Deploy to multiple Azure subscriptions using Terraform

Houssem Dellai

Why multiple providers in Terraform ?

Deploying using multiple identities to multiple environments

Deploying to multiple Azure subscriptions

Deploying to multiple Azure AD tenants

Hub & Spoke architecture

Enterprise Landing Zone
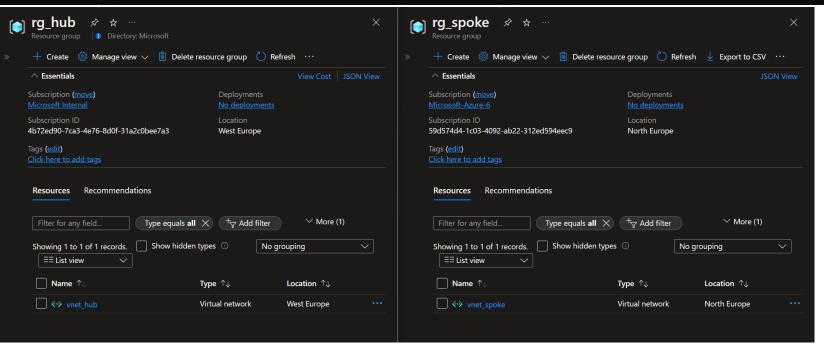
Using multiple providers in Terraform

```terraform
terraform {
  required_version = ">= 1.2.8"
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = ">= 3.26.0"
    }
  }
}

provider "azurerm" {
  alias               = "subscription_hub"
  subscription_id = "4b72ed90-7ca3-4e76-8d0f-xxxxxxxxxx"
  tenant_id       = "72f988bf-86f1-41af-91ab-xxxxxxxxxx"
  # client_id       = "a0d7fbe0-dca2-4848-b6ac-xxxxxxxxxxx"
  # client_secret   = "BAFHTR3235FEHsdfb%#$W%weF#@a"
  # auxiliary_tenant_ids = ["558506eb-9459-4ef3-b920-xxxxxxxxxx"]
  features {}
}

provider "azurerm" {
  alias               = "subscription_spoke"
  subscription_id = "59d574d4-1c03-4092-ab22-xxxxxxxxxx"
  tenant_id       = "558506eb-9459-4ef3-b920-xxxxxxxxxx"
  # client_id       = "a0d7fbe0-xxxxxxxxxxxxxxxxxxxxxx"
  # client_secret   = "BAFHTxxxxxxxxxxxxxxxxxxxxxxx"
  # auxiliary_tenant_ids = ["72f988bf-86f1-41af-91ab-xxxxxxxxxx"]
  features {}
}
```

```terraform
resource "azurerm_resource_group" "rg_hub" {
  provider = azurerm.subscription_hub
  name     = "rg_hub"
  location = "westeurope"
}

resource "azurerm_resource_group" "rg_spoke" {
  provider = azurerm.subscription_spoke
  name     = "rg_spoke"
  location = "northeurope"
}

resource "azurerm_virtual_network" "vnet_hub" {
  provider            = azurerm.subscription_hub
  name                = "vnet_hub"
  resource_group_name = azurerm_resource_group.rg_hub.name
  location            = "westeurope"
  address_space       = ["10.1.0.0/16"]
}

resource "azurerm_virtual_network" "vnet_spoke" {
  provider = azurerm.subscription_spoke
  name                = "vnet_spoke"
  resource_group_name = azurerm_resource_group.rg_spoke.name
  location            = "northeurope"
  address_space       = ["10.2.0.0/16"]
}
```

Using multiple providers in Terraform

```
$
$ terraform apply tfplan
azurerm_resource_group.rg_hub: Creating...
azurerm_resource_group.rg_hub: Creation complete after 1s [id=/subscriptions/4b72ed90-7ca3-4e76-8d0f-31a2c0bee7a3/resourceGroups/rg_hub]
azurerm_virtual_network.vnet_hub: Creating...
azurerm_virtual_network.vnet_hub: Creation complete after 5s [id=/subscriptions/4b72ed90-7ca3-4e76-8d0f-31a2c0bee7a3/resourceGroups/rg_hub/providers/M
icrosoft.Network/virtualNetworks/vnet_hub]
azurerm_resource_group.rg_spoke: Creating...
azurerm_resource_group.rg_spoke: Creation complete after 1s [id=/subscriptions/59d574d4-1c03-4092-ab22-312ed594eec9/resourceGroups/rg_spoke]
azurerm_virtual_network.vnet_spoke: Creating...
azurerm_virtual_network.vnet_spoke: Creation complete after 4s [id=/subscriptions/59d574d4-1c03-4092-ab22-312ed594eec9/resourceGroups/rg_spoke/provide
rs/Microsoft.Network/virtualNetworks/vnet_spoke]

Apply complete! Resources: 4 added, 0 changed, 0 destroyed.
$
```

rg_hub
Resource group
Directory: Microsoft

+ Create   Manage view ∨   🗑 Delete resource group   ↻ Refresh   ⋯

∧ Essentials   View Cost   JSON View

Subscription (move)   Deployments
Microsoft Internal   No deployments

Subscription ID   Location
4b72ed90-7ca3-4e76-8d0f-31a2c0bee7a3   West Europe

Tags (edit)
Click here to add tags

Resources   Recommendations

Filter for any field...   Type equals all ✕   + Add filter   ∨ More (1)

Showing 1 to 1 of 1 records.   ☐ Show hidden types ⓘ   No grouping ∨
≡ List view ∨

☐ Name ↑↓	Type ↑↓	Location ↑↓
☐ ⟨·⟩ vnet_hub	Virtual network	West Europe	⋯

rg_spoke
Resource group

+ Create   Manage view ∨   🗑 Delete resource group   ↻ Refresh   ↓ Export to CSV   ⋯

∧ Essentials   JSON View

Subscription (move)   Deployments
Microsoft-Azure-6   No deployments

Subscription ID   Location
59d574d4-1c03-4092-ab22-312ed594eec9   North Europe

Tags (edit)
Click here to add tags

Resources   Recommendations

Filter for any field...   Type equals all ✕   + Add filter   ∨ More (1)

Showing 1 to 1 of 1 records.   ☐ Show hidden types ⓘ   No grouping ∨
≡ List view ∨

☐ Name ↑↓	Type ↑↓	Location ↑↓
☐ ⟨·⟩ vnet_spoke	Virtual network	North Europe	⋯

Demo: deploying Terraform with multi providers

Lab: https://github.com/HoussemDellai/terraform-course/tree/main/25_multi_provider

Terraform multi providers with Azure AD

```
provider "azuread" {
  alias     = "tenant_hub"
  tenant_id = "72f988bf-86f1-41af-91ab-xxxxxxxxx"
  # use_cli = true
}

provider "azuread" {
  alias     = "tenant_spoke"
  tenant_id = "558506eb-9459-4ef3-b920-xxxxxxxxx"
  # use_cli = true
}
```

Resources for Terraform

Official labs: https://learn.microsoft.com/en-us/azure/aks/learn/tutorial-kubernetes-workload-identity

Workload Identity doc: https://learn.microsoft.com/en-us/azure/aks/workload-identity-overview

AKS labs: docker-kubernetes-course/readme.md at main · HoussemDellai/docker-kubernetes-course · GitHub