

AZ-104 - Administration - Azure ARM Templates

Deploy Azure infrastructure by using JSON ARM templates

ARM templates are azure resource manager templates we create JSON files and provides

- IaC (Infrastructure as code)
- Deploy environments quickly
- Repeatable deployments

ARM Template

Skeleton arm template

```
{
  "$schema" : "https://schema.management.azure.com"
  ,
  "contentVersion":
    "1.0.0.0",
  "parameters": {},
  "variables": {},
  "resources": {},
  "outputs": {}
}
```

Parameters and variables: components are used to pass information to the template.

Resources: Define resources to use in the template

Outputs: Component is used to return output from the execution of the template

Example of a template:

azuredeploy.json template

```
{
  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": {
    "adminUsername": {
      "type": "string",
      "metadata": {
        "description": "Username for the Virtual Machine."
      }
    },
    "adminPassword": {
      "type": "secureString",
      "minLength": 12,
      "metadata": {
        "description": "Password for the Virtual Machine."
      }
    },
    "dnsLabelPrefix": {
      "type": "string",
      "defaultValue": "[toLower(format('{0}-{1}', parameters('vmName'), uniqueString(resourceGroup().id, parameters('vmName'))))]",
      "metadata": {
        "description": "Unique DNS Name for the Public IP used to access the Virtual Machine."
      }
    },
    "publicIpName": {
      "type": "string",
      "defaultValue": "myPublicIP",
      "metadata": {
        "description": "Name for the Public IP used to access the Virtual Machine."
      }
    },
    "publicIPAllocationMethod": {
      "type": "string",
      "defaultValue": "Dynamic",
```

```
"allowedValues": [
  "Dynamic",
  "Static"
],
"metadata": {
  "description": "Allocation method for the Public IP used to access the Virtual Machine."
}
},
"publicIpSku": {
  "type": "string",
  "defaultValue": "Basic",
  "allowedValues": [
    "Basic",
    "Standard"
  ],
  "metadata": {
    "description": "SKU for the Public IP used to access the Virtual Machine."
  }
},
"OSVersion": {
  "type": "string",
  "defaultValue": "2022-datacenter-azure-edition-core",
  "allowedValues": [
    "2008-R2-SP1",
    "2008-R2-SP1-smalldisk",
    "2012-Datacenter",
    "2012-datacenter-gensecond",
    "2012-Datacenter-smalldisk",
    "2012-datacenter-smalldisk-g2",
    "2012-Datacenter-zhcn",
    "2012-datacenter-zhcn-g2",
    "2012-R2-Datacenter",
    "2012-r2-datacenter-gensecond",
    "2012-R2-Datacenter-smalldisk",
    "2012-r2-datacenter-smalldisk-g2",
    "2012-R2-Datacenter-zhcn",
    "2012-r2-datacenter-zhcn-g2",
    "2016-Datacenter",
    "2016-datacenter-gensecond",
```

"2016-datacenter-gs",
"2016-Datacenter-Server-Core",
"2016-datacenter-server-core-g2",
"2016-Datacenter-Server-Core-smallldisk",
"2016-datacenter-server-core-smallldisk-g2",
"2016-Datacenter-smallldisk",
"2016-datacenter-smallldisk-g2",
"2016-Datacenter-with-Containers",
"2016-datacenter-with-containers-g2",
"2016-datacenter-with-containers-gs",
"2016-Datacenter-zhcn",
"2016-datacenter-zhcn-g2",
"2019-Datacenter",
"2019-Datacenter-Core",
"2019-datacenter-core-g2",
"2019-Datacenter-Core-smallldisk",
"2019-datacenter-core-smallldisk-g2",
"2019-Datacenter-Core-with-Containers",
"2019-datacenter-core-with-containers-g2",
"2019-Datacenter-Core-with-Containers-smallldisk",
"2019-datacenter-core-with-containers-smallldisk-g2",
"2019-datacenter-gensecond",
"2019-datacenter-gs",
"2019-Datacenter-smallldisk",
"2019-datacenter-smallldisk-g2",
"2019-Datacenter-with-Containers",
"2019-datacenter-with-containers-g2",
"2019-datacenter-with-containers-gs",
"2019-Datacenter-with-Containers-smallldisk",
"2019-datacenter-with-containers-smallldisk-g2",
"2019-Datacenter-zhcn",
"2019-datacenter-zhcn-g2",
"2022-datacenter",
"2022-datacenter-azure-edition",
"2022-datacenter-azure-edition-core",
"2022-datacenter-azure-edition-core-smallldisk",
"2022-datacenter-azure-edition-smallldisk",
"2022-datacenter-core",
"2022-datacenter-core-g2",

```
"2022-datacenter-core-smalldisk",
"2022-datacenter-core-smalldisk-g2",
"2022-datacenter-g2",
"2022-datacenter-smalldisk",
"2022-datacenter-smalldisk-g2"
],
"metadata": {
  "description": "The Windows version for the VM. This will pick a fully patched image of this given
Windows version."
}
},
"vmSize": {
  "type": "string",
  "defaultValue": "Standard_B2s",
  "metadata": {
    "description": "Size of the virtual machine."
  }
},
"location": {
  "type": "string",
  "defaultValue": "[resourceGroup().location]",
  "metadata": {
    "description": "Location for all resources."
  }
},
"vmName": {
  "type": "string",
  "defaultValue": "vm-demo-002",
  "metadata": {
    "description": "Name of the virtual machine."
  }
}
},
"variables": {
  "storageAccountName": "[format('bootdiags{0}', uniqueString(resourceGroup().id))]",
  "nicName": "myVMNic",
  "addressPrefix": "10.0.0.0/16",
  "subnetName": "Subnet",
  "subnetPrefix": "10.0.0.0/24",
```

```
"virtualNetworkName": "MyVNET",
"networkSecurityGroupName": "default-NSG"
},
"resources": [
{
  "type": "Microsoft.Storage/storageAccounts",
  "apiVersion": "2021-04-01",
  "name": "[variables('storageAccountName')]",
  "location": "[parameters('location')]",
  "sku": {
    "name": "Standard_LRS"
  },
  "kind": "Storage"
},
{
  "type": "Microsoft.Network/publicIPAddresses",
  "apiVersion": "2021-02-01",
  "name": "[parameters('publicIpName')]",
  "location": "[parameters('location')]",
  "sku": {
    "name": "[parameters('publicIpSku')]"
  },
  "properties": {
    "publicIPAllocationMethod": "[parameters('publicIPAllocationMethod')]",
    "dnsSettings": {
      "domainNameLabel": "[parameters('dnsLabelPrefix')]"
    }
  }
},
{
  "type": "Microsoft.Network/networkSecurityGroups",
  "apiVersion": "2021-02-01",
  "name": "[variables('networkSecurityGroupName')]",
  "location": "[parameters('location')]",
  "properties": {
    "securityRules": [
      {
        "name": "default-allow-3389",
        "properties": {
```

```

        "priority": 1000,
        "access": "Allow",
        "direction": "Inbound",
        "destinationPortRange": "3389",
        "protocol": "Tcp",
        "sourcePortRange": "*",
        "sourceAddressPrefix": "*",
        "destinationAddressPrefix": "*"
    }
}
]
}
},
{
    "type": "Microsoft.Network/virtualNetworks",
    "apiVersion": "2021-02-01",
    "name": "[variables('virtualNetworkName')]",
    "location": "[parameters('location')]",
    "properties": {
        "addressSpace": {
            "addressPrefixes": [
                "[variables('addressPrefix')]"
            ]
        },
        "subnets": [
            {
                "name": "[variables('subnetName')]",
                "properties": {
                    "addressPrefix": "[variables('subnetPrefix')]",
                    "networkSecurityGroup": {
                        "id": "[resourceId('Microsoft.Network/networkSecurityGroups',
variables('networkSecurityGroupName'))]"
                    }
                }
            }
        ]
    },
    "dependsOn": [
        "[resourceId('Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]"
    ]
}

```

```

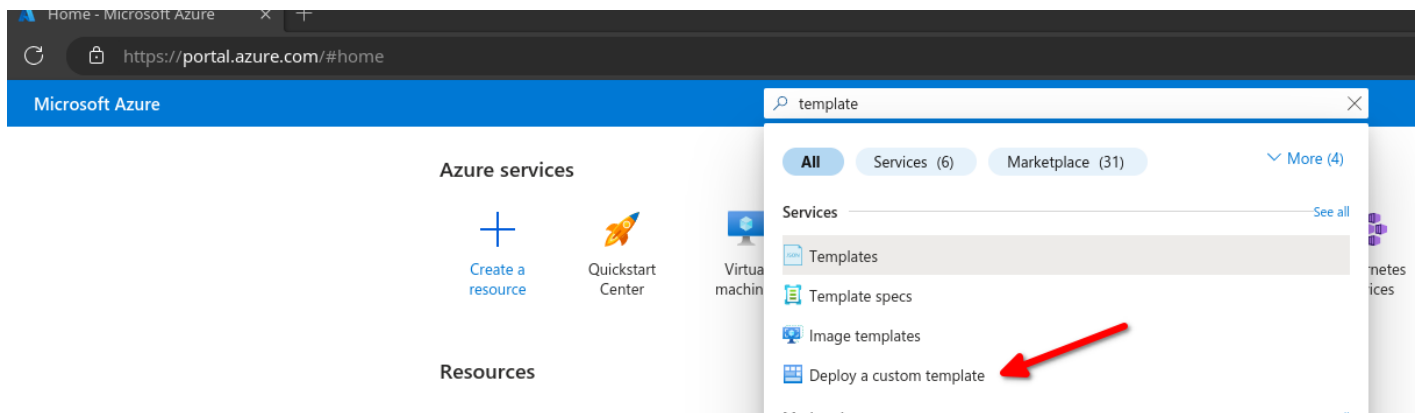
    ]
  },
  {
    "type": "Microsoft.Network/networkInterfaces",
    "apiVersion": "2021-02-01",
    "name": "[variables('nicName')]",
    "location": "[parameters('location')]",
    "properties": {
      "ipConfigurations": [
        {
          "name": "ipconfig1",
          "properties": {
            "privateIPAllocationMethod": "Dynamic",
            "publicIPAddress": {
              "id": "[resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIpName'))]"
            },
            "subnet": {
              "id": "[resourceId('Microsoft.Network/virtualNetworks/subnets', variables('virtualNetworkName'),
variables('subnetName'))]"
            }
          }
        }
      ]
    },
    "dependsOn": [
      "[resourceId('Microsoft.Network/publicIPAddresses', parameters('publicIpName'))]",
      "[resourceId('Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]"
    ]
  },
  {
    "type": "Microsoft.Compute/virtualMachines",
    "apiVersion": "2021-03-01",
    "name": "[parameters('vmName')]",
    "location": "[parameters('location')]",
    "properties": {
      "hardwareProfile": {
        "vmSize": "[parameters('vmSize')]"
      },
      "osProfile": {

```

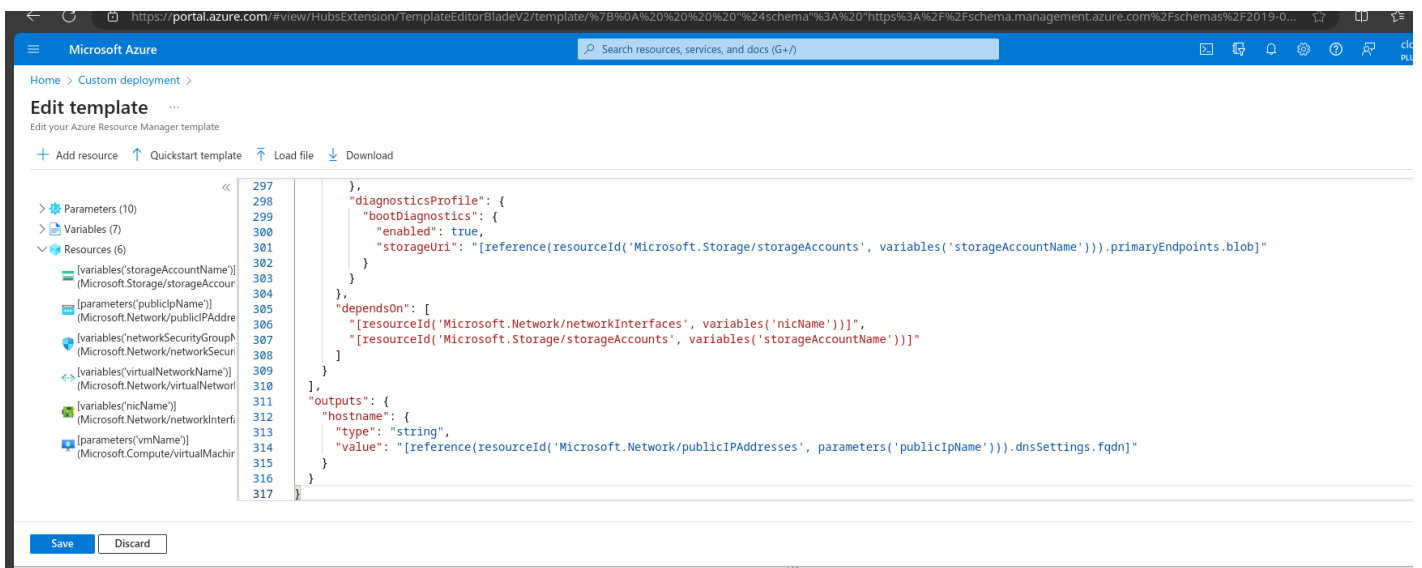
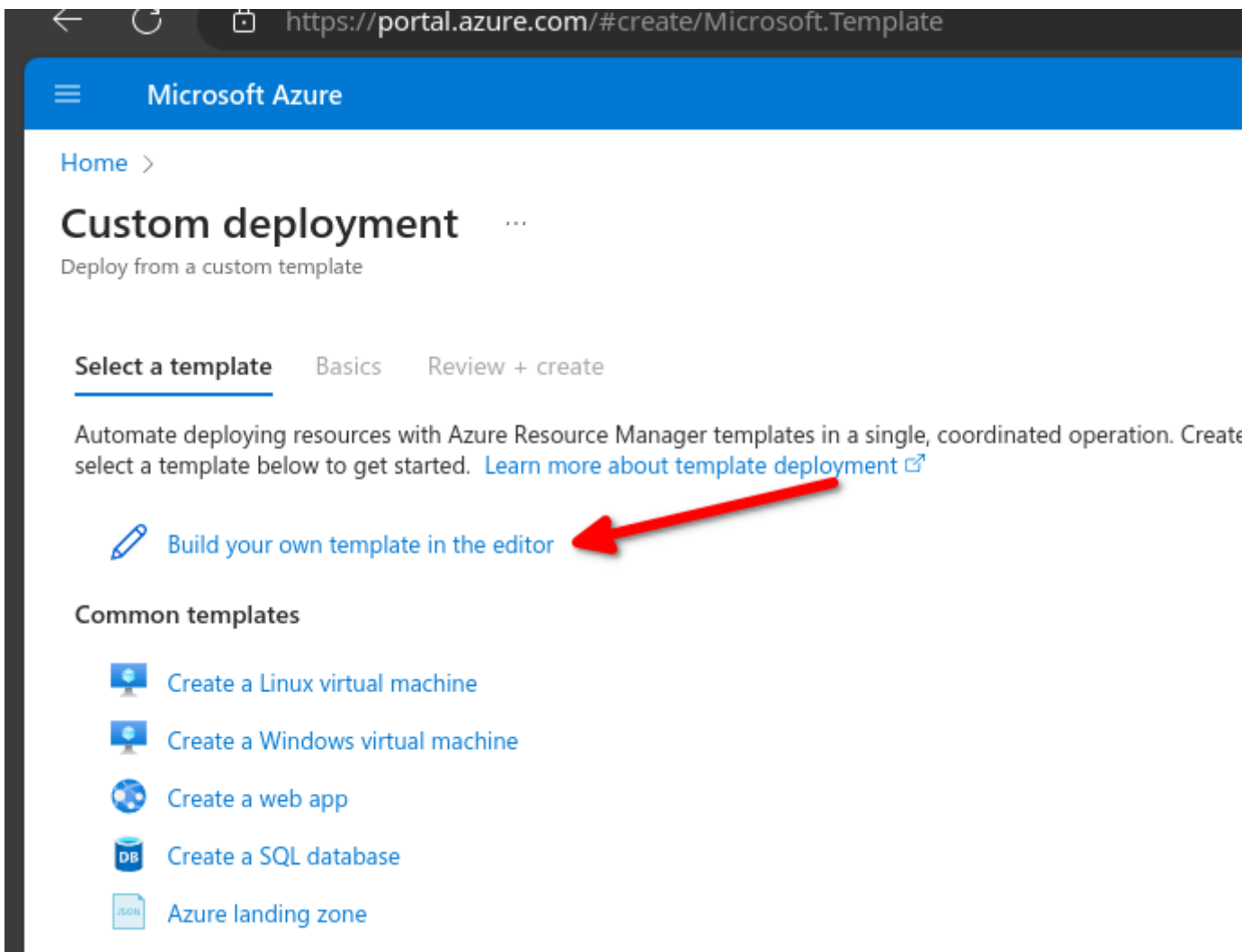
```
"computerName": "[parameters('vmName')]",
"adminUsername": "[parameters('adminUsername')]",
"adminPassword": "[parameters('adminPassword')]"
},
"storageProfile": {
  "imageReference": {
    "publisher": "MicrosoftWindowsServer",
    "offer": "WindowsServer",
    "sku": "[parameters('OSVersion')]",
    "version": "latest"
  },
  "osDisk": {
    "createOption": "FromImage",
    "managedDisk": {
      "storageAccountType": "StandardSSD_LRS"
    }
  },
  "dataDisks": [
    {
      "diskSizeGB": 1023,
      "lun": 0,
      "createOption": "Empty"
    }
  ]
},
"networkProfile": {
  "networkInterfaces": [
    {
      "id": "[resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]"
    }
  ]
},
"diagnosticsProfile": {
  "bootDiagnostics": {
    "enabled": true,
    "storageUri": "[reference(resourceId('Microsoft.Storage/storageAccounts',
variables('storageAccountName'))).primaryEndpoints.blob]"
  }
}
```

```
},
"dependsOn": [
  "[resourceId('Microsoft.Network/networkInterfaces', variables('nicName'))]",
  "[resourceId('Microsoft.Storage/storageAccounts', variables('storageAccountName'))]"
]
},
],
"outputs": {
  "hostname": {
    "type": "string",
    "value": "[reference(resourceId('Microsoft.Network/publicIPAddresses',
parameters('publicIpName'))).dnsSettings.fqdn]"
  }
}
}
```

Go to Deploy a custom template



Build your own template in the editor



Home >

Custom deployment

Deploy from a custom template

New! Deployment Stacks let you manage the lifecycle of your deployments. Try it now →

Select a template Basics Review + create

Template **6 resources based on template**



Customized template [↗](#)
6 resources

Edit template

Edit parameters

Visualize

to view diagram



Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

P4-Real Hands-On Labs

Resource group * ⓘ

[Create new](#)



select a resource group

Instance details

Region * ⓘ

East US

Admin Username * ⓘ

Admin Password * ⓘ

Dns Label Prefix ⓘ

[toLower(format('{0}-{1}', parameters('vmName'), uniqueString(resource...

Public Ip Name ⓘ

myPublicIP

Public IP Allocation Method ⓘ

Dynamic

Public Ip Sku ⓘ

Basic

OS Version ⓘ

2022-datacenter-azure-edition-core

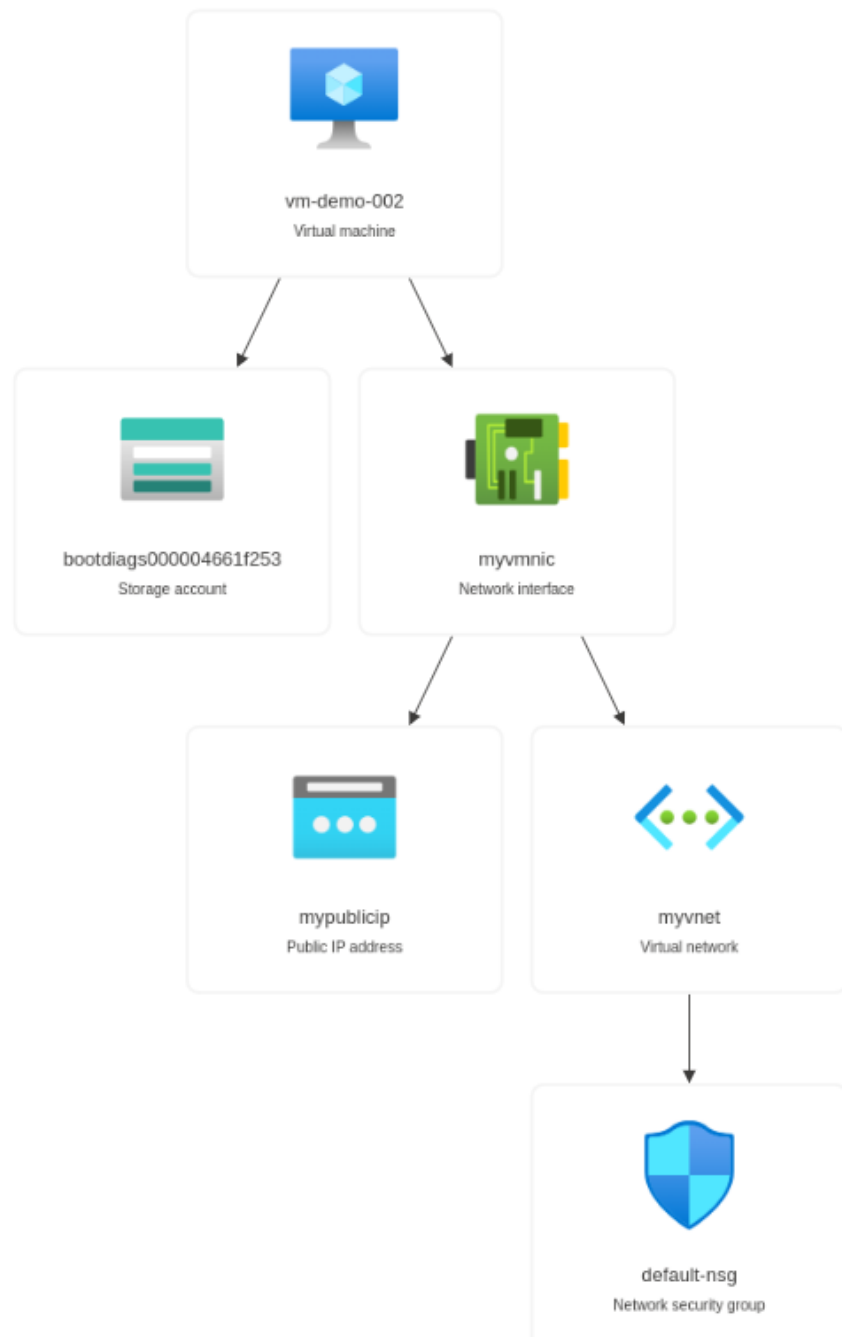
Vm Size ⓘ

Standard_B2s

Previous

Next

Review + create



Fill out all parameters then review and create

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ

P4-Real Hands-On Labs



Resource group * ⓘ

1-d3dd8e5d-playground-sandbox



[Create new](#)

Instance details

Region * ⓘ

(US) South Central US



Admin Username * ⓘ

csr



Admin Password * ⓘ

.....



Dns Label Prefix ⓘ

[toLower(format('{0}-{1}', parameters('vmName'), uniqueString(resourc...)]



Public Ip Name ⓘ

myPublicIP



Public IP Allocation Method ⓘ

Dynamic



Public Ip Sku ⓘ

Basic



OS Version ⓘ

2022-datacenter-azure-edition-core



Vm Size ⓘ

Standard_B2s



Location ⓘ

[resourceGroup().location]



Vm Name ⓘ

vm-demo-002



[Previous](#)

[Next](#)

[Review + create](#)



Deployment in progress



Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

Deployment is in progress



Deployment name : Microsoft.Template-20240206223726
Subscription : P4-Real Hands-On Labs
Resource group : 1-d3dd8e5d-playground-sandbox

Start time : 2/6/2024, 10:37:31 PM
Correlation ID : fe7a22e3-22a9-44df-a71c-6b6c9c385332

Deployment details

Resource	Type	Status
default-NSG	Network security group	Created

Give feedback

Tell us about your experience with deployment

Revision #2

Created 7 February 2024 04:04:39 by Cesar Gzz
Updated 14 February 2024 00:11:43 by Cesar Gzz