Salesforce CLI Setup Guide

Version 64.0, Summer '25

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CONTENTS

CHAPTER 1 Quick Start

Salesforce CLI is a command-line interface that simplifies development and build automation when working with your Salesforce org. Use it to create and manage orgs, synchronize source to and from orgs, create and install packages, and more.

Salesforce CLI is based on oclif, an open-source framework for building command-line interfaces in Node.js. You run it on your local machine or continuous integration (CI) system. It supports the installation of custom plugins.

Important: Are you still using `sfdx` (v7)? See Move from sfdx (v7) to sf (v2) if so.

Run through these steps to install Salesforce CLI on your computer and optionally configure it for your specific environment.

1. Read the system requirements to ensure Salesforce CLI works correctly on your computer.
2. Install Salesforce CLI on your computer.

   Follow the documentation for your computer's operating system, such as Windows or macOS. You can also install using `npm` or from a TAR file.
3. Verify that you've installed Salesforce CLI correctly by opening a terminal (macOS, Linux) or command prompt (Windows) and running this command to see the list of all available CLI commands.

   ```
   sf commands
   ```

   Run this command to see the version of Salesforce CLI you just installed.

   ```
   sf --version
   ```
4. Optionally configure Salesforce CLI so it works exactly how you want.

   Here are a few examples of what you can do:
   - Enable autocomplete.
   - Set CLI configuration and environment variables.
   - Customize the colors in the `--help` output.
   - Use Salesforce CLI from behind a company firewall.
5. Read the weekly release notes to learn about new features, changes, and bug fixes.

Congratulations! You can now start using Salesforce CLI for all kinds of fun tasks. For example, read this documentation to learn how to use a sample GitHub repo to get started with Salesforce DX.

SEE ALSO:

Salesforce DX Developer Guide

Salesforce CLI Command Reference

oclif: The Open CLI Framework

CHAPTER 2 System Requirements

Review these system requirements to get the most out of Salesforce CLI and developer tools.

Operating Systems

Salesforce CLI supports the following operating systems.

- Windows—Windows 8.1 and Windows Server 2012 (64-bit and 32-bit) or later
- Mac—macOS 10.11 or later (Intel and M1)
- Linux—Ubuntu 20.04

Code Editor or IDE

You can use any code editor. We recommend that you use Visual Studio Code (VS Code) and install the Salesforce Extensions for VS Code that are designed for development on Salesforce Platform.

Note: If you're using Salesforce Extensions for VS Code, keep in mind that some CLI commands are unavailable in the command palette. If you can't find a command in VS Code, run it in the integrated terminal.

API Enabled System Permission in Your Org

If you're using Salesforce CLI to interact with an org, the CLI requires the "API Enabled" system permission, which provides programmatic access to your org's information. If you're unable to run CLI commands against your org, ask your Salesforce admin to enable this permission.

Version Control System

You can use any version control system (VCS). We recommend that you use GitHub to take advantage of the samples in our GitHub repository.

Node.js

We bundle Node.js in each operating system-specific Salesforce CLI installer. We include the version of Node.js with Active LTS status and update it in tandem with the Node.js release schedule.

If you prefer to install Salesforce CLI using `npm`, we recommend you also use the Active LTS version of Node.js.

Salesforce CLI Version Support

Salesforce supports only the most current version of Salesforce CLI. See the Salesforce CLI Release Notes for the latest version information.

SEE ALSO:

Salesforce Extensions for Visual Studio Code

CHAPTER 3 Move from `sfdx` (v7) to `sf` (v2)

If you're currently using `sfdx` (v7), we highly recommend that you move to `sf` (v2). The move is easy: you first uninstall `sfdx` (v7) and then install `sf` (v2). After you move, the CLI commands that you've been running in a terminal or continuous integration (CI) scripts continue to work as before.

Important: You must uninstall `sfdx` (v7) before you install `sf` (v2), or you can get an installation error. This requirement applies to all installation methods: npm, OS-specific installers, and TAR files.

To determine if `sfdx` (v7) is installed on your computer, run this command in a terminal (macOS and Linux) or command prompt (Windows):

```
sfdx version
sfdx-cli/7.208.10 darwin-arm64 node-v18.16.0
```

If the displayed version starts with `sfdx-cli/7`, as shown, then `sfdx` (v7) is installed on your computer.

The sections in this document show how to move to `sf` (v2) for the three installation methods: `npm`, macOS or Windows installers, and TAR files. Pick the section that applies to your environment. If you're not sure how you originally installed `sfdx` (v7), read this document. Are you using Docker? Read our updated Docker instructions to see how to get the `sf` (v2) image.

npm

1. Open a terminal (macOS and Linux) or command prompt (Windows).
2. Uninstall `sfdx` (v7) with this command:

```
npm uninstall sfdx-cli --global
```

3. Verify that you've uninstalled `sfdx` (v7) by running the `sfdx version` command. If you uninstalled correctly, the command fails. For example, on macOS:

```
sfdx version
-bash: sfdx: command not found
```

4. Install `sf` (v2) with this command.

```
npm install @salesforce/cli --global
```

If you already had `sf` (v1) installed, this command updates it to v2.

5. Verify that you've installed `sf` (v2) by running this command:

   ```
   sf version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

   The version starts with `@salesforce/cli/2`. The following command also returns the same version because `sfdx` is now aliased to `sf`:

   ```
   sfdx version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

Congrats, you successfully moved to `sf` (v2)!

macOS or Windows Installers

Installers refer to the Windows `.exe` or macOS `.pkg` installer files.

1. Uninstall your current `sfdx` (v7) installation.

   As of October 2021, if you originally installed Salesforce CLI using the OS-specific installers, you actually got *two* interoperable CLIs (AKA executables) bundled together: `sfdx` (v7) and `sf` (v1). When you uninstall Salesforce CLI, it removes both executables.

2. Open a terminal (macOS) or command prompt (Windows).
3. Verify that you've uninstalled `sfdx` (v7) by running the `sfdx version` command. If you uninstalled correctly, the command fails. For example, on macOS:

   ```
   sfdx version
   -bash: sfdx: command not found
   ```

4. Install `sf` (v2) using these installer links:
   - macOS
     - Apple Silicon
     - Intel CPU
   - Windows
     - x64
     - x86

5. Verify that you've installed `sf` (v2) by running this command:

   ```
   sf version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

   The version starts with `@salesforce/cli/2`. The following command also returns the same version because `sfdx` is now aliased to `sf`:

   ```
   sfdx version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

Congrats, you successfully moved to `sf` (v2)!

TAR Files

Salesforce CLI distributes TAR files that you can install on all supported operating systems.

1. Uninstall your current `sfdx` (v7) installation.

   As of October 2021, if you originally installed Salesforce CLI using TAR files, you actually got *two* interoperable CLIs (AKA executables) bundled together: `sfdx` (v7) and `sf` (v1). When you uninstall Salesforce CLI, it removes both executables.

2. Open a terminal (macOS and Linux) or command prompt (Windows).
3. Verify that you've uninstalled `sfdx` (v7) by running the `sfdx version` command. If you uninstalled correctly, the command fails. For example, on macOS:

   ```
   sfdx version
   -bash: sfdx: command not found
   ```

4. Install `sf` (v2).
5. Verify that you've installed `sf` (v2) by running this command:

   ```
   sf version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

   The version starts with `@salesforce/cli/2`. The following command also returns the same version because `sfdx` is now aliased to `sf`:

   ```
   sfdx version
   @salesforce/cli/2.0.1 darwin-arm64 node-v18.16.0
   ```

Congrats, you successfully moved to `sf` (v2)!

Update Your Continuous Integration (CI) Scripts

If you use Salesforce CLI in a continuous integration (CI) system, update your scripts to use `sf` (v2).

npm

If your CI scripts install Salesforce CLI with `npm`, update them to use this command to install `sf` (v2):

```
npm install @salesforce/cli --global
```

Warning: When updating your CI script, if it includes this command to install `sfdx` (v7), you must remove it:

```
npm install sfdx-cli --global
```

If you keep both commands, the command to install `sf` (v2) returns an error and your script fails.

TAR Files

If your CI scripts install Salesforce CLI with TAR files, update the download URLs to point to the `sf` (v2) downloads. For example, change this URL:

```
https://developer.salesforce.com/media/salesforce-cli/sfdx/channels/stable/sfdx-linux-x64.tar.gz
```

To this URL:

```
https://developer.salesforce.com/media/salesforce-cli/sf/channels/stable/sf-linux-x64.tar.gz
```

See Install the CLI with a TAR File for the URLs for all operating systems.

After You Move to `sf` (v2)

Here are a few things to be aware of after you make the move.

- Regenerate your autocomplete cache by running this command in a terminal (macOS and Linux) or command prompt (Windows).

  ```
  sf autocomplete --refresh-cache
  ```

  Open a new terminal for the change to take effect. Autocomplete doesn't work correctly until you regenerate its cache.

- Every CLI command execution, VS Code invocation of Salesforce CLI, and CI script works the same in both `sfdx` (v7) and `sf` (v2). If you find a difference, open a GitHub issue.
- You can run commands with either `sfdx` or `sf`; they're now the same. For example, these two command executions are the same.

  ```
  sf project deploy start
  sfdx project deploy start
  ```

  Everything that was in `sfdx` is available in `sf`, with the same names and flags.

Why Should You Move?

`sf` (v2) became generally available on July 12, 2023. At that time we stopped publishing updates to `sfdx` (v7) and `sf` (v1). To get new Salesforce CLI features and bug fixes, you must use `sf` (v2).

Also, `sfdx` (v7) is twice the size of `sf` (v2) because it also includes `sf` (v1). To reduce the size of your Salesforce CLI installation and downloads, we recommend you move to `sf` (v2).

Troubleshoot npm Error: code EEXIST

If you try to install `sf` (v2) using `npm` without first uninstalling `sfdx` (v7), you get this error:

```
npm ERR! code EEXIST
npm ERR! path /Users/user/.nvm/versions/node/v18.16.0/bin/sfdx
npm ERR! EEXIST: file already exists
npm ERR! File exists: /Users/user/.nvm/versions/node/v18.16.0/bin/sfdx
npm ERR! Remove the existing file and try again, or run npm
npm ERR! with --force to overwrite files recklessly.
```

```
npm ERR! A complete log of this run can be found in:
npm ERR!
/Users/user/.npm/_logs/2023-06-28T22_16_15_181Z-debug-0.log
```

You can also encounter this error in your continuous integration (CI) system when `sf` (v2) becomes generally available. If your CI scripts already use `npm` to install both `sfdx` (v7) and `sf` (v1), and you don't update the script, the error can start happening automatically as of July 12, 2023.

To fix the problem, remove this command from your script.

```
npm install sfdx-cli --global
```

Keep this command, which installs `sf` (v2).

```
npm install @salesforce/cli --global
```

Return to sfdx (v7)

We don't anticipate any reason for you to move back to `sfdx` (v7). However, if you must return, follow these steps.

1. Uninstall `sf` (v2).
2. Install `sfdx` (v7).

   For `npm`, run this command in a terminal (macOS and Linux) or command prompt (Windows).

   ```
   npm install sfdx-cli --global
   ```

   For the installers and TAR files, refer to the `sfdx` (v7) JSON files that list the recent download URLs for each supported operating system. See this topic on page 15 for details.

   Note: As of July 12, 2023, the web page to download Salesforce CLI has been updated to download only `sf` (v2).

3. In your CI scripts, go back to the `npm` commands or TAR download URLs you were using before.

SEE ALSO:

Salesforce CLI Command Reference: Migrate sfdx-Style Commands to the New sf-Style

CHAPTER 4 Install Salesforce CLI

In this chapter ...

Install Salesforce CLI on your computer using operating system-specific artifacts, such as `.pkg` on macOS, TAR files, or with `npm`.

Choose one method to install on your computer. For example, don't install on macOs with both a `.pkg` file and `npm`. Installing it both ways can lead to confusing path issues on your computer, sometimes without an explicit error and thus difficult to diagnose.

Install the CLI on macOS

Install Salesforce CLI on macOS with a `.pkg` file.

1. Open the Salesforce CLI download page in your browser and click **macOS**.
2. Click the download button that applies to the processor of your macOS computer.

   For example, if your processor is Apple Silicon, click **Download for macOS (Apple Silicon)**, which downloads an `sf-arm64.pkg` file.

3. Run the `.pkg` file, such as double-clicking it from Finder, and answer all the prompts.
4. After the installation completes, restart your Terminal windows or IDEs to make sure Salesforce CLI is available.

SEE ALSO:

Verify Your Installation and Get Version Information

Disable Automatic Update of the CLI

Install the CLI on Windows

Install Salesforce CLI on Windows with an `.exe` file.

1. Open the Salesforce CLI download page in your browser and click **Windows**.
2. Click the download button that applies to the architecture of your Windows computer.

   For example, if you're using a 64-bit version of the Windows operating system that's built for the x86-64 architecture, click **Download for Windows x64**, which downloads an `sf-x64.exe` file.

3. Run the `.exe` file, such as double-clicking it from Windows Explorer, and answer all the prompts.

   (Optional) In the Choose Components window, if you want Microsoft Defender Antivirus to exclude the installed Salesforce CLI files when it scans, select **Add %LOCALAPPDATA%\sf to Windows Defender exclusions**.

   This option is initially deselected because we want the default Windows installation to be more secure. But excluding the CLI files from the antivirus scans improves the performance of Salesforce CLI, which is why we give you the option. Use with care.

4. After the installation completes, close and then restart all your your command prompts, PowerShell windows, and IDEs to make sure Salesforce CLI is available.

Warning: Salesforce CLI works best within the native Windows command prompt (`cmd.exe`) and the Microsoft Windows PowerShell. We don't recommend using Salesforce CLI with a Linux terminal emulator, such as Windows 10 Subsystem for Linux, cygwin, or MinGW, because support for bugs is limited.

SEE ALSO:

Verify Your Installation and Get Version Information

Disable Automatic Update of the CLI

Install the CLI with a TAR File

Salesforce CLI distributes TAR files that you can install on all supported operating systems.

Use this table to find the unversioned URLs for the TAR file (`.tar.gz` or `.tar.xz`) for your operating system. When we release a new version of Salesforce CLI every week, we also update these URLs so they point to the most up-to-date version. Unversioned URLs are especially useful for CI use cases. The table also includes manifest URLs that show the versioned URL for each file.

Operating System	Tar Files	Manifest
Linux	• sf-linux-x64.tar.gz • sf-linux-x64.tar.xz • sf-linux-arm.tar.gz • sf-linux-arm.tar.xz • sf-linux-arm64.tar.gz • sf-linux-arm64.tar.xz	• sf-linux-x64-buildmanifest • sf-linux-arm-buildmanifest • sf-linux-arm64-buildmanifest
macOS	• sf-darwin-x64.tar.gz (Intel CPU) • sf-darwin-x64.tar.xz (Intel CPU) • sf-darwin-arm64.tar.gz (Apple Silicon) • sf-darwin-arm64.tar.xz (Apple Silicon)	• sf-darwin-x64-buildmanifest (Intel CPU) • sf-darwin-arm64-buildmanifest (Apple Silicon)
Windows	• sf-win32-x64.tar.gz • sf-win32-x64.tar.xz • sf-win32-x86.tar.gz • sf-win32-x86.tar.xz	• sf-win32-x64-buildmanifest • sf-win32-x86-buildmanifest

Important: We highly recommended that you use the installers or `npm` to install Salesforce CLI on Windows. If, however, you decide to use the Windows TAR files, you must first install a separate program, such as 7Zip, to extract the file contents.

In these examples it's assumed that you're installing Salesforce CLI on Linux and in the `cli/sf` subdirectory of your home directory.

1. Open a terminal window.
2. Download one of these TAR files. Alternatively, run `wget` in the terminal to get a TAR file.

   ```
   wget
   https://developer.salesforce.com/media/salesforce-cli/sf/channels/stable/sf-linux-x64.tar.xz
   ```

3. Create the directory where you want to install Salesforce CLI.

   ```
   mkdir -p ~/cli/sf
   ```

4. Unpack the contents for your TAR file:

   ```
   tar xJf sf-linux-x64.tar.xz -C ~/cli/sf --strip-components 1
   ```

   `-C` unpacks the contents in the `~/cli/sf` directory, while `--strip-components 1` removes the root path component.

   Note: This example shows just one possible set of flags for the `tar` command on Linux. For other options on your operating system, refer to the `tar` documentation.

5. Update your PATH environment variable to include the Salesforce CLI `bin` directory. For example, to set it for your current terminal session:

   ```
   export PATH=~/cli/sf/bin:$PATH
   ```

   To update your PATH permanently, add the appropriate entry to your shell's configuration file. For example, if you use the Bash shell, add this line to your `~/.bashrc` or `~/.bash_profile` file:

   ```
   PATH=~/cli/sf/bin:$PATH
   ```

SEE ALSO:

Verify Your Installation and Get Version Information

Disable Automatic Update of the CLI

Install the CLI with `npm`

If you've installed `Node.js` on your computer, you can use `npm` to install Salesforce CLI. This method lets you install Salesforce CLI from the command line and can be especially useful for continuous integration (CI) use cases.

This installation method is a good option if you don't have administrator permissions on your workstation, or if group policy blocks CLI installation and updates. Installing Salesforce CLI with `npm` doesn't require root permissions.

1. Open a terminal (macOS and Linux) or command prompt (Windows).
2. Ensure that the long-term support (Active LTS) version of Node.js is installed on your computer. To install the LTS version, go to https://nodejs.org/en/download/. To check your version number, run this command from the terminal or command prompt:

   ```
   node --version
   ```

3. To install Salesforce CLI, run this command.

   ```
   npm install @salesforce/cli --global
   ```

   If you receive a permission error when installing Salesforce CLI using `npm` macOS or Linux, we don't recommend using `sudo`. See Fixing npm permissions.

SEE ALSO:

Verify Your Installation and Get Version Information

npm Documentation

Install Older Versions of Salesforce CLI

We recommend that you always use the latest version or release candidate of Salesforce CLI. However, we also understand that sometimes you want an older version of the CLI.

Installers

If you installed Salesforce CLI with the installers, update to an older version with the `--version` flag. For example, to update to version `2.0.1`, run this command in a terminal (macOS and Linux) or command prompt (Windows).

```
sf update --version 2.0.1
```

Use the `--available` flag to list all available older versions to which you can update. The output also shows whether you already have a local copy or if it must be downloaded.

```
sf update --available
```

Use `--interactive` to choose a version interactively.

Use this command to return to the current version.

```
sf update stable
```

npm

To update to an older version of Salesforce CLI using `npm`, specify the version using `@<version>` after the `@salesforce/cli` package name. For example, to update to version `2.0.1`, run this command in a terminal (macOS and Linux) or command prompt (Windows).

```
npm install @salesforce/cli@2.0.1 --global
```

To return to the current version, run this command.

```
npm install @salesforce/cli --global
```

See the Salesforce CLI npmjs.com page for a list of all versions. We keep all old versions of the @salesforce/cli and sfdx-cli (deprecated) npm packages.

TAR Files

We publish JSON files that list the download URLs for recent versions of the installers and TAR files for each supported operating system. We continually add new versions to the lists; versions remain on the list for 20 weeks. We keep the TAR and installer files themselves for 40 weeks minimum.

`sf` **(v2)**

Operating System	File Type	TAR Compression Type	Link to JSON File
Linux ARM	TAR	`gz`	sf-linux-arm-tar-gz.json
Linux ARM	TAR	`xz`	sf-linux-arm-tar-xz.json
Linux 64	TAR	`gz`	sf-linux-x64-tar-gz.json
Linux 64	TAR	`xz`	sf-linux-x64-tar-xz.json
Windows 64	TAR	`gz`	sf-win32-x64-tar-gz.json
Windows 64	TAR	`xz`	sf-win32-x64-tar-xz.json
Windows x86	TAR	`gz`	sf-win32-x86-tar-gz.json

Operating System	File Type	TAR Compression Type	Link to JSON File
Windows x86	TAR	`xz`	sf-win32-x86-tar-xz.json
macOS (Intel CPU)	TAR	`gz`	sf-darwin-x64-tar-gz.json
macOS (Intel CPU)	TAR	`xz`	sf-darwin-x64-tar-xz.json
macOS (Apple Silicon)	TAR	`gz`	sf-darwin-arm64-tar-gz.json
macOS (Apple Silicon)	TAR	`xz`	sf-darwin-arm64-tar-xz.json
Windows 64	Installer		sf-x64-exe.json
Windows x86	Installer		sf-x86-exe.json
macOS (Intel CPU)	Installer		sf-x64-pkg.json
macOS (Apple Silicon)	Installer		sf-arm64-pkg.json

`sfdx` (v7) - Deprecated

Note: As of July 12, 2023, we no longer update `sfdx` (v7). We keep these old versions for historical reasons only.

Operating System	File Type	TAR Compression Type	Link to JSON File
Linux ARM	TAR	`gz`	sfdx-linux-arm-tar-gz.json
Linux ARM	TAR	`xz`	sfdx-linux-arm-tar-xz.json
Linux 64	TAR	`gz`	sfdx-linux-x64-tar-gz.json
Linux 64	TAR	`xz`	sfdx-linux-x64-tar-xz.json
Windows 64	TAR	`gz`	sfdx-win32-x64-tar-gz.json
Windows 64	TAR	`xz`	sfdx-win32-x64-tar-xz.json
Windows x86	TAR	`gz`	sfdx-win32-x86-tar-gz.json
Windows x86	TAR	`xz`	sfdx-win32-x86-tar-xz.json
macOS (Intel CPU)	TAR	`gz`	sfdx-darwin-x64-tar-gz.json
macOS (Intel CPU)	TAR	`xz`	sfdx-darwin-x64-tar-xz.json
macOS (Apple Silicon)	TAR	`gz`	sfdx-darwin-arm64-tar-gz.json
macOS (Apple Silicon)	TAR	`xz`	sfdx-darwin-arm64-tar-xz.json

Operating System	File Type	TAR Compression Type	Link to JSON File
Windows 64	Installer		sfdx-x64-exe.json
Windows x86	Installer		sfdx-x86-exe.json
macOS (Intel CPU)	Installer		sfdx-x64-pkg.json
macOS (Apple Silicon)	Installer		sfdx-arm64-pkg.json

Verify Your Installation and Get Version Information

To ensure that you've installed Salesforce CLI correctly, run these commands to view the version and list of available commands.

1. Open a terminal (macOS and Linux) or a command prompt (Windows) on your computer.
2. To view the Salesforce CLI version that you've installed, run this command.

   ```
   sf --version
   ```

   The command returns details about the version, such as this example output.

   ```
   @salesforce/cli/2.83.6 darwin-arm64 node-v22.14.0
   ```

3. To view the installed core plugins and their versions, run this command.

   ```
   sf plugins --core
   ```

   The command displays information such as this sample output.

   ```
   @oclif/plugin-autocomplete 3.2.26 (core)
   @oclif/plugin-commands 4.1.22 (core)
   @oclif/plugin-help 6.2.27 (core)
   @oclif/plugin-not-found 3.2.48 (core)
   @oclif/plugin-plugins 5.4.36 (core)
   @oclif/plugin-search 1.2.23 (core)
   @oclif/plugin-update 4.6.36 (core)
   @oclif/plugin-version 2.2.27 (core)
   @oclif/plugin-warn-if-update-available 3.1.38 (core)
   @oclif/plugin-which 3.2.34 (core)
   apex 3.6.11 (core)
   api 1.3.3 (core)
   auth 3.6.108 (core)
   data 4.0.24 (core)
   deploy-retrieve 3.21.2 (core)
   info 3.4.51 (core)
   limits 3.3.51 (core)
   marketplace 1.3.7 (core)
   org 5.5.7 (core)
   packaging 2.12.3 (core)
   schema 3.3.58 (core)
   settings 2.4.22 (core)
   sobject 1.4.53 (core)
   ```

```
telemetry 3.6.37 (core)
templates 56.3.43 (core)
trust 3.7.78 (core)
user 3.6.16 (core)

Uninstalled JIT Plugins:
code-analyzer 5.0.0
community 3.3.18
custom-metadata 3.3.48
dev 2.5.1
devops-center 1.2.27
signups 2.6.19
@salesforce/sfdx-plugin-lwc-test 1.2.1
@salesforce/sfdx-scanner 4.11.0
```

4. To view all available Salesforce CLI commands and a summary, run this command.

```
sf commands
```

5. To display the release notes for the version of Salesforce CLI that's currently installed on your computer, run this command.

```
sf whatsnew
```

SEE ALSO:

Salesforce CLI Plugins

CHAPTER 5 Update Salesforce CLI

In this chapter ...

If you want to ensure that you're running the latest version of Salesforce CLI, you can manually update it.

Determine How You Installed Salesforce CLI

Because the method to update or uninstall Salesforce CLI differs depending on whether you used the operating system-specific installers or npm, you must know how you installed before you can update or uninstall. In case you forgot, here are some tips.

- Run `sf update` in a terminal (macOS and Linux) or command prompt (Windows). If Salesforce CLI successfully updates, then you installed with the installers. If the command returns this or similar warning, then you installed with npm:

  ```
  sf update
   ›   Warning: Use "npm update --global @salesforce/cli" to update
   npm-based installations.
  @salesforce/cli: Updating CLI... not updatable
  ```

  If you get an error similar to this one, then you're probably still using `sf` (v1), which was bundled with `sfdx` (v7):

  ```
  Running "sf update" has no effect because you're using a version
  of sf that was installed by sfdx.
  ```

  Both `sf` (v1) and `sfdx` (v7) are deprecated, so see Move from sfdx (v7) to sf (v2) for information on how to move to the latest supported version of Salesforce CLI, which is `sf` (v2).

- Run `npm list -g --depth 0`. If you got valid output, and the displayed list includes the entry `@salesforce/cli@<version>`, then you installed Salesforce CLI with `npm`.

If You Installed Salesforce CLI Using the Installer

To install the latest Salesforce CLI and plugin versions, run this command in a terminal (macOS) or command prompt (Windows):

```
sf update
```

By default, the CLI periodically checks for and installs updates. To disable auto-update, set the `SF_AUTOUPDATE_DISABLE` environment variable to `true`.

When you update Salesforce CLI, we automatically display the release notes for the version you're updating to so you can learn about the new, changed, and fixed features. To silence the display, set the

`SF_HIDE_RELEASE_NOTES` and `SF_HIDE_RELEASE_NOTES_FOOTER` environment variables to `true`.

If You Installed Salesforce CLI Using npm

The auto-update option isn't available. When a new version of the CLI is available, run this command in a terminal (macOS and Linux) or command prompt (Windows):

```
npm install --global @salesforce/cli
```

What Happens When You Update Salesforce CLI?

As previously described, you can update Salesforce CLI using two methods: `sf update` or `npm install --global @salesforce/cli`. Let's break down the upgrade process for both methods. See Salesforce CLI Plugins on page 59 for terminology and architecture information about plugins.

Common Updates for Both Methods

- Salesforce CLI: Updated to the latest version, which is the public `@salesforce/cli` npm package that has the latest tag.
- Core plugins: All core plugins are also updated to their latest versions based on the `latest` tag. Examples include @salesforce/plugin-org and @salesforce/plugin-deploy-retrieve.

Update Behavior of Non-Core Plugins

- **If you used `sf update` to update Salesforce CLI**, then the update process attempts to update all non-core plugins to their latest available versions. Specifically, the process updates a non-core plugin only if the currently-installed one is older than the latest version. If the installed non-core plugin is newer than the latest version, then this plugin isn't updated.

  For example, let's say the latest available version of the `code-analyzer` plugin is `5.3.0`. If the installed version is `5.3.1`, then the `code-analyzer` plugin isn't updated when you run `sf update`. If, however, if the installed version is `5.2.0`, then the plugin is updated to `5.3.0`.

- **If you used `npm install --global @salesforce/cli` to update**, then the non-core plugins (JIT and user-installed) aren't updated. You must update them yourself manually.

Update to the CLI Release Candidate or Nightly

We release a new version of the CLI weekly. At the same time we also publish a release candidate of the CLI that contains changes that we plan to include in the next weekly release. Think of the release candidate as the CLI-version of the Salesforce sandbox preview. You can update to a release candidate if you want to check out upcoming features. Or stay on the current and official release. Or go back and forth. It's up to you!

We also release nightly builds every day. Nightly builds include the latest versions of all our libraries and plugins. If you want to try out a fix that was merged just a day ago, try installing a nightly build. Similar to the release candidate, the nightly builds help improve the stability of Salesforce CLI by catching issues before they make it to the stable release.

While the latest (stable) release is the most reliable, we encourage users to also test the release candidates and nightly builds and report issues to our GitHub issues repository. We recommend you run your continuous integration (CI) jobs against both the current release and the release candidate to identify potential breaking changes before they happen.

To display the version of your installed Salesforce CLI, run this command from a terminal (macOS and Linux) or command prompt (Windows). The version doesn't indicate if it's a release candidate or nightly build, so check the release notes for the current version numbers.

```
sf version
```

Update Using Installers

Installers use the tags `stable` for the current release, `stable-rc` for the release candidate, and `nightly` for the nightly builds.

If you've already installed Salesforce CLI and are using the current release, run this command in a terminal (macOS and Linux) or command prompt (Windows) to switch to the release candidate.

```
sf update stable-rc
```

Similarly, run this command to install the nightly build.

```
sf update nightly
```

To uninstall the release candidate or nightly build and return to the current version, run this command.

```
sf update stable
```

Install Using npm

Npm installs use the tags `latest` for the current release, `latest-rc` for the release candidate, and `nightly` for the nightly builds.

To install the release candidate using npm, run this command in a terminal (macOS and Linux) or command prompt (Windows).

```
npm install --global @salesforce/cli@latest-rc
```

Similarly, run this command to install the nightly build.

```
npm install --global @salesforce/cli@nightly
```

To uninstall the release candidate or nightly build and return to the current version, run this command.

```
npm install --global @salesforce/cli@latest
```

To view the Salesforce CLI versions that are currently associated with the npm tags, run this command.

```
npm view @salesforce/cli dist-tags --json
```

Install from a TAR File

Salesforce CLI distributes TAR files for the release candidate and nightly builds that you can install on all supported operating systems. The download URLs are similar to the URLs for installing the current release, but use the `stable-rc` or `nightly` channel rather than the `stable` channel.

For example, to `wget` the Linux TAR file for the release candidate, run this command in a terminal (macOS and Linux) or command prompt (Windows), which downloads from the `stable-rc` channel.

```
wget
https://developer.salesforce.com/media/salesforce-cli/sf/channels/stable-rc/sf-linux-x64.tar.xz
```

This command downloads a nightly build.

```
wget
https://developer.salesforce.com/media/salesforce-cli/sf/channels/nightly/sf-linux-x64.tar.xz
```

Other than using a different channel, the instructions for installing the release candidate or nightly build from a TAR file are the same as the instructions for installing the current release.

SEE ALSO:

Trailhead: Get Early Access with the Sandbox Preview

Disable Automatic Update of the CLI

When you run a command, Salesforce CLI checks to see if you have the latest version. If not, the CLI automatically updates itself. You can disable this automatic update with an environment variable.

To remain on the current version of the CLI and disable automatic updates, set the `SF_AUTOUPDATE_DISABLE` environment variable to `true`. How you set an environment variable is different for different operating systems. See the operating system vendor's help for instructions on how to set environment variables.

CHAPTER 6 Salesforce CLI Configuration and Tips

In this chapter ...

Use Salesforce CLI for most development and testing tasks. These tasks include authorizing a Dev Hub org, creating a scratch org, synchronizing source code between your scratch orgs and VCS, and running tests.

You can start using Salesforce CLI right after you install it.

The CLI commands are grouped into top-level topics. For example, the `org` top-level topic contains commands to create and manage orgs, such as `org list`, `org create sandbox`, and `org generate password`. The `config` top-level topic contains commands for managing configuration variables.

Run `--help` at each level to get more information.

```
sf --help                          // lists all top-level topics
sf org --help                     // lists all the topics and commands
under "org"
sf org create --help               // lists all the commands in the
subtopic "org create"
sf org create sandbox --help   // detailed info about the "org create
 sandbox" command
sf org create sandbox -h        // quick and short info about the "org
 create sandbox" command
```

Run this command to view all available Salesforce CLI commands:

```
sf commands
```

To see all commands with their flags, run the command with the `--json` flag:

```
sf commands --json
```

- Disable Salesforce CLI Data Collection and Metrics

Autocomplete Salesforce CLI Commands and Flags

Use autocomplete to quickly find the exact Salesforce CLI command and flag you want to execute.

You must set up the autocomplete feature before you can use it. Autocomplete supports these shells:

- Bash: macOS and Linux
- Z shell (`zsh`): macOS and Linux
- PowerShell: Typically used on Microsoft Windows, although you can also install PowerShell on macOS and Linux.

Configure Autocomplete

The CLI command to configure autocomplete is the same on all shells. But the output of the command, which provides the next steps, differs depending on the shell you're on.

1. Open a terminal window (macOS and Linux) or Powershell command window (Windows).
2. Run this command, which builds the autocomplete cache on your computer:

```
sf autocomplete
```

3. Follow the displayed instructions, which reflect the shell you're currently using.

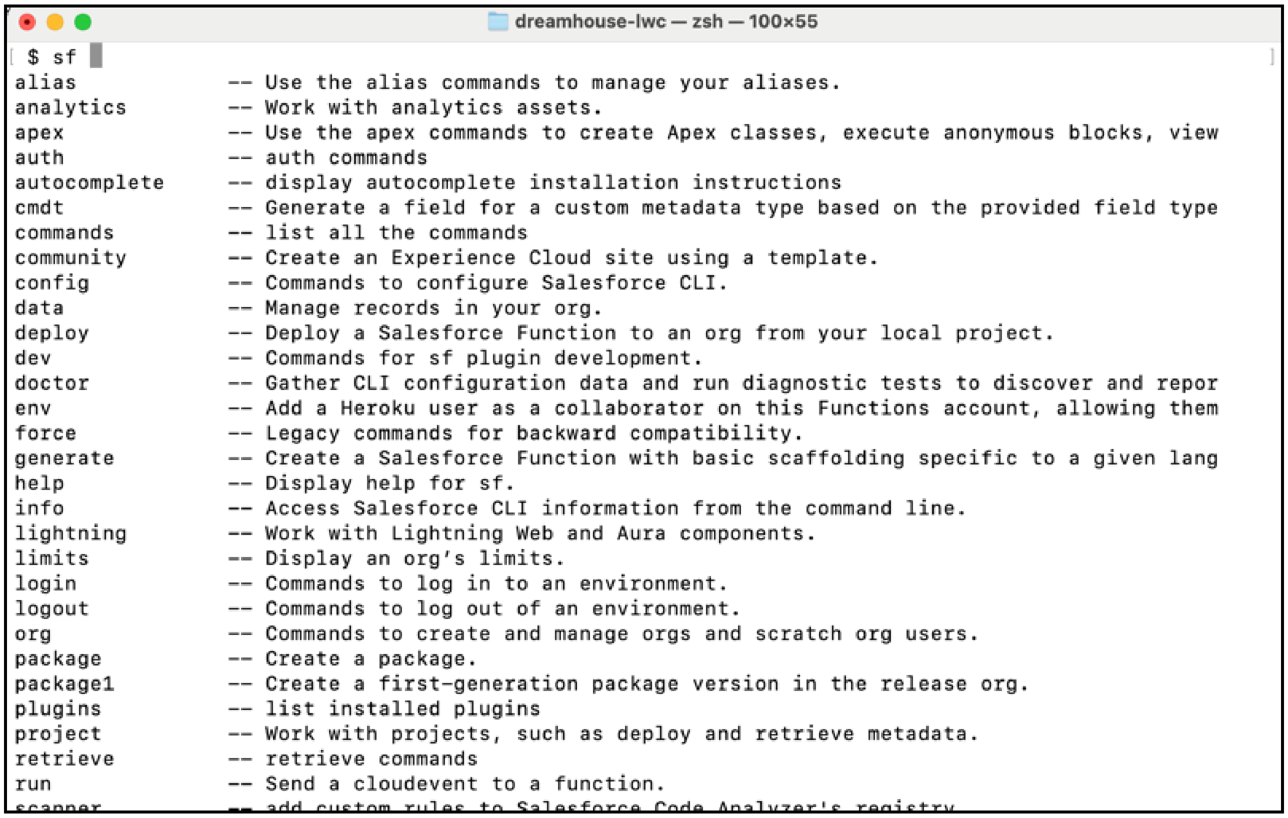
If autocomplete doesn't work immediately after configuration, open a new terminal or command window and try again.

After you update Salesforce CLI to a new version, run `sf autocomplete --refresh-cache` to ensure that autocomplete works correctly on any new commands.

Use Autocomplete

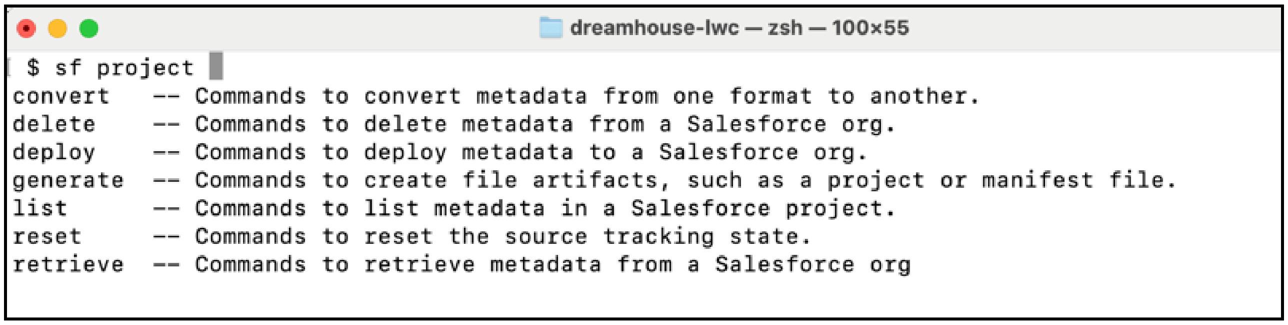
Partially type a Salesforce CLI command and then press the tab key (*<TAB>*) to autocomplete it. The autocomplete feature also works on Salesforce CLI flags and their values. Depending on the shell you're using, you might have to type *<TAB>* twice to get completion suggestions; keep tabbing until you see something.

Let's look at some examples using Z shell (`zsh`). In a terminal or command window, type *sf*, a space, and then *<TAB>* until you see the full list of top-level topics and commands with their summaries.



```
$ sf
alias             -- Use the alias commands to manage your aliases.
analytics         -- Work with analytics assets.
apex              -- Use the apex commands to create Apex classes, execute anonymous blocks, view
auth              -- auth commands
autocomplete      -- display autocomplete installation instructions
cmdt              -- Generate a field for a custom metadata type based on the provided field type
commands          -- list all the commands
community         -- Create an Experience Cloud site using a template.
config            -- Commands to configure Salesforce CLI.
data              -- Manage records in your org.
deploy            -- Deploy a Salesforce Function to an org from your local project.
dev               -- Commands for sf plugin development.
doctor            -- Gather CLI configuration data and run diagnostic tests to discover and repor
env               -- Add a Heroku user as a collaborator on this Functions account, allowing them
force             -- Legacy commands for backward compatibility.
generate          -- Create a Salesforce Function with basic scaffolding specific to a given lang
help              -- Display help for sf.
info              -- Access Salesforce CLI information from the command line.
lightning         -- Work with Lightning Web and Aura components.
limits            -- Display an org's limits.
login             -- Commands to log in to an environment.
logout            -- Commands to log out of an environment.
org               -- Commands to create and manage orgs and scratch org users.
package           -- Create a package.
package1          -- Create a first-generation package version in the release org.
plugins           -- list installed plugins
project           -- Work with projects, such as deploy and retrieve metadata.
retrieve          -- retrieve commands
run               -- Send a cloudevent to a function.
scanner           -- add custom rules to Salesforce Code Analyzer's registry
```

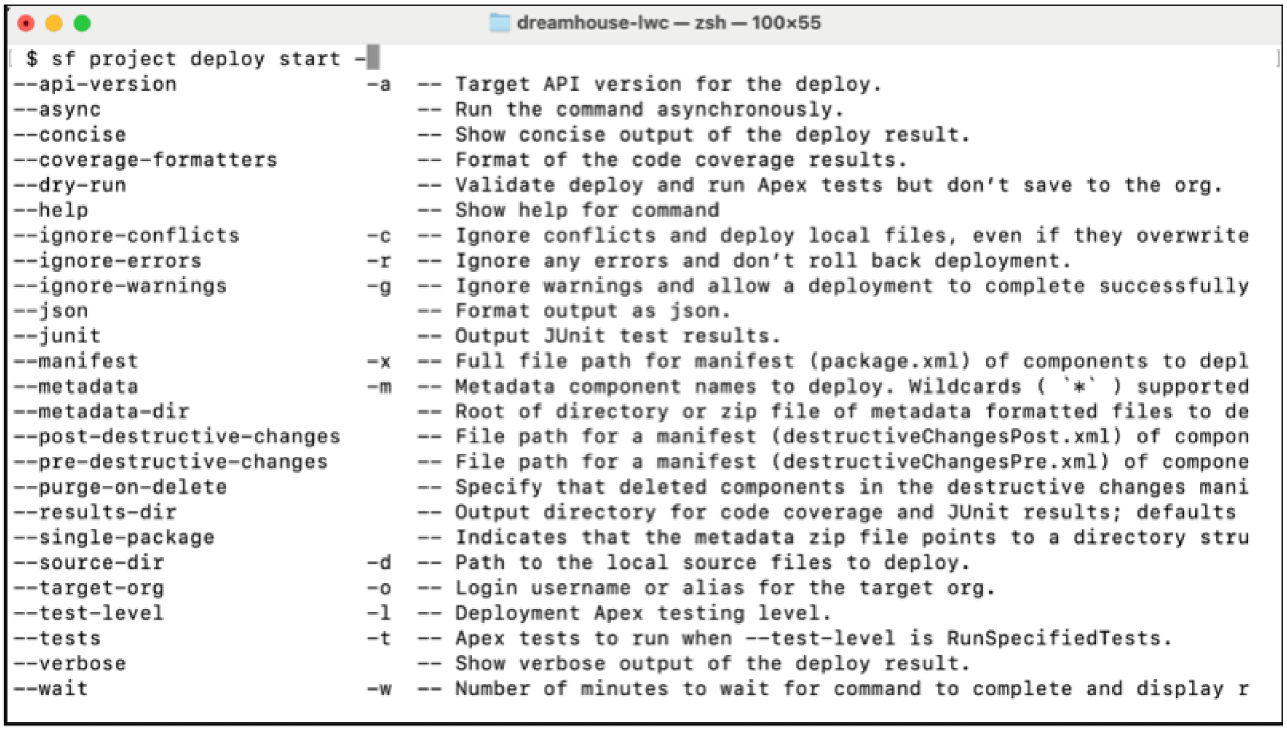
Let's say you want to deploy metadata from your Salesforce DX project; the `project` topic looks promising! To see the list of sub-topics under `project`, type the letters `pr` and then *<TAB>*.



```
$ sf project
convert    -- Commands to convert metadata from one format to another.
delete     -- Commands to delete metadata from a Salesforce org.
deploy     -- Commands to deploy metadata to a Salesforce org.
generate   -- Commands to create file artifacts, such as a project or manifest file.
list       -- Commands to list metadata in a Salesforce project.
reset      -- Commands to reset the source tracking state.
retrieve   -- Commands to retrieve metadata from a Salesforce org
```

The output includes a `deploy` sub-topic; we're getting there! To drill down, type the letters `dep` and *<TAB>*, and the commands in the `deploy` sub-topic are displayed. Keep typing and tabbing this way until you get to the full command to deploy metadata, which is `project deploy start`.

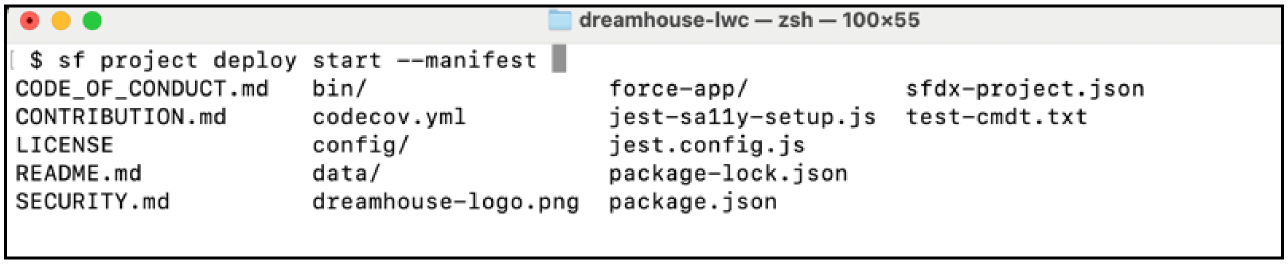
Now that you found the correct command, you probably now want to see the available flags. Simply type `-` (hyphen) and *<TAB>* to see the full list of flags, with their short and long names and summaries:



```
$ sf project deploy start -
--api-version                   -a  -- Target API version for the deploy.
--async                             -- Run the command asynchronously.
--concise                           -- Show concise output of the deploy result.
--coverage-formatters               -- Format of the code coverage results.
--dry-run                           -- Validate deploy and run Apex tests but don't save to the org.
--help                              -- Show help for command
--ignore-conflicts              -c  -- Ignore conflicts and deploy local files, even if they overwrite
--ignore-errors                 -r  -- Ignore any errors and don't roll back deployment.
--ignore-warnings               -g  -- Ignore warnings and allow a deployment to complete successfully
--json                              -- Format output as json.
--junit                             -- Output JUnit test results.
--manifest                      -x  -- Full file path for manifest (package.xml) of components to depl
--metadata                      -m  -- Metadata component names to deploy. Wildcards ( `*` ) supported
--metadata-dir                      -- Root of directory or zip file of metadata formatted files to de
--post-destructive-changes          -- File path for a manifest (destructiveChangesPost.xml) of compon
--pre-destructive-changes           -- File path for a manifest (destructiveChangesPre.xml) of compone
--purge-on-delete                   -- Specify that deleted components in the destructive changes mani
--results-dir                       -- Output directory for code coverage and JUnit results; defaults
--single-package                    -- Indicates that the metadata zip file points to a directory stru
--source-dir                    -d  -- Path to the local source files to deploy.
--target-org                    -o  -- Login username or alias for the target org.
--test-level                    -l  -- Deployment Apex testing level.
--tests                         -t  -- Apex tests to run when --test-level is RunSpecifiedTests.
--verbose                           -- Show verbose output of the deploy result.
--wait                          -w  -- Number of minutes to wait for command to complete and display r
```

Type the first letter of a flag, then *<TAB>* until you've autocompleted the flag name.

You can also use autocomplete to specify a value for some flags. For example, if your current directory is a Salesforce DX project and you want to specify a manifest file for the `--manifest` flag, press *<TAB>* after the flag to see a list of files. Then enter the first letter and *<TAB>* until you complete the name of the file, such as `package.xml`.



```
$ sf project deploy start --manifest
CODE_OF_CONDUCT.md    bin/                  force-app/            sfdx-project.json
CONTRIBUTION.md       codecov.yml           jest-sa11y-setup.js   test-cmdt.txt
LICENSE               config/               jest.config.js
README.md             data/                 package-lock.json
SECURITY.md           dreamhouse-logo.png   package.json
```

SEE ALSO:

PowerShell Documentation

Use Salesforce CLI from Behind a Company Firewall or Web Proxy

If you install or update Salesforce CLI on a computer that's behind a company firewall or web proxy, you sometimes receive error messages. In this case, you must further configure your system.

You get this type of error when you run a command after installing Salesforce CLI behind a firewall or web proxy. This error is from a Linux computer, but Windows and macOS users sometimes see a similar error.

```
@salesforce/cli: Updating CLI... !
 □  'ECONNRESET': tunneling socket could not be established, cause=connect EHOSTUNREACH
0.0.23.221:8080 - Local (10.126.148.39:53107)
```

To address this issue, run these commands from your terminal or Windows command prompt, replacing *`username:pwd`* with your web proxy username and password. If your proxy doesn't require these values, omit them. Also replace *`proxy.company.com:8080`* with the URL and port of your company proxy.

```
npm config set https-proxy https://username:pwd@proxy.company.com:8080
npm config set proxy https://username:pwd@proxy.company.com:8080
```

Then set the HTTP_PROXY or HTTPS_PROXY environment variable to the full URL of the proxy. For example, on UNIX:

```
export HTTP_PROXY=https://username:pwd@proxy.company.com:8080
```

```
export HTTPS_PROXY=https://username:pwd@proxy.company.com:8080
```

On a Windows machine:

```
set HTTP_PROXY=https://username:pwd@proxy.company.com:8080
```

```
set HTTPS_PROXY=https://username:pwd@proxy.company.com:8080
```

If You Still See an Error

Your Proxy Requires an Extra Certificate Authority

If you set the proxy environment variable, and you still see error messages, it's possible that your proxy requires an extra certificate authority (CA). Ask your IT department where to find or download the certificates.

Set this environment variable to point to the CA file: NODE_EXTRA_CA_CERTS.

Your Corporate Network Is Blocking Salesforce Hosts

It's possible that your corporate network is blocking the Salesforce hosts for updating or installing Salesforce CLI. Contact your IT department add these URLs to your allowlist:

- `https://developer.salesforce.com/media/salesforce-cli`
- `https://registry.npmjs.org`

As written, these URLs aren't meant to actually go anywhere. Rather, they act as prefixes for the bucket of Salesforce CLI artifacts that you can dowload, such as installation TAR files, or install from the npm registry.

Windows Performance Suggestions

Follow these suggestions to improve the performance of Salesforce CLI on Windows.

Warning: We recommend that you consult your security administrator before making any of these suggested configuration changes.

Use a local file system for your Salesforce DX project rather than a cloud-based one.

Salesforce CLI performs better when your Salesforce DX project and associated files are on a local file system. Cloud-based file systems, such as OneDrive, Google Drive, and Dropbox, constantly watch all the files and directories in the file system. As a result, if you create your Salesforce DX project in one of these file systems, it can limit the performance of the Salesforce CLI. To avoid this issue, move your project directory away from these systems.

Install Salesforce CLI with the official installer and exclude the `sf` executable from Windows Defender.

- Windows Defender continually rescans executables for potential threats. This scanning can have a noticeable performance impact on slower machines.
- To exclude Salesforce CLI, use the `sf` executable installed from developer.salesforce.com and follow these steps:
  1. Add an exclusion to Windows Security.
  2. When prompted to select a folder, select *`C:\Program Files\Salesforce CLI`*.

Exclude the project folder from Windows Defender.
It's also possible that Windows Defender keeps rescanning your project folder, causing negative performance. To exclude your project folder, follow these steps.

Exclude the `sf` executable from other security software.
Some companies use more extensive security software than Windows Defender, and this security software can cause Salesforce CLI to perform slowly. Work with your internal IT department to exclude the `sf` executable from all security software.

Close memory intensive programs.
Salesforce CLI can be performing slowly because other programs such as Google Chrome or VS Code are using too much memory. Try restarting these programs to free up memory.

Configuration Variables

You can set configuration (config) variables for your current project or for all projects. You can set two kinds of config variables: global and local. Global config variables apply to all projects on your computer. Local config variables apply to a specific project. Local config variables override global ones when commands are run from within a Salesforce DX project directory.

To set a config variable for the current project:

```
sf config set name <value>
```

For local config variables, you must issue the command from within the Salesforce DX project directory.

To set the config variable for all your projects:

```
sf config set name <value> --global
```

You can issue global commands anywhere or within any Salesforce DX project, yet they apply to all the Salesforce CLI commands you run.

View the local and global config variables that you have set with the `config list` command. The output lists the local variables for the project directory from which you're running the command and all global variables.

```
sf config list
```

```
List Config
=========================================================
| Name                 Value                        Location
| ──────────────────── ──────────────────────────── ────────
| org-instance-url     https://test.salesforce.com Local
| org-max-query-limit 20000                        Local
| target-dev-hub       DevHub                       Local
```

To return one or more previously set config variables, use `config get`. It's often useful to specify JSON output for this command for easier parsing in a continuous integration (CI) environment. For example, to return the value of `target-org` and `target-dev-hub`:

```
sf config get target-org target-dev-hub --json
```

To unset a config variable, run the `config unset` command. For example, to unset the `org-instance-url` config variable:

```
sf config unset org-instance-url
```

Note: Alternately, you can set all CLI config variables as environment variables. Environment variables override config variables.

List of Configuration Variables

These are the Salesforce CLI configuration variables.

org-api-version

The API version for a specific project or all projects. Normally, Salesforce CLI assumes that you're using the same version of the CLI as the Dev Hub org.

This example sets the API version for all projects (globally) to 57.0.

```
sf config set org-api-version 57.0 --global
```

Be sure not to confuse this config variable with the `sourceApiVersion` project option, which has a similar name. See How API Version and Source API Version Work in Salesforce CLI for more information.

Environment variable: SF_ORG_API_VERSION

```
SF_ORG_API_VERSION=57.0
```

org-capitalize-record-types

Specifies whether Salesforce CLI capitalizes the first letter of a default record type when it creates a scratch org. Valid values are `true` or `false`. The default value is `true`.

Default record types are defined in the `objectSettings` option of a scratch org definition file, as described in Scratch Org Definition File Options. The setting is required before installing a package that creates record types.

```
sf config set org-capitalize-record-types false --global
```

Environment variable: SF_CAPITALIZE_RECORD_TYPES

org-custom-metadata-templates

Specifies either a local directory or a cloned GitHub repository that contains the default custom code templates used by the `project generate` command. The GitHub URL points to either the root directory that contains your templates or to a subdirectory on a branch in the repo that contains your templates. For example:

```
sf config set org-custom-metadata-templates
https://github.com/mygithubacct/salesforcedx-templates
```

Environment variable: SF_ORG_CUSTOM_METADATA_TEMPLATES

```
SF_ORG_CUSTOM_METADATA_TEMPLATES=https://github.com/mygithubacct/salesforcedx-templates
```

target-org

The username or alias for an org that all commands run against by default.

```
sf config set target-org test-scratch-org@example.com
```

Environment variable: SF_TARGET_ORG

```
SF_TARGET_ORG=test-scratch-org@example.com
```

target-dev-hub

The username or alias for your default Dev Hub org.

```
sf config set target-dev-hub my-dev-hub@devhub.org
```

Environment variable: SF_TARGET_DEV_HUB

```
SF_TARGET_DEV_HUB=my-dev-hub@devhub.org
```

target-devops-center (DevOps Center commands only)

The username or alias for the org in which DevOps Center is installed.

```
sf config set target-devops-center myDevOpsCenterOrg@example.com
```

disable-telemetry

By default, Salesforce CLI collects usage information, user environment information, and crash reports. This option allows you to opt out.

```
sf config set disable-telemetry true
```

Environment variable: SF_DISABLE_TELEMETRY

org-instance-url

The URL of the Salesforce instance that's hosting your org. Default value is `https://login.salesforce.com`. We recommend that you set this config variable to the My Domain login URL for your org. You can find the My Domain login URL on the My Domain page in Setup.

```
sf config set org-instance-url https://yoda.my.salesforce.com
```

Environment variable: SF_ORG_INSTANCE_URL

```
SF_ORG_INSTANCE_URL=https://yoda.my.salesforce.com
```

org-max-query-limit

The maximum number of Salesforce records returned by a Salesforce CLI command. Default value is 10,000.

For example, let's say you run `sf org list metadata -m Role` on a Salesforce org that has 15,000 roles. By default the command displays only 10,000 roles. A message warns you that the command retrieved only some of the roles. To see all of them, set this config variable to a larger number.

```
sf config set org-max-query-limit 20000
```

Environment variable: SF_ORG_MAX_QUERY_LIMIT

```
SF_ORG_MAX_QUERY_LIMIT=200000
```

org-metadata-rest-deploy

If `true`, Salesforce CLI uses Metadata REST API for deployments. By default, Salesforce CLI uses SOAP. Deployments using REST aren't bound by the 39-MB `.zip` file size limit that applies to SOAP deployments.

```
sf config set org-metadata-rest-deploy true
```

Environment variable: SF_ORG_METADATA_REST_DEPLOY

SEE ALSO:

- Disable Salesforce CLI Data Collection and Metrics
- CLI Parameter Resolution Order
- *Salesforce DX Developer Guide*: Salesforce DX Usernames and Orgs
- *Salesforce DX Developer Guide*: Authorization

Salesforce CLI Environment Variables

You can set environment variables to configure certain values that Salesforce CLI uses.

How you set an environment variable depends on your operating system and whether you want it to apply to only the current session or always. The exact steps are beyond the scope of this document, but here are some hints.

- **Windows:** Use the Control Panel (**System** > **Advanced System Settings** > **Environment Variables**) or the command-line `set` command. See the Windows documentation for details.
- **macOS or Linux**: Open a terminal and use the `export` command to set it for your current shell session:

  ```
  export SF_MDAPI_TEMP_DIR=/users/myName/myDXProject/metadata
  ```

  To set an environment for all shell sessions, edit your shell configuration files like `.bashrc` or `.zshrc` .

Environment variables override Configuration Variables. To set an environment variable for only the command you're running, prepend the variable:

```
SF_ORG_API_VERSION=57.0 sf org create scratch -<options>
```

FORCE_OPEN_URL

Specifies the web page that opens in your browser when you run `org open`. For example, to open Lightning Experience, set to `lightning`.

Equivalent to the `--path` flag of `org open`.

FORCE_SHOW_SPINNER

Set to `true` to show a spinner animation on the command line when running asynchronous CLI commands. Default is `false`.

FORCE_SPINNER_DELAY

Specifies the speed of the spinner in milliseconds. The default value is 60.

SF_ACCESS_TOKEN

Specifies an access token when using the `org login access-token` command. If you don't set this environment variable, the command prompts you for the access token. Useful for continuous integration (CI) scripts.

SF_APPLY_REPLACEMENTS_ON_CONVERT

Set to `true` to test string replacement without actually deploying files to the org. Instead, run `project convert source` to convert the files to metadata format and then inspect the files to see what will be deployed.

See Replace Strings in Code Before Deploying for details.

SF_AUDIENCE_URL

Overrides the **aud** (audience) field used for JWT authentication so that it matches the expected value of the authorization server URL for the org you're logging into. For example, `https://`***`MyDomainName`***`.my.salesforce.com` or `https://login.salesforce.com` for a production org, and `https://`***`MyDomainName`***`--`***`SandboxName`***`.sandbox.my.salesforce.com` or `https://test.salesforce.com` for a sandbox.

Example:

```
SF_AUDIENCE_URL=https://MyDomainName.my.salesforce.com
```

SF_CAPITALIZE_RECORD_TYPES

Specifies whether Salesforce CLI capitalizes the first letter of a default record type when it creates a scratch org. Valid values are `true` or `false`. The default value is `true`.

Default record types are defined in the `objectSettings` option of a scratch org definition file, as described in Scratch Org Definition File Options. The setting is required before installing a package that creates record types.

Example:

```
SF_CAPITALIZE_RECORD_TYPES=false
```

SF_CI_HEARTBEAT_FREQUENCY_MS

Defines how frequently a CLI command repeats the last status message if no new update is received from the org. This environment variable applies only to commands that produce multi-stage output in continuous integration (CI) environments.

Some commands, such as `org create scratch` and `project deploy start`, display the stages they are going through as they interact with the org. In a CI job, if no new status is received within 5 minutes, then the command displays the last status message again. Use this environment variable to change this interval.

The default value is `300000` (5 minutes).

For example, to specify a 10-minute interval:

```
SF_CI_HEARTBEAT_FREQUENCY_MS=600000
```

SF_CI_UPDATE_FREQUENCY_MS

Specifies the wait time between CLI command status updates. This environment variable applies only to commands that produce multi-stage output in continuous integration (CI) environments.

Some commands, such as `org create scratch` and `project deploy start`, display the stages they are going through as they interact with the org. In a CI job, the command might attempt to update the output 10 times within a 5-second interval (for example), but the command actually displays only one of the updates. Use this environment variable to change the interval.

The default value is `5000` (5 seconds).

For example, to specify a 10-second interval:

```
SF_CI_UPDATE_FREQUENCY_MS=10000
```

SF_CONTAINER_MODE

When set to `true`, commands that usually open the org in a browser, such as `org open` or `org login web`, output the org's URL instead and don't open a browser. When set to `false` (the default value), the commands open the org in a browser.

This environment variable is useful in headless environments, such as Docker or continuous integration.

SF_CONTENT_TYPE

When set to `JSON`, specifies that all CLI commands output results in JSON format. If you set the environment variable to any other value, or unset it, the CLI commands output their results as specified by the flags.

Example:

```
SF_CONTENT_TYPE=JSON
```

SF_CRYPTO_V2

Used to enable 256-bit encryption of internal Salesforce CLI files, such as the authorization (auth) files associated with the orgs you've logged into. Salesforce CLI uses 128-bit encryption by default.

For more information, see Enable 256-Bit Encryption of Authorization Files.

SF_CUSTOM_ORG_METADATA_TEMPLATES

Specifies either a local directory or a cloned GitHub repository that contains the default custom code templates used by the `project create` command. The GitHub URL points to either the root directory that contains your templates or to a subdirectory on a branch in the repo that contains your templates.

Example:

```
SF_CUSTOM_ORG_METADATA_TEMPLATES=https://github.com/mygithubacct/salesforcedx-templates
```

SF_DEPLOY_SIZE_THRESHOLD

Salesforce CLI displays a warning when you run `project deploy start` and either the total size of the metadata or the number of metadata files is over 80% of the corresponding Metadata API limit. Use this environment variable to change the threshold by setting it to a number from 1 through 100. The default value is 80.

This example sets the threshold to 70%, which means that you get the warning when you try to deploy metadata that's over 70% of the limit.

```
SF_DEPLOY_SIZE_THRESHOLD=70
```

Salesforce CLI always attempts to deploy the metadata when you run the `project deploy start` command, even if it determines that the metadata size or file count is likely over the limit.

SF_DISABLE_AUTOUPDATE or SF_AUTOUPDATE_DISABLE (either var works)

Set to `true` to disable the auto-update feature of the CLI. By default, the CLI periodically checks for and installs updates.

SF_DISABLE_DNS_CHECK

Set to `true` to stop the Salesforce CLI commands that require an org to check whether the org is connected. For example, the `org create scratch` command requires a Dev Hub org. The default value is `false` (always check.)

This environment variable is useful if you get this error when running certain Salesforce CLI commands.

```
DomainNotFound: The org cannot be found
```

First try setting the SF_DNS_TIMEOUT environment variable to increase the number of seconds that Salesforce CLI waits for a response. If that doesn't work, try disabling the check entirely with the SF_DISABLE_DNS_CHECK environment variable.

SF_DISABLE_SOURCE_MEMBER_POLLING

Set to `true` to disable polling of your org's SourceMember object when you run the `project deploy|retrieve` commands.

The commands poll the SourceMember object to track what's changed between your local source and the org after the deploy or retrieve completes. If you have a large metadata deployment, however, the polling can take a while, or even time out. Sometimes you don't require source tracking at all, such as in a continuous integration (CI) job. These use cases are good candidates for setting this environment variable.

The environment variable works with both scratch orgs and sandboxes.

Warning: When you disable SourceMember polling, the CLI's internal tracking of what's changed between your local source and org metadata gets out of sync. As a result, subsequent runs of the `project deploy|retrieve` commands are unreliable, and it's up to you to synchronize your source. To reset source tracking, use the `project reset tracking` command.

SF_DISABLE_SOURCE_MOBILITY

Set to `true` to disable the source mobility feature.

With source mobility you can move source files within your local Salesforce DX project without the source-tracking feature determining that you've deleted and then recreated a metadata component.

The default value of this environment variable is `false`, which means that source mobility is enabled by default.

SF_DISABLE_TELEMETRY

Set to `true` to disable the CLI from collecting usage information, user environment information, and crash reports.

SF_DNS_TIMEOUT

Specifies the number of seconds that Salesforce CLI commands that require an org wait for a response when checking whether the org is connected. For example, the `org create scratch` command requires a Dev Hub org. If the commands don't receive a response in that time, they time out. The default value is 3.

This environment variable is useful if you get this error when running certain Salesforce CLI commands.

```
DomainNotFound: The org cannot be found
```

First try setting the SF_DNS_TIMEOUT environment variable to increase the number of seconds that Salesforce CLI waits for a response. If that doesn't work, try disabling the check entirely with the SF_DISABLE_DNS_CHECK environment variable.

SF_DOMAIN_RETRY

Specifies the time, in seconds, that the CLI waits for the Lightning Experience domain to resolve and become available in a newly created scratch org.

The default value is 240 (4 minutes). Set the variable to 0 to bypass the Lightning Experience domain check entirely.

SF_HIDE_RELEASE_NOTES

Set to `true` to silence the automatic display of the release notes when you run `sf update`. The default value is `false`.

Example:

```
SF_HIDE_RELEASE_NOTES=true
```

SF_HIDE_RELEASE_NOTES_FOOTER

Set to `true` to silence the boilerplate footer about displaying the release notes when you run `sf update`. The default value is `false`.

Example:

```
SF_HIDE_RELEASE_NOTES_FOOTER=true
```

SF_IMPROVED_CODE_COVERAGE

Scopes Apex test results to the classes entered during a test run when running `apex run test` and `apex get test`. Set to `true` to improve code coverage.

SF_JSON_TO_STDOUT

Sends messages when Salesforce CLI commands fail to `stdout` instead of `stderr`. Setting this environment variable to `true` is helpful for scripting use cases.

Example:

```
SF_JSON_TO_STDOUT=true
```

SF_LIST_METADATA_BATCH_SIZE

Specifies the number of concurrent API requests that the `project generate manifest --from-org` command makes when discovering the metadata that exists in an org and using it to generate a manifest. Set the environment variable to a batch size that works best for your org and environment. The default value is `500`.

This example limits the number of concurrent API calls to 20:

```
SF_LIST_METADATA_BATCH_SIZE=20
```

If you experience timeouts or inconsistent manifest contents, then setting this environment variable can improve accuracy when running `project generate manifest`. However, the command takes longer to run because it sends fewer requests at a time.

SF_LOG_LEVEL

Sets the level of messages that the CLI writes to the log file.

Example:

```
SF_LOG_LEVEL=debug
```

SF_LOG_ROTATION_PERIOD

Time period after which Salesforce CLI rotates the log file. Rotating the log file refers to making a backup copy of the file and then clearing out the current log file to start afresh. For example, if set to `1d`, Salesforce CLI rotates the log file daily at midnight.

You can set this variable to `1h` (one hour) or `1m` (one minute) if you want more, but smaller, log files. Any other value is treated as `1d`, which is the default value.

Example:

```
SF_LOG_ROTATION_PERIOD=1h
```

SF_MDAPI_TEMP_DIR

Directory that holds the retrieved, deployed, or converted metadata files when you run these CLI commands:

- `project retrieve start`
- `project deploy start`
- `project delete source`
- `project convert mdapi|source`

If you don't set this environment variable, the commands automatically delete the directory after they finish executing.

Retaining these files can be useful for several reasons. You can debug problems that occur during command execution. You can use the generated `package.xml` when running subsequent commands, or as a starting point for creating a manifest that includes all the metadata you care about.

For more information, see Debug Errors When Deploying or Retrieving Source.

```
SF_MDAPI_TEMP_DIR=/users/myName/myDXProject/metadata
```

SF_NEW_VERSION_CHECK_FREQ

A number that specifies the frequency that a warning message is displayed about the availability of a new Salesforce CLI version. By default, every CLI command execution checks whether there's a new Salesforce CLI version available, and prints out a warning message if it finds one. Use this environment variable with `SF_NEW_VERSION_CHECK_FREQ_UNIT` to change the frequency that the message is displayed. To disable the version check completely, use `SF_SKIP_NEW_VERSION_CHECK`.

The default value is `0`, which means that the warning message is displayed each time a new version is found.

For example, to see the warning message one time a day:

```
SF_NEW_VERSION_CHECK_FREQ=1
SF_NEW_VERSION_CHECK_FREQ_UNIT=days
```

SF_NEW_VERSION_CHECK_FREQ_UNIT

The unit of time for the frequency that a warning message is displayed about the availability of a new Salesforce CLI version. By default, every CLI command execution checks whether there's a new Salesforce CLI version available, and prints out a warning message if it finds one. Use this environment variable with `SF_NEW_VERSION_CHECK_FREQ` to change the frequency that the message is displayed. To disable the version check completely, use `SF_SKIP_NEW_VERSION_CHECK`.

Possible values are `days`, `hours`, `minutes`, `seconds`, and `milliseconds`. The default value is `minutes`.

For example, to see the warning message one time a day:

```
SF_NEW_VERSION_CHECK_FREQ=1
SF_NEW_VERSION_CHECK_FREQ_UNIT=days
```

SF_NETWORK_MUTEX_PORT

Specifies the local network server's port when you set SF_USE_NETWORK_MUTEX to `true` to enable the `yarn --mutex network` option when installing or updating Salesforce CLI.

This variable affects your environment only if you also set SF_USE_NETWORK_MUTEX. The default value is 31997.

SF_NO_TABLE_STYLE

Set to `true` to remove all stylings, such as borders and colors, from command output presented in table format. An example of a command that produces table output is `org list limits`. The default value is `false`.

Example:

```
SF_NO_TABLE_STYLE=true
```

SF_NPM_REGISTRY

Sets the URL to a private npm server, where all packages that you publish are private. We support only repositories that don't require authentication.

Example:

```
SF_NPM_REGISTRY=http://mypkgs.myclient.com/npm/my_npm_pkg
```

Verdaccio is an example of a lightweight private npm proxy registry.

SF_ORG_API_VERSION

The API version for a specific project or all projects. Normally, the Salesforce CLI assumes that you're using the same version of the CLI as your Dev Hub.

SF_ORG_INSTANCE_URL

The URL of the Salesforce instance that's hosting your org. The default value is `https://login.salesforce.com`. We recommend that you set this value to the My Domain login URL for your org. You can find the My Domain login URL on the My Domain page in Setup.

SF_ORG_MAX_QUERY_LIMIT

The maximum number of Salesforce records returned by a CLI command. The default value is 10,000.

Example:

```
SF_ORG_MAX_QUERY_LIMIT=200000
```

SF_ORG_METADATA_REST_DEPLOY

Set to `true` to make Salesforce CLI use the Metadata REST API for deployments. By default, Salesforce CLI uses SOAP. Deployments using REST aren't bound by the 39-MB `.zip` file size limit that applies to SOAP deployments.

SF_PRECOMPILE_ENABLE

Set to `true` to enable Apex pre-compile before the tests are run. This variable works with the `apex run test` command. Default is `false`.

Important: The duration of an Apex test pre-compilation can be inconsistent. As a result, runs of the same Apex tests are sometimes quick and other times they time out. We recommend that you set this variable to `true` only if your Apex tests (without pre-compile) activate multiple concurrent Apex compilations that consume many system resources.

SF_PROJECT_AUTOUPDATE_DISABLE_FOR_PACKAGE_CREATE

For `package create`, disables automatic updates to the `sfdx-project.json` file.

SF_PROJECT_AUTOUPDATE_DISABLE_FOR_PACKAGE_VERSION_CREATE

For `package version create`, disables automatic updates to the `sfdx-project.json` file.

SF_SKIP_NEW_VERSION_CHECK

Set to `true` to disable Salesforce CLI version checking. By default, every CLI command execution checks whether there's a new Salesforce CLI version available, and prints out a warning message if it finds one. While this message is useful, it's often unwanted, especially in continuous integration (CI) environments. Default is `false`.

To continue checking for a new CLI version, but change the frequency of the displayed warning message, use the `SF_NEW_VERSION_CHECK_FREQ` and `SF_NEW_VERSION_CHECK_FREQ_UNIT` environment variables.

SF_SOURCE_MEMBER_POLLING_TIMEOUT

Set to the number of seconds you want the `project deploy start` command to keep polling the SourceMember object before the command times out. The `project deploy start` command polls the SourceMember object to track what's changed between your local source and the org after the deploy completes. Salesforce CLI calculates a time-out for each `project deploy start` command run based on the number of components it deploys. Use this environment variable to override the calculated time-out.

For example, if the deployment times out after 3 minutes, try setting a time-out of 5 minutes (300 seconds):

```
SF_SOURCE_MEMBER_POLLING_TIMEOUT=300
```

SF_SOURCE_TRACKING_BATCH_SIZE

Sets the source-tracked file batch size during a deploy or retrieve. The default value is 8,000 (Windows) or 15,000 (Linux/macOS).

This environment variable is useful when deploying or retrieving a large project that contains many source-tracked files, and you exceed your operating system open file limit. While the deploy or retrieve likely complete successfully, source-tracking can run into errors in this case. Either increase your open file limit, such as with the `ulimit -Hn <number>` command (Linux/macOS), or set the `SF_SOURCE_TRACKING_BATCH_SIZE` environment variable to a number significantly lower than the output of `ulimit -Hn.`

SF_TABLE_OVERFLOW

Specifies how to handle text in table-formatted command output that is too wide for its column. An example of a command that produces table output is `org list limits`. Valid values are:

- `wrap`: Wrap text within a cell.
- `truncate`: Truncate the end of the text; same as `truncate-end`.
- `truncate-middle`: Truncate the middle of the text.
- `truncate-start`: Truncate the start of the text.
- `truncate-end`: Truncate the end of the text; same as `truncate`.

The default value is `truncate`, unless the table implementation for that command specifically overrides that default.

For example, to specify that you want the end of the text to be wrapped:

```
SF_TABLE_OVERFLOW=wrap
```

SF_TABLE_BORDER_STYLE

Specifies how to display the borders of table-formatted command output, such as whether the table has an outline or vertical lines between columns. An example of a command that produces table output is `org list limits`. Valid values are:

- `all`: Display all vertical and horizontal lines, giving every cell a complete border.
- `headers-only`: Display a border around the headers only.
- `headers-only-with-outline`: Display a border around the headers and the entire table.
- `headers-only-with-underline`: Display a horizontal line between the headers and the table content, but no other borders.
- `horizontal`: Display horizontal lines between all rows, including headers, but no vertical lines.
- `horizontal-with-outline`: Display horizontal lines between all rows, including headers, and a border around the entire table.
- `none`: Don't display any lines or borders.
- `ouline`: Display a border around the entire table, but no other lines.
- `vertical`: Display vertical lines between table columns only.
- `vertical-with-outline`: Display vertical lines between columns, a line between headers and content, and a border around the entire table.

The default value is `vertical-with-outline`.

For example, to specify that tables display a border around the headers and the entire table:

```
SF_TABLE_BORDER_STYLE=headers-only-with-outline
```

SF_TARGET_DEV_HUB

Specifies the username of your default Dev Hub org so you don't have to use the `--target-dev-hub` flag. Overrides the value of the `target-dev-hub` configuration value.

Example of setting it to an alias:

```
SF_TARGET_DEV_HUB=myDevHub
```

Example of setting it to an org username:

```
SF_TARGET_DEV_HUB=mydevhuborg@example.com
```

SF_TARGET_ORG

Specifies the username of your default org so you don't have to use the `--target-org` flag. Overrides the value of the `target-org` configuration variable.

Example of setting it to an alias:

```
SF_TARGET_ORG=myscratchorg
```

Example of setting it to a username:

```
SF_TARGET_ORG=test-xhquykly9fhl@example.com
```

SF_USE_GENERIC_UNIX_KEYCHAIN

(Linux and macOS only) Set to `true` if you want to use the generic UNIX keychain instead of the Linux `libsecret` library or macOS keychain. Specify this variable when using Salesforce CLI with ssh or "headless" in a CI environment.

SF_USE_NETWORK_MUTEX

Set to `true` to enable the `yarn --mutex network` option when installing or updating Salesforce CLI. The default value is `false` (which enables the `--mutex file` option.)

Salesforce CLI plugin installs use `yarn` under the hood. If you run into errors during installs or updates, try setting this environment variable to `true` to open a local network to manage the concurrent `yarn` instances. This behavior is more reliable and can sometimes fix install errors. The default port for this local network server is 31997. Set the SF_NETWORK_MUTEX_PORT environment variable to use a different port.

See the yarn documentation for more information.

General Environment Variables

These environment variables aren't specific to Salesforce CLI but are general variables that you might want to set.

HTTP_PROXY

If you receive an error when you install or update the Salesforce CLI on a computer that's behind a firewall or web proxy, set this environment variable. Use the URL and port of your company proxy, for example:

```
http://username:pwd@proxy.company.com:8080
```

HTTPS_PROXY

If you receive an error when you install or update the Salesforce CLI on a computer that's behind a firewall or web proxy, set this environment variable. Use the URL and port of your company proxy, for example:

```
http://username:pwd@proxy.company.com:8080
```

NODE_EXTRA_CA_CERTS

Installs your self-signed certificate. Indicate the fully qualified path to the certificate file name. Then run `sf update`.

See NODE_EXTRA_CA_CERTS=file for more details.

NODE_TLS_REJECT_UNAUTHORIZED

To allow Node.js to use the self-signed certificate in the certificate chain, indicate *0*.

SEE ALSO:

Log Messages and Log Levels

Support for JSON Responses

How API Version and Source API Version Work in Salesforce CLI

Salesforce CLI uses both the API version and source API version when deploying or retrieving metadata to or from an org. While they sound the same, and are often set to the same value, the two settings work differently.

For simplicity, let's use the terms `apiVersion` and `sourceApiVersion` in this topic, and first define what each means.

apiVersion

The `apiVersion` value determines the *shape of the HTTPS request or response*.

Digging a little deeper, `apiVersion` refers to the core Metadata API version used to service an HTTPS request or response. When deploying metadata source to an org, Salesforce CLI sets the `apiVersion` value on the `Connection` object and uses the URL of the HTTPS request with either the SOAP or REST API. Because there's currently no REST API for metadata retrievals, Salesforce CLI uses the `apiVersion` value set on the `Connection` object to create the URL for a SOAP endpoint.

sourceApiVersion

The `sourceApiVersion` value determines the *shape of the metadata in the HTTPS request or response*.

Salesforce CLI uses the `sourceApiVersion` value when setting the `<version>` element in the manifest file (`package.xml`). The `package.xml` file is included in the HTTPS request or response when deploying or retrieving, respectively.

These examples show how the two settings work together:

- Retrieve: Let's say that a new field was added to a metadata type in the Summer '22 release, which is API version `55.0`. If you set `sourceApiVersion` to `54.0`, and then execute the `project retrieve start` command, the retrieved metadata doesn't include this new field. However, the same retrieve with `sourceApiVersion` set to `55.0` does return the metadata with the new field.
- Deploy: Again assume that a new field was added to a metadata type in API version `55.0`. If you set `sourceApiVersion` to `54.0` and try to deploy a local metadata file that includes this new field, the deploy fails. To successfully deploy metadata with the new field, you must set `sourceApiVersion` to `55.0` or greater.

Precedence of Salesforce CLI Settings

There are multiple ways to set `apiVersion` and `sourceApiVersion`, and multiple ways Salesforce CLI determines their values if you haven't explicitly set them. Use the following prioritized lists to determine the value of the two settings in your environment. Settings higher on the list take precedence over lower ones. See the examples after this section to understand how this precedence affects metadata deploys and retrieves.

apiVersion: Order of Precedence

1. `--api-version` command flag.
2. SF_ORG_API_VERSION environment variable.
3. `org-api-version` local configuration variable.
4. `org-api-version` global configuration variable.
5. Highest API version supported by the target org.

sourceApiVersion: Order of Precedence

1. `<version>` element in the manifest file (`package.xml`).
2. `sourceApiVersion` property in the `sfdx-project.json` file.
3. `--api-version` command flag.
4. SF_ORG_API_VERSION environment variable.
5. `org-api-version` local configuration variable.
6. `org-api-version` global configuration variable.
7. Highest API version supported by the target org.

Deploy Examples That Show Settings Precedence

These examples set up various use cases, and then show the result after you deploy.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file.

Command: `sf project deploy start --source-dir force-app`

Result: Salesforce CLI sends the deploy request to an API version `55.0` endpoint. The `<version>` element in the manifest that's sent with the request has a value of `54.0`, which means the metadata source being deployed is in API version `54.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file.

Command: `sf project deploy start --source-dir force-app --api-version=56.0`

Result: Salesforce CLI sends the deploy request to an API version `56.0` endpoint. The `<version>` element in the manifest that's sent with the request has a value of `54.0`, which means the metadata source being deployed is in API version `54.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The SF_ORG_API_VERSION environment variable is set to `56.0`. The `sourceApiVersion` isn't defined in `sfdx-project.json`.

Command: `sf project deploy start --source-dir force-app`

Result: Salesforce CLI sends the deploy request to an API version `56.0` endpoint. The `<version>` element in the manifest that's sent with the request has a value of `56.0`, which means the metadata source being deployed is in API version `56.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file. The `<version>` element in the manifest file is set to `53.0`.

Command: `sf project deploy start --manifest ./package.xml`

Result: Salesforce CLI sends the deploy request to an API version `55.0` endpoint. The `<version>` element in the manifest that's sent with the request has a value of `53.0`, which means the metadata source being deployed is in API version `53.0` shape.

Settings: None. The maximum API version supported by the org is `56.0`

Command: `sf project deploy start --source-dir force-app`

Result: Salesforce CLI sends the deploy request to an API version `56.0` endpoint. The `<version>` element in the manifest that's sent with the request has a value of `56.0`, which means the metadata source being deployed is in API version `56.0` shape.

Retrieve Examples That Show Settings Precedence

These examples set up various use cases, and then show the result after you retrieve.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file.

Command: `sf project retrieve start --source-dir force-app`

Result: Salesforce CLI sends the retrieve request to an API version `55.0` SOAP endpoint. The `<version>` element in the manifest that's sent with the request has a value of `54.0`, which means the metadata source being retrieved is in API version `54.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file.

Command: `sf project retrieve start --source-dir force-app --api-version 56.0`

Result: Salesforce CLI sends the retrieve request to an API version `56.0` SOAP endpoint. The `<version>` element in the manifest that's sent with the request has a value of `54.0`, which means the metadata source being retrieved is in API version `54.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The SF_ORG_API_VERSION environment variable is set to `56.0`. The `sourceApiVersion` isn't defined in `sfdx-project.json`.

Command: `sf project retrieve start --source-dir force-app`

Result: Salesforce CLI sends the retrieve request to an API version `56.0` SOAP endpoint. The `<version>` element in the manifest that's sent with the request has a value of `56.0`, which means the metadata source being retrieved is in API version `56.0` shape.

Settings: The `apiVersion` is set to `55.0` using the local configuration variable (`sf config set org-api-version=55.0`). The `sourceApiVersion` is set to `54.0` in the `sfdx-project.json` file. The `<version>` element in the manifest file is set to `53.0`.

Command: `sf project retrieve start --manifest ./package.xml`

Result: Salesforce CLI sends the retrieve request to an API version `55.0` SOAP endpoint. The `<version>` element in the manifest that's sent with the request has a value of `53.0`, which means the metadata source being retrieved is in API version `53.0` shape.

Settings: None. The maximum API version supported by the org is `56.0`

Command: `sf project retrieve start --source-dir force-app`

Result: Salesforce CLI sends the retrieve request to an API version `56.0` SOAP endpoint. The `<version>` element in the manifest that's sent with the request has a value of `56.0`, which means the metadata source being retrieved is in API version `56.0` shape.

SEE ALSO:

Configuration Variables

Salesforce CLI Environment Variables

Salesforce DX Developer Guide: Salesforce DX Project Configuration

CLI Parameter Resolution Order

Because you can specify parameters for a given Salesforce CLI command in several ways, it's important to know the order of resolution.

Salesforce CLI resolves command-line flags and arguments, definition files, environment variables, and settings in this order, which means items at the top of the list take precedence over items lower down:

- Command-line flags such as `--target-org`.
- Options listed in a file specified at the command line. An example is a scratch org definition in a file, which you specify with the `--definition-file` flag of `org create scratch`. If you specify a flag at the command line, such as `--edition`, whose value differs from what exists in the definition file, the command-line flag takes precedence.
- Environment variables, such as SF_TARGET_ORG.
- Local configuration variables, such as `target-org` or `target-dev-hub`. To view the local configuration variables, run `sf config list` from your project directory.
- Global CLI configuration variables. To view the global configuration variables, run `sf config list --global` from any directory.

Remember, command-line flags are at the top of the precedence list. For example, let's say you set the SF_TARGET_ORG environment variable to `myorg@mydomain.com`. If you specify `--target-org myotherorg@myotherdomain.com` when you run a command, it connects to an org with the `myotherorg@myotherdomain.com` username.

Similarly, let's say you set the configuration variable `target-org` to `myorg@mydomain.com`. If you specify `--target-org myotherorg@myotherdomain.com` when you run a command, you connect to an org with the `myotherorg@myotherdomain.com` username.

SEE ALSO:

- Configuration Variables
- Salesforce CLI Environment Variables

Support for JSON Responses

Salesforce CLI commands typically display their output to the terminal or command prompt (`stdout`) in non-structured, human-readable format. Messages written to the log file (`stderr`) are always in JSON format.

To view the console output in JSON format, specify the `--json` flag for a particular CLI command.

```
sf org display --json
```

Most CLI commands support JSON output. To confirm, run the command with the `--help` flag to view the supported flags. The `--json` flag is listed under GLOBAL FLAGS.

To get JSON responses to all Salesforce CLI commands without specifying the `--json` flag each time, set the SF_CONTENT_TYPE environment variable to `JSON`.

```
export SF_CONTENT_TYPE=JSON
```

JSON Response Change Policy

Salesforce reserves the right to change the human-readable output of a Salesforce CLI command at any time. It also reserves the right to make non-breaking changes to the JSON response of a Salesforce CLI command at any time. Examples of non-breaking JSON changes include:

- Adding JSON properties.
- Changing the values of JSON properties that are meant for human consumption, such as warning messages.

When Salesforce intends to make a breaking change to the JSON response of a CLI command, the change first goes through an official deprecation process. Examples of breaking changes to a JSON response include:

- Removing JSON properties.
- Changing the type of a JSON property, such as switching an array for an object.

Before making such a change, the change is announced and released behind an environment variable. Users can test the change by setting this environment variable. Not setting the environment variable keeps the current behavior. After the deprecation period (4 months or more), Salesforce CLI switches the behavior so that the new JSON response is outputted by default.

JSON Schema Files

Scripts, such as those for continuous integration (CI) jobs, often use the JSON response of a CLI command to get information that's used later when executing a different CLI command. Knowing the structure of the JSON response is therefore useful when you create these scripts. Each Salesforce CLI command has a JSON schema file that describes the structure of the response.

For example, let's say the CI script first runs the `org list --json` command to get the list of available orgs. The command's response is in the `result` JSON object, as shown in this partial example.

```
{
  "status": 0,
  "result": {
    "other": [],
    "scratchOrgs": [
      {
        "accessToken": "00DIP000000Atfx!AQfakefakeZukpHxor.XYArinSHxK0IrQGhQB0L8S",
        "instanceUrl": "https://connect.scratch.my.salesforce.com",
        "orgId": "00DIfakefx2AC",
        "username": "test-fake@example.com",
        "loginUrl": "https://connect.scratch.my.salesforce.com",
        "clientId": "PlatformCLI",
        "isDevHub": false,
        "devHubUsername": "jules@sf.com",
        "created": "1715292658000",
        "expirationDate": "2024-05-16",
        "createdOrgInstance": "USA198S",
        "isScratch": true,
        "isSandbox": false,
        "instanceApiVersion": "61.0",
        "instanceApiVersionLastRetrieved": "5/9/2024, 3:11:22 PM",
        "tracksSource": true,
        "alias": "myscratch",
        "isDefaultDevHubUsername": false,
        "isDefaultUsername": false,
        "lastUsed": "2024-05-09T22:11:24.935Z",
        "signupUsername": "test-5endbwn8yjaj@example.com",
        "createdBy": "jules@sf.com",
        "createdDate": "2024-05-09T22:10:58.000+0000",
        "devHubOrgId": "00DB0000000c7jiMAA",
        "devHubId": "00DB0000000c7jiMAA",
        "attributes": {
          "type": "ScratchOrgInfo",
          "url": "/services/data/v61.0/sobjects/ScratchOrgInfo/2SR1QavjWAC"
        },
        "orgName": "Dreamhouse",
        "edition": "Developer",
        "status": "Active",
        "isExpired": false,
        "namespace": null
      }
    ],
...<more information about other orgs>
  "warnings": []
}
```

The CI script then parses this JSON response to find an org to deploy to with the `project deploy start` command.

Find the JSON Schema File for a Command

The JSON schema file for a Salesforce CLI command is stored in the associated plugin's GitHub repository.

1. Run the `which` command, which returns the npm name of the plug-in that contains the CLI command.
   This example shows that the `org list` command is in the `@salesforce/plugin-org` plugin.

   ```
   $ sf which org list
   === org list

   plugin: @salesforce/plugin-org
   ```

2. Go to the Salesforce CLI Status page and find the npm plugin name in the Package column. Click the left **Repository** link, which takes you to the GitHub repository that stores the plugin's source code.
   In our example, the GitHub repository for the `@salesforce/plugin-org` plugin is https://github.com/salesforcecli/plugin-org.

3. In the GitHub repository, search the top-level `schemas` directory for the command's JSON schema file. The name of the file is the same as the command name, with hyphens instead of spaces.
   In our example, the schema file for the `org list` command is called `org-list.json` and is https://github.com/salesforcecli/plugin-org/blob/main/schemas/org-list.json.

The `definitions` object in the JSON schema file describes the response when you run a CLI command with the `--json` flag. Here's a snippet of the JSON schema file for the `org list` command.

```
{
  "$schema": "http://json-schema.org/draft-07/schema#",
  "$ref": "#/definitions/OrgListResult",
  "definitions": {
    "OrgListResult": {
      "type": "object",
      "properties": {
        "scratchOrgs": {
          "type": "array",
          "items": {
            "$ref": "#/definitions/FullyPopulatedScratchOrgFields"
          }
        },
<lotsa stuff>
    "FullyPopulatedScratchOrgFields": {
      "type": "object",
      "additionalProperties": false,
      "properties": {
        "isExpired": {
          "type": "boolean"
        },
        "expirationDate": {
          "type": "string"
        },
        "devHubUsername": {
          "type": "string"
        },
<more stuff>
```

The schema snippet shows, for example, that the `isExpired` key is a Boolean value in a `scratchOrgs` object.

SEE ALSO:

CLI Deprecation Policy

Specify Topics and Commands in Any Order

When you type a command at a terminal or command prompt, you can enter the topics and commands in any order. Salesforce CLI determines which command you mean and automatically runs it without errors.

For example, let's say you want to log into an org using JWT but you forgot the exact command. All of these commands work without returning a `Command not found` error:

```
sf login org jwt <flags>
sf org login jwt <flags>
sf jwt org login <flags>
```

If you remember only parts of a command, run the partial command anyway to see a list of all the commands that contain the parts. Use arrows to highlight the one you want, then press return to choose it.

For example, when you type `sf list`, you see this dialogue where you can choose the command you want:

```
 sf list
? Which of these commands do you mean (Use arrow keys)
□ community list template         Retrieve the list of templates available in your org.
  env list                        List the environments you've created or logged into.
  env logdrain list               List log drains connected to a specified environment.
  env var list                    List your environment's config vars in a table.
  org list shape                  List all org shapes you've created.
  org list snapshot               List scratch org snapshots.
  package installed list          List the org's installed packages.
```

To narrow down a long list of possible commands, provide a flag. For example, if you run `sf list --all`, it displays only the `env list` and `org list` commands because they're the only ones that have the `--all` flag.

Each command still has a canonical signature, which we use in the `--help` examples and to organize the Salesforce CLI Command Reference.

SEE ALSO:

Salesforce CLI Command Reference

Customize the Colors in Help Output

When you run a command with the `--help` or `-h` flag, the help output uses colors to highlight certain parts, such as command and flag descriptions, executable name, and more. If you don't like the default colors, you can customize them.

1. Create a file called `theme.json` using your favorite editor.
2. Add key-value pairs to the `theme.json` file where the key specifies the help section you want to colorize and the value is a color.

   You can use chalk-style colors (such as `greenBright`), hex code (`#FF0000`), or RGB (`rgb(255,255,255)`). See the default `theme.json` file on page 49 for an example.

   Here's the list of available JSON keys and what they colorize:

   - `alias`: The aliases that are listed in the ALIASES section.
   - `bin:` The `sf` executable name.
   - `command`: The command's name.
   - `commandSummary`: The command's summary.

- `dollarSign`: The `$` character printed before examples and command usage.
- `flag`: The long and short flag names.
- `flagDefaultValue`: The text `[default: X]` that is displayed for flags that have a default value.
- `flagOptions`: The valid options for a flag.
- `flagRequired`: The text `(required)` that is displayed for required flags.
- `flagSeparator`: The `,` character (comma) that separates the short and long flag names.
- `sectionDescription`: The text inside the sections, such as all the text in the DESCRIPTION section.
- `sectionHeader`: The section header, such as DESCRIPTION.
- `topic`: The topics listed in the TOPICS section.
- `version`: The VERSION section that's displayed when you run `sf --help`.

To configure a section's color back to the default black, set the associated JSON key to `none`.

3. Save the `theme.json` file in the appropriate directory

   The directory where you save the file depends on your operating system.

   - Linux and macOS: `$HOME/.config/sf`
   - Windows: Depending on your Salesforce CLI configuration, either `C:\Users\<username>\.config\sf` or `%LOCALAPPDATA%\sf`

When you next run a command with the `--help` or `-h` flag, the help output uses your customized colors.

Example: As an example, here's the internal `theme.json` file that Salesforce CLI uses to configure the default help output colors.

```
{
   "aliases": "none",
   "bin": "blueBright",
   "command": "blueBright",
   "commandSummary": "none",
   "dollarSign": "green",
   "flag": "green",
   "flagDefaultValue": "blueBright",
   "flagOptions": "blueBright",
   "flagRequired": "red",
   "flagSeparator": "none",
   "sectionDescription": "none",
   "sectionHeader": "blue",
   "topic": "blueBright",
   "version": "none"
 }
```

Specify Flag Values in Files

When you run a Salesforce CLI command, you can optionally store the command's flag values in local text files rather than specify the flag values at the command line. This feature is useful if your command has many flags, or the flag values are very long, and the resulting command exceeds the maximum string length you can use at a terminal or command prompt.

Let's say, for example, that you want to use the `data create record` command to create a record for a custom object that has over 100 fields. You use the `--values` flag of the `data create record` command to specify the values for the 100 fields, but there are so many fields that the command is too long to run in your shell.

You can work around this issue by first creating local text files that contain the flag values and storing them in a local directory in your Salesforce DX project. Then, when you run the command, use the `--flags-dir <directory>` flag to point to the directory. If the command finds a file in the specified directory with the same name as one of its flags, it uses the contents of the file as the flag value.

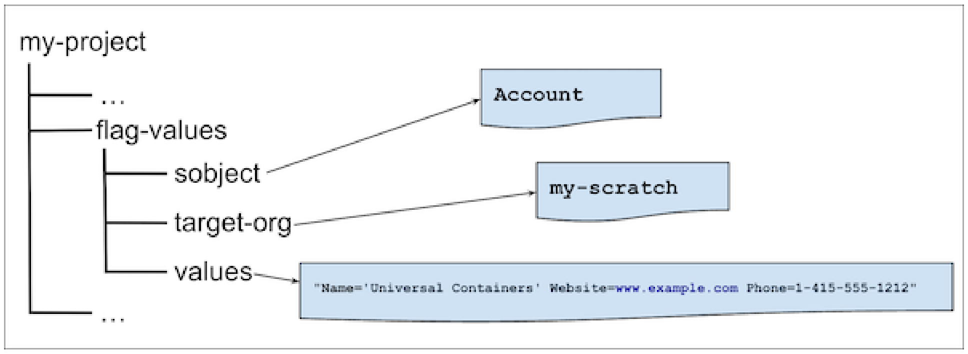
Let's see how this feature works using this sample command to create an Account record in the org with alias `my-scratch`.

```
sf data create record --sobject Account --values "Name='Universal Containers'
Website=www.example.com Phone=1-415-555-1212" --target-org my-scratch
```

For simplicity, the previous sample command includes only three Account fields. But the Account object has over 30 fields, so you can imagine how the command can get very long. To change the command to use `--flags-dir`, first follow these steps in your Salesforce DX project:

- Create a directory, such as `flag-values`.
- In the `flag-values` directory, create three files:
  - A file called `subject`, with no extension. Edit the file and add a single line of content: `Account`.
  - A file called `target-org`, with no extension. Edit the file and add a single line of content: `my-scratch`.
  - A file called `values`, with no extension. Edit the file and add a single line of content: `"Name='Universal Containers' Website=www.example.com Phone=1-415-555-1212"`

Here's a graphic that shows how to set up the directory, where the name of your DX project is `my-project`:


my-project
...
flag-values
sobject
target-org
values
...
Account
my-scratch
"Name='Universal Containers' Website=www.example.com Phone=1-415-555-1212"

Then run the sample command from your DX project this way:

```
sf data create record --flags-dir ./flag-values
```

You can combine the `--flags-dir` flag with actual command flags, but the actual flags take precedence over values in a file. For example, let's say you run the command again, but this time specify `--target-org my-other-scratch` at the command line, like this:

```
sf data create record --flags-dir ./flag-values --target-org my-other-scratch
```

The command now connects to the org with alias `my-other-scratch`, and not `my-scratch`.

Note: For flags that take multiple values, such as the `--metadata` flag of `project deploy start`, if you specify values at both the command line and using `--flags-dir`, then the values are combined.

Follow these guidelines when you create the files that contain the file values:

- Don't include a file extension. The only exception is if the file contains JSON content, in which case you must use the `.json` extension, such as `values.json`.
- For Boolean flags, create an empty file with the name of the Boolean flag. For example, to specify the `--concise` flag, create an empty file called `concise`.
- You can name files for Boolean flags `no-<flagname>`, as long as the Boolean flag supports it. For example, to use this feature with the `org create scratch` command and disable source tracking, create an empty file called `no-track-source`.
- To specify the equivalent of multiple flags, such as `--metadata ApexClass --metadata CustomObject --metadata PermissionSet`, specify each value in its own line in the `metadata` file.
- You can name the file using the flag's short name, such as `m` rather than `metadata`.

Log Messages and Log Levels

Salesforce CLI writes all log messages to a rotating file in the user's home directory whose name is based on the day. For example, the logs for August 8, 2024 are written to the file `USER_HOME_DIR/.sf/sf-2024-08-07.log`. Salesforce CLI command invocations append log messages to this running log file. Only errors are output to the terminal or command window from which you run the CLI.

Important: The files in the `USER_HOME_DIR/.sf` directory are used internally by Salesforce CLI. Don't remove or edit them.

The default level of log messages is `warn`. You can set the log level to one of the following, listed in order of least to most information. The level is cumulative: for the `debug` level, the log file also includes messages at the `info`, `warn`, and `error` levels.

- `error`
- `warn`
- `info`
- `debug`
- `trace`
- `fatal`

Globally set the log level for all CLI commands with the SF_LOG_LEVEL environment variable. For example, on UNIX:

```
export SF_LOG_LEVEL=debug
```

Note: Salesforce CLI gathers diagnostic information about its use and reports it to Salesforce so that the development team can investigate issues. The type of information includes command duration and command invocation counts.

Rotating Log Files

Salesforce CLI uses rotating log files. By default, every day at midnight Salesforce CLI makes a backup copy of the log file and then clears out its entries to start afresh. This behavior ensures that the current log file doesn't get too large.

Salesforce CLI checks for, and then deletes, any log files that are older than seven days. If you want to keep these old log files, copy them to a different location.

You can change how often a new log file is created by setting the SF_LOG_ROTATION_PERIOD environment variable to either `1h` (one hour) or `1m` (one minute). Both of these values result in more, but smaller, log files. Any other value is treated as `1d`, which is the default value.

SEE ALSO:

Salesforce CLI Environment Variables

Enable 256-Bit Encryption of Local Authorization Files

Salesforce CLI uses 128-bit encryption to encrypt its local internal files, such as the authorization (auth) files associated with the orgs you've logged into. For increased security, you can enable 256-bit encryption.

Important: This topic explains how to enable 256-bit encryption for internal files stored on your computer that are part of the Salesforce CLI installation. It doesn't cover making changes to your org.

Tip: For simplicity in this document, we call 128-bit encryption *v1 crypto* and 256-bit encryption *v2 crypto*.

Prerequisites

You must complete all these steps before you enable v2 crypto. If you don't, your Salesforce CLI installation can be a mix of v1 crypto and v2 crypto, which can result in errors.

1. Gather the usernames and passwords for all your existing authorized orgs, including for any scratch orgs that you want to continue using after enabling v2 crypto.
   Part of enabling v2 crypto includes reauthorizing all your existing authorized orgs.
2. Update to the latest version of Salesforce CLI; if you use Salesforce Extensions for VS Code, be sure to update to its latest version too. For Salesforce CLI, read the update documentation. For Salesforce Extensions for VS Code, see the installation documentation.
3. Ensure that all 3rd-party plugins installed on your system are ready for v2 crypto.
   a. Open a terminal (macOS and Linux) or PowerShell command-line shell (Windows).
   b. Run the `doctor` command.

   ```
   sf doctor
   ```

   c. In the output, make sure that the `[@salesforce/plugin-auth] CLI supports v2 crypto` test is passing, as shown in this sample output:

   ```
   pass - [@salesforce/plugin-auth] CLI supports v2 crypto
   ```

   If the test fails, at least one plugin in your Salesforce CLI installation is using an outdated version of the `@salesforce/core` library. The v2 crypto supports only plugins that use version 6.7.0 or later of `@salesforce/core`. All the core plugins that ship with the latest Salesforce CLI version use the supported version of `@salesforce/core`, so the problem is likely with one of your user-installed plugins. Work with your plugin provider to request updates.

Enable 256-Bit Encryption (v2 Crypto)

To update your Salesforce CLI installation to use v2 crypto, complete these steps.

1. Did you complete all the prerequisites? They're important, so be sure you finish all the steps.
2. Make a backup copy of up the `sfdx` key in your key store.
   - On Windows, your key store is a file called `key.json`. The file is usually in the `.sfdx` directory in your home directory, such as `C:\\Users\<username>\.sfdx`.
   - On macOS or Linux:
     - If the SF_USE_GENERIC_UNIX_KEYCHAIN environment variable is set, your key is in the file `key.json`. This file is usually in the `.sfdx` directory in your home directory, such as `/Users/<username>/.sfdx`.

- Otherwise, on macOS, your key store is most likely in the Keychain Access app. On Linux, the key store depends on the specific flavor of Linux you're using; refer to your documentation.

3. Rename the Salesforce CLI `.sfdx` directory.
   For example, open a terminal (macOS and Linux) and run this command.

   ```
   mv ~/.sfdx ~/.sfdx-bak
   ```

4. Set the SF_CRYPTO_V2 environment variable to `true`.

   ```
   export SF_CRYPTO_V2=true
   ```

5. Log in to one of your orgs using one of the `org login` commands.
   For example, run the `org login web` CLI command from a terminal or command prompt, and log in to your org using the browser that opens.
6. After successfully logging into your org, confirm that you're using the new improved encryption (v2 crypto).
   - If you're using `key.json` as your key store:
     - Run `sf doctor`.
     - Ensure that the output includes the message `CLI using stable v2 crypto`.
   - If you're not using `key.json` as your key store:
     - Locate the `sfdx` key in your key store application.
     - Confirm that the key is 64 characters long.

7. Unset the SF_CRYPTO_V2 environment variable because you no longer need it.

   ```
   unset SF_CRYPTO_V2
   ```

8. Log in to the rest of your orgs.

Your Salesforce CLI installation now uses 256-bit encryption for its internal files.

Go Back to 128-Bit Encryption (v1 Crypto)

After you enable v2 crypto, there's nothing more for you to do; auth files automatically start using 256-bit encryption. However, if you must revert to using v1 crypto due to unforeseen circumstances, follow these steps.

1. If you haven't already, unset the SF_CRYPTO_V2 environment variable.

   ```
   unset SF_CRYPTO_V2
   ```

2. Move the renamed `.sfdx-bak` directory back to its original name (`.sfdx`).
   For example, on macOS or Linux:

   ```
   mv ~/.sfdx-bak ~/.sfdx
   ```

3. If you're not using `key.json` as your key store, use the backup copy of the `sfdx` key and set it back to its original value in your password manager, such as the Keychain Access app on macOS.
   If you're using `key.json` as your key store, you don't have to do anything because the original value has been restored as part of the previous step.

4. All your original org authentications are now restored. To check that they're working correctly, run the `org open` command on one of your orgs; if the browser automatically opens to the org's UI correctly, then the recovery was successful. If the browser doesn't open to your org, manually log into it again.

Disable Salesforce CLI Data Collection and Metrics

Salesforce collects usage data and metrics (telemetry) to help improve Salesforce CLI. We collect anonymous information related to the use of Salesforce CLI and plugins, such as which commands and flags were run, and performance and error data.

We use these data to improve the CLI by looking at trends in command executions and how the CLI is configured. We also research error data to improve the CLI and to create efficiencies in our work (and yours). You're automatically enrolled in telemetry when you use the CLI.

If you would prefer to opt out of telemetry, set the `disableTelemetry` configuration variable to `true`.

```
sf config set disable-telemetry=true --global
```

Alternatively, you can opt out by setting the environment variable: `SF_DISABLE_TELEMETRY=true`.

CHAPTER 7 Uninstall Salesforce CLI or Plugins

Uninstalling Salesforce CLI removes it entirely from your computer.

The method to uninstall Salesforce CLI differs depending on whether you used an operating-specific installer or npm. You must therefore know how you installed before you can uninstall. See Determine How You Installed Salesforce CLI for more information.

You Installed on macOS or Linux Using the Installers or TAR Files

Enter all these commands in a terminal to remove Salesforce CLI. The commands uninstall both `sfdx` (v7) and `sf` (v1 and v2).

```
sudo rm -rf /usr/local/sfdx
sudo rm -rf /usr/local/lib/sfdx
sudo rm -rf /usr/local/bin/sfdx
sudo rm -rf ~/.local/share/sfdx ~/.config/sfdx ~/.cache/sfdx
sudo rm -rf ~/Library/Caches/sfdx
sudo rm -rf /usr/local/sf
sudo rm -rf /usr/local/bin/sf
sudo rm -rf ~/.local/share/sf ~/.config/sf ~/.cache/sf
sudo rm -rf ~/Library/Caches/sf
```

You Installed on Windows Using the Installer

These steps uninstall both `sfdx` (v7) and `sf` (v1 and v2):

1. Select **Start** > **Control Panel** > **Programs** > **Programs and Features**.
2. Select **@salesforce/cli**, and click **Uninstall**.
3. Inside your home directory, delete these two directories:
   - `.config\sfdx`
   - `.config\sf`

If Salesforce CLI is still installed, delete these directories:

- `%LOCALAPPDATA%\sfdx`
- `%LOCALAPPDATA%\sf`

You Installed Using npm

1. To uninstall `sfdx` (v7), run this `npm` command from a terminal or command prompt:

   ```
   npm uninstall sfdx-cli --global
   ```

   To uninstall `sf` (v1 or v2), run this command:

   ```
   npm uninstall @salesforce/cli --global
   ```

2. Inside your home directory, delete these two directories.
   - `Library/Caches/sfdx` (On Windows: `Library\Caches\sfdx`)
   - `Library/Caches/sf` (On Windows: `Library\Caches\sf`)

Remove Authorization and Log Files

After uninstalling Salesforce CLI, your computer still has data specific to your CLI usage, such as log files and authorization information about the orgs you've logged into or created. Retaining these files is useful if you later reinstall Salesforce CLI, because you don't have to reauthorize these orgs and you can view your old logs. But if you want to remove these files too, run these commands.

On macOS or Linux:

```
sudo rm -rf ~/.sfdx
sudo rm -rf ~/.sf
```

On Windows, delete these directories in your home directory:

- `.sfdx`
- `.sf`

Uninstall a Plugin

Use the `plugins:uninstall` command to uninstall a plugin you've previously installed.

Let's say, for example, that you previously installed a specific version of the `auth` plugin, but now you want to go back to the latest version. Uninstalling the plugin takes you back to the core version that's bundled with the CLI. Enter this command from a terminal or Windows command prompt:

```
sf plugins:uninstall auth
```

If the plugin is standalone and not bundled with the CLI, then uninstalling it removes it from Salesforce CLI.

CHAPTER 8 Run Salesforce CLI Using a Docker Image

Salesforce publishes Docker container images for Salesforce CLI on Docker Hub. We follow the same release process as our installers and `npm` packages. Each week we publish a Docker container image for that week's release candidate (`latest-rc)`. The following week we retag the image as `latest`. You can run the `latest` or `latest-rc` CLI versions, or a specific numbered version.

For each Salesforce CLI version, we provide two flavors:

- slim—The CLI installed on Linux with a TAR file, plus OpenJDK 11.
- full—The CLI installed on Linux with npm on a full Node.js installation, plus OpenJDK 11 and additional utilities such as `jq`.

Refer to this Web page or the following table to determine the name of the image you want to use.

Salesforce CLI Version Type	Docker Hub Image Name
Slim latest release	`salesforce/cli:latest-slim`
Full latest release	`salesforce/cli:latest-full`
Slim release candidate	`salesforce/cli:latest-rc-slim`
Full release candidate	`salesforce/cli:latest-rc-full`
Slim specific version, such as 2.0.1	`salesforce/cli:2.0.1-slim`
Full specific version, such as 2.0.1	`salesforce/cli:2.0.1-full`

For example, to pull and run the slim CLI release candidate image:

```
docker pull salesforce/cli:latest-rc-slim
docker run -it salesforce/cli:latest-rc-slim
```

Then you can run Salesforce CLI commands, such as:

```
sf version
```

To exit the Salesforce CLI Docker container:

```
exit
```

You can also remotely execute commands from outside the container after you have it running and know the container ID:

```
docker exec -it 8b1e2696a243 bin/bash sf version
```

SEE ALSO:

Docker Hub: The official Dockerfile for Salesforce DX.

CHAPTER 9 Salesforce CLI Plugins

In this chapter ...

Salesforce CLI consists of an npm (Node.js package manager) package called `@salesforce/cli` and multiple plugins—also npm packages—that contain commands. Node.js is a JavaScript (also Typescript) runtime environment that supports execution outside of a browser. Most of the core functionality that Salesforce CLI provides comes from plugins.

Some plugins are automatically installed when you install Salesforce CLI. These core plugins contain commands that support source-driven development, such as:

- Create and manage scratch orgs and sandboxes: The plugin-org plugin contains commands such as `org create scratch` and `org delete sandbox`
- Deploy and retrieve metadata between the org and your local project: The plugin-deploy-retrieve plugin contains commands such as `project deploy start` and `project retrieve preview`.
- Authorize orgs: The plugin-auth plugin contains commands such as `org login web` and `org logout`.
- Work with test data: The plugin-data plugin contains commands such as `data export bulk`, `data query`, and `data import tree`.
- Create and manage scratch org users: The plugin-user plugin contains commands such as `org create user` and `org generate password`.
- Create, preview, and test agents: The plugin-agent plugin contains commands such as `agent create` and `agent test run`.

Some plugins are installed just when you need them, rather than being included automatically in a Salesforce CLI installation. When you run a command in a "just-in-time" (JIT) plugin for the first time, Salesforce CLI installs the latest released version of the plugin and then runs the command. The plugin installation happens automatically, although we display a little message so you know what's going on. From then on, run any of the commands contained in the plugin as usual. When you next update Salesforce CLI with `sf update`, if the JIT plugin has released a new version, then it's also updated. These JIT plugins contain specialized commands that aren't typically used by most CLI users, such as:

- Create and manage scratch org snapshots and shapes: The plugin-signups plugin contains commands such as `org create shape` and `org delete snapshot`.
- Scan and evaluate Apex, LWC, Flow, and Visualforce code for potential issues: The code-analyzer plugin contains commands such as `code-analyzer rules` and `code-analyzer run`.
- Run Flow tests in your org and view the results: The plugin-flow contains commands such as `flow run test` and `flow get test`.

To determine whether a plugin is core or JIT, check the `package.json` file of the aggregator `@salesforce/cli` plugin:

- Core plugins are listed in the `oclif:plugins` section.
- JIT plugins are listed in the `oclif:jitPlugins` section.

See the Salesforce CLI Status page for the full list of core and JIT plugins, their GitHub repositories, and their status.

You can also install more plugins, such as CRM Analytics, to incorporate other Salesforce features into your development environment. You can also develop your own plugin to add your custom functionality to Salesforce CLI. See Salesforce CLI Plugin Developer Guide.

By default, the latest versions of the core plugins are installed when you both install Salesforce CLI for the first time and subsequently update. See What Happens When You Update Salesforce CLI? on page 19 for details about how non-core plugins are updated.

To determine the versions of the plugins currently installed in your CLI, run:

```
sf plugins --core
```

The command displays information such as this sample output.

```
@oclif/plugin-autocomplete 3.2.34 (core)
@oclif/plugin-commands 4.1.30 (core)
@oclif/plugin-help 6.2.32 (core)
@oclif/plugin-not-found 3.2.62 (core)
@oclif/plugin-plugins 5.4.46 (core)
@oclif/plugin-search 1.2.28 (core)
@oclif/plugin-update 4.7.2 (core)
@oclif/plugin-version 2.2.32 (core)
@oclif/plugin-warn-if-update-available 3.1.46 (core)
@oclif/plugin-which 3.2.39 (core)
agent 1.23.7 (core)
apex 3.6.19 (core)
api 1.3.3 (core)
auth 3.7.14 (core)
code-analyzer 5.3.0 (5.3.0)
data 4.0.50 (core)
deploy-retrieve 3.22.36 (core)
info 3.4.75 (core)
limits 3.3.61 (core)
marketplace 1.3.8 (core)
org 5.9.16 (core)
packaging 2.18.4 (core)
schema 3.3.76 (core)
settings 2.4.39 (core)
sobject 1.4.67 (core)
telemetry 3.6.51 (core)
templates 56.3.55 (core)
trust 3.7.113 (core)
user 3.6.31 (core)

Uninstalled JIT Plugins:
community 3.3.33
custom-metadata 3.3.63
dev 2.5.1
devops-center 1.2.27
flow 1.0.2
signups 2.6.39
@salesforce/sfdx-plugin-lwc-test 1.2.1
```

As shown in the sample output, if a plugin has `(core)` next to its name, it's the version bundled with the CLI. If you install a specific version of the plugin, or it was automatically installed as a JIT plugin, its version number or tag is displayed instead. For example, the `code-analyzer` commands are contained in the JIT `code-analyzer` plugin and the sample output indicates that version `5.3.0` is installed.

The end of the `plugins --core` output also displays the available JIT plugins that haven't yet been installed.

SEE ALSO:

Install Other Versions of Salesforce CLI Plugins

Discover Salesforce Plugins

Salesforce CLI Plugin Developer Guide

Install a CLI Plugin

You can extend the functionality of the core Salesforce CLI by installing a plugin, which is a set of CLI commands that are grouped in an npm package. The plugin can come from a variety of providers: Salesforce, a third party, or even one that you create yourself. Salesforce CLI plugin installs work similarly to npm installs.

An example of a non-core plugin provided by Salesforce is DevOps Center. The examples in this topic use this plugin.

The typical way to install a plugin is to specify its long name with the `plugins install` command. This method installs the latest release of the plugin. The long name is the `name` property in the plugin's `package.json` file, such as `@salesforce/plugin-devops-center`.

```
sf plugins install @salesforce/plugin-devops-center
```

To install a specific release of a plugin, specify its tag with the `@` character after the long name.

```
sf plugins install @salesforce/plugin-devops-center@1.2.27
```

SEE ALSO:

Salesforce DevOps Center Documentation

npm Documentation: npm install

sf Plugin Developer Guide

Install Other Versions of Salesforce CLI Plugins

Sometimes you want to use a specific version of a plugin. For example, let's say Salesforce fixed a bug in the `apex run` command. The fix has been released in the associated plugin, but Salesforce hasn't yet included that plugin release in the current Salesforce CLI. But you want to test the bug fix in your local development environment. Follow these steps to install the version of the plugin that has the fix.

1. Determine the plugin that contains the command by running the `which` command. This example shows that the `apex run` command is in the `plugin-apex` plugin.

```
sf which apex run
=== apex run

plugin: @salesforce/plugin-apex
```

2. Find the plugin's repository with the Salesforce CLI Status page. Then navigate to its GitHub repo, such as @salesforce/plugin-apex, which lists all the releases and tags.

3. Install the version that contains the bug fix. For example, to install version `2.2.22` of the `apex` plugin, run this command:

```
sf plugins install apex@2.2.22
```

The preceding example uses the plugin's short name, which is shown in the output of `sf plugins --core`. You can also use the plugin's long name, which is the `name` property in the plugin's package.json file.

```
sf plugins install @salesforce/plugin-apex@2.2.22
```

When you now run `sf plugins --core`, the `apex` plugin entry shows the newly installed version rather than `(core)`.

```
apex 2.2.21 (2.2.22)
```

4. When you finish testing, go back to using the current version of the plugin by uninstalling the tagged version.

```
sf plugins uninstall apex
```

Important: When you install a specific plugin version using a tag, such as `2.2.22`, you stay with that tag until you explicitly uninstall it.

Install Trusted Unsigned Plugins Automatically

When you install a plugin with the `sf plugins install` command, Salesforce CLI first verifies its digital signature. If the plugin provides a valid signature, the CLI installs it. Otherwise, Salesforce CLI doesn't install it until you answer a warning prompt and acknowledge that you understand the risks. This process works well when you install a plugin interactively at the command line, but can prevent a batch job from completing. To automatically install a plugin without prompting, even when unsigned, create an allowlist file on your local file system and add the plugins you trust.

Warning: After you install a plugin and run one of its commands in a terminal, the command runs with your user privileges. As a result, the command can read encrypted data, communicate with any Salesforce org you authenticated to, or remove files in your home directory. Install only unsigned and unverified plugins that you trust.

1. Create a file called `unsignedPluginAllowList.json` and put it in one of these directories:
   - (Linux and macOS): `$HOME/.config/sf`
   - (Windows) Depending on your Windows configuration, either `C:\Users\username\.config\sf` or `%LOCALAPPDATA%\sf`
2. Add the names of the plugins you trust to the JSON file in a simple array of strings. For example:

```
[
    "sfdx-templates",
    "salesforce-cmdt",
    ...
]
```

Discover Salesforce Plugins

Check out these other plugins that work with specific Salesforce features. These plugins are created by Salesforce.

ISV Technical Enablement Plugin

The ISVTE plugin is an on-demand Technical Evangelist. It scans your package metadata and code, and provides targeted feedback to help you improve and future-proof your app. The feedback includes a detailed metadata inventory, recommendations on features or technologies to consider using, enablement resources, and installation limitations. The feedback also includes best practices, partner alerts, guidance on improving your partner Trailblazer score, and more. While it's designed for ISV and OEM partners, anyone developing on the platform can use it.

When you install the plugin, you're asked to confirm that it's unsigned. Answer *`yes`*. This behavior is expected.

See GitHub for documentation and more information.

CRM Analytics Plugin

CRM Analytics is a cloud-based platform for connecting data from multiple sources, creating interactive views of that data, and sharing those views in apps.

Use the CRM Analytics CLI plugin to create scratch orgs with Analytics Studio, which you can use to develop and test source code. The plugin includes commands that call a subset of the Analytics REST API endpoints to manage CRM Analytics assets programmatically. Create and iteratively develop CRM Analytics templates. Update and delete apps, dashboards, lenses, and dataflows. Use history commands to restore previous versions of dashboards and dataflows. Manage the auto-install lifecycle for embedded templated apps.

See Develop with the Analytics Plugin for the Salesforce CLI for documentation and more information.

Salesforce Code Analyzer Plugin

The Salesforce Code Analyzer plugin is a unified tool for static analysis of source code, in multiple languages (including Apex), with a consistent command-line interface and report output. We currently support the PMD rule engine, ESLint, and RetireJS.

The plugin creates "rule violations" when the scanner identifies issues. Developers use this information as feedback to fix their code. Integrate this plugin into your continuous integration (CI) solution to continually enforce the rules and ensure high-quality code.

See Salesforce Code Analyzer for documentation and more information.

Quickly Uninstall All Non-Core Plugins

Sometimes you want to quickly uninstall all the non-core Salesforce CLI plugins that were installed after you first installed the CLI.

Examples of non-core plugins include:

- Third-party plugins that you explicitly installed with the `plugins install` command.
- JIT plugins that were automatically installed when you ran one of their commands.
- Local plugins that you linked with the `plugins link` command.

To uninstall all non-core plugins, run this command.

```
sf plugins reset
```

After the command finishes, you're left with only the core Salesforce CLI plugins, as if you had installed the CLI from scratch.

To uninstall, then reinstall, all non-core plugins, specify the `--reinstall` flag.

```
sf plugins reset --reinstall
```

To remove all package manager-related files and directories (`node_modules`, `package.json`, `yarn.lock`, `package-lock.json`) from Salesforce CLI's internal data directory, specify the `--hard` flag.

```
sf plugins reset --hard
```

CHAPTER 10 Troubleshoot Salesforce CLI

In this chapter ...

Here's a list of Salesforce CLI errors and how to fix them.

Check Our GitHub Repository for Issues and Discussions

Don't see your problem in this section? Then check out the issues that our customers and open-source community enter in the top-level Salesforce CLI GitHub repository.

Click the Issues tab to find both open and closed bugs. Use the filters to search for issues that match the one you're experiencing, and add your voice in the comments! Click the Discussions tab to read about the discussions we're having about new features. You can join a discussion if you want, or even create a new issue or discussion. We love feedback!

We also publish the weekly release notes in this GitHub repository.

Use the Doctor to Troubleshoot Problems

Quickly gather Salesforce CLI configuration data and run diagnostic tests with the `doctor` command. The main use case of the command is to easily generate information files that you can attach to GitHub issues or provide to Salesforce Customer Support. You can also use the `doctor` command to troubleshoot Salesforce CLI problems by interpreting the output yourself.

Run without flags, the command first displays basic information, such as whether you're on the latest CLI version. It then writes your configuration and a detailed diagnosis to a JSON file in the current directory. Use the `--output-dir` flag to specify a different directory. The name of the file is `<timestamp>-diagnosis.json`, such as `1708472775780-diagnosis.json`.

```
sf doctor --output-dir diagnostic-files
```

The CLI doctor is in and ready to diagnose all your problems!

Run the Doctor on a Specific Command or Plugin

Use the `--command` flag to run a specific command in debug mode. Encapsulate the command in double quotes. The doctor generates two additional log files, one for the standard output (`stdout`) and another with debug information (`stderr`). The log files are called `<timestamp>-command-stdout.log` and `<timestamp>-command-debug.log`, respectively.

```
sf doctor --command "org list --all"
```

To run diagnostic tests on a specific plugin, rather than Salesforce CLI itself, use the `--plugin` flag. If the plugin isn't listening to the doctor, then you get a warning and no data.

```
sf doctor --plugin @salesforce/plugin-deploy-retrieve
```

Create a GitHub Issue

To create a GitHub issue, use the `--create-issue` flag, enter a title at the prompt, and a browser window automatically opens with a partially filled GitHub issue. Enter the remaining information about your specific issue, click **Submit new issue**, and the Salesforce CLI team is alerted about your issue.

Interpret the Initial Doctor Output

The `doctor` command first outputs basic information to the terminal about your Salesforce CLI installation in the form of diagnostic tests and whether they passed or failed, as shown in this sample output. The command outputs more comprehensive information to a file in the specified location.

```
sf doctor --output-dir diagnostic-files
=== Running all diagnostics

pass - salesforcedx plugin not installed
fail - no linked plugins
warn - [@salesforce/plugin-deploy-retrieve] sourceApiVersion matches apiVersion
pass - using latest or latest-rc CLI version
...
```

Note: The `doctor` command includes a set of diagnostic tests that always run. Plugin developers can also add custom diagnostic tests to the `doctor` command. If you've installed additional plugins that have these customizations, then your output looks different.

Each test that results in a `fail` or `warn` usually has a corresponding suggestion in the Suggestions section at the end of the output; make sure that you check them out!

Let's look at the diagnostic tests that always run, and what you can do if they fail.

- **Test Name**: `salesforcedx plugin not installed`

  What it does: Checks whether the `salesforcedx` plugin is installed. Having the plugin installed is an error, because the Salesforce CLI team stopped supporting it, and then removed it from the core CLI, many years ago. But some CLI installations continue to have it installed, which can cause problems.

  If you get a `fail` result for this test, then your installation includes the `salesforcedx` plugin. You must uninstall it and update to the latest CLI version:

  ```
  sf plugins uninstall salesforcedx
  sf update
  ```

- **Test Name**: `no linked plugins`

  What it does: Checks for any linked plugins in the CLI. Because the test checks for an *absence* of linked plugins, a `pass` means no linked plugins are detected, and a `fail` means that the `doctor` command detected at least one linked plugin. Linked plugins are plugins that you install from local files with the `plugins link` command.

  If you get a `fail` for this test, see the Suggestions section at the end of the `doctor` output for the list of linked plugins. If you explicitly linked these plugins, great! If, however, you see a plugin that you don't want linked, unlink it so you use the plugin version that's included in Salesforce CLI. Another problem with linked plugins is that they aren't updated when you update the CLI. Here's how to unlink a plugin:

  ```
  sf plugins unlink my-plugin
  ```

- **Test Name**: `[@salesforce/plugin-deploy-retrieve] sourceApiVersion matches apiVersion`

  What it does: Checks whether the values of the `apiVersion` and `sourceApiVersion` variables are the same. Salesforce CLI uses the API version and source API version when deploying and retrieving metadata to and from the org.

  If you get a `fail` or a `warn`, see the Suggestions section at the end of the `doctor` output for an explanation of why the test didn't pass. For example, the values might be the same because you haven't explicitly set them, and so they both default to the same value. If you desire this behavior, you don't need to do anything.

See How API Version and Source API Version Work in Salesforce CLI for more information about how these two variables interact.

- **Test Name**: `using latest or latest-rc CLI version`

  What it does: Checks whether the Salesforce CLI version is either the latest or the release candidate.

  If you get a `fail`, we recommend that you update to the latest release of Salesforce CLI if possible. See Update Salesforce CLI for more information.

  The `doctor` command also checks whether you're using `sfdx` (v7) or `sf` (v1), both of which are deprecated. If you see this warning, read Move from sfdx (v7) to sf (v2) for information on how to move to `sf` (v2).

Interpret the Diagnostic File Information

After displaying basic information in the terminal, the `doctor` command then creates a JSON diagnostic file in the current directory, or the directory specified by the `--output-dir` flag. Let's look at the main JSON objects and keys, and the diagnostic information they provide.

versionDetail

Provides version information about Salesforce CLI and your computer, similar to the output of the `sf version --verbose` command. The JSON key names are self-explanatory, but here's a recap anyway.

- `cliVersion`—Version of the installed Salesforce CLI.
- `nodeVersion`—Version of Node.js that Salesforce CLI is using.
- `osVersion` and `architecture`—Operating system version and architecture of your computer.
- `rootPath`—Location of the Salesforce CLI binary file.
- `pluginVersions`—List of core and user-installed plugins, along with their versions. User-installed plugins include the JIT plugins, such as `packaging` and `devops-center`.

sfdxEnvVars and sfEnvVars

Lists the environment variables that are set for your Salesforce CLI installation. The list includes user environment variables that you've explicitly set and internal variables that Salesforce CLI sets. See Salesforce CLI Environment Variables for list of user environment variables.

The `sfdxEnvVars` JSON object lists the deprecated `SFDX_` environment variables. Even though they're deprecated, they still affect the behavior of Salesforce CLI. The `sfEnvVars` object lists the `SF_` environment variables.

Most of the deprecated `SFDX_` environment variables have an `SF_` equivalent with a similar name, such as `SFDX_HIDE_RELEASE_NOTES` and `SF_HIDE_RELEASE_NOTES`. Some environment variables had bigger name changes between SFDX and SF, see the Environment Variables section of the Migration Guide for details. If you set these `SFDX_` and `SF_` equivalent pairs to different values, the `SF_` environment variable takes precedence.

Note: We highly recommend that you use only the `SF_` environment variables.

Check the values of the user environment variables and ensure they're what you expect and want. If you see a value you don't want, determine how you've set the environment variable and change it as needed.

cliConfig

Lists the Salesforce CLI configuration settings, most of which are used by the underlying oclif framework, which Salesforce CLI is built on. A few examples include:

- `binPath`—Name and location of the `sf` binary.
- `cacheDir`—Directory that Salesforce CLI uses for internal caching.
- `configDir`—Directory in which Salesforce CLI stores internal configuration data.
- `dataDir`—Directory in which Salesforce CLI stores data.
- `name`—The npm name of Salesforce CLI, which is `@salesforce/cli`.
- `theme`—The default color theme for `--help` messages.
- `shell`—Shell you're using, such as `bash` or `zsh`. The value is oclif's best guess, but this information is notoriously difficult to glean, so the value can be wrong or unknown, especially on Windows computers.

See the oclif documentation for more information.

pluginSpecificData

If you ran the `doctor` command with either the `--command` or `--plugin` flag, and the associated plugin is listening to the doctor, then this section contains additional diagnostic information about the plugin. If the plugin isn't listening, then this section is empty.

By default, the doctor runs all diagnostic tests, including all plugin-defined tests. You can target tests for a specific plugin using the `--plugin` flag as a way to reduce some noise or if you're a plugin author writing new doctor tests.

Debug Errors When Deploying or Retrieving Source

When you run `project deploy start` or `project retrieve start`, Salesforce CLI creates a temporary directory with all the metadata files, and then deletes the directory upon successful completion of the command. If you run into errors when executing either command, retaining these files can be useful for debugging purposes.

Sometimes you want to inspect the retained files even if you don't run into an explicit error. Let's say, for example, that your deployment completes successfully, but when you check your org, the deployed components look different from what you expect. You can inspect the metadata files before Salesforce sent them to the org and possibly find the problem. Similarly, if a retrieve completes successfully, but the source files in your package directory aren't what you expect, or something is missing, you can inspect the metadata format files that were initially retrieved from the org, but before they were converted to source format.

How To Retain Temporary Metadata Files

To retain all the metadata files in a directory when you run the `project deploy start` and `project retrieve start` commands, set the SF_MDAPI_TEMP_DIR environment variable to the directory path.

This example, run from a DX project directory, shows how to set the environment variable for a single retrieve.

```
SF_MDAPI_TEMP_DIR=mdapiout sf project retrieve start
```

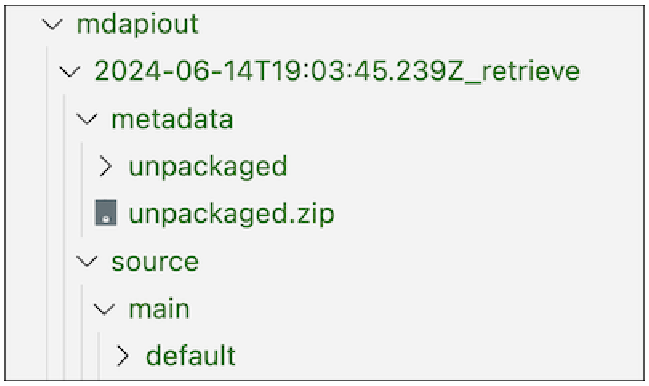
When the command completes, the retained files are in a subdirectory of the `mdapiout` directory. The subdirectory's name consists of the timestamp when you ran the command, and either the suffix `_retrieve` or `_deploy`, depending on whether the command was a retrieve or a deploy.

The format and location of the retained files depends on whether you ran a retrieve or a deploy:

- For retrieves, the retained files are in both formats and in their own directories (`metadata` and `source`). The `metadata` directory includes the downloaded metadata `.ZIP` file, the unzipped metadata format files, and the `package.xml` file.
  The `source` directory contains the converted files in source format.

- For deploys, the retained files are only in metadata format in the `metadata` directory, along with the `package.xml` file. There are no source-format files because they're already in your package directory.

Here's what the `mdapiout` directory looks like after running `project retrieve start` with SF_MDAPI_TEMP_DIR set.



Error: Bad CPU Type

You get the error `Bad CPU type in executable` when you try to install Salesforce CLI on macOS.

Answer: Make sure you download and install the correct `.pkg` file for your macOS computer. Our download page provides two macOS flavors based on the computer's processor: Apple Silicon and Intel CPU.

To determine which type of processor your computer is using, see this Apple Support document.

Where is Salesforce CLI Installed?

When troubleshooting installation problems, it's often useful to know which directories Salesforce CLI is installed in.

Run this command and search the output for the `location` property, which points to the global Salesforce CLI installation directory. The command works for all types of installations: installers, `npm`, and TAR files.

```
sf plugins inspect @salesforce/cli
```

In this sample output, Salesforce CLI is installed in the `/Users/astro/.local/share/sf/client/2.25.7-b42201f` directory.

```
sf plugins inspect @salesforce/cli
└─ @salesforce/cli
   ├─ version 2.25.7
   ├─ homepage https://github.com/salesforcecli/cli
   ├─ location /Users/astro/.local/share/sf/client/2.25.7-b42201f
   ├─ commands
   │  ├─ cmdt:generate:field
      ...
   └─ dependencies
      ├─ @inquirer/select ^1.3.1 => 1.3.1
      ...
```

To find the directories in which the plugins are installed, set the DEBUG environment variable to `sf` and run the `version` command. For example:

```
DEBUG=sf sf version
```

The `data` property in the output contains the directory that contains the installed plugins. In this truncated sample output, plugins are installed in the `/Users/astro/.local/share/sf` directory.

```
DEBUG=sf sf version
  sf                          OS: +0ms
  sf                    platform: darwin +1ms
  sf                architecture: x64 +0ms
  sf                     release: 23.2.0 +0ms
  sf                       shell: bash +0ms
  sf                        NODE: +0ms
  sf                     version: 20.10.0 +0ms
  sf                         CLI: +0ms
  sf                     version: 2.25.7 +0ms
  sf                     channel: stable +0ms
  sf                         bin: sf +0ms
  sf                        data: /Users/astro/.local/share/sf +0ms
  sf                       cache: /Users/astro/Library/Caches/sf +0ms
  sf                      config: /Users/astro/.config/sf +0ms
  sf                         ENV: +1ms
  sf                  SF_BINPATH: /Users/astro/.local/share/sf/client/bin/sf +0ms
  sf               SF_REDIRECTED: 1 +0ms
...
```

Error: Command Failed with ENOENT

After recently installing Salesforce CLI, you get this error when you run a command such as `project generate`.

```
ERROR running project generate:  Command failed with ENOENT: npm root -g --prefix
/Users/johndoe/Documents/sf_workspaces/.yo-repository --loglevel error
spawnSync npm ENOENT
```

Answer: Install Node.js.

Error After Installing Salesforce CLI on PowerShell Using npm

After installing Salesforce CLI on Windows PowerShell using npm, you get a security policy error whenever you try to execute any CLI command. Installing with the Windows-specific installer works correctly.

The error looks something like this:

```
sf : File C:\Users\<username>\AppData\Roaming\npm\sf.ps1 cannot be loaded because running
 scripts is disabled on this system
```

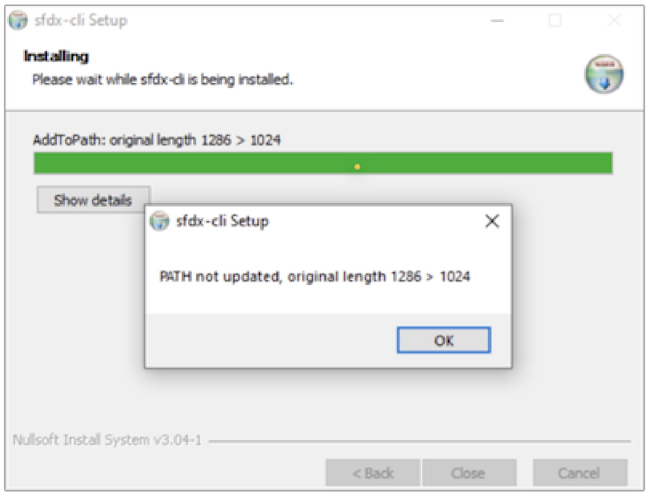
The problem is that you have a PowerShell execution policy configured for your computer that's blocking Salesforce CLI from working correctly.

To fix the error, work with your administrator to manage the policy settings on your computer to disable the one that's blocking Salesforce CLI. For more information, see about_Execution_Policies in the Microsoft PowerShell documentation.

Error Installing on Windows About the PATH Not Updated

While installing Salesforce CLI on Windows using the `*.exe` installer executable, you get the error `PATH not updated, original length XX > 1024`, where `XX` is a number greater than 1024.

The error looks something like this:


sfdx-cli Setup
Installing
Please wait while sfdx-cli is being installed.
Show details
Nullsoft Install System v3.04-1
< Back
Close
Cancel
sfdx-cli Setup
OK

AddToPath: original length 1286 > 1024

PATH not updated, original length 1286 > 1024

The problem is that your PATH environment variable has a value whose string length is greater than 1024. This limitation isn't from Salesforce CLI; rather, it's a limitation of the Nullsoft Scriptable Install System (NSIS), which Salesforce CLI uses for its Windows installer. The installer is checking for the PATH length on your computer to make sure that NSIS fails gracefully and doesn't get into a bad state.

To fix the problem, manually update your PATH variable to be shorter, such as removing unneeded paths. Check your Windows documentation for details.

Warning: Be careful updating your PATH variable, especially the one in your System Variables; updating it incorrectly can cause major headaches. Check with your admin, just to be sure.

CHAPTER 11 CLI Deprecation Policy

Salesforce deprecates CLI commands and flags when, for example, the underlying API changes.

The Salesforce CLI deprecation policy is:

- Salesforce announces new and upcoming deprecations of commands and flags in the weekly Salesforce CLI release notes.
- Salesforce can deprecate a command or flag at any time.
- When you run the deprecated command, Salesforce provides a deprecation warning for a minimum of 4 months.
- Salesforce removes the deprecated command or flag 4 months, or more, after the deprecation warning first appears.
- If you use a command or flag that's been deprecated but not yet removed, you get a warning message in `stderr` in the human-readable output. If you specify JSON output, the warning is presented as a property. The message includes the plugin version in which we plan to remove the command or flag. The command help also includes deprecation information when appropriate.
- When possible, Salesforce provides a functional alternative to the deprecated command or flag.
- For our policy on changes to a Salesforce CLI command's JSON response, see Support for JSON Responses.

SEE ALSO:

Salesforce CLI Weekly Release Notes

CHAPTER 12 Next Steps

Read on to learn what to do after you've installed Salesforce CLI.

Check out the examples in the Sample Gallery. The gallery contains sample apps that show what you can build on the Salesforce platform. They're continuously updated to incorporate the latest features and best practices.

Ramp up quickly on Salesforce CLI with the Quick Start: Salesforce DX Trailhead project. Then dive right into development with the Build Apps Together with Package Development trail.

Looking for a more visual developer experience? We got you covered! Check out Salesforce Extensions for VS Code, which is built on Salesforce CLI.

Read the Salesforce DX documentation:

- *Salesforce DX Developer Guide* to learn how to manage and develop apps on the Salesforce Platform across their entire lifecycle.
- *Salesforce CLI Command Reference* for the complete list of CLI commands and how to use them.
- *Salesforce CLI Plugin Developer Guide* to learn how to develop your own plugins for Salesforce CLI.

Development Pathways

Salesforce CLI is a powerful tool that you can use to develop applications in many different ways. Here are some common pathways, with the required steps to get you started and suggestions on what to do next.

Get Started: Use Scratch Orgs for Development

A scratch org is a source-driven and disposable deployment of Salesforce code and metadata. Scratch orgs drive developer productivity and collaboration during the development process, and facilitate automated testing and continuous integration.

1. As the Admin user, enable Dev Hub in your Developer Edition, trial, or production org (if you're a customer), or your business org (if you're an AppExchange partner).

   If you don't have an org, sign up for a free Developer Edition org on the Salesforce Developers website.

2. If you want your dev team to create scratch orgs, add them to your Dev Hub org.
3. (Optional) Turn on Einstein Features in your Dev Hub to eliminate the manual steps for enabling the chatbot feature in scratch orgs.
4. Clone a sample Salesforce DX project from GitHub and try out the most common CLI commands. Then check out the *Salesforce DX Developer Guide* and learn about Salesforce DX project configuration, scratch orgs, synchronizing your code, and other developer topics.

Get Started: Develop Second-Generation Managed Packages

As an AppExchange partner, use second-generation managed packaging (2GP) to organize your source, build small modular packages, integrate with your version control system, and better use your custom Apex code.

1. As the Admin user, enable Dev Hub in your Developer Edition, trial, or production org (if you're a customer), or your business org (if you're an AppExchange partner).

   If you don’t have an org, sign up for a free Developer Edition org on the Salesforce Developers website.

2. In the Dev Hub, enable Second-Generation Packaging.
3. If you want your dev team to create 2GP managed packages add them to your Dev Hub org.
4. Read all about 2GP managed packages and how to create them in the *Salesforce DX Developer Guide*.

Get Started: Use a Sandbox

Sandboxes are copies of your Salesforce org that you can use for development, testing, and training, without compromising the data and applications in your production org. You can turn on source tracking in your production org so Developer and Developer Pro sandboxes automatically track changes between the production org and your local development workspace.

1. Enable source tracking in your sandbox.
2. Learn how to use Salesforce CLI to create, manage, and develop with sandboxes by reading the *Salesforce DX Developer Guide*.

SEE ALSO:

Salesforce DX Developer Guide

Salesforce CLI Command Reference

Salesforce CLI Plugin Developer Guide

CHAPTER 13 Salesforce CLI Release Notes

Use the Release Notes to learn about the most recent updates and changes to Salesforce CLI.

We release new versions of Salesforce CLI weekly. Read the weekly release notes to learn about new features, changes, and bug fixes in both the current release and the release candidate.