HashiCorp Terraform - Terraform Enterprise API LifeCycle

Pre-Requisites

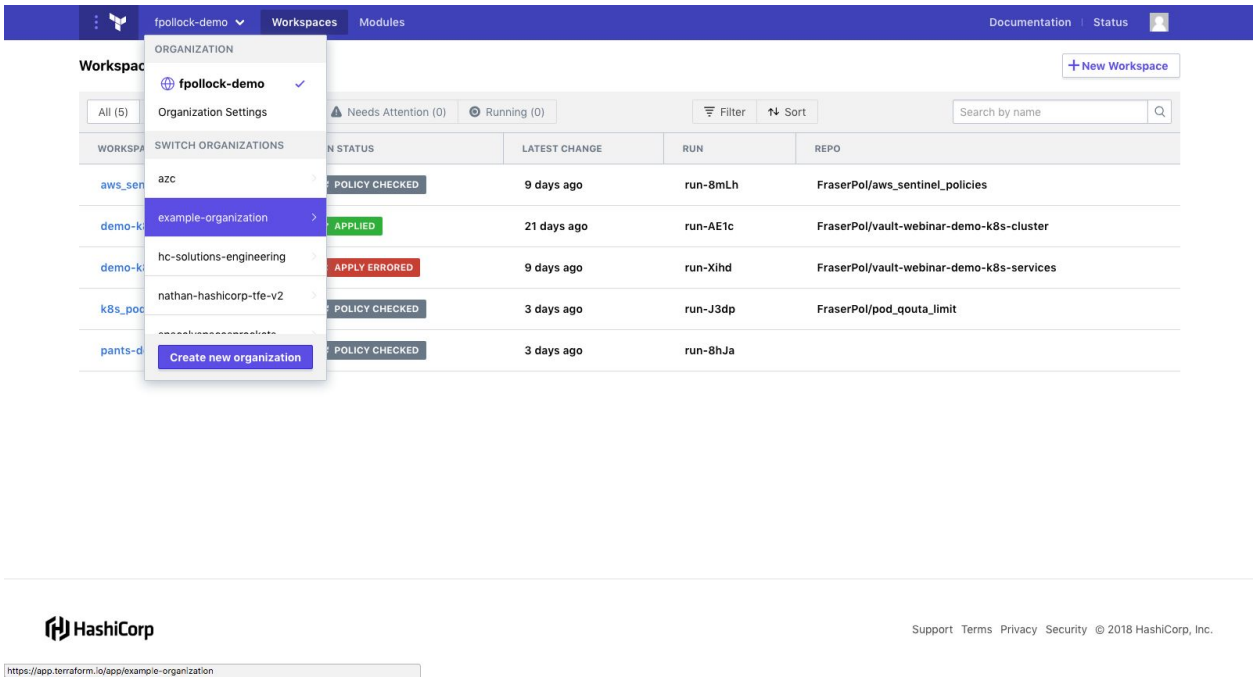
- An Organization is created on Private Terraform Enterprise or SaaS Terraform Enterprise
- User has the permissions and capability to get an **organization token** as well as their team/user token
- We'll be using JQ for the duration of this tutorial but its not required

This guide will go over the API-driven Run workflow for (P)TFE. You can use the following URL to follow along the logic or skip right into coding.

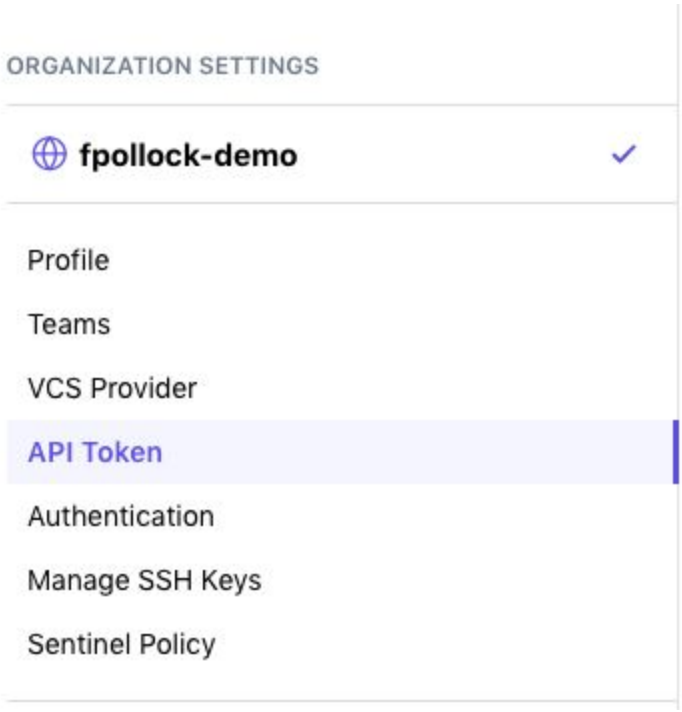
Step 1 - Create a Workspace

The user must create a workspace. Note: Workspace creation is restricted to members of the owners team, the owners team service account, and the organization service account. To interact with the API you need a authorization token. To create a workspace this needs to be an organization token. This can be acquired through the API or (P)TFE UI as follows;

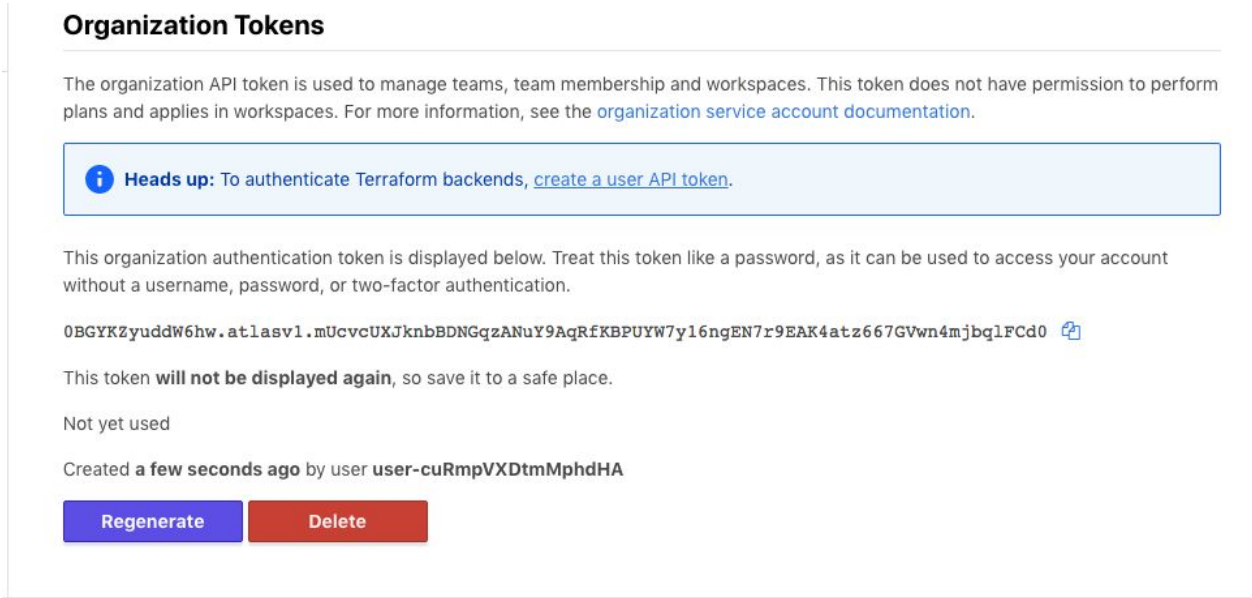
1. From the home page of Terraform Enterprise GUI select your organization drop down and "Organization Settings"



2. In the “Organization Settings” page then select “API Token”



3. Finally under “Organization Tokens” select either “Generate” if this is your first time or select “Regenerate” if you have created a token before

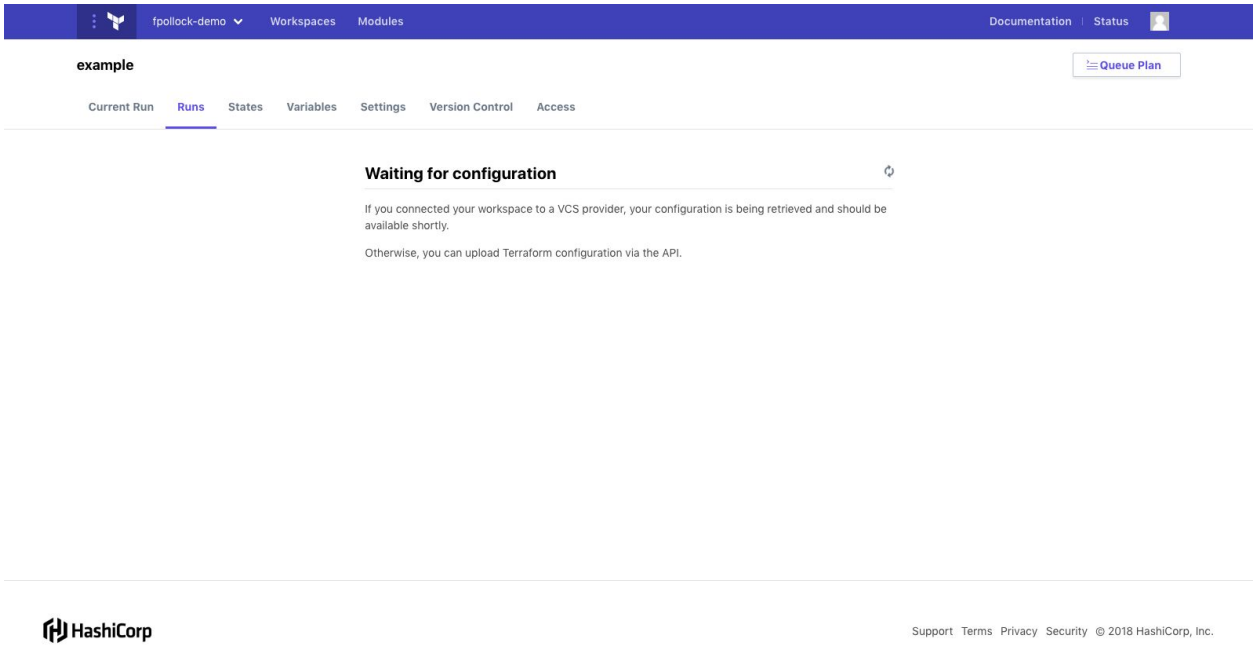


Once you have the token the next step is to actually create the Workspace. This particular guide is intended to create a Workspace without VSC backing for use in a CI/CD pipeline. The code to complete that is here.

Note - The response will contain a “id” field similar to “ws-o9L7sVHQMzAALezA”. This will be used in later POST.

Step 2 - Post Variables

Once a workspace is created through the API you’ll have a blank canvas to continue. If you look at your Workspace via the GUI you should now see a similar landing page



The next step for our ‘example’ Workspace is to configure our variables. There are two ways to do this. One is through the TFE-CLI which you can review here. The way we will be doing it is via the API.

The code required to do this can be found here. Remember you’ll need the workspace ID we got from our first step.

NOTE - TFE allows variables to be marked as sensitive, make sure you hide those cloud credentials!

NOTE - To loop through this in a more effective manner you can do a for statement, use this example to guide you.

NOTE - If you are doing this for PTFE ensure you have a filter for your organization and workspace!

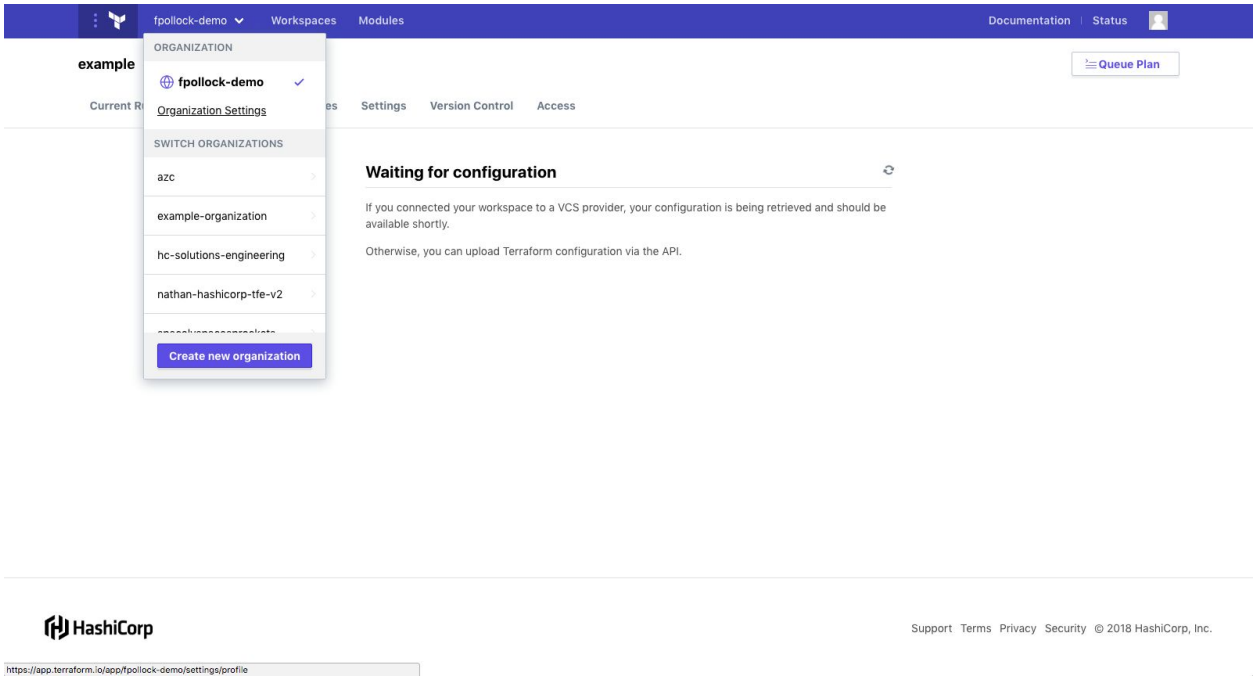
Here is an example - https://${address}/api/v2/vars?filter%5Borganization%5D%5Bname%5D=${organization}&filter%5Bworkspace%5D%5Bname%5D=${workspace}`

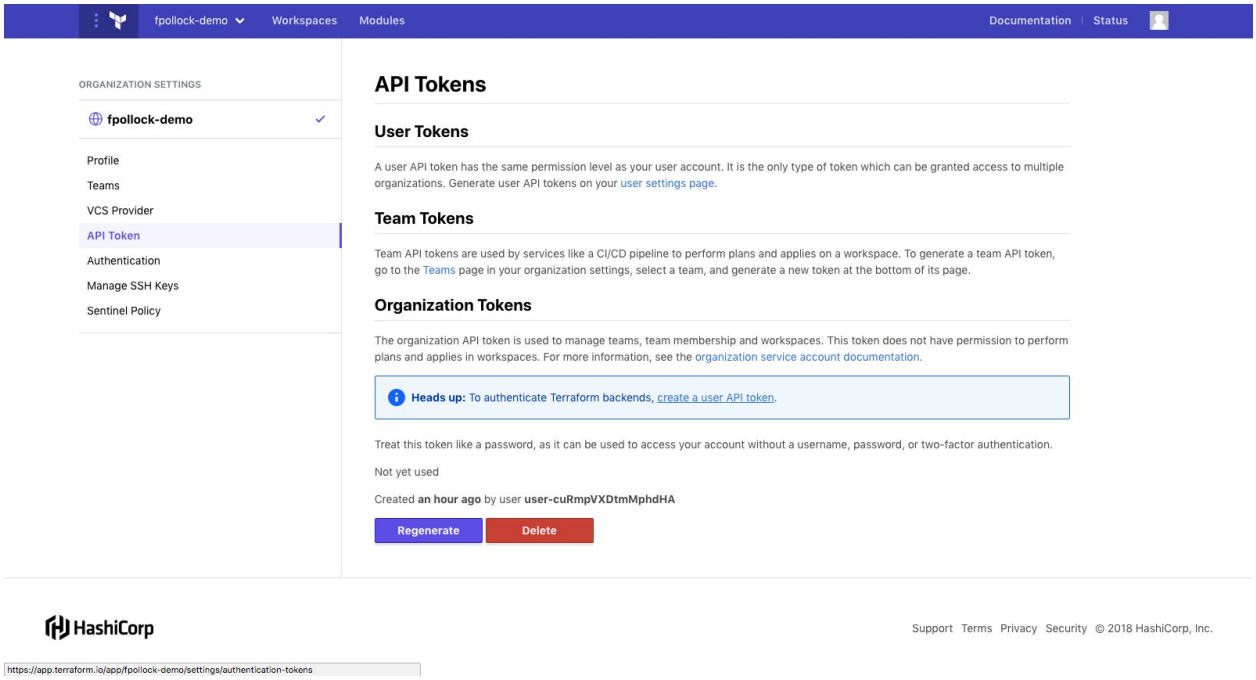
Step 3 - Creating a Configuration, Run and Apply

Performing a run on a new configuration is a multi-step process.

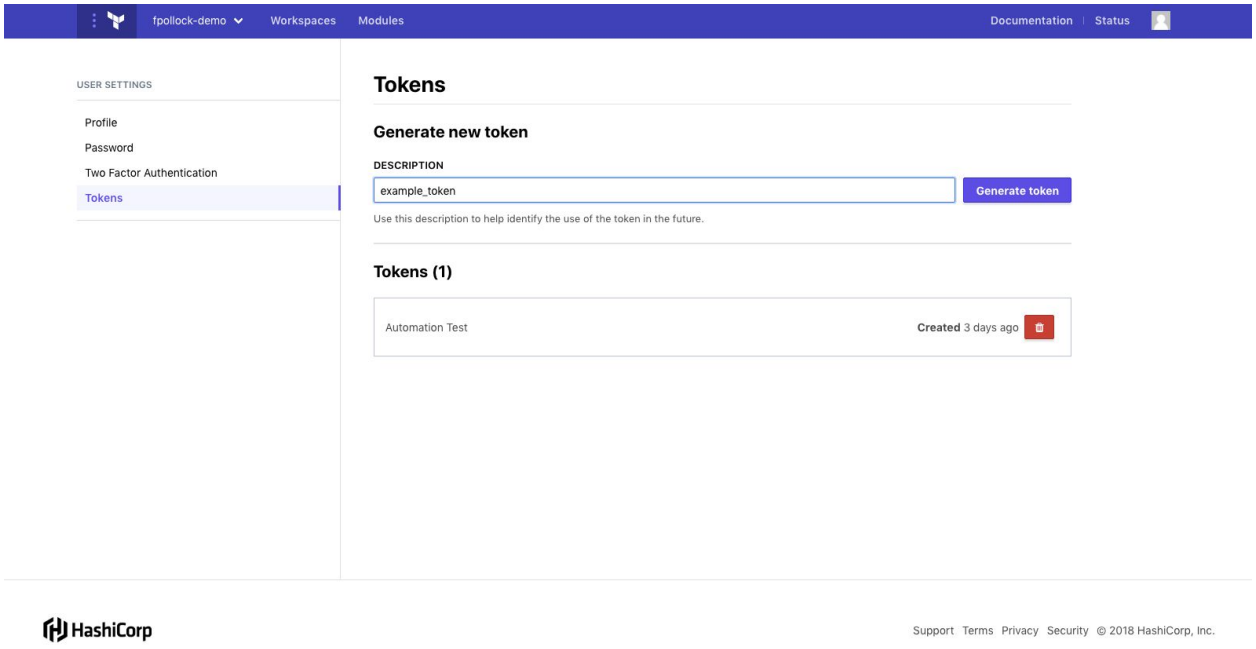
1. Create a configuration version on the workspace.
2. Upload configuration files to the configuration version.
3. Create a run on the workspace; this is done automatically when a configuration file is uploaded.
4. Create and queue an apply on the run; if auto-apply is not enabled.

This endpoint cannot be accessed with organization tokens. You must access it with a user token or team token. To get a user token we'll go back into our "Organization Settings" then into "API Tokens" and finally this time we'll select "User Tokens"





Give our token a name and click “Generate Token”



This token will not be displayed again, so save it to a safe place.

Now that we have a token to authenticate we can start to go through the steps to invoke a run. First we need to Create a configuration version on the workspace. The code to complete this can be found here.

Note: The upload-url will be needed later, that's where we're going to post our configuration later!

Now that we've got a configuration version we need to populate it with our Terraform code. The most significant difference in this workflow is that TFE *does not* fetch configuration files from version control. Instead, your own tooling must upload the configurations as a .tar.gz file. This allows you to work with configurations from unsupported version control systems, automatically generate Terraform configurations from some other source of data, or build a variety of other integrations.

The most important thing to note here is that when we upload our configuration we must make sure the main.tf is at the root of the uploaded folder as such;

- Example.tar.gz
    - main.tf
    - variables.tf
    - output.tf
    - modules
        - network
        - app

Once we've successfully zipped up our Terraform configuration the the next step is to upload it. The code to accomplish this is here.

NOTE - The upload URL should have came from your creating a configuration step

If in the first step you followed our example the run will be automatically que'd

Key path	Type	Default	Description
`data.attributes.auto-queue-runs`	boolean	true	When true, runs are queued automatically when the configuration version is uploaded.

If not you'll need to follow the extra steps to create a run on the workspace.

Finally the last thing we need to do is "Confirm the run" by Creating and queueing an apply on the run.

You can do this by listing all the runs in a workspace or by checking our last output for the run_id. The steps to apply are listed here.

Congratulations! You just created and invoked a run in TFE with the API. If you wanted to do an additional run you could start again at the step where we created the configuration and repeat.

If you want additional references or code to review you can see the API Driven Workflow logic here the entirety of the TFE API Documents here and also a reference guide here.