

Міністерство освіти і науки України  
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*Факультет математики та інформатики  
Кафедра інформаційних технологій*

### **Лабораторна робота № 3**

з дисципліни  
"Хмарні  
технології"

Тема: Manage Azure resources by using Azure  
Resource Manager Templates

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Група ІПЗ-41

Дата: 20 жовтня 2025 р.

Task 1: Create an Azure Resource Manager template.

Створюємо диск

### Create a managed disk

✓ Validation passed

Basics

Encryption

Networking

Advanced

Tags

Review + create

Basics

Subscription

Resource group

Region

Disk name

Availability zone

Source type

VM architecture

Size

Size

Performance tier

Storage type

Encryption

Encryption type

Advanced

Azure subscription 1

(new) az104-rg3

Poland Central

az104-disk1

No infrastructure redundancy required

None

x64

32 GiB

P4 - 120 IOPS, 25 MB/s (default)

Premium SSD LRS

Platform-managed key

Create

< Previous

Next >

Download a template for automation

Успішно створено

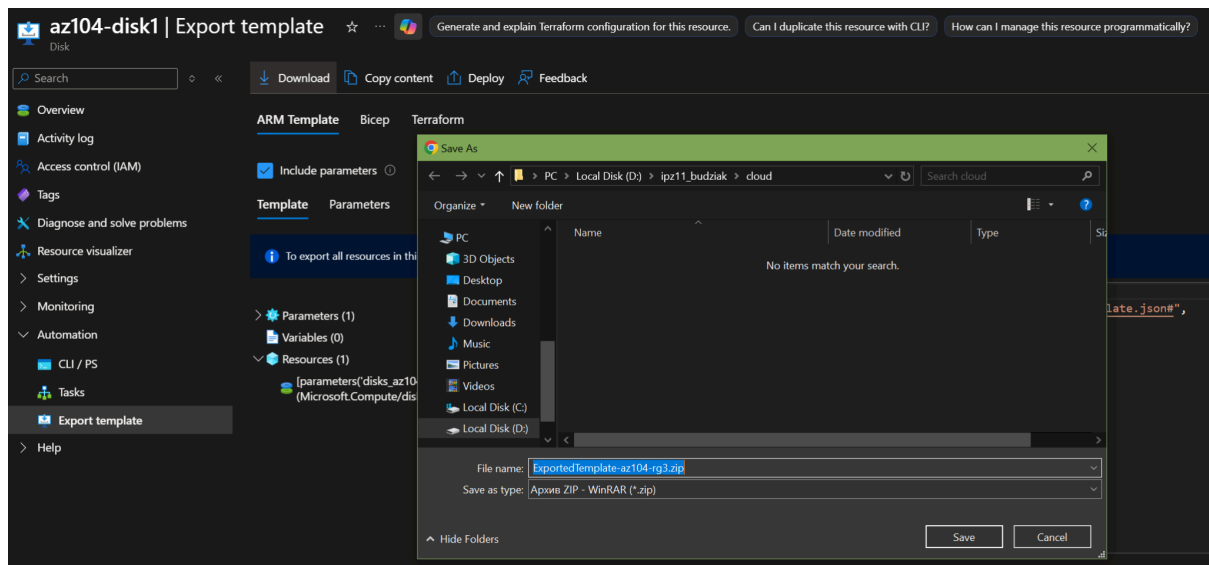
✓ Deployment succeeded

Deployment 'CreateDiskBlade-20251020170149' to resource group 'az104-rg3' was successful.

Go to resource

📌 Pin to dashboard

## Експортуємо шаблон



У завантаженому архіві отримуємо два JSON файли (template and parameters)

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

Деплоїмо власний шаблон

[Home](#) > [Custom deployment](#) >

## Edit template ...

Edit your Azure Resource Manager template

[+](#) Add resource   [↑](#) Quickstart template   [↑](#) Load file   [↓](#) Download

```
1 {  
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",  
3   "contentVersion": "1.0.0.0",  
4   "parameters": {},  
5   "resources": []  
6 }
```

Save

Discard

Загрузили власний шаблон і трішки його змінили

Home > Custom deployment >

## Edit template

Edit your Azure Resource Manager template

[+](#) Add resource [↑](#) Quickstart template [↑](#) Load file [↓](#) Download

```
1  {
2    "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3    "contentVersion": "1.0.0.0",
4    "parameters": {
5      "disk_name": {
6        "defaultValue": "az104-disk2",
7        "type": "String"
8      }
9    },
10   "variables": {},
11   "resources": [
12     {
13       "type": "Microsoft.Compute/disks",
14       "apiVersion": "2025-01-02",
15       "name": "[parameters('disk_name')]",
16       "location": "polandcentral",
17       "sku": {
18         "name": "Premium_LRS",
19         "tier": "Premium"
20       },
21       "properties": {
22         "creationData": {
23           "createOption": "Empty"
24         },
25         "diskSizeGB": 32,
26         "diskIOPSReadWrite": 120,
27         "diskMBpsReadWrite": 25,
28         "encryption": {
29           "type": "EncryptionAtRestWithPlatformOwnedKey"
```

Save

Discard

## Edit parameters ...

 Load file  Download

```
1 {  
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentParameters.json#",  
3   "contentVersion": "1.0.0.0",  
4   "parameters": {  
5     "disk_name": {  
6       "value": null  
7     }  
8   }  
9 }
```

Save

Discard

# Завершуемо деплой

Custom deployment

Deploy from a custom template

How do I roll back a failed ARM deployment?

Automate Azure deployments with CLI

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

Select a template

Basics

Review + create

Template

Customized template

1 resource

Edit template

Edit parameters

Visualize

Project details

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

Subscription

Azure subscription 1

Resource group

az104-rg3

Create new

Instance details

Region

(Europe) Poland Central

Disk\_name

az104-disk2

Previous

Next

Review + create


## Custom deployment

Deploy from a custom template

How do I roll back a failed ARM deployment? Automate Azure deployments with CLI

Select a template Basics **Review + create**

### Summary

 Customized template  
1 resource

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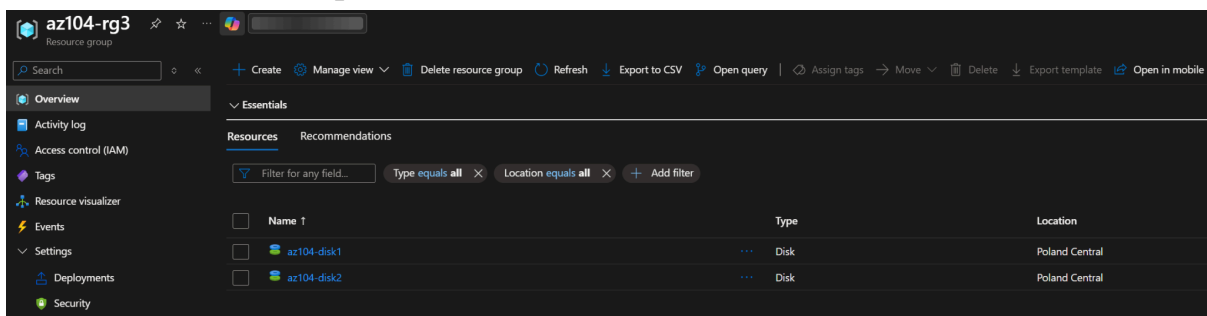
Deploying this template will create one or more Azure resources or Marketplace offerings. You acknowledge that you are responsible for reviewing the applicable pricing and legal terms associated with all resources and offerings deployed as part of this template. Prices and associated legal terms for any Marketplace offerings can be found in the [Azure Marketplace](#); both are subject to change at any time prior to deployment.

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## Маємо наші два створені диски



Name	Type	Location
az104-disk1	Disk	Poland Central
az104-disk2	Disk	Poland Central

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

## Налаштовуємо CLI



## Deployment is in progress

Subscription: Azure subscription 1  
Resource group: az104-rg3  
Storage account: nemessi10  
File share: fs-cloudshell  
Region: Germany West

Успішно

```
Switch to Bash Restart Manage files New session Editor Web preview Settings Help
Storage fileshare subscription bb797eda-d832-402a-93a2-b4a307a0487e is not registered to Microsoft.CloudShell Namespace. Please follow these instructions "https://aka.ms/RegisterCloudShell" to register. In future, unregistered subscriptions will have restricted access to CloudShell service.

MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense

VERBOSE: Authenticating to Azure ...
WARNING: You're using Az version 14.3.0. The latest version of Az is 14.5.0. Upgrade your Az modules using the following commands:
Update-PSResource Az -Whatif -- Simulate updating your Az modules.
Update-PSResource Az -- Update your Az modules.
VERBOSE: Building your Azure drive ...
PS /home/roman>
```

Завантажуємо наші два JSON файли

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

Storage fileshare subscription bb797eda-d832-402a-93a2-b4a307a0487e is not registered to Microsoft.CloudShell Namespace. Please follow these instructions "https://aka.ms/RegisterCloudShell" to register. In future, unregistered subscriptions will have restricted access to CloudShell service.

MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense

VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/roman>

Upload destination: /home/roman
parameters.json COMPLETE
```

У template.json змінюємо назву диска на az104-disk3

```
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     "disk_name": {
6       "defaultValue": "az104-disk3",
7       "type": "String"
8     },
9   },
10  "variables": {},
11  "resources": [
12    {
13      "type": "Microsoft.Compute/disks",
14      "apiVersion": "2019-01-01",
15      "name": "[parameters('disk_name')]",
16      "location": "polandcentral",
17      "sku": {
18        "name": "Premium_LRS",
19        "tier": "Premium"
20      },
21      "properties": {
22        "creationData": {
23          "createOption": "Empty"
24        },
25        "diskSizeGB": 32,
26        "diskIOPSReadWrite": 120,
27      }
28    }
29  ]
30 }
```

```
MOTD: Azure Cloud Shell now includes Predictive IntelliSense! Learn more: https://aka.ms/CloudShell/IntelliSense

VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/roman>
```

Усе успішно

```
PS /home/roman> New-AzResourceGroupDeployment -ResourceGroupName az104-rg3 -TemplateFile template.json -TemplateParameterfile parameters.json

DeploymentName      : template
ResourceGroupName   : az104-rg3
ProvisioningState    : Succeeded
Timestamp           : 10/20/2025 2:41:05 PM
Mode                : Incremental
TemplateLink         :
Parameters          :
                    Name      Type      Value
                    =====
                    disks_az104_disk1_name String    "az104-disk3"

Outputs
DeploymentDebugLogLevel :

PS /home/roman> Get-AzDisk | ft

ResourceGroupName ManagedBy ManagedByExtended Sku Zones TimeCreated OsType HyperVGeneration CreationData
-----
AZ104-RG3          {}          Microsoft.Azure.Management.Compute.Models.DiskSku 10/20/2025 2:04:15 PM Microsoft.Azure.Management.Compute.Models.Cr...
AZ104-RG3          {}          Microsoft.Azure.Management.Compute.Models.DiskSku 10/20/2025 2:22:50 PM Microsoft.Azure.Management.Compute.Models.Cr...
AZ104-RG3          {}          Microsoft.Azure.Management.Compute.Models.DiskSku 10/20/2025 2:40:58 PM Microsoft.Azure.Management.Compute.Models.Cr...
```

Task 4: Deploy a template with the CLI.

Цього разу будемо працювати з bash

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

Storage fileshare subscription bb797eda-d832-402a-93a2-b4a307a0487e is not registered to Microsoft.CloudShell
egister. In future, unregistered subscriptions will have restricted access to CloudShell service.

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

Змінюємо назву для диску на az104-disk4

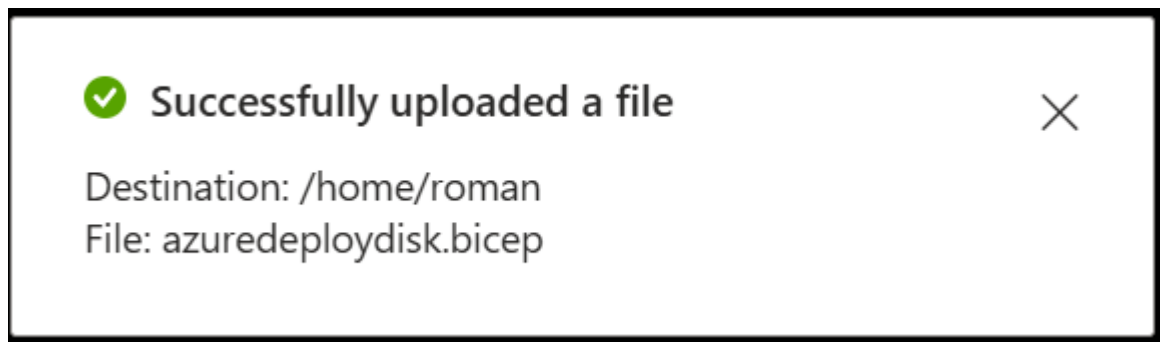
```
Bash
template.json
1 {
2   "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "disks_az104_disk1_name": {
6       "defaultValue": "az104-disk4",
7       "type": "String"
8     }
9   },
10  "variables": {},
11  "resources": [
12    {
13      "type": "Microsoft.Compute/disks",
14      "apiVersion": "2025-01-02",
15      "name": "[parameters('disks_az104_disk1_name')]",
16      "location": "polandcentral",
17      "sku": {
```

Успішно створено 4-ий диск

```
roman [ ~ ]$ az disk list --output table
Name      ResourceGroup Location      Zones      Sku      SizeGb      ProvisioningState
-----
az104-disk1 AZ104-RG3    polandcentral  Premium_LRS 32      Succeeded
az104-disk2 AZ104-RG3    polandcentral  Premium_LRS 32      Succeeded
az104-disk3 AZ104-RG3    polandcentral  Premium_LRS 32      Succeeded
az104-disk4 AZ104-RG3    polandcentral  Premium_LRS 32      Succeeded
```

Task 5: Deploy a resource by using Azure Bicep.

Завантажуємо необхідний файл для роботи



Змінюємо полі у файлі на необхідні нам значення

```
FILES 1 @description('Name of the managed disk to be copied')
2 param managedDiskName string = 'az104-disk5'
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(160000)
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'
```

Успішно створено 5-ий диск

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

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

```
roman [ ~ ]$
```

Висновок: Вивчив як автоматизувати розгортання ресурсів. Дізнався про шаблони Azure Resource Manager і шаблони Вісер. Вивчив різні способи розгортання шаблонів.