles and Sharing.*

The following licenses aren't available to new partners, but can be resold by existing partners where noted.

- Partner Community—Similar to a Gold Partner license. Well suited for business-to-business communities, such as a partner community. Existing partners who currently sell Partner Community licenses can continue offering them.*
- ISV Portal—An Authenticated Website license with basic data sharing options (manual sharing to user and participation in sharing groups is not permitted). Users can only log in via Lightning Platform Sites. This is best used when projected user volumes will exceed 100,000. This legacy license type is no longer available.*
- ISV Portal with Sharing—A Customer Portal Manage Custom license with full sharing capabilities. Users can log in only via Lightning Platform Sites. Best used when projected user volumes are under 100,000 and granular security access is required. This legacy license type is no longer available.*

Licenses sold by partners can only be used to access the partner's app. End users can't develop or extend apps by creating custom objects, but they can access additional apps as long as those apps are sold with an embedded license.

* Licenses can be assigned to external users only.

The following symbols are used in the tables:

- ✓—Included in license
- $—Available as an add-on for a fee
- C—Create access to the object
- R—Read access to the object
- U—Update access to the object
- D—Delete access to the object

Objects

Object Accessed	OEM Embedded	ISV Portal	ISV Portal with Sharing	Customer Community	Customer Community Plus	Partner Community
Accounts	CRUD		CRU	R	CRU	CRUD
Activities, Tasks	CRUD			R	CRU	CRUD
Calendar, Events	CRUD					CRUD
Contacts	CRUD		CRU	R	CRU	CRUD
Content	CRUD		R		View and Upload	CRUD
Contracts*	CRUD	CRU	CRU	CRUD	CRUD	CRUD
Documents	CRUD	R	R	R	R	R
Ideas	CR	CR	CR	CR	CR	CR
Orders*	CRUD	CRU	CRU	CRUD	CRUD	CRUD
Products & Price Books*	CRUD	CRU	CRU	R	R	R
ISV Custom Object	CRUD	CRUD	CRUD	CRUD	CRUD	CRUD

* With the Orders Platform permission set license (PSL), available to OEM partners only, administrators can give users with Lightning Platform user licenses access to Contracts, Products, Price Books, and Orders. Orders functionality is automatically available to all licenses except the Lightning Platform licenses, which explicitly require the new PSL to grant access.

User Features

User Feature	OEM Embedded	ISV Portal	ISV Portal with Sharing	Customer Community	Customer Community Plus	Partner Community
Knowledge	$		R	R	R	R
Send Mass Email	✓					
Salesforce Mobile App	✓	✓	✓	✓	✓	✓
Identity	✓	✓	✓	✓	✓	✓
Flows	✓	✓	✓	✓	✓	✓
Original Territory Management*	✓		✓			✓
Enterprise Territory Management	✓					✓

* Original Territory Management is scheduled for retirement for all customers as of Summer '20. After the feature is retired, users can't access the original territory management feature and its underlying data. We encourage you to migrate to Enterprise Territory Management. For more information, see The Original Territory Management Module Retirement.

User Permissions

User Permission	OEM Embedded	ISV Portal	ISV Portal with Sharing	Customer Community	Customer Community Plus	Partner Community
Create and Customize Reports	✓				Create and Manage	Create and Manage
View Reports	✓		✓		✓	✓
Create and Customize Dashboards	✓				Create and Manage	
View Dashboards*	✓				✓	✓
Enhanced User/Role Based Sharing	✓		✓		✓	✓
Identity	✓	✓	✓	✓	✓	✓
Chatter (Groups, Files, Profiles)	✓			✓	✓	✓
Submit Workflow Approvals	✓		✓	✓	✓	✓
Custom Apps Limit	1					
Custom Tabs Limit	25	25	25	25		25
Custom Objects Limit	400**	200	200	200		200

* The running user of a dashboard must be a Lightning Platform user to view the dashboard. Dashboards using the Lightning Platform administrator as the running user are not viewable by other Lightning Platform license types.

** The limit of 400 custom objects applies to the primary app offering. Subscribers cannot create their own custom objects.

Storage Limits

Additional Organization Limits (Added Per User)	OEM Embedded	ISV Portal	ISV Portal with Sharing	Customer Community	Customer Community Plus	Partner Community
Data Storage	20 MB	0	2 MB	0	2 MB per member (member-based license)	5 MB

Additional Organization Limits (Added Per User)	OEM Embedded	ISV Portal	ISV Portal with Sharing	Customer Community	Customer Community Plus	Partner Community
					1 MB per member (login-based license)	
File Storage	2 GB	0	0	0	0	0

For data storage, each OEM Embedded organization is allocated either 1 GB or a per-user limit, whichever is greater. For example, an OEM Embedded organization with 20 users receives 1 GB because 20 users multiplied by 20 MB per user is 400 MB, which is less than the 1 GB minimum. An OEM Embedded organization with 100 users receives more than the 1 GB minimum because 100 users multiplied by 20 MB per user is 2 GB.

For file storage, each OEM Embedded organization is allocated a per-user limit multiplied by the number of users in the organization plus a per organization allocation of 11 GB. For example, an OEM Embedded organization with 600 users receives 1,211 GB of file storage, or 2 GB per user multiplied by 600 users plus 11 GB.

Salesforce Edition	Data Storage Minimum per Organization	File Storage Minimum per Organization	Storage Allocation Per User License
OEM Embedded	1 GB, plus 5 MB for each Gold Partner license	11 GB	20 MB of data storage and 2 GB of file storage

API Limits

The following table lists the limits for the total API requests (calls) for an OEM Embedded org.

Salesforce Edition	API Calls Per License Type	Total Calls Per 24-Hour Period
OEM Embedded	• Salesforce: 1,000 • Salesforce Platform: 1,000	100,000 + (number of licenses x calls per license type)

Limits are enforced against the aggregate of all API calls made by the org in a 24-hour period. Limits are not on a per-user basis. When an org exceeds a limit, all users in the org can be temporarily blocked from making more calls. Calls are blocked until usage for the preceding 24 hours drops below the limit.

GLOSSARY

EDITIONS

Available in: Salesforce Classic (not available in all orgs)

Available in: **Group**, **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Developer** Editions

The following terms and definitions describe key application and packaging concepts and capabilities:

App

Short for "application." A collection of components such as tabs, reports, dashboards, and Visualforce pages that address a specific business need. Salesforce provides standard apps such as Sales and Service. You can customize the standard apps to match the way you work. In addition, you can package an app and upload it to the AppExchange along with related components such as custom fields, custom tabs, and custom objects. Then, you can make the app available to other Salesforce users from the AppExchange.

AppExchange

The AppExchange is a sharing interface from Salesforce that allows you to browse and share apps and services for the Lightning Platform.

Beta, Managed Package

In the context of managed packages, a beta managed package is an early version of a managed package distributed to a sampling of your intended audience to test it.

Deploy

To move functionality from an inactive state to active. For example, when developing new features in the Salesforce user interface, you must select the “Deployed” option to make the functionality visible to other users.

The process by which an application or other functionality is moved from development to production.

To move metadata components from a local file system to a Salesforce organization.

For installed apps, deployment makes any custom objects in the app available to users in your organization. Before a custom object is deployed, it is only available to administrators and any users with the “Customize Application” permission.

License Management Application (LMA)

A free AppExchange app that allows you to track sales leads and accounts for every user who downloads your managed package (app) from the AppExchange.

License Management Organization (LMO)

The Salesforce organization that you use to track all the Salesforce users who install your package. A license management organization must have the License Management Application (LMA) installed. It automatically receives notification every time your package is installed or uninstalled so that you can easily notify users of upgrades. You can specify any Enterprise, Unlimited, Performance, or Developer Edition organization as your license management organization. For more information, go to http://www.salesforce.com/docs/en/lma/index.htm.

Major Release

A significant release of a package. During these releases, the major and minor numbers of a package version increase to any chosen value.

Managed Package

A collection of application components that is posted as a unit on the AppExchange and associated with a namespace and possibly a License Management Organization. To support upgrades, a package must be managed. An organization can create a single managed package that can be downloaded and installed by many different organizations. Managed packages differ from unmanaged packages by having some locked components, allowing the managed package to be upgraded later. Unmanaged packages do not include locked components and cannot be upgraded. In addition, managed packages obfuscate certain components (like Apex) on subscribing organizations to protect the intellectual property of the developer.

Managed Package Extension

Any package, component, or set of components that adds to the functionality of a managed package. You cannot install an extension before installing its managed package.

Namespace Prefix

In a packaging context, a namespace prefix is a one to 15-character alphanumeric identifier that distinguishes your package and its contents from packages of other developers on AppExchange. Namespace prefixes are case-insensitive. For example, ABC and abc are not recognized as unique. Your namespace prefix must be globally unique across all Salesforce organizations. It keeps your managed package under your control exclusively.

Package

A group of Lightning Platform components and applications that are made available to other organizations through the AppExchange. You use packages to bundle an app along with any related components so that you can upload them to AppExchange together.

Package Dependency

This is created when one component references another component, permission, or preference that is required for the component to be valid. Components can include but are not limited to:

- Standard or custom fields
- Standard or custom objects
- Visualforce pages
- Apex code

Permissions and preferences can include but are not limited to:

- Divisions
- Multicurrency
- Record types

Package Installation

Installation incorporates the contents of a package into your Salesforce organization. A package on the AppExchange can include an app, a component, or a combination of the two. After you install a package, you may need to deploy components in the package to make it generally available to the users in your organization.

Package Version

A package version is a number that identifies the set of components uploaded in a package. The version number has the format *`majorNumber.minorNumber.patchNumber`* (for example, 2.1.3). The major and minor numbers increase to a chosen value during every major release. The *`patchNumber`* is generated and updated only for a patch release.

Unmanaged packages are not upgradeable, so each package version is simply a set of components for distribution. A package version has more significance for managed packages. Packages can exhibit different behavior for different versions. Publishers can use package versions to evolve the components in their managed packages gracefully by releasing subsequent package versions without breaking existing customer integrations using the package. See also Patch and Patch Development Organization.

Patch

A patch enables a developer to change the functionality of existing components in a managed package, while ensuring subscribing organizations that there are no visible behavior changes to the package. For example, you can add new variables or change the body of an Apex class, but you may not add, deprecate, or remove any of its methods. Patches are tracked by a *`patchNumber`* appended to every package version. See also Patch Development Organization and Package Version.

Patch Development Organization

The organization where patch versions are developed, maintained, and uploaded. Patch development organizations are created automatically for a developer organization when they request to create a patch. See also Patch and Package Version.

Patch Release

A minor upgrade to a managed package. During these releases, the patch number of a package version increments.

Publisher

The publisher of an AppExchange listing is the Salesforce user or organization that published the listing.

Push Upgrade

A method of delivering updates that sends upgrades of an installed managed package to all organizations that have installed the package.

Subscriber

The subscriber of a package is a Salesforce user with an installed package in their Salesforce organization.

Test Drive

A test drive is a fully functional Salesforce organization that contains an app and any sample records added by the publisher for a particular package. It allows users on AppExchange to experience an app as a read-only user using a familiar Salesforce interface.

Unmanaged Package

A package that cannot be upgraded or controlled by its developer.

Upgrading

Upgrading a package is the process of installing a newer version. Salesforce supports upgrades for managed packages that are not beta.

Uploading

Uploading a package in Salesforce provides an installation URL so other users can install it. Uploading also makes your packaged available to be published on AppExchange.

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