

# Lab 03 - Manage Azure resources by using Azure Resource Manager Templates

## Task 1: Create an Azure Resource Manager template

```
● user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform init
Initializing the backend...
Initializing provider plugins...
- Finding hashicorp/azurerm versions matching "~> 2.48"...
- Finding hashicorp/azurerm versions matching "~> 3.100"...
- Installing hashicorp/azurerm v2.53.1...
- Installed hashicorp/azurerm v2.53.1 (signed by HashiCorp)
- Installing hashicorp/azurerm v3.117.1...
- Installed hashicorp/azurerm v3.117.1 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.
```

**Terraform has been successfully initialized!**

You may now begin working with Terraform. Try running "terraform plan" to see any changes that are required for your infrastructure. All Terraform commands should now work.

If you ever set or change modules or backend configuration for Terraform, rerun this command to reinitialize your working directory. If you forget, other commands will detect it and remind you to do so if necessary.

```
● user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform plan
azurerm_resource_group.rg: Refreshing state... [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create
-/+ destroy and then create replacement

Terraform will perform the following actions:

# azurerm_managed_disk.disk1 will be created
+ resource "azurerm_managed_disk" "disk1" {
  + create_option           = "Empty"
  + disk_iops_read_only     = (known after apply)
  + disk_iops_read_write   = (known after apply)
  + disk_mbps_read_only     = (known after apply)
  + disk_mbps_read_write   = (known after apply)
  + disk_size_gb            = 32
  + id                     = (known after apply)
  + location                 = "germanywestcentral"
  + logical_sector_size     = (known after apply)
  + max_shares              = (known after apply)
  + name                    = "az104-disk1"
  + optimized_frequent_attach_enabled = false
  + performance_plus_enabled = false
  + public_network_access_enabled = true
  + resource_group_name     = "az104-rg3"
  + source_uri              = (known after apply)
  + storage_account_type    = "Standard_LRS"
  + tier                     = (known after apply)
}

# azurerm_resource_group.rg must be replaced
-/+ resource "azurerm_resource_group" "rg" {
  ~ id          = "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3" -> (known after apply)
  ~ location    = "eastus" -> "germanywestcentral" # forces replacement
  ~ name        = "az104-rg3"
  ~ tags        = {} -> null
  # (1 unchanged attribute hidden)
}

Plan: 2 to add, 0 to change, 1 to destroy.
```

```
user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform apply
+ disk_iops_read_write      = (known after apply)
+ disk_mbps_read_only       = (known after apply)
+ disk_mbps_read_write      = (known after apply)
+ disk_size_gb              = 32
+ id                        = (known after apply)
+ location                  = "germanywestcentral"
+ logical_sector_size       = (known after apply)
+ max_shares                 = (known after apply)
+ name                      = "az104-disk1"
+ optimized_frequent_attach_enabled = false
+ performance_plus_enabled  = false
+ public_network_access_enabled = true
+ resource_group_name       = "az104-rg3"
+ source_uri                = (known after apply)
+ storage_account_type      = "Standard_LRS"
+ tier                       = (known after apply)
}

# azurerm_resource_group.rg must be replaced
-/+ resource "azurerm_resource_group" "rg" {
  id = "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3" -> (known after apply)
  location = "eastus" -> "germanywestcentral" # forces replacement
  name = "az104-rg3"
  tags = {} -> null
  # (1 unchanged attribute hidden)
}

Plan: 2 to add, 0 to change, 1 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

azurerm_resource_group.rg: Destroying... [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3]
azurerm_resource_group.rg: Still destroying... [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3, 00m10s elapsed]
azurerm_resource_group.rg: Destruction complete after 18s
azurerm_resource_group.rg: Creating...
azurerm_resource_group.rg: Still creating... [00m10s elapsed]
azurerm_resource_group.rg: Creation complete after 11s [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3]
azurerm_managed_disk.disk1: Creating...
azurerm_managed_disk.disk1: Creation complete after 6s [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Compute/disks/az104-disk1]

Apply complete! Resources: 2 added, 0 changed, 1 destroyed.
```

Microsoft Azure

Search resources, services, and docs (G+)

Copilot

manowe9460@erynka.c...  
КАТАЛОГ ПО УПОТРЕБЛЕНИЮ...

Home > Recent > Azure for Students | Resource groups > az104-rg3 >

az104-disk1

Disk

Show protection details for this disk

Search

Create VMCreate VM image versionCreate snapshotDeleteRefreshGive feedback

Overview

Essentials

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Settings

Monitoring

Automation

Help

Resource group (move)

Disk state

Last ownership update time

Location

Subscription (move)

Subscription ID

Time created

Tags (edit)

az104-rg3

Unattached

-

Germany West Central

Azure for Students

bc1a0270-6de3-4984-9e04-aec67432b9ef

10/27/2025, 3:38:10 PM

Add tags

Get started

Properties

Monitoring

Disk

Operating system type

Create option

VM generation

VM architecture

Availability zone

Completion percent

-

Empty

-

-

-

100

Size

Size

Storage type

IOPS

Throughput (MBps)

Disk tier

32 GiB

Standard HDD LRS

500

60

-

JSON View

Resource group (move)	: az104-rg3	Disk size	: 32 GiB
Disk state	: Unattached	Storage type	: Standard HDD LRS
Last ownership update time	: -	Managed by	: -
Location	: Germany West Central	Operating system	: -
Subscription (move)	: Azure for Students	Max shares	: 0
Subscription ID	: bc1a0270-6de3-4984-9e04-aec67432b9ef	Availability zone	: No infrastructure redundancy required
Time created	: 10/27/2025, 3:38:10 PM	Security type	: Standard
Tags (edit)	: Add tags		

Operating system type	-	Size	32 GiB
Create option	Empty	Storage type	Standard HDD LRS
VM generation	-	IOPS	500
VM architecture	-	Throughput (MBps)	60
Availability zone	-	Disk tier	-
Completion percent	100		

## Task 2: Edit an Azure Resource Manager template and then redeploy the template

```
user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform plan
azurerm_resource_group.rg: Refreshing state... [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3]
azurerm_managed_disk.disk1: Refreshing state... [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Compute/disks/az104-disk1]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurerm_managed_disk.disk2 will be created
+ resource "azurerm_managed_disk" "disk2" {
  + create_option           = "Empty"
  + disk_iops_read_only     = (known after apply)
  + disk_iops_read_write    = (known after apply)
  + disk_mbps_read_only     = (known after apply)
  + disk_mbps_read_write    = (known after apply)
  + disk_size_gb            = 32
  + id                     = (known after apply)
  + location                 = "germanywestcentral"
  + logical_sector_size     = (known after apply)
  + max_shares              = (known after apply)
  + name                    = "az104-disk2"
  + optimized_frequent_attach_enabled = false
  + performance_plus_enabled = false
  + public_network_access_enabled = true
  + resource_group_name     = "az104-rg3"
  + source_uri              = (known after apply)
  + storage_account_type    = "Standard LRS"
  + tier                     = (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.
```

```
user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform apply
+ resource "azurerm_managed_disk" "disk2" {
  + create_option           = "Empty"
  + disk_iops_read_only     = (known after apply)
  + disk_iops_read_write    = (known after apply)
  + disk_mbps_read_only     = (known after apply)
  + disk_mbps_read_write    = (known after apply)
  + disk_size_gb            = 32
  + id                     = (known after apply)
  + location                 = "germanywestcentral"
  + logical_sector_size     = (known after apply)
  + max_shares              = (known after apply)
  + name                    = "az104-disk2"
  + optimized_frequent_attach_enabled = false
  + performance_plus_enabled = false
  + public_network_access_enabled = true
  + resource_group_name     = "az104-rg3"
  + source_uri              = (known after apply)
  + storage_account_type    = "Standard LRS"
  + tier                     = (known after apply)
}

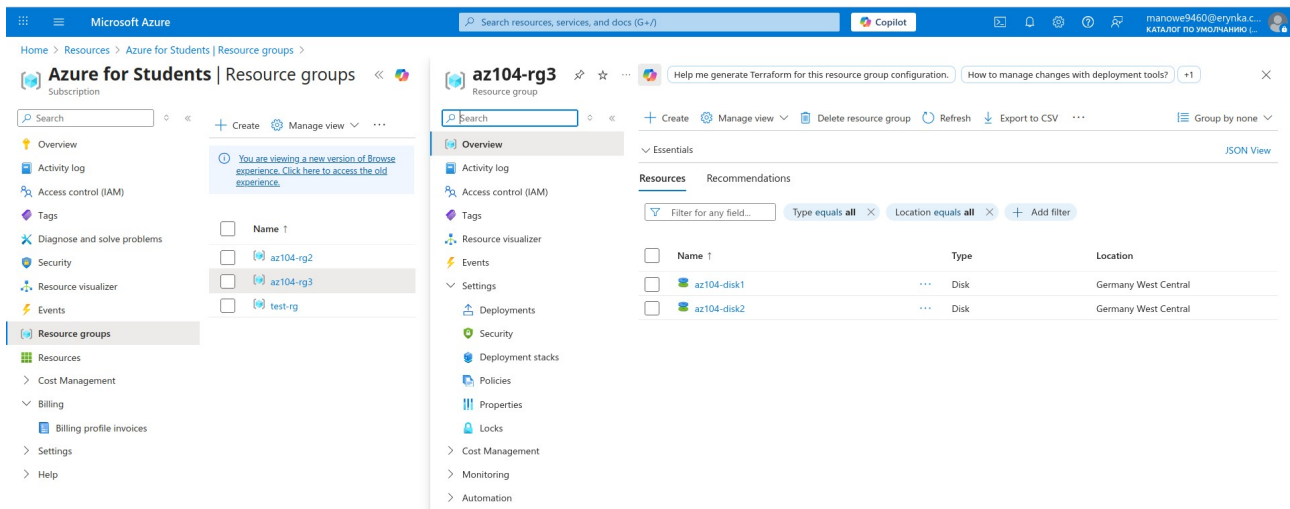
Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

azurerm_managed_disk.disk2: Creating...
azurerm_managed_disk.disk2: Creation complete after 5s [id=/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Compute/disks/az104-disk2]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
```



### Task 3: Configure the Cloud Shell and deploy a template with PowerShell

```
user@user-HP-250-G7-Notebook-PC:/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform plan
+ sftp_enabled = false
+ shared_access_key_enabled = true
+ table_encryption_key_type = "Service"
+ tags = {
  + "environment" = "dev"
}

+ blob_properties (known after apply)
+ network_rules (known after apply)
+ queue_properties (known after apply)
+ routing (known after apply)
+ share_properties (known after apply)
+ static_website (known after apply)
}

# azurerm_storage_share.fileshare will be created
+ resource "azurerm_storage_share" "fileshare" {
  + access_tier = (known after apply)
  + enabled_protocol = "SMB"
  + id = (known after apply)
  + metadata = (known after apply)
  + name = "fs-cloudshell"
  + quota = 100
  + resource_manager_id = (known after apply)
  + storage_account_name = "stcloudshell123"
  + url = (known after apply)
}

Plan: 2 to add, 0 to change, 0 to destroy.
```

```
user@user-HP-250-G7-Notebook-PC:~/media/user/EEC899A8C8996F97/Cloud/lab3$ terraform apply
azurerm_storage_account.sa: Creating...
```

Home > **az104-rg3** Resource group

Search [ ] x < + Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete Export template Open in mobile Group by none

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

Deployment stacks

Policies

Properties

Locks

Essentials

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

Name ↑	Type	Location
az104-disk1	Disk	Germany West Central
az104-disk2	Disk	Germany West Central
az104-disk3	Disk	Germany West Central
ivankiv1234	Storage account	Germany West Central

## Task 4: Deploy a template with the CLI

```
user@user-HP-250-G7-Notebook-PC:~/Downloads/ExportedTemplate-az104-rg3$ az deployment group create --resource-group az104-rg3 --template-file template.json --parameters parameters.json
{"id": "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Resources/deployments/template",
"location": null,
"name": "template",
"properties": {
  "correlationId": "bd6815ff-4182-49e3-a10f-e98203ae5a91",
  "debugSetting": null,
  "dependencies": [],
  "diagnostics": null,
  "duration": "PT8.7173588S",
  "error": null,
  "extensions": null,
  "mode": "Incremental",
  "onErrorDeployment": null,
  "outputResources": [
    {
      "apiVersion": null,
      "extension": null,
      "id": "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Compute/disks/az104-disk1",
      "identifiers": null,
      "resourceGroup": "az104-rg3",
      "resourceType": null
    }
  ]
},
"outputs": null,
"parameters": {
  "disks_az104_disk4_name": {
    "type": "String",
    "value": "az104-disk1"
  }
}
}
```

+ Create Manage view Refresh Export to CSV Open query Assign tags Group by none

You are viewing a new version of Browse experience. Click here to access the old experience.

Filter for any field... Subscription equals all Resource Group equals all Location equals all Add filter

Name ↑	Storage type	Size (GiB)	Owner	Resource Group	Location
az104-disk1	Standard HDD LRS	32	-	az104-rg3	Germany West Central
az104-disk2	Standard HDD LRS	32	-	az104-rg3	Germany West Central
az104-disk3	Standard HDD LRS	32	-	az104-rg3	Germany West Central
az104-disk4	Standard HDD LRS	32	-	az104-rg3	Germany West Central

## Task 5: Deploy a resource by using Azure Bicep

```
ivankiv [ ~ ]$ nano azuredeploydisk.bicep
ivankiv [ ~ ]$ az deployment group create --resource-group az104-rg3 --template-file azuredeploydisk.bicep

{
  "id": "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Resources/deployments/azuredeploydisk",
  "location": null,
  "name": "azuredeploydisk",
  "properties": {
    "correlationId": "22dc53f7-7657-42be-9871-5e1cf5dda3dd",
    "debugSetting": null,
    "dependencies": [],
    "diagnostics": null,
    "duration": "PT17.52556S",
    "error": null,
    "extensions": null,
    "mode": "Incremental",
    "onErrorDeployment": null,
    "outputResources": [
      {
        "apiVersion": null,
        "extension": null,
        "id": "/subscriptions/bc1a0270-6de3-4984-9e04-aec67432b9ef/resourceGroups/az104-rg3/providers/Microsoft.Compute/disks/az104-disk5",
        "identifiers": null,
        "resourceGroup": "az104-rg3",
        "resourceType": null
      }
    ]
  }
},
```

```
ivankiv [ ~ ]$ az disk list --output table
```

Name	ResourceGroup	Location	Zones	Sku	SizeGb	ProvisioningState
az104-disk1	AZ104-RG3	germanywestcentral		Standard_LRS	32	Succeeded
az104-disk2	AZ104-RG3	germanywestcentral		Standard_LRS	32	Succeeded
az104-disk3	AZ104-RG3	germanywestcentral		Standard_LRS	32	Succeeded
az104-disk4	AZ104-RG3	germanywestcentral		Standard_LRS	32	Succeeded
az104-disk5	AZ104-RG3	germanywestcentral		StandardSSD_LRS	32	Succeeded