

Terraform Cloud Workload Identity for AWS

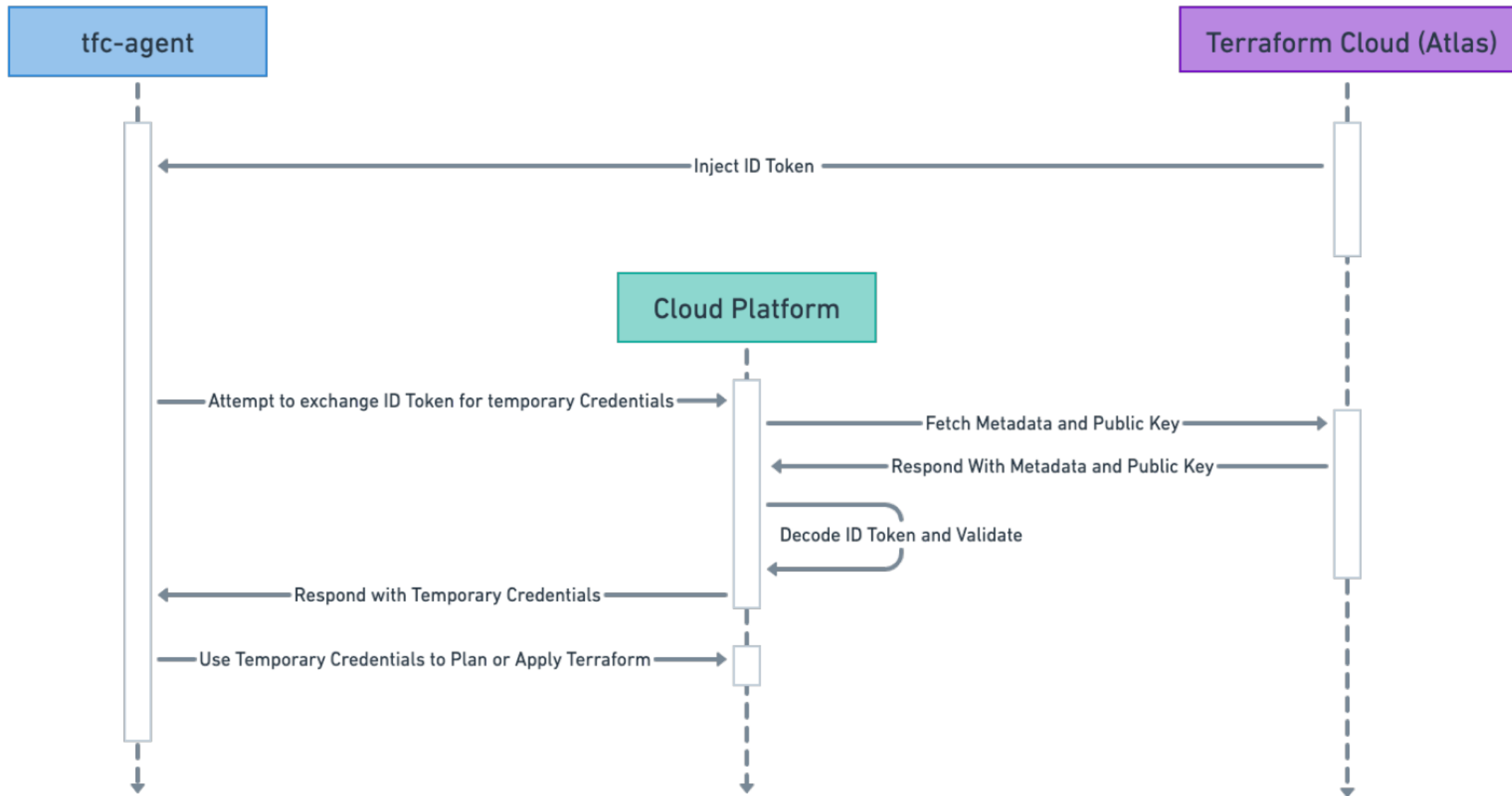
Assuming AWS IAM Roles from workspaces

Introduction

- Assume IAM Roles from Terraform Cloud/Terraform Enterprise
- **Requires Terraform Cloud/Enterprise Agents**

Why?

- No more static AWS Credentials on TFC
- No more secrets rotation (manual or otherwise)
- No more complicated Vault setup
- Secure ephemeral and dynamic credentials used to interact with AWS APIs



Setup

- Setup OIDC Provider in AWS
- Create IAM role with appropriate trust policy
- Deploy TFC Agents with pre-plan and pre-apply hooks
- Add environment variables in TFC

OIDC Tokens

```
{
  "typ": "JWT",
  "alg": "RS256",
  "kid": "j-fFp9evPJAzV5I2_58HY5UvdCK6Q4LLB1rnPOUfQAk"
}
{
  "jti": "1192426d-b525-4fde-9d42-f238be437bbd",
  "iss": "https://app.terraform.io",
  "aud": "my-example-audience",
  "iat": 1650486122,
  "nbf": 1650486117,
  "exp": 1650486422,
  "sub": "organization:my-organization-name:workspace:my-workspace-name:run_phase:apply",
  "terraform_run_phase": "apply",
  "terraform_workspace_id": "ws-mbsd5E3Ktt5Rg2Xm",
  "terraform_workspace_name": "my-example-workspace",
  "terraform_organization_id": "org-GRNbCjYNpBB6NEH9",
  "terraform_organization_name": "my-example-organization",
  "terraform_run_id": "run-X3n1AUXNGWbfECsJ"
}
```

Injected as environment variable `TFC_WORKLOAD_IDENTITY_TOKEN`

aud and sub

- `sts:AssumeRoleWithWebIdentity`
- IAM Conditions only **supports** matching on `aud` and `sub` .

AWS Setup

- Module published at <https://github.com/SPHTech-Platform/terraform-aws-tfc-workload-identity>

```
module "tfc" {  
  source = "SPHTech-Platform/tfc-workload-identity/aws"  
  version = "~> 0.1.0"  
  
  tfc_oidc_provider_audiences = ["tfc.workload.identity"]  
  tfc_workload_identity_workspaces = {  
    my-org = [  
      "my-workspace",  
    ]  
    my-second-org = [  
      "special-workspaces-*,  
    ]  
  }  
}
```


OpenID Connect Provider

```
locals {
    oidc_provider_url = "https://app.terraform.io"
}

data "tls_certificate" "tfc_certificate" {
    url = local.oidc_provider_url
}

resource "aws_iam_openid_connect_provider" "tfc_provider" {
    url = local.oidc_provider_url
    client_id_list = ["tfc.workload.identity"]
    thumbprint_list = [
        data.tls_certificate.tfc_certificate.certificates.0.sha1_fingerprint,
    ]
}
```

IAM Role

```
module "tfc_workload_identity_role" {
  source  = "terraform-aws-modules/iam/aws//modules/iam-assumable-role-with-oidc"
  version = "~> 5.3.0"

  create_role = true

  role_name = "tfc"
  role_policy_arns = [
    "arn:aws:iam::aws:policy/AdministratorAccess",
  ]

  provider_url = aws_iam_openid_connect_provider.tfc_provider.url

  oidc_subjects_with_wildcards    = ["organization:my-organization-name:workspace:my-workspace-name:run_phase:*"]
  oidc_fully_qualified_audiences = ["tfc.workload.identity"]
}
```

IAM Role Trust Policy

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "",
      "Effect": "Allow",
      "Principal": {
        "Federated": "arn:aws:iam::123456789001:oidc-provider/app.terraform.io"
      },
      "Action": "sts:AssumeRoleWithWebIdentity",
      "Condition": {
        "StringLike": {
          "app.terraform.io:aud": "tfc.workload.identity",
          "app.terraform.io:sub": "organization:my-org:workspace:my-workspaces:run_phase:*"
        }
      }
    }
  ]
}
```

TFC Agents

- Write injected OIDC Token to a file
- Use [hooks](#) to configure AWS Provider to use web identity federation
- Beware of AWS Provider credentials [precedence](#)!

Hooks

```
#!/bin/bash
set -euo pipefail

if [ -z ${TFC_AWS_APPLY_ROLE_ARN+x} ] && [ -z ${TFC_AWS_RUN_ROLE_ARN+x} ]; then
    echo "Skipping this script because both env vars are missing and unset";
else
    set +u
    ROLE_ARN="${TFC_AWS_APPLY_ROLE_ARN:-$TFC_AWS_RUN_ROLE_ARN}"
    set -u
    echo "Preparing AWS provider auth..."

    # Remove any previous identity tokens
    rm -f /.aws-workload/token-file
    echo "${TFC_WORKLOAD_IDENTITY_TOKEN}" > /.aws-workload/token-file

    mkdir ~/.aws
    rm -f ~/.aws/config
    {
        echo "[default]"
        echo "role_arn=${ROLE_ARN}"
        echo "web_identity_token_file=/.aws-workload/token-file"
        echo "role_session_name=${TFC_RUN_ID}"
    } >> ~/.aws/config

    echo "AWS provider auth prepared"
fi
```

TFC Workspace Environment Variables

- `TFC_WORKLOAD_IDENTITY_AUDIENCE` - Audience that must match the values in the OIDC provider and the IAM Role Trust policy.
- `TFC_AWS_RUN_ROLE_ARN` : ARN of IAM Role to be assumed or,
 - `TFC_AWS_PLAN_ROLE_ARN` : Plan role
 - `TFC_AWS_APPLY_ROLE_ARN` : Apply role

my-workspace

ID: ws-Zi3GUjMgbymvJM5a

Resources
456

Terraform version
~> 1.2.0

Updated
3 days ago

- Overview
- Runs
- States
- Variables
- Settings

Unlocked

Actions

Variables

Terraform uses all [Terraform](#) and [Environment](#) variables for all plans and applies in this workspace. Workspaces using Terraform 0.10.0 or later can also load default values from any *.auto.tfvars files in the configuration. You may want to use the Terraform Cloud Provider or the variables API to add multiple variables at once.

Sensitive variables

[Sensitive](#) variables are never shown in the UI or API, and can't be edited. They may appear in Terraform logs if your configuration is designed to output them. To change a sensitive variable, delete and replace it.

Workspace variables (4)

Variables defined within a workspace always overwrite variables from variable sets that have the same type and the same key. Learn more about variable set [precedence](#).

Key	Value	Category	
TFC_WORKLOAD_IDENTITY_AUDIENCE Workload Identity	tfc.workload.identity	env	...
TFC_AWS_RUN_ROLE_ARN Workload Identity	arn:aws:iam::12345678901:role/TfcWorkloadIdentity	env	...

+ Add variable

✓ Applied

Triggered via UI

CURRENT

 **yongwen-sph** triggered a **run** from UI 3 days ago

Run Details ▾

✓ **Plan finished** 3 days ago

Resources: 1 to add, 20 to change, 1 to destroy ^

Started 3 days ago > Finished 3 days ago

Agent pool workload-identity Agent tfc-workload-sph-aft-stg

+ 1 to create

~ 20 to change

- 1 to destroy

Filter resources by address...

Terraform 1.2.9

 Download raw log

```
Executing pre-plan hook...
Preparing AWS provider auth...
AWS provider auth prepared
```

**Warning: Reference to undefined provider**

on ../../modules/bootstrap/iam.tf line 7, in module "github_actions_oidc_provider":

```
aws = aws.aft_management
```

There is no explicit declaration for local provider name "aws" in module.bootstrap.module.github_actions_oidc_provider, so Terraform is assuming you mean to pass a configuration for "hashicorp/aws".

If you also control the child module, add a required_providers entry named "aws" with the source address "hashicorp/aws".

↕ aws module.bootstrap.data.aws_default_tags.this

↕ aws module.bootstrap.data.aws_dynamodb_table.account_request

↕ aws module.bootstrap.data.aws_iam_policy_document.api_helper_deploy

↕ aws module.bootstrap.data.aws_iam_policy_document.chatbot_iam_role

Wishlist

- `sts:AssumeRoleWithWebIdentity` to support arbitrary OIDC claims
- Match OIDC token against workspace tags