

FAILOVER CLUSTER PROTECTED BY IPSEC BASED ON MICROSOFT AZURE

The first step, In the Azure portal, create resource groups in two different regions.

The screenshot shows the Azure services homepage. In the top right, there is a 'Resource groups' card with a 'Create' button and a 'View' button. A red circle highlights this card. Below the card, there is a 'Free training from Microsoft' section and a 'Useful links' section with 'Overview' and 'Get Started' buttons.

The screenshot shows the 'Resource groups' blade. At the top, it says 'Home > Resource groups'. It displays a search bar with 'Subscription == Azure для учащихся' and a filter bar with 'Location == all'. Below this, it says 'Showing 0 to 0 of 0 records.' and 'Name ↑'. On the right, there are 'Subscription ↑' and 'Location ↑' buttons. In the center, there is a large 'Create resource group' button with a red circle around it. Below the button, there is a link 'Learn more'.

For example, SR-AZ2AZ in West US 2 and SR-AZCROSS in West Central US.

Example of creating a resource group.

The screenshot shows the 'Create a resource group' wizard. At the top, it says 'Home > Resource groups > Create a resource group'. Below this, there are tabs: 'Basics' (which is selected), 'Tags', and 'Review + create'. The 'Project details' section shows 'Subscription * (Visual Studio Pro (AzOpiskelija01))' and 'Resource group * (SR-AZ2AZ)'. The 'Resource details' section shows 'Region * (US) West US 2'. There is also a note: 'Resource group - A container that holds related resources for an Azure solution. The resource group can include all the resources for the solution, or only those resources that you want to manage as a group. You decide how you want to allocate resources to resource groups based on what makes the most sense for your organization. [Learn more](#)'.

Home >

Resource groups

Metropolia Ammattikorkeakoulu Oy

+ Add Manage view Refresh Export to CSV Open query Assign tags Feedback

Subscription == Azure для учащихся Location == all Add filter

Showing 1 to 1 of 1 records.

Name	Subscription	Location
<input type="checkbox"/> SR-AZ2AZ	Visual Studio Pro (AzOpiskelija01)	West US 2

No grouping List view

Home >

Resource groups

Metropolia Ammattikorkeakoulu Oy

+ Add Manage view Refresh Export to CSV Open query Assign tags Feedback

Filter by name... Subscription == Azure для учащихся Location == all Add filter

Showing 1 to 2 of 2 records.

Name	Subscription	Location
<input type="checkbox"/> SR-AZ2AZ	Visual Studio Pro (AzOpiskelija01)	West US 2
<input type="checkbox"/> SR-AZCROSS	Visual Studio Pro (AzOpiskelija01)	West Central US

No grouping List view

Create two availability sets, one in each resource group for each cluster.

All services X

Overview

Categories

- All
- General
- Compute
- Networking
- Storage
- Web
- Mobile

Availability sets

Function App
Keywords: java

Service Bus
Keywords: Java Message Service

Create View

Description
Create an availability set to provide redundancy for your application. Create two or more virtual machines in the availability set to distribute their placement across Azure hardware clusters.

All services >

Availability sets

Metropolia Ammattikorkeakoulu Oy

+ Add Manage view Refresh Export to CSV Open query Assign tags Feedback Leave preview

Filter by name... Subscription == Azure для учащихся Resource group == all Location == all Add filter

Showing 0 to 0 of 0 records.

Name	Resource group	Location	Subscription
------	----------------	----------	--------------

No availability sets to display

Create an availability set to provide redundancy for your application. Create two or more virtual machines in the availability set to distribute their placement across Azure hardware clusters.

Learn more about Windows virtual machine availability sets [\(W\)](#) Learn more about Linux virtual machine availability sets [\(L\)](#)

Create availability set

All services > Availability sets >

Create availability set

and network switches. If a hardware or software failure happens, only a subset of your VMs are impacted and your overall solution stays operational. Availability Sets are essential for building reliable cloud solutions. [Learn more about availability sets.](#)

Project details

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

Subscription * ⓘ	Visual Studio Pro (AzOpiskelija01)
Resource group * ⓘ	SR-AZ2AZ
	Create new

Instance details

Name * ⓘ	az2azAS1
Region * ⓘ	(US) West US 2
Fault domains ⓘ	2
Update domains ⓘ	5
Use managed disks ⓘ	No (Classic) Yes (Aligned)

[Review + create](#)

< Previous

Next : Advanced >

All services > Availability sets >

Create availability set

Validation passed

[Basics](#) [Advanced](#) [Tags](#) [Review + create](#)

Basics

Subscription	Visual Studio Pro (AzOpiskelija01)
Resource group	SR-AZ2AZ
Region	West US 2
Name	az2azAS1
Fault domain count	2
Update domain count	5
Use managed disks	Yes (Aligned)

Advanced

Proximity placement group None

Tags

(none)

[Create](#)

< Previous

Next >

Download a template for automation

All services >

Microsoft.AvailabilitySet-20201105121557 | Overview

Deployment name: Microsoft.AvailabilitySet-20201105121557
Subscription: Visual Studio Pro (AzOpiskelija01)
Resource group: SR-AZ2AZ

Start time: 11/5/2020, 12:18:25 PM
Correlation ID: b78dde61-8760-4c53-a76a-533aa5687a5b

Your deployment is complete

Deployment details (Download)

Next steps

Go to resource

Security Center
Secure your apps and infrastructure
[Go to Azure security center >](#)

Free Microsoft tutorials
[Start learning today >](#)

Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
[Find an Azure expert >](#)

The same applies to the second resource group deployed in South Central US.

All services >

Microsoft.AvailabilitySet-20201105121914 | Overview

Deployment name: Microsoft.AvailabilitySet-20201105121914
Subscription: Visual Studio Pro (AzOpiskelija01)
Resource group: SR-AZCROSS

Start time: 11/5/2020, 12:19:54 PM
Correlation ID: 2765a87f-932f-4217-a612-f1e57af91ba8

Your deployment is complete

Deployment details (Download)

Resource	Type	Status	Operation details
azcross-AS	Microsoft.Compute/availabilitySets	OK	Operation details

Next steps

Go to resource

Security Center
Secure your apps and infrastructure
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Create two virtual networks.

Create the virtual network (az2az-Vnet) in the first resource group (SR-AZ2AZ), having one subnet and one Gateway subnet.

All services >

Microsoft.AvailabilitySet-20201105121557 | Overview

Search (Ctrl+ /)

Overview

Inputs

Outputs

Template

Virtual networks

Virtual network gateways

Virtual networks (classic)

Virtual machines

Private DNS zones

Virtual clusters

Virtual WANs

Windows Virtual Desktop

SQL virtual machines

Virtual machine scale sets

Services

Marketplace

Virtual Network

Virtual network gateway

Azure Virtual Network Endpoints Management

KoSiSistem Azure Virtual Network (VNet) Management

Documentation

Azure Virtual Network | Microsoft Docs

Virtual networks - Azure Virtual Machines | Microsoft Docs

Azure virtual network service endpoints | Microsoft Docs

Connect virtual networks with VNet peering - tutorial ...

Resource Groups

No results were found.

Resources

No results were found.

Searching 1 of 2 subscriptions.

Next steps

Go to resource

Security Center
Secure your apps and infrastructure
[Go to Azure security center >](#)

Free Microsoft tutorials
[Start learning today >](#)

Work with an expert
Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.
[Find an Azure expert >](#)

All services >

Virtual networks

Metroppia Ammattiopiskelijan Oy

+ Add Manage view Refresh Export to CSV Open query Assign tags Feedback

Filter by name... Subscription == Azure для учащихся Resource group == all Location == all Add filter

No grouping List view

Showing 0 to 0 of 0 records.

Name ↑ Resource group ↑ Location ↑ Subscription ↑

No virtual networks to display

Create a virtual network to securely connect your Azure resources to each other. Connect your virtual network to your on-premises network using an Azure VPN Gateway or ExpressRoute.

Learn more Create virtual network

Create virtual network

All services > Virtual networks >

Create virtual network

Basics IP Addresses Security Tags Review + create

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation. [Learn more about virtual network](#)

Project details

Subscription *

Resource group * [Create new](#)

Instance details

Name *

Region *

Review + create

< Previous

Next : IP Addresses >

Download a template for automation

All services > Virtual networks >

Create virtual network

IP Addresses

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space
10.3.0.0/16 10.3.0.0 - 10.3.255.255 (65536 addresses)

Add IPv6 address space ⓘ

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

+ Add subnet Remove subnet

Subnet name: default Subnet address range: 10.3.0.0/24

This virtual network doesn't have any subnets.

✖ This virtual network doesn't have any subnets.

Review + create < Previous Next : Security > Download a template for automation

Add Cancel

All services > Virtual networks >

Create virtual network

IP Addresses

The virtual network's address space, specified as one or more address prefixes in CIDR notation (e.g. 192.168.1.0/24).

IPv4 address space
10.3.0.0/16 10.3.0.0 - 10.3.255.255 (65536 addresses)

Add IPv6 address space ⓘ

The subnet's address range in CIDR notation (e.g. 192.168.1.0/24). It must be contained by the address space of the virtual network.

+ Add subnet Remove subnet

Subnet Add subnet

Subnet name: default Subnet address range: 10.3.0.0/24

Review + create < Previous Next : Security > Download a template for automation

Add Cancel

All services > Virtual networks >

Create virtual network

Validation passed

Basics

Subscription: Visual Studio Pro (AzOpiskelija01)
Resource group: SR-AZ2AZ
Name: az2az-Vnet
Region: West US 2

IP addresses

Address space: 10.3.0.0/16
Subnet: default (10.3.0.0/24), GatewaySubnet (10.3.1.0/24)

Tags

None

Security

Create

< Previous Next > Download a template for automation

The screenshot shows the Azure portal's deployment overview for a virtual network. The deployment is marked as complete with a green checkmark. Key details include:

- Deployment name:** Microsoft.VirtualNetwork-20201105124702
- Subscription:** Visual Studio Pro (AzOpiskelija01)
- Resource group:** SR-AZ2AZ
- Start time:** 11/5/2020, 12:52:15 PM
- Correlation ID:** 326233e7-59f8-4c34-9567-1f2aa1ed3725

On the right side of the portal, there are links to Security Center, Free Microsoft tutorials, and Work with an expert.

Create the virtual network (azcross-VNET) in the second resource group (SR-AZCROSS), having one subnet and one Gateway subnet. For this virtual network, we must choose another IP address set let's say 10.0.0.0/16.

The screenshot shows the 'Create virtual network' wizard in the Azure portal, currently on the 'IP Addresses' step. The configuration includes:

- IPv4 address space:** 10.0.0.0/16 (highlighted with a red box)
- Subnets:**
 - default:** Subnet address range 10.0.0.0/24 (highlighted with a red box)
 - azcross-Gateway:** Subnet address range 10.0.1.0/24 (highlighted with a red box)

At the bottom, the 'Review + create' button is highlighted with a red circle, indicating the next step in the process.

 Validation passed

Basics IP Addresses Security Tags Review + create

Basics

Subscription	Visual Studio Pro (AzOpiskelija01)
Resource group	SR-AZCROSS
Name	azcross-VNET
Region	West Central US

IP addresses

Address space	10.0.0.0/16
Subnet	default (10.0.0.0/24),azcross-Gateway (10.0.1.0/24)

Tags

None

Security



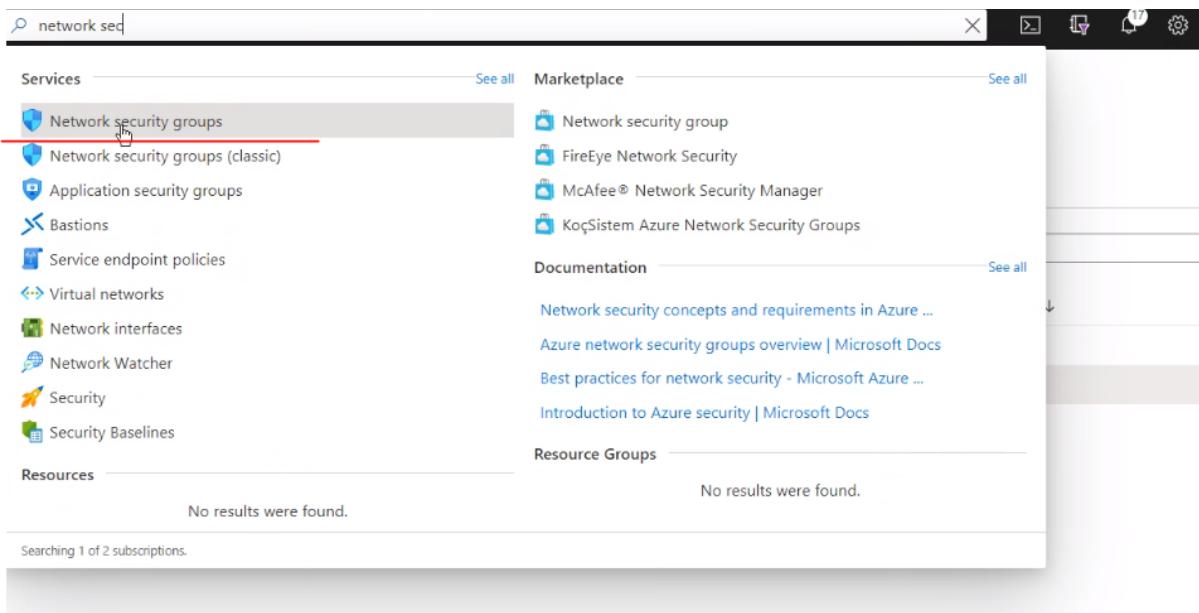
< Previous

Next >

Download a template for automation

Create two network security groups.

Create the network security group (az2az-NSG) in the first resource group (SR-AZ2AZ).



The screenshot shows the Azure portal search interface. The search bar at the top contains the text "network sec". Below the search bar, there are two main sections: "Services" and "Marketplace".

Services:

- Network security groups** (highlighted with a red circle and has a blue "Create" button above it)
- Network security groups (classic)
- Application security groups
- Bastions
- Service endpoint policies
- Virtual networks
- Network interfaces
- Network Watcher
- Security
- Security Baselines

Marketplace:

- Network security group
- FireEye Network Security
- McAfee® Network Security Manager
- KoçSistem Azure Network Security Groups

Documentation:

- Network security concepts and requirements in Azure ...
- Azure network security groups overview | Microsoft Docs
- Best practices for network security - Microsoft Azure ...
- Introduction to Azure security | Microsoft Docs

Resource Groups:

No results were found.

At the bottom left, it says "Searching 1 of 2 subscriptions."

Microsoft Azure narta@metropolia.fi METROPOLIA AMMATTIKOKEAKOULU OY

Home > Network security groups ×

+ Add Edit columns Refresh Try preview Assign tags

Subscriptions: 1 of 2 selected - Don't see a subscription? Open Directory + Subscription settings

Filter by name... (Disabled) Azure для учащихся All resource groups All locations All tags No grouping

0 items

Name ↑↓	Resource group ↑↓	Location ↑↓	Subscription ↑↓
			
No network security groups to display			
Create a network security group with rules to filter inbound traffic to, and outbound traffic from, virtual machines and other resources. Learn more ↗			
Create network security group Create network security group			

 Validation passed

Basics Tags Review + create

Basics

Subscription Visual Studio Pro (AzOpiskelija01)
Resource group SR-AZ2AZ
Region West US 2
Name az2az-NGS

Tags

None

Create

< Previous

Next >

Download a template for automation

Home > Network security groups >
Create network security group

Validation passed

Basics Tags **Review + create**

Basics

Subscription	Visual Studio Pro (AzOpiskelija01)
Resource group	SR-AZCROSS
Region	West Central US
Name	azcross-NSG

Tags

None

Create < Previous Next > Download a template for automation

Add one Inbound security rule for RDP:3389 to both Network Security Groups. You can choose to remove this rule once you finish your setup.

Home > Network security groups > az2az-NGS

Network security group Metropolia Ammattikorkeakoulu Oy

+ Add Edit columns ...

Filter by name...

Name ↑ az2az-NGS azcross-NSG

az2az-NGS | Inbound security rules

Network security group

+ Add Default rules Refresh

Search (Ctrl + /) Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Priority	Name	Port	Protocol	Source	Destination
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any
65500	DenyAllInBound	Any	Any	Any	Any

Settings

- + Inbound security rules **(selected)**
- + Outbound security rules
- Network interfaces
- Subnets
- Properties
- Locks

Monitoring

- Diagnostic settings
- Logs

The screenshot shows the Azure portal interface for managing Network Security Groups (NSGs). On the left, there's a sidebar with navigation links like 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Settings' (selected), 'Inbound security rules' (selected), 'Outbound security rules', 'Network interfaces', 'Subnets', 'Properties', 'Logs', and 'NSG flow logs'. The main area shows a table of 'Inbound security rules' with columns 'Priority' and 'Name'. There are three entries: 'AllowVnetInBound' (Priority 65000), 'AllowAzureLoadBalancerInBound' (Priority 65001), and 'DenyAllInBound' (Priority 65500). To the right, a modal window titled 'Add inbound security rule' is open. It has fields for 'Service' (set to 'RDP'), 'Port ranges' (set to '3389'), 'Priority' (set to '100'), 'Name' (set to 'RDP3389'), and 'Description'. At the bottom of the modal is a blue 'Add' button, which is circled in red.

The same process must be done for the second network. In our case the network security group with the name (azcross-NSG) in the second resource group (SR-AZCROSS).

Virtual Machines

Create Windows Server virtual machines in the previously created resource groups.

The screenshot shows the Azure portal interface for managing virtual machines. The left sidebar includes links for 'Services' (Virtual machines, Virtual networks, Virtual clusters, Virtual WANs, Virtual network gateways, Virtual machine scale sets, Virtual machines (classic), Activity log, SQL virtual machines), 'Resources' (No results were found), and 'Subnets' (Properties). The main content area displays a table of virtual machines with columns 'Name' (e.g., 'virt'), 'Status' (e.g., 'Running'), 'Region' (e.g., 'West Europe'), 'Size' (e.g., 'Standard_B2ms'), and 'Actions'. To the right, a modal window titled 'Add inbound security rule' is overlaid. It contains a table with columns 'Protocol', 'Source', and 'Destination'. The table has four rows:

Protocol	Source	Destination
TCP	Any	Any
TCP	VirtualNetwork	VirtualNetwork
TCP	AzureLoadBalancer	Any
TCP	Any	Any

 The 'Add' button at the bottom of the modal is circled in red.

Home >

Virtual machines

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Add

Try the new virtual machine resource browser! This experience is faster and has improved sorting and filtering capabilities. Please note that the new experience will not show classic virtual machines and does not include support for some columns such as maintenance status.

Subscriptions: 1 of 2 selected - Don't see a subscription? Open Directory + Subscription settings

Filter by name... Visual Studio Pro (AzOpiskelija01) Edit columns Refresh Try preview Assign tags Start Restart Stop Delete Services

0 items

Name ↑↓	Type ↑↓	Status	Resource group ↑↓	Location ↑↓	Source	Maintenance status	Subscription ↑↓

Create a virtual machine - Microsoft Azure Sponsors Presenting... Give control Stop presenting

portal.azure.com/#create/Microsoft.VirtualMachine

Mail.Ru: почта S-Pankki.fi kela.fi YouTube Yle Uutiset Переводчик Global NetAcad Ins... CyberOps Associate ITU Online Training...

Microsoft Azure Search resources, services, and docs (G+/-)

Home > Virtual machines > Create a virtual machine

Basics Disks Networking Management Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

Project details

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

Subscription * Visual Studio Pro (AzOpiskelija01)

Resource group * SR-AZ2AZ [Create new](#)

Instance details

Virtual machine name * az2az1

Region * (US) West US 2

Availability options Availability set

Availability set * az2azAS1

Review + create < Previous Next : Disks >

Create a virtual machine

Region * ⓘ (US) West US 2

Availability options ⓘ Availability set

Availability set * ⓘ az2azAS1
Create new

Image * ⓘ Windows Server 2016 Datacenter - Gen1
Browse all public and private images

Azure Spot instance ⓘ Yes No

Size * ⓘ Standard_B2s - (25,61 €/month)
Select size

Administrator account

Username * ⓘ nart

Password * ⓘ
Confirm password * ⓘ

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular

Home > Virtual machines >

Create a virtual machine

Virtual network * ⓘ az2az-Vnet
Create new

Subnet * ⓘ default (10.3.0.0/24)
Manage subnet configuration

Public IP ⓘ (new) az2az1-ip
Create new

NIC network security group ⓘ None Basic Advanced

Configure network security group * ⓘ az2az-NGS
Create new

Accelerated networking ⓘ On Off

The selected VM size does not support accelerated networking.

Load balancing

You can place this virtual machine in the backend pool of an existing Azure load balancing solution. [Learn more](#)

Place this virtual machine behind an existing load balancing solution? Yes No

Home > Virtual machines >

Create a virtual machine

Validation passed

Basics Disks Networking Management Advanced Tags **Review + create**

PRODUCT DETAILS

Standard B2s

by Microsoft

[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ

0.0351 EUR/hr

[Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

Basics

Subscription

Visual Studio Pro (AzOpiskelija01)

Create

< Previous

Next >

[Download a template for automation](#)

URL: /
CreateVm-MicrosoftWindowsServer.WindowsServer-201-20201105133414 | Overview ↗

Deployment

Search (Ctrl+ /) Delete Cancel Redeploy Refresh

We'd love your feedback! →

Your deployment is complete

Deployment name: CreateVm-MicrosoftWindowsServer.WindowsSe... Start time: 11/5/2020, 2:06:19 PM
Subscription: Visual Studio Pro (AzOpiskelija01) Correlation ID: 30cf11e-78e9-4611-b26f-0b6edfce4d08
Resource group: SR-AZ2AZ

Deployment details (Download)

Resource	Type	Status	Operation details
shutdown-computevm-az2az1	Microsoft.DevTestLab/schedules	Created	Operation details
az2az1	Microsoft.Compute/virtualMachi...	OK	Operation details
az2az1258	Microsoft.Network/networkInterf...	Created	Operation details
az2az1_DataDisk_1	Microsoft.Compute/disks	OK	Operation details
az2az1_DataDisk_0	Microsoft.Compute/disks	OK	Operation details
az2az1_DataDisk_2	Microsoft.Compute/disks	OK	Operation details
az2az1-ip	Microsoft.Network/publicIPAddre...	OK	Operation details

Next steps

Security Center
Secure your apps and infrastructure
[Go to Azure security center >](#)

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Work with an expert
Azure experts are service provider partner who can help manage your assets on Azure and be your first line of support.
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Domain Controller (az2azDC). You can choose to create a 3rd availability set for your domain controller or add the domain controller in one of the two availability sets. If you are adding this to the availability set created for the two clusters, assign it a Standard public IP address during VM creation. Install Active Directory Domain Service. Create a domain (contoso.com). Create a user with administrator privileges (contosoadmin).

Create two virtual machines (**az2az1**, **az2az2**) in the resource group (**SR-AZ2AZ**) using the virtual network (**az2az-Vnet**) and network security group (**az2az-NSG**) in the availability set (**az2azAS1**). Assign a standard public IP address to each virtual machine during the creation itself. So the final result must be the same as in the picture below. Add at-least two managed disks to each machine. Install Failover Clustering.

Create two virtual machines (**azcross1**, **azcross2**) in the resource group (**SR-AZCROSS**) using the virtual network (**azcross-VNET**) and network security group (**azcross-NSG**) in the availability set (**azcross-AS**). Assign a standard Public IP address to each virtual machine during the creation itself. Add at-least two managed disks to each machine. Install Failover Clustering.

Name	Subscription	Resource group	Location	Status	Operating system	Size	Public IP address	Disk count
az2az1	Visual Studio Pro (AzOpiskelija01)	SR-AZ2AZ	West US 2	Running	Windows	Standard_B2s	52.250.104.19	1
az2az2	Visual Studio Pro (AzOpiskelija01)	SR-AZ2AZ	West US 2	Running	Windows	Standard_B2s	52.229.9.19	1
az2azDC	Visual Studio Pro (AzOpiskelija01)	SR-AZ2AZ	West US 2	Running	Windows	Standard_B2s	52.250.56.97	3
azcross1	Visual Studio Pro (AzOpiskelija01)	SR-AZCROSS	South Central US	Running	Windows	Standard_B2s	-	1
azcross2	Visual Studio Pro (AzOpiskelija01)	SR-AZCROSS	South Central US	Running	Windows	Standard_B2s	-	1

Create a Virtual network gateway for Vnet-to-Vnet connectivity.

No virtual network gateways to display

Azure VPN Gateway connects your on-premises networks to Azure through Site-to-Site VPNs in a similar way that you set up and connect to a remote branch office. The connectivity is secure and uses the industry-standard protocols Internet Protocol Security (IPsec) and Internet Key Exchange (IKE). Learn more about Virtual network gateway.¹⁰

Create virtual network gateway

Create virtual network gateway

Project details

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

Subscription *

Visual Studio Pro (AzOpiskelija01)



Resource group ⓘ

SR-AZ2AZ (derived from virtual network's resource group)

Instance details

Name *

az2az-VNetGateway



Region *

West US 2



Gateway type * ⓘ

 VPN ExpressRoute Route-based Policy-based

SKU * ⓘ

VpnGw1



Generation ⓘ

Generation1



Virtual network * ⓘ

az2az-Vnet

[Create virtual network](#)

Subnet ⓘ

GatewaySubnet (10.3.1.0/24)



i Only virtual networks in the currently selected subscription and region are listed.

Public IP address

Public IP address * ⓘ

 Create new Use existing

Public IP address name *

VPNaz2az



Public IP address SKU

Basic

Assignment

 Dynamic Static

Enable active-active mode * ⓘ

 Enabled Disabled

Configure BGP * ⓘ

 Enabled Disabled**Review + create**[Previous](#)[Next : Tags >](#)[Download a template for automation](#)

VPN for across the network

Home > Resource groups > SR-AZCROSS > New > Virtual network gateway >

Create virtual network gateway

Basics Tags Review + create

Azure has provided a planning and design guide to help you configure the various VPN gateway options. [Learn more.](#)

Project details

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

Subscription *	Visual Studio Pro (AzOpiskelija01)
Resource group ⓘ	SR-AZCROSS (derived from virtual network's resource group)
Instance details	
Name *	azcross-VNetGateway
Region *	South Central US
Gateway type * ⓘ	<input checked="" type="radio"/> VPN <input type="radio"/> ExpressRoute
VPN type * ⓘ	<input checked="" type="radio"/> Route-based <input type="radio"/> Policy-based

SKU * ⓘ	VpnGw1
Generation ⓘ	Generation1
Virtual network * ⓘ	azcross-VNET Create virtual network
<small> ⓘ Only virtual networks in the currently selected subscription and region are listed.</small>	
Gateway subnet address range * ⓘ	10.0.2.0/24 10.0.2.0 - 10.0.2.255 (256 addresses)

Public IP address	
Public IP address * ⓘ	<input checked="" type="radio"/> Create new <input type="radio"/> Use existing
Public IP address name *	VPNazcross
Public IP address SKU	Basic
Assignment	<input checked="" type="radio"/> Dynamic <input type="radio"/> Static
Enable active-active mode * ⓘ	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Configure BGP * ⓘ	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled

Press Create

Connection Vnet to Vnet

The screenshot shows the 'Connections' blade in the Azure portal. At the top, it displays 'Subscriptions: 1 of 2 selected - Don't see a subscription? Open Directory + Subscription settings'. Below this are filters for 'Filter by name...', 'Visual Studio Pro (AzOpiskelija01)', 'All resource groups', 'All locations', 'All tags', and 'No grouping'. A table header row includes columns for Name, Status, Peer 1, Peer 2, Resource group, Location, and Subscription. Below the table, there is a large circular icon with a double-headed arrow and the text 'No connections to display'. A callout box points to a 'Create connection' button.

The screenshot shows the 'Create connection' dialog in the Azure portal. The title bar says 'Microsoft Azure' and 'Search resources, services, and docs (G+)'. The user 'narta@metropolia.fi' is logged in. The dialog has a 'Settings' tab selected. It contains fields for 'First virtual network gateway' (set to 'azcross-VNetGateway') and 'Second virtual network gateway' (set to 'az2az-VNetGateway'). A checked checkbox 'Establish bidirectional connectivity' is present. Under 'First connection name', the value 'azcross-VNetGateway-to-az2az-VNetGat...' is shown with a green checkmark. Under 'Second connection name', the value 'az2az-VNetGateway-to-azcross-VNetGat...' is shown with a green checkmark. The 'Shared key (PSK)' field contains 'metropolia123'. Under 'IKE Protocol', 'IKEv2' is selected. There are also checkboxes for 'Use Azure Private IP Address' and 'Enable BGP', both of which are unchecked. At the bottom right is an 'OK' button.

Connect all the nodes to the domain and provide administrator privileges to the previously created user. Change the DNS Server of the virtual network to the domain controller's private IP address.

In the example, the domain controller az2azDC has a private IP address (10.3.0.8). In the Virtual Network (az2az-Vnet and azcross-VNET) change DNS Server 10.3.0.8.

In the example, connect all the nodes to "contoso.com" and provide administrator privileges to "contosoadmin". Login as contosoadmin from all the nodes.

Pricing of resources

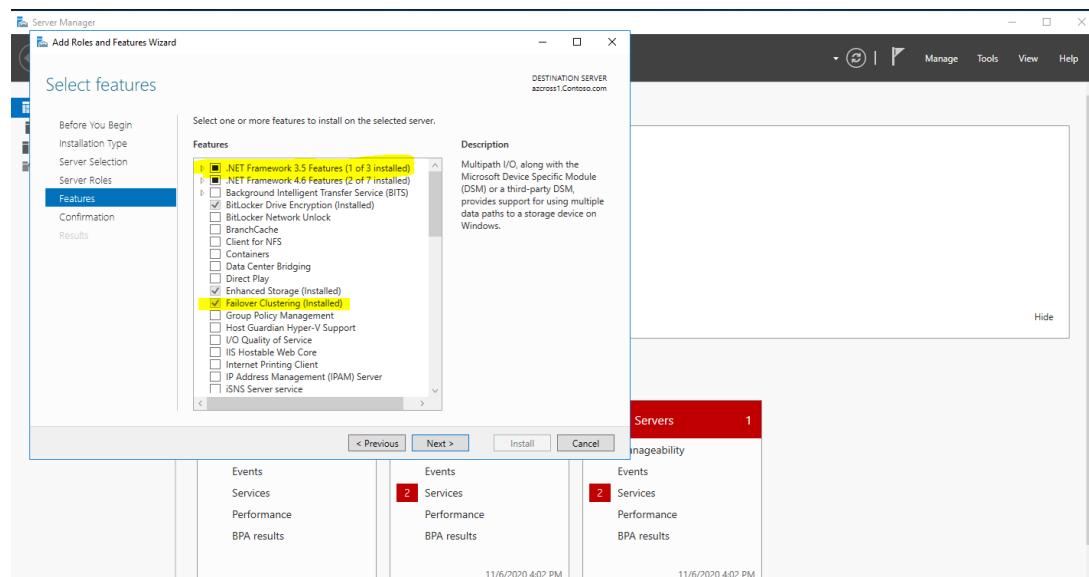
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/subscription/microsoft.cinternetcentral	sr-az2az	bandwidth	inter-region	data trans.	0.000000891908596000	0.000000758970000000	EUR			
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/subscription/microsoft.cus.southcentral	sr-across-s	storage	standard	h disk open	0.0000026221212195000	0.000002231300000000	EUR			
/subscription/microsoft.cus.southcentral	sr-az2az	bandwidth	inter-region	data trans.	0.0000041126665790000	0.000004199695000000	EUR			
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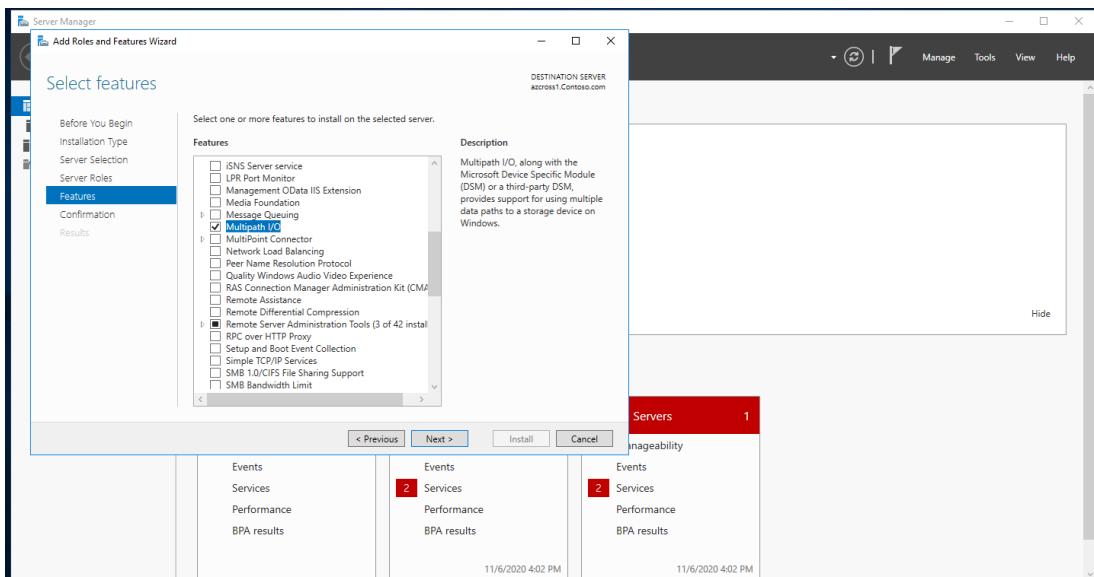
The most expensive are VPN gateways.

The next charts show graphically the cost of the services we used on the Azure platform

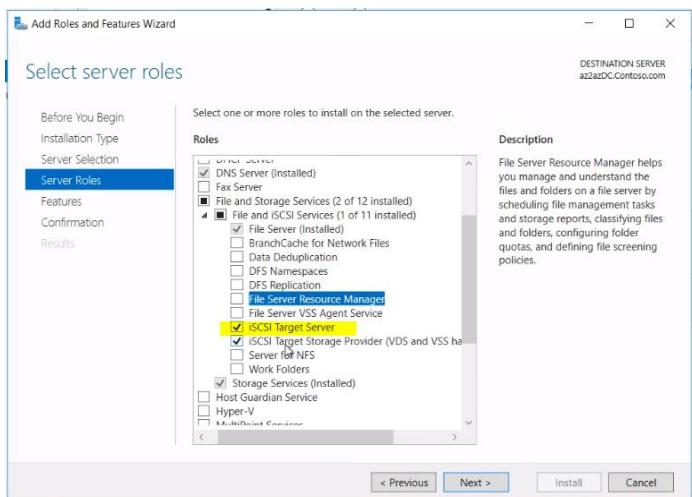


Installing needed features to deploy failover cluster on the servers(nodes).

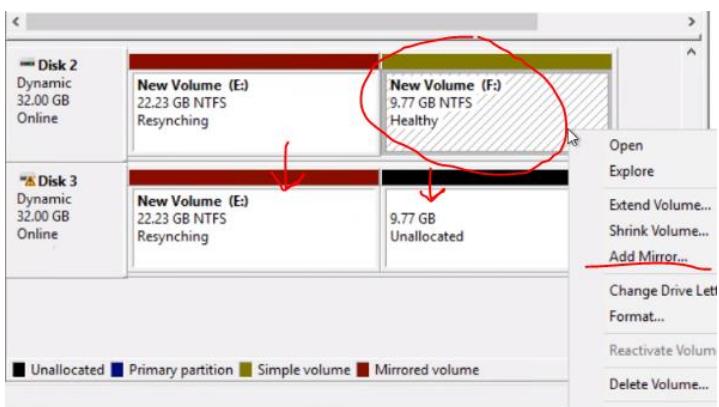




On the DC-Server we have to install the iSCSI Target Server



Deploy mirroring between two disks



New iSCSI Virtual Disk Wizard

Select iSCSI virtual disk location

iSCSI Virtual Disk Location

Server:

Server Name	Status	Cluster Role	Owner Node
azAzDC	Online	Not Clustered	

The list is filtered to show only servers with the iSCSI Target Server role installed.

Storage location:

Select by volume:

Volume	Free Space	Capacity	File System
C:	114 GB	127 GB	NTFS
D:	6.96 GB	8.00 GB	NTFS
E:	22.2 GB	22.2 GB	NTFS
F:	9.73 GB	9.77 GB	NTFS

The iSCSI virtual disk will be saved at \\SCSIVirtualDisk on the selected volume.

Type a custom path:

E:\\SCSIVirtualDisks\\Data.vhdx

New iSCSI Virtual Disk Wizard

Specify iSCSI virtual disk name

iSCSI Virtual Disk Location

Name: **Data**

Description:

Path: E:\\SCSIVirtualDisks\\Data.vhdx

New iSCSI Virtual Disk Wizard

Specify iSCSI virtual disk size

iSCSI Virtual Disk Location

Free space: 22.1 GB

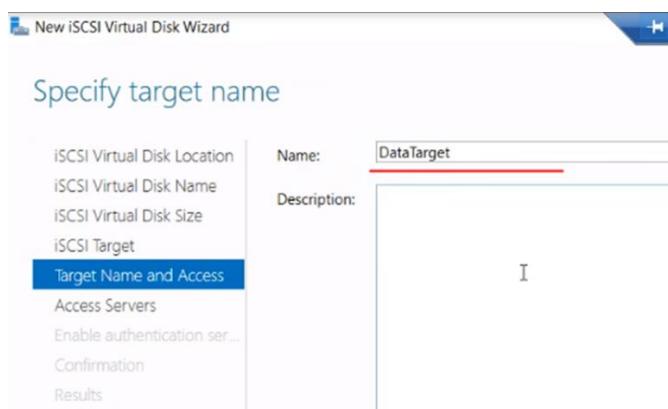
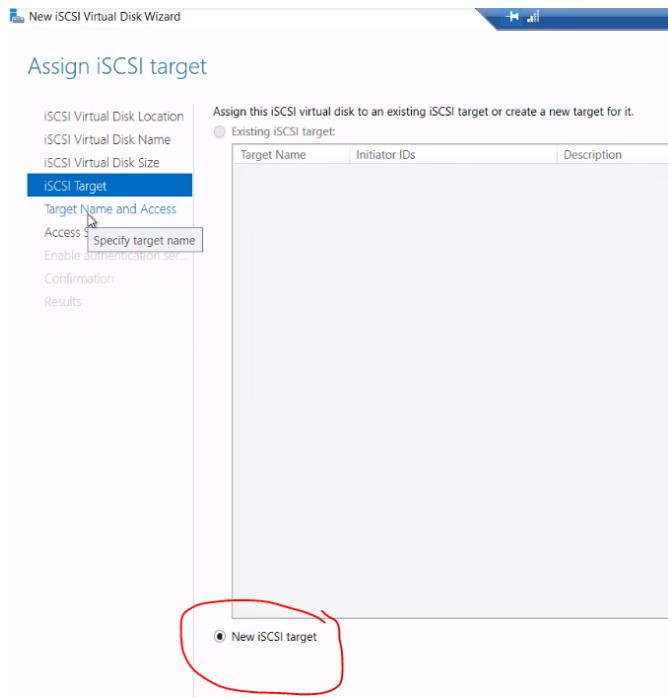
Size: **22.1** GB

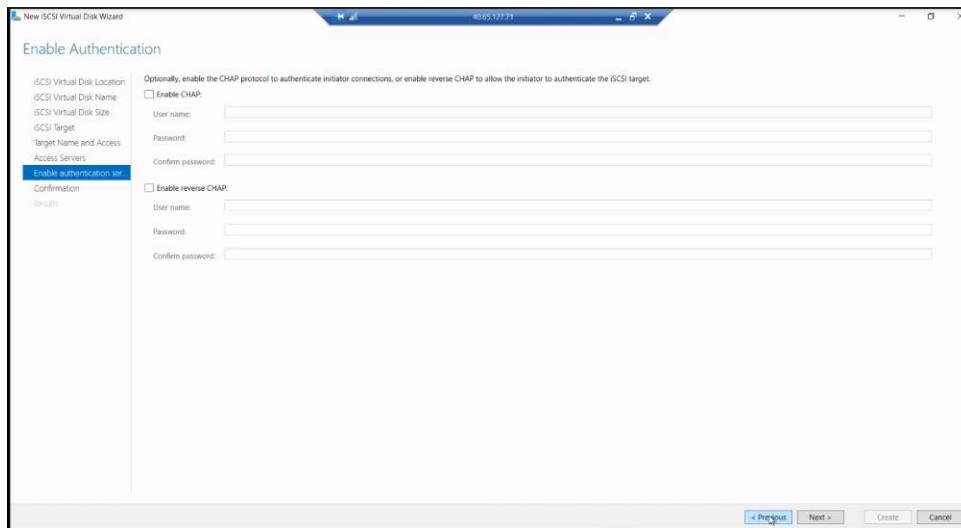
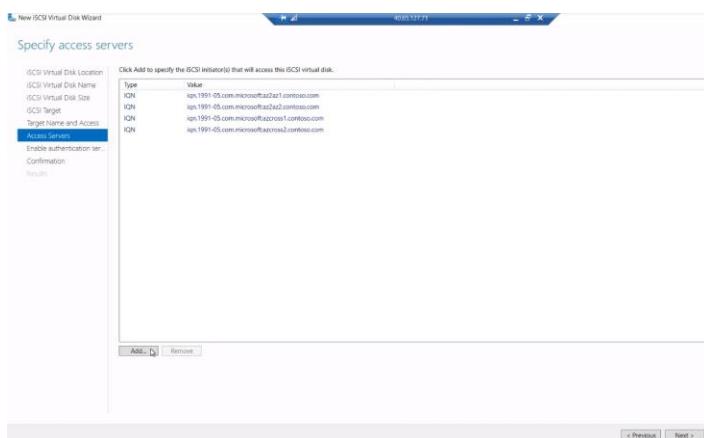
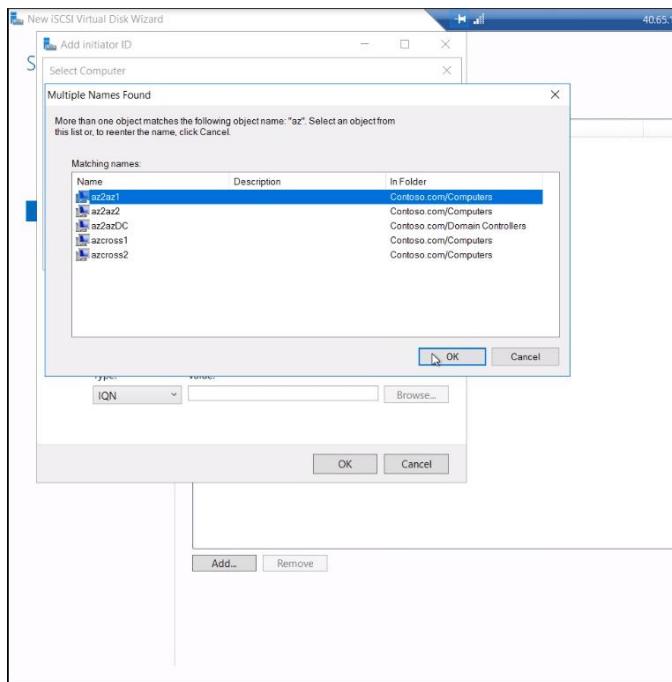
Fixed size
This type of disk provides better performance and is recommended for servers running applications with a high level of disk activity. The virtual hard disk is created using the size of the fixed virtual hard disk. It does not change when data is added or deleted.
 Clear the virtual disk on allocation
Note: Un-selecting is NOT RECOMMENDED. Clearing a disk to zero will remove any fragments of data that remained on underlying storage, thus protecting from information leaks.

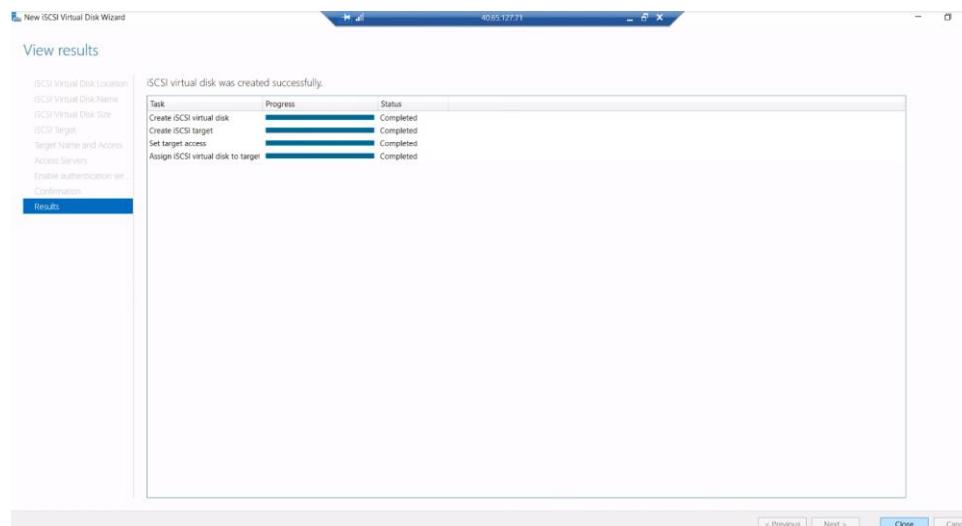
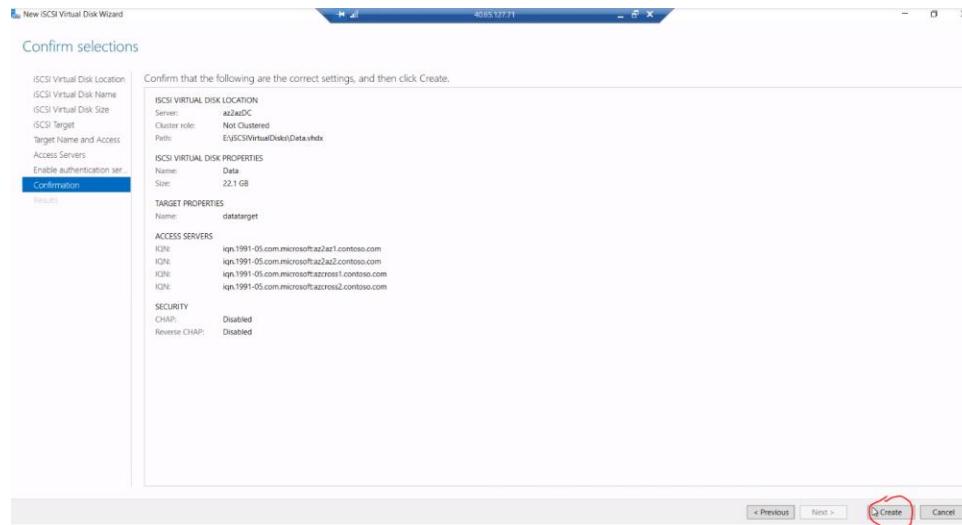
Dynamically expanding
This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The .vhdx file is small when the disk is created and grows as data is written to it.

Differencing
This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to this virtual hard disk without affecting the parent disk and easily revert the changes later.

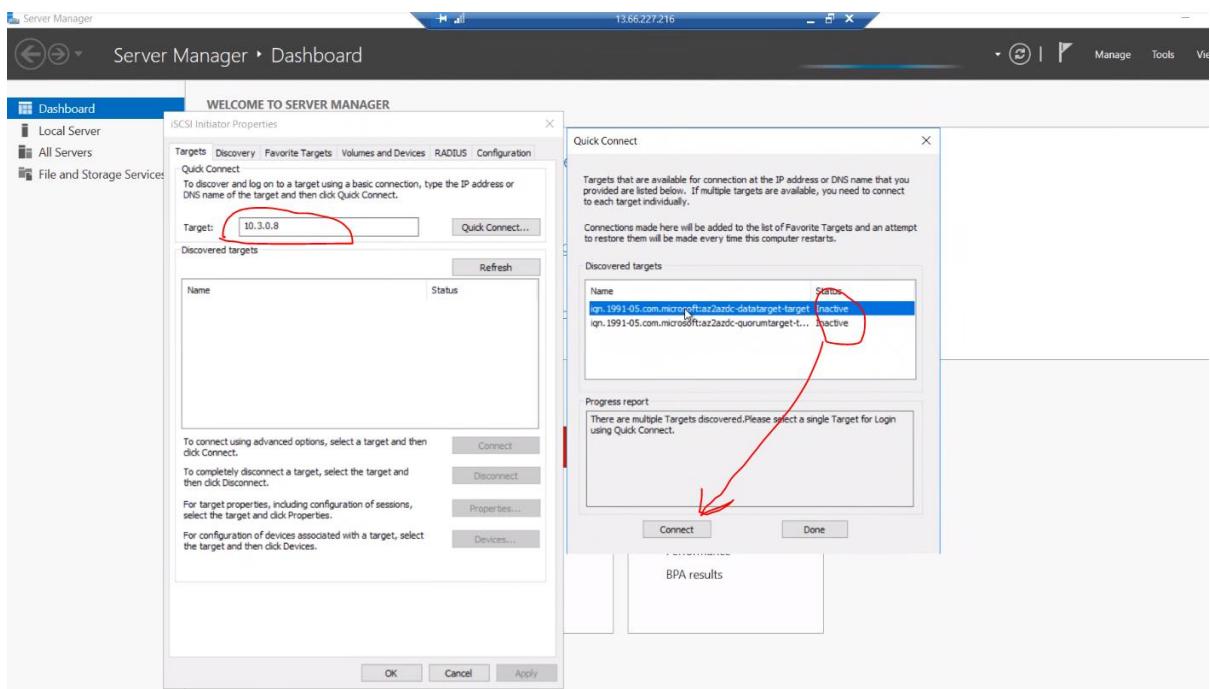
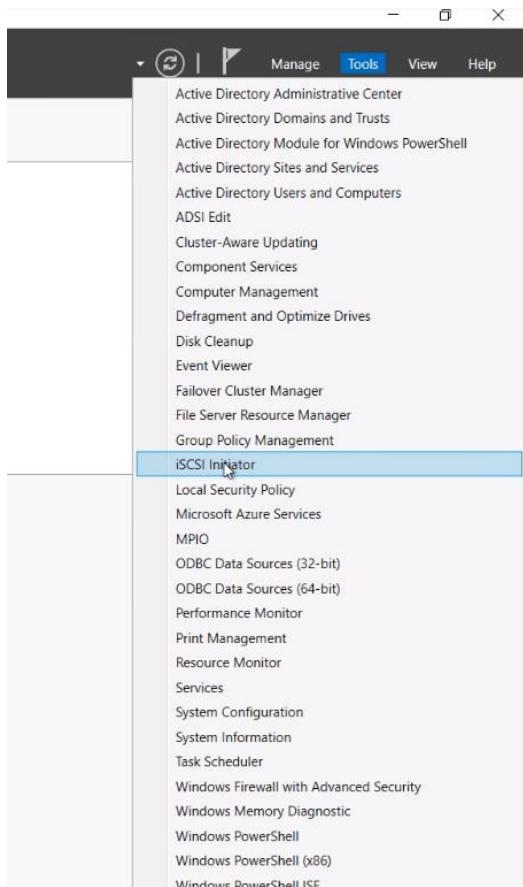
Parent virtual disk path:

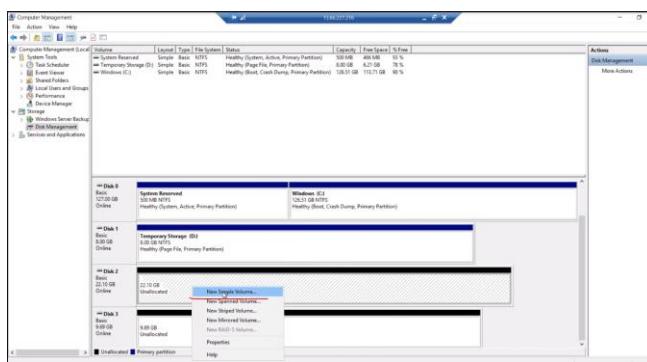
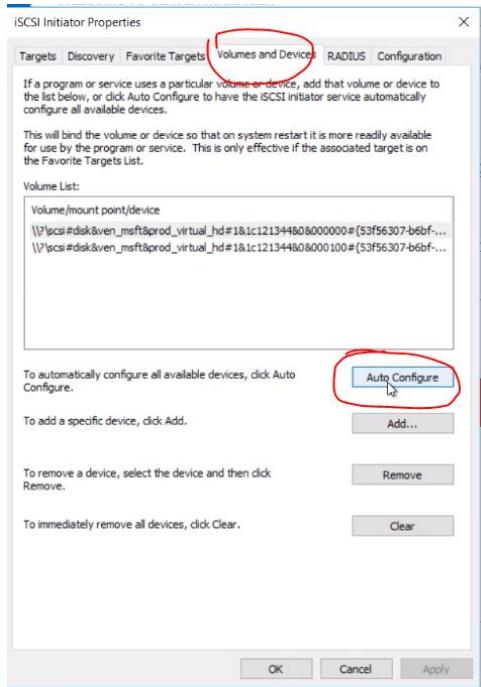




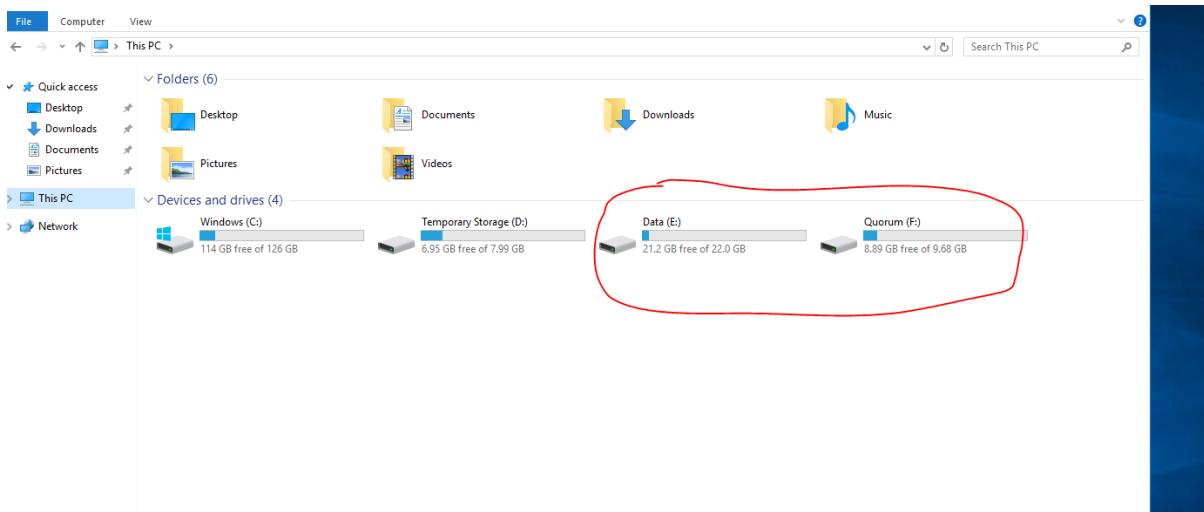


Connect iSCSI disks to the Cluster server



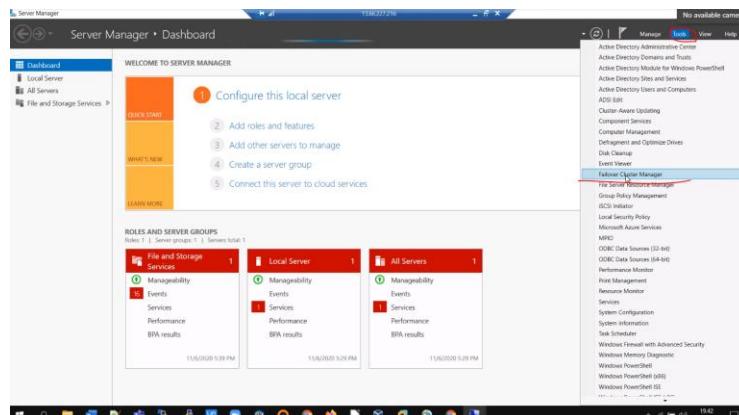


The same steps must be done in other clusters' servers. Expect the last step.

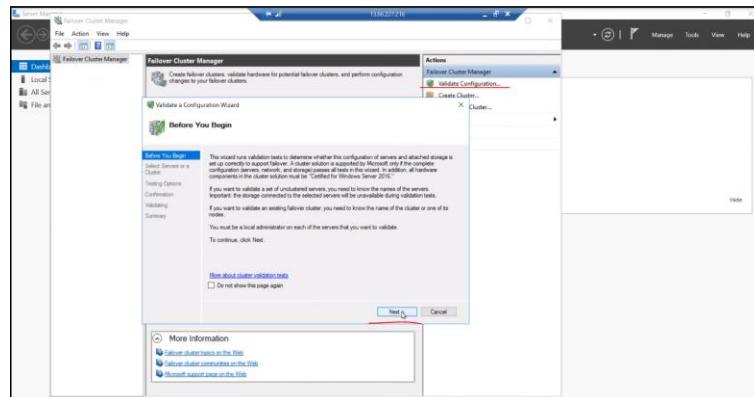


Now we are ready to deploy the failover cluster

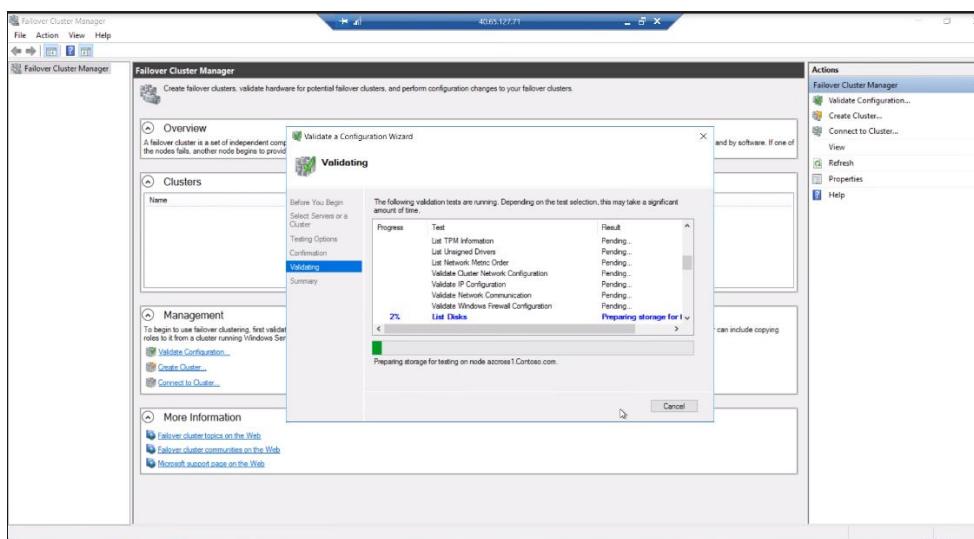
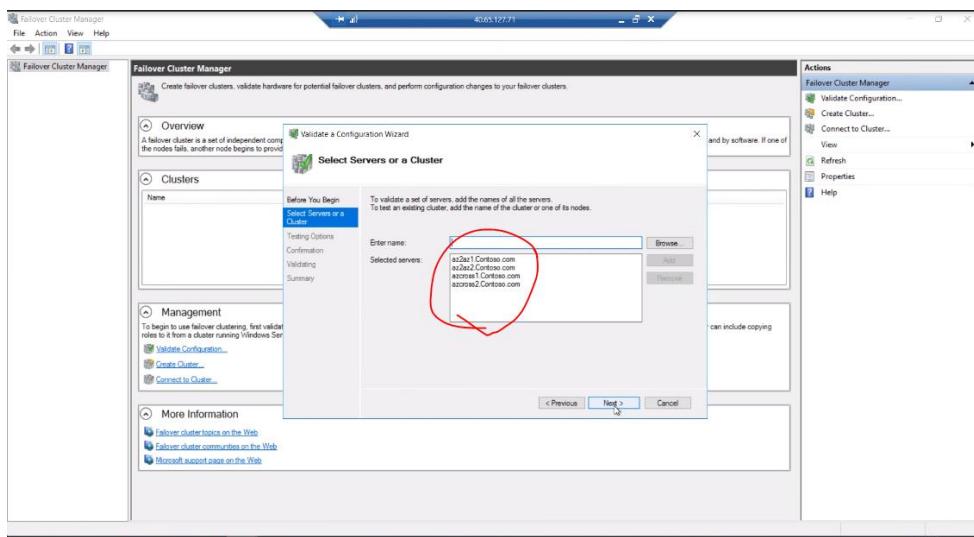
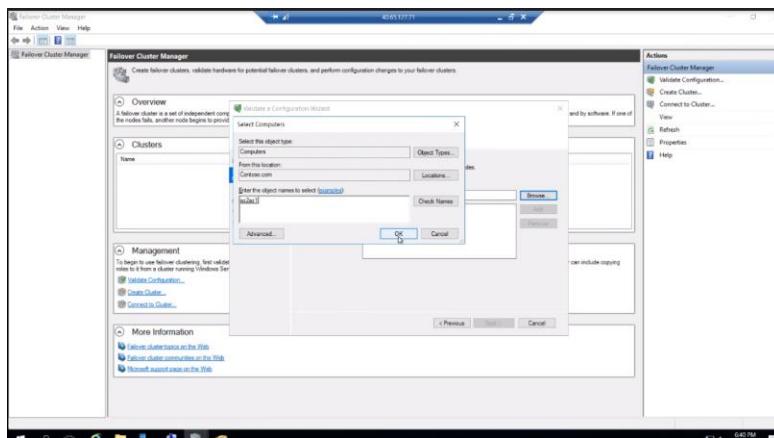
On the DC server az2azDC

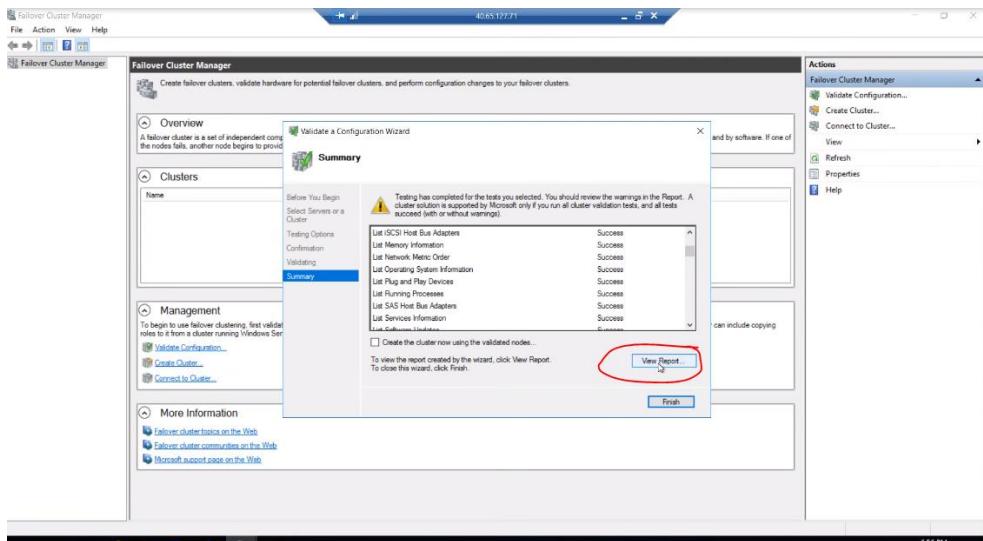


Before deploying the cluster, we can perform the validation



Adding servers to clusters





Failover Cluster Validation Report

Name	Result Summary	Description
Inventory		Warning
Network		Success
Storage		Success
System Configuration		Warning

Inventory

Name	Result	Description
List BIOS Information		Success
List Environment Variables		Success
List Fibre Channel Host Bus Adapters		Success
List Host Guardian Service client configuration		Success

Since we are using a VPN connection between networks, we can skip those errors.

Validate Network Communication

Description: Validate that servers can communicate with acceptable latency on all networks.

Start: 11/6/2020 6:54:39 PM.

Analyzing connectivity results...

None az2a1.Contoso.com is reachable from Node az2a1.Contoso.com by only one pair of network interfaces. It is possible that this network path is a single point of failure for communication within the cluster. Please verify that this single path is highly available or consider adding additional networks to the cluster.

Following are the connectivity checks made using UDP on port 3343 from network interfaces on node az2a1.Contoso.com to network interfaces on node az2a2.Contoso.com

Result	Source Interface Name	Source IP Address	Destination Interface Name	Destination IP Address	Same Cluster Network	Packet Loss (%)
Success	az2a1.Contoso.com - Ethernet 2	10.0.0.10	az2a2.Contoso.com - Ethernet	10.0.0.5	True	0

None az2a1.Contoso.com is reachable from Node az2a1.Contoso.com by only one pair of network interfaces. It is possible that this network path is a single point of failure for communication within the cluster. Please verify that this single path is highly available or consider adding additional networks to the cluster.

Following are the connectivity checks made using UDP on port 3343 from network interfaces on node az2a1.Contoso.com to network interfaces on node az2a3.Contoso.com

Result	Source Interface Name	Source IP Address	Destination Interface Name	Destination IP Address	Same Cluster Network	Packet Loss (%)
Success	az2a1.Contoso.com - Ethernet 2	10.0.0.10	az2a3.Contoso.com - Ethernet 2	10.0.0.10	False	0

None az2a1.Contoso.com is reachable from Node az2a2.Contoso.com by only one pair of network interfaces. It is possible that this network path is a single point of failure for communication within the cluster. Please verify that this single path is highly available or consider adding additional networks to the cluster.

Following are the connectivity checks made using UDP on port 3343 from network interfaces on node az2a2.Contoso.com to network interfaces on node az2a1.Contoso.com

Result	Source Interface Name	Source IP Address	Destination Interface Name	Destination IP Address	Same Cluster Network	Packet Loss (%)
Success	az2a2.Contoso.com - Ethernet 2	10.0.0.10	az2a1.Contoso.com - Ethernet 2	10.0.0.11	False	0

Because the validation did not show any critical errors, we can deploy our cluster

