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Інформатика і програмування

Лабораторна робота No 3b

Тема: Manage Azure resources by using Azure Resource Manager
Templates

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Дата: 12 грудня 2025
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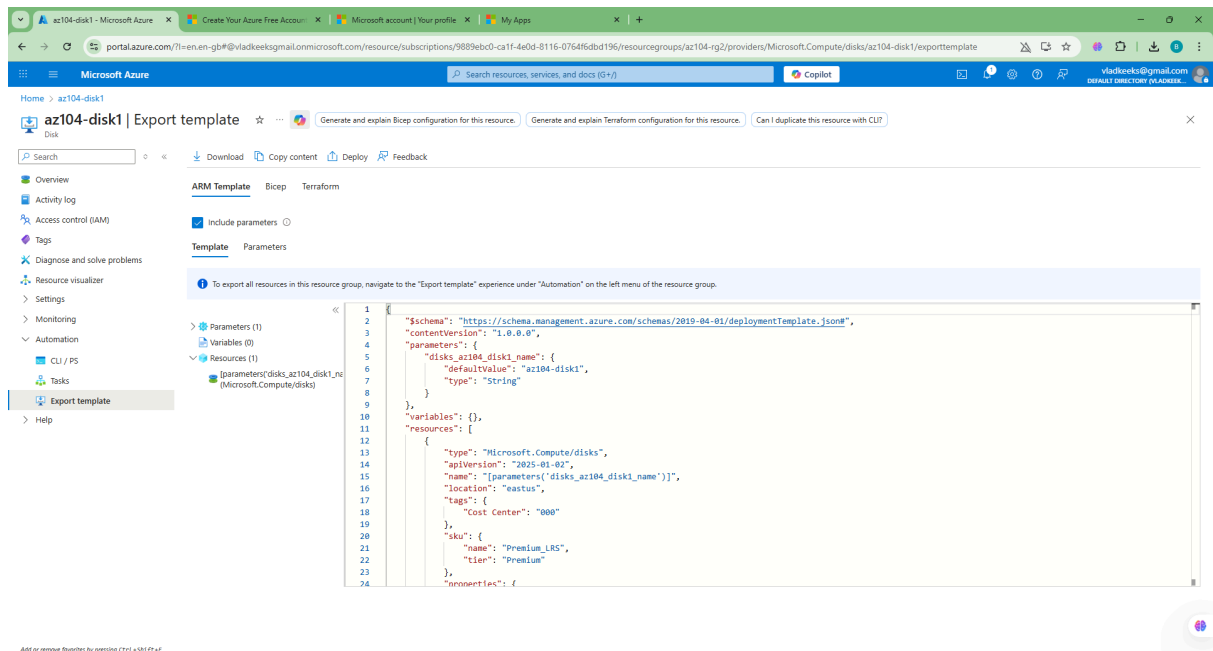
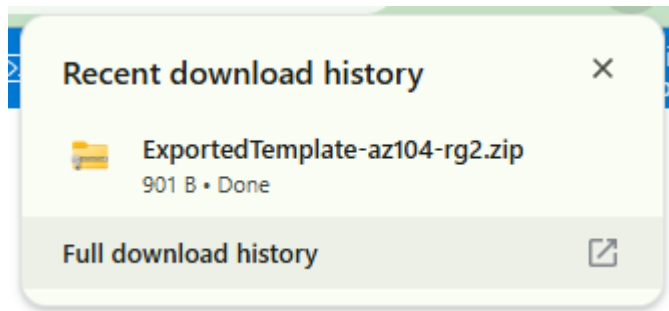
Івано-Франківськ – 2025

Task 1: Create an Azure Resource Manager template

In this task, we will create a managed disk in the Azure portal. Managed disks are storage designed to be used with virtual machines. Once the disk is deployed you will export a template that you can use in other deployments.

The screenshot shows the 'Create a managed disk' wizard in the Azure portal, specifically the 'Review + create' step. The page has a green header bar with the Microsoft Azure logo and a search bar. Below the header, there's a breadcrumb trail: 'Home > Storage center > Azure Disks >'. The main title is 'Create a managed disk'. A green banner at the top indicates 'Validation passed'. The wizard is divided into tabs: 'Basics', 'Encryption', 'Networking', 'Advanced', 'Tags', and 'Review + create'. The 'Review + create' tab is active. It displays the configuration details for the disk, organized into sections: 'Basics', 'Size', 'Encryption', 'Advanced', and 'Networking'. At the bottom, there are buttons for 'Create', '< Previous', 'Next >', and a link to 'Download a template for automation'. A 'Give feedback' button is also visible in the bottom right corner.

Section	Property	Value
Basics	Subscription	Azure subscription 1
	Resource group	az104-rg2
	Region	East US
	Disk name	az104-disk1
	Availability zone	No infrastructure redundancy required
	Source type	None
Size	Size	32 GiB
	Performance tier	P4 - 120 IOPS, 25 MB/s (default)
Encryption	Encryption type	Platform-managed key
	Encryption type	Platform-managed key
Advanced	Enable shared disk	No
	Enable on-demand bursting	No
Networking	Network access	AllowAll



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

The screenshot shows the Microsoft Azure Storage center interface. The top navigation bar includes the Microsoft Azure logo, an 'Upgrade' button, a search bar, and a user profile. The main content area is titled 'Storage center | Azure Disks' and shows a list of disks under the 'Resources' tab. The list includes columns for Name, Storage type, Size (GiB), Owner, Resource Group, and Location. Five disks are listed, all with a size of 32 GiB and located in the East US region. The disks are named az104-disk1 through az104-disk5. The interface also includes a left sidebar with navigation options like Overview, All storage resources, Object storage, File storage, Block storage, Data management, Migration, Partner solutions, Management services, and Help. A bottom status bar indicates 'Showing 1 - 5 of 5. Display count: auto'.

Name	Storage type	Size (GiB)	Owner	Resource Group	Location
az104-disk1	Premium SSD LRS	32	-	az104-rg3	East US
az104-disk2	Premium SSD LRS	32	-	az104-rg3	East US
az104-disk3	Premium SSD LRS	32	-	az104-rg3	East US
az104-disk4	Premium SSD LRS	32	-	az104-rg3	East US
az104-disk5	Standard SSD LRS	32	-	az104-rg3	East US

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

In this task, you work with the Azure Cloud Shell and Azure PowerShell. Azure Cloud Shell is an interactive, authenticated, browser-accessible terminal for managing Azure resources. It provides the flexibility of choosing the shell experience that best suits the way you work, either Bash or PowerShell. In this task, you use PowerShell to deploy a template.

Storage center - Microsoft Azure | Microsoft Azure | Home - Microsoft Azure | Create Your Azure Free Account | Microsoft account | Your profile | My Apps

portal.azure.com/#cloudshell/

Microsoft Azure

PowerShell

```
template.json
1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "disks_az104_disk1_name": {
6       "defaultValue": "az104-disk3",
7       "type": "String"
8     }
9   },
10  "variables": {},
11  "resources": [
12    {
13      "type": "Microsoft.Compute/disks",
14      "apiVersion": "2025-01-02",
15      "name": "[parameters('disks_az104_disk1_name')]",
16      "location": "eastus",
17      "tags": {
18        "Cost Center": "000"
19      },
20      "sku": {
21        "name": "Premium_LRS",
22        "tier": "Premium"
23      },
24      "properties": {
25        "creationData": {
26          "createOption": "Empty"
27        },
28        "diskSizeGB": 32,
29        "diskIOPSReadWrite": 120,
30        "diskMbpsReadWrite": 25,
31        "encryption": {
32          "type": "EncryptionAtRestWithPlatformKey"
33        },
34        "networkAccessPolicy": "AllowAll",
35        "publicNetworkAccess": "Enabled"
36      }
37    }
38  ]
39 }
```

Parameters

Name	Type	Value
disks_az104_disk1_name	String	"az104-disk3"

Outputs

DeploymentDebugLogLevel :

PS /home/vladkeeks>

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portal.azure.com/#cloudshell/

Microsoft Azure

PowerShell

```
template.json
1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "disks_az104_disk1_name": {
6       "defaultValue": "az104-disk3",
7       "type": "String"
8     }
9   },
10  "variables": {},
11  "resources": [
12    {
13      "type": "Microsoft.Compute/disks",
14      "apiVersion": "2025-01-02",
15      "name": "[parameters('disks_az104_disk1_name')]",
16      "location": "eastus",
17      "tags": {
18        "Cost Center": "000"
19      },
20      "sku": {
21        "name": "Premium_LRS",
22        "tier": "Premium"
23      },
24      "properties": {
25        "creationData": {
26          "createOption": "Empty"
27        },
28        "diskSizeGB": 32,
29        "diskIOPSReadWrite": 120,
30        "diskMbpsReadWrite": 25,
31        "encryption": {
32          "type": "EncryptionAtRestWithPlatformKey"
33        },
34        "networkAccessPolicy": "AllowAll",
35        "publicNetworkAccess": "Enabled"
36      }
37    }
38  ]
39 }
```

PS /home/vladkeeks> Get-AzDisk | ft

ResourceGroupName	ManagedBy	ManagedByExtended	Sku	Zones	TimeCreated	OsType	HyperVGeneration	CreationData	DiskSizeGB
AZ104-RG3	()		Microsoft.Azure.Management.Compute.Models.DiskSku		12/11/2025 4:32:36 PM			Microsoft.Azure.Management.Compute.Models.CreationData	32
AZ104-RG3	()		Microsoft.Azure.Management.Compute.Models.DiskSku		12/11/2025 4:48:37 PM			Microsoft.Azure.Management.Compute.Models.CreationData	32
AZ104-RG3	()		Microsoft.Azure.Management.Compute.Models.DiskSku		12/11/2025 4:53:06 PM			Microsoft.Azure.Management.Compute.Models.CreationData	32

PS /home/vladkeeks>

Task 4: Deploy a template with the CLI

```
Bash  v | p ? ⚙️ 📄 📁 {} 📄

Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Storage fileshare subscription 9889ebc0-ca1f-4e0d-8116-0764f6dbd196 is not registered.
ons will have restricted access to CloudShell service.

vladkeeks [ ~ ]$ ls
clouddrive  Microsoft  parameters.json  template.json
vladkeeks [ ~ ]$
```

```
Microsoft Azure portal.azure.com/#cloudshell/

template.json
1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "disks_az104_disk1_name": {
6       "defaultValue": "az104-disk4",
7       "type": "string"
8     },
9   },
10  "variables": {},
11  "resources": [
12    {
13      "type": "Microsoft.Compute/disks",
14      "apiVersion": "2025-01-02",
15      "name": "[parameters('disks_az104_disk1_name')]",
16      "location": "eastus",
17      "tags": {
18        "Cost Center": "000"
19      },
20      "sku": {
21        "name": "Premium_LRS",
22        "tier": "Premium"
23      },
24      "properties": {
25        "creationData": {
26          "createdOption": "Empty"
27        },
28        "diskSizeGb": 32,
29        "diskIOPSReadWrite": 120,
30        "diskMbpsReadWrite": 25,
31        "encryption": {
32          "type": "EncryptionAtRestWithPlatformKey"
33        },
34        "networkAccessPolicy": "AllowAll",
35        "publicNetworkAccess": "Enabled"
36      }
37    }
38  ]
39}

"timestamp": "2025-12-11T16:55:27.140906+00:00",
"validatedResources": null,
"validationLevel": null
},
"resourceGroup": "az104-rg3",
"tags": null,
"type": "Microsoft.Resources/deployments"
}
vladkeeks [ ~ ]$

32
33
34
35

}
vladkeeks [ ~ ]$ az disk list --resource-group az104-rg3 --output table
Name          ResourceGroup Location Zones Sku          SizeGb ProvisioningState
-----
az104-disk1   az104-rg3    eastus  Premium_LRS 32 Succeeded
az104-disk2   az104-rg3    eastus  Premium_LRS 32 Succeeded
az104-disk3   az104-rg3    eastus  Premium_LRS 32 Succeeded
az104-disk4   az104-rg3    eastus  Premium_LRS 32 Succeeded
vladkeeks [ ~ ]$
```

Task 5: Deploy a resource by using Azure Bicep

```
portal.azure.com/#cloudshell/

Bash

2 param managedDiskName string = 'az104-disks'
3
4 @description('Disk size in GiB')
5 @minValue(4)
6 @maxValue(65536)
7 param diskSizeInGiB int = 32
8
9 @description('Disk IOPS value')
10 @minValue(100)
11 @maxValue(150000)
12 param diskIopsReadWrite int = 100
13
14 @description('Disk throughput value in MBps')
15 @minValue(1)
16 @maxValue(2000)
17 param diskMbpsReadWrite int = 10
18
19 @description('Location for all resources.')
20 param location string = resourceGroup().location
21
22 resource managedDisk 'Microsoft.Compute/disks@2020-09-30' = (
23   name: managedDiskName
24   location: location
25   sku: {
26     name: 'StandardSSD_LRS'
27   }
28   properties: {
29     creationData: {
30       createOption: 'Empty'
31     }
32     diskSizeGB: diskSizeInGiB
33     diskIopsReadWrite: diskIopsReadWrite
34     diskMbpsReadWrite: diskMbpsReadWrite
35   }
36 )

{
  "timestamp": "2025-12-11T17:02:51.000300+00:00",
  "validatedResources": null,
  "validationLevel": null
},
{
  "resourceGroup": "az104-rg3",
  "tags": null,
  "type": "Microsoft.Resources/deployments"
}

vladkeeks [ ~ ]$
```

```
36 }
```

```
vladkeeks [ ~ ]$ az disk list --resource-group az104-rg3 --output table
```

Name	ResourceGroup	Location	Zones	Sku	SizeGb	ProvisioningState
az104-disk1	az104-rg3	eastus		Premium_LRS	32	Succeeded
az104-disk2	az104-rg3	eastus		Premium_LRS	32	Succeeded
az104-disk3	az104-rg3	eastus		Premium_LRS	32	Succeeded
az104-disk4	az104-rg3	eastus		Premium_LRS	32	Succeeded
az104-disk5	az104-rg3	eastus		StandardSSD_LRS	32	Succeeded

```
vladkeeks [ ~ ]$
```