# Sandboxes: Staging Environments for Customizing and Testing

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# SANDBOXES: STAGING ENVIRONMENTS FOR CUSTOMIZING AND TESTING

Want to customize your organization in a staging environment where you can test changes without affecting your production organization or its users? Want to have an organization that users can log into and test new features before they're production-ready? Or maybe you just want to log into a Salesforce organization for training or development that mirrors your production organization.

### When to Use a Sandbox

*Sandboxes* create copies of your Salesforce org in separate environments. Use them for development, testing, and training, without compromising the data and applications in your production org.

### Sandbox Setup Considerations

Sandbox behavior is similar to a Salesforce production org, but important differences affect how you configure and test a sandbox org.

### Create, Clone, or Refresh a Sandbox

Create a sandbox to use for development, testing, and training. Clone a sandbox to copy its data and metadata into another sandbox. Refresh an existing sandbox to update its contents.

### Manage Your Sandboxes

In Setup, enter `Sandboxes` in the `Quick Find` box, then select **Sandboxes**. Sandboxes displays the available sandboxes that you purchased and a list of your sandboxes in use.

### Manage Your Sandboxes Programmatically

Use Salesforce CLI to authorize in to, create, and clone sandboxes. Traditionally, admins create and manage sandboxes through the Setup UI. But we realize that many admins and developers want the ability to create and manage their development and testing environments programmatically, and to automate their CI processes. Salesforce CLI enables you to do both.

### Inactive Sandbox Expiration

To better utilize capacity and support growth, we perform a routine cleanup of inactive sandboxes. A sandbox is considered inactive and eligible for deletion if it hasn't been accessed for 180 days.

### Inactive User Freezing

Users who haven't logged in to a Developer or Developer Pro sandbox within the first 60 days based on the time the user was created are frozen. This feature can't be disabled.

### Deploy Your Changes

Migrate metadata changes between Salesforce orgs by using the deployment tools available in Setup.

### Secure Your Sandbox Data with Salesforce Data Mask

Data Mask is a powerful data security resource for Salesforce admins and developers. Instead of manually securing data and access for sandbox orgs, admins can use Data Mask to automatically mask the data in a sandbox. Data Mask enables admins and developers to mask sensitive data in sandboxes such as personally identifiable information (PII) or sales revenue.

SEE ALSO:

Scale Test

*Salesforce Help*: Data Cloud in a Sandbox (Beta)

# When to Use a Sandbox

*Sandboxes* create copies of your Salesforce org in separate environments. Use them for development, testing, and training, without compromising the data and applications in your production org.

Salesforce offers sandboxes and a set of deployment tools, so you can:

- Isolate customization and development work from your production environment until you're ready to deploy changes.
- Test changes against copies of your production data and users.
- Provide a training environment.
- Coordinate individual changes into one deployment to production.

Whether you're an administrator adding features to an organization, a solo developer writing code, or a team of developers working to enhance your organization, you should work with the right tools in the right environment to build and deploy change successfully to your production organization.

Sandbox Types and Templates

Sandboxes are isolated from your production org, so operations that you perform in your sandboxes don't affect your production org.

Sandbox Licenses and Storage Limits by Type

A sandbox is a copy of your organization in a separate environment that you can use for a variety of purposes, such as testing and training. Sandboxes are completely isolated from your Salesforce production organization. The operations you perform in your sandboxes don't affect your Salesforce production organization. You can create different sandbox environments for your org, depending on your needs for storage, copy configuration, and frequency of refresh.

SEE ALSO:

Sandbox Types and Templates

Deploy Your Changes

Choose Your Tools for Developing and Deploying Changes

# Sandbox Types and Templates

Sandboxes are isolated from your production org, so operations that you perform in your sandboxes don't affect your production org.

From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes** to view and manage your existing sandboxes or create new ones.

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:
- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

## Sandbox Types

- Developer Sandbox – A Developer sandbox is intended for development and testing in an isolated environment. A Developer Sandbox includes a copy of your production org's configuration (metadata).
- Developer Pro Sandbox – A Developer Pro sandbox is intended for development and testing in an isolated environment and can host larger data sets than a Developer sandbox. A Developer Pro sandbox includes a copy of your production org's configuration (metadata). Use a Developer Pro sandbox to handle more development and quality assurance tasks and for integration testing or user training.
- Partial Copy Sandbox – A Partial Copy sandbox is intended to be used as a testing environment. This environment includes a copy of your production org's configuration (metadata) and a sample of your production org's data as defined by a sandbox template. Use a Partial Copy sandbox for quality assurance tasks such as user acceptance testing, integration testing, and training.
- Full Sandbox – A Full sandbox is intended to be used as a testing environment. Only Full sandboxes support performance testing, load testing, and staging. Full sandboxes are a replica of your production org, including all data, such as object records and attachments, and metadata. The length of the refresh interval makes it difficult to use Full sandboxes for development.

  We recommend that you apply a sandbox template so that your sandbox contains only the records that you need for testing or other tasks.

  When you create a Full sandbox, you also have to decide whether to include field tracking history and Chatter activity. Include it only if you require it for testing use cases.

  - The default is to omit field tracking.
  - Chatter activity data can be extensive, which can add a significant amount of time to your Full sandbox copy.

## Sandbox Templates Tab

If you've purchased a license for Partial Copy or Full sandboxes, this tab lists any templates you've created.

Create a Sandbox Data Template, create a sandbox from a template, edit or delete a template, or click the template name for more information. For more information about creating a Sandbox Data Template, see Create or Edit Sandbox Templates on page 5.

## Sandbox History Tab

This tab displays a log of your sandbox creation and a history of refreshes, including when sandbox were created and who created them. The Sandbox History tab shows the sandboxes you created or refreshed within the last year, up to 500 entries. The tab lists sandboxes with the most recent activity (the ones created or refreshed) first.

This tab provides information only. To view or edit an existing sandbox, use the Sandbox tab.

## Sandbox Licenses

You purchase licenses for each sandbox type and can purchase multiple licenses of each type. Sandbox licenses are hierarchical. Specifically, the following table shows the type of sandbox you can create with each license:

| | Full Sandbox license | Partial Copy Sandbox license | Developer Pro Sandbox license | Developer Sandbox license |
|---|---|---|---|---|
| | **Allows you to create:** | | | |
| Developer sandbox type | ✓ | ✓ | ✓ | ✓ |
| Developer Pro sandbox type | ✓ | ✓ | ✓ | |
| Partial Copy sandbox type | ✓ | ✓ | | |
| Full sandbox type | ✓ | | | |

License stages are:

- Available – The displayed value represents the number of sandbox that you've purchased but haven't used.
- In use – The displayed value represents the number of sandboxes that you've purchased and used.

Note: If you don't see a sandbox option or need licenses for more sandboxes, contact Salesforce to order sandboxes for your org.

When your sandbox licenses expire, your existing sandboxes are subject to certain restrictions. See Unlock a Sandbox on page 31 for resolution of license expiration issues.

Create or Edit Sandbox Templates
Sandbox templates control which data is copied into a Partial Copy or Full sandbox.

SEE ALSO:

Create a Sandbox
Sandbox Licenses and Storage Limits by Type
Unlock a Sandbox

# Create or Edit Sandbox Templates

Sandbox templates control which data is copied into a Partial Copy or Full sandbox.

Sandbox templates allow you to pick specific objects and data to copy to your Full or Partial Copy sandbox to control the size and content of each sandbox. Sandbox templates are only available for use with Full or Partial Copy sandboxes.

When you create a sandbox template, you select the object data (standard and custom) to copy during the creation or refresh of a sandbox.

The sandbox template editor understands the relationships that are defined in your Salesforce org object schema. Some objects are included even before you've selected anything because they're required in any org. As you select objects to copy, the editor ensures that the associated required objects are added. To see which related objects are required by an object, select it in the **Object** table. Required objects are displayed in the **Required Objects** column.

As you change the schema of the objects in your org, Salesforce updates the template by adding or subtracting related required objects. For example, if Object A is a master of Object B, and you add Object B to a template, Salesforce requires Object A in the template and adds Object A.

Note: Full and Partial Copy sandboxes can support asset files along with other content entities. Make sure to select **Content Body** in the template.

1. From Setup, enter *Sandboxes* in the Quick Find box, select **Sandboxes**, then click the **Sandbox Templates** tab.
2. Click **New Sandbox Template** or click **Edit** next to an existing template you want to modify.
3. Enter a name and description for the sandbox template.
4. To add objects to the template, select the checkbox for each object you want from the available Objects list.
   The Object Details section shows you the objects to be added automatically with the one you've selected.
5. To remove objects from the template, deselect the checkbox for the object in the available Objects list.
   If you remove an object you previously selected, dependent objects you didn't explicitly select are removed. If you attempt to remove an object with dependent objects, you receive a warning requesting a confirmation of the removal. After you confirm your choice, those objects are also removed.
6. Click **Save**.

To understand how to use a Sandbox template during sandbox creation or refresh, see Create a Sandbox on page 19.

To understand how a Sandbox template is used by the sandbox copy engine to create a Full or Partial Copy sandbox, see Sandbox Licenses and Storage Limits by Type on page 6.

Warning: If you modify your object schema, your sandbox templates could be altered to include objects that are required by relationships. If you make a change to a required relationship in your object schema, review your sandbox templates to ensure that objects that you expect to be selected are still selected.

SEE ALSO:

- Create a Sandbox
- Sandbox Licenses and Storage Limits by Type
- Sandbox Types and Templates

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a Partial Copy or Full sandbox:
- Manage Sandboxes

# Sandbox Licenses and Storage Limits by Type

A sandbox is a copy of your organization in a separate environment that you can use for a variety of purposes, such as testing and training. Sandboxes are completely isolated from your Salesforce production organization. The operations you perform in your sandboxes don't affect your Salesforce production organization. You can create different sandbox environments for your org, depending on your needs for storage, copy configuration, and frequency of refresh.

Each type has different features to support the activities it's designed for.

EDITIONS

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Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

**Table 1: Sandboxes Available Per Edition**

| Sandbox Type | Professional Edition | Enterprise Edition | Unlimited Edition | Performance Edition |
|---|---|---|---|---|
| Developer Sandbox | 10 | 25 | 100 | 100 |
| Developer Pro Sandbox | | | 5 | 5 |
| Partial Copy Sandbox | Not Available | 1 | 1 | 1 |
| Full Sandbox | Not Available | | 1 | 1 |

- If you need licenses for more sandboxes, contact Salesforce to order sandboxes for your organization.
- You can order an unlimited number of QA databases.

Note: You can buy additional Developer Pro sandboxes for any edition, or Partial and Full sandboxes for Enterprise, Unlimited, and Performance editions.

Developer sandboxes aren't available for purchase but are bundled with add-on sandboxes of other types.

- The Developer Pro Sandbox add-on is bundled with 5 Developer Sandboxes.
- The Partial Copy Sandbox add-on is bundled with 10 Developer Sandboxes.
- The Full Sandbox add-on is bundled with 15 Developer Sandboxes.

Note: You can match provisioned licenses in production to your sandbox org without having to refresh your sandbox. Sandbox license counts are updated to match the counts in production. The process also adds licenses that are in production but not in the sandbox, and deletes licenses that aren't in production.

**Table 2: Sandbox Feature Quick Reference**

| Sandbox Type | Refresh Interval | Storage Limit | What's Copied | Sandbox Templates |
|---|---|---|---|---|
| Developer Sandbox | 1 day | Data storage: 200 MB<br>File storage: 200 MB | Metadata only | Not available |
| Developer Pro Sandbox | 1 day | Data storage: 1 GB<br>File storage: 1 GB | Metadata only | Not available |
| Partial Copy Sandbox | 5 days | Data storage: 5 GB<br>File storage: Same as your production org | Metadata and sample data | Required |

| Sandbox Type | Refresh Interval | Storage Limit | What's Copied | Sandbox Templates |
|---|---|---|---|---|
| Full Sandbox | 29 days | Same as your production org | Metadata and all data | Available |

Entities defined as metadata types aren't counted as part of storage allocations in sandboxes. For more information about entities that are counted against storage allocations, see *Salesforce Help*: Data and File Storage Allocations.

Note: Sandboxes don't send email notifications when storage limits are reached. However, if you reach the storage limit of your sandbox, you can't save new data in it. To check your storage limits, from Setup, enter `Storage Usage` in the Quick Find box, then select **Storage Usage**.

SEE ALSO:

- Create a Sandbox
- Create or Edit Sandbox Templates
- Sandbox Setup Considerations
- Refresh Your Sandbox

# Sandbox Setup Considerations

Sandbox behavior is similar to a Salesforce production org, but important differences affect how you configure and test a sandbox org.

### Servers and IDs

Sandbox and production orgs have unique org IDs. The sandbox copy engine creates an org as part of each creation and refresh request.

### Users and Contacts

User information is included in a sandbox copy or refresh for all sandbox types.

### Email Deliverability

New and refreshed sandboxes use the System email only setting by default. Sandboxes created before Spring '13 default to All email.

### Configuring Full Sandboxes

When you create or refresh a full sandbox, you can configure it to determine what data is copied. Minimizing the amount of data you include speeds up your sandbox copy.

### Sandbox Access Considerations

Review some important considerations about access before you create a sandbox so that sandbox users can make full use of the sandbox environment for development and UAT testing.

### Customization and Data Changes

Customizations and data changes in your production org aren't reflected in your sandboxes.

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:

- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:

- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

Multi-Factor Authentication

Sandbox environments aren't contractually required to use multi-factor authentication (MFA). But we strongly recommend using MFA for sandboxes that include intellectual property, customer data, or other Salesforce production data. To develop a strategy for managing MFA in sandbox environments, review these considerations.

Product and Service Exclusions

Some products and services are enabled in production orgs and disabled by default in sandboxes. Some can be re-enabled, while others cannot.

Other Service Differences

Sandbox behavior is similar to a Salesforce production org, but important differences affect how you configure and test a sandbox org.

SEE ALSO:

Knowledge Article: Match production and sandbox licenses without a sandbox refresh

*Apex Developer Guide*: SandboxPostCopyInterface

Create a Sandbox

Sandbox Types and Templates

Sandbox Licenses and Storage Limits by Type

Unlock a Sandbox

# Servers and IDs

Sandbox and production orgs have unique org IDs. The sandbox copy engine creates an org as part of each creation and refresh request.

- The org ID of the sandbox changes each time it's refreshed. In any place where a production org ID or a sandbox org ID is used, such as text values and metadata, Salesforce inserts the new sandbox org ID value.

  To find the ID of the org that you're logged in to, from Setup, enter `Company Information` in the Quick Find box, then select **Company Information**. A script or process, such as a test script or Web-to-Lead, that depends on a "hard-coded" org ID must use the current ID for the sandbox. When you deploy your changes to a production org, update the scripts or processes with the production org ID.

- Salesforce creates sandbox orgs on several instances. When a sandbox is created or refreshed, Salesforce selects an instance for your sandbox. Sometimes, sandboxes appear on different instances and have different URLs.
- When data is copied to a sandbox, object IDs for records are copied. Object IDs are unique identifiers for all objects—the same as the ID Field Type in the developer API. After being copied, however, object IDs don't synchronize between the production org and sandbox. The sandbox and its corresponding production org act as independent orgs. Object data (and corresponding object IDs) that are created in the production org after the sandbox is created or refreshed don't synchronize into the sandbox. The sandbox has the same behavior—new objects that are created in the sandbox aren't synchronized back to the production org.

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USER PERMISSIONS

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- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:
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# Users and Contacts

User information is included in a sandbox copy or refresh for all sandbox types.

- Because all Salesforce usernames must be unique and reference a single org, usernames are modified to ensure uniqueness as they are copied.

  For each username, the copy process does the following.

  - First, the sandbox name is appended to the username. For example, the username `user@acme.com` for a sandbox named `test` becomes `user@acme.com.test`.
  - If the resulting username is not unique, a second modification is performed in which some characters and digits are prepended to the modified username. This second modification results in a username such as `00x7Vquser@acme.com.test`.

  When you log in with the modified username, you log in to the corresponding sandbox.

- The copy process doesn't copy Contact data to Developer or Developer Pro sandboxes. Therefore, Customer Portal users aren't copied. However, the copy process does copy the Customer Portal licenses, so you can create Customer Portal users in Developer or Developer Pro sandboxes.
- When you create or refresh a sandbox, user email addresses are modified so that production users don't receive automatically generated email messages from the sandbox. User email addresses are appended with `.invalid`. This modification ensures that the system ignores these email addresses. For example, a user email of `awheeler@universalcontainers.com` in production becomes `awheeler@universalcontainers.com.invalid` when migrated to sandbox. If you want sandbox users to receive automatically generated emails as part of testing, you can correct the email addresses while logged in to the sandbox. Return email addresses set in users' Email Settings in production aren't appended with `.invalid` in the sandbox.

  Warning: Sandboxes change Salesforce user email addresses, but don't change other email addresses in Salesforce, such as email addresses in contact records. To avoid sending unsolicited email, manually invalidate or delete all email addresses in your sandboxes that don't belong to users of the sandbox. When testing outbound email, change contact email addresses to the addresses of testers or an automated test script.

- Each sandbox user's account email must be verified before that user's account can send email from Salesforce.

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USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:
- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

# Email Deliverability

New and refreshed sandboxes use the System email only setting by default. Sandboxes created before Spring '13 default to All email.

This setting applies to production and sandbox. To set it, from Setup, enter `Deliverability` in the Quick Find box, and then select **Deliverability**. If editable, set the access level in the Access to Send Email section. If Salesforce restricted your ability to change this setting, you can't edit the access level.

- No access—Allows only password reset emails. Prevents all other outbound email to and from users.
- System email only—Allows only automatically generated emails, such as new user and password reset emails.
- All email—Allows all types of outbound email. Default for new orgs that aren't sandboxes.

Tip: The System email only setting is useful for controlling email sent from sandboxes so that testing and development work doesn't send test emails to your users.

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USER PERMISSIONS

To view a sandbox:
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# Configuring Full Sandboxes

When you create or refresh a full sandbox, you can configure it to determine what data is copied. Minimizing the amount of data you include speeds up your sandbox copy.

- Decide whether to include field tracking history.
- By default, Chatter data isn't copied to your sandbox. Chatter data includes feeds and messages. Select **Copy Chatter Data** if you want to include it.
- The setup audit trail history of your production org isn't copied to your sandbox. The audit trail for your sandbox org starts when you begin to use it.
- Archived activities (tasks and events that aren't available because they're over a year old) and user password history aren't copied.

Note: Don't increase the default selections unless special circumstances require it. Large amounts of data can significantly lengthen the time it takes to copy your sandbox.

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USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a Full sandbox:
- Manage Sandboxes

# Sandbox Access Considerations

Review some important considerations about access before you create a sandbox so that sandbox users can make full use of the sandbox environment for development and UAT testing.

- Access changes to consider for sandbox users:
  - A sandbox refresh deletes and recreates the sandbox as a copy of the production org. This process reverses any manual access changes you made. If you created sandbox-only users, then they no longer exist. Other users' profile and permissions revert to their values in the production org. After a refresh, make any access changes in the new copy.
  - You can create users in your production org that are inactive, and then activate them in a sandbox. This method is a good way to create a user that has the appropriate permissions to develop in a sandbox.
  - Many development and testing tasks require the Modify All Data permission. If your developers don't have that permission in the production org, increase their permissions in the sandbox. Exercise caution when granting this permission in a sandbox that contains sensitive information copied from production (for example, social security numbers).
  - Users added in a production org after creating or refreshing a sandbox don't have access to the production org instance's related sandboxes. To create users in a sandbox, log in as the administrator on the sandbox org and create them in the sandbox instance.
  - You can create users for sandbox development, but these new users count against the number of licensed users in your org. To reduce your license count, you can disable production users who don't need access to the sandbox before you create or refresh a sandbox.
- Always log in to your sandbox org using either the My Domain login URL for the sandbox or `https://test.salesforce.com`. My Domain login URLs are recommended because they add an extra layer of security. Sandbox My Domain login URLs are in the format *`MyDomainName--SandboxName`*`.sandbox.my.salesforce.com`. You can find an org's My Domain login URL on the My Domain Setup page.

  Note: After a sandbox is created or refreshed, it can take 24–48 hours before you're able to log in using *`https://test.salesforce.com`*. During this period, access your sandbox via its My Domain login URL.
- Admins can log in to a sandbox via the **Log In** action on the Sandboxes Setup page only when the My Domain option **Prevent login from https://test.salesforce.com** is disabled in the sandbox. If that option is enabled, log in via the sandbox's My Domain login URL instead.
- Remember to log in using the modified username as described in Users and Contacts on page 9.
- If using the API, after you log in, use the redirect URL that is returned in the loginResult object for subsequent access. This URL reflects the instance on which the sandbox is located and the appropriate server pool for API access.
- Sandbox copies are made with federated authentication with SAML disabled. Configuration information is preserved, except the value for Salesforce Login URL. Salesforce Login URL is updated to match your sandbox URL, for example `https://`*`yourInstance`*`.salesforce.com/`, after you re-enable SAML. To enable SAML in the sandbox, from Setup, in the Quick Find box, enter *`Single Sign-On Settings`*, and then select **Single Sign-On Settings**. Then click **Edit**, and select **SAML Enabled**. For more information about configuring SAML settings, see Configure SAML Settings for Single Sign-On.

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# Customization and Data Changes

Customizations and data changes in your production org aren't reflected in your sandboxes.

- To incorporate the most recent customizations made to your org, create or refresh a sandbox.
- You can only add, edit, or delete Apex using the Salesforce user interface in a Developer Edition or sandbox org. In a Salesforce production org, you can only change Apex by using the `compileAndTestAPI()` call.
- If your sandbox is the same version as Salesforce AppExchange, you can:
  - Install and deploy apps from Salesforce AppExchange in your sandbox.
  - Publish apps from your sandbox to Salesforce AppExchange.

    Publishing managed packages from a Lightning Platform Sandbox is not advised, as refreshing or deleting the sandbox prevents any revisions to that managed package.

  The version of your sandboxes can differ from Salesforce AppExchange around the time of a Salesforce release. Check the logo in the upper left corner of your sandbox home page for version information.
- If your org uses quote templates and you create a Developer Pro sandbox, you can't open templates that contain Text/Image fields for editing within the sandbox.
- If your production org uses an image in quote templates or service reports and you copy the org to your sandbox, the image path isn't correct and the image appears as a broken link. To display the image, reinsert it from the correct location on your sandbox.
- If your production org uses an image in a knowledge article and you copy the org to your sandbox, the image path isn't correct and the image appears as a broken link. To display the image, reinsert it from the correct location on your sandbox, which is only possible for draft articles as archived or published articles can't be edited.
- Big Object records aren't copied to a sandbox. The sandbox contains the Big Object definition, but none of the records associated with the Big Object.

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# Multi-Factor Authentication

Sandbox environments aren't contractually required to use multi-factor authentication (MFA). But we strongly recommend using MFA for sandboxes that include intellectual property, customer data, or other Salesforce production data. To develop a strategy for managing MFA in sandbox environments, review these considerations.

Note: To learn more about the MFA requirement, see the Salesforce Multi-Factor Authentication FAQ.

- When you create or refresh a sandbox, all Multi-Factor Authentication for User Interface Logins user permission assignments — whether set via profiles or permission sets — are copied over from your production org. However, none of the MFA verification methods that a user has registered for your production org are copied to your sandbox. As a result, all MFA-enabled users must register an MFA method the first time they log in to a new sandbox. And they must repeat this step each time the sandbox is refreshed.
- If a user registers Salesforce Authenticator as an MFA verification method for their sandbox account, the connection to the account is invalidated each time the sandbox is refreshed. But the connection details aren't automatically removed from Salesforce Authenticator. To avoid a long list of invalid connected accounts in Salesforce Authenticator, users should manually delete their old sandbox account from the app each time the sandbox is refreshed.

  Salesforce Authenticator assigns the same default name each time a user registers the app for their sandbox account. To avoid losing track of which sandbox connected accounts are active and which are invalid, delete the old sandbox account before logging in to the new version of the sandbox.
- If you use SSO for access to your production org but want to use MFA instead of SSO for your sandboxes, do so by assigning the Multi-Factor Authentication for User Interface Logins user permission to users when you create or refresh a sandbox.

  But when you deploy customizations to your production org, take care that you don't accidentally include the sandbox's MFA configuration. To help keep MFA isolated to your sandbox:
  - Use a dedicated permission set to assign the Multi-Factor Authentication for User Interface Logins permission to sandbox users.
  - Give the permission set an obvious MFA-related name so it's easy to distinguish it from other permission sets.
  - Create a checklist that reminds Salesforce admins to exclude the MFA permission set from each deployment.

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:
- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

SEE ALSO:

Implement Multi-Factor Authentication

Register Verification Methods for Multi-Factor Authentication

# Product and Service Exclusions

Some products and services are enabled in production orgs and disabled by default in sandboxes. Some can be re-enabled, while others cannot.

The following features are disabled and can't be enabled in sandboxes.

- Contract expiration warnings
- Case escalation

  Contract expiration warnings and case escalation are disabled because they automatically send email to contacts, customers, and production org users.

- Subscription summary
- Data exports (by clicking **Export Now** or **Schedule Export** on the Weekly Export Service page in Setup)
- The ability to create Salesforce sandboxes
- The ability to copy email service addresses that you create in your sandbox to your production org
- The ability to publish Site.com sites

When creating a sandbox, some products that are enabled in your production org are disabled by default in the associated sandbox org. You can enable some of these disabled products in the sandbox org. Products that are disabled by default, and can be enabled in a sandbox.

- Sales Engagement
- Salesforce Inbox

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# Other Service Differences

Sandbox behavior is similar to a Salesforce production org, but important differences affect how you configure and test a sandbox org.

- Login history isn't copied over from the production org during creation or the source sandbox during cloning. The new sandbox is treated as a separate org with its own login history.
- Salesforce has a background process that permanently deletes records in the Recycle Bin that are older than 15 days. This process runs at different times on different servers, so the timestamp in your sandbox differs from the timestamp in your production org. Applications and integrations that depend on this timestamp can fail if they're first connected to one environment, such as your production org, and then connected to another environment, such as your sandbox. Consider this behavior when developing applications and integrations that depend on this timestamp.

  The time of the latest execution of the background delete process is available through the `getDeleted()` API call.
- For Salesforce authentication providers set up in the Summer '14 release and earlier, the user identity provided by a sandbox doesn't include the org ID. The destination org can't differentiate between users with the same user ID from two sources (such as two sandboxes). To differentiate users, edit the Salesforce Auth. Provider settings in the destination org, and select the checkbox to include the org ID for third-party account links. After you enable this feature, your users must reapprove the linkage to their third-party links. Salesforce authentication providers created in the Winter '15 release and later have this setting enabled by default.
- Only custom links created as relative URLs, such as `/00Oz0000000EVpU&pv0={!Account_ID}`, work when copied to your sandboxes. Custom links created as absolute URLs, such as `https://MyDomainName.my.salesforce.com/00Oz0000000EVpU&pv0={!Account_ID}` and `https://yourInstance.salesforce.com/00Oz0000000EVpU&pv0={!Account_ID}`, don't work in your org's sandboxes. We recommend that you use only relative URLs in your production org. Otherwise, correct the URLs in each sandbox.
- After an org's sandbox refresh is completed, a user has login access for 10 years after the refresh date if they are:
  - A Salesforce admin.
  - Copied into the sandbox from the production org, not created directly in the sandbox.
- To log in as any user, access your sandbox via the My Domain login URL for the sandbox, which you can find on the My Domain page in Setup. Alternatively, if your admin allows it, you can log in via `test.salesforce.com`. The option to log in as any user isn't available when users access a sandbox from production by using the Login link.

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# Create, Clone, or Refresh a Sandbox

Create a sandbox to use for development, testing, and training. Clone a sandbox to copy its data and metadata into another sandbox. Refresh an existing sandbox to update its contents.

You have a few ways to copy metadata and data to a sandbox. What data gets copied during creation and cloning depends on sandbox type.

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## Where Are Sandboxes Created?

Sandboxes are created on sandbox instances. The location of the sandbox instance depends on where it's corresponding production org is located.

- Sandboxes created from a production org in Salesforce First-Party are created on a Salesforce First-Party instance in the same region.
- Sandboxes created from a production org in Hyperforce are created on a Hyperforce instance in the same country.
- Sandboxes created from a production org in Government Cloud or Government Cloud Plus are created on a Government Cloud instance.

If a production org is migrated to a different infrastructure type (example: Salesforce First-Party to Hyperforce), new sandboxes created post-migration are also created on the new infrastructure type. Existing sandboxes remain on their current instance until they are refreshed or deleted by an admin, or migrated by Salesforce.

### Determine Who Has Sandbox Access

Selective Sandbox Access helps you limit access to only required users who are included in a public group. It also removes the additional step for a Salesforce admin to change user email addresses back to their original format.

### Create a Sandbox

When you create a sandbox, Salesforce copies the metadata from your production org to a sandbox org. What data gets copied depends on the sandbox type.

### Refresh Your Sandbox

Refreshing a sandbox updates its metadata from the source org. If the sandbox is a clone or if it uses a sandbox template, the refresh process updates the org's data and its metadata. The org ID of the sandbox changes each time it's refreshed.

### Activate Your Refreshed Sandbox

If you didn't select **Auto Activate** while refreshing your sandbox, you must activate your sandbox before you can use it.

### What are Preview and Non-Preview Sandboxes?

During the Salesforce major release transitions, sandboxes get upgraded on different timelines based on their release type. The two release types for sandboxes are preview and non-preview.

### Some Considerations

Review these considerations when you create, refresh, or delete a sandbox.

Sandbox Cloning

You can create a sandbox by cloning an existing sandbox rather than using your production org as your source. Save time by customizing a sandbox with a set of data and metadata and then replicating it. Sandbox cloning simplifies having multiple concurrent streams of work in your application life cycle. You can set up a sandbox for each type of work, such as development, testing, and staging. Your colleagues can easily clone individual sandboxes instead of sharing one sandbox and avoid stepping on each other's toes.

Monitor Your Sandbox's Progress

From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**. The list of your sandboxes displays a progress bar for items in the queue, in progress, or recently completed.

# Determine Who Has Sandbox Access

Selective Sandbox Access helps you limit access to only required users who are included in a public group. It also removes the additional step for a Salesforce admin to change user email addresses back to their original format.

USER PERMISSIONS

To create or edit a public group:
- Manage Users

To create, refresh, activate, and delete a sandbox:
- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

## Do I Have to Use a Public Group to Provide Access to a Sandbox?

When you create or refresh a Developer and Developer Pro sandbox, you must grant access to the sandbox using a public group. For Partial Copy and Full sandboxes, we recommend that you provide access through a public group; however, you still have the option to provide access to all active users.

## How Do I Provide Access Through a Public Group?

When creating or refreshing a sandbox, you select a public group for **Sandbox Access**. To create a public group, see Create and Edit Groups.

- Make sure all members of the group are of type Users.
- To improve security and reduce sandbox creation times, we recommend that the public group contains fewer than 150 members.

How you select the public group depends on how many public groups are defined in your org.

- If the production org has fewer than 60 public groups, select the group from the Public Groups dropdown.
- If the production org has 60 or more public groups, enter the public group name in the Public Groups field.

If the public group is empty, only the sandbox creator has access.

## Sandbox Access User Group Options

The Sandbox Access User Group determines the email address formats when creating a sandbox. When you clone a sandbox, Selective Sandbox Access is unavailable. Cloned sandbox access is determined based on access to the source sandbox.

| Sandbox Operation | Sandbox Access User Group | Users With Access | Email Address Format |
|---|---|---|---|
| Create (applies to only Partial Copy and Full sandboxes) | All Active Users (Match Source Org Access) | Matches users who have access in the production org. | The email address of the sandbox creator is copied |

| Sandbox Operation | Sandbox Access User Group | Users With Access | Email Address Format |
|---|---|---|---|
| | | | unmodified from the production org.<br>Email addresses of the remaining users are appended with `.invalid`. |
| Create (applies to all sandbox types) | Public User Group | The sandbox creator and users belonging to the public user group have access to the sandbox.<br>We freeze remaining users to remove sandbox access. | The email addresses of all users with sandbox access are copied unmodified from the production org.<br>Email addresses of the remaining users are appended with `.invalid`. |
| Clone (applies to all sandbox types) | Not selectable. Source sandbox matches production access. | All users with access to the source sandbox. | The email address of the sandbox creator is copied unmodified from the source org.<br>Email addresses of the remaining users are appended with `.invalid`. |

## Provide Access to Additional Users in Existing Sandboxes

You can provide access to additional users by unfreezing their user accounts. See Salesforce Help: Freeze or Unfreeze User Accounts for instructions.

# Create a Sandbox

When you create a sandbox, Salesforce copies the metadata from your production org to a sandbox org. What data gets copied depends on the sandbox type.

1. From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**.
2. Click **New Sandbox**.
3. Enter a name (10 characters or fewer) and a description for the sandbox.

   We recommend that you choose a name that:

   - Reflects the purpose of this sandbox, such as QA.
   - Has only a few characters, because Salesforce appends the sandbox name to usernames on user records in the sandbox environment. Names with fewer characters make sandbox logins easier to type.

4. Select the type of sandbox you want.

   If you don't see a sandbox option or need licenses for more, contact Salesforce to order sandboxes for your org.

   If you reduce the number of sandboxes you purchase, you're required to match the number of your sandboxes to the number you purchased. For example, if you have two Full sandboxes but purchased only one, you can't create a Full sandbox. Instead, convert a Full sandbox to a smaller one, such as a Developer Pro or Developer sandbox, depending on which types you have available.

5. Select the data to include in your Partial Copy or Full sandbox.

   - For a Partial Copy sandbox, click **Next**, and then select the template you created to specify the data for your sandbox. If you haven't created a template for this Partial Copy sandbox, see Create or Edit Sandbox Templates.
   - For a Full sandbox click **Next**, and then decide how much data to include.
     - To include template-based data for a Full sandbox, select an existing sandbox template. For more information, see Create or Edit Sandbox Templates.
     - Choose whether to include field tracking history data. If your production org is on Hyperforce, select the checkbox to include 30 days of field tracking history. For non-Hyperforce production orgs, select an option from the dropdown menu.
     - Decide whether to copy Chatter data. Chatter data includes feeds, messages, and topics and is used in many components that affect your sandbox copy.

   Decreasing the amount of data you copy can significantly speed sandbox copy time.

6. To run scripts after each create and refresh for this sandbox, specify the Apex class you previously created from the SandboxPostCopy interface.
7. For Sandbox Access, indicate a public user group that contains the users that require access to the sandbox (required for Developer and Developer Pro sandboxes).

   For Partial Copy and Full sandboxes, you also have the option to select **All Active Users**. Selecting all users can increase sandbox creation times and impact the login experience.

   How you select the public group depends on how many public groups exist in your production org.

   - If the production org has fewer than 60 public groups, select the group from the Public Groups dropdown.
   - If the production org has 60 or more public groups, enter the group name in the Public Groups field.

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USER PERMISSIONS

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To create, refresh, activate, and delete a sandbox:

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For more information on Selective Sandbox Access, see Determine Who Has Sandbox Access.

8. Click **Create**.

Tip: Try to limit changes in your production org while the sandbox copy proceeds.

The process takes from several minutes to several days, depending on the size and type of your org.

When your sandbox is ready for use, you receive an email notification that your sandbox has completed copying.

To access your sandbox, click the link in the notification email. Users can log in to the sandbox at `https://test.salesforce.com` by appending `.sandbox_name` to their Salesforce usernames. For example, if a username for a production org is `user1@acme.com`, and the sandbox is named "test," the modified username to log in to the sandbox is `user1@acme.com.test`.

However, if a sandbox username exists, a 7-digit alphanumeric value is prepended to the username to ensure that the sandbox username is unique. For example: `1a2bc3duser1@acme.com.test`.

If you prevent user logins from `https://login.salesforce.com` in production through My Domain settings, the sandbox prevents user logins from `https://test.salesforce.com` by default. In this case, instruct users to log in to the sandbox using its My Domain login URL in the format `https://MyDomainName--SandboxName.sandbox.my.salesforce.com`. You can find an org's My Domain login URL on the My Domain Setup page.

Note: Salesforce automatically changes sandbox usernames, but not passwords. New sandboxes have the default email deliverability setting `System email only`. The System email only setting is especially useful for controlling email sent from sandboxes so that testing and development work doesn't send test emails to your users.

SEE ALSO:

*Apex Developer Guide*: SandboxPostCopyInterface
Sandbox Types and Templates
Sandbox Licenses and Storage Limits by Type
Create or Edit Sandbox Templates
Sandbox Setup Considerations
Unlock a Sandbox

# Refresh Your Sandbox

Refreshing a sandbox updates its metadata from the source org. If the sandbox is a clone or if it uses a sandbox template, the refresh process updates the org's data and its metadata. The org ID of the sandbox changes each time it's refreshed.

If custom domains are associated with your sandbox, before you refresh it, review Considerations for Custom Domains in Sandboxes.

1. From Setup, in the Quick Find box, enter `Sandboxes`, and then select **Sandboxes**.

   A list of your sandboxes appears. Sandboxes that you can refresh have a Refresh link next to their name.

2. Next to the name, click **Refresh**.
3. Review the Name, Description, and Create From values, and edit these values if needed.
4. Select the type of sandbox environment you want.

   A table shows the number and type of sandbox licenses available in your org. You can select a different sandbox type to refresh.

   If the sandbox you're refreshing is a clone, this option isn't available. A cloned sandbox refreshes from its source org and retains the source org's sandbox license type. If a sandbox's source org is deleted, the clone refreshes from production.

5. Select the data you want to copy.
   - For a Partial Copy sandbox, click **Next**, and then select the template to specify the data for your sandbox. If you haven't created a template for this Partial Copy sandbox, see Create or Edit Sandbox Templates.
   - For a Full sandbox click **Next**, and then decide how much data to include.
     - To include template-based data for a Full sandbox, select an existing sandbox template. For more information, see Create or Edit Sandbox Templates.
     - Choose whether to include field tracking history data. If your production org is on Hyperforce, select the checkbox to include 30 days of field tracking history. For non-Hyperforce production orgs, select an option from the dropdown menu.
     - Decide whether to copy Chatter data. Chatter data includes feeds, messages, and topics and is used in many components that affect your sandbox copy.

   Decreasing the amount of data you copy can significantly speed sandbox copy time.

6. To activate your sandbox immediately after you refresh it, select **Auto Activate**. In this case, you don't receive an activation email.
7. For Sandbox Access, indicate a public user group that contains the users that require access to the sandbox (required for Developer and Developer Pro sandboxes).

   For Partial Copy and Full sandboxes, you also have the option to select **All Active Users**. Selecting all users can increase sandbox creation times and impact the login experience.

   How you select the public group depends on how many public groups exist in your production org.

   - If the production org has fewer than 60 public groups, select the group from the Public Groups dropdown.
   - If the production org has 60 or more public groups, enter the group name in the Public Groups field.

   For more information on Selective Sandbox Access, see Determine Who Has Sandbox Access.

8. Click **Create**.

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9. Refreshing your sandbox can move it to a different Salesforce instance. For example, the sandbox can move from CS40 to CS50. If you're subscribed to Trust Notifications, check your subscription settings to ensure that you continue to receive updates about unforeseen incidents and planned maintenance that affects your sandbox.

Salesforce starts copying data to the sandbox.

If you didn't select **Auto Activate** while refreshing your sandbox, Salesforce sends you an email when your sandbox is ready to activate.

Note: Salesforce deletes new sandboxes that weren't activated within 30 days. Users who created or most recently refreshed any sandbox for your org get at least two email notifications before we schedule the unactivated sandbox for deletion.

# Activate Your Refreshed Sandbox

If you didn't select **Auto Activate** while refreshing your sandbox, you must activate your sandbox before you can use it.

1. From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**

   A list of your sandboxes displays. Refreshed sandboxes that haven't been activated yet show an **Activate** link next to their name.

2. Click **Activate** next to the sandbox you want to activate.

   Warning: Activating a replacement sandbox that was created using the Refresh link deletes the sandbox it is refreshing. The current configuration and data are erased, including application or data changes that you've made. Click the **Activate** link only if you don't need the current contents of the sandbox. Your production org and its data aren't affected.

   Salesforce deletes new sandboxes that aren't activated within 30 days. Users who created or most recently refreshed any sandboxes for your org receive at least two email notifications before Salesforce schedules the sandbox for deletion.

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# What are Preview and Non-Preview Sandboxes?

During the Salesforce major release transitions, sandboxes get upgraded on different timelines based on their release type. The two release types for sandboxes are preview and non-preview.

## Preview Sandbox

A preview sandbox provides early access to new features and lets you test your configurations before the production upgrade. Preview sandboxes are upgraded approximately six weeks in advance of production orgs during every major release.

## Non-Preview Sandbox

Non-preview sandboxes aren't upgraded early. Use non-preview sandboxes when building new changes for your production org.

## View Preview and Non-Preview Sandboxes

To view which of your existing sandboxes are preview or non-preview, from Setup enter *Sandboxes* in the Quick Find box. Select **Sandboxes**, and then locate the Release Type column.

## Create a Preview or Non-Preview Sandbox

A sandbox is marked as preview or non-preview depending on the instance on which it's created. For instructions on how to create a preview or non-preview sandbox, see Salesforce Sandbox Preview Instructions in Salesforce Help.

# Some Considerations

Review these considerations when you create, refresh, or delete a sandbox.

## Sandbox Copy and Post-Copy

- You can specify a post-copy script to run on a sandbox every time it's refreshed (and the first time it's created). Specify the script when you create the sandbox.
- Sandbox copy is a long-running background operation. You're notified of the completion of a sandbox copy by email. Sandbox refreshes can take hours, days, or even more than a week to complete.
- Several conditions affect the duration of a sandbox copy or refresh. These conditions include the number of customizations, data size, numbers of objects and configuration choices, and server load. Also, sandbox refreshes are queued, so your copy request doesn't always start immediately.

## Creating a Sandbox

- A sandbox isn't a point-in-time snapshot of the exact state of your data. We recommend that you limit changes to your production org while a sandbox is being created or refreshed. Setup and data changes to your production org during the sandbox creation and refresh operations can result in inconsistencies in your sandbox. Check for inconsistencies in your sandbox after it's created or refreshed.
- If you've reached your org's limit, some types of sandboxes aren't available. For example, if your org is limited to one full sandbox, and you already have a full sandbox, you can't create another full sandbox. However, you can refresh your existing full sandbox.
- Requests to create a sandbox can't be canceled.

## Refreshing a Sandbox

- When you finish with a sandbox, you can refresh it. This process replaces the sandbox with a copy of your production org. Requests to refresh a sandbox can't be canceled.
- You can choose to either activate or discard a refreshed sandbox. A discarded sandbox can't be recovered. Discarding a refreshed sandbox reverts it to its previous version, and deletes the new version. Activating a refreshed sandbox deletes the previous sandbox version.
- If you have active Salesforce-to-Salesforce connections in your sandbox, deactivate the connections and then reactivate them after the sandbox is refreshed. The connections and mappings aren't copied to the refreshed sandbox.
- When you refresh a sandbox, Apex scheduled jobs from the source org aren't copied. You must reschedule any jobs that you need in the refreshed sandbox.

## Deleting a Sandbox

- If you've reduced your org's number of sandbox licenses, a **Delete** link shows next to existing sandboxes. Delete a sandbox before creating or refreshing any more sandboxes.
- A deleted sandbox can't be recovered.
- Deleting a sandbox doesn't terminate your sandbox subscription. If you delete your sandbox, you can create a new one.

## Sandboxes with an Associated Custom Domain

If custom domains are associated with your sandbox, before you refresh, clone, or delete it, review Considerations for Custom Domains in Sandboxes.

# Sandbox Cloning

You can create a sandbox by cloning an existing sandbox rather than using your production org as your source. Save time by customizing a sandbox with a set of data and metadata and then replicating it. Sandbox cloning simplifies having multiple concurrent streams of work in your application life cycle. You can set up a sandbox for each type of work, such as development, testing, and staging. Your colleagues can easily clone individual sandboxes instead of sharing one sandbox and avoid stepping on each other's toes.

Clone a Sandbox

When you clone a sandbox, its data and metadata are copied to the new sandbox. Entity history and Chatter are copied for only Full sandboxes, if they were included in the source sandbox. A cloned sandbox uses the same license type as its source org. For example, to clone a Full sandbox you must have a Full sandbox license available.

Refresh a Cloned Sandbox

Refreshing a cloned sandbox updates the sandbox's metadata and data from its source org. The org ID of the sandbox changes each time it's refreshed.

## Clone a Sandbox

When you clone a sandbox, its data and metadata are copied to the new sandbox. Entity history and Chatter are copied for only Full sandboxes, if they were included in the source sandbox. A cloned sandbox uses the same license type as its source org. For example, to clone a Full sandbox you must have a Full sandbox license available.

If custom domains are associated with your sandbox, before you clone it, review Considerations for Custom Domains in Sandboxes.

1. From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**.
2. Click **New Sandbox**, or click **Clone** next to a completed sandbox.

   If you're cloning a sandbox hosted on a Hyperforce instance, our Quick Clone technology enhances the speed at which your sandbox is replicated. To see whether your sandbox is on Hyperforce, check the Location information in the list of sandboxes in Setup.
3. Enter a name (10 characters or fewer) and description for the sandbox.

   We recommend that you choose a name that:

   - Reflects the purpose of this sandbox, such as QA.
   - Has only a few characters, because Salesforce appends the sandbox name to usernames on user records in the sandbox environment. Names with fewer characters make sandbox logins easier to type.
4. If you clicked New Sandbox, from the Create From dropdown, select the name of the sandbox that you want to clone.
5. If you clicked Clone, confirm that the sandbox name selected in the Create From dropdown is the sandbox you want to use as your source org.

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6. Make sure that the org you're cloning has the license type that you want for your new sandbox. To use a different license type, choose a different source org from the Create From dropdown.
7. Click **Next**.
8. In the Sandbox Options page, click **Create** to continue.
9. To run scripts after each creation and refresh for this sandbox, specify an Apex class that extends the `SandboxPostCopy` interface. The Apex class you specify must exist in your source org.

   For sandbox clones, Sandbox Access is non-selectable. Sandbox access is provided to users who have access to the source sandbox (all active users).

10. Click **Create**.

    Avoid making changes in your source org while the sandbox copy occurs.

When your new sandbox is ready, you can manage it from your production org like any other sandbox.

## Refresh a Cloned Sandbox

Refreshing a cloned sandbox updates the sandbox's metadata and data from its source org. The org ID of the sandbox changes each time it's refreshed.

If custom domains are associated with your sandbox, before you refresh or clone it, review Considerations for Custom Domains in Sandboxes.

1. From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**.

   A list of your sandboxes displays. Sandboxes that you can refresh have a Refresh link next to their name.

2. Next to the name of the sandbox you want to refresh, click **Refresh**.
3. Review the name and description, and edit them if needed.
4. Review the Create From value, which is the source org for the refresh. If you don't want to refresh the cloned sandbox using its original source org, select a different sandbox or your production org.

   A cloned sandbox refreshes from its source org and retains the source org's sandbox license type. If a sandbox's source org has been deleted, the clone refreshes from your production org.

5. If you want to activate your sandbox immediately after you refresh it, select **Auto Activate**. In this case, you don't receive an activation email.
6. To run scripts after each creation and refresh for this sandbox, specify an Apex class that extends the `SandboxPostCopy` interface. The Apex class you specify must exist in your source org.

   For sandbox clones, Sandbox Access is non-selectable. Sandbox access is provided to users who have access to the source sandbox (all active users).

7. Click **Create**.
8. Refreshing your sandbox can move it to a different Salesforce instance. For example, the sandbox can move from CS40 to CS50. If you're subscribed to Trust Notifications, check your subscription settings to ensure that you continue to receive updates about unforeseen incidents and planned maintenance that affect your sandbox.

Salesforce starts copying metadata and data to the sandbox.

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If you didn't select **Auto Activate**, Salesforce emails you when your sandbox is ready to activate.

SEE ALSO:

Activate Your Refreshed Sandbox

# Monitor Your Sandbox's Progress

From Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**. The list of your sandboxes displays a progress bar for items in the queue, in progress, or recently completed.

- To show the percentage completed of a copy in progress, hover over the progress bar.
- To see information about the sandbox, including copy progress or how much time before the next available refresh, click the name.

If your sandbox status is suspended or stopped for more than 1 hour, contact Salesforce customer support.

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:

- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:

- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

# Manage Your Sandboxes

In Setup, enter *Sandboxes* in the Quick Find box, then select **Sandboxes**. Sandboxes displays the available sandboxes that you purchased and a list of your sandboxes in use.

### Sandbox Action and Status Reference

Access the list of your sandboxes from the Sandbox Setup page. Each entry shows the status of the sandbox and the actions that you can take.

### Sandbox License Compliance

To ensure sandbox license compliance, we inform you when you have more sandboxes than provisioned licenses. When you exceed your sandbox allocations, we lock the appropriate number of sandboxes to restore your license compliance, starting with the least recently used sandboxes. After you meet compliance, locked sandboxes are unlocked.

### Unlock a Sandbox

Sandboxes are licensed separately from the Salesforce service and are subject to restrictions. When your sandbox licenses expire, Salesforce decreases the count of available sandbox licenses for the selected sandbox type.

## EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

## USER PERMISSIONS

To view a sandbox:

- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:

- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

# Sandbox Action and Status Reference

Access the list of your sandboxes from the Sandbox Setup page. Each entry shows the status of the sandbox and the actions that you can take.

## Available Sandbox Actions

You can perform these actions from the sandbox list and on the sandbox detail page. To view the sandbox detail page, click a sandbox name.

| Action | Description |
|---|---|
| Log In | To log in to the sandbox as an admin, click **Log In**. This option is available only to users logged in as an admin and only for active sandboxes. |
| Refresh | To replace a sandbox with a new copy, click **Refresh**. This option is available only for sandboxes that can be refreshed.<br>This process replaces the sandbox with a copy of your production org. Requests to refresh a sandbox can't be canceled. Your existing copy of the sandbox remains available while you wait for the refresh to be completed. After the process is complete, the refreshed copy is inactive until you activate it. |
| Activate | To access a refreshed sandbox, activate it. Click **Activate**. This option is available only for sandboxes with the Pending Activation status.<br>Activating a refreshed sandbox replaces the current sandbox with the refreshed version and permanently deletes the older version and all data in it. Your production org and its data aren't affected. |
| Discard | To discard a refreshed sandbox, click **Discard**. This action is available only for refreshed sandboxes that aren't activated.<br>When you discard a refreshed sandbox, the sandbox reverts to its previous version, and the new version is deleted. |
| Del | To remove the sandbox entirely, click **Del**.<br>Deleting a sandbox permanently erases the sandbox and all data in it, including any outbound change sets that have been uploaded from the sandbox. Your production org and its data aren't affected. |

Note: The Delete and Refresh operations are available only when the refresh interval for that sandbox type has elapsed.

EDITIONS

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Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:
- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

## Sandbox Statuses

| Status | Description |
|---|---|
| Sampling | The copy engine is determining which object records are sampled and copied from the production org. This status is used only by Partial Copy sandboxes. |
| Pending | The sandbox is in the queue to be processed by the copy engine. If other sandbox copy requests were made before yours, your sandbox could remain in this state for an extended time. |
| Processing | The copy engine picked up the copy request and is building the sandbox. |
| Suspended | The copy engine was interrupted while refreshing or creating the sandbox. The copy engine automatically recovers from this state and returns to Processing. If this status remains unchanged for more than one hour, contact Salesforce Customer Support. |
| Stopped | Multiple events prevented the copy engine from completing a process. If your sandbox is in this state, contact Salesforce Customer Support for specific details and next steps. Salesforce is notified automatically about sandboxes in this state so that we can resolve the issues. |
| Pending Activation | The copy engine created the sandbox. You can now activate, discard, or delete the sandbox. |
| Activating | The copy engine is completing the final steps to make your new sandbox available. |
| Discarding | The copy engine is discarding the refreshed sandbox, because an admin clicked **Discard**. The current sandbox and your production org aren't affected by this process. |
| Completed | The copy engine created or refreshed the sandbox, and an admin activated it. You can log in to your new sandbox. |
| Deleting | The copy engine is deleting the sandbox and its data, because an admin clicked **Delete**. This process doesn't affect your production org. |
| Locking | A background process locked the sandbox. For more information, see the **Locked** status. |
| Locked | You can't log in to this sandbox because some or all of your sandbox licenses expired.<br>Contact your account manager to restore the expired licenses. After a license expires, you have 60 days to restore it. If the licenses for this sandbox aren't restored within 60 days, your sandbox is deleted. |

# Sandbox License Compliance

To ensure sandbox license compliance, we inform you when you have more sandboxes than provisioned licenses. When you exceed your sandbox allocations, we lock the appropriate number of sandboxes to restore your license compliance, starting with the least recently used sandboxes. After you meet compliance, locked sandboxes are unlocked.

When you exceed your sandbox allocations, we send users with the Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types) permission an email notification informing them about non-compliance. After 30 days, we lock the appropriate number of sandboxes to restore license compliance, starting with the least recently used sandboxes based on login date. Users with the Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types) permission are sent an email notification that lists the affected sandboxes. Sixty days after a sandbox is locked, it's deleted and can't be recovered.

Note: When you exceed your sandbox allocation limits, you can't perform sandbox operations such as refresh for any of your sandboxes regardless of sandbox type. After you meet compliance, the locked sandboxes are unlocked and you once again can perform sandbox operations.

EDITIONS

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Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

| Days After Sandbox Is Flagged as Non-Compliant | What Happens to the Non-Compliant Sandboxes? |
|---|---|
| From 1 through 30 | Non-compliant sandboxes remain unlocked during this grace period. Delete any unneeded sandboxes to free up sandbox licenses, or purchase additional sandbox licenses to meet compliance. |
| From 31 through 90 | Non-compliant sandboxes are locked. Delete any unneeded sandboxes to free up sandbox licenses, or purchase additional sandbox licenses to meet compliance. |
| From 91 and later | Non-compliant sandboxes are permanently deleted and can't be recovered. |

To purchase additional sandbox licenses, contact your Salesforce Account Executive. Be sure to allow provisioning time when purchasing licenses.

SEE ALSO:

Unlock a Sandbox

# Unlock a Sandbox

Sandboxes are licensed separately from the Salesforce service and are subject to restrictions. When your sandbox licenses expire, Salesforce decreases the count of available sandbox licenses for the selected sandbox type.

If your current license count is lower than the number of your provisioned sandbox orgs, Salesforce removes sandbox services, such as Sandbox org accessibility or Login.

**Important:** When you exceed your sandbox allocations, the appropriate number of sandboxes are locked to restore your license compliance, starting with the least recently used sandboxes. If you do nothing, sandboxes locked for more than 60 days are deleted and can't be recovered. For more information about license compliance, see Sandbox License Compliance.

Here are some scenarios and solutions, based on licensing and usage.

| Scenario | Cause | Example | Effect | Resolution |
|---|---|---|---|---|
| Unable to refresh a particular type of sandbox | Your org is using more sandboxes than its sandbox licenses permit. | Your org has three Partial Copy sandboxes but only two Partial Copy sandbox licenses. | You can't refresh any sandbox. When you're over your limit on any type of sandbox, your org isn't allowed to refresh any sandboxes. | Delete sandboxes to comply with the number allowed by your org's sandbox licenses, or purchase more sandbox licenses. |
| All or some sandboxes of a particular type are locked | Your org is using more sandboxes than its sandbox licenses permit. | Your org has three Partial Copy sandboxes but only two Partial Copy sandbox licenses. | You don't have access to the sandboxes. | Delete sandboxes to comply with the number allowed by your org's sandbox licenses, or purchase more sandbox licenses. |
| All sandboxes are locked | Your production org is locked. | Your org has one Full sandbox and one Developer sandbox, but you can't log in to either sandbox. | If your production org is locked, all sandboxes associated with the org are locked. | Contact your Salesforce representative to unlock your org. When your production org is unlocked, the |

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

| Scenario | Cause | Example | Effect | Resolution |
|---|---|---|---|---|
| | | | | sandboxes are unlocked as well. |

SEE ALSO:

- Create a Sandbox
- Sandbox Licenses and Storage Limits by Type
- Manage Your Sandboxes
- Sandbox Setup Considerations

# Manage Your Sandboxes Programmatically

Use Salesforce CLI to authorize in to, create, and clone sandboxes. Traditionally, admins create and manage sandboxes through the Setup UI. But we realize that many admins and developers want the ability to create and manage their development and testing environments programmatically, and to automate their CI processes. Salesforce CLI enables you to do both.

To get started:

- Install Salesforce CLI.
- Create a Salesforce DX project with a manifest file.
- Authorize to a production org with available sandbox licenses.
- Create the sandbox definition file.

SEE ALSO:

- *Salesforce CLI Setup Guide*: Install Salesforce CLI
- *Salesforce DX Developer Guide*: Sandboxes
- *Tooling API*: SandboxInfo
- *Tooling API*: SandboxProcess

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:

- View Setup and Configuration

To create, refresh, activate, and delete a sandbox:

- Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types)

# Inactive Sandbox Expiration

To better utilize capacity and support growth, we perform a routine cleanup of inactive sandboxes. A sandbox is considered inactive and eligible for deletion if it hasn't been accessed for 180 days.

Note: This change doesn't terminate or change any of your sandbox subscriptions. If your sandbox is deleted due to inactivity, your subscription remains in effect, and you're still able to create sandboxes.

We send consolidated email notifications once a month for inactive sandboxes at approximately 90, 120, and 150 days to users in the production org with the Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types) permission. This email lists all inactive sandboxes per production org, and includes the sandbox org ID, sandbox name, sandbox username, and last login date.

After 180 days, a final email is sent to notify users that the sandbox has been deleted.

**Important:** After the sandbox has been deleted, it can't be recovered.

To continue using any existing sandbox, log in to the sandbox at least one time every 179 days. If your sandbox is deleted, the license is made available, and you can use this license to create sandboxes.

## How Do I Make Sure I Receive the Email Notifications?

- Make sure that you and any other teammates who want to be notified have the Manage Dev Sandboxes (Developer or Developer Pro only) or Manage Sandboxes (all sandbox types) permission in the production org.
- Make sure that Sandbox Expiration Email Opt Out is disabled in Setup for the production org.

## Suspend Inactive Sandbox Email Notifications

A Salesforce admin can decide to suspend email notifications for sandboxes created from a specific source org. After email notifications are suspended, you can view information for deleted sandboxes from the View Setup Audit Trail page.

**Warning:** This setting disables email notifications regarding inactive sandboxes for all users in the production org.

- Log in to the production org for the sandboxes.
- From Setup, in the Quick Find box, enter *Dev Hub*, and then select **Dev Hub**.
- For Sandbox Expiration Email Opt Out, click the **Enabled** toggle to suspend inactive sandbox email notifications.

# Inactive User Freezing

Users who haven't logged in to a Developer or Developer Pro sandbox within the first 60 days based on the time the user was created are frozen. This feature can't be disabled.

## Why Is Salesforce Running This Process?

Salesforce is running this process for two main reasons:

- Security—Most production users have login access to sandboxes but don't require it. Security is improved by limiting access to only active users.
- Performance—Inactive users impact the login experience for sandboxes. By limiting access to only active users, the login experience is faster in existing and new sandboxes.

## Who's Impacted by This Change?

Users who have login access to a sandbox, including admins, are subject to freezing if they don't log in within the first 60 days of the user being created in the sandbox. This change also applies to users created by the sandbox refresh process and users created by an admin in the sandbox after a sandbox was created, refreshed, or cloned. For existing sandboxes older than 60 days, users that logged in at least one time aren't frozen.

EDITIONS

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

Available in: **Professional**, **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To view a sandbox:
- View Setup and Configuration

To freeze or unfreeze user accounts:
- Freeze Users or Manage Users

## Are Any Users Exempt From the Freezing Process?

No. Any user who can log in to a sandbox is eligible for freezing. After a sandbox is created, refreshed, or cloned, users must log in within 60 days to retain access.

Users are exempted from freezing if they've logged in using any of these authentication methods:

- Basic authentication
- API key authentication
- OAuth 1.0
- OAuth 2.0

## Which Sandboxes Are Impacted?

This change applies to all new and existing Dev and Dev Pro sandboxes on all instances (Salesforce first-party and Hyperforce) regardless of their creation method.

Note: This process doesn't affect Partial Copy and Full sandboxes. We'll provide advanced notice when we enable this feature for these sandbox types.

## Can I Opt Out of This Process?

No. Users that need access to a sandbox must log in at least one time in the 60 days following the date the user was added to the sandbox.

## If I Log into the Sandbox and Don't Log In Again for 60 or More Days, Will I Be Frozen?

No. After you log in to a sandbox, you're exempt from being frozen when the process runs again in the future.

## Is There a Way to Unfreeze a User?

Yes. A user with access to the sandbox who has the appropriate user permissions can unfreeze other users. See Salesforce Help: Freeze or Unfreeze User Accounts for details.

## What Can I Do If All Admin Users Are Frozen? What If No One Can Access the Sandbox?

We strongly recommend that at least one admin user logs in to a sandbox after creation, refresh, or cloning. If all users with the appropriate user permissions to manage or unfreeze users are frozen, you have some options:

- If the existing sandbox is outdated or not being actively used, you can refresh it. Users must log in within 60 days to retain access.
- If you want to regain access to the existing sandbox, contact Salesforce Customer Support, who can unfreeze the desired user accounts.

## How Do I Know That the Process Has Run on a Sandbox?

The Setup Audit Trail in the sandbox provides information about the number of users that were frozen due to inactivity. Salesforce isn't sending any email notifications before or after the process runs.

SEE ALSO:

*Salesforce Help:* Freeze or Unfreeze User Accounts

# Deploy Your Changes

Migrate metadata changes between Salesforce orgs by using the deployment tools available in Setup.

To access these pages, use the `Quick Find` box.

- Deployment Settings: To use the change sets feature, a deployment connection is required. You can specify connection permissions for both outbound and inbound change sets on the Deployment Connections page.
- Deployment Status: Monitor the progress of deployments made through the Metadata API.
- Outbound Change Sets: Make changes in the org you are logged into, and upload those changes to another org.
- Inbound Change Sets: Accept, modify, or reject change sets uploaded from other orgs.

Choose Your Tools for Developing and Deploying Changes

Whether you're an admin using point-and-click tools or a developer writing code, you can pick the right tool, work in a sandbox, and deploy complete changes to a production org. You can customize and code changes for your org in a sandbox using one, or more, of the tools provided by Salesforce.

Connect Organizations for Deployment

Deploy connections for change sets and authorize a deployment connection.

Change Sets

Use change sets to send customizations from one Salesforce org to another. For example, you can create and test a new object in a sandbox org, then send it to your production org using a change set. Change sets can contain only modifications you can make through the Setup menu. For example, you can't use a change set to upload a list of contact records. Change sets contain information about the org. They don't contain data, such as records.

Metadata API Edit Access

To use Metadata API, a user must have these things.

Special Behavior in Deployments

Use the information here to determine what to include in your deployment and how the changes appear in the destination.

Monitor Deployments

You can monitor deployments that are in progress, check which deployments are waiting for execution, and view the results of completed deployments on the Deployment Status page.

SEE ALSO:

*Salesforce Help*: Deploy Data Cloud Changes from a Sandbox (Beta)

# Choose Your Tools for Developing and Deploying Changes

Whether you're an admin using point-and-click tools or a developer writing code, you can pick the right tool, work in a sandbox, and deploy complete changes to a production org. You can customize and code changes for your org in a sandbox using one, or more, of the tools provided by Salesforce.

Develop and Deploy Apex in the Developer Console

The Developer Console is an integrated development environment with a collection of tools you can use to create, debug, and test applications in your Salesforce org.

Develop and Deploy Using Salesforce Extensions for Visual Studio Code and Code Builder

Salesforce Extensions for VS Code and Code Builder are powered by Salesforce CLI and the Salesforce APIs. Both these products provide a robust set of tools for developing on the Salesforce platform.

Develop and Deploy Using Metadata API

Use Metadata API to retrieve, deploy, create, update or delete customization information, such as custom object definitions and page layouts, for your org. This API is intended for managing customizations and for building tools that can manage the metadata model, not the data itself.

Deploy Using Change Sets

You can deploy workflows, rules, Apex classes and triggers, and other customization from a sandbox org to your production org. You can create an outbound change set in the Salesforce user interface and add the components that you want to upload and deploy to the target org.

SEE ALSO:

Welcome, Point & Click Administrators

Welcome, Developers

## Develop and Deploy Apex in the Developer Console

The Developer Console is an integrated development environment with a collection of tools you can use to create, debug, and test applications in your Salesforce org.

SEE ALSO:

Open the Developer Console

Using the Developer Console

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in: **Performance**, **Unlimited**, **Developer**, **Enterprise**, and **Database.com** Editions

USER PERMISSIONS

To use the Apex Deployment Tool:

- Author Apex

## Develop and Deploy Using Salesforce Extensions for Visual Studio Code and Code Builder

Salesforce Extensions for VS Code and Code Builder are powered by Salesforce CLI and the Salesforce APIs. Both these products provide a robust set of tools for developing on the Salesforce platform.

The Salesforce Extension pack includes tools for developing on the Salesforce platform in the lightweight, extensible VS Code editor. To use Salesforce Extensions for VS Code, download and install the extensions along with the other required software. See Install Salesforce Extensions for details.

Salesforce Code Builder is a web-based integrated development environment that has all the power and flexibility of Visual Studio Code, Salesforce Extensions for VS Code, and Salesforce CLI in your web browser. Code Builder provides a modern developer experience for all developers, regardless of expertise level. See Code Builder for details.

SEE ALSO:

Choose Your Tools for Developing and Deploying Changes

## Develop and Deploy Using Metadata API

Use Metadata API to retrieve, deploy, create, update or delete customization information, such as custom object definitions and page layouts, for your org. This API is intended for managing customizations and for building tools that can manage the metadata model, not the data itself.

For information about Metadata API, see the Metadata API Developer Guide.

SEE ALSO:

Choose Your Tools for Developing and Deploying Changes

EDITIONS

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

USER PERMISSIONS

To use Metadata API:

- Modify Metadata Through Metadata API Functions

## Deploy Using Change Sets

You can deploy workflows, rules, Apex classes and triggers, and other customization from a sandbox org to your production org. You can create an outbound change set in the Salesforce user interface and add the components that you want to upload and deploy to the target org.

1. To access change sets, from Setup, enter `Outbound Change Sets` in the Quick Find box.
2. Select **Outbound Change Sets**.

SEE ALSO:

Change Sets

Choose Your Tools for Developing and Deploying Changes

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in **Enterprise**, **Performance**, **Professional**, **Unlimited**, and **Database.com** Editions

# Connect Organizations for Deployment

Deploy connections for change sets and authorize a deployment connection.

Deployment Connections for Change Sets
A deployment connection is required between two Salesforce orgs to send change sets from one org to another. You can't create deployment connections between arbitrary orgs. Instead, you create connections between all orgs affiliated with a production org. For example, if you have a production org and two sandboxes, a deployment connection is created between production and each sandbox. Also, a deployment connection is created between the two sandboxes.

Authorize a Deployment Connection
Authorize inbound changes so that another Salesforce org can send change sets to the org you are logged into.

View Available Deployment Connections
A deployment connection enables customizations to be copied from one Salesforce org to another. The deployment connections list shows which orgs are authorized to upload changes to this org, and which orgs allow this org to upload changes to them.

View Details of a Deployment Connection
A deployment connection enables customizations to be copied from one Salesforce org to another. The deployment connections list shows which orgs are authorized to upload changes to this org, and which orgs allow this org to upload changes to them.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in **Enterprise**, **Performance**, **Professional**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To edit deployment connections:

- Deploy Change Sets

  AND

  Modify Metadata Through Metadata API Functions

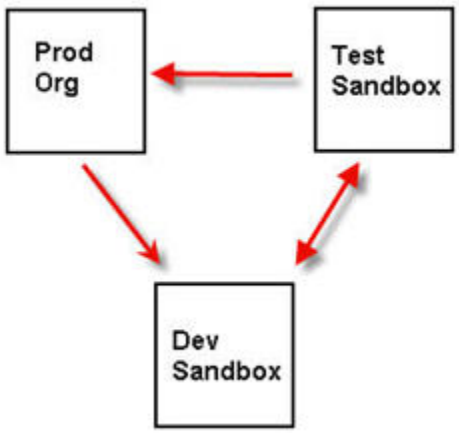
## Deployment Connections for Change Sets

A deployment connection is required between two Salesforce orgs to send change sets from one org to another. You can't create deployment connections between arbitrary orgs. Instead, you create connections between all orgs affiliated with a production org. For example, if you have a production org and two sandboxes, a deployment connection is created between production and each sandbox. Also, a deployment connection is created between the two sandboxes.

A deployment connection alone doesn't enable change sets to be sent between orgs. Each org must be authorized to send and receive change sets. This added level of security enforces code promotion paths and keeps orgs' setup metadata from being overwritten by mistake.

For example, the following figure illustrates one possible migration path for a production org (Prod) and two sandboxes (Dev and Test). In this example, the production org can only receive changes that have been fully tested, so only the Test sandbox is authorized to upload change sets to production. To synchronize development projects with the production org, the Prod org can send change sets to the Dev sandbox, but not to the Test sandbox. Finally, because the features in development need iterative testing, Dev and Test sandboxes should be able to send change sets back and forth.

**Change Set Authorization Enforces Code Path**




Note: This illustration describes one possible code migration path. Your department must create its own policies for orgs to send and receive change sets to one another.

SEE ALSO:

- Deploy a Change Set
- View Available Deployment Connections
- Authorize a Deployment Connection
- View Details of a Deployment Connection

## Authorize a Deployment Connection

Authorize inbound changes so that another Salesforce org can send change sets to the org you are logged into.

1. From Setup, enter *Deployment* in the Quick Find box, then select **Deployment Settings**, and then click **Continue**.
2. Click **Edit** next to the org you want to authorize.
3. Select **Allow Inbound Changes**.
4. Click **Save**.

SEE ALSO:

- View Available Deployment Connections
- View Details of a Deployment Connection
- Deployment Connections for Change Sets

## View Available Deployment Connections

A deployment connection enables customizations to be copied from one Salesforce org to another. The deployment connections list shows which orgs are authorized to upload changes to this org, and which orgs allow this org to upload changes to them.

1. To view available connections, from Setup, enter *Deployment* in the Quick Find box.
2. Select **Deployment Settings**.

| | |
|---|---|
| Action | Click **Edit** next to the org that you want to allow or disallow change sets from. |
| Name | A list of orgs that have deployment connections to the org you are currently logged into. Click the name of an org to view more information about the connection. |
| Description | A brief description of the connected orgs. |
| Type | The type of org you are connected to. Possible values are Production, Full Copy Sandbox, Configuration Only Sandbox, and Developer Sandbox. |
| Upload Authorization Direction | The arrows show the direction in which uploads can occur. A broken line means that no change sets are authorized in either direction. To authorize the connected org to send you inbound change sets, edit the deployment connection for this org. If you want to send outbound change sets to a connected org, the administrator for that org must edit the connection for that org. |

SEE ALSO:

Authorize a Deployment Connection
View Details of a Deployment Connection
Deployment Connections for Change Sets

## View Details of a Deployment Connection

A deployment connection enables customizations to be copied from one Salesforce org to another. The deployment connections list shows which orgs are authorized to upload changes to this org, and which orgs allow this org to upload changes to them.

1. From Setup, enter *Deployment* in the Quick Find box, then select **Deployment Settings**.
2. Click the name of the org you want to view.

| | |
|---|---|
| Name | The name of the selected org. This is not the org you are logged into. |
| Description | A brief description of the org. |
| Type | The type of org you are connected to. Possible values are Production, Full, Partial Copy, Developer Pro, and Developer. |
| Allow Inbound Changes | If selected, the named org can send change sets to the org you are currently logged into. This is a read-only field and can only be modified by selecting Allow Inbound Changes in the target org. |

| | |
|---|---|
| Accepts Outbound Changes | If selected, the named org allows change sets to be sent to it from the org you are currently logged into. |

SEE ALSO:

- Authorize a Deployment Connection
- View Available Deployment Connections
- Deployment Connections for Change Sets

# Change Sets

Use change sets to send customizations from one Salesforce org to another. For example, you can create and test a new object in a sandbox org, then send it to your production org using a change set. Change sets can contain only modifications you can make through the Setup menu. For example, you can't use a change set to upload a list of contact records. Change sets contain information about the org. They don't contain data, such as records.

When you want to send customizations from your current org to another org, create an *outbound change set*. After you send the change set, the receiving org sees it as an *inbound change set*.

Sending a change set between two orgs requires a deployment connection. Change sets can only be sent between orgs that are affiliated with a production org. For example, a production org and a sandbox, or two sandboxes created from the same org can send or receive change sets.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in **Enterprise**, **Performance**, **Professional**, **Unlimited**, and **Database.com** Editions

USER PERMISSIONS

To edit deployment connections:

- Deploy Change Sets

  AND

  Modify Metadata Through Metadata API Functions

To use outbound change sets:

- Create and Upload Change Sets

To use inbound change sets:

- Deploy Change Sets AND Modify Metadata Through Metadata API Functions

### Permission Sets and Profile Settings in Change Sets

Developers can use permission sets or profile settings to specify permissions and other access settings in a change set. When deciding whether to use permission sets, profile settings, or a combination of both, consider the similarities and differences.

### Components Available in Change Sets

The components available for a change set vary by experience and edition. Also, some components require corresponding features to be enabled in your Salesforce org.

### Restrictions for Approval Processes in Change Sets

Understand these restrictions before you include approval processes in change sets.

### Change Sets Implementation Tips

Review these tips before you implement your change sets.

### Change Sets Best Practices

Review these best practices about dependencies, validation, and access settings.

### Inbound Change Sets

An *inbound change set* is a change set that has been sent from another Salesforce org to the org you are logged in to. A change set must be *deployed* for the changes to take effect. You can deploy the contents of an inbound change set as a whole but not on a component-by-component basis.

### Outbound Change Sets

An *outbound change set* is a change set created in the Salesforce org in which you are logged in and that you want to send to another org. You typically use an outbound change set for customizations created and tested in a sandbox and that are then sent to a production org.

SEE ALSO:

- Deployment Connections for Change Sets
- Special Behavior in Deployments
- Release Management Video: From Sandbox to Production How To Series (Salesforce Classic)

## Permission Sets and Profile Settings in Change Sets

Developers can use permission sets or profile settings to specify permissions and other access settings in a change set. When deciding whether to use permission sets, profile settings, or a combination of both, consider the similarities and differences.

In API version 40.0 and later, when you deploy the output of a retrieval to another org, the metadata in the deployment replaces the target org metadata. In API version 39.0 and earlier, when you deploy your retrieved permission set output to another org, the deployment contents are merged with your current org data. For example:

- In API version 40.0 and later, if your permission set contains the Manage Roles user permission and you deploy a metadata file without this user permission, Manage Roles is disabled in the target org. Or, let's say you have a permission set with edit access to fields in an object. If the change set fails to include these fields, the permissions are still carried over to the target org and these changes are deployed.
- In API version 39.0 and earlier, if you deploy a metadata file without this user permission, Manage Roles remains enabled.
- Keep in mind that by default, change set deploys enable dependencies. For example, if your change set contains a custom profile with Lead Conversion enabled, Lead object permissions are enabled.

EDITIONS

Available in: both Salesforce Classic and Lightning Experience

Available in **Enterprise**, **Performance**, **Unlimited**, and **Database.com** Editions

Permission sets available in: **Contact Manager**, **Professional**, **Group**, **Enterprise**, **Performance**, **Unlimited**, **Developer**, and **Database.com** Editions

| Behavior | Permission Sets | Profile Settings |
|---|---|---|
| Included permissions and settings | • Standard object permissions<br>• Standard field permissions<br>• User permissions (such as "API Enabled")<br>Assigned apps and tab settings are *not* included in permission set components. | • Tab settings<br>• Page layout assignments<br>• Record type assignments<br>• Login IP ranges<br>• User permissions |
| Included permissions and settings that require supporting components | • Apex class access<br>• Visualforce page access | • Assigned apps<br>• Custom object permissions<br>• Custom field permissions<br>• Apex class access<br>• Visualforce page access |
| Added as a component? | Yes | No. Profiles are added in a separate setting. |

For Visualforce page access and Apex class access, always include supporting components in the change set.

Note: Login IP ranges included in profile settings overwrite the login IP ranges for any matching profiles in the target org.

SEE ALSO:

Inbound Change Sets
Outbound Change Sets
Change Sets Best Practices

## Components Available in Change Sets

The components available for a change set vary by experience and edition. Also, some components require corresponding features to be enabled in your Salesforce org.

- If you create or modify components unavailable in a change set, you can't send those components from one org to another in a change set. In this case, migrate the changes manually by repeating the steps you performed when you created or modified the component.
- By default, list views are visible to all users when you deploy a change set. You can deploy a change set with Restricted Visibility, or change the visibility in the destination org if necessary.
- Deployed custom tabs are hidden by default for all users. They're visible only if the change set also contains profiles that set the visibility property appropriately. Professional Edition orgs are an exception—deployed custom tabs in those orgs are always visible by default.
- Reports stored in the My Personal Custom Reports folder (private reports) don't appear in the list of reports that can be added to the change set. Reports stored in the Unfiled Public Reports folder appear in the list of reports that can be added to the change set, but they aren't deployed even if added to the change set. To deploy a private or unfiled report using a change set, first copy or move the report to a different report folder.

The following types of components can be added to a change set.

- Action
- Action Link Group Template
- Allow URL for Redirects
- Allowed Sites
- Analytics Application
- Analytics Dashboard
- Analytics Dataflow
- Analytics Dataset
- Analytics Dataset Metadata
- Analytics Lens
- Analytics Recipe
- Analytics Template
- Apex Class
- Apex Sharing Reason
- Apex Trigger
- App
- Approval Process

- Asset File
- Assignment Rule
- Assistant Recommendation Type
- Aura Component Bundle
- Auth. Provider
- Auto-Response Rule
- Bot
- Button or Link
- CORS Whitelist Origin
- Call Center
- Campaign Influence Model
- Channel Menu Deployment
- Chatter Extension
- Classic Letterhead
- Communication Channel Layout
- Compact Layout
- Content Security Policy Trusted Site
- Custom Data Type
- Custom Field
- Custom Help Menu Section
- Custom Index
- Custom Label
- Custom Metadata Type
- Custom Notification Type
- Custom Object
- Custom Permission
- Custom Report Type
- Custom Setting
- Dashboard
- Data Service
- Digital Experience
- Digital Experience Bundle
- Document
- Duplicate Rule
- EclairNG Map GeoJson
- Email Service
- Email Template (Classic and Lightning, including templates made in Email Template Builder)
- Embedded Service Deployment (limited to only standard Chat and not Messaging for In-app and Web)
- Enablement Measures
- Enablement Programs

- Entity Implements
- Escalation Rule
- Event Relay Configuration
- Event Subscription
- Experience Property Type Bundle (Beta)
- External Credential
- Extension
- External Data Source
- External Service Registration
- Field Mapping
- Field Set
- Flow Definition
- Flow Test
- Folder
- Gen AI Prompt Template
- Gen AI Prompt Template Activation
- Global Value Set
- Group
- Home Page Component
- Home Page Layout
- Inbound Network Connection
- Lightning Bolt
- Lightning Community Template
- Lightning Community Theme
- Lightning Experience Theme
- Lightning Message Channel
- Lightning Page
- Lightning Web Component Bundle
- List View
- Managed Content Type
- Matching Rule
- Microsoft® Outlook® Web App Domain
- Named Credential
- Network
- Outbound Network Connection
- Page Layout
- Path Assistant
- Permission Set
- Permission Set Group
- Platform Cache Partition

- Platform Event Channel
- Platform Event Channel Member
- Platform Event Subscriber Configuration
- Post Template
- Process Flow Migration
- Prompt
- Queue
- Recommendation Strategy
- Record Type
- RecordAction Deployment
- Remote Site
- Report
- Reporting Snapshot
- Restriction Rule
- Role
- S-Control
- Scoping Rule
- Security Custom Baseline
- Send Action
- Sharing Criteria Rule
- Sharing Owner Rule
- Site.com
- Static Resource
- Tab
- Transaction Security Policy
- User Provisioning Config
- Validation Rule
- Visualforce Component
- Visualforce Page
- Whitelisted URL for Redirects
- Workflow Email Alert
- Workflow Field Update
- Workflow Outbound Message
- Workflow Rule
- Workflow Task

- Zone

SEE ALSO:

- Validate a Change Set
- Create an Outbound Change Set
- Select Components for an Outbound Change Set
- Special Behavior in Deployments

## Restrictions for Approval Processes in Change Sets

Understand these restrictions before you include approval processes in change sets.

- If the approval page fields include any custom fields on standard objects, manually add those custom fields to outbound change sets. The `View/Add Dependencies` option for selecting change set components don't include these fields.
- If the approval process references any post templates that contain custom fields, resave those post templates in the originating organization before adding them to the change set. From Setup, enter *`Post Templates`* in the `Quick Find` box, then select **Post Templates**. For each post template, click **Edit** and then **Save**.
- Change sets don't include the order of active approval processes from the source org. Sometimes you must reorder the approval processes in the destination org after deployment.
- If you change the `Unique Name` of an approval process that was previously included in a change set and deployed in another organization, and you resend the approval process via a change set, a new approval process is created upon deployment in the other organization. The previously deployed approval process isn't modified.

## Change Sets Implementation Tips

Review these tips before you implement your change sets.

### Authorization required to upload changes

Before you can deploy a change set from one org to another, an administrator in the target org must authorize uploads across the deployment connection between the two orgs.

### Deployment Connections list displays all connections

The Deployment Connections list is automatically populated with your production org and all sandboxes. It is possible to deploy between any of these orgs, but no other orgs.

### Change set connections unavailable during maintenance

Authorizing deployment connections and uploading pages require information from the production org, and are unavailable when production is undergoing maintenance. During this time, you can construct outbound change sets but not upload them.

### Sandboxes must be available

If an org has no sandboxes provisioned, the user could see an Insufficient Privileges error on the Deployment Connections page.

### Deployment doesn't automatically restart

If an error occurs during change set validation or deployment, you must manually restart the process. Be sure that your org is not locked, undergoing maintenance, or otherwise inaccessible.

### Deployment is a one-way transaction

A change set is deployed in a single transaction. If the deployment is unable to complete for any reason, the entire transaction is rolled back. After a deployment completes successfully, all changes are committed to your org and the deployment can't be rolled back.

### Deployments maintain user references

If a component in a change set refers to a specific user, such as recipients of workflow email notifications or dashboard running users, then during deployment the system attempts to locate a matching user in the destination org by comparing usernames.

When you copy data to a sandbox, the fields containing usernames from the production org are altered to include the sandbox name. For example, in a sandbox named `test`, the username `user@acme.com` becomes `user@acme.com.test`. During a deployment using change sets, the `.test` in the username is ignored. This process transfers a user added to a component in one sandbox to other sandboxes or production orgs.

### Change sets with many dependent components

Opening a change set in Salesforce can take several minutes if it contains a component with many dependencies or if a component's parent has many dependencies. The delay is because Salesforce checks component dependencies before displaying the change set page. An example of a component with many dependencies is a custom field that belongs to a custom object with 2,500 dependent components.

### Action overrides in change sets

An action override is pulled into a change set if the override is associated with a custom object or app that is included in the change set.

Because you can't include standard objects in a change set, you can't use a change set to deploy an action override associated with a standard object.

SEE ALSO:

- Change Sets Best Practices
- Special Behavior in Deployments

## Change Sets Best Practices

Review these best practices about dependencies, validation, and access settings.

**Important:** Where possible, we changed noninclusive terms to align with our company value of Equality. We maintained certain terms to avoid any effect on customer implementations.

### Deploy all dependent components

Make sure each outbound change set contains all interdependent components that don't exist in the target org. If you try to deploy a component that refers to another component missing from the target org and from the change set, the deployment fails.

Change sets give you fine-grained control over what you deploy. For example, you can migrate custom fields individually. To deploy a custom object and all of its fields, you must add the custom object and every field to the change set; adding just the custom object to the change set won't cause deployment to fail, but results in an empty custom object.

## Add permissions and access settings to outbound change sets

Adding profiles or permission sets to outbound change sets allows administrators to migrate permissions for users so they can access the new functionality. There are significant differences between permission sets and profile settings in change sets.

## Clone a change set to add dependent components to an uploaded change set

After you upload a change set, you can't change its contents. If you need to add dependent components to a change set you already uploaded, clone the change set, add the dependent components, and then upload it again.

## Use distinct names for global publisher layouts and Outlook publisher layouts

When you add page layouts to an outbound change set, the type for global publisher layouts and Outlook publisher layouts isn't displayed. Make sure that you provide unique names for your global publisher layouts and Outlook publisher layouts so that you can differentiate them in an outbound change set.

## Plan deployments around maintenance schedule

Plan your deployment activities around the maintenance schedule for both your production and sandbox orgs. Some features require information from your production org when accessed from a sandbox. In addition, the originating org is locked while validating an outbound change set, and the target org is locked while deploying an inbound change set. (When change sets lock an org, you can still read and write data to the org, but you can't make any setup changes that would modify the metadata.)

## Validate change sets before deployment

You can perform a test deployment of an inbound change set to view the success or failure messages that would occur with an actual deployment. This is a good idea if you are planning a deployment on a schedule (for example during low-use hours) and want to determine if the deployment will succeed ahead of time. However, you don't need to perform a test deployment every time you deploy, as this process takes time to complete and the org is locked for the duration. (You can still read and write data to the org, but you can't make any setup changes that would modify the metadata.) To test deploy an inbound change set, click its name and then click **Validate**.

## View component details

You can view the XML representation of a component after you upload an outbound change set or before you deploy an inbound change set.

## Limit change sets to 10,000 files

Change sets are limited to 10,000 files. If your change set exceeds this limit, you can create separate change sets for email templates, dashboards, and reports. These components are often the most numerous and have fewer dependencies.

## Delete or rename components using the Web interface

You can't use change sets to delete or rename components. To delete components, use the Web interface on the target org. To rename a component, first delete the component on the target org and then upload the new component in a change set.

Editing the sharing settings for objects in a master-detail relationship, such as changing org-wide defaults from Controlled by Parent to Public Read/Write, is considered deleting a component.

### Consider possible delays in deployment time when a change set includes field type changes

If a change set includes changes to custom field types, the deployment time might be delayed by an extended period of time because custom field type changes might require changes in a large number of records. To avoid long delays in deployment, an alternative is to apply the field type change manually after the change set is deployed.

### Plan for tests to run in the target org

When a change set is deployed to a production org, all local Apex tests in that org are run by default if you're deploying any Apex classes or triggers. If the target org is a sandbox, however, tests aren't automatically run.

SEE ALSO:

- Change Sets Implementation Tips
- Special Behavior in Deployments

## Inbound Change Sets

An *inbound change set* is a change set that has been sent from another Salesforce org to the org you are logged in to. A change set must be *deployed* for the changes to take effect. You can deploy the contents of an inbound change set as a whole but not on a component-by-component basis.

Watch a Demo: Release Management: Deploying Changes Using Change Sets (Salesforce Classic)

USER PERMISSIONS

To deploy inbound change sets:

- Deploy Change Sets AND Modify Metadata Through Metadata API Functions

View Inbound Change Sets

The Inbound Change Sets page lists change sets awaiting deployment, as well as the history of deployed change sets.

Viewing Change Set Details

The Change Sets detail page lists information about a particular change set.

Validate a Change Set

You can validate a change set without deploying changes. By validating you can view the success or failure messages you receive with an actual deploy.

Deploy a Change Set

You can deploy the contents of an inbound change set as a whole but not on a component-by-component basis.

Monitor Deployments of Change Sets

Track the status of deployments that are in progress in the Deployment Status page.

When Change Sets Become Unavailable

A change set deployed from a source sandbox that you recently deleted or refreshed can temporarily appear available for deployment in the target org.

SEE ALSO:

- Change Sets

## View Inbound Change Sets

The Inbound Change Sets page lists change sets awaiting deployment, as well as the history of deployed change sets.

1. To view inbound change sets, from Setup, enter *Inbound Change Sets* in the Quick Find box.
2. Select **Inbound Change Sets**.

   Inbound change sets are permanently deleted six months after the change set is uploaded.

SEE ALSO:

- Viewing Change Set Details
- Validate a Change Set
- Deploy a Change Set

## Viewing Change Set Details

The Change Sets detail page lists information about a particular change set.

1. From Setup, enter *Inbound Change Sets* in the Quick Find box, then select **Inbound Change Sets**.
2. Click the name of a change set.

SEE ALSO:

- View Inbound Change Sets
- Validate a Change Set
- Deploy a Change Set

## Validate a Change Set

You can validate a change set without deploying changes. By validating you can view the success or failure messages you receive with an actual deploy.

We recommend starting a validation during off-peak usage time and limiting changes to your org while the validation is in progress. The validation process locks the resources that are being deployed. Changes you make to locked resources or items related to those resources while the validation is in progress can result in errors.

1. From Setup, enter *Inbound Change Sets* in the Quick Find box, then select **Inbound Change Sets**.
2. Click **Validate** next to the change set you want to validate.

   To review the change set before validating it, click the name of the change set to view its detail page. When ready, click **Validate**. If the change set has been deleted from its source org, the **Validate** link isn't available. If a deployment of the change set is in progress, the **Validate** link isn't available until after the deployment completes.

3. After the validation completes, click **View Results**.

If you change a field type from Master-Detail to Lookup or vice versa, the change isn't supported when using the **Validate** option to test a deployment. This change isn't supported for test deployments to avoid data loss or corruption. If a change that isn't supported for test deployments is included in the deployment package, the test deployment fails and issues an error.

If your deployment package changes a field type from Master-Detail to Lookup or vice versa, you can still validate the changes before you deploy to production. Perform a full deployment to another test sandbox. A full deployment includes a validation of the changes as part of the deployment process.

Change sets that have been successfully validated can qualify for a quick deployment. For more information, see Quick Deployments.

SEE ALSO:

View Inbound Change Sets
Viewing Change Set Details
Deploy a Change Set

## Deploy a Change Set

You can deploy the contents of an inbound change set as a whole but not on a component-by-component basis.

1. From Setup, enter *Inbound Change Sets* in the Quick Find box, then select **Inbound Change Sets**.
2. Click **Deploy** next to the change set you want to deploy.

   If you prefer to review the change set before deploying it, first click the name of the change set to view its detail page. When ready, click **Deploy**.

   If the change set has been deleted from its source org, the **Deploy** link isn't available. If a deployment of the change set is already in progress, the **Deploy** link isn't available until after the deployment completes.

Alternatively, you can perform a quick deployment to shorten your deployment time to production. Change sets that have been successfully validated can sometimes qualify for a quick deployment. For more information, see Quick Deployments.

To prevent a deployment from failing when components are referenced by Apex jobs, in the Deployment Settings page, click **Allow deployments of components when corresponding Apex jobs are pending or in progress**, and then click **Save**. This option lets you deploy components that are referenced by Apex jobs—including scheduled jobs, batch jobs, and future methods— that are pending or in progress. This option applies to change sets and deployments that are started through the Metadata API.

A change set is deployed in a single transaction. If the deployment is unable to complete for any reason, the entire transaction is rolled back. After a deployment completes successfully, all changes are committed to your org and the deployment can't be rolled back.

The Lightning Platform requires that at least 75% of your code is covered by unit tests before you can deploy it to a production org. Ideally, strive for 100% coverage. The code coverage restriction isn't enforced for sandbox or Developer Edition orgs.

- Enabling this option can sometimes cause Apex jobs to fail due to unsupported changes.
- This option doesn't affect editing and saving Apex code in the Salesforce user interface (in Setup or the Developer Console). These operations fail when there are active jobs associated with the Apex class.

SEE ALSO:

View Inbound Change Sets
Viewing Change Set Details
When Change Sets Become Unavailable
Special Behavior in Deployments
Monitor Deployments of Change Sets

## Monitor Deployments of Change Sets

Track the status of deployments that are in progress in the Deployment Status page.

1. From Setup, enter **Deployment Status** in the Quick Find box.
2. Select **Deployment Status**

The Deployment Status page also shows completed deployments.

Alternatively, you can check completed deployments on the Change Set Detail page. To access this page from Setup, enter *Inbound Change Sets* in the Quick Find box, select **Inbound Change Sets**, and then click the name of a deployed change set. Deployments for the change set are listed under the Deployment History section.

SEE ALSO:

- Deploy a Change Set
- Deployment Connections for Change Sets
- Monitor Deployments

### When Change Sets Become Unavailable

A change set deployed from a source sandbox that you recently deleted or refreshed can temporarily appear available for deployment in the target org.

A change set is unavailable for deployment after the following events.

- The change set expires.
- The change set is deleted from the source org.
- After the change set is deployed from a source sandbox to a target org, the source sandbox is deleted or refreshed.

A delay can occur between when the source sandbox is deleted or refreshed and when the target org shows the change set as unavailable. The length of the delay depends on how long it takes internal database cleanup processes to complete. When the source sandbox is deleted or refreshed, assume that the change set is no longer available for deployment in the target org.

## Outbound Change Sets

An *outbound change set* is a change set created in the Salesforce org in which you are logged in and that you want to send to another org. You typically use an outbound change set for customizations created and tested in a sandbox and that are then sent to a production org.

Watch a Demo: Release Management: Deploying Changes Using Change Sets (Salesforce Classic)

A change set can have up to 10,000 files with a total file size of 400 MB. Change set components are represented as metadata XML files. Make sure that your change set doesn't exceed approximately 5,000 components.

USER PERMISSIONS

To create, edit, or upload outbound change sets:

- Create and Upload Change Sets

Sending an outbound change set to another org doesn't guarantee that the changes are implemented in that org. The change set must be deployed by the target org before the changes can take effect. To help ensure a smooth deployment, review information about permission sets and profile settings in change sets.

After you upload a change set, its status becomes closed, and you can't make changes to its components. Also, the components in a closed change set don't get refreshed. To redeploy the same set of components, clone the change set. The cloned change set includes the latest changes to its components source. You can add and remove components in the cloned change set. Cloning change sets is helpful during the iterative phases of a project.

- Select Components for an Outbound Change Set

  You typically use an outbound change set for customizations created and tested in a sandbox and that are then sent to a production org.

View and Add Dependent Components to a Change Set

A dependency is a relationship where one or more components must exist for another component to exist. Add dependent components to a change set, unless the dependent components exist in every org where this change set is deployed.

Upload an Outbound Change Set

When you've assembled the components in a change set, you can upload it to another Salesforce org. After you upload a change set, you can't edit it or recall it.

Create an Outbound Change Set

An outbound change set is a change you send from the Salesforce org you are logged into to another org.

Clone an Outbound Change Set

You can create a copy of an existing change set by cloning it.

Delete an Outbound Change Set

You can locate outbound via the Quick Find box.

Outbound Change Set Validation Errors

If you receive an error about cross-version validation, the org used to create the outbound change set is running on a different version than the destination org.

Upload Change Sets During Staggered Salesforce Service Upgrades

During Salesforce service upgrades, production and sandbox environments don't always run the same version of the platform because the upgrades are staggered. Some components may have new functionality that prevents you from deploying that type of component. You can deploy such components after the production org runs the same version as sandbox.

SEE ALSO:

Permission Sets and Profile Settings in Change Sets

Inbound Change Sets

Change Sets

## Select Components for an Outbound Change Set

You typically use an outbound change set for customizations created and tested in a sandbox and that are then sent to a production org.

To select the components in an outbound change set:

1. From Setup, enter *Outbound Change Sets* in the Quick Find box, then select **Outbound Change Sets**.
2. In the Change Sets list, click the name of a change set, or create a new one.
3. Click **Add** to add components.
4. Choose the type of component and the components you want to add, and then click **Add to Change Set**.
5. Click **Add Profiles** to add profile settings to the change set. You can't add profile settings to a change set in Professional Edition.

6. Optionally, click **View/Add Dependencies** to add dependent components. Dependent components rely on the existence of other components. Unless you're certain that the dependent components exist in every org this change set will be deployed to, add dependent components to the change set.

SEE ALSO:

Create an Outbound Change Set
View and Add Dependent Components to a Change Set
Components Available in Change Sets

## View and Add Dependent Components to a Change Set

A dependency is a relationship where one or more components must exist for another component to exist. Add dependent components to a change set, unless the dependent components exist in every org where this change set is deployed.

1. From Setup, in the Quick Find box, enter `Outbound Change Sets`, and then select **Outbound Change Sets**.
2. In the Change Sets list, click the name of a change set.
3. Click **View/Add Dependencies**. If your change set contains more than 2,500 dependencies, you can see only the first 2,500 in the Component Dependencies page.
4. On the Component Dependencies page, select the dependent components that you want to deploy, and click **Add to Change Set**.

Outbound change sets include direct and indirect dependencies for successful deployment. Therefore, your change set can list unexpected components as dependencies or a high number of dependencies, even if it's for a single custom object. The object's dependencies are valid, and they're required to successfully deploy the change sets.

For example, Apex Class A has a dependency on Class B and Object B. Class B has a dependency on Class C and Object C. When Apex Class A is added to a change set, these components are listed as dependencies.

- Class A
- Class B
- Class C
- Object B
- Object C

While Class C doesn't have a direct dependency on Class A, Class C and Object C are required.

SEE ALSO:

Select Components for an Outbound Change Set
Upload an Outbound Change Set
Components Available in Change Sets

## Upload an Outbound Change Set

When you've assembled the components in a change set, you can upload it to another Salesforce org. After you upload a change set, you can't edit it or recall it.

1. From Setup, enter `Outbound Change Sets` in the `Quick Find` box, then select **Outbound Change Sets**.
2. Click **Upload** next to the change set you want to upload. To review the change set before uploading it, click the name of the change set to view its detail page. When ready, click **Upload**.

   If the change set doesn't contain any components, the Upload link isn't available.

3. Select the org you want to send the change set to.
4. Click **Upload**.

Outbound change sets expire six months after upload. Change sets are permanently deleted when they expire.

SEE ALSO:

Upload Change Sets During Staggered Salesforce Service Upgrades
Create an Outbound Change Set

## Create an Outbound Change Set

An outbound change set is a change you send from the Salesforce org you are logged into to another org.

To view outbound change sets, from Setup, enter *Outbound Change Sets* in the Quick Find box, then select **Outbound Change Sets**.

- To create a new change set, click **New**.
- To view the details of an existing change set, click its name.

SEE ALSO:

Clone an Outbound Change Set
Outbound Change Set Validation Errors

## Clone an Outbound Change Set

You can create a copy of an existing change set by cloning it.

1. From Setup, enter *Outbound Change Sets* in the Quick Find box, then select **Outbound Change Sets**.
2. Click **Clone** next to the change set you want to clone. To review the change set before cloning it, click the name of the change set to view its detail page. When ready, click **Clone**.

SEE ALSO:

Create an Outbound Change Set

## Delete an Outbound Change Set

You can locate outbound via the Quick Find box.

1. From Setup, enter *Outbound Change Sets* in the Quick Find box, then select **Outbound Change Sets**.
2. Click the name of the change set you want to delete.
3. Click **Delete**.

SEE ALSO:

Create an Outbound Change Set

### Outbound Change Set Validation Errors

If you receive an error about cross-version validation, the org used to create the outbound change set is running on a different version than the destination org.

This error typically occurs during upgrades, because orgs may be upgraded at different times due to Salesforce staggered releases. If you receive this error, you can only deploy those components that are compatible between versions.

SEE ALSO:

- Create an Outbound Change Set
- Upload an Outbound Change Set

### Upload Change Sets During Staggered Salesforce Service Upgrades

During Salesforce service upgrades, production and sandbox environments don't always run the same version of the platform because the upgrades are staggered. Some components may have new functionality that prevents you from deploying that type of component. You can deploy such components after the production org runs the same version as sandbox.

If you upload a change set with components that can't be deployed because of incompatible versions, the system detects which components can't be deployed. Salesforce gives you the option of uploading the remaining components.

SEE ALSO:

- Upload an Outbound Change Set

## Metadata API Edit Access

To use Metadata API, a user must have these things.

- One of these editions: Enterprise, Unlimited, or Developer
- Either the Modify Metadata Through Metadata API Functions OR Modify All Data permission
- Permission that enables use of the feature supported by the metadata that they want to modify
- Permission that enables their deployment tool, such as Salesforce CLI or change sets

With the Modify Metadata Through Metadata API Functions permission, a user can access and edit metadata via Metadata API as long as the user has any additional permission needed to access certain metadata types. This additional permission information is listed in the *Metadata API Developer Guide* for each metadata type. With the Modify All Data permission, a user can access and edit all data.

The Modify Metadata Through Metadata API Functions permission doesn't affect direct customization of metadata using Setup UI pages because those pages don't use Metadata API for updates.

Some metadata, such as Apex, executes in system context, so be careful how you delegate the Modify Metadata Through Metadata API Functions permission. The Modify Metadata Through Metadata API Functions permission allows deployment of Apex metadata, but it doesn't allow certain Apex development and debugging features that still require the Modify All Data permission.

The Modify Metadata Through Metadata API Functions permission is enabled automatically when either the Deploy Change Sets OR Author Apex permission is selected.

When the Manage Prompts user permission and the Modify Metadata Through Metadata API Functions permission are combined, users can manage In-App Guidance in Lightning Experience.

# Special Behavior in Deployments

Use the information here to determine what to include in your deployment and how the changes appear in the destination.

**Important:** Where possible, we changed noninclusive terms to align with our company value of Equality. We maintained certain terms to avoid any effect on customer implementations.

The behaviors listed in the Metadata API section apply if you're using Salesforce Extensions for Visual Studio Code.

## Change Set Components

- Approval Processes
  - If the approval page fields include any custom fields on standard objects, manually add those custom fields to outbound change sets. The `View/Add Dependencies` option for selecting change set components doesn't include these fields.
  - If the approval process references any post templates that contain custom fields, resave those post templates in the originating organization before adding them to the change set. From Setup, in the Quick Find box, enter *`Post Templates`*, then select **Post Templates**. For each post template, click **Edit** and then **Save**.
  - Change sets don't include the order of active approval processes from the source. Sometimes it's necessary to reorder the approval processes in the destination after deployment.
  - If you change the `Unique Name` of an approval process that previously was included in a change set and deployed in another organization, and you resend the approval process via a change set, a new approval process is created upon deployment in the other organization. The previously deployed approval process isn't modified.
- Apex Classes and Apex Triggers

  By default, changes to Apex code that has Apex jobs pending or in progress can't be deployed. To deploy these changes, take one of these steps.
  - Cancel Apex jobs before deploying changes to Apex code. Reschedule the jobs after the deployment.
  - Enable deployments with Apex jobs in the Salesforce user interface in the Deployment Settings page.
- Custom Fields
  - To change the data type of a custom field, you can use change sets. But the deployment is sometimes delayed as many records are updated. Consider changing the target through the user interface instead.
- Custom Objects
  - You can encounter an error if you're deploying a change set with a custom object that has a parent-child relationship without the master/detail field in the same change set. To resolve this error, include the master/detail custom field in the change set, even if you haven't changed the overall default.
  - Simultaneously inserting a custom object, updating the `sharingModel` field for an object, and adding a new owner-based sharing rule isn't supported. Instead, three separate deployments are required. First deploy the custom object, then deploy the updated `sharingModel` for the object, and then deploy the new owner-based sharing rule. You can update the `sharingModel` field and add a criteria-based or guest user sharing rule in one deployment.
- Flows
  - If you plan to deploy a flow with change sets, consider limitations in migration support. Make sure that your flows reference only fields and components that are available in change sets.
  - You can include only one version of a flow in a change set.
  - If the flow has no active version when you upload the outbound change set, the latest inactive version is used.

  - When you view the dependent components for the change set, the Component Dependencies page lists the dependencies for all versions of the flow. Add all interdependent components for the relevant flow version to the outbound change set.
  - An active flow in a change set is deployed to its destination as inactive. Activate the flow manually after deployment.
  - Deploying or redeploying a flow with change sets creates a version of the flow in the destination.
  - In production orgs, you can enable the setting to deploy a new active version of a process or flow via change sets or Metadata API. The setting doesn't appear in non-production orgs (such as scratch, sandbox, and developer orgs), because you can always deploy a new active version. See Deploy Processes and Flows as Active.

- Permissions

  See Permission Sets and Profile Settings in Change Sets on page 42.

- Page Layout

  A deployment containing a profile and record type, but not the assigned page layout for that record type, removes the existing layout assignment from the profile for that record type. Always include all page layouts for all required record types in the change set.

- Picklist Values

  Values for a picklist field in a target that aren't included in the change set are set to inactive.

  For example, if the target's picklist includes an active value of `1`, and the change set's picklist doesn't include `1` as a value, `1` changes from active to inactive in the target.

- Sharing

  Simultaneously updating the `sharingModel` field for an object and adding a new owner-based sharing rule isn't supported. You can add an owner-based sharing rule when the overall default is public, and then update the `sharingModel`, which results in a single sharing recalculation. You can deploy a criteria-based or guest user sharing rule and changes to the `sharingModel` field together using change set components.

## Metadata API

- Apex Classes and Apex TriggersBy default, changes to Apex code that has Apex jobs pending or in progress can't be deployed. To deploy these changes, take one of these steps.
  - Cancel Apex jobs before deploying changes to Apex code. Reschedule the jobs after the deployment.
  - Enable deployments with Apex jobs in the Salesforce user interface in the Deployment Settings page.
- Approval Processes
  - To use approval processes on Salesforce Knowledge articles with the Metadata API, the article type must be deployed. For article version (_kav) in approval processes, the supported action types are: Knowledge Action, Email Alert, Field Update, and Outbound Message.
  - If the approval process references any post templates that contain custom fields, resave those post templates in the originating organization before adding them to the change set. From Setup, in the Quick Find box, enter *`Post Templates`*, and then select **Post Templates**. For each post template, click **Edit** and then **Save**.
  - The metadata doesn't include the order of active approval processes. It can be necessary to reorder the approval processes in the destination after deployment.
  - If you change the `Unique Name` of an approval process that previously was included in a change set and deployed in another organization, and you resend the approval process via a change set, a new approval process is created upon deployment in the other organization. The previously deployed approval process isn't modified.

- Authentication Providers

  Beginning in November 2022, if a change set includes an authentication provider with a consumer secret defined, the consumer secret is changed to a placeholder value. You must insert the consumer secret manually during change set deployment.

- Custom Fields

  Starting in API version 30.0, when deploying a new custom field, the default values for the `editable` and `readable` fields in profile field permissions are `false`. To override the default values, include field permissions for the new field in your profiles.

- Custom Objects

  Simultaneously inserting a custom object, updating the `sharingModel` field for an object, and adding a new owner-based sharing rule isn't supported. Instead, three separate deployments are required. First deploy the custom object, then deploy the updated `sharingModel` for the object, and then deploy the new owner-based sharing rule. You can update the `sharingModel` field and add a criteria-based or guest user sharing rule in one deployment.

- Connected App
  - You can't set the `consumerKey` in Metadata API. It's included in a retrieve operation for informational purposes. If you try to move the connected app to another org, you must remove the `consumerKey` from the .zip file before the deployment to an org. A new key is generated in the destination.
  - Mobile settings of connected apps aren't supported in change sets and must be manually migrated.

- Groups

  Members of the public group aren't migrated when you deploy the group type.

- Master-Detail Relationships

  A Metadata API deployment that includes Master-Detail relationships deletes all detail records in the Recycle Bin in these cases.
  - For a deployment with a new Master-Detail field, soft delete (send to the Recycle Bin) all detail records before proceeding to deploy the Master-Detail field, or the deployment fails. During the deployment, detail records are permanently deleted from the Recycle Bin and can't be recovered.
  - For a deployment that converts a Lookup field relationship to a Master-Detail relationship, detail records must reference a master record or be soft-deleted (sent to the Recycle Bin) for the deployment to succeed. But a successful deployment permanently deletes any detail records in the Recycle Bin.

- Page Layout

  A deployment containing page layout assignments replaces all existing page layout assignments in the destination org with the assignments specified in the .zip file. If existing page layouts in the org aren't included in the .zip file, they disappear. Always include all page layouts for all required record types in the .zip file.

- Picklist Values

  Values for a picklist field in a target org that aren't included in the metadata are set to inactive.

  For example, if the target org has a picklist that includes an active value of `1`, and the metadata doesn't include a picklist value of `1`, `1` changes from active to inactive in the target org.

- Profiles

  If a package includes a profile with a name that doesn't exist in the target, a new profile is created with that name. In API version 59.0 and earlier, if the deployed profile doesn't specify any permissions or settings, the resulting profile contains all the permissions and settings in the standard Standard User profile. These permissions and settings can be more permissive than you intend. Instead, we recommend using API version 60.0 and later, because if the deployed profile doesn't specify any permissions or settings, the resulting profile contains all the permissions and settings in the standard Minimum Access - Salesforce profile.

Note: Custom fields on the ContentVersion object are available to all profile users. When you export profile metadata, all custom fields are exposed.

- Sharing
  - Using API version 29.0, you can't change the `sharingModel` of an object using Metadata API. Manually change the target through the user interface.
  - Starting with API version 30.0, you can change the `sharingModel` of an object for internal users using Metadata API and the user interface.
  - Simultaneously updating the `sharingModel` field for an object and adding a new owner-based sharing rule isn't supported in Metadata API. You can add an owner-based sharing rule when the overall default is public, and then update the `sharingModel`, which results in a single sharing recalculation. You can deploy a criteria-based or guest user sharing rule and changes to the `sharingModel` field together using the Metadata API.
- Workflow

  Test mode for flow triggers isn't supported in the Metadata API. If you want a flow trigger to run the latest flow version when an administrator causes the workflow rule to fire, enable test mode via the user interface after deployment.

Change Set Components
Consider how approval processes, Apex code, custom fields and objects, flows, and other custom components affect your deployment.

Metadata API
The behaviors listed here apply if you're using Salesforce Extensions for Visual Studio Code.

SEE ALSO:

Deploy a Change Set
Change Sets
Components Available in Change Sets
Working with the Zip File

# Change Set Components

Consider how approval processes, Apex code, custom fields and objects, flows, and other custom components affect your deployment.

## Approval Processes

- If the approval page fields include any custom fields on standard objects, manually add those custom fields to outbound change sets. The `View/Add Dependencies` option for selecting change set components doesn't include these fields.
- If the approval process references any post templates that contain custom fields, resave those post templates in the originating organization before adding them to the change set. From Setup, in the Quick Find box, enter *`Post Templates`*, then select **Post Templates**. For each post template, click **Edit** and then **Save**.
- Change sets don't include the order of active approval processes from the source. Sometimes it's necessary to reorder the approval processes in the destination after deployment.
- If you change the `Unique Name` of an approval process that previously was included in a change set and deployed in another organization, and you resend the approval process via a change set, a new approval process is created upon deployment in the other organization. The previously deployed approval process isn't modified.

## Apex Classes and Apex Triggers

By default, changes to Apex code that has Apex jobs pending or in progress can't be deployed. To deploy these changes, take one of these steps.

- Cancel Apex jobs before deploying changes to Apex code. Reschedule the jobs after the deployment.
- Enable deployments with Apex jobs in the Salesforce user interface in the Deployment Settings page.

## Custom Fields

- To change the data type of a custom field, you can use change sets. But the deployment is sometimes delayed as many records are updated. Consider changing the target through the user interface instead.

## Custom Objects

- You can encounter an error if you're deploying a change set with a custom object that has a parent-child relationship without the master/detail field in the same change set. To resolve this error, include the master/detail custom field in the change set, even if you haven't changed the overall default.
- Simultaneously inserting a custom object, updating the `sharingModel` field for an object, and adding a new owner-based sharing rule isn't supported. Instead, three separate deployments are required. First deploy the custom object, then deploy the updated `sharingModel` for the object, and then deploy the new owner-based sharing rule. You can update the `sharingModel` field and add a criteria-based or guest user sharing rule in one deployment.

## Flows

- If you plan to deploy a flow with change sets, consider limitations in migration support. Make sure that your flows reference only fields and components that are available in change sets.
- You can include only one version of a flow in a change set.
- If the flow has no active version when you upload the outbound change set, the latest inactive version is used.
- When you view the dependent components for the change set, the Component Dependencies page lists the dependencies for all versions of the flow. Add all interdependent components for the relevant flow version to the outbound change set.
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## Permissions

See Permission Sets and Profile Settings in Change Sets on page 42

## Page Layout

A deployment containing a profile and record type, but not the assigned page layout for that record type, removes the existing layout assignment from the profile for that record type. Always include all page layouts for all required record types in the change set.

## Picklist Values

Values for a picklist field in a target that aren't included in the change set are set to inactive.

For example, if the target's picklist includes an active value of `1`, and the change set's picklist doesn't include `1` as a value, `1` changes from active to inactive in the target.

### Sharing

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## Metadata API

The behaviors listed here apply if you're using Salesforce Extensions for Visual Studio Code.

### Apex Classes and Apex Triggers

By default, changes to Apex code that has Apex jobs pending or in progress can't be deployed. To deploy these changes, take one of these steps.

- Cancel Apex jobs before deploying changes to Apex code. Reschedule the jobs after the deployment.
- Enable deployments with Apex jobs in the Salesforce user interface in the Deployment Settings page.

### Approval Processes

- To use approval processes on Salesforce Knowledge articles with the Metadata API, the article type must be deployed. For article version (_kav) in approval processes, the supported action types are: Knowledge Action, Email Alert, Field Update, and Outbound Message.
- If the approval process references any post templates that contain custom fields, resave those post templates in the originating organization before adding them to the change set. From Setup, in the Quick Find box, enter *`Post Templates`*, and then select **Post Templates**. For each post template, click **Edit** and then **Save**.
- The metadata doesn't include the order of active approval processes. It can be necessary to reorder the approval processes in the destination after deployment.
- If you change the `Unique Name` of an approval process that previously was included in a change set and deployed in another organization, and you resend the approval process via a change set, a new approval process is created upon deployment in the other organization. The previously deployed approval process isn't modified.

### Authentication Providers

Beginning in November 2022, if a change set includes an authentication provider with a consumer secret defined, the consumer secret is changed to a placeholder value. You must insert the consumer secret manually during change set deployment.

### Custom Fields

Starting in API version 30.0, when deploying a new custom field, the default values for the `editable` and `readable` fields in profile field permissions are `false`. To override the default values, include field permissions for the new field in your profiles.

## Custom Objects

Simultaneously inserting a custom object, updating the `sharingModel` field for an object, and adding a new owner-based sharing rule isn't supported. Instead, three separate deployments are required. First deploy the custom object, then deploy the updated `sharingModel` for the object, and then deploy the new owner-based sharing rule. You can update the `sharingModel` field and add a criteria-based or guest user sharing rule in one deployment.

## Connected App

- You can't set the `consumerKey` in Metadata API. It's included in a retrieve operation for informational purposes. If you try to move the connected app to another org, you must remove the `consumerKey` from the .zip file before the deployment to an org. A new key is generated in the destination.
- Mobile settings of connected apps aren't supported in change sets and must be manually migrated.

## Groups

Members of the public group aren't migrated when you deploy the group type.

## Master-Detail Relationships

A Metadata API deployment that includes Master-Detail relationships deletes all detail records in the Recycle Bin in these cases.

- For a deployment with a new Master-Detail field, soft delete (send to the Recycle Bin) all detail records before proceeding to deploy the Master-Detail field, or the deployment fails. During the deployment, detail records are permanently deleted from the Recycle Bin and can't be recovered.
- For a deployment that converts a Lookup field relationship to a Master-Detail relationship, detail records must reference a master record or be soft-deleted (sent to the Recycle Bin) for the deployment to succeed. But a successful deployment permanently deletes any detail records in the Recycle Bin.

## Page Layout

A deployment containing page layout assignments replaces all existing page layout assignments in the destination org with the assignments specified in the .zip file. Existing page layouts in the org disappear if they're not included in the .zip file. Always include all page layouts for all required record types in the .zip file.

## Picklist Values

Values for a picklist field in a target org that aren't included in the metadata are set to inactive.

For example, if the target org has a picklist that includes an active value of `1`, and the metadata doesn't include a picklist value of `1`, `1` changes from active to inactive in the target org.

## Profiles

If a package includes a profile with a name that doesn't exist in the target, a new profile is created with that name. If the deployed profile doesn't specify any permissions or settings, the resulting profile consists of all the permissions and settings in the Standard Profile.

Custom fields on the ContentVersion object are available to all profile users. When you export profile metadata, all custom fields are exposed.

### Sharing

- Using API version 29.0, you can't change the `sharingModel` of an object using Metadata API. Manually change the target through the user interface.
- Starting with API version 30.0, you can change the `sharingModel` of an object for internal users using Metadata API and the user interface.
- Simultaneously updating the `sharingModel` field for an object and adding a new owner-based sharing rule isn't supported in Metadata API. You can add an owner-based sharing rule when the overall default is public, and then update the `sharingModel`, which would result in a single sharing recalculation. You can deploy a criteria-based or guest user sharing rule and changes to the `sharingModel` field together using the Metadata API.

### Workflow

Test mode for flow triggers isn't supported in the Metadata API. If you want a flow trigger to run the latest flow version when an administrator causes the workflow rule to fire, enable test mode via the user interface after deployment.

# Monitor Deployments

You can monitor deployments that are in progress, check which deployments are waiting for execution, and view the results of completed deployments on the Deployment Status page.

This page lists all deployments—change sets, Metadata API-based deployments, including deployments started from the Salesforce Extensions for Visual Studio Code and package installations.

The size and complexity of the metadata components affect the deployment time. To track the status of deployments that are in progress or have completed in the last 30 days, from Setup, enter *Deployment* in the `Quick Find` box, then select **Deployment Status**. Deployments are listed in different sections depending on their status.

EDITIONS

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

Available in: **Enterprise**, **Performance**, **Unlimited**, **Developer**, and **Database.com** Editions

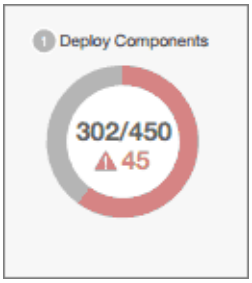
USER PERMISSIONS

To view metadata deployments:

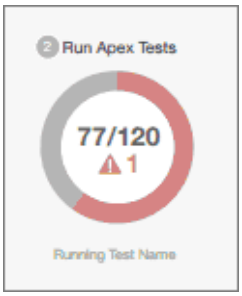
- Modify Metadata Through Metadata API Functions

## In-Progress and Queued Deployments

When running a deployment, the Deployment Status page shows you the real-time progress of your current deployment. This page contains charts that provide a visual representation of the overall deployment progress. The first chart shows how many components have already been deployed out of the total and includes the number of components with errors. For example, the following chart indicates that 302 components were processed successfully out of 450 and there were 45 components with errors.



After all components have been deployed without errors, Apex tests start executing, if required or enabled. A second chart shows how many Apex tests have run out of the total number of tests and the number of errors returned. In addition, the chart shows the name of the currently running test. For example, in the following chart, 77 tests have completed execution out of a total of 120, and 1 test failed.




The following information is displayed for the current deployment.

| Field | Description |
|---|---|
| `Name` | The change set name or a unique identifier that's used to track the Metadata API deployment. For a Metadata API deployment, this value is returned by the `deploy()` call. |
| `Type` | The deployment type: Change Set or API. |
| `Deployed By` | The name of the user performing the deployment. |
| `Start Time` | The date and time when the deployment actually started, not the time the request was queued. This value is the time the deployment `Status` is set to In Progress. |
| `Validated` | The date and time when the deployment validation finished. |

If the current deployment has errors, you can view these errors before the deployment finishes by clicking **View Errors**.

## Pending Deployments

You can initiate multiple deployments, but only one deployment can run at a time. The other deployments will remain in the queue waiting to be executed after the current deployment finishes. Queued deployments are listed under Pending Deployments in the order they will be executed.

## Deployment Validations

A deployment validation is a deployment that is used only to check the results of deploying components and is rolled back. A validation doesn't save any deployed components or change the Salesforce org in any way. You can determine whether a deployment is a validation only (Validate) or an actual deployment (Deploy) by inspecting the information for pending deployments or the `Status` column of deployments in the Failed and Succeeded sections.

If a validation completed successfully in the last 10 days, and all tests passed with sufficient code coverage, you can perform a quick deployment by deploying this validation to production without running tests.

## Cancel a Deployment

You can cancel a deployment while it's in progress or in the queue by clicking **Cancel** next to the deployment. The deployment then has the status `Cancel Requested` until the deployment is completely canceled. A canceled deployment is listed in the Failed section.

## Completed Deployments

Deployments that have finished are listed either in the Failed or Succeeded sections depending on their status.

Deployments that have finished but failed, and deployments that were canceled are listed in the Failed section. No changes were committed to the Salesforce org for these deployments because files were missing, components had errors, tests failed, or the deployment was canceled.

Deployments that have completed successfully or have partially succeeded are listed in the Succeeded section. Only deployments to a non-production org can partially succeed. These are deployments that have the `rollbackOnError` field set to `false` in the deployment options and have errors in a subset of components. In a partially succeeded deployment, the failed components aren't committed and the remaining components are committed to the org.

To get more details about a deployment, click **View Details** next to a deployment. Use the information on the Deployment Details page to view the errors and troubleshoot problems for a failed or partially succeeded deployment. The Deployment Details page includes the error messages that occurred during the deployment, errors for Apex tests with stack trace information, code coverage warnings, and information about slow tests. For a successful deployment, the Deployment Details page shows information about the deployment including how many components were deployed and how many Apex tests were run.

## Deployment Status

The `Status` column for completed deployments in the Failed and Succeeded sections lists the type and status of a deployment and has two parts:

- The prefix indicates whether the deployment is a validation only (Validate:) or an actual deployment (Deploy:).
- The second part of the status value contains the status of the deployment: Failed or Canceled for failed deployments, Succeeded for succeeded deployments, or Partially Succeeded for partially succeeded deployments.

## Quick Deployments

As part of a deployment, all Apex tests are run in production. If the production org contains many Apex tests, executing the tests can be time consuming and can delay your deployment. To reduce deployment time to production, you can perform a quick deployment by skipping the execution of tests. Quick deployments are available for change sets and Metadata API components when the following requirements are met.

- The components have been validated successfully for the target environment within the last 10 days.
- As part of the validation, Apex tests in the target org have passed.
- Code coverage requirements are met.
  - If all tests in the org or all local tests are run, overall code coverage is at least 75%, and Apex triggers have some coverage.
  - If specific tests are run with the **Run specified tests** test level, each class and trigger that was deployed is covered by at least 75% individually.

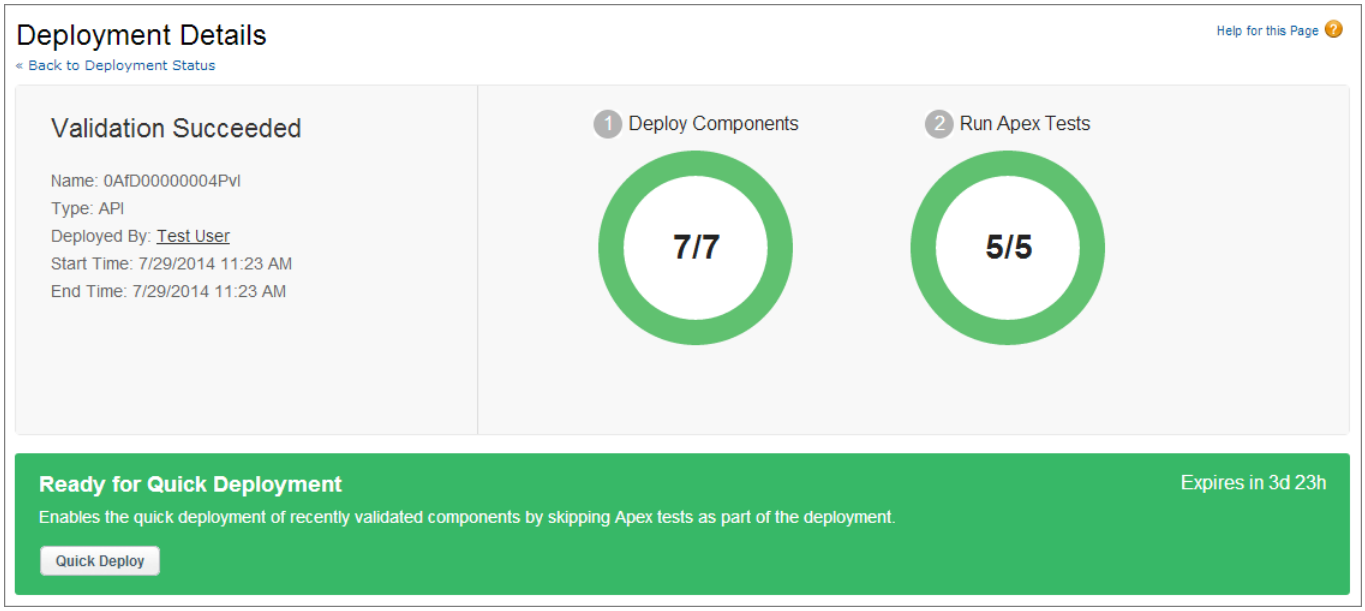
A validation is a deployment that's used only to check the results of deploying components and doesn't save any components in the org. A validation enables you to view the success or failure messages that you would receive with an actual deployment. You can validate change sets or metadata components through the API.

To learn how to validate a change set, see Validate a Change Set in the Salesforce Help.

## Performing a Quick Deployment through the User Interface or the API

To perform a quick deployment, first run a validation-only deployment with Apex test execution on the set of components that you need to deploy. If your validation succeeds and qualifies for a quick deployment, you can start a quick deployment.

You can quick-deploy validated change sets and Metadata API components in the user interface. In the Deployment Status page, deploy a recent validation by clicking **Quick Deploy** next to your validation or on the validation's detail page. This button appears only for qualifying validations.




To learn how to perform a quick deployment of change sets and run specific tests, check out this video: Release Management: Deploy Changes Efficiently with Quick Deployments & Test Levels (Salesforce Classic).

Alternatively, you can start a quick deployment through Metadata API for Metadata API components (excluding change sets). For Metadata API, call `deployRecentValidation()` and pass it the validation ID.

Quick Deploy is enabled for recent validations in which Apex tests have executed successfully and code coverage requirements have been met. Note the following.

- In production, quick deployments are supported for validations that meet the criteria. You can deploy recent validations of change sets and Metadata API components.
- In sandbox, Quick Deploy is supported only for validations that explicitly enable test execution (for example, by choosing a test option when validating inbound sets or through the `testLevel` parameter for the Migration Tool). By default, Apex tests aren't required nor ran in sandbox deployments.
- If you perform a deployment after a validation, whether through Quick Deploy, a package installation, or a regular deployment, all validations no longer qualify for quick deployment. Revalidate the set of components to quick-deploy.

## Performance Tuning Resources for Long-Running Tests

If required or enabled, Apex tests run as part of a deployment after all components are deployed. Apex tests that take a long time to execute delay the entire deployment. The top-five long-running tests, that is the top-five tests that ran longer than two minutes, are flagged for a completed deployment in the Deployment Details page. You can improve the performance of these tests to make them

more efficient and speed up future deployments. There can be many causes for slow performance. For example, accessing org data instead of using test data, or exercising SOQL queries or Apex code with poor performance. Here are some resources you can use to learn about performance best practices for Apex and SOQL.

- Isolation of Test Data from Organization Data in Unit Tests
- Working with Very Large SOQL Queries
- Webinar: Inside the Lightning Platform Query Optimizer
- Performance Tuning for Visualforce and Apex Webinar
- Architect Core Resources

SEE ALSO:

Inbound Change Sets

Outbound Change Sets

Metadata API Developer's Guide

# Secure Your Sandbox Data with Salesforce Data Mask

Data Mask is a powerful data security resource for Salesforce admins and developers. Instead of manually securing data and access for sandbox orgs, admins can use Data Mask to automatically mask the data in a sandbox. Data Mask enables admins and developers to mask sensitive data in sandboxes such as personally identifiable information (PII) or sales revenue.

Data Mask uses platform-native obfuscation technology to mask sensitive data in any full or partial sandboxes. When you mask sandbox data, you can't unmask it. This irreversible process ensures that the data isn't replicated in a readable or recognizable way into another environment. Your production data remains unaffected, so if you change your mind, you can always refresh the data from production and create a sandbox org.

Note: Many Salesforce products mask data in different ways to help keep your data secure and compliant. Data Mask uses platform-native obfuscation technology to mask sensitive data in full or partial sandboxes.Data Masking masks select sensitive data types (such as PII or PCI) included in AI prompts in production orgs.

You can configure four different levels of masking, depending on the sensitivity of the data.

- Replace private data in your sandboxes with random characters.
- Replace private data with similarly mapped words.
- Replace private data using pattern-based masking.
- Delete sensitive data.

Data Mask Considerations

When running Data Mask in your sandbox, it's important to understand how rules and records are handled.

Supported Data Mask Types

Data masking types are supported on these objects.

Understand How Different Masking Types Work

Data Mask uses different levels or types of masking to help keep your sensitive production data private in a sandbox. For example, you can replace sensitive data in your sandboxes with random characters or similarly mapped words, or eliminate it.

Data Mask Best Practices

We recommend that you mask fields that typically contain personally identifiable information (PII) or other sensitive data. These fields are a good place to start.

Install the Managed Package in a Production Org

Data Mask is a managed package that you install in your production org. You can run the masking process from any new sandbox created from the production org. To install and use Data Mask, you must enable certain features in your production org and specify user permissions. After you install the package, Salesforce automatically upgrades it with new features and bug fixes. Data Mask currently supports API version 50.0.

Create or Edit a Data Mask Configuration

You can configure the masking process in one of two ways. Configure it in production, then when a sandbox is created or refreshed, the configuration appears in the sandbox. Or, configure the masking process in an existing sandbox.

Create Custom Libraries

Create a custom library that's separate from the predefined Data Mask libraries. Custom libraries can contain any string value, such as long text, integers, and non-English characters.

Run a Data Mask Job

While the Data Mask package can be installed and configured in your production org, data masking jobs only run in sandbox orgs. That way, the data in the production org isn't accidentally masked. When the configuration is complete, you can mask your sandbox data. Run the mask each time you want to replace or delete the data in your sandbox.

# Data Mask Considerations

When running Data Mask in your sandbox, it's important to understand how rules and records are handled.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

## Data in Required Fields Is Missing

All required fields must have data for Data Mask to finish running. A field that changes from optional to required can have data missing. The Data Mask is considered complete in this scenario, but it skips incomplete records.

## Duplicate Rules Handling

Masking can affect certain records depending on duplicate rules set up for the object.

Data Mask skips:

- Records with existing data that conflicts with any duplicate matching rules.
- Records with a large number to be masked, where replacing the data with library values inadvertently creates duplicates.

To prevent skipping, configure a user profile that bypasses Duplicate Rules, and then run Data Mask from this profile.

## Bypassing Workflows, Triggers, and Validation Rules

Data Mask bypasses custom workflow rules, triggers, and validation rules created in the org running data masking, including automations from installed managed packages.

## Masking Person Accounts

Person Account objects can be masked through the Account or Contact object, but it is best to mask through the Account object. Data Mask cannot bypass automations on the Contact object when Person Accounts are enabled. Automations will then need to be manually disabled to avoid saving errors.

## Picklists Aren't a Supported Field Type

Picklist fields, such as State and Country, aren't masked when enabling a picklist in the sandbox. You see an error message during the mask.

# Supported Data Mask Types

Data masking types are supported on these objects.

Field and Masking Type

Example:

Note: Due to specific formatting requirements, not all masking types are supported for all fields.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

| Field Type | Random | Library | Pattern | Delete |
|---|---|---|---|---|
| Auto number | ✓ | ✗ | ✗ | ✗ |
| Address | ✓ | ✓ | ✓ | ✓ |
| Formula | ✗ | ✗ | ✗ | ✗ |
| Roll Up Summary | ✗ | ✗ | ✗ | ✗ |
| Lookup Relationship | ✗ | ✗ | ✗ | ✗ |
| External Lookup Relationship | ✗ | ✗ | ✗ | ✗ |
| Checkbox | ✓ | ✗ | ✗ | ✗ |
| Currency | ✓ | ✗ | ✗ | ✓ |
| Date | ✓ | ✗ | ✗ | ✓ |
| Date/Time | ✓ | ✗ | ✗ | ✓ |
| Email | ✓ | ✓ | ✓ | ✓ |
| Geolocation | ✓ | ✗ | ✗ | ✓ |
| Number | ✓ | ✗ | ✗ | ✓ |
| Percent | ✓ | ✗ | ✗ | ✓ |
| Phone | ✓ | ✗ | ✗ | ✓ |
| Picklist | ✗ | ✗ | ✗ | ✗ |
| Picklist (Multi-Select) | ✗ | ✗ | ✗ | ✗ |

| Field Type | Random | Library | Pattern | Delete |
|---|---|---|---|---|
| Text | ✓ | ✓ | ✓ | ✓ |
| Text Area | ✗ | ✗ | ✗ | ✓ |
| Text Area (Long) | ✗ | ✗ | ✗ | ✓ |
| Text Area (Rich) | ✗ | ✗ | ✗ | ✓ |
| Text (Encrypted) | ✗ | ✗ | ✗ | ✗ |
| Time | ✓ | ✗ | ✗ | ✓ |
| URL | ✓ | ✗ | ✗ | ✓ |

# Understand How Different Masking Types Work

Data Mask uses different levels or types of masking to help keep your sensitive production data private in a sandbox. For example, you can replace sensitive data in your sandboxes with random characters or similarly mapped words, or eliminate it.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

## Make Your Data Random

Use a random masking type for sensitive data where enforcing a specific value type isn't necessary. Replaces sensitive data with random characters that are readable, but not recognizable. For example, annual revenue, a birth date, or integers. You can still enforce the upper and lower bounds to the data, but you're less concerned with the specific value of any one record. For date fields, specify earliest and latest dates.

Business processes can function at this masking level, but it preserves confidentiality in the production environment. When you use random characters to mark fields for replacement, Data Mask transforms sensitive, readable sandbox data into random data. For example, if you replace the values of the First Name, Last Name, and Email Address fields in the Contact object with random characters, then a production entry such as `Susan Badger, me@example.net` transforms into `vqiz olmt,cxznd@sfdc.co` in a sandbox.

## Replace Your Data with Library Values

Use this masking type when you need similar data to test so developers can understand the results that they're getting. For example, replacing names with names and emails with emails helps developers recognize what they see as an appropriate value when testing a feature.

Field types remain the same at this masking level, so any business processes that rely on specific data types function normally. You can also recognize the data type, thus making informed decisions from the random data. Any sensitive information in the production environment remains confidential. When you use library values to mark fields for replacement, Data Mask transforms sensitive, readable sandbox data into random but recognizable data by using proprietary libraries embedded in the managed package. For example, if you replace the values of the First Name, Last Name, and Email Address fields in the Contact object with library values, then an entry such as `Nancy Simon, nan@example1.com` becomes `Gregory Fitzpatrick, liza.perez@example.com`.

## Replace Your Data with Data Generated by Using a Pattern

Replacing data with a pattern is similar to replacing with library values. You have greater control over the value because you can enforce a specific value for the field. For example, use a pattern to generate a formatted integer or string, such as an email, or enter a static value so that the field always represents the needed value.

The field type remains the same at this masking level, so any business processes that rely on specific data types function normally. Any sensitive information in the production environment remains confidential. You can use a pattern of your choice to mark fields for replacement. Data Mask transforms sensitive, readable sandbox data into random but recognizable data that uses a pattern. The pattern must follow the following rules:

- %c = replace with lower-case letter (a-z)
- %C = replace with upper-case letter (A-Z)
- %d = replace with digit (0-9)
- %% = replace with % sign
- %nd or %nc = replace with "n" number of digits or characters

For example, if you replace the Email Address field in a contact object with a pattern, then an entry such as `john@example.org` becomes `user-32342@example.com` using the pattern `user-%5d@example.com`.

## Delete Your Data

Use this masking type when you have sensitive data in fields that aren't necessary for testing, such as long-text areas, notes, or fields that take up a large amount of storage space. This transformation is the most efficient way to eliminate private data from the sandbox.

When you mark fields for deletion, Data Mask transforms sensitive, readable sandbox data into empty sets. This transformation is the most efficient way to eliminate private data from the sandbox.

Warning: When data is deleted from a sandbox, it can't be restored. Be selective in choosing privacy assurance methods, as deletion can remove the ability to test some business processes.

# Data Mask Best Practices

We recommend that you mask fields that typically contain personally identifiable information (PII) or other sensitive data. These fields are a good place to start.

These Data Mask guidelines help you to implement features efficiently and securely while optimizing performance.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

## Guidelines

Example:

- Create Data Mask configurations in production orgs. While Data Mask can't run in your production org, install and configure it there so that your policies are easily manageable. When a sandbox is refreshed, Data Mask configurations are automatically pushed to the sandbox.
- To improve performance and manageability during masking processes, divide large objects into smaller configurations. Dividing them up helps to prevent row locking and traversal issues on complex objects. For example, objects such as Contact, Account, Case, and Opportunity with more than 20 million records, more than 400 custom fields, or thousands of parent-child relationships.
- Avoid executing resource-intensive actions such as large data loads or complex queries in sandboxes concurrently with Data Mask processes to prevent performance degradation.

- By using data filters to target subsets of records or new data consumption, you avoid redundant masking operations. This use case is especially helpful if Data Mask runs into a the limitation issue and only a few records remain unmasked.
- To ensure that all records are masked as planned, use the Dev Console to query them after running Data Mask. Querying records post-implementation validates the effectiveness of the masking process and ensures all targeted records are appropriately masked.
- Only mask the fields or objects that you need. Selectively masking only the fields and objects that contain sensitive data necessary for testing minimizes unnecessary processing and potential performance impacts.
- Only copy over data from production that you must test. Transfer and mask data from production environments selectively, focusing only on datasets essential for testing scenarios to streamline data masking efforts.

**Table 3: Example Configuration: Replacing Sensitive Customer PII on the Account and Contact Objects**

| Object | Example Configuration |
|---|---|
| Account | • Account Name - Replace with Library: Company Name<br>• Account Phone - Replace with Random Value<br>• Billing Street - Replace with Library: Street<br>• Billing City - Replace with Library: City<br>• First Name, when `PersonAccounts` is enabled, replace with Library: First Name<br>• Last Name, when `PersonAccounts` is enabled, replace with Library: Last Name |
| Contact | • First Name - Replace with Library: First Name<br>• Last Name - Replace with Library: Last Name<br>• Home Phone - Replace with Random Value<br>• Birthdate - Replace with Random Value<br>• Email - Replace with Pattern: %5c@invalid.com |

# Install the Managed Package in a Production Org

Data Mask is a managed package that you install in your production org. You can run the masking process from any new sandbox created from the production org. To install and use Data Mask, you must enable certain features in your production org and specify user permissions. After you install the package, Salesforce automatically upgrades it with new features and bug fixes. Data Mask currently supports API version 50.0.

Ensure that your organization has the Data Mask User permission set licenses. To purchase more licenses, contact your Salesforce account executive.

1. Enable MyDomain and Lightning Experience features in your production org.
2. Follow the standard process for installing a managed package by using the Data Mask package link.
3. Assign these permissions and profiles to your users in your production org.

EDITIONS

Available in: Lightning Experience as a Managed Package

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

- Modify All Data user permission. If your user doesn't have this permission or write access for the objects being masked, the masking process still runs, but those objects aren't masked.
- API Enabled user permission
- System Administrator user profile

If you manually add a user to your sandbox org who runs a data mask, assign the same permissions and profiles for that user.

4. Assign the Data Mask User permission set license to your user.
5. Assign the Data Mask permission set included in the installed package to your user.

Install in Existing Sandboxes

To use Data Mask in sandboxes created before you installed the managed package in your production org, additional steps are required.

Add Configuration Security by Using Named Credentials

If your organization requires heightened security when making configuration changes, enhance your Data Mask configuration security. Use a named credential with an Auth provider and a connected app to provide a secure connection to the Salesforce Metadata API. This feature is available in Data Mask version 4.2 and later.

SEE ALSO:

View and Manage Your Permission Set Licenses

Install a Package

"View All" and "Modify All" Permissions Overview

Assign a Permission Set License to a User

Assign Permission Sets to a Single User

## Install in Existing Sandboxes

To use Data Mask in sandboxes created before you installed the managed package in your production org, additional steps are required.

1. Confirm that MyDomain and Lightning Experience are enabled in your sandbox org.
2. Change the URL in the Data Mask package link from login.salesforce.com to test.salesforce.com. For example if the URL is:
   `https://login.salesforce.com/?ec=302&startURL=%2Fpackaging%2FinstallPackage.apexp%3Fp0%3D04t3kxxxxxxxxxx`
   change it to
   `https://test.salesforce.com/?ec=302&startURL=%2Fpackaging%2FinstallPackage.apexp%3Fp0%3D04t3kxxxxxxxxxx`
3. Install the managed package using the edited installation link.
4. Follow Steps 3, 4 and 5 from Install the Managed Package in a Production Org on page 74.

SEE ALSO:

Install the Managed Package in a Production Org

# Add Configuration Security by Using Named Credentials

If your organization requires heightened security when making configuration changes, enhance your Data Mask configuration security. Use a named credential with an Auth provider and a connected app to provide a secure connection to the Salesforce Metadata API. This feature is available in Data Mask version 4.2 and later.

Note: Carefully note certain items during these procedures as required later: Your org's URL, the generated callback URL, the Consumer Key, and the Consumer Secret.

Data Mask leverages the Metadata API to save configuration data. If your organization enabled the session setting Lock sessions to the IP address from which they originated, you can get an Invalid Session ID error. One solution is to disable the session setting, or use a named credential.

1. To create a Connected App with Apps Manager from the Home Tab in Setup, search for Apps Manager under Apps, and then click **New Connected App**.
2. Complete the fields.

| Field | Description |
|---|---|
| **Connected App Name** | Data Mask API |
| **API Name** | Data_Mask_API |
| **Contact Email** | Your email, if you're the Administrator |
| **Enable OAuth Settings** | Select OAuth Settings. |
| **Callback URL** | `https://example.com` (to be updated later) |
| **Selected OAuth Scopes** | Full Access (full), Perform requests at any time (refresh_token, offline_access) |
| **Require Proof Key for Code Exchange (PKCE) Extension for Supported Authorization Flows** | Enable |
| **Require Secret for Web Server Flow** | Enable |
| **Require Secret for Refresh Token Flow** | Enable |

3. Save your changes.
4. To view and record the Consumer Key and Consumer Secret for later use, go to Manage Consumer Details.
5. To create an Auth Provider, from Setup, search for Auth Providers in the search box, and then click **New**.
6. Complete the fields.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

USER PERMISSIONS

To view named credentials:
- View Setup and Configuration

To create, edit, or delete named credentials:
- Manage Named Credentials or Customize Applications

| Field | Description |
|---|---|
| **Provider Type** | Salesforce |
| **Name** | Data Mask AP |
| **URL Suffix** | Data_Mask_AP |
| **Consumer Key** | Use the Consumer Key you noted from the Connected App. |
| **Consumer Secret** | Use the Consumer Secret you noted from the Connected App. |
| **Default Scopes** | Add full, refresh_token, offline_access. (Don't use commas to separate.) |

7. Save the Auth Provider, and copy the Callback URL to a clipboard.
8. Edit the Connected App to include the Callback URL provided from the Auth Provider that you saved.
9. To create a named credential, from Setup, select Named Credentials **Named Credentials**, click the dropdown arrow next to New, and then select **New Legacy**.
10. Complete the fields.

| Field | Description |
|---|---|
| **Label** | Data Mask NC |
| **Name** | Data_Mask_NC |
| **URL** | The specific login URL for your org (not test.salesforce.com or login.salesforce.com) |
| **Identity Type** | Named Principal |
| **Authentication Provider** | The name of the Auth Provider created earlier |
| **Start Authentication Flow on Save** | Enable |
| **Generate Authorization Header** | Enable |
| **Allow Merge Fields in HTTP Body** | Enable |

11. Save the named credential. It's possible that you must log back into the org and approve the `OAuth connection (Allow Access)`.
12. To update Data Mask Settings, from Setup, search for **Custom Settings**.
13. Locate Find and Manage Masking Configuration, and click **Manage**.
14. Under the Masking Configuration section, click **Edit**, and then enter the name of the named credential `Data_Mask_NC` in the Named Credential field (no spaces allowed).

**15.** Save the changes. Now, new or existing configurations are changed securely.

# Create or Edit a Data Mask Configuration

You can configure the masking process in one of two ways. Configure it in production, then when a sandbox is created or refreshed, the configuration appears in the sandbox. Or, configure the masking process in an existing sandbox.

A user must have view access on objects to configure masking and modify access on objects and related fields to mask. A particular field may not be available for masking because of its type. External objects, platform events, and BigObjects are not supported.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

Important: Choose the objects and the masking type to apply to its fields carefully. The choices that you make determine the speed of data mask completion.

1. To create a masking configuration and select which data to mask, go to the App Launcher and click the **Data Mask** app. You can edit or clone a previously saved masking configuration or start from scratch.
2. On the Configurations tab, select **New Configuration** to open the new configuration page.
3. Give this configuration a name to help you remember its purpose (no special characters or spaces are allowed), and describe its use or test. Then click **Continue**.
4. Click **Add Object and then Add Object from the Objects section.**
5. From the list of all standard and custom objects in your production org, select any objects that contain sensitive data that you want to mask and click **Confirm.**
6. From the Objects panel, select an object to modify. For each selected object, configure the masking rules for each of its fields.

   Important: Checkbox, lookup, and picklist field types aren't supported.

7. Adjust the Org-Level and Scheduled Run settings. Your configuration runs manually by default.
8. To add a masking type, select the object and then choose a data categorization type and data filter for each field. Refer to Supported Data Mask Types for reference.
9. To edit an existing mask, click **Edit** from your masking configuration.
10. To delete an existing mask, click **Delete** from your masking configuration.
11. To manually run an existing mask, click **Run** and select **Confirm**. Or, set the mask to run on a schedule so that it starts automatically.

Org-Level Settings

Configure Org-Level settings for data masking outside of Objects and Fields.

Set Filter Criteria

Target specific data records for masking to meet business requirements and security goals.

Set Masking Rules

Set masking rules for standard and custom objects in your sandbox org.

Schedule Data Mask Jobs

Decide whether to set a scheduled start with a repeating frequency or continue to run your mask with the manual default.

SEE ALSO:

Supported Data Mask Types

## Org-Level Settings

Configure Org-Level settings for data masking outside of Objects and Fields.

Select from these three settings.

- To delete all case comments in the sandbox, select **Delete Case Comments**.
- To delete all data in the EmailMessage object in the sandbox org, select **Delete All Email**. EmailMessages that reference records that don't exist aren't deleted. Such orphaned emails must be purged in the production org before creating your sandbox. For more information about purging emails, see Error 'Insufficient Access' and considerations for delete of EmailMessage records.
- To delete all chatter data in the sandbox, select **Delete All Chatter**.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

## Set Filter Criteria

Target specific data records for masking to meet business requirements and security goals.

Use this feature to:

- Reduce the time taken to mask a sandbox by anonymizing only selected data.
- Gain finer grained control over your Data Masking configuration.
- Incrementally mask newly added data, saving time.

You can define data filters when setting mask rules on the **Configure Masking** page.

1. To only mask data that meets the filtering criteria, switch **Data Filter** to **Active**.
2. Select one of more fields to apply the filter to.
3. Select the operator to apply to the field. You can choose from:

| Field Type | Available Operators |
|---|---|
| All fields | equals, does not equal |
| TEXT (STRING), ID | is null, is not null, in, not in |
| DATETIME | is before, is within, is after |
| PICKLIST VALUE (STRING) | is null, is not null |
| INTEGER, DOUBLE | is less than, is less than or equal to, is greater than, is greater than or equal to, is null, is not null |

4. If necessary, add more conditions, and repeat steps 3 and 4.
5. To create a filter criteria, enter the condition logic. For example, 1 AND (2 OR 3).
6. Optionally, to preview your query in SOQL, click **Query Preview**.

Example: **Examples of Filtering Criteria to Narrow Which Records Are Masked**

- Set filter criteria on the **CreatedDate** field to mask only newly created records by setting the **is after** operator to a recent date.
- Set filter criteria on the **SystemModstamp** field to mask data that was excluded from previous masking by setting the **is before** operator to the date of last masking

Before you finalize your record filtering choices, we recommend that you take these steps:

- To make sure that it returns a result, test the query on Postman or dev console.
- Create one or more records to test incremental masking with a date filter on the object.
- When a sandbox is created, **CreatedDate** represents the record creation date and **SystemModstamp** represents the last modified date in the production org.

## Set Masking Rules

Set masking rules for standard and custom objects in your sandbox org.

A user must have view access on objects to configure masking and modify access on objects and related fields to mask. A particular field may not be available for masking because of its type (currently picklist, formula, checkbox, and roll-up summary are not supported). External objects, platform events, and BigObjects are not supported.

Important: Choose the objects and the masking type to apply to its fields carefully. The choices that you make determine the speed of data mask completion.

The following masking types are available:

| Masking Type | Description | Supported Field Types |
|---|---|---|
| Replace with Random Characters | Replaces sensitive data with random characters that are readable, but not recognizable. For date fields, specify earliest and latest dates. | Text, Short Text, Phone, Date, Email, Fax, Date/Time, Address, URL |
| Replace with Random Value | Replaces sensitive data with random numbers that are readable, but not recognizable. Specify minimum and maximum values for the field. | Percent, Number, Currency, Geolocation |
| Replace all with True/False | Replaces all boolean checkbox data with either True or False | Checkbox |
| Replace From Library | Replaces sensitive data with random but recognizable data using one of these selected libraries:<br>• First Name<br>• Last Name<br>• Company Name<br>• Email<br>• Street<br>• City<br>• Country<br>• Country (Abbr.)<br>• State<br>• Postal Code<br>• Phone Number<br>• Social Security Number | Text, Short Text, Email, Address |

| Masking Type | Description | Supported Field Types |
|---|---|---|
| Replace using Pattern | Replaces sensitive data with data generated using a defined pattern. The pattern must follow the following rules:<br>• %c = replace with lower-case letter (a-z)<br>• %C = replace with upper-case letter (A-Z)<br>• %d = replace with digit (0-9)<br>• %% = replace with % sign<br>• %nd or %nc = replace with "n" number of digits or characters | Text, Email, Address |
| Delete | Deletes sensitive data entirely, leaving an empty data set | Text, Phone, Date, Long Text Area, Email, Fax, Date/Time, Geolocation, Address, Percent, Number, Currency, URL<br>This rule is not available for required fields, and is the only masking option available for long text fields which can hold a large amount of data, and masking them would slow down the masking process considerably. |

## Schedule Data Mask Jobs

Decide whether to set a scheduled start with a repeating frequency or continue to run your mask with the manual default.

Note: These changes don't persist with a sandbox refresh.

- To schedule your mask to run and start for a daily, weekly, monthly, or yearly repetition, select **Run on a Schedule** from Policy Type in your configuration.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

# Create Custom Libraries

Create a custom library that's separate from the predefined Data Mask libraries. Custom libraries can contain any string value, such as long text, integers, and non-English characters.

Create, edit, or clone string value custom libraries from the Data Mask Custom Value Libraries tab.

1. From the Data Mask Custom Value Libraries tab, select **New**.
2. Enter a name for this library to help you remember its purpose.
3. Enter a description of the values for the library. Currently, String is the only available content type.
4. To make your library accessible in your configurations, select **Active**. Libraries marked Active are accessed in a Data Mask configuration by using the **Replace with Custom Library** action on a field. Leave it unchecked if you're not yet ready to use it, as inactive libraries are unavailable in your configurations.

EDITIONS

Available in: **Developer**, **Enterprise**, **Professional**, **Unlimited** Editions

5. Click **Save Changes**. You see your new library page. To create multiple libraries, click **Save and New**.
6. Enter your string in the Add Entry field. Add any string value, such as long text, integers, and non-English characters. You can copy and paste longer text strings into the field. The Preview box shows what you added to the Library. If you decide that you don't want to add an item, remove it by clicking the **X** next to it.
7. When you finish adding all the strings, click **Save Changes**. Your library is ready for use when creating a configuration.
8. At this point, you have several options. You can click the **Edit** button to make any updates to the library that you created. You can click the **Delete** button to remove your library completely, which can't be undone. Or you can click the **Clone** button to make a copy of your created library. Before saving, you must change the library name.
9. To view your custom library in the list of libraries, click the **Data Mask Custom Value Libraries** tab. From this list view, you can edit the library name or description, change from active to inactive, sort, or delete the library.
10. To test your new library, validate it by including it in a Data Mask configuration.

    These predefined Data Mask library values are included: First Name, Last Name, Company Name, Email, Street, City, Country, Country (Abbr.), State, Postal Code, Phone Number, and Social Security Number.

# Run a Data Mask Job

While the Data Mask package can be installed and configured in your production org, data masking jobs only run in sandbox orgs. That way, the data in the production org isn't accidentally masked. When the configuration is complete, you can mask your sandbox data. Run the mask each time you want to replace or delete the data in your sandbox.

1. From your Configuration tab in your sandbox, click **Run** and then **Confirm**.
2. To monitor the progress of a masking run, click the **Jobs** tab and then the mask name link. From the Affected Records section, you can choose to wrap or clip the text for any of the fields from the dropdown. To open another masking run or investigate any errors, close the tab.

| Summary Items | Description |
|---|---|
| Scheduled or Summary | The date and time that the mask runs. For a manual mask run, it shows a summary, otherwise it shows the scheduled run time. The summary explains the job status. For example, in the queue, it identifies whether a job is completed. It shows the configuration from where the job was created. If a configuration is deleted after a job runs, it displays [Deleted]. |
| [Object Name] | The status of the field now being masked. For example, for a contact, you see loading records, acting on records, and clean up. |
| Jobs Completed | A green check mark indicates that the masking job is complete. |
| Affected Records (X) | If any of the records are affected during the mask run, you see the object name, number matched, deleted, masked, or errors. By closing the dialog, you can view another mask job or investigate any errors from the Failures section. |
| Errors | It shows the object name, its record id, the type of error, and any associated message. |

3. To verify that records are masked properly, manually spot-check your sandbox data. Then you can grant more users access to the sandbox.

The masking process runs asynchronously and can take several hours for large sandboxes. Data Mask bypasses these automations during execution, including objects from Managed Packages.

- Triggers
- Workflow Rules
- Validation Rules
- Flows
- Feed Tracking

Data Mask also deletes all Field History Tracking associated with the Object when the masking job is complete.

If the Email Deliverability setting is set to All Emails, you receive an email when the job completes.

Stop Data Mask Job
You can stop a current running data mask job.

SEE ALSO:

Guidelines for Configuring Deliverability Settings for Emails Sent from Salesforce
Data Mask Considerations
Stop Data Mask Job

## Stop Data Mask Job

You can stop a current running data mask job.

From the Jobs tab, click **Cancel Job** for the masking configuration currently running. To resume or rerun a stopped job, use the filtering feature to start the job from a scheduled date rather than rerunning the entire job.

Important: Stop doesn't undo any masking that has already been completed.

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