**Build Azure Landing Zone**

**using ARM Template**

(Virtual Network)

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# Introduction

The Cloud Adoption Framework (CAF) by Microsoft provides a structured approach to migrating, building, and managing applications in the cloud. One of the critical components of this framework is the Azure landing zone, which serves as a foundation for your cloud infrastructure. Azure ARM template simplifies the process of creating and managing these landing zones. This guide will walk you through the steps to build your Azure landing zone using ARM template.

# Prerequisites

Before we begin, ensure you have the following prerequisites in place:

* **Azure Subscription**: Ensure you have an active Azure subscription.
* **Azure CLI or Azure PowerShell**: Install Azure CLI or Azure PowerShell locally or use the Azure Cloud Shell available in the Azure portal.
* **Access**: Ensure you have the necessary permissions to deploy resources in the chosen Azure subscription and resource group.

# Setting Up Your Environment

Below is a high-level outline for creating a basic Azure Landing Zone using an ARM template. This template provides flexibility for:

* Single VNet
* Hub-and-Spoke architecture
* Single VNet with a third-party NVA
* Single VNet with Azure Firewall
* Hub-and-Spoke architecture with NVA or Azure Firewall

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| --- |
| JSON |
| {  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",  "contentVersion": "1.0.0.0",  "parameters": {  "architectureType": {  "type": "string",  "allowedValues": [  "SingleVNet",  "HubAndSpoke",  "SingleVNetWithNVA",  "SingleVNetWithFirewall",  "HubAndSpokeWithNVAOrFirewall"  ],  "defaultValue": "SingleVNet",  "metadata": {  "description": "Choose the network architecture to deploy."  }  },  "location": {  "type": "string",  "defaultValue": "eastus",  "metadata": {  "description": "Location for the resources."  }  },  "vnetAddressPrefix": {  "type": "string",  "defaultValue": "10.0.0.0/16",  "metadata": {  "description": "Address prefix for the Virtual Network."  }  },  "subnetPrefix": {  "type": "array",  "defaultValue": [  "10.0.1.0/24",  "10.0.2.0/24"  ],  "metadata": {  "description": "Subnet prefixes for the Virtual Network."  }  }  },  "variables": {  "firewallName": "AzureFirewall",  "nvaName": "ThirdPartyNVA",  "hubVnetName": "HubVNet",  "spokeVnetName": "SpokeVNet"  },  "resources": [  {  "condition": "[equals(parameters('architectureType'), 'SingleVNet')]",  "type": "Microsoft.Network/virtualNetworks",  "apiVersion": "2023-02-01",  "name": "SingleVNet",  "location": "[parameters('location')]",  "properties": {  "addressSpace": {  "addressPrefixes": [  "[parameters('vnetAddressPrefix')]"  ]  },  "subnets": [  {  "name": "Subnet1",  "properties": {  "addressPrefix": "[parameters('subnetPrefix')[0]"  }  },  {  "name": "Subnet2",  "properties": {  "addressPrefix": "[parameters('subnetPrefix')[1]"  }  }  ]  }  },  {  "condition": "[equals(parameters('architectureType'), 'HubAndSpoke')]",  "type": "Microsoft.Network/virtualNetworks",  "apiVersion": "2023-02-01",  "name": "[variables('hubVnetName')]",  "location": "[parameters('location')]",  "properties": {  "addressSpace": {  "addressPrefixes": [  "10.1.0.0/16"  ]  },  "subnets": [  {  "name": "HubSubnet",  "properties": {  "addressPrefix": "10.1.1.0/24"  }  }  ]  }  },  {  "condition": "[or(equals(parameters('architectureType'), 'HubAndSpoke'), equals(parameters('architectureType'), 'HubAndSpokeWithNVAOrFirewall'))]",  "type": "Microsoft.Network/virtualNetworks",  "apiVersion": "2023-02-01",  "name": "[variables('spokeVnetName')]",  "location": "[parameters('location')]",  "properties": {  "addressSpace": {  "addressPrefixes": [  "10.2.0.0/16"  ]  },  "subnets": [  {  "name": "SpokeSubnet",  "properties": {  "addressPrefix": "10.2.1.0/24"  }  }  ]  }  },  {  "condition": "[equals(parameters('architectureType'), 'SingleVNetWithNVA')]",  "type": "Microsoft.Network/virtualNetworks",  "apiVersion": "2023-02-01",  "name": "SingleVNetWithNVA",  "location": "[parameters('location')]",  "properties": {  "addressSpace": {  "addressPrefixes": [  "[parameters('vnetAddressPrefix')]"  ]  },  "subnets": [  {  "name": "GatewaySubnet",  "properties": {  "addressPrefix": "10.0.3.0/24"  }  }  ]  }  },  {  "condition": "[equals(parameters('architectureType'), 'SingleVNetWithFirewall')]",  "type": "Microsoft.Network/virtualNetworks",  "apiVersion": "2023-02-01",  "name": "SingleVNetWithFirewall",  "location": "[parameters('location')]",  "properties": {  "addressSpace": {  "addressPrefixes": [  "[parameters('vnetAddressPrefix')]"  ]  },  "subnets": [  {  "name": "AzureFirewallSubnet",  "properties": {  "addressPrefix": "10.0.4.0/24"  }  }  ]  }  }  ]  } |

## Explanation of the ARM Template:

1. **architectureType**

* **Type:** string
* **Allowed Values:**
  + SingleVNet: Deploys a single virtual network.
  + HubAndSpoke: Deploys a hub-and-spoke architecture.
  + SingleVNetWithNVA: Deploys a single VNet with a third-party Network Virtual Appliance (NVA).
  + SingleVNetWithFirewall: Deploys a single VNet with Azure Firewall.
  + HubAndSpokeWithNVAOrFirewall: Deploys a hub-and-spoke architecture with either an NVA or Azure Firewall in the hub.
* **Default Value:** SingleVNet
* **Description:** This parameter allows the user to choose which network architecture to deploy. The template uses conditional logic to deploy the appropriate resources based on this selection.

1. **location**

* **Type:** string
* **Default Value:** eastus
* **Description:** Specifies the Azure region where the resources will be deployed. Users can change it to their desired location.

1. **vnetAddressPrefix**

* **Type:** string
* **Default Value:** 10.0.0.0/16
* **Description:** Defines the address space for the primary virtual network. This is used to create the VNet and its subnets.

1. **subnetPrefix**

* **Type:** array
* **Default Value:**
  + 10.0.1.0/24: For the first subnet.
  + 10.0.2.0/24: For the second subnet.
* **Description:** Specifies the address prefixes for the subnets in the VNet. This array enables you to define multiple subnets within the same address space. Each subnet will use a different portion of the vnetAddressPrefix.

**How the Parameters Work Together**

* The architectureType parameter determines which architecture will be deployed, and based on this, the template uses conditional logic (condition) to include only the relevant resources.
* The location parameter ensures that all resources are deployed in the specified Azure region.
* The vnetAddressPrefix and subnetPrefix define the networking setup (IP ranges) for the VNet and its subnets, providing flexibility for users to customize the network as needed.

## Steps to Deploy

1. **Prerequisites**

* **Azure Subscription**: Ensure you have an active Azure subscription.
* **Azure CLI or Azure PowerShell**: Install Azure CLI or Azure PowerShell locally, or use the Azure Cloud Shell available in the Azure portal.
* **Access**: Ensure you have the necessary permissions to deploy resources in the chosen Azure subscription and resource group.

1. **Save the Template**
2. Copy the ARM template into a JSON file, e.g., vnet-template.json.
3. **Modify Parameters (Optional)**
4. Open the JSON file and adjust default parameter values if needed (e.g., location, address prefixes, etc.).
5. Alternatively, you can create a separate parameters.json file to provide parameter overrides during deployment. For example:

|  |
| --- |
| JSON |
| *{*  *"$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentParameters.json#",*  *"contentVersion": "1.0.0.0",*  *"parameters": {*  *"architectureType": {*  *"value": "SingleVNet"*  *},*  *"location": {*  *"value": "westus2"*  *},*  *"vnetAddressPrefix": {*  *"value": "10.0.0.0/16"*  *},*  *"subnetPrefix": {*  *"value": ["10.0.1.0/24", "10.0.2.0/24"]*  *}*  *}*  *}* |

1. **Deploy the Template**

You can deploy the ARM template using either the Azure Portal, Azure CLI, or PowerShell.

**Option 1: Deploy via Azure Portal**

1. Log in to the [Azure Portal](https://portal.azure.com).
2. Navigate to **"Deploy a custom template"**:
   * Search for "Template deployment" in the portal search bar.
   * Click on **"Create"** or **"Build your own template in the editor"**.
3. Upload the vnet-template.json file or paste its content into the editor.
4. Specify the parameters (e.g., architecture type, location) in the portal.
5. Click **Review + Create**, then **Create**.

**Option 2: Deploy via Azure CLI**

**Using Azure CLI**:

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| Bash |
| *az deployment group create --resource-group <ResourceGroupName> --template-file vnet-template.json*  or  *az deployment group create --resource-group <ResourceGroupName> --template-file vnet-template.json --parameters @parameters.json* |

**Using PowerShell**:

|  |
| --- |
| Template |
| *New-AzResourceGroup -Name <ResourceGroupName> -Location <Location>*  *New-AzResourceGroupDeployment -ResourceGroupName <ResourceGroupName> -TemplateFile "vnet-template.json"*  ***OR***  *New-AzResourceGroupDeployment -ResourceGroupName <ResourceGroupName> -TemplateFile "vnet-template.json" -TemplateParameterFile "parameters.json"* |

1. **Verify Deployment**

* Navigate to the Azure Portal and open the resource group where the template was deployed.
* Confirm that the VNet(s) and associated resources (subnets, NVAs, Firewall, etc.) were deployed as per the selected architecture.

**About Cobweb**

Cobweb is one of Europe’s largest cloud solutions providers. Founded in 1996, the company draws on in-depth expertise and decades of experience in what is now known as cloud, empowering organisations of all sizes to grow into flexible, agile businesses through the deployment of best-of-breed cloud technologies.

A member of the Cloud Industry Forum and a Microsoft Gold Certified Partner, Cobweb was the first provider in Europe to deliver Microsoft cloud services through the Microsoft Cloud Solution Provider programme. The company prides itself on innovation and liberating its customers and partners through technology. This is backed up by UK support and advice 24 hours a day, 365 days per year. Based in London and Dubai, with an operations centre on the south coast, Cobweb is a British company with a global outlook.

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