

StarWind Virtual SAN® Installing and Configuring SQL Server 2012 Failover Cluster Instance on Windows Server 2012

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StarWind is a pioneer in virtualization and a company that participated in the development of this technology from its earliest days. Now the company is among the leading vendors of software and hardware hyper-converged solutions. The company's core product is the years-proven StarWind Virtual SAN, which allows SMB and ROBO to benefit from cost-efficient hyperconverged IT infrastructure. Having earned a reputation of reliability, StarWind created a hardware product line and is actively tapping into hyperconverged and storage appliances market. In 2012, Gartner named StarWind "Cool Vendor for Compute Platforms" following the success and popularity of StarWind HyperConverged Appliance. StarWind partners with world-known companies: Microsoft, VMware, Veeam, Intel, Dell, Mellanox, Citrix, Western Digital, etc.

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Contents

Introduction	4
Solution Diagram	5
SQL Server 2012 Windows System Requirements	6
Hardware requirements:	6
Software Requirements:	6
Cluster Configuration Details	7
Connecting to the iSCSI Storage	8
Initializing and Formatting Disks	11
Installing .NET Framework 3.5	20
Installing Windows Failover Cluster Feature	21
Configuring Windows Server Failover Clustering	23
Installing SQL Server 2012 Failover Cluster Instance	
Initial Cluster Node	
Failover Cluster Node	
Contacts	

Introduction

This guide is intended for experienced Windows system administrators, IT professionals, and the SQL Server database administrators who would like to install and configure a 2-node Windows Server 2012 Failover Cluster that will host SQL Server 2012 Failover Cluster Instance (FCI).

The Windows Server 2012 hosted storage that will be used for building Windows Server Failover Cluster leverages <u>StarWind Virtual SAN</u> for the implementation of a block-level replication.

This document assumes that:

- Windows Server 2012 is installed on each server that would be joined to the cluster and to the Active Directory (AD) domain.
- The disks (LUNs) are exposed to the servers that should be clustered and are configured according to the StarWind Virtual SAN High Availability <u>Best Practices</u> documentation.
- The disk witness will be used as a quorum model.

A full set of up-to-date technical documentation can always be found <u>here</u>, or by pressing the **Help** button in StarWind Management Console.

For any technical inquiries please visit our <u>online community</u>, <u>Frequently Asked Questions page</u>, or use the <u>support form</u> to contact our technical support department.

Solution Diagram

The diagram below illustrates the network and storage configuration of the solution described in this guide.



The diagram of a 2-node HA SQL Cluster based on StarWind Virtual SAN

NOTE: Additional network connections may be necessary, depending on the cluster setup and application requirements. For any technical help in regards to configuring additional networks, please, do not hesitate to contact the StarWind Support Department via <u>online</u> <u>community</u> forum, or via <u>support form</u> (depending on the support plan).

- 1. Make sure to have a domain controller and the servers added to the domain.
- 2. Install **Failover Clustering** and **Multipath I/O** features on both servers.

3. Configure network interfaces on each node to make sure that the Synchronization and iSCSI/StarWind Heartbeat interfaces are in different subnets and connected according to the network diagram above. In this document, 10.0.0.x subnet is used for the iSCSI/StarWind Heartbeat traffic, while 10.1.1.x subnet is used for the Synchronization traffic.

The procedures mentioned above can be performed by following the instructions below.

SQL Server 2012 Windows System Requirements

Make sure that the server used for SQL Server 2012 deployment satisfies the requirements listed below.

Hardware requirements

Memory: 512 MB minimum for Express, 1 GB for Standard, Developer & Enterprise.
File System: NTFS or ReFS. Please note that other file systems, such as FAT32, are not supported.
Disk space: 6 GB minimum.
Processor speed: Clockspeed of 2 GHz or more. 1.4 GHz minimum.
Processor cores: 2 cores (Virtual or Physical).
Processor type: 64-bit x64-compatible AMD or Intel CPU only.

Software Requirements:

- A minimum of .NET 4.6.1 is required. The SQL Server 2012 setup will install the necessary files before the actual installation.
- The SQL Server setup support files and the native client should be installed first.
- Client versions of Windows 10 or 8.1 and Windows Server 2012 R2. Windows Server Essentials and Foundation Editions are also supported.
 However, the SQL Server setup requires a GUI and will not work on the Core editions.
- To install all the components, 8030 MB of the hard disk space is required.

- The supported storage types are the following:
 - Local
 - Shared
 - Storage Spaces (including S2D)
 - SMB (supported with certain limitations)
- SQL Server has limitations when installing on a domain controller (DC). Failover clustering is not supported on a DC.

The SQL Server Core engine is 64-bit only and does not support the 32-bit editions of Windows 8 or Windows 10. Barring a few 32-bit components (such as Client Tools, Data Quality Client), all other parts require the native 64-bit support.

Cluster Configuration Details

The following prerequisites are used in the configuration:

Active Directory Domain Name: TESTDOMAIN.local StarWind Virtual SAN Servers IP addresses: 10.0.0.200, 10.0.0.201 Cluster Nodes Names: WS-CLUSTER3, WS-CLUSTER4 Cluster Disks: Q:\, E:\, F:\ & H:\ Windows Server Failover Cluster Name: WINCLUSTER2 Windows Server Failover Cluster IP Address: 172.16.0.211 SQL Server Failover Cluster IP Address: 172.16.0.212 SQL Server Failover Cluster IP Address: 172.16.0.212 SQL Server Service Account: TESTDOMAIN\sqlservice

Connecting to the iSCSI Storage

 Windows Server 2012 comes with the iSCSI Initiator that enables connection of a Windows host to an external iSCSI storage array, i.e. StarWind Virtual SAN using network adapters. To launch the tool from the **Server Manager** dashboard, select the **iSCSI Initiator** in the **Tools** drop-down menu.

NOTE: These steps should be performed on both servers to act as nodes in the Failover Cluster.

		Server Mana	ger				-	ő X
Server Ma	anager • Dash	board		- <u>@ </u>	Manage	Tools	View	Help
rd	WELCOME TO SERV	ER MANAGER			Cluster-Aware U Component Ser Computer Mana	lpdating vices gement		
ver rs Storage Services ⊅		1 Configure t	his local ser	ver	Defragment and Event Viewer Failover Cluster	l Optimize D Manager	rives	
	QUICK START	2 Add roles	and features		Local Security Policy ODBC Data Sources (32-bit)			
WHAT'S NE	WHAT'S NEW	3 Add other4 Create a set	servers to mar erver group	nage	ODBC Data Sou Performance Mi Resource Monit	rces (64-bit) onitor or		
LEARN MORE					Security Configu Services System Configu	ration Wizar ration	đ	
	ROLES AND SERVER Roles: 1 Server group	GROUPS s: 1 Servers total: 1			Task Scheduler Windows Firewa Windows Memo	II with Advar	nced Secu c	rity
	File and Storage 1		1	Windows Power Windows Power Windows Power	Shell Shell (x86) Shell ISE			
	Manageabilit Events	y 💿	Manageability Events		Windows Power Windows Server	Shell ISE (x8 Backup	6)	

5. The message informing that **The Microsoft iSCSI service is not running** appears. Ignore it and click **Yes** to continue.

Microsoft iSCSI	x
The Microsoft iSCSI service is not running. The service is required to be started for iSCSI to function correctly. To start the service now and have the service start automatically each time the computer restarts, click the Yes button.	
Yes No	

6. To connect to the iSCSI target:

In the **iSCSI Initiator Properties** dialog box, in the **Targets** tab, enter the IP address of the StarWind Virtual SAN server in the **Target** field. Click **Quick Connect...** The list of the iSCSI Targets can be found in the table.

iSCSI Initiator Properties	×
Targets Discovery Favorite Targets Volumes and Devices Quick Connect To discover and log on to a target using a basic connection, to DNS name of the target and then click Quick Connect.	RADIUS Configuration
Target: 10.0.0.200	Quick Connect
Discovered targets	Refresh
To connect using advanced options, select a target and then dick Connect.	Connect
To completely disconnect a target, select the target and then click Disconnect.	Disconnect
For target properties, including configuration of sessions, select the target and click Properties.	Properties
For configuration of devices associated with a target, select the target and then click Devices.	Devices
ОК	Cancel Apply

In the Quick Connect dialog box, select the target that will be used and click Connect.
 Click Done to go back to the iSCSI Initiator Properties window.

	Quick Connect	X
Targets that an provided are lis to each target	re available for connection at the IP address or DNS name that you sted below. If multiple targets are available, you need to connect individually.	+
Discovered ta	n will be made every time this computer restarts.	
Name	s	
ign.2008-08.	com.starwindsoftware:win-m2iggm12obi.sw-demo.local-storage1 In	
ign.2008-08.	com.starwindsoftware:win-m2iggm12obi.sw-demo.local-storage2 In	r
<		
Progress repo There are mu using Quick C	rt Iltiple Targets discovered.Please select a single Target for Login Connect.	
	Connect Done	

8. Click **OK** to close the iSCSI Initiator Properties window. Once the targets are defined using the iSCSI Initiator tool, bring the disks online, initialize them, and create new volumes using the **Disk Management** console.

Initializing and Formatting Disks

- 9. After configuring the servers to connect to the iSCSI target, proceed with initializing and formatting the disks using the **Disk Management** console.
- To launch the tool from the Server Manager dashboard, select Computer Management in the Tools drop-down menu.

NOTE: These steps must be performed on both servers to act as nodes in the Failover Cluster.

2	Server 1	Manager	_ D X
Server M	anager • Dashboard	• ©	Manage Tools View Help
🔛 Dashboard	WELCOME TO SERVER MANAGER		Cluster-Aware Updating Component Services Computer Management
 Local Server All Servers File and Storage Services ▷ IIS 	QUICK START	igure this local ser	Defragment and Optimize Drives Event Viewer Failover Cluster Manager Internet Information Services (IIS) Manager iSCSI Initiator
	2 Ac 3 Ac WHAT'S NEW 4 Cm	Id roles and features Id other servers to man eate a server group	Local Security Policy Microsoft Azure Services ODBC Data Sources (32-bit) ODBC Data Sources (64-bit)
	5 CC	onnect this server to clo	Performance Monitor Resource Monitor Security Configuration Wizard Services
	ROLES AND SERVER GROUPS Roles: 2 Server groups: 1 Servers tota	k 3	System Configuration System Information Task Scheduler Windows Firewall with Advanced Security
	File and Storage 3 Services 3 Manageability Events	Manageability Events	Windows Memory Diagnostic Windows PowerShell Windows PowerShell (x86) Windows PowerShell ISE
	Services Performance BPA results	Services Performance BPA results	Windows PowerShell ISE (x86) Windows Server Backup
			v

11. To initialize and format the drives:

In the **Computer Management** console, expand the **Storage** section and select **Disk Management**.

2		Comput	er Management		_ 🗆 X
File Action View Help					
🗢 🔿 🙍 🖬 📓					
Ecomputer Management (Local	Volume	Layout Type F	ile System Status		Actions
⊿ System Tools N Task Scheduler		Simple Basic N EV EN-US (D:) Simple Basic I	NTFS Healthy (Boot, F IDE Healthy (Primar	Page File, Crash Dump, Primary P. v Partition)	Disk Management 🔹
Fusic Scheduler Event Viewer	New Volume (E	E:) Simple Basic N	NTFS Healthy (Primar	y Partition)	More Actions
b m Shared Folders	System Reserve	ed Simple Basic N	NTFS Healthy (System	n, Active, Primary Partition)	
Eccal Users and Groups Reformance					
🚔 Device Manager					
Storage Windows Server Backur					
Disk Management					
Services and Applications					
	<	Ш		>	
				· ^	
	Basic	System Reserved	(C:)		
	40.00 GB Online	350 MB NTFS Healthy (System, Active, Prin	39.66 GB NTFS Healthy (Boot, Page File, C	rash Dump, Primary Partitio	
	Disk 1				
	Basic 20.99 GR	New Volume (E:)			
	Online	Healthy (Primary Partition)			
		<u> </u>			
	Disk 2				
	Unknown 1.00 GB	1.00 GB			
	Offline 🕕	Unallocated		~	
		Primary partition			<u> </u>

12. Right-click the disk that needs to be configured and select **Online**. Once the disk is brought online, it is marked as **Not Initialized.**



13. To initialize, right-click the disk and select **Initialize Disk**. The **Initialize Disk** dialog box will appear.

£				(Compi	uter Mana <u>c</u>	gement
File Action View Help							
🗢 🔿 🖄 🖬 👔 🕼 🕯	e 😼						
 Computer Management (Local System Tools Task Scheduler Event Viewer Shared Folders Coal Users and Groups Performance Device Manager Storage Windows Server Backup Disk Management Services and Applications 	Volume (C:) IR2_S New Syste	SS_X64FRE Volume (E: m Reserved	V_EN-US (D:)) d	Layout Simple Simple Simple	Type Basic Basic Basic Basic	File System NTFS UDF NTFS NTFS	Status Healthy (Boot, Page Healthy (Primary Par Healthy (Primary Par Healthy (System, Ac
	<						
	Carlor Basic 40.00 G Online	k 0 iB	System Res 350 MB NTF Healthy (Sys	s erved FS stem, Act	ive, Prir	(C:) 39.66 GB I Healthy (B	NTFS Boot, Page File, Crash
	Basic 39.88 G Online	k 1 iB	New Volun 39.87 GB NT Healthy (Pri	n e (E:) IFS imary Par	tition)		
		⊳ 2 Initialize D	isk				
		Offline					
< III >		Properties		tion			
		Help					

In the Initialize Disk dialog box, make sure that the appropriate disk is selected and choose the partition style to initialize the disk: MBR (Master Boot Record) or GPT (GUID Partition Table).

The most common partition style for disks used in SQL Server instances is **MBR**, which is selected by default. Click **OK**.

Initialize Disk	x
You must initialize a disk before Logical Disk Manager can access it. Select disks:	
 ✓ Disk 3 ✓ Disk 4 	
Use the following partition style for the selected disks: MBR (Master Boot Record) GPT (GUID Partition Table) 	
Note: The GPT partition style is not recognized by all previous versions of Windows.	
OK Cancel	

15. To create the disk partition, right-click the unallocated space and select **New Simple Volume...**



16. In Welcome to the New Simple Volume Wizard, click Next.



17. In the **Specify Volume Size** dialog box, enter the volume size and click **Next**.

New Simple	Volume Wizard
Specify Volume Size Choose a volume size that is between the	maximum and minimum sizes.
Maximum disk apace is MP:	990
Maximum disk space in Mb.	330
Minimum disk space in MB:	8
Simple volume size in MB:	990
	< Back Next > Cancel

18. In the **Assign Drive Letter or Path** dialog box, specify the drive letter and click **Next**.

New Simple Volume Wizard
Assign Drive Letter or Path For easier access, you can assign a drive letter or drive path to your partition.
 ● Assign the following drive letter: Mount in the following empty NTFS folder: Browse O not assign a drive letter or drive path
< Back Next > Cancel

- 19. In the **Format Partition** dialog box:
- Make sure that the **NTFS** file system is selected.
- According to Microsoft Best Practices on allocation unit size, the unit size should be **64K**.
- In the **Volume label** text box, enter the appropriate name.

This volume label will be used to verify the configuration on the other cluster node.

Click **Next**.

New Sim	nple Volume Wizard				
Format Partition To store data on this partition, you n	Format Partition To store data on this partition, you must format it first.				
Choose whether you want to format	this volume, and if so, what settings you want to use.				
\bigcirc Do not format this volume					
 Format this volume with the format 	ollowing settings:				
File system:	NTFS V				
Allocation unit size:	Default V				
Volume label:	SAN_DATA_F				
Perform a quick format					
Enable file and folder compression					
	< Back Next > Cancel				

20. In the **Completing the New Simple Volume Wizard** dialog box, review the settings and click **Finish**.



21. Repeat the steps above on all disks that need to be configured as part of Windows Server Failover Cluster.

Installing .NET Framework 3.5

SQL Server 2012 requires both Microsoft .NET Framework 3.5.1 and 4.0 as parts of its prerequisite software. The .NET Framework 3.5.1 package is already a part of the Windows Server 2012 installation media, while the .NET Framework 4.0 is included in the SQL Server 2012 installation media. The installation of the .NET Framework 3.5.1 on the Windows Server 2012 machines may lead to issues in case if the Server Manager dashboard is used. For more information about possible issues and workarounds, please navigate to the Microsoft article at the following link.

The <u>Deployment Image Servicing and Management (DISM) Command-Line</u> tool can be used to install Microsoft .NET Framework 3.5.1 on Windows Server 2012.

NOTE: These steps must be performed on both servers that will act as nodes in the failover cluster.

22. To install Microsoft .NET Framework 3.5.1, open the command line and type the following:

dism /online /enable-feature /featurename:NetFX3 /all /Source:d:\sources\sxs /LimitAccess

C:\>dism /online /enable-feature /featurename:NetFX3 /all /Source:d:\sources\sxs /L Deployment Image Servicing and Management tool Version: 6.2.9200.16384 Image Version: 6.2.9200.16384 Enabling feature(s) [=========] The operation completed successfully. C:\>_

Installing Windows Server Failover Clustering Feature

The Windows Server Failover Clustering feature provides high availability and scalability in many server workloads. SQL Server 2012 takes advantage of this feature and its capabilities to support Failover Cluster Instance and the AlwaysOn Availability Group feature. This guide is focused on SQL Server Failover Cluster Instances.

NOTE: These steps must be performed on both servers to act as nodes in the Failover Cluster.

23. To add the Failover Clustering feature:

Open the Server Manager dashboard and select Add roles and features.

a	Server Manager	_ D X	
Server N	1anager 🕻 Dashboard 🛛 🗸 🕄 🖡 Manage Tools	View Help	
 Dashboard Local Server All Servers File and Storage Services D IIS 	WELCOME TO SERVER MANAGER QUICK START 1 Configure this local server QUICK START 2 Add roles and features 3 Add other servers to manage 4 Create a server group 5 Connect this server to cloud services WHAT'S NEW 6 Connect this server to cloud services LERN MORE Posses Services 1 Imageability Services 1 Performance Performance BPA results Performance BPA results Performance	Hide	

24. Click **Next** until reaching the **Select features** dialog box. Select the **Failover Clustering** checkbox.

b	Add Roles and Features Wizard	_ D X
ESSURE Confirmation Results	Add Roles and Features Wizard Select one or more features to install on the selected server. Features Image: Mark the selected server is the selected server. Features Image: Mark the selected server is the selected server. Image: Mark the selected server is the selected server. Image: Mark the selected server.	DESTINATION SERVER WIN-M2IGGM12OBLsw-demo.local Description Failover Clustering allows multiple servers to work together to provide high availability of server roles. Failover Clustering is often used for File Services, virtual machines, database applications, and mail applications.
	Group Policy Management IIS Hostable Web Core Ink and Handwriting Services V	
	< Previous Next >	Install Cancel

25. When prompted with the **Add Roles and Features Wizard** dialog box, click the **Add Features** button. Then click **Next**.

þ	Add Roles and Features Wizard
	Add features that are required for Failover Clustering? The following tools are required to manage this feature, but do not have to be installed on the same server.
	▲ Remote Server Administration Tools
	▲ Feature Administration Tools
	▲ Failover Clustering Tools
	[Tools] Failover Cluster Management Tools
	[Tools] Failover Cluster Module for Windows PowerShe
	Include management tools (if applicable)
	Add Features Cancel

26. Click **Install** to set up the Failover Clustering feature.

Configuring Windows Server Failover Clustering

- 27. Once the Windows Server Failover Clustering feature is installed, proceed with the configuring of Windows Server Failover Cluster. Start with running Validate a Configuration Wizard to make sure that the cluster configuration will be officially supported by Microsoft.
- 28. To configure Windows Failover Clustering:Launch Failover Cluster Manager from the Server Manager console.

6	Server M	Manager	_ D X
Server M	lanager • Dashboard	- ©	Manage Tools View Help
Dashboard	WELCOME TO SERVER MANAGER		Cluster-Aware Updating Component Services Computer Management Defragment and Optimize Drives
 III Servers III File and Storage Services ▷ 	1 Conf	igure this local se	Failover Cluster Manager
to IIS	QUICK START	d roles and features	iSCSI Initiator Local Security Policy
	3 Ad	d other servers to ma	Microsoft Azure Services ODBC Data Sources (32-bit)
	4 Cr	eate a server group	ODBC Data Sources (64-bit) Performance Monitor Resource Monitor
	LEARN MORE		Security Configuration Wizard Services
	ROLES AND SERVER GROUPS	• 1	System Configuration System Information Task Scheduler
	File and Storage Services 1		Windows Firewall with Advanced Security Windows Memory Diagnostic Windows PowerShell
	Manageability Events Services	Manageability Events Services	Windows PowerShell (x86) Windows PowerShell ISE Windows PowerShell ISE (x86)
	Performance BPA results	Performance BPA results	Windows Server Backup

29. In the **Failover Cluster Manager** dialog box, click on the **Validate Configuration...** link.

閹	Failover Cluster Manager		_ □ X
File Action View Help			
📲 Failover Cluster Manager	Failover Cluster Manager	^	Actions
	Create failover clusters, validate hardware for potential failover clusters, and perform configuration changes to your failover clusters. Create failover clusters, validate hardware for potential failover clusters, and perform configuration changes to your failover clusters. Create failover cluster is a set of independent computers that work together to increase the availability of server roles. The clustered aeners (called nodes) are connected by physical cables and by software. If one of the nodes fails, another node begins to provide services. This process is known as failover. Clusters Name Role Status Node Status Ever No items found.		Failover Cluster Manager Validate Configuration Create Cluster Connect to Cluster View Refresh Properties Help
	Management To begin to use failover clustering, first validate your hardware configuration, and then create a cluster. After these steps are complete, you can manage the cluster. Managing a cluster can include copying roles to it from a cluster running Windows Server 2012 R2. Windows Server 2012 R2. Windows Server 2012, revinced server 2008 R2. Create Cluster Connect to Cluster Connect to Cluster Falover cluster topics on the Web Salover cluster communities on the Web. Microsoft support page on the Web. Microsoft support page on the Web.		

30. In the **Validate a Configuration Wizard** dialog box, click **Next**.

- N	Validate a Configuration Wizard	x
Before Y	'ou Begin	
Before You Begin Select Servers or a Cluster Testing Options Confirmation Validating Summary	This wizard runs validation tests to determine whether this configuration of servers and attached storage is set up correctly to support failover. A cluster solution is supported by Microsoft only if the complete configuration (servers, network, and storage) passes all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2012 R2." If you want to validate a set of unclustered servers, you need to know the names of the servers. Important: the storage connected to the selected servers will be unavailable during validation tests. If you want to validate an existing failover cluster, you need to know the name of the cluster or one of its nodes. You must be a local administrator on each of the servers that you want to validate. To continue, click Next. More about cluster validation tests Do not show this page again	1

31. In the **Select Servers or a Cluster** dialog box, add the following server names: WS-CLUSTER3 and WS-CLUSTER4. Click **Next**.

Ø	Valid	late a Configuration Wizard	x
Select Se	ervers or a Cluster		
Before You Begin Select Servers or a Cluster	To validate a set of server To test an existing cluster,	s, add the names of all the servers. add the name of the cluster or one of its nodes.	
Testing Options Confirmation Validating Summary	Enter name: Selected servers:	WS-CLUSTER3.TESTDOMAIN.local WS-CLUSTER4.TESTDOMAIN.local	Add Remove
		< Previous Next >	Cancel

32. In the **Testing Options** dialog box, make sure that the option **Run all tests** (recommended) is selected. Click **Next**.

- M	Validate a Configuration Wizard				
Testing (Options				
Before You Begin Select Servers or a Cluster Testing Options Confirmation Validating Summary	Choose between running all tests or running selected tests. The tests examine the Cluster Configuration, Hyper-V Configuration, Inventory, Network, Storage, and System Configuration. Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2012 R2." Run all tests (recommended) Run only tests I select				
	More about cluster validation tests < Previous]			

33. In the **Confirmation** dialog box, click **Next**.

- 潮	Validate a Configuration Wizard			
	ation			
Before You Begin Select Servers or a Cluster	You are ready to start validation. Please confirm that the following settings are correct	t:		
Testing Options Confirmation Validating Summary	Servers to Test WS-CLUSTER3.TESTDOMAIN.local WS-CLUSTER4.TESTDOMAIN.local Tests Selected by the User List Fibre Channel Host Bus Adapters List iSCSI Host Bus Adapters List SAS Host Bus Adapters List BIOS Information List Environment Variables To continue, click Next.	Category Inventory Inventory Inventory Inventory	~	
		< Previous Next > Ca	ancel	

34. In the **Summary** dialog box, click **Finish** to create the Windows Server Failover Cluster.



35. In the **Access Point for Administering the Cluster** dialog box, enter the following credentials:

Cluster Name: WINCLUSTER2 Address: 172.16.0.211

Click **Next**.

禮	Create Cluster Wizard				x
Access Point for Administering the Cluster					
Before You Begin	Type the name you	ı want to	use when administering the cluster.		
Access Point for	Cluster Name:	WINC	CLUSTER2		
Administering the Cluster	The NetBIOS n	ame is lin	nited to 15 characters. One or more IPv4	addresses could not be configured	ł
Confirmation	 automatically. address. 	For each	n network to be used, make sure the netw	vork is selected, and then type an	
Creating New Cluster			Networks	Address	7
Summary			172.16.0.0/24	172 . 16 . 0 . 211	
				1	
					_
			< Previous	Next > Cancel	

36. In the **Confirmation** dialog box, click **Next**. As a result, the Windows Server Failover Cluster using the servers as nodes of the cluster will be created. Add the DNS and Active Directory entries for the cluster host name.

i		Create Cluster Wizard	X
Confirma	tion		
Before You Begin Select Servers	You are ready to create The wizard will create y	e a cluster. rour cluster with the following settings:	
Access Point for Administering the Cluster	Cluster: Node:	WINCLUSTER2 WS-CLUSTER3TESTDOMAINlocal.sw-demo.local	^
Confirmation Creating New Cluster	Node: IP Address:	WS-CLUSTER4TESTDOMAINlocal.sw-demo.local 172.16.0.211	
Summary			
			\sim
	 Add all eligible stora To continue, click Next 	ge to the cluster.	
		< Previous Next >	Cancel

37. In the **Summary** dialog box, verify that the configuration is successful and click **Finish**.

a		Create Cluster Wizard	x
Summary			
Before You Begin Select Servers Access Point for	You have suc	cessfully completed the Create Cluster Wizard.	
Administering the Cluster		Create Cluster	^
Creating New Cluster Summary	Cluster: Node: Node: Quorum: IP Address:	WINCLUSTER2 WS-CLUSTER3.TESTDOMAIN.local WS-CLUSTER4.TESTDOMAIN.local Node Majority 172.16.0.211	
	To view the report cre To close this wizard, c	ated by the wizard, click View Report. lick Finish.	View Report Finish

38. Verify that the cluster **Quorum Configuration** is using **Node and Disk Majority** and the appropriate drive that is configured as the quorum disk.

Railover Cluster Manager						
File Action View Help						
🗢 🄿 🖄 🖬 🚺						
Hailover Cluster Manager		^	Actions			
WINCLUSTER2.sw-demo.lo Roles	Configure high availability for a specific clustered role, add one or more servers (nodes), or copy roles from a cluster running Windows Server 2012 R2, Windows Server 2012, or Mindows Server 2012 R2.		WINCLUSTER2.sw-demo.local	-		
Nodes	Configure Role Failover cluster topics on the Web		🧑 Configure Role			
⊿ 📇 Storage	Walidate Cluster		Validate Cluster			
Pools	Add Node		View Validation Report			
Networks	Copy Cluster Roles		Add Node			
Uuster Events	Cluster-Aware Updating		Close Connection			
			Reset Recent Events			
			More Actions	•		
	Reles R Nodes		View	•		
			G Refresh			
	Storage Retworks		Properties			
	Cluster Events		🛛 Help			
			Cluster Disk 1	•		
	Cluster Core Resources		🙀 Bring Online			
			Take Offline			
	Name Status		Information Details			
	WINCLUSTER2 Online		Show Critical Events			
	Storage		More Actions	•		
	Cluster Disk 2 Online		Properties			
			P Help			
	< III >					
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Installing SQL Server 2012 Failover Cluster Instance

Initial Cluster Node

Installing SQL Server 2012 Failover Cluster Instance requires appropriate permissions in the Active Directory domain and the local Administrator rights to the machines that will act as nodes in the Failover Cluster. Configuring the appropriate permissions in Active Directory is beyond the scope of this document. For more information, refer to the document <u>Failover Cluster Step-by-Step Guide: Configuring Accounts in Active Directory</u>.

There are two ways to install the SQL Server 2012 Failover Cluster Instance. The first one is to use the integrated failover cluster installation with the **Add Node** option. The second one is the **Advanced/Enterprise Installation** option.

The process outlined below describes the first option and the **DEFAULT** SQL Server instance configuration.

To install SQL Server 2012 Failover Cluster Instance:

39. Run setup.exe from the installation media to launch SQL Server Installation Center.Click on the Installation link on the left-hand side.

40. Click the New SQL Server failover cluster installation to run the SQL Server 2012 Setup Wizard.

1	SQL Server Installation Center
Planning Installation	New SQL Server stand-alone installation or add features to an existing installation Launch a wizard to install SQL Server 2012 in a non-clustered environment or to add features to an existing SQL Server 2012 instance.
Maintenance Tools	New SQL Server failover cluster installation
Resources	Launch a wizard to install a single-hode SQL Server 2012 failover cluster.
Advanced	Add node to a SQL Server failover cluster Launch a wizard to add a node to an existing SQL Server 2012 failover cluster.
Options	Upgrade from SQL Server 2005, SQL Server 2008 or SQL Server 2008 R2 Launch a wizard to upgrade SQL Server 2005, SQL Server 2008 or SQL Server 2008 R2 to SQL Server 2012.

41. In the **Setup Support Rules** dialog box, validate that the tests return successful results and click **Next**.

1	SQL Server 2012 Setup		- 🗆 X
Setup Support Rules Setup Support Rules identify proble corrected before Setup can continue	ms that might occur when you install SQL Server Setup support file e.	s. Failures must be	
Setup Support Rules	peration completed. Passed: 8. Failed 0. Warning 0. Skipped 0. Hide details << ew detailed report		Re-run
	Pule	Status	
	Setup administrator	Passed	
	Setup account privileges	Passed	
	Restart computer	Passed	
	Windows Management Instrumentation (WMI) service	Passed	
	Consistency validation for SQL Server registry keys	Passed	
	Long path names to files on SQL Server installation media	Passed	
	SQL Server Setup Product Incompatibility	Passed	
	.NET 2.0 and .NET 3.5 Service Pack 1 update for Windows 2008	Passed	
		ОК	Cancel

42. In the **Product Key** dialog box, enter the product key that came with the installation media and click **Next**.

1	SQL Server 2012 Setup	x
Product Key Specify the edition of SQ	L Server 2012 to install.	
Product Key License Terms Product Updates Install Setup Files	Validate this instance of SQL Server 2012 by entering the 25-character key from the Microsoft certificate of authenticity or product packaging. You can also specify a free edition of SQL Server, such as Evaluation or Express. Evaluation has the largest set of SQL Server features, as documented in SQL Server Books Online, and is activated with a 180-day expiration. To upgrade from one edition to another, run the Edition Upgrade Wizard. Specify a free edition: Evaluation © Enter the product key: 	< III
	< Back Next > Cancel	

43. In the **License Terms** dialog box, enable the **I accept the license terms** and click **Next**.

1	SQL Server 2012 Setup
License Terms To install SQL Server 2012,	you must accept the Microsoft Software License Terms.
Product Key	MICROSOFT SOFTWARE LICENSE TERMS
License lerms Broduct Undater	MICROSOFT SOL SERVER 2012 ENTERDRISE CORE
Install Setup Files	These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft updates, supplements, Internet-based services, and
	Copy Print
	✓ I accept the license terms. Send feature usage data to Microsoft. Feature usage data includes information about your hardware configuration and how you use SQL Server and its components.
	See the Microsoft SQL Server 2012 Privacy Statement for more information.
	< Back Next > Cancel

44. In the **Product Updates** dialog, select the checkbox to enable the **Include SQL Server product updates** (such as service packs and cumulative updates) option. If servers are connected to the Internet, the installation media will connect to Windows Update and check for available SQL Server 2012 updates. The detected updates can be included as a part of the installation process. Click **Next**.

15	SQL Server 2012	Setup	_ _ X
Product Updates Always install the latest u	updates to enhance your SQL Server security and pr	erformance.	
Product Key License Terms	✓ Include SQL Server product updates	Size (MR)	Maya Information
Product Updates	SOL Server 2012 SP1 GDR Product Undate	145	KB 2793634
Install Setup Files	SQL Server 2012 SP1 GDR Setun Undate	26	KB 2793634
	Read our privacy statement online		
	Learn more about SQL Server product upd	<u>ates</u>	
		< B	ack Next > Cancel

45. In the **Setup Support Rules** dialog box, validate that the tests return successful results. If the tests return warnings, fix them before proceeding with the installation. Click **Next**.

1	Install a SQL Server Failover Cluster						
Setup Support Rules					64	ŝ	
Setup Support Rules identify pr corrected before Setup can con	ems that might occur e.	when you install SQL Server Setup s	upport files.	Failures must be			
Setup Support Rules	peration completed. F	assed: 15. Failed 0. Warning 2. Sl	kipped 0.				
Product Key							
License Terms							
Setup Role	Hide details <<				Re-ru	in	
Feature Selection	iew detailed report						
Feature Kules	Rule			Status			
Error Reporting	Fusion Active Tem	plate Library (ATL)		Passed			
Cluster Installation Rules	Cluster Node			Passed			
Ready to Install	Windows Manage	ment Instrumentation (WMI) service	(WIN-M	Passed			
Installation Progress	Cluster Remote A	cess (WIN-M2IGGM12OBI)		Passed		≡	
Complete	Cluster service ver	ification		Passed			
	Distributed Transa	ction Coordinator (MSDTC) installed	I (WIN	Passed			
	Distributed Transa	ction Coordinator (MSDTC) service		Passed			
	1 Distributed Transa	ction Coordinator (MSDTC) clustered	d	Warning		1	
	Microsoft Cluster	Service (MSCS) cluster verification er	rors	Passed			
	1 Microsoft Cluster	Service (MSCS) cluster verification wa	arnings	Warning			
	Remote registry se	rvice (WIN-M2IGGM12OBI)		Passed		~	
		< Back	Next >	Cancel	Help		

In the Setup Role dialog box, choose the SQL Server Feature Installation option and 46. click Next.



47.

In the **Feature Selection** dialog box, select the following components:

- Database Engine Services
- SQL Server Replication
- Client Tools Connectivity
- Management Tools.

Click **Next**.

1	Install a SQL Server Failover Cluster	_ D X
Feature Selection		
Select the Evaluation features to) install.	
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Features: Feature destinations Instance Features Interconfig Database Engine Services Instance for isolated fr SQL Server Replication SQL Server Replication Image: Pull-Text and Semantic Extractions for Searce SQL Server side on the solated of the solated for SQL Server side on the solated for SQL Server side on the solated for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions Image: Pull-Text and Semantic Extractions for Searce Image: Pull-Text and Semantic Extractions	scription: guration and operation of each eature of a SQL Server instances. r instances can operate side-by- e same computer. es for selected features: istalled: soft .NET Framework 4.0 ows PowerShell 2.0 soft .NET Framework 3.5 ialled from media: soft Visual Studio 2010 Shell er/
	Shared feature directory (x86): [C:\Program Files (x8b)\Microsoft SQL	. server\
	< Back Next >	Cancel Help

NOTE: Data Quality Services is required when installing Database Engine Services on the Failover Cluster when the installation media includes SQL Server 2012 Service Pack 1 as <u>per Microsoft KB</u> <u>article 2674817</u>.

48. In the **Feature Rules** dialog box, verify that all the rules are passed. If the rules return warnings, fix them before to proceed with the installation. Click **Next**.

1	Install a SQL Server Failover Cluster		_ □	x
Feature Rules Feature rules identify problems	that might block this setup operation based on the features selected.			
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules	Operation completed. Passed: 3. Failed 0. Warning 0. Skipped 0. Hide details << <u>View detailed report</u>		Re	-run
Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Rule Cluster supported for edition Prior Visual Studio 2010 instances requiring update. Microsoft .NET Framework 3.5 is installed on Windows 8 or hig	Status Passed Passed Passed		
	< Back Next >	Cancel	Hel	p

49. In the **Instance Configuration** dialog box, enter the following credentials:

SQL Server Network Name: SQLCLUSTER2

Instance ID: MSSQLSERVER

Click **Next**.

1	Install a S	QL Server Failov	er Cluster		_ [x
Instance Configuration Specify the name and instance	ID for the instance of SQL S	erver. Instance ID be	comes part of th	e installation path	h.	
Global Rules Microsoft Update	Specify a network name for your failover cluster on the	or the new SQL Serv e network.	er failover cluster	. This will be the r	name used to identif	y
Product Updates	SQL Server Network Name	sQLCLUSTER2				
Install Failover Cluster Rules Product Key License Terms	 Default instance Named instance: 	MSSQLSERVER				
Setup Role Feature Selection	Instance ID:	MSSQLSERVER]			
reature Kules Instance Configuration Cluster Resource Group	SQL Server directory:	C:\Program Files	\Microsoft SQL S	erver\MSSQL12.M	ISSQLSERVER	
Cluster Disk Selection	Detected SQL Server insta	nces and features or	this computer:			
Cluster Network Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install	Instance Cluste	r Network Name	Features	Edition	Version	Inst
Installation Progress	<		III			>
			< Back I	Next > (Cancel He	elp :

50. In the **Disk Space Requirements** dialog box, check that there is enough space on local disks to install the SQL Server 2012 binaries. Click **Next**.

1	Install a SQL Server Failover Cluster
Disk Space Requirement Review the disk space summary	nts for the SQL Server features you selected.
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Disk Usage Summary: • Orive C: 1580 MB required, 9812 MB available System Drive (C:\): 185 MB required Shared Install Directory (C:\Program Files\Microsoft SQL Server\): 0 MB required Instance Directory (C:\Program Files\Microsoft SQL Server\): 1395 MB required
	< Back Next > Cancel Help

51. To make sure that a new Resource Group for the SQL Server Failover Cluster Instance can be created, check the resource availability in the **Cluster Resource Group** dialog box. To specify an existing **SQL Server cluster resource group name**, use the drop-down box or type the name of a new group to create it. Accept all the defaults and click **Next**.

1		Install a SQL Server Fa	ilove	er Cluster			_ 🗆 X
Cluster Resource Group	,						
Create a new cluster resource gr	roup for your	SQL Server failover cluster.					
Setup Support Rules Product Key License Terms Setup Role Feature Selection	Specify a name for the SQL Server cluster resource group. The cluster resource group is where SQL Server failover cluster resources will be placed. You can choose to use an existing cluster resource group name or enter a new cluster resource group name to be created. SQL Server cluster resource group name: SQL Server (MSSQLSERVER)					here SQL Server a group name	
Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress	Qualified	Name Available Storage Cluster Group Placeholder VM SOFS SQL Server (DEMOSQLFCI) sw-demo-veeam-test-hpv	Me The The The The The	essage cluster gro cluster gro cluster gro cluster gro cluster gro cluster gro	up 'Available Stor up 'Cluster Group up 'Placeholder V up 'SOFS' is not o up 'SQL Server (D up 'sw-demo-vee	age' is reserved by \ M' is not owned wned by the loc EMOSQLFCI)' is am-test-hpv' is	by Windows Fai Windows Failov I by the local no al node. not owned by t not owned by t
							Refresh
		[<	Back	Next >	Cancel	Help

52. In the **Cluster Disk Selection** dialog box, select the available disk groups on the cluster for SQL Server 2012 to use. Click **Next**.

1	Install a SQL Server Failover Cluster					
Cluster Disk Selection						
Select shared cluster disk resou	es for your SQL Server failover cluster.					
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules	Specify the shared disks to be included in the SQL Server resource cluster group. The first drive will be used as the default drive for all databases, but this can be changed on the Database Engine or Analysis Services configuration pages. SAN_BACKUP_H SAN_DATA_E SAN_LOGS_F					
Disk Space Requirements	Available shared disks:					
Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Qualified Disk Message SAN_BACKUP_H SAN_DATA_E SAN_LOGS_F SAN_QUORUM The disk resource 'SAN_QUORUM_Q' cannot be used because it is a cluste.					
	< Back Next > Cancel Help					

53. In the **Cluster Network Configuration** dialog box, enter the virtual IP address for SQL Server 2012 failover cluster to use:

IP Type: IPv4 **Address:** 172.16.0.212

1	Install a	a SQL Server Fa	ailover Cluster		_ 🗆 X
Cluster Network Confi Select network resources for yo	guration our SQL Server failover clu	ister.			
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install	Specify the network se	Address 172.16.0.212	Subnet Mask 255.255.254.0	Subnet(s) 192.168.12.0/23	Network Management
Installation Progress Complete					Refresh
			< Back	Next > Cancel	Help

54. In the **Server Configuration** dialog box, use the following credentials for the SQL Server service accounts in the **Service Accounts** tab.

SQL Server Agent: TESTDOMAIN\sqlservice **SQL Server Database Engine:** TESTDOMAIN\sqlservice

Make sure that both SQL Server Agent and SQL Server Database Engine services have the **Manual** Startup Type. Windows Server Failover Cluster will take care of stopping and starting the service.

Click **Next**.

1	Install a SQL Server Fa	ailover Cluster		_ [x
Server Configuration Specify the service accounts and	d collation configuration.				
Setup Support Rules Product Key	Service Accounts Collation	a constrate account for each	SOL Server convi		
License Terms			SQL SCIVE SCIVI		
Setup Role	Service	Account Name	Password	Startup Typ	e
Feature Selection	SQL Server Agent	TESTDOMAIN\sqlservice	••••••	Manual	\sim
Feature Rules	SQL Server Database Engine	TESTDOMAIN\sqlservice	•••••	Manual	\sim
Instance Configuration	SQL Full-text Filter Daemon Launc	NT Service\MSSQLFDLa		Manual	
Disk Space Requirements	SQL Server Browser	NT AUTHORITY\LOCAL		Automatic	\sim
Cluster Resource Group					
Cluster Disk Selection					
Cluster Network Configuration					
Server Configuration					
Database Engine Configuration					
Error Reporting					
Cluster Installation Rules					
Ready to Install					
Installation Progress					
Complete					
·					
		< Back Next	> Cano	el H	elp

55. In the **Database Engine Configuration** dialog box, select the **Windows authentication mode** in the **Server Configuration** tab. To add the currently logged on

user to the SQL Server administrators group, click the **Add Current User** button.

Otherwise, add the appropriate domain accounts or security groups.

1	Install a SQL Server Failover Cluster	_ _ ×				
Database Engine Configuration						
Specify Database Engine auther	ntication security mode, administrators and data directories.					
Setup Support Rules	Server Configuration Data Directories FILESTREAM					
License Terms	Specify the authentication mode and administrators for the Database E	ngine.				
Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration	Authentication Mode Windows authentication mode Mixed Mode (SQL Server authentication and Windows authentication) Specify the password for the SQL Server system administrator (sa) account. Enter password: Confirm password:					
Server Configuration	Specify SQL Server administrators					
Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	SQL Server administrators have unrestricted access to the Database Engine.					
	<pre>Add Nemove </pre>	Cancel Help				

56. In the **Data Directories** tab, enter the following credentials:

Data root directory: E:\ User database directory: E:\SQLSERVER\MSSQL\Data User database log directory: F:\SQLSERVER\MSSQL\Data Temp DB directory: E:\SQLSERVER\MSSQL\Data Temp DB log directory: F:\SQLSERVER\MSSQL\Data Backup directory: H:\SQLSERVER\MSSQL\Backup

1 Install a SQL Server Failover Cluster					
Database Engine Configuration					
Specify Database Engine authentication security mode, administrators and data directories.					
Global Rules	Server Configuration Data Di	rectories FILESTREAM			
Microsoft Update					
Install Setup Files	Data root directory:	E:\			
Install Failover Cluster Rules	System database directory:	E:\MSSQL12.MSSQLSERVER\MSSQL\Data			
Product Key	Lines databases divertes a				
License Terms	User database directory:				
Setup Role	User database log directory:	F:\SQLSERVER\MSSQL\Data			
Feature Selection	Temp DB directory	E:\SOLSERVER\MSSOL\Data			
Feature Rules	remp bb directory.				
Instance Configuration	Temp DB log directory:	F:\SQLSERVER\MSSQL\Data			
Cluster Resource Group	Backup directory:	H:\SQLSERVER\MSSQL\Backup			
Cluster Disk Selection		· · · · · · · · · · · · · · · · · · ·			
Cluster Network Configuration					
Server Configuration					
Database Engine Configuration					
Feature Configuration Rules					
Ready to Install					
Installation Progress					
Complete					
		< Back Next > Cancel Help			

NOTE: SQL Server 2012 has the option to store the **tempdb** database on a local drive instead of the cluster drive. Make sure that all nodes in the cluster contain the same directory structure and the SQL Server service account has read/write permissions on those folders. Click **Yes**. Then, click **Next**.

	Install a SQL Server Failover Cluster
You have specifi	a local directory G:\SQLSERVER\MSSQL\Data as the tempdb data or log directory
same directory e	ister. To avoid possible failures during a failover, you must make sure that the its on each cluster node and grant read/write permission to SQL server service.

57. In the **Error Reporting** dialog box, click **Next**.

1	Install a SQL Server Failover Cluster					
Error Reporting Help Microsoft improve SQL S	erver features and services.					
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Specify the information that you would like to automatically send to Microsoft to improve future releases of SQL Server. These settings are optional. Microsoft treats this information as confidential. Microsoft may provide updates through Microsoft Update to modify feature usage data. These updates might be downloaded and installed on your machine automatically, depending on your Automatic Update settings. See the Microsoft SQL Server 2012 Privacy Statement for more information. Read more about Microsoft Update and Automatic Update.					
	< Back Next > Cancel Help					

58. In the **Cluster Installation Rules** dialog box, verify that all tests are successful and click **Next**.

1	Install a SQL Server Failover Cluster	_ D X			
Cluster Installation Rules					
Setup is running rules to deterr Help.	nine if the failover cluster installation operation will be blocked. For m	ore information, click			
Setup Support Rules	Operation completed. Passed: 1. Failed 0. Warning 1. Skipped 0.				
Product Key					
License Terms					
Setup Role	Hide detail <u>s</u> <<	<u>R</u> e-run			
Feature Selection	View detailed report				
Feature Rules					
Instance Configuration	Rule	Status			
Disk Space Requirements	Sector FAT32 File System	Passed			
Cluster Resource Group	▲ Cluster Resource DLL Update Restart Check	Warning			
Cluster Disk Selection					
Cluster Network Configuration					
Server Configuration					
Database Engine Configuration					
Reporting Services Configuration					
Error Reporting					
Cluster Installation Rules					
Ready to Install					
Installation Progress					
Complete					
	< <u>B</u> ack <u>N</u> ext :	Cancel Help			

59. In the **Ready to Install** dialog box, verify that all configurations are correct. Click **Next**.



60. In the **Complete** dialog box, click **Close**. This step finishes the installation of the SQL Server 2012 Failover Cluster Instance.

1	Install a SQL Server Failover Clu	uster 📃 🗖	x
Complete Your SQL Server 2012 f	allover cluster installation is complete with product updates.		
Setup Support Rules Product Key License Terms Setup Role Feature Selection Feature Rules Instance Configuration Disk Space Requirements Cluster Resource Group Cluster Disk Selection Cluster Network Configuration	Rules Information about the Setup operation or possible next steps: Feature Status Management Tools - Complete Succeeded Of Client Tools Connectivity Succeeded Management Tools - Basic Succeeded Management Tools - Basic Succeeded Otabase Engine Services Succeeded Otabase Engine Services Succeeded Otabase Engine Services Succeeded Pata Quality Services Succeeded Pull-Text and Semantic Extractions for Search Succeeded Details: Details:		
Server Configuration Database Engine Configuration Error Reporting Cluster Installation Rules Ready to Install Installation Progress Complete	Only the components that you use to view and been installed. By default, the Help Viewer com SQL Server, you can use the Help Library Mani- your local computer. For more information, see (<http: ?linkid="29957<br" fwlink="" go.microsoft.com="">Summary log file has been saved to the following lo C:\Program Files\Microsoft SQL Server\120\Setup B \Summary SQLCLUSTER1_20140818_230558.txt</http:>	manage the documentation for SQL Server have nponent uses the online library. After installing ager component to download documentation to Use Microsoft Books Online for SQL Server (8>). cation: sootstrap\Log\20140818 230558	III
	< Back	c Install Cancel Help	

Failover Cluster Node

This part describes how to make the cluster highly available by adding nodes. Most of the steps outlined below are similar to the ones described in the Initial Cluster Node part. While all the steps are still included, some screenshots have been omitted for brevity. To add a node to the SQL Server 2012 Failover Cluster Instance:

- 61. Run **setup.exe** from the installation media to launch the **SQL Server Installation Center**. Click on the **Installation** link on the left-hand side.
- 62. Click on the **Add node to a SQL Server failover cluster** link to run the SQL Server 2012 Setup Wizard.



63. In the **Setup Support Rules** dialog box, validate that the tests return successful results and click **OK**. Click **Next**.

64. In the **Cluster Node Configuration** dialog box, check if the information on the existing SQL Server 2012 cluster is correct. Click **Next**.

t Add a Failover Cluster Node X					x			
Cluster Node Configura Add a node to an existing SQL S	ation erver failover cluste	r.						
Product Key License Terms Global Rules Microsoft Update Product Updates Install Setup Files Add Node Rules	SQL Server inst Name of this n Disk Space Rec	tance name: iode: quirements:	MSS WIN	QLSERVER -V8VC4SBL0BA e C: 2656 MB requir	red, 13111 MB availab	le		>
Cluster Node Configuration Cluster Network Configuration Service Accounts	Instance Name	Cluster Network Name	L	Features	Nodes			
Feature Rules Ready to Add Node Add Node Progress Complete		SQLCLUSTE	<u>π</u> 2	Juckengine, SQ	wii-m2iGGW120B			
				< Back	Next >	Cancel	He	lp

65. In the **Service Accounts** dialog box, verify that the information is the same as it was used to configure the first node. Click **Next**.

5	Add a Failover Cl	uster Node		
Service Accounts				
Specify the service accounts a	nd collation configuration.			
Product Key	Microsoft recommends that you use a	separate account for each SQL	Server service.	
License Terms	Service	Account Name	Password	Startup Type
Global Rules	SQL Full-text Filter Daemon Launcher	NT Service\MSSQLFDLaun		Manual
Microsoft Update	SQL Server Database Engine	sw-demo\suser	•••••	Manual
Product Updates	SQL Server Browser	NT AUTHORITY\LOCAL SE		Automatic
nstall Setup Files	SQL Server Agent	sw-demo\suser	•••••	Manual
Juster Node Computation Juster Node Computation Service Accounts Feature Rules Ready to Add Node Add Node Progress Complete				
		< Back Next >	Cancel	Help

NOTE: In case of using different service accounts for the SQL Server services, make sure that the credentials provided are correct.

- 66. In the Error Reporting dialog box, click Next.
- 67. In the **Add Node Rules** dialog box, verify that all tests are successful and click **Next**.
- 68. In the **Ready to Add Node** dialog box, verify that all configurations are correct and click **Install**.
- 69. In the **Complete** dialog box, click **Close**. This step concludes adding the node to the SQL Server 2012 Failover Cluster.
- 70. Reboot both nodes after completing the installation to make sure that there are no pending reboot operations that may be flagged as warnings.

Conclusion

The steps described above allow configuring a 2-node Windows Server 2012 Failover Cluster that will host a SQL Server Failover Cluster Instance (FCI). StarWind Virtual SAN was taken as the basis for use in the Windows Server 2012 hosted storage during the implementation of a block-level replication and creating Windows Server Failover Cluster. StarWind VSAN ensures data safety of the entire system and maintains continuous application availability.

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