

## Documentation: Defining an AKS cluster with IaC

Task: Implementing the necessary resources using Infrastructure as code for automating the provisioning of an AKS cluster. To help with the launch of a Kubernetes cluster using Terraform, as with the network-module, an aks-cluster-module would be created to be comprised of 3 files also namely, variables.tf, main.tf and outputs.tf respectively. The input variables should have a description, type and a default value.

### Steps:

1. Variables.tf configuration file is used to define the input variables for this aks-cluster-module. These will allow for the customisation of various aspects of the AKS cluster. The following input variables were defined:
  - a. aks\_cluster\_name : this represents the name of the AKS cluster to be created.
  - b. cluster\_location : a variable that specifies the Azure region where the AKS cluster will be deployed to.
  - c. dns\_prefix variable that defines the DNS prefix of cluster.
  - d. kubernetes\_version variable that specifies which Kubernetes version the cluster will use.
  - e. service\_principal\_client\_id variable that provides the Client ID for the service principal associated with the cluster. The
  - f. service\_principal\_secret variable that supplies the Client Secret for the service principal.

Additionally, the output variables from the network module were added as input variables for this module:

- g. resource\_group\_name variable
- h. vnet\_id variable
- i. control\_plane\_subnet\_id variable
- j. worker\_node\_subnet\_id variable

Note that including these variables is important since the networking module plays an important role in establishing the networking resources for the AKS cluster. When configuring the cluster, it will be necessary to define the specific networking resources that the cluster will utilize.

2. Main.tf configuration file, defines the necessary Azure resources for provisioning an AKS cluster. This includes creating the AKS cluster, specifying the node pool and the service principal. The input variables defined in the previous task was used to specify the necessary arguments as shown below:

```
aks-terraform-main > aks-cluster-module > main.tf
1 resource "azurerm_kubernetes_cluster" "aks_cluster" {
2   name = var.aks_cluster_name
3   location = var.cluster_location
4   resource_group_name = var.resource_group_name
5   dns_prefix = var.dns_prefix
6   kubernetes_version = var.kubernetes_version
7
8
9
10  default_node_pool {
11    name = "default"
12    node_count = 1
13    vm_size = "standard_DS2_v2"
14    enable_auto_scaling = true
15    min_count = 1
16    max_count = 3
17  }
18
19  service_principal {
20    client_id = var.service_principal_client_id
21    client_secret = var.service_principal_secret
22  }
23
24 }
```

3. Outputs.tf: is a configuration file where the output variables of this module are defined to capture the essential information about the provisioned AKS cluster. The following output variables were defined:
  - a. aks\_cluster\_name variable that will store the name of the provisioned cluster.
  - b. aks\_cluster\_id variable that will store the ID of the cluster.
  - c. aks\_kubeconfig variable that will capture the Kubernetes configuration file of the cluster. This file is essential for interacting with and managing the AKS cluster using kubectl.

```
aks-terraform-main > aks-cluster-module > outputs.tf
1  ∨ output "aks_cluster_name" {
2      description = "Name of aks cluster"
3      value = azurerm_kubernetes_cluster.aks_cluster.name
4  }
5
6  ∨ output "aks_cluster_id" {
7      description = "ID of aks cluster"
8      value = azurerm_kubernetes_cluster.aks_cluster.id
9  }
10
11 ∨ output "aks_kubeconfig" {
12     description = "kubeconfig file for accessing the aks cluster"
13     value = azurerm_kubernetes_cluster.aks_cluster.kube_config_raw
14 }
```

4. Finally, pushed the latest IaC file to github. First while on the aks-cluster module directory add the files to git (git add <file name>), then commit the files (git commit -m <"description of action">). And git push command to push to git hub.