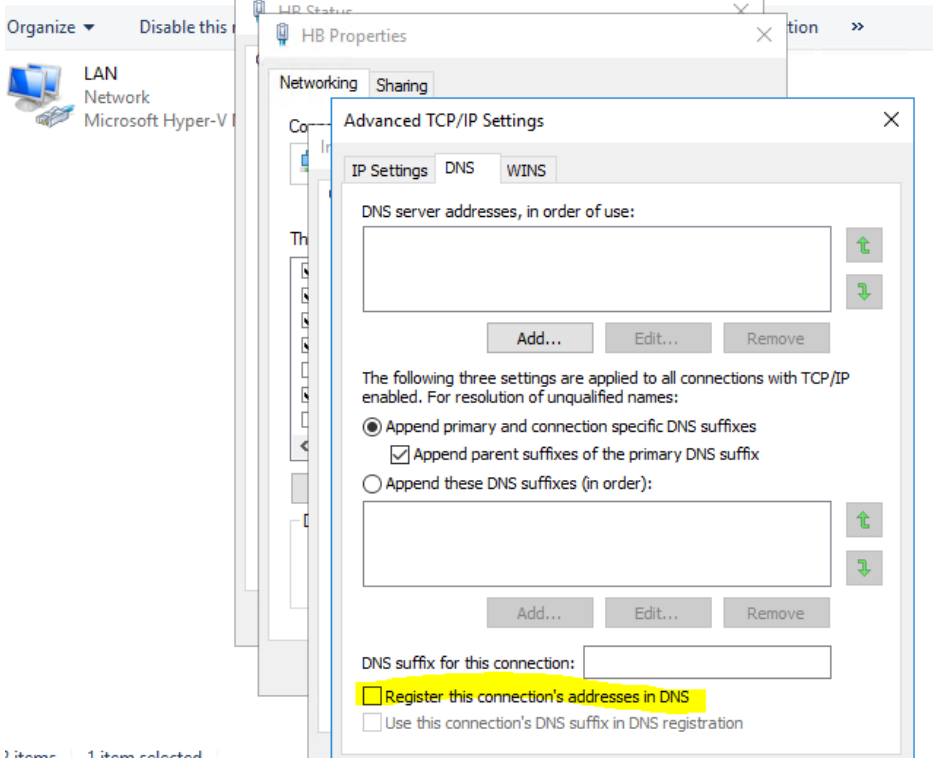


SQL Serever ı Windows Failover Cluster altında HA olarak çalıştırmak için yapılacaklar aşağıdaki gibidir. 2 Node ve iscsi bağlı bir storage üzerinde gerekli işlemleri gerçekleştireceğim.

Sunucu üzerinde client ların sql e bağlanacağı bir network ve cluster ortamında bulunan sunucuların bir birleri ile erişmesi için kullanılacak ikinci bir network e ihtiyaç vardır. Bu network e heratbet network ü denir. Bu network sadece cluster da bulunan sunucular arasında kullanıldığından network lerinin dns e register edilmesine gerek yoktur. Ayrıca backup için sunucularda ayrı bir interface kullanılması gerekmektedir. Aşağıki ayarı cluster da bulunan her sunucuda gerçekleştirmek gerekir.

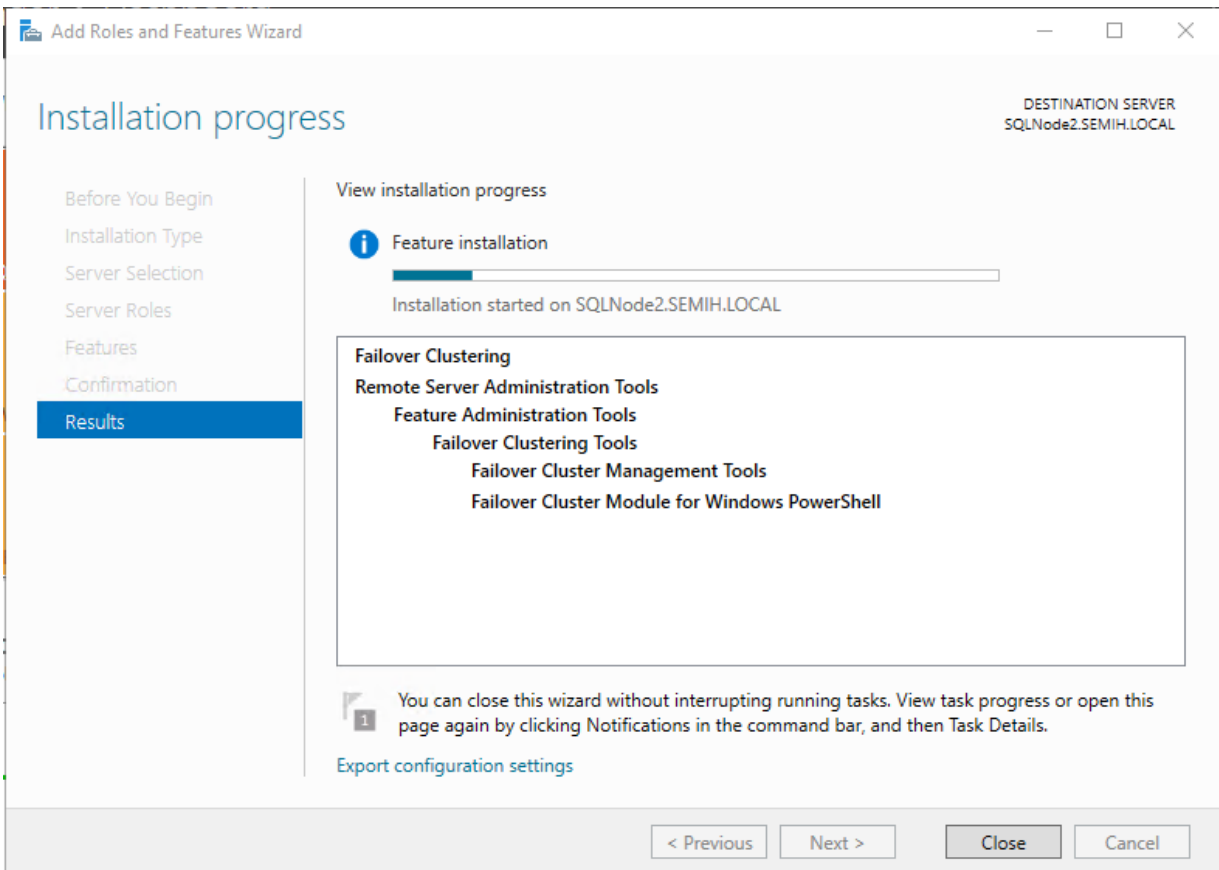
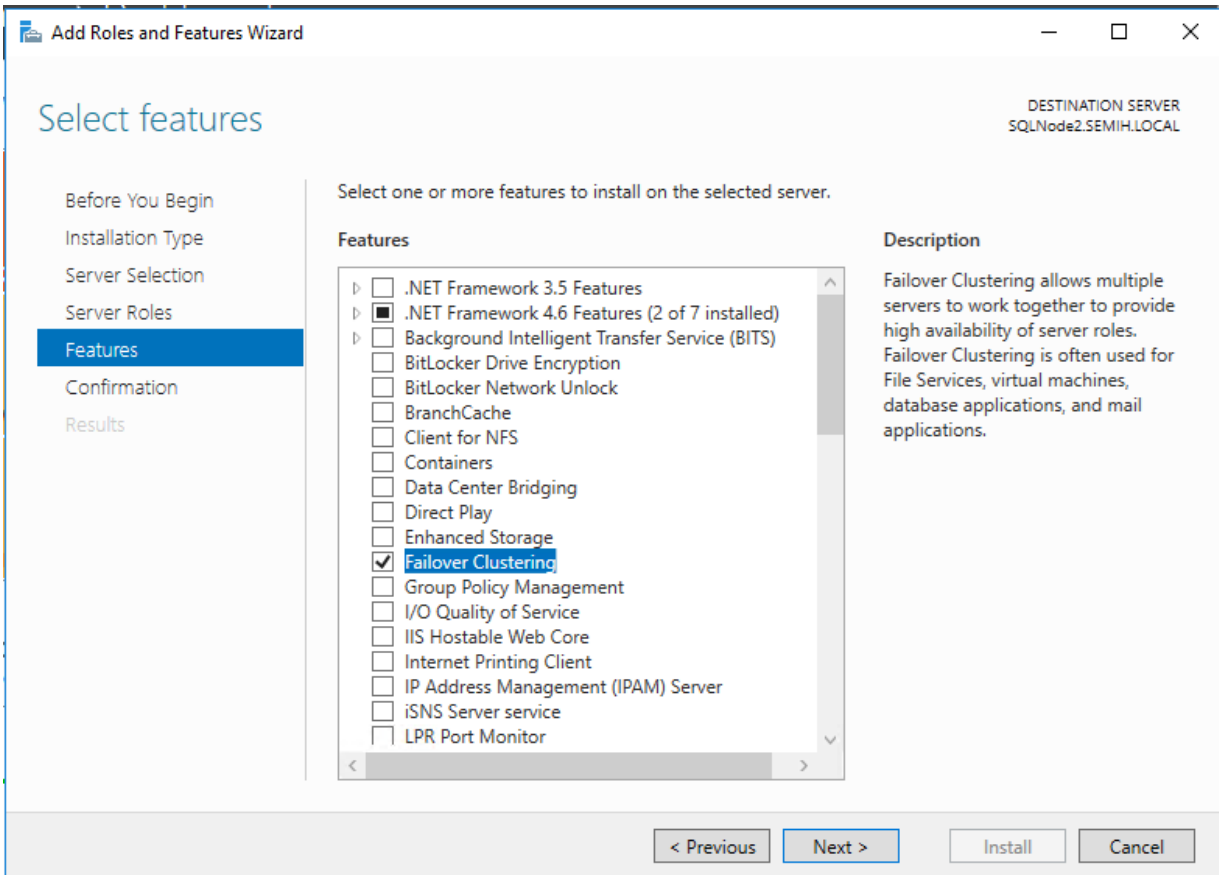


Cluster da bulunan sunucuların işletim sistemi versiyon ve update lerinin ayno olması, driver ve firmware güncellemerinin aynı olması tavsiye edilir. Sunucuların domainde olması gerekmektedir.

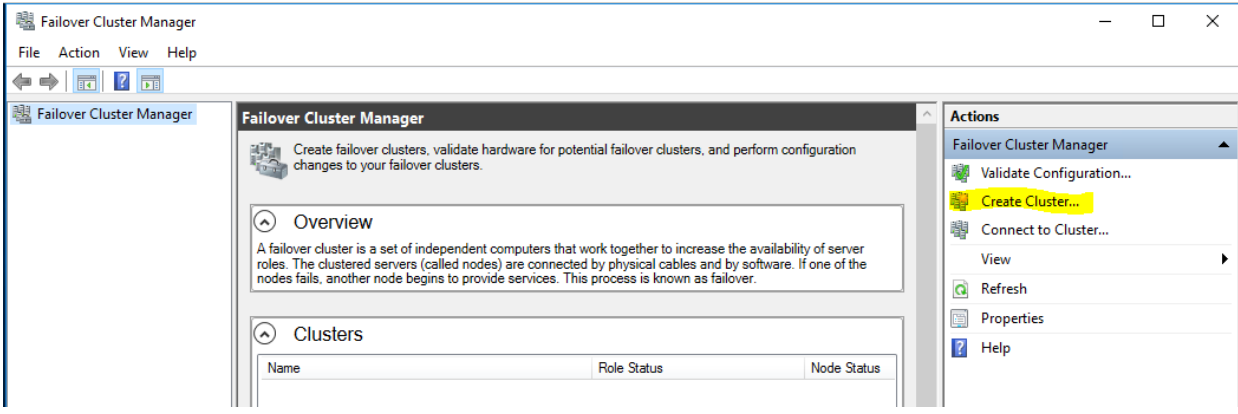
SQL kurulumundan önce cluster ortamını hazırlamak gerekmektedir. Cluster da çalışacak her sunucuya failover cluster feature ını kuruyorum.

Sunucular storage a birden fazla path ile gidiyorsa yani server ve storage arasında 2 veya daha fazla kablo ile bağlantı sağlandıysa Multipath IO nun da kurulması gerekmektedir. Multipat IO kurulduktan sonra MPIO da discovered olarak disklerin durmaması gerek. MPIO kurulumundan sonra sunucunun resetlenmesi gerekmektedir. MPIO yoksa diske giden her path için windows tarafında bir disk görülür. Yani storage üzerinde açılan her alan için var olan path sayısı kadar windows tarafında disk göölür. Bunları teke düşürmek içi MPIO kullanılır. Bazı storage ların üreticileri bu işlemin için kendi driver larını kullanırlar. Vmware tarafında MPIO nu vmware kendi yönettiği gibi bazı sstorage lar için vmware mpio nun vmware e kurulması gerekmektedir.

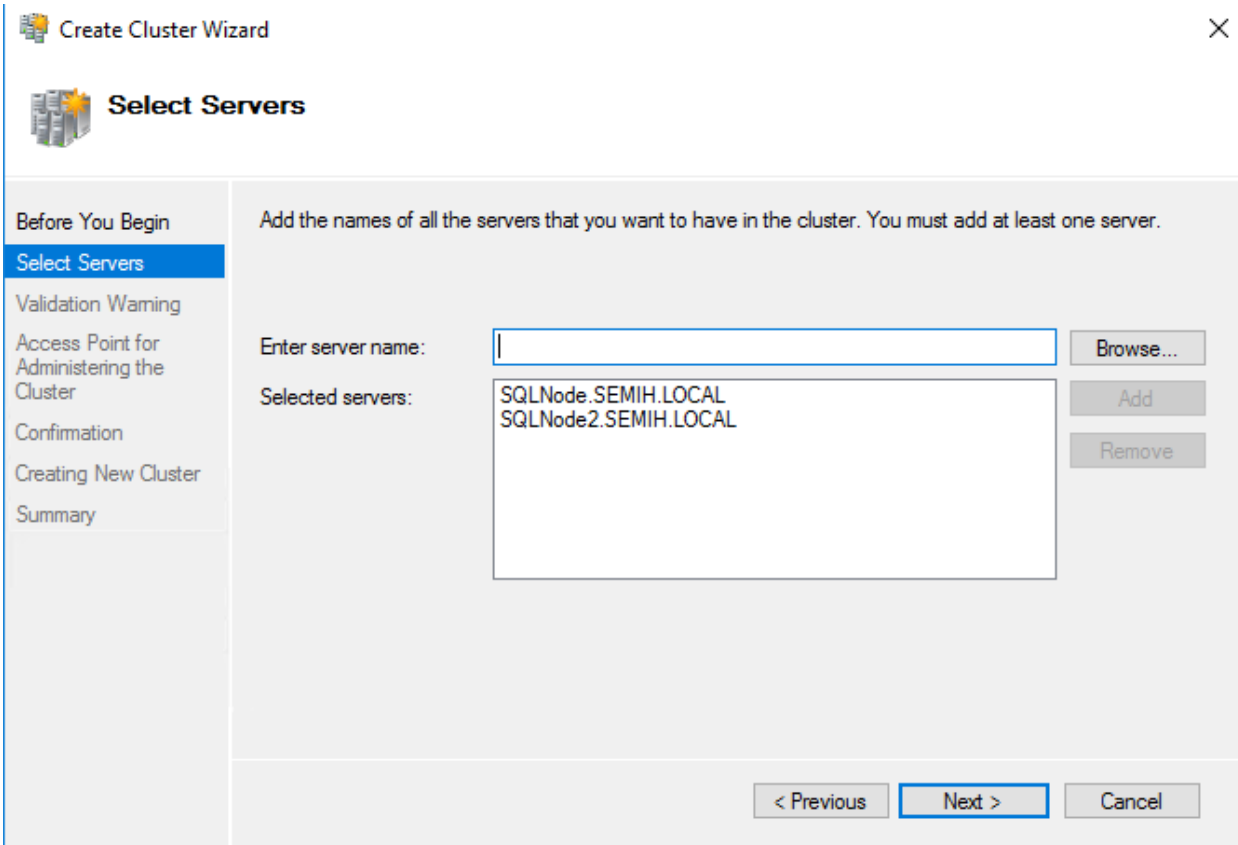
Failover cluster feature ını kuruyorum.



Failover cluster manager dan cluster ı create ediyorum.



Cluster da çalışacak node ları seçiyorum.



Cluster oluşturulurken wfcs her node üzerinde cluster için gerekli donanım\yazılım ve config i test eder. Bu testin yapılmasını öneririm. Bir sorun varsa cluster kurulumundan önce çözülmelidir.

Create Cluster Wizard

Validation Warning

Before You Begin
Select Servers
Validation Warning
Access Point for Administering the Cluster
Confirmation
Creating New Cluster
Summary

For the servers you selected for this cluster, the reports from cluster configuration validation tests appear to be missing or incomplete. Microsoft supports a cluster solution only if the complete configuration (servers, network and storage) can pass all the tests in the Validate a Configuration wizard.

Do you want to run configuration validation tests before continuing?

☐ Yes. When I click Next, run configuration validation tests, and then return to the process of creating the cluster.

☒ No. I do not require support from Microsoft for this cluster, and therefore do not want to run the validation tests. When I click Next, continue creating the cluster.

[More about cluster validation tests](#)

Cluster adını yazıyor ve cluster IP sini belirtiyorum. AD de clustername adında bir computer account u açılacaktır. Bu nedenle AD de computer account u create edebilecek ve node lar üzerinde local admin yetkisine sahip bir account ile kuruluşu gerçekleştiriyorum.

Create Cluster Wizard

Access Point for Administering the Cluster

Before You Begin
Select Servers
Validation Warning
Access Point for Administering the Cluster
Confirmation
Creating New Cluster
Summary

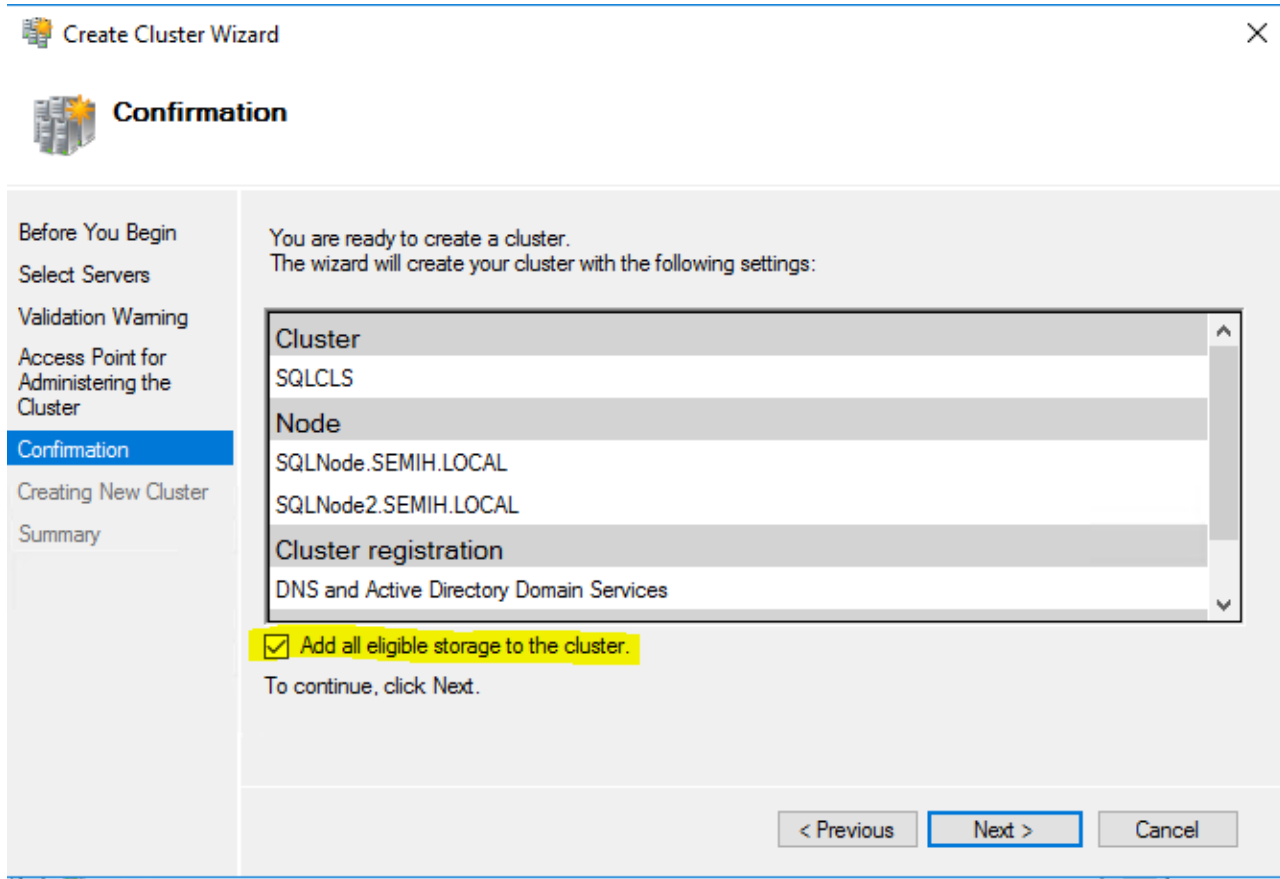
Type the name you want to use when administering the cluster.

Cluster Name:

The NetBIOS name is limited to 15 characters. One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.

	Networks	Address
☒	192.168.1.0/24	192 . 168 . 1 . 250

Aşağıdaki özellikler ile sunucu üzerindeki tüm diskleri cluster ortamında kullanılması ve configure edilmesi için seçiyorum.



The screenshot shows the 'Confirmation' step of the 'Create Cluster Wizard'. The left sidebar lists the steps: 'Before You Begin', 'Select Servers', 'Validation Warning', 'Access Point for Administering the Cluster', 'Confirmation' (highlighted), 'Creating New Cluster', and 'Summary'. The main area contains the text: 'You are ready to create a cluster. The wizard will create your cluster with the following settings:'. Below this is a list of settings: 'Cluster' (SQLCLS), 'Node' (SQLNode.SEMIH.LOCAL, SQLNode2.SEMIH.LOCAL), 'Cluster registration' (DNS and Active Directory Domain Services), and a checked checkbox 'Add all eligible storage to the cluster.'. At the bottom, there are buttons for '< Previous', 'Next >', and 'Cancel'.

Create Cluster Wizard

Confirmation

Before You Begin
Select Servers
Validation Warning
Access Point for Administering the Cluster
Confirmation
Creating New Cluster
Summary

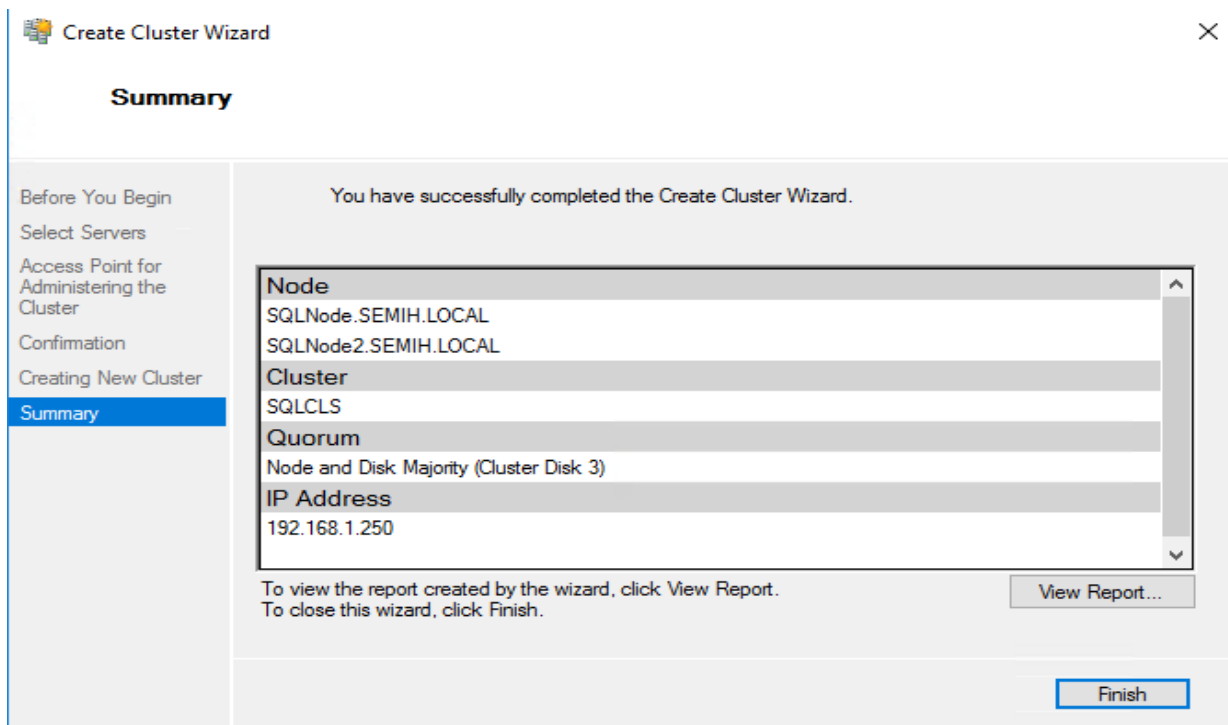
You are ready to create a cluster.
The wizard will create your cluster with the following settings:

- Cluster: SQLCLS
- Node: SQLNode.SEMIH.LOCAL, SQLNode2.SEMIH.LOCAL
- Cluster registration: DNS and Active Directory Domain Services
- ☒ Add all eligible storage to the cluster.

To continue, click Next.

< Previous Next > Cancel

Kuruluş tamamlandıktan sonra aşağıdaki gibi bir özet görülmekte. Server 2016 ile quorum disk cluster otomatik olarak configure etmektedir.



The screenshot shows the 'Summary' step of the 'Create Cluster Wizard'. The left sidebar lists the steps: 'Before You Begin', 'Select Servers', 'Access Point for Administering the Cluster', 'Confirmation', 'Creating New Cluster', and 'Summary' (highlighted). The main area contains the text: 'You have successfully completed the Create Cluster Wizard.'. Below this is a list of settings: 'Node' (SQLNode.SEMIH.LOCAL, SQLNode2.SEMIH.LOCAL), 'Cluster' (SQLCLS), 'Quorum' (Node and Disk Majority (Cluster Disk 3)), and 'IP Address' (192.168.1.250). At the bottom, there are buttons for 'View Report...' and 'Finish'.

Create Cluster Wizard

Summary

Before You Begin
Select Servers
Access Point for Administering the Cluster
Confirmation
Creating New Cluster
Summary

You have successfully completed the Create Cluster Wizard.

- Node: SQLNode.SEMIH.LOCAL, SQLNode2.SEMIH.LOCAL
- Cluster: SQLCLS
- Quorum: Node and Disk Majority (Cluster Disk 3)
- IP Address: 192.168.1.250

To view the report created by the wizard, click View Report.
To close this wizard, click Finish.

View Report... Finish

Disks (5)							
Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication Role
Cluster Disk 1	Online	Available Storage	SQLNode	5	GPT	30.0 GB	
Cluster Disk 2	Online	Available Storage	SQLNode	1	GPT	32.0 GB	
Cluster Disk 3	Online	Disk Witness in Quorum	SQLNode	2	GPT	5.00 GB	
Cluster Disk 4	Online	Available Storage	SQLNode	4	GPT	22.0 GB	
Cluster Disk 5	Online	Available Storage	SQLNode	3	GPT	20.0 GB	

Cluster manager da sunucu üzerindeki diskler ve cluster manager daki disk isimleri aynı yapıyorum. Kuruluş ve ilerleyen zamanlarda oluşacak sorunların çözümü için önemli bir konu.

Aynı şekilde local network ve HB network ü içinde interface leri rename ediyorum.

Disks (5)							
Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication Role
SQLBACKUP	Online	Available Storage	SQLNode	1	GPT	32.0 GB	
SQLDATA	Online	Available Storage	SQLNode	5	GPT	30.0 GB	
SQLLOG	Online	Available Storage	SQLNode	4	GPT	22.0 GB	
TEMP	Online	Available Storage	SQLNode	3	GPT	20.0 GB	
QUORUM	Online	Disk Witness in Quorum	SQLNode	2	GPT	5.00 GB	

Disks (5)							
Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication Role
SQLBACKUP	Online	Available Storage	SQLNode	1	GPT	32.0 GB	
SQLDATA	Online	Available Storage	SQLNode	5	GPT	30.0 GB	
SQLLOG	Online	Available Storage	SQLNode	4	GPT	22.0 GB	
TEMP	Online	Available Storage	SQLNode	3	GPT	20.0 GB	
QUORUM	Online	Disk Witness in Quorum	SQLNode	2	GPT	5.00 GB	

Disks (5)							
Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication Role
SQLBACKUP	Online	Available Storage	SQLNode	1	GPT	32.0 GB	
SQLDATA	Online	Available Storage	SQLNode	5	GPT	30.0 GB	
SQLLOG	Online	Available Storage	SQLNode	4	GPT	22.0 GB	
TEMP	Online	Available Storage	SQLNode	3	GPT	20.0 GB	
QUORUM	Online	Disk Witness in Quorum	SQLNode	2	GPT	5.00 GB	

Networks (2)			
Name	Status	Cluster Use	Information
LAN	Up	Cluster and Client	
HB	Up	Cluster Only	

Network Connections			
Name	Status	Cluster Use	Information
LAN	Up	Cluster and Client	
HB	Up	Cluster Only	

En son olara cluster daki disk leri CSV ye dönüştürdüm.

Failover Cluster Manager

SQLCLS.SEMIH.LOCAL

Roles

Nodes

Storage

Disks

Pools

Enclosures

Networks

Cluster Events

Disks (5)

Search

Queries

Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication Role
QUORUM	Online	Disk Witness in Quorum	SQLNode	1	GPT	5.00 GB	
SQLBACKUP	Online	Available Storage	SQLNode	5	GPT	32.0 GB	
SQLDATA	Online	Available Storage	SQLNode	4	GPT	30.0 GB	
SQLLOG	Online	Available Storage	SQLNode	3	GPT	22.0 GB	
TEMP	Online	Available Storage	SQLNode	2	GPT	20.0 GB	

Bring Online

Take Offline

Simulate Failure

Add to Cluster Shared Volumes

More Actions

Remove

Disks (5)

Search

Queries

Name	Status	Assigned To	Owner Node	Disk Number	Partition Style	Capacity	Replication R
QUORUM	Online	Disk Witness in Quorum	SQLNode	1	GPT	5.00 GB	
SQLBACKUP	Online	Cluster Shared Volume	SQLNode2	5	GPT	32.0 GB	
SQLDATA	Online	Cluster Shared Volume	SQLNode	4	GPT	30.0 GB	
SQLLOG	Online	Cluster Shared Volume	SQLNode2	3	GPT	22.0 GB	
TEMP	Online	Cluster Shared Volume	SQLNode	2	GPT	20.0 GB	

Daha sonra SQL in ilk node unu kuruyorum.

SQL Server Installation Center

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Resources

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Options

Microsoft SQL Server 2017

New SQL Server stand-alone installation or add features to an existing installation

Launch a wizard to install SQL Server 2017 in a non-clustered environment or to add features to an existing SQL Server 2017 instance.

Install SQL Server Reporting Services

Launch a download page that provides a link to install SQL Server Reporting Services. An internet connection is required to install SSRS.

Install SQL Server Management Tools

Launch a download page that provides a link to install SQL Server Management Studio, SQL Server command-line utilities (SQLCMD and BCP), SQL Server PowerShell provider, SQL Server Profiler and Database Tuning Advisor. An internet connection is required to install these tools.

Install SQL Server Data Tools

Launch a download page that provides a link to install SQL Server Data Tools (SSDT). SSDT provides Visual Studio integration including project system support for Azure SQL Database, the SQL Server Database Engine, Reporting Services, Analysis Services and Integration Services. An internet connection is required to install SSDT.

New SQL Server failover cluster installation

Launch a wizard to install a single-node SQL Server 2017 failover cluster.

Add node to a SQL Server failover cluster

Launch a wizard to add a node to an existing SQL Server 2017 failover cluster.

Upgrade from a previous version of SQL Server

Launch a wizard to upgrade a previous version of SQL Server to SQL Server 2017.

New Machine Learning Server (Standalone) installation

Launch a wizard to install Machine Learning Server (Standalone) on a Windows machine. This is typically used by data scientists as a standalone analysis server or as a

Install Failover Cluster Rules

Setup rules identify potential problems that might occur while running Setup. Failures must be corrected before Setup can continue.

- Product Key
- License Terms
- Global Rules
- Microsoft Update
- Product Updates
- Install Setup Files
- Install Failover Cluster Rules**
- Feature Selection
- Feature Rules
- Feature Configuration Rules
- Ready to Install
- Installation Progress
- Complete

Operation completed. Passed: 19. Failed 0. Warning 1. Skipped 0.

Hide details <<

Re-run

[View detailed report](#)

Rule	Status
✓ Remote registry service (SQLNODE)	Passed
✓ Domain controller	Passed
✓ Windows Firewall	Passed
✓ DNS settings (SQLNODE)	Passed
✓ WOW64 setup	Passed
✓ Windows Management Instrumentation (WMI) service (SQLNO...	Passed
✓ Cluster Remote Access (SQLNODE2)	Passed
✓ Distributed Transaction Coordinator (MSDTC) installed (SQLNO...	Passed
✓ Remote registry service (SQLNODE2)	Passed
✓ DNS settings (SQLNODE2)	Passed

Cluster için DB ve shared tools tan client tools connectivity yi kurmak yeterli. İsteğe göre diğer bileşenler de kurulabilir.

Feature Selection

Select the Evaluation features to install.

- Product Key
- License Terms
- Global Rules
- Microsoft Update
- Product Updates
- Install Setup Files
- Install Failover Cluster Rules
- Feature Selection**
- Feature Rules
- Instance Configuration
- Cluster Resource Group
- Cluster Disk Selection
- Cluster Network Configuration
- Server Configuration
- Database Engine Configuration
- Feature Configuration Rules
- Ready to Install
- Installation Progress
- Complete

Looking for Reporting Services? [Download it from the web](#)

Features:

Feature description:

- Instance Features**
- ☒ Database Engine Services
 - ☒ SQL Server Replication
 - ☒ Full-Text and Semantic Extractions for Search
 - ☒ Data Quality Services
 - ☐ PolyBase Query Service for External Data
 - ☐ Analysis Services
- Shared Features**
- ☐ Data Quality Client
 - ☒ Client Tools Connectivity
 - ☐ Integration Services

The configuration and operation of each instance feature of a SQL Server instance is

Prerequisites for selected features:

Already installed:

- Windows PowerShell 3.0 or higher
- Microsoft .NET Framework 4.6

Disk Space Requirements

Drive C: 1620 MB required, 17516 MB available

Select All

Unselect All

Instance root directory: C:\Program Files\Microsoft SQL Server\

Shared feature directory: C:\Program Files\Microsoft SQL Server\

Shared feature directory (x86): C:\Program Files (x86)\Microsoft SQL Server\

Install a SQL Server Failover Cluster

Instance Configuration

Specify the name and instance ID for the instance of SQL Server. Instance ID becomes part of the installation path.

Product Key
License Terms
Global Rules
Microsoft Update
Install Setup Files
Install Failover Cluster Rules
Feature Selection
Feature Rules
Instance Configuration
Cluster Resource Group
Cluster Disk Selection
Cluster Network Configuration
Server Configuration
Database Engine Configuration
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Specify a network name for the new SQL Server failover cluster. This will be the name used to identify your failover cluster on the network.

SQL Server Network Name:

☒ Default instance
☐ Named instance:

Instance ID:

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL14.MSSQLSERVER

Detected SQL Server instances and features on this computer:

Instance	Cluster Network Name	Features	Edition	Version	Inst
----------	----------------------	----------	---------	---------	------

Oluşturulan disklere db, log, temp ve backup için installation path leri düzenliyorum. Temp db local diskler üzerinde de olabilir ancak ben csv üzerinde çalışması için düzenlemeleri yapıyorum.

Install a SQL Server Failover Cluster

Database Engine Configuration

Specify Database Engine authentication security mode, administrators, data directories and TempDB settings.

Product Key
License Terms
Global Rules
Microsoft Update
Install Setup Files
Install Failover Cluster Rules
Feature Selection
Feature Rules
Instance Configuration
Cluster Resource Group
Cluster Disk Selection
Cluster Network Configuration
Server Configuration
Database Engine Configuration
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Server Configuration | Data Directories | **TempDB** | FILESTREAM

Data root directory:

System database directory: C:\ClusterStorage\Volume2\DATA\MSSQL14.MSSQLSERVER\MSSQL\Data

User database directory:

User database log directory:

Backup directory:

< Back Next > Cancel

Install a SQL Server Failover Cluster

Database Engine Configuration

Specify Database Engine authentication security mode, administrators, data directories and TempDB settings.

Product Key
License Terms
Global Rules
Microsoft Update
Install Setup Files
Install Failover Cluster Rules
Feature Selection
Feature Rules
Instance Configuration
Cluster Resource Group
Cluster Disk Selection
Cluster Network Configuration
Server Configuration
Database Engine Configuration
Feature Configuration Rules
Ready to Install
Installation Progress
Complete

Server Configuration Data Directories TempDB FILESTREAM

TempDB data files: tempdb.mdf, tempdb_mssql_#.ndf

Number of files: 2

Initial size (MB): 8 Total initial size (MB): 16

Autogrowth (MB): 64 Total autogrowth (MB): 128

Data directories: C:\ClusterStorage\Volume3\Temp

Add... Remove

TempDB log file: templog.ldf

Initial size (MB): 8 Setup could take longer with large initial size.

Autogrowth (MB): 64

Log directory: C:\ClusterStorage\Volume3\Temp

< Back Next > Cancel

İlk node kuruluđu tamamlandı.

Install a SQL Server Failover Cluster

Complete

Your SQL Server 2017 failover cluster installation is complete.

Product Key
License Terms
Global Rules
Microsoft Update
Install Setup Files
Install Failover Cluster Rules
Feature Selection
Feature Rules
Instance Configuration
Cluster Resource Group
Cluster Disk Selection
Cluster Network Configuration
Server Configuration
Database Engine Configuration
Feature Configuration Rules
Ready to Install

Information about the Setup operation or possible next steps:

Feature	Status
✓ Data Quality Services	Succeeded
✓ Full-Text and Semantic Extractions for Search	Succeeded
✓ Database Engine Services	Succeeded
✓ SQL Server Replication	Succeeded
✓ SQL Browser	Succeeded
✓ SQL Writer	Succeeded

Details:

Install successful.

İkinci node un sql kuruluđu gerekleřtirim.

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Microsoft SQL Server 2017

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**New SQL Server failover cluster installation**

Launch a wizard to install a single-node SQL Server 2017 failover cluster.

**Add node to a SQL Server failover cluster**

Launch a wizard to add a node to an existing SQL Server 2017 failover cluster.

**Upgrade from a previous version of SQL Server**

Launch a wizard to upgrade a previous version of SQL Server to SQL Server 2017.

**New Machine Learning Server (Standalone) installation**

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Cluster Node Configuration

Add a node to an existing SQL Server failover cluster.

Product Key

License Terms

Global Rules

Microsoft Update

Product Updates

Install Setup Files

Add Node Rules

Cluster Node Configuration

Cluster Network Configuration

Service Accounts

Feature Rules

Ready to Add Node

Add Node Progress

Complete

SQL Server instance name: MSSQLSERVER

Name of this node: SQLNODE2

Disk Space Requirements: Drive C: 1620 MB required, 16634 MB available

Instance Name	Cluster Network Name	Features	Nodes
MSSQLSERVER	SQLNET2	SQLEngine, SQ...	SQLNODE

< Back

Next >

Cancel

Cluster Network Configuration

The current node that is being added does not require any additional or new IP addresses. The IP addresses and subnets shown are the previously configured settings for the SQL Server cluster, and cannot be modified. Review and click Next t...

Product Key

License Terms

Global Rules

Microsoft Update

Product Updates

Install Setup Files

Add Node Rules

Cluster Node Configuration

Cluster Network Configuration

Service Accounts

Feature Rules

Ready to Add Node

Add Node Progress

Complete

Specify the network settings for this failover cluster:

☒	IP Ty...	DHCP	Address	Subnet Mask	Subnet(s)	Network
☒	IPv4	☐	192.168.1.222	255.255.255.0	192.168.1.0/24	LAN

Refresh

< Back

Next >

Cancel

Service Accounts

Specify the service accounts and collation configuration.

Product Key

License Terms

Global Rules

Microsoft Update

Product Updates

Install Setup Files

Add Node Rules

Cluster Node Configuration

Cluster Network Configuration

Service Accounts

Feature Rules

Ready to Add Node

Add Node Progress

Complete

Microsoft recommends that you use a separate account for each SQL Server service.

Service	Account Name	Password	Startup Type
SQL Full-text Filter Daemon Launcher	NT Service\MSSQLFDLaun...		Manual
SQL Server Database Engine	SEMIH\sqladmin	••••••••	Manual
SQL Server Browser	NT AUTHORITY\LOCAL SE...		Automatic ▾
SQL Server Agent	SEMIH\sqladmin	••••••••	Manual

☒ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

< Back

Next >

Cancel

Add Node Progress

- Product Key
- License Terms
- Global Rules
- Microsoft Update
- Product Updates
- Install Setup Files
- Add Node Rules
- Cluster Node Configuration
- Cluster Network Configuration
- Service Accounts
- Feature Rules
- Ready to Add Node
- Add Node Progress**
- Complete

Expanding user features.

Next >

Cancel

İkinci node un da kuruluđu tamamlandı.

Complete

Your SQL Server 2017 failover cluster add node operation is complete with product updates.

- Product Key
- License Terms
- Global Rules
- Microsoft Update
- Product Updates
- Install Setup Files
- Add Node Rules
- Cluster Node Configuration
- Cluster Network Configuration
- Service Accounts
- Feature Rules
- Ready to Add Node
- Add Node Progress
- Complete**

Information about the Setup operation or possible next steps:

Feature	Status
✓ Data Quality Services	Succeeded
✓ Full-Text and Semantic Extractions for Search	Succeeded
✓ Database Engine Services	Succeeded
✓ SQL Server Replication	Succeeded
✓ SQL Browser	Succeeded
✓ SQL Writer	Succeeded

Details:

Install successful.

Failover Cluster Manager

- SQLCLS.SEMIH.LOCAL
 - Roles
 - Nodes
 - Storage
 - Disks
 - Pools
 - Enclosures
 - Networks
 - Cluster Events

Roles (1)

Search

Name	Status	Type	Owner Node	Priority	Information
SQL Server (MSSQLSE...	Running	Other	SQLNode	Medium	

SQL Server (MSSQLSERVER)

Preferred Owners: [Any node](#)

Name	Status	Information
Server Name		
Name: SQLNet2	Online	
IP Address: 192.168.1.222	Online	
Other Resources		
SQL Server	Online	
SQL Server Agent	Online	
Roles		
SQL Server CEIP (MSSQLSERVER)	Online	

Var olan 2 node tan biri fail olursa diskler shared bir alanda olduđu için diğerk sql sunucusu datalara erişecek ve sql server hizmet vermeye devam edecektir.