

# StarWind Virtual SAN: Hybrid Cloud Configuration Guide, VSAN Deployed as a Window Application and Azure Instance using GUI

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**TECHNICAL PAPERS** 



StarWind Virtual SAN: Hybrid Cloud Configuration Guide, VSAN Deployed as a Window Application and Azure Instance using GUI



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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 2016, 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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# Annotation

**Relevant Products** 

StarWind Virtual SAN (VSAN)

Purpose

This document serves as a configuration guide for implementing StarWind Virtual SAN (VSAN) in a hybrid cloud setup based on on-premise Microsoft Windows Server and Azure. The configuration involves deploying VSAN as a Windows application and integrating it with Azure Cloud instances using a graphical user interface (GUI).

#### Audience

This technical guide is intended for IT professionals, system administrators, and network engineers responsible for designing and implementing hybrid cloud Microsoft solutions.

#### Expected Result

The expected result is the successful deployment of a hybrid cloud environment utilizing StarWind Virtual SAN for Hyper-V. This environment will enable the creation of a highly available infrastructure that replicates data between on-premises locations and the Azure public cloud. Users will achieve the desired Recovery Time Objective (RTO) and Recovery Point Objective (RPO) for their disaster recovery needs.

# Introduction To Starwind Vsan Hybrid Cloud [For Azure]

StarWind Virtual SAN for Hyper-V allows building a hybrid cloud solution to extend On-Premises virtualization workloads from a datacenter to Azure public cloud. With its implementation, it becomes possible to assemble the on-premises servers and Azure VMs in a well-known Hyper-V Failover Cluster. The Hybrid Cloud is orchestrated using StarWind Management Console, Hyper-V, and SCVMM, requiring no experience in the Azure platform.

StarWind Virtual SAN for Hyper-V distributes highly-available shared storage replicating the data between locations. Delivering active-active storage, StarWind provides faulttolerant Disaster Recovery site in Azure public cloud to meet the required RTO and RPO.



## Solution Diagram

The diagram below illustrates the StarWind VSAN for Hyper-V Hybrid Cloud configuration with Azure public cloud.



# **Implementing Starwind Hybrid Cloud With Azure**

## Prerequisites

Make sure that the following prerequisites are met before deploying StarWind Hybrid Cloud:

- An Azure Subscription (a free trial can be found here)
- Azure location allowing nested virtualization. It's recommended to choose the location with minimal network latency. The latency can be here
- An externally facing public IPv4 address for a VPN device
- At least 100Mbps network connection to the Internet. The 1Gbps bandwidth link is highly recommended
- Deployed Active Directory structure and DNS at on-premises
- Windows Server 2016 installed on the server that is going to be clustered

Example values



The following values in this document are used as examples. These values can be used to create an environment or referred to better understand the deployment process.

- Virtual Network Name: AzureVNet1
- Azure Address Space: 10.10.0.0/25
- Azure Subnet: 10.10.0.0/26
- Azure GatewaySubnet: 10.10.0.128/27
- Resource Group: AzureRG
- Location: East US
- DNS Server: Optional. The IP address of your DNS server
- Virtual Network Gateway Name: AzureVNet1GW
- Public IP: AzureVNet1GW-IP
- VPN Type: Route-based
- Connection Type: Site-to-site (IPsec)
- Gateway Type: VPN
- Local Network Gateway Name: On-Premise
- Connection Name: AzureVNet1toOnPremise

## Creating a Resource Group

1. From a browser, navigate to the Azure portal and sign in with an Azure account.

- 2. Create a Resource group in the Azure portal and click New.
- 3. In the Search the marketplace field, type 'Virtual Network'.

4. Locate Resource group from the list and click it to open the Resource group window. Click Create.

| Resource group<br>Create an empty resource group |      | × |
|--------------------------------------------------|------|---|
| * Resource group name                            |      |   |
| AzureRG                                          | ~    |   |
| * Subscription                                   |      |   |
| Pay-As-You-Go                                    | *    |   |
| * Resource group location                        |      |   |
| East US                                          | *    |   |
| Pin to dashboard                                 |      |   |
| Create                                           |      |   |
| reating a virtual netw                           | vork |   |



- 1. Navigate to Resource group, select it, and click Add.
- 2. In the Search the marketplace field, type 'Virtual Network'.
- 3. Locate Virtual Network from the list, click it, and open the Virtual Network window.
- 4. Use Resource Manager as a deployment model.

| AzureVNet1 - Subnets                  |                                                                                    | * × | Add subnet                                                | Ξ× |
|---------------------------------------|------------------------------------------------------------------------------------|-----|-----------------------------------------------------------|----|
| P Search (Chrite))                    | + Subret + Gateway subret                                                          |     | * Name                                                    |    |
| ++ Overview                           | Search subsets     NAME     '- ADDRESS RANCE     '- ANNUASLE ADDR'- SECURITY GROUP |     | Address range (0DR block)     Address range (0DR block)   |    |
| Activity log                          | defaalt 10.10.8.0/26 59 -                                                          |     | 10.10.0.64 - 10.10.0.79 (11 + 5 Azure reserved addresses) |    |
| 🗶 Tags                                |                                                                                    |     | Route table<br>None                                       | >  |
| SETTINGS                              |                                                                                    |     |                                                           |    |
| ↔ Address space                       |                                                                                    |     |                                                           |    |
| <ul> <li>Connected devices</li> </ul> |                                                                                    |     |                                                           |    |
| CO Subrets                            |                                                                                    |     |                                                           |    |
| DNS servers +                         |                                                                                    |     | ox                                                        |    |

Creating gateway subnet

1. In Resource group, click on the virtual network, open Subnets, and Create a Gateway subnet.



| Name AzureVNet1GW  AzureVNet1GW  VPN ExpressRoute  N type  oute-based Policy-based SKU  StrueVNet1  Public IP address  (new) AzureVNet1GW-IP  Configure BGP ASN Subscription Pay-As-You-Go source group  O                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul> <li></li> <li></li> </ul> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| AzureVNet1GW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul> <li></li> <li></li> </ul> |
| Ateway type  VPN ExpressRoute VI type  Void ExpressRoute Vision V | *                              |
| VPN ExpressRoute  N type  oute-based Policy-based  SKU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ¥                              |
| N type  oute-based Policy-based SKU  SkU  Sasic Virtual network  AzureVNet1 Public IP address  (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ۷                              |
| oute-based Policy-based SKU  SKU SKU SKU SKU SKU SKU SKU SKU SKU SKU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | *                              |
| SKU  SkU SkU SkU SkU SkU SkU SkU SkU SkU SkU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ۲                              |
| Basic Virtual network  AzureVNet1 Public IP address  (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | *                              |
| Virtual network  AzureVNet1 Public IP address  (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                |
| AzureVNet1 Public IP address  (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                |
| Public IP address  Public IP address (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | >                              |
| Public IP address  (new) AzureVNet1GW-IP Configure BGP ASN Subscription Pay-As-You-Go source group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |
| (new) AzureVNet1GW-IP<br>Configure BGP ASN<br>Subscription<br>Pay-As-You-Go<br>source group ®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | >                              |
| Configure BGP ASN<br>Subscription<br>Yay-As-You-Go<br>source group ®                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |
| Subscription<br>Pay-As-You-Go<br>source group <b>®</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |
| Pay-As-You-Go<br>source group <b>®</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |
| source group 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ۷                              |
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| ureRG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |
| Location 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                |
| ast US                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ۷                              |
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| Pin to dashboard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |
| Create Automation options                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |

## Creating a VPN gateway

1. On the Portal page, click Create new and type 'Virtual Network Gateway' in the search field.

2. Locate and click Virtual network gateway.

3. In the Virtual network gateway window, click Create to open Create virtual network gateway.

4. In the Create virtual network gateway window, specify the values for the virtual network gateway:

- Name: Name the gateway.
- Gateway type: Select VPN.



- VPN type: Select the Route-based VPN type.
- SKU: Select the gateway SKU from the drop-down menu.
- Resource Group: click use existing and then select the required group.
- Location: Point to the location where the virtual network is located.
- Virtual network: Choose the virtual network to be added to this gateway.
- Public IP address: Click Public IP address and then click Create New in the Choose public IP address window. Input a Name for the public IP address and click OK.

| Choose public IP address<br>Dynamic public IP addresses that are not in use won't have an IP address assigned to them. | × | Create public IP address  | × |
|------------------------------------------------------------------------------------------------------------------------|---|---------------------------|---|
| No public IP addresses found in the selected subscription and location 'East US'.                                      |   | * Name<br>AzureVNet1GW-IP |   |
| + Create new                                                                                                           |   |                           |   |
| No results                                                                                                             |   |                           |   |

#### 5. Verify the settings.

6. Click Create to begin creating the VPN gateway.

NOTE: The settings will be validated and Deploying Virtual network gateway will appear on the dashboard. Creation of a gateway can take up to 45 minutes.

## Creating the local network gateway

1. Provide the site with a name by which Azure can refer to it, and specify the IP address of the on-premises VPN device to which a connection will be established.

2. Specify the IP address prefixes that will be routed through the VPN gateway to the VPN device. The specified address prefixes are the prefixes located on the on-premises network.

3. Navigate to All resources, click +Add.

4. In the Search box, locate and select Local network gateway. Then click Create to open the Create local network gateway window.



| 0.0                                                                          |   |
|------------------------------------------------------------------------------|---|
| On-Premise                                                                   | ~ |
| P address 0                                                                  |   |
| 172.48.58.50                                                                 | ~ |
| Address space <b>0</b>                                                       |   |
| 192.168.0.0/24                                                               |   |
| Add additional address range                                                 |   |
| Configure BGP settings                                                       |   |
| Subscription                                                                 | ~ |
| 19/10/00                                                                     | · |
| Resource group <b>0</b> <ul> <li>Create new</li> <li>Use existing</li> </ul> |   |
| AzureRG                                                                      | * |
|                                                                              |   |
| Location                                                                     |   |
| * Location<br>East US                                                        | ~ |
| * Location<br>East US                                                        | * |
| * Location<br>East US<br>Pin to dashboard                                    | * |

5. On the Create local network gateway blade, specify the values for the local network gateway:

- Name: The name of the local network gateway object
- IP address: The public IP address of the VPN device connected to Azure
- Address Space: The address ranges for the network that the local network represents
- Subscription: Subscription plan
- Resource Group: The resource group that can be used
- Location: The location where the object will be created

6. Click Create at the bottom of the window to deploy the local network gateway.

Creating the VPN connection



1. To create the Site-to-Site VPN connection between the virtual network gateway and on-premises VPN device, open the Virtual network gateway window.

- 2. On the AzureVNet1GW window, click Connections.
- 3. At the top of the Connections window, click +Add to open Add connection.

| Add connection                                                        | □ × |
|-----------------------------------------------------------------------|-----|
| * Name                                                                |     |
| AzureVNet1toOnPremise                                                 | ~   |
| Connection type 0                                                     |     |
| Site-to-site (IPsec)                                                  | *   |
| <ul> <li>★ Virtual network gateway ●</li> <li>AzureVNet1GW</li> </ul> | >   |
| * Local network gateway 0                                             | ۵   |
| On-Premise                                                            |     |
| * Shared key (PSK) O                                                  |     |
| StrongPasswordKey                                                     | ~   |
| Subscription 0                                                        |     |
| Pay-As-You-Go                                                         | ~   |
| Resource group 🖲                                                      |     |
| AzureRG                                                               | ₽   |
| Create new                                                            |     |
| Location 0                                                            |     |
| East US                                                               | *   |
|                                                                       |     |
|                                                                       |     |
| OK                                                                    |     |

4. On the Add connection window, fill in the values to create the connection:

- Name: Name the connection. In this guide, the AzureVNet1toOnPremise name is used.
- Connection type: Select Site-to-site (IPSec).
- Virtual network gateway: This value is fixed because of the connection from this gateway.
- Local network gateway: Click Choose a local network gateway and select the local network gateway to be used. In this guide, On-Premise is used.
- Shared Key: This value must match the value used for the local on-premises VPN device. In this guide, 'StrongPasswordKey' is used.



5. Click OK to create your connection.

# **Setting Up Rras Server**

NOTE: In order to set up the VPN tunnel between on-premises and Azure, the Routing and Remote Access Service (RRAS) role is configured on Windows Server 2016, which in this guide also stands for AD DC and DNS roles. In case of using an external VPN device, check its compatibility with Azure here.

1. Open Server Manager and select Manage -> Add Roles and Features.

- 2. In the Add Roles and Features Wizard -> Before You Begin, click Next.
- 3. In Installation Type, select Role-based, and click Next.
- 4. In Server Selection, select RRAS-Server and click Next.
- 5. In Server Roles, check Remote Access and click Next.
- 6. On the Features and Remote Acess steps, click Next.

7. On the Role Services step, choose Direct Access and VPN (RAS), Routing and click Add Features on the pop-up window. Click Next.

- 8. On the Web Server Role (IIS) step, click Next.
- 9. On the Role Services step, accept the defaults and click Next.
- 10. In Confirmation, click Install.



| Add Roles and Features Wizar | d                                                                                                         | -          |            | ×    |
|------------------------------|-----------------------------------------------------------------------------------------------------------|------------|------------|------|
| Confirm installati           | on selections                                                                                             | DESTIN     | ATION SER  | ver  |
| Before You Begin             | To install the following roles, role services, or features on selected server, click lns                  | tall.      |            |      |
| Installation Type            | <ul> <li>Restart the destination server automatically if required</li> </ul>                              |            |            |      |
| Server Selection             | Optional features (such as administration tools) might be displayed on this page                          | because t  | hey have   | -    |
| Server Roles                 | been selected automatically. If you do not want to install these optional features,<br>their check boxes. | click Prev | rious to c | lear |
| Features                     |                                                                                                           |            |            | _    |
| Remote Access                | Group Policy Management                                                                                   |            |            | ^    |
| Role Services                | RAS Connection Manager Administration Kit (CMAK)                                                          |            |            |      |
| Web Server Role (IIS)        | Remote Access                                                                                             |            |            |      |
| Role Services                | DirectAccess and VPN (RAS)                                                                                |            |            |      |
| Confirmation                 | Routing                                                                                                   |            |            |      |
| Comminisoon                  | Remote Server Administration Tools                                                                        |            |            |      |
|                              | Role Administration Tools                                                                                 |            |            |      |
|                              | Remote Access Management Tools                                                                            |            |            |      |
|                              | Remote Access module for Windows PowerShell                                                               |            |            |      |
|                              | Remote Access GUI and Command-Line Tools                                                                  |            |            | ~    |
|                              | Export configuration settings<br>Specify an alternate source path                                         |            |            |      |
|                              | < <u>Previous</u> <u>Next</u> > <u>Int</u>                                                                | stall      | Cance      | el   |

## Configuring the RRAS Server

1. Open Routing and Remote Access and select Secure connection between two private networks. Complete the configuration with the default settings.

| 🏊 Server Manager                                                    |                                                                       |                                                                           | - 0 ×                                                                                                                                                                 |
|---------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| €∋- Server M                                                        | anager • Dashboard                                                    |                                                                           |                                                                                                                                                                       |
| Dashboard     Local Server                                          | WELCOME TO SERVER MANAGER                                             |                                                                           | Active Directory Administrative Center<br>Active Directory Domains and Trusts<br>Active Directory Module for Windows PowerShell<br>Active Directory Stee and Services |
| All Servers<br>W AD DS<br>& DNS                                     |                                                                       | figure this local serv                                                    | Active Directory Users and Computers<br>ADSI Edit<br>Component Services<br>Computer Management                                                                        |
| मेड्ड File and Storage Services ▷<br>हेंe IIS<br>gव्र Remote Access | 2 AC<br>3 AC<br>WHAT'S NEW 4 CI                                       | dd roles and teatures<br>dd other servers to mana<br>reate a server group | Connection Manager Administration Kit<br>Defragment and Optimize Drives<br>Disk Cleanup<br>DNS                                                                        |
|                                                                     | 5 CO                                                                  | onnect this server to clou                                                | Event Viewer<br>Group Policy Management<br>Internet Information Services (IIS) Manager<br>ISCSI Initiator                                                             |
|                                                                     | ROLES AND SERVER GROUPS<br>Roles: 5   Server groups: 1   Servers tota | d: 1                                                                      | Local Security Policy<br>Microsoft Azure Services<br>Network Policy Server<br>ODBC Data Sources (32-bit)                                                              |
|                                                                     | AD DS 1                                                               | DNS     Manageability                                                     | ODBC Data Sources (64-bit)<br>Performance Monitor<br>Print Management                                                                                                 |
|                                                                     | Events<br>Services<br>Performance<br>BPA results                      | Events<br>Services<br>Performance<br>BPA results                          | Remote Access Management<br>Resource Monitor<br>Routing and Remote Access<br>Services<br>System Configuration<br>System Information                                   |

2. In Demand-Dial Interface Wizard, specify a name for the Interface. In this guide,



"OnPremise-To-Azure" is used.

| Demand-Dial Interface Wizard |                                                                                                                                                                                      | $\times$ |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|                              | Welcome to the Demand-Dial Interface Wizard.         This wizard helps you create a demand-dial connection to connect this router to other routers.         To continue, click Next. |          |
|                              | < <u>B</u> ack <u>Next</u> > Cancel                                                                                                                                                  |          |

- 3. In Connection Type, select Connect using virtual private networking (VPN).
- 4. In VPN Type, select IKEv2.
- 5. In Destination Address, enter Host name or IP address.
- 6. In Protocols and Security, select Route IP packets on this interface.
- 7. In Static Routes for Remote Networks, add the route of the Azure-VMs subnet.
- 8. On the Dial-Out Credentials step, enter the credentials.
- 9. Click Finish to complete the wizard.

10. In Routing and Remote Access > Network Interfaces, right-click On-Premise-To-Azure and choose Properties.

11. Click the Options tab and set the connection type to persistent. In the Security tab, set the pre-shared key set up on Azure previously.



| On-Premise-To-Azure Properties ×                                              | On-Premise-To-Azure Properties X                                                                                                                                                                                 |
|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Genera Options Security Networking                                            | General Options Security Networking                                                                                                                                                                              |
| Connection type O Demand-dial Idle time before hanging up: never              | Type of VPN:<br>IKEv2                                                                                                                                                                                            |
| Persistent connection                                                         | Data encryption:<br>Require encryption (disconnect if server declines)                                                                                                                                           |
| Dialing policy <u>R</u> edial attempts: 0  Average redial intervals: 1 minute | Authentication     O Use Extensible Authentication Protocol (EAP)                                                                                                                                                |
| Callback PPP Settings                                                         | Properties         Use machine certificates         Verify the Name and Usage attributes of the server's         Certificate         Use preshared key for authentication         Key:         StrongPasswordKey |
| OK Cancel                                                                     | OK Cancel                                                                                                                                                                                                        |

12. Right-click the On-Premise-To-Azure connection and select Connect. It will be displayed as connected in RRAS as shown in the screenshot below.

| R Pauties and Parata Assault  |                                |             |         |      |           | ~   |
|-------------------------------|--------------------------------|-------------|---------|------|-----------|-----|
| Routing and Remote Access     |                                |             |         | _    |           |     |
| <u>File Action View H</u> elp |                                |             |         |      |           |     |
| 🗢 🔿 🙍 📷 🙆 👔 t                 |                                |             |         |      |           |     |
| 🚊 Routing and Remote Access   | Network Interfaces             |             |         |      |           |     |
| Server Status                 | LAN and Demand Dial Interfaces | Туре        | Status  | Conr | ection St | ate |
| Network Interfaces            | On-Premise-To-Azure            | Demand-dial | Enabled | Conn | ected     |     |
| Ports                         | tay Loopback                   | Loopback    | Enabled | Conr | rected    |     |
| Remote Access Logging         | ि Internal                     | Internal    | Enabled | Conn | nected    |     |
| ✓ 圓 IPv4                      | Ethernet0 2                    | Dedicated   | Enabled | Conn | nected    |     |
| 🦉 General                     |                                |             |         |      |           |     |
| Static Routes                 |                                |             |         |      |           |     |
| <u>m</u> NAT                  |                                |             |         |      |           |     |
| > <u>肖</u> IPv6               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
|                               |                                |             |         |      |           |     |
| < >                           | <                              |             |         |      |           | >   |
|                               |                                |             |         |      |           |     |

13. Double check IPv4 Static Routes. The configuration should look the same as in the screenshot below.



| Routing and Remote Access                                                                                                                                                                                                                                                  |                                                                                                                            |                                                                                         |                                                                |                                             | -       | $\times$ |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------|---------|----------|
| File Action View Help                                                                                                                                                                                                                                                      |                                                                                                                            |                                                                                         |                                                                |                                             |         |          |
| <ul> <li>Routing and Remote Access</li> <li>Server Status</li> <li>SW-HC-DC01 (local)</li> <li>Network Interfaces</li> <li>Ports</li> <li>Remote Access Logging</li> <li>○ IPv4</li> <li>③ General</li> <li>③ Static Routes</li> <li>④ NAT</li> <li>&gt; ④ IPv6</li> </ul> | Static Routes Destination 10.10.00 IPv4 Static Route Interface: Destination: Network mask: Gateway: Metric: Use this route | Network mask<br>255.255.255.128<br>000-Pr<br>10<br>255<br>25<br>to initiate demand-dial | Gateway<br>None<br>emise-To-Azure<br>10 0 0<br>255 255 128<br> | Interface<br>On-Premise-To<br>? X<br>•<br>• | o-Azure | N<br>2:  |

Opening Ports in the Firewall

- 1. Open Windows Firewall, click the Exceptions tab and then click Add Port.
- 2. Click Inbound Rules and click New Rule.

3. Allow connection for 500, 4500, 1701, 50 UPD ports to allow VPN traffic to pass through.

4. Repeat the same procedure for Outbound Rules.

## Preconfiguring the On-Premise server

NOTE: This document assumes that the domain controller is set up and the On-Premise server is added to the domain. The Failover Clustering and Multipath I/O features, and the Hyper-V role must be installed on the local server. These actions can be performed using Server Manager (the Add Roles and Features menu item).

1. Download and install StarWind Virtual SAN on the local server. The latest StarWind build can be found by following this link.

## **Enabling Multipath Support**

- 1. Open the MPIO manager: Start->Administrative Tools->MPIO.
- 2. Navigate to the Discover Multi-Paths tab.
- 3. Select the Add support for iSCSI devices checkbox.



| MPIO Properties                                              | ×                                  |
|--------------------------------------------------------------|------------------------------------|
| MPIO Devices Discover Multi-Paths                            | DSM Install Configuration Snapshot |
| Device Hardware Id                                           |                                    |
| Add support for iSCSI devices<br>Add support for SAS devices | Add                                |
| Qthers                                                       |                                    |
| Device Hardware Id                                           |                                    |
|                                                              | A <u>d</u> d                       |
|                                                              | OK Cancel                          |

4. Click Add. Then click Yes when prompted to restart the server.

# **Deploying Starwind Vm In Azure**

- 1. Navigate to the Azure portal and search for StarWind Virtual SAN VM.
- 2. Select StarWind Virtual SAN BYOL in case the StarWind license is already purchased.

NOTE: Alternatively, select StarWind Virtual SAN Hourly. Alike BYOL, it's a pre-installed Azure VM with the Hyper-V role, MPIO, and Failover Cluster features but StarWind is shipped on a per-hour license basis.



| Micr       | osoft Azure New             | Q | Q | >_ | ្លែរ |
|------------|-----------------------------|---|---|----|------|
| ≡          | New                         |   |   |    | ×    |
| +          |                             |   |   | ×  | Î    |
|            | starwind                    |   |   |    |      |
| <b>Q</b>   | StarWind Software           |   |   |    |      |
| <b>(*)</b> | StarWind Virtual SAN BYOL   |   |   |    |      |
| ~          | StarWind Virtual SAN Hourly |   |   |    |      |

3. Create a StarWind VM using Resource Manager.

| Cre | Create virtual machine |                                         |   | × | Basics                                                          | ∎ × |
|-----|------------------------|-----------------------------------------|---|---|-----------------------------------------------------------------|-----|
|     | 1                      | Basics<br>Configure basic settings      | > |   | * Name<br>sw-azure-01                                           | ~   |
|     | 2                      | Size<br>Choose virtual machine size     | > |   | SSD<br>* User name<br>starwind                                  | *   |
|     | 3                      | Settings<br>Configure optional features | > |   | * Password                                                      |     |
|     | 4                      | Purchase<br>StarWind Virtual SAN Hourly | > |   | * Confirm password                                              |     |
|     |                        |                                         |   |   | Pay-As-You-Go  Resource group  Create new Use existing  AzureRG | *   |
|     |                        |                                         |   |   | * Location<br>East US                                           | *   |
|     |                        |                                         |   |   | ок                                                              |     |

- 4. Enter Name for the virtual machine.
- 5. Enter User name and a strong Password to create a local account on the VM.
- 6. Select the existing Resource group or type a name for a new one. In the



example, AzureRG is the name of the resource group.

7. Select an Azure datacenter Location to run the VM. In this guide, East US is specified as the location.

| Create virtual machine                    | Ξ× | Choose a size<br>Browse the available sizes and their features                                                                                                                                                                                                                                      | □ ×                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
|-------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| 1 Basics<br>Done                          | ~  | Prices presented are estimates in your local currency that include Azure infrastructure applicable software costs, as well as any discounts for the subscription and location. Recommended sizes are determined by the publisher of the selected image based on hardware and software requirements. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| 2 Size<br>Choose virtual machine size     | >  | Supported disk type Minimum vC<br>SSD v                                                                                                                                                                                                                                                             | Supported disk type Minimum vCPUs Minimum memory (GiB) SSD    Recommended   View all                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
| 3 Settings<br>Configure optional features | >  | D2S_V3 Standard D4S_V3                                                                                                                                                                                                                                                                              | Kecommended View all     Standard     D85_V3 Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |
| 4 Purchase<br>StarWind Virtual SAN Hourly | >  | 8 GB 16 GB                                                                                                                                                                                                                                                                                          | 32 GB<br>16 Data diaks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
|                                           |    |                                                                                                                                                                                                                                                                                                     | 00 CPS CB 16000 Max 10PS CB 16000 Max 10PS CB 16000 CP 16 |  |  |  |  |
|                                           |    | Premium disk support     Pre     Coad balancing     Coad balancing                                                                                                                                                                                                                                  | mium disk support A Premium disk support de la balancing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |
|                                           |    | 306.53<br>USD/MONTH (ESTIMATED) US                                                                                                                                                                                                                                                                  | 449.38 735.07<br>DIMONTH (ESTIMATED) USD/MONTH (ESTIMATED)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |
|                                           |    | E25_V3 Standard E45_V3<br>2 vCPUs 4 vC                                                                                                                                                                                                                                                              | Standard E85_V3 Standard PUs 8 vCPUs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
|                                           |    | Select                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |

NOTE: The Size windows identifies the configuration details of the VM, and lists various choices that include OS, number of processors, disk storage type, and estimated monthly usage costs. For the StarWind Hybrid Cloud implementation, only Dv3 and Ev3 VM sizes are supported.

8. Choose the VM size, and then click Select to continue. In this example, D2S\_V3 Standard is specified as a VM size.



| Create virtual machine                    |   | × | Settings 🗖 🗙                                                                                 |
|-------------------------------------------|---|---|----------------------------------------------------------------------------------------------|
| 1 Basics<br>Done                          | ~ |   | High availability  * Availability set  >                                                     |
| 2 Size Done                               | ~ |   | Storage<br>Use managed disks <b>®</b>                                                        |
| 3 Settings<br>Configure optional features | > |   | No Yes<br>Network                                                                            |
| 4 Purchase<br>StarWind Virtual SAN Hourly | > |   | Virtual network      AzureVNet1     Subpet                                                   |
|                                           |   |   | default (10.10.0/26)                                                                         |
|                                           |   |   | * Public IP address  (new) sw-azure-01-ip                                                    |
|                                           |   |   | * Network security group (firewall)  (new) sw-azure-01-nsg                                   |
|                                           |   |   | Extensions                                                                                   |
|                                           |   |   | Extensions © >                                                                               |
|                                           |   |   | Auto-shutdown<br>Enable auto-shutdown <b>O</b>                                               |
|                                           |   |   | Monitoring<br>Boot diagnostics <b>1</b><br>Disabled Enabled<br>Guest OS diagnostics <b>1</b> |
|                                           |   |   | OK                                                                                           |

9. In the Settings window, click Network security group.

10. Add 500, 4500, 1701, 50 UPN ports to an inbound and an outbound rule to allow VPN traffic to pass through.

11. Mark the High availability option as None.

12. In the Summary window, double check the settings specified in the previous steps and click OK.



## Adding a network adapter

NOTE: While it's possible to create NICs in the Azure management portal, they can not be attached to VMs there. That can only be done using PowerShell. Make sure the latest version of Microsoft Azure PowerShell is installed on the PC. The latest release can be installed using the Web Platform Installer.

1. Open Windows PowerShell ISE and log in to your Azure subscription using the following cmdlet:

#### Login-AzureRmAccount

2. Define the following variables for the VM, network, and other parameters that will be required:

```
$vmName = 'sw-sed-azure-01'
$vnetName = 'AzureVNet1'
$RG = 'AzureRG'
$subnetName = 'default'
$nicName = 'sw-sed-azure-01011'
$location = 'East US
$ipAddress = '10.10.0.10'
```

3. Create an object for the VM using Get-AzureRmVM:

\$VM = Get-AzureRmVM -Name \$vmName -ResourceGroupName \$RG

4. Create an object for the virtual network using Get-AzureRmVirtualNetwork:

\$vnet = Get-AzureRmVirtualNetwork -Name \$vnetName ResourceGroupName \$RG

5. Prior to connecting a NIC to a subnet (\$subnetName), receive the subnet ID in PowerShell:

```
$subnetID = (Get-AzureRmVirtualNetworkSubnetConfig -Name
$subnetName -VirtualNetwork $vnet).Id
```

6. Create a new NIC using the New-AzureRmNetworkInterface cmdlet:

```
New-AzureRmNetworkInterface -Name $nicName -ResourceGroupName
```



\$RG -Location \$location -SubnetId \$subnetID -PrivateIpAddress
\$ipAddress

7. The new NIC can now be attached to the VM. Create an object for the NIC using the Get-AzureRmNetworkInterface cmdlet:

\$NIC = Get-AzureRmNetworkInterface -Name \$nicName -ResourceGroupName \$RG

8. Add the NIC to the VM configuration:

```
$VM = Add-AzureRmVMNetworkInterface -VM $VM -Id $NIC.Id
```

9. To check that the configuration has been changed to include the new NIC, run the command below to see the list of NICs attached to the VM:

\$VM.NetworkProfile.NetworkInterfaces

10. Assign the first NIC as the primary:

```
$VM.NetworkProfile.NetworkInterfaces.Item(0).Primary = $true
```

11. Commit the new configuration using the *Update-AzureRmVM* cmdlet:

Update-AzureRmVM -VM \$VM -ResourceGroupName \$RG

IP forwarding

- 1. Navigate to VM -> Networking.
- 2. Select the first Network interface.
- 3. Open IP configuration page from the sidebar menu
- 4. Enable IP forwarding settings and Save the configuration.

## Adding storage

NOTE: Azure requires a Storage account to store VM disks.

- 1. On the Hub menu, select New -> Storage -> Storage account.
- 2. Enter a name for the storage account.
- 3. Specify the deployment model to be used: Resource Manager or Classic. Resource



Manager is the recommended deployment model.

4. Select General purpose as the type of storage account and specify the performance tier: Standard or Premium with regards to On-Premises storage configuration. The default is Standard.

- 5. Select the replication option, subscription, and region.
- 6. Click Create to create the storage account.
- 7. Navigate to StarWind VM -> Disks.
- 8. Click +Add data disk.
- 9. Specify disk Account type and Size according to On-Premises storage configuration.
- 10. Select Storage container.
- 11. Click OK to finish the setup.

### Install roles and Features

- 1. Connect to VM using Remote Desktop Connection.
- 2. Launch Server Manager and click Add New Roles and Features.
- 3. Check the Hyper-V role installation.

| Before You Begin<br>Installation Type<br>Server Selection<br>Server Roles | Select one or more Roles Active Direc Active Direc Active Direc                                                                                                                            | Add Roles and Features Wizard Add features that are required for Hyper-V? The following tools are required to manage this feature, but do not                                                                                  | × |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|                                                                           | Active Direc<br>Active Direc<br>Device Hea<br>DHCP Server<br>Fax Server<br>Fax Server<br>File and Sto<br>Host Guard<br>Hyper-M<br>MultiPoint Co<br>Network Po<br>Print and D<br>Remote Act | A Remote Server Administration Tools     A Role Administration Tools     A Role Administration Tools     A Hyper-V Management Tools     (Tools) Hyper-V Module for Windows PowerShell     [Tools] Hyper-V GUI Management Tools |   |
|                                                                           | Remote De<br>Volume Act<br>Web Server                                                                                                                                                      | Add Features Cancel                                                                                                                                                                                                            |   |

4. Select Failover Clustering and Multipath I/O features installation.



|                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | >                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Select features                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DESTINATION SERVER<br>sw-azure-01                                                                                                                                                        |
| Before You Begin                                                                                                                      | Select one or more features to install on the selected server.                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                          |
| Installation Type                                                                                                                     | Features                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Description                                                                                                                                                                              |
| Server Selection<br>Server Roles<br>Features<br>Hyper-V<br>Virtual Switches<br>Migration<br>Default Stores<br>Confirmation<br>Results | Client for NFS     Containers     Data Center Bridging     Direct Play     Enhanced Storage     Failover Clustering     Group Policy Management     Host Guardian Hyper-V Support     VO Quality of Service     IIS Hostable Web Core     Internet Printing Client     IP Address Management (IPAM) Server     ISNS Server service     LPR Port Monitor     Management OData IIS Extension     Media Foundation     Message Queuing     ✓ Multipath I/O     Multipath I/O | Multipath I/O, along with the<br>Microsoft Device Specific Module<br>(DSM) or a third-party DSM,<br>provides support for using multiple<br>data paths to a storage device on<br>Windows. |

5. Complete the installation on Azure VM.

Join the Azure VM to the on-premises domain

1. Press Windows key + X in Azure VM to invoke the context menu, and select System field.

- 2. In the opened window, click Change settings to open System properties.
- 3. Click the Change.. button. Mark the domain field and type the local domain name.



| C                                                            |                                      | 0                            |
|--------------------------------------------------------------|--------------------------------------|------------------------------|
| Computer Name/Domain C                                       | hanges                               | ×                            |
| You can change the name and<br>computer. Changes might affec | I the membership<br>t access to netw | o of this<br>work resources. |
| Computer name:                                               |                                      |                              |
| sw-azure-01                                                  |                                      |                              |
| Full computer name:<br>sw-azure-01.starwind.local            |                                      |                              |
|                                                              |                                      | More                         |
| Member of                                                    |                                      |                              |
| Omain:                                                       |                                      |                              |
| starwind.local                                               |                                      |                              |
| O Workgroup:                                                 |                                      |                              |
|                                                              | ОК                                   | Cancel                       |

4. Click the OK button. Confirm the action by entering the domain administrator's credentials.

5. Accept system reboot to complete the join.

# **Configuring Starwind Highly-Available Storage**

1. Double-click the StarWind tray icon to launch StarWind Management Console.

| StarWind Management Consol   | le                           |                   |                 |               |          | -                 | × |
|------------------------------|------------------------------|-------------------|-----------------|---------------|----------|-------------------|---|
| FILE HOST TARGET TOOLS       | OPTIONS HELP                 |                   |                 |               |          |                   |   |
| Refresh Connect Disconnect A | Add Server Remove Server Add | + +               | anced) Add VTLI | Device Remove | Target H | 2p                |   |
| Servers                      | General Configuration        | CHAP Permissions  | Access Rights   | Server Log    | Events   | Performance       |   |
| SW-ONPREM-01                 |                              |                   |                 |               |          |                   |   |
|                              |                              |                   | 1.000           |               |          |                   |   |
|                              | SW-ONPREM-0                  | 1 ( 192.168.0.231 | ): 3261         |               |          |                   |   |
|                              | A Disconnect                 | Remove Server of  | Add Target e    | Add Device    | Add I    | Vevice (advanced) |   |
|                              | Add VTL Device               | Add Control Dev   | ice & Target    | Groups Mana   | ger CB   | efresh            |   |
|                              | Address                      | 192,168,0,231     |                 |               |          |                   |   |
|                              | Server Name                  | SW-ONPREN         | 1-01            |               |          |                   |   |
|                              | Port                         | 3261              |                 |               |          |                   |   |
|                              | Authentication               | Basic             |                 |               |          |                   |   |
|                              | Status                       | Logged-in         |                 |               |          |                   |   |

2. Press the Yes button to configure the storage pool. To change the storage pool destination, press Choose path... and point the browser to the necessary disk.



| StarWind Management Console                          |                               |                       | ×                 |
|------------------------------------------------------|-------------------------------|-----------------------|-------------------|
| Storage pool is not cont<br>Would you like to set th | figured!<br>e default locatio | n of the storage pool | to My Computer\E? |
|                                                      | Yes                           | Choose path           | Disconnect        |

NOTE: Please make sure that each of the arrays, which will be used by StarWind Virtual SAN to store virtual disk images meets the following requirements:

- Initialized as GPT
- Have a single NTFS-formatted partition
- Have a drive letter assigned
- 3. Press the Add Device (advanced) button on the toolbar.
- 4. Add Device Wizard will appear. Select Hard disk device and click Next.
- 5. Select Virtual disk and click Next.
- 6. Specify the virtual disk Name, Location, and Size. Click Next

|   |                  |                                        | ?    | ×  |
|---|------------------|----------------------------------------|------|----|
| ~ | Add Device Wiza  | d                                      |      |    |
|   | Virtual Disk Loc | ation                                  |      |    |
|   | Create a New \   | irtual Disk                            |      |    |
|   | Name:            | Witness                                |      |    |
|   | Location:        | My Computer\E\                         |      |    |
|   | Size:            | 1 GB 🗸                                 |      |    |
|   | OUse an Existing | Virtual Disk                           |      |    |
|   | Location:        | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |      |    |
|   | Read-On          | y Mode                                 |      |    |
|   |                  |                                        |      |    |
|   |                  |                                        |      |    |
|   |                  | Next                                   | Canc | el |

7. Specify Virtual Disk Options. Click Next



|                                                                     | ?   | ×     |
|---------------------------------------------------------------------|-----|-------|
| ← Add Device Wizard                                                 |     |       |
|                                                                     |     |       |
| Virtual Disk Options                                                |     |       |
|                                                                     |     |       |
| Thick-provisioned                                                   |     |       |
| Olsfs                                                               |     |       |
| Deduplication                                                       |     |       |
| StarPack Cache Size: 16 MB $\checkmark$                             |     |       |
| Block Size                                                          |     |       |
| Use 512 bytes sector size                                           |     |       |
| O Use 4096 bytes sector size. May be incompatible with some clients |     |       |
|                                                                     |     |       |
|                                                                     |     |       |
|                                                                     |     |       |
|                                                                     |     |       |
|                                                                     |     |       |
| <u>N</u> e                                                          | t C | ancel |

8. Define the caching policy and specify the cache size (in MB). Click Next

|   |                                                                                                          | ?  | ×    |
|---|----------------------------------------------------------------------------------------------------------|----|------|
| ← | Add Device Wizard                                                                                        |    |      |
|   |                                                                                                          |    |      |
|   | Specify Device RAM Cache Parameters                                                                      |    |      |
|   | Mode                                                                                                     |    |      |
|   | Write-Back<br>Writes are performed asynchronously, actual Writes to Disk are delayed, Read<br>are cached | ds |      |
|   | <ul> <li>Write-Through<br/>Writes are performed synchronously, Reads are cached</li> </ul>               |    |      |
|   | N/A     Reads and Writes are not cached                                                                  |    |      |
|   | Set Maximum available Size                                                                               |    |      |
|   | Size: 128 MB V                                                                                           |    |      |
|   |                                                                                                          |    |      |
|   |                                                                                                          |    |      |
|   | Next                                                                                                     | Ca | ncel |



9. Define the Flash Cache Parameters policy and size if necessary. Click Next to continue

NOTE: It is highly recommended to use SSD-based storage for "Flash Cache" caching.

10. Specify the target parameters.

11. Select the Target Name checkbox to enter a custom name of a target. Otherwise, the name will be generated automatically based on the target alias. Click Next to continue.

| ÷ | Add Devic             | Wizard           |           | ? ×         |
|---|-----------------------|------------------|-----------|-------------|
|   | Specify Fla           | h Cache Parar    | neters    |             |
|   | No Flash     Use Flas | Cache<br>h Cache |           |             |
|   | Nam                   | Flash-Witne      | 55        |             |
|   | Loca                  | on: My Comput    | er/E/     |             |
|   | Size:                 | 1                | GB $\lor$ |             |
|   |                       |                  |           |             |
|   |                       |                  |           |             |
|   |                       |                  |           |             |
|   |                       |                  |           | vext Cancel |

12. Click Create to add a new device and attach it to the target. Then, click Close to close the wizard.



| ÷ | Add Device Wizard                                                                                                                                | ?   | ×   |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
|   | Creation Page                                                                                                                                    |     |     |
|   | Press "Create" to add new Device and attach it to new Target Progress Creating Device Folder Creating Image File Creating Header Creating Device |     |     |
|   | Create                                                                                                                                           | Can | cel |

13. Right-click on the servers field and select Add Server. Select the Azure VM as a new StarWind Server to add. Click OK to continue.



14. Right-click on the created device and select Replication Manager. Press the Add Replica button in the Replication Manager window.

15. Select Synchronous "Two-Way Replication" and click Next to proceed.



| StarWind Manageme                               | ent Console                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |
|-------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| FILE HOST TARGET                                | TOOLS OPTION                                                                              | IS HELP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |
| O X a                                           | Replication Manag                                                                         | er for imagefile1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ? ×   |
| Refresh Connect (                               |                                                                                           | ×                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | _     |
| * SW-ONF Re                                     | plication Parts                                                                           | ?<br>Replication Witard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ×     |
| ir i                                            | _                                                                                         | Replication Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |
| SW-AZU<br>PR<br>Hi<br>Tu<br>M<br>Py<br>Sy<br>Sy | IOPERTIES<br>lost Name<br>arget Name<br>tode<br>initity<br>mchronization<br>mchronization | Synchronosis "Two Way" Replication     Replication Partner must be connected to Clerk as Source Device as well, MP2O on Clerk     must be enabled, needs dedicated high Performance Network: Connection for     Synchronosis "Con-Way" Replication     Asynchronosis "Con-Way" Replication     Replica is used to astern replicated Delay, Data is stored as Snapshots, Clerk cannot     Data     Orego as used to astern replicated Delay, Data is stored as Snapshots, Clerk cannot     Data     Witness Node     Witness Node     Witness Node     Witness Node     Nodes number of nodes odd number and exade proper functioning of     Hode Reportly policy.     Link     Link | 4     |
|                                                 |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Close |

16. Specify the partner server Host Name or IP address. The default StarWind management port is 3261. In case a different port is configured, please type it in the Port number field. Click Next.

|   |                                                                                 | ?  | ×     |
|---|---------------------------------------------------------------------------------|----|-------|
| ← | Replication Wizard                                                              |    |       |
|   |                                                                                 |    |       |
|   | Add Partner Node                                                                |    |       |
|   |                                                                                 |    |       |
|   | Specify Partner Host Name or IP Address where Replication Node would be created |    |       |
|   | Host Name or IP Address w-azure-01 V                                            |    |       |
|   | Port Number 3261                                                                |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 |    |       |
|   |                                                                                 | _  |       |
|   | Next                                                                            | Ca | incel |

17. Select the Heartbeat Failover Strategy.



|   |         |                                                                                                                                                                                                                                                                                                                                                                            | ?       | х   |
|---|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| ÷ | Replie  | cation Wizard                                                                                                                                                                                                                                                                                                                                                              |         |     |
|   | Failove | r Strategy                                                                                                                                                                                                                                                                                                                                                                 |         |     |
|   | ۲       | Heartbeat<br>Process node and communication failures using additional communication channel<br>(heartbeat). At least one synchronization or heartbeat channel must be functional<br>proper failover processing. Loss of all communication channels may lead to split brai<br>issue, so it's recommended to use client iSCSI connection interfaces as heartbeat<br>channel. | for     |     |
|   |         | Node Majority<br>Process node and communication failures using majority policy: node stays active w<br>sees more than half of nodes including itself. In case of 2 storage nodes, requires<br>configuring additional witness node. Does not require additional heartbeat channel.                                                                                          | hile it |     |
|   |         | Next                                                                                                                                                                                                                                                                                                                                                                       | Cano    | :el |

18. Choose Create new Partner Device.

|   |                                                                                      | ?   | ×    |
|---|--------------------------------------------------------------------------------------|-----|------|
| ← | Replication Wizard                                                                   |     |      |
|   |                                                                                      |     |      |
|   | Partner Device Setup                                                                 |     |      |
|   | Create new Partner Device     Existing Device Parameters would be used as a Template |     |      |
|   | <ul> <li>Select existing Device</li> </ul>                                           |     |      |
|   | Select existing Device on Partner Server                                             |     |      |
|   |                                                                                      |     |      |
|   |                                                                                      |     |      |
|   |                                                                                      |     |      |
|   |                                                                                      |     |      |
|   |                                                                                      |     |      |
|   |                                                                                      |     |      |
|   | Next                                                                                 | Car | ncel |

19. Specify the partner device Location if necessary. The target name can be modified by clicking the appropriate button.



| é Renlicat | ion Witterd                                  | ?    | ×  |
|------------|----------------------------------------------|------|----|
| < Replicat |                                              |      |    |
| Partner D  | Device Setup                                 |      |    |
| Location   | : My Computer\E\                             |      |    |
| ign. 2008  | -08.com.starwindsoftware:sw-azure-01-witness |      |    |
| Mod        | fy Target Name                               |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            |                                              |      |    |
|            | Next                                         | Cano | el |

20. To select the synchronization and heartbeat channels for the HA device, click Change network settings. To modify the ALUA settings, click the appropriate button.

|   |                                                         |      | ?    | ×  |
|---|---------------------------------------------------------|------|------|----|
| ← | Replication Wizard                                      |      |      |    |
|   | Network Options for Replication                         |      |      |    |
|   | Networks for Synchronization and Heartbeat              |      |      |    |
|   | Press "Change Network Settings" to configure Interfaces |      |      |    |
|   | Networks for Heartbeat                                  |      |      |    |
|   | Press "Change Network Settings" to configure Interfaces |      |      |    |
|   | Change Network Settings                                 |      |      |    |
|   | ALUA preferred SW-ONPREM-01, sw-azure-01                |      |      |    |
|   | Change ALUA Settings                                    |      |      |    |
|   |                                                         |      |      |    |
|   |                                                         |      |      |    |
|   |                                                         |      |      |    |
|   |                                                         | Next | Cano | el |

21. Click Allow Free Select Interfaces to be able to specify NICs from different subnetworks. Specify the interfaces for synchronization and Heartbeat. Click OK. Then



click Next.

| elect syndronization charmen |             |                       |           |   |  |
|------------------------------|-------------|-----------------------|-----------|---|--|
| Interfaces                   | Networks    | Synchronization and H | Heartbeat |   |  |
| Host Name: SW                | -ONPREM-01  |                       |           |   |  |
| 192.168.0.165                | 192.168.0.0 | 7                     |           | Γ |  |
| 192.168.0.231                | 192.168.0.0 |                       | <b>v</b>  |   |  |
| Host Name: sw                | -azure-01   |                       |           |   |  |
| 10.10.0.10                   | 10.10.0.0   |                       | ~         | Γ |  |
| 10.10.0.9                    | 10.10.0.0   |                       |           |   |  |
|                              |             |                       |           |   |  |
|                              |             |                       |           |   |  |

22. Set Do not Synchronize as the partner device initialization mode. Click Next.

NOTE: Use this type of synchronization for adding partner only to the device which doesn' contain any data.

|   |        |                                                                                                 | ?   | ×    |
|---|--------|-------------------------------------------------------------------------------------------------|-----|------|
| ← | Repli  | cation Wizard                                                                                   |     |      |
|   |        |                                                                                                 |     |      |
|   | Select | Partner Device Initialization Mode                                                              |     |      |
|   | 0      | Synchronize from existing Device<br>All Data from existing Device would be copied to new Device |     |      |
|   | ۲      | Do not Synchronize<br>Data on HA Nodes remains unchanged.                                       |     |      |
|   |        |                                                                                                 |     |      |
|   |        |                                                                                                 |     |      |
|   |        |                                                                                                 |     |      |
|   |        |                                                                                                 |     |      |
|   |        |                                                                                                 |     |      |
|   |        |                                                                                                 |     |      |
|   |        | Next                                                                                            | Car | icel |



23. Press the Create Replica button. Then click Close.

|                                         |   | ? ×    |
|-----------------------------------------|---|--------|
| Replication Wizard                      |   |        |
|                                         |   |        |
| Creation Page                           |   |        |
| Creating Device Folder                  |   | ^      |
| Creating Storage File on Partner Host   |   |        |
| Creating Storage Header on Partner Host |   |        |
| Creating Storage Device on Partner Host |   |        |
| Creating Device Header on Partner Host  |   |        |
| Creating Device Header on current Host  |   |        |
| Requesting Device Name                  |   |        |
| Updating Target Device on current Host  |   | ~      |
|                                         |   |        |
|                                         |   |        |
|                                         |   |        |
|                                         |   |        |
|                                         |   |        |
| Create Replic                           | 8 | Cancel |

24. The added device will appear in StarWind Management Console.

| StarWind Management Consol   | le                                            |                                                    | -           |        | ×   |
|------------------------------|-----------------------------------------------|----------------------------------------------------|-------------|--------|-----|
| FILE HOST TARGET TOOLS       | OPTIONS HELP                                  |                                                    |             |        |     |
| Refresh Connect Disconnect A | Add Server Remove Server Add Device           | Add Device (solvanced) Add VTL Device Remove Devic | e Help      |        |     |
| <ul> <li>Servers</li> </ul>  |                                               |                                                    |             |        | ^   |
| SW-ONPREM-01                 | HAIMAGE1                                      |                                                    |             |        |     |
| 4 🗘 Witness                  | Remove Device                                 | rre remove Device III Chappe Partner Authenti      | ication Sal | tings  |     |
| HAlmage1                     | Change Synchronization                        | Priority EReplication Node Interfaces              | Replication | n Mana | aer |
| , E                          | Extend Size of HA (High                       | Availability) Device Cache settings(Experime       | ntal)       |        |     |
| - SW-AZURE-01 (1             | Reset Cache Statistics                        |                                                    |             |        |     |
| 4 🛇 Witness                  | Device                                        | HAlmage1                                           |             |        |     |
| HAlmage1                     | Size                                          | 1 GB                                               |             |        |     |
|                              | Target Name                                   | ign.2008-08.com.starwindsoftware:sw-onprem-01-wit  | ness        |        |     |
|                              | Virtual Disk                                  | imagefile1                                         |             |        |     |
|                              | Serial Id                                     | C409E5DAAA61A9C4                                   |             |        |     |
|                              | Priority                                      | First                                              |             |        |     |
|                              | Mode                                          | Synchronous                                        |             |        |     |
|                              | Failover Strategy                             | Heartbeat                                          |             |        |     |
|                              | Auto Synchronization after<br>Failure         | Yes                                                |             |        |     |
|                              | Synchronization Status                        | Synchronized                                       |             |        |     |
|                              | HEALTH STATUS                                 |                                                    |             |        | - 1 |
|                              | <ul> <li>Storage is working proper</li> </ul> | fy                                                 |             |        |     |

25. Repeat the steps 1 - 23 for the remaining virtual disks that will be used for File



| StarWind Management Console                         | = U                                                                        |
|-----------------------------------------------------|----------------------------------------------------------------------------|
| FILE HOST TARGET TOOLS OPTIONS HELP                 |                                                                            |
| Refresh Connect Disconnect Add Server Remove Server | dd Device Add Device (advanced) Add VTL Device Remove Device Help          |
| Servers                                             |                                                                            |
| SW-ONPREM-01 HAIMAGE2                               |                                                                            |
| ✓ Witness Remove Dev                                | e 🚔 Force remove Device 🛛 🐺 Change Partner Authentication Settings         |
| HAlmage1 Change Syn                                 | ronization Priority 🔛 Replication Node Interfaces 🛛 St Replication Manager |
|                                                     | HA (High Availability) Device                                              |
| Device                                              | HAlmage2                                                                   |
| HAImagez Size                                       | 81 GB                                                                      |
| SW-AZURE-01 (1 Target Name)                         | ign.2008-08.com.stanvindsoftware:sw-azure-01-csv1                          |
| Virtual Disk                                        | imagefile2                                                                 |
| - Vitness Serial Id                                 | C8C695DD5EAFF247                                                           |
| HAlmage1 Priority                                   | Second                                                                     |
| Mode                                                | Synchronous                                                                |
| Failover Strategy                                   | Heartbeat                                                                  |
| HAlmage2 Auto Synchronizat                          | n after Ves                                                                |
| Synchronization S                                   | us Synchronized                                                            |
| HEALTH STATUS                                       |                                                                            |
| ✓ Storage is w                                      | ting property                                                              |
|                                                     |                                                                            |

# **Configuring Failover Cluster**

1. To launch Microsoft iSCSI Initiator, click Start > Administrative Tools > iSCSI Initiator or iscsicpl from the command line interface. The iSCSI Initiator Properties window appears.

|                                | Ľ                                     |                            |                  |         | Quidt Ct | mect  |
|--------------------------------|---------------------------------------|----------------------------|------------------|---------|----------|-------|
| Ascovered to                   | rgets                                 |                            |                  |         | Bet      | hesh  |
| Name                           |                                       |                            |                  | Sta     | tus      |       |
|                                |                                       |                            |                  |         |          |       |
|                                |                                       |                            |                  |         |          |       |
|                                |                                       |                            |                  |         |          |       |
|                                |                                       |                            |                  |         |          |       |
|                                |                                       |                            |                  |         |          |       |
| To connect u<br>dick Connect   | sing advanced                         | options, se                | elect a target a | nd then | Cog      | nect  |
| To completel<br>then dick Dis  | y disconnect a<br>connect.            | target, sek                | ect the target a | and     | Disco    | nnect |
| For target pr<br>select the ta | operties, indu<br>rget and click P    | ding configu<br>roperties. | ration of sessi  | ons,    | Brope    | tiez  |
| For configura                  | ation of devices<br>and then click De | associated                 | d with a target  | select  | Degi     |       |
| and an Acro                    |                                       |                            |                  |         |          |       |



2. Navigate to the Discovery tab.

| iSCSI Initiator Prope                                   | erties                                              |                             |               | ×            |
|---------------------------------------------------------|-----------------------------------------------------|-----------------------------|---------------|--------------|
| Targets Discovery                                       | Favorite Targets                                    | Volumes and Devices         | RADBUS Co     | nfiguration  |
| Target portals<br>The system will k<br>Address          | ook for <u>T</u> argets on fo                       | llowing portals:<br>Adapter | Rgfr<br>IP ad | esh<br>dress |
| To add a target :                                       | portal, dick Discover                               | Portal.                     | Discover      | Bortal       |
| ISNS servers<br>The system is reg                       | e.<br>gistered on the follow                        | wing (SNS servers:          | Bern<br>Refr  | esh          |
| Name                                                    |                                                     |                             |               |              |
| To add an ISNS S<br>To remove an ISN<br>then dick Remov | erver, diox Add Serv<br>KS server, select the<br>e. | er.<br>server above and     | Rem           | ove          |
|                                                         |                                                     |                             |               |              |
|                                                         |                                                     | OK                          | Cancel        | Apply        |

3. Click the Discover Portal button. Discover Target Portal dialog appears. Type in 127.0.0.1.

4. Click the Advanced button. Select Microsoft ISCSI Initiator as Local adapter and select Initiator IP (leave the default for 127.0.0.1).

| Discover Target Portal                                             | ×                                |
|--------------------------------------------------------------------|----------------------------------|
| Enter the IP address or DNS name and po<br>want to add.            | ort number of the portal you     |
| To change the default settings of the disc<br>the Advanced button. | overy of the target portal, dick |
| IP address or DNS name:                                            | Port: (Default is 3260.)         |
| 127.0.0.1                                                          | 3260                             |
| Advanced                                                           | OK Cancel                        |

5. Click OK. Then click OK again to complete the Target Portal discovery.



| eral IPsec<br>Connect using<br>ocal adapter: Microsoft SC<br>nitiator IP: Default                | 7 July 14                                                                                                                                       |  |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Connect using<br>ocal adapter: Microsoft ISC<br>nitiator IP; Default                             | T Teldadar and                                                                                                                                  |  |
| pcal adapter: Microsoft ISC                                                                      | T Tellisten                                                                                                                                     |  |
| nitiator IP: Default                                                                             | M Bugatok ~                                                                                                                                     |  |
|                                                                                                  | ~                                                                                                                                               |  |
| arget portal IP:                                                                                 | ~                                                                                                                                               |  |
| CRC / Checksum                                                                                   |                                                                                                                                                 |  |
| Data digest                                                                                      | Header digest                                                                                                                                   |  |
| reador. The name will delaart to die pr                                                          | tiator Name of the system unless another name is                                                                                                |  |
| jeme: iqn. 1991-05.c                                                                             | Itator Name of the system unless another name is<br>om.microsoft:sw-azure-01.starwind.local                                                     |  |
| jame: iqn. 1991-05.c                                                                             | Ibator Name of the system unless another name is<br>om.microsoft:sw-azure-01.starwind.local                                                     |  |
| arget georet:                                                                                    | itiator Name of the system unless another name is<br>om.microsoft:sw-azure-01.starwind.local<br>itiator secret on the Configuration page or use |  |
| HAP helps ensure connection security to<br>n initiator.<br>To use, specify the same name and CHA | ly providing authentication between a target and                                                                                                |  |

- 6. Click the Discover Portal... button again.
- 7. Discover Target Portal dialog appears.

| Discover Target Portal                                             | ×                                |
|--------------------------------------------------------------------|----------------------------------|
| Enter the IP address or DNS name and po<br>want to add.            | ort number of the portal you     |
| To change the default settings of the disc<br>the Advanced button. | overy of the target portal, dick |
| IP address or DNS name:                                            | Port: (Default is 3260.)         |
| 10.10.0.10                                                         | 3260                             |
| Advanced                                                           | <u>Q</u> K <u>C</u> ancel        |

8. Type in the first IP address of the partner node used to connect the secondary mirrors of the HA devices. Click Advanced.

9. Select Microsoft ISCSI Initiator as Local adapter and select the Initiator IP in the same subnet as the IP address on the partner server from the previous step.



10. Click OK. Then click OK again to complete the Target Portal discovery.

| Advanced Settings                                                     |                                                                                                                                                                                     | ?               | $\times$ |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|
| General IPsec                                                         |                                                                                                                                                                                     |                 |          |
| Connect using                                                         |                                                                                                                                                                                     |                 |          |
| Local adapter:                                                        | Microsoft iSCSI Initiator                                                                                                                                                           | ~               |          |
| Initiator IP:                                                         | 192.168.0.231                                                                                                                                                                       |                 |          |
| Target portal IP:                                                     |                                                                                                                                                                                     | ~               |          |
| Target portai tr:                                                     |                                                                                                                                                                                     |                 |          |
| CRC / Checksum                                                        |                                                                                                                                                                                     |                 |          |
| Data digest                                                           | Header digest                                                                                                                                                                       |                 |          |
| To use, specify the same<br>initiator. The name will de<br>specified. | name and CHAP secret that was configured on the target fo<br>fault to the Initiator Name of the system unless another nan<br>ign. 1991-05.com.microsoft:sw-onprem-01.starwind.local | r this<br>ne is |          |
| Target secret:                                                        |                                                                                                                                                                                     |                 |          |
|                                                                       | ntication<br>er specify an initiator secret on the Configuration page or us<br>nte user authentication credentials<br>nticate target credentials                                    | e               |          |
|                                                                       | OK Cancel                                                                                                                                                                           | App             | yly      |

11. Click the Discover Portal... button again

12. Discover Target Portal dialog appears. Type in the IP address of the partner node used to connect the parent node of the HA devices.

- 13. Click Advanced.
- 14. All target portals have been added to the first node.



| iSC | SI Initi | iator Proper  | ties            |                |         |                     |       |          |            | × |
|-----|----------|---------------|-----------------|----------------|---------|---------------------|-------|----------|------------|---|
| Ta  | rgets    | Discovery     | Favor           | ite Targets    | Volur   | nes and Devices     | RADIU | S Con    | figuration |   |
|     | Targe    | t portals     |                 |                |         |                     |       |          |            |   |
|     | The s    | ystem will lo | ok for <u>1</u> | argets on fo   | ollowin | g portals:          |       | Refre    | sh         |   |
|     | Addr     | ess           | Po              | rt             | Ada     | apter               |       | IP add   | ress       |   |
|     | 127.     | 0.0.1         | 32              | 60             | Mic     | rosoft ISCSI Initia | tor   | Defaul   | t          |   |
|     | 10.1     | 0.0.10        | 32              | 60             | Mic     | rosoft iSCSI Initia | tor   | 192.1    | 58.0.231   |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     | To ad    | ld a target p | ortal, d        | lick Discover  | Porta   | l.                  | Dis   | cover P  | ortal      |   |
|     | To re    | move a targ   | et porta        | al, select the | e addre | ess above and       |       | Bemo     | ve         |   |
|     | UNET     | CICK ROBINOVO | L.              |                |         |                     |       |          |            |   |
|     | SNS 9    | ervers        |                 |                |         |                     |       |          |            |   |
|     | The s    | ystem is reg  | istered         | on the follo   | wing (S | NS servers:         |       | Refre    | sh         |   |
|     | Name     | 2             |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     | To ad    | id an iSNS se | rver, d         | lick Add Serv  | ver.    |                     | - 4   | Add Serv | /er        |   |
|     | To re    | move an ISN   | 5 serve         | r, select the  | e serve | r above and         |       | Remo     | ve         |   |
|     | urien    | CICK INEMOVE  |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         |                     |       |          |            |   |
|     |          |               |                 |                |         | 01                  | 0     | al a     |            |   |
|     |          |               |                 |                |         | OK                  | Can   | cel      | Apply      |   |

- 15. Complete the steps 1-14 for the second node.
- 16. All target portals have been added to the second node.



|                                                                            | Favorite Tar                                                         | rgets Volumes and Device                                            | s RADIUS Configuration          |
|----------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------|
| larget portals                                                             |                                                                      |                                                                     |                                 |
| The system wi                                                              | I look for <u>T</u> argets                                           | s on following portals:                                             | Refresh                         |
| Address                                                                    | Port                                                                 | Adapter                                                             | IP address                      |
| 127.0.0.1                                                                  | 3260                                                                 | Microsoft ISCSI In                                                  | itiator Default                 |
| 192.168.0.42                                                               | 3260                                                                 | Microsoft ISCSI Ini                                                 | tiator 10.10.0.10               |
| To add a targe                                                             | et portal, click Dis                                                 | scover Portal.                                                      | Discover Portal                 |
| To remove a ta<br>then dick Rem                                            | arget portal, sele<br>ove.                                           | ect the address above and                                           | Remove                          |
| SNS servers                                                                |                                                                      |                                                                     |                                 |
|                                                                            |                                                                      |                                                                     |                                 |
| The system is                                                              | registered on the                                                    | e following iSNS servers:                                           | Refresh                         |
| The system is Name                                                         | registered on the                                                    | e following iSNS servers:                                           | Refresh                         |
| The system is in Name                                                      | registered on the<br>S server, click Ad                              | e following iSNS servers:                                           | Refresh<br>Add Server           |
| The system is i<br>Name<br>To add an iSNS<br>To remove an<br>then dick Rem | registered on the<br>S server, click Ad<br>iSNS server, sele<br>ove. | e following iSNS servers:<br>Id Server.<br>ect the server above and | Refresh<br>Add Server<br>Remove |
| The system is in Name<br>To add an iSNS<br>To remove an then click Rem     | registered on the<br>S server, click Ad<br>iSNS server, sele<br>ove. | e following iSNS servers:<br>Id Server.<br>act the server above and | Refresh<br>Add Server<br>Remove |

## **Connecting Targets**

1. Click the Targets tab. The previously created targets are listed in the Discovered Targets section.

NOTE: If the created targets are not listed, check the firewall settings of the StarWind Server as well as the list of networks served by the StarWind Server (navigate to StarWind Management Console -> Configuration -> Network).



|                                                                                  | inter Denne                                                                                                                   | rties                                                                                                 |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|---------|-------|----------------------------------------------|---------------------|---|
| .SI Init                                                                         | lator Prope                                                                                                                   |                                                                                                       |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
| argets                                                                           | Discovery                                                                                                                     | Favorite 1                                                                                            | argets                                                                 | Volumes                                                | and Device                                            | s RAD   | DIUS  | Config                                       | guration            |   |
| Ouide (                                                                          | Connect                                                                                                                       |                                                                                                       |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
| To disc<br>DNS na                                                                | cover and log<br>ame of the t                                                                                                 | g on to a tai<br>arget and ti                                                                         | rget usin<br>hen dick                                                  | ig a basic<br>Quick Cor                                | connection,<br>nnect.                                 | type ti | he IP | addres                                       | s or                |   |
| <u>⊺</u> arget                                                                   | :                                                                                                                             |                                                                                                       |                                                                        |                                                        |                                                       |         | Q     | uidk Con                                     | mect                |   |
| Discove                                                                          | ered targets                                                                                                                  |                                                                                                       |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
|                                                                                  |                                                                                                                               |                                                                                                       |                                                                        |                                                        |                                                       |         |       | Refre                                        | esh                 |   |
| Name                                                                             |                                                                                                                               |                                                                                                       |                                                                        |                                                        |                                                       | Stati   | JS    |                                              |                     | 1 |
| ion 2                                                                            | 008-08.com                                                                                                                    | starwindsof                                                                                           | flwarers                                                               | w-azure-(                                              | 1-csv1                                                | Inac    | tive  |                                              |                     | 1 |
| ion.2                                                                            | 008-08.com                                                                                                                    | starwindsof                                                                                           | ftware:s                                                               | w-azure-0                                              | )1-witness                                            | Inac    | tive  |                                              |                     | 1 |
| ion.2                                                                            | 008-08.com.                                                                                                                   | starwindsof                                                                                           | ftware:s                                                               | w-onprem                                               | -01-csv1                                              | Inac    | tive  |                                              |                     | L |
| ion.2                                                                            | 008-08.com                                                                                                                    | starwindsof                                                                                           | ftware:s                                                               | w-onorem                                               | -01-witnes                                            | Inac    | tive  |                                              |                     | L |
|                                                                                  |                                                                                                                               |                                                                                                       |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
|                                                                                  |                                                                                                                               |                                                                                                       |                                                                        |                                                        |                                                       |         |       |                                              |                     |   |
| To con<br>dick Ce                                                                | nect using a                                                                                                                  | dvanced op                                                                                            | itions, se                                                             | elect a tar                                            | get and the                                           | n       |       | Cogn                                         | ect                 |   |
| To con<br>dick Co<br>To con                                                      | nect using a<br>onnect.<br>opletely disco                                                                                     | dvanced op<br>onnect a tar                                                                            | itions, se                                                             | elect a tar                                            | get and the                                           | n       |       | Cogn                                         | ect                 |   |
| To con<br>dick Co<br>To con<br>then d                                            | nect using a<br>onnect.<br>Ipletely disco                                                                                     | dvanced op<br>onnect a tar<br>ct.                                                                     | itions, se<br>rget, sele                                               | elect a tar                                            | get and the<br>rget and                               | n       |       | Cogn                                         | ect                 |   |
| To con<br>dick Co<br>To con<br>then d<br>For tar<br>select                       | nect using a<br>onnect.<br>npletely disco<br>lick Disconne<br>rget properti<br>the target a                                   | dvanced op<br>onnect a tar<br>ct.<br>ies, indudin<br>nd click Prop                                    | itions, se<br>rget, seli<br>g configu<br>perties.                      | elect a tar<br>ect the ta<br>uration of                | rget and the<br>rget and<br>sessions,                 | n       |       | Cogn<br>Discon<br>Propert                    | ect<br>nect         |   |
| To con<br>dick Co<br>To con<br>then d<br>For tar<br>select<br>For co<br>the tar  | nect using a<br>onnect.<br>npletely disco<br>lick Disconne<br>rget properti<br>the target a<br>nfiguration o<br>rget and the  | dvanced op<br>onnect a tar<br>ct.<br>nd dick Proj<br>of devices a<br>n dick Devic                     | otions, se<br>rget, seli<br>g configu<br>perties.<br>ssociated<br>ces. | elect a tar<br>ect the ta<br>uration of<br>d with a ta | get and the<br>rget and<br>sessions,<br>arget, selec  | n<br>t  |       | Cogn<br>Discon<br>Propert<br>De <u>v</u> ice | ect<br>nect<br>ties |   |
| To con<br>dick Cr<br>To con<br>then d<br>For tar<br>For tar<br>For co<br>the tar | nect using a<br>onnect.<br>Inpletely disco<br>lick Disconne<br>rget properti<br>the target a<br>nfiguration o<br>rget and the | dvanced op<br>onnect a tar<br>ct.<br>ies, includin<br>nd click Prop<br>of devices ar<br>n click Devic | ations, se<br>rget, sele<br>g configu<br>perties.<br>ssociater<br>es.  | elect a tar<br>ect the ta<br>uration of<br>d with a ta | rget and the<br>rget and<br>sessions,<br>arget, selec | t       |       | Cogn<br>Discon<br>Propert<br>De <u>v</u> ice | ect<br>nect<br>bes  |   |

2. Select a target of the witness located on the local server and click Connect. Then click Advanced.

| Connect To Target                                                                                                                                |                                    | $\times$ |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------|
| Target name:<br>ign.2008-08.com.starwindsoftware:sw-onprem                                                                                       | -01-witness                        |          |
| Add this connection to the list of Favorite Tar<br>This will make the system automatically attem<br>connection every time this computer restarts | ngets.<br>npt to restore the<br>s. |          |
| ⊡ Enable multi-path                                                                                                                              |                                    |          |
| Advanced                                                                                                                                         | OK Cancel                          |          |

3. Select Microsoft iSCSI Initiator in the Local adapter text field.



4. Select 127.0.0.1 in the Target portal IP.

| Connect using                                                                                                                      |                                                                                                                                                                                                                                                                                 |  |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Local adapter:                                                                                                                     | Microsoft iSCSI Initiator 🗸                                                                                                                                                                                                                                                     |  |
| Initiator IP:                                                                                                                      | Default ~                                                                                                                                                                                                                                                                       |  |
| Target portal IP:                                                                                                                  | 127.0.0.1 / 3260 ~                                                                                                                                                                                                                                                              |  |
| CRC / Checksum                                                                                                                     |                                                                                                                                                                                                                                                                                 |  |
| Data digest                                                                                                                        | Header digest                                                                                                                                                                                                                                                                   |  |
| onw heps ensure of<br>an initiator.<br>To use, specify the sinitiator. The name w<br>specified.                                    | onnection security by providing authentication between a target and<br>ame name and CHAP secret that was configured on the target for this<br>will default to the Initiator Name of the system unless another name is                                                           |  |
| umer helps ensure of<br>an initiator.<br>To use, specify the si<br>nitiator. The name w<br>specified.                              | onnection security by providing authentication between a target and<br>ame name and CHAP secret that was configured on the target for this<br>will default to the Initiator Name of the system unless another name is<br>ign. 1991-05.com.microsoft:sw-onprem-01.starwind.local |  |
| unwe' helps ensure of<br>an initiator.<br>To use, specify the si-<br>nitiator. The name w<br>specified.<br>Name:<br>Target secret: | onnection security by providing authentication between a target and<br>ame name and CHAP secret that was configured on the target for this<br>will default to the Initiator Name of the system unless another name is<br>ign. 1991-05.com.microsoft:sw-onprem-01.starwind.local |  |

5. Click OK. Then click OK again.

NOTE: Do not connect the partner-target for the Witness device from the other StarWind node.

4. Select another target located on the local server and click Connect. Click Advanced.



5. Select Microsoft iSCSI Initiator in the Local adapter text field. Select 127.0.0.1 in the Target portal IP.



| Advanced Settings                                                                                     |                                                                                                                                                                                                                                                                             | ?              | ×  |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|
| General IPsec                                                                                         |                                                                                                                                                                                                                                                                             |                |    |
| Connect using                                                                                         |                                                                                                                                                                                                                                                                             |                |    |
| Local adapter:                                                                                        | Microsoft iSCSI Initiator                                                                                                                                                                                                                                                   | $\sim$         |    |
| Initiator IP:                                                                                         | Default                                                                                                                                                                                                                                                                     | $\sim$         |    |
| Target portal IP:                                                                                     | 127.0.0.1 / 3260                                                                                                                                                                                                                                                            | $\sim$         |    |
| CRC / Checksum                                                                                        |                                                                                                                                                                                                                                                                             |                |    |
| Data digest                                                                                           | Header digest                                                                                                                                                                                                                                                               |                |    |
| CHAP helps ensure of<br>an initiator.<br>To use, specify the s<br>initiator. The name s<br>specified. | onnection security by providing authentication between a target and<br>ame name and CHAP secret that was configured on the target for the<br>will default to the Initiator Name of the system unless another name<br>ign. 1991-05.com.microsoft:sw-onprem-01.starwind.local | d<br>his<br>Is |    |
| Target secret:                                                                                        |                                                                                                                                                                                                                                                                             |                |    |
| Berform mutual a     To use mutual CHAP,     RADIUS.      Use RADIUS to g     Use <u>R</u> ADIUS to a | uthentication<br>, either specify an initiator secret on the Configuration page or use<br>enerate user authentication credentials<br>uthenticate target credentials                                                                                                         |                |    |
|                                                                                                       | OK Cancel                                                                                                                                                                                                                                                                   | Арр            | ly |

6. Click OK. Then click OK again.

7. Select the partner-target from the other StarWind node and click Connect. Click Advanced.

| Connect To Target                                                    |                                                                                     |                                    | ×      |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------|--------|
| Target name:                                                         |                                                                                     |                                    | _      |
| ign.2008-08.com.starv                                                | vindsoftware:sw-azure-0                                                             | )1-csv1                            | ]      |
| Add this connection<br>This will make the sy<br>connection every tir | to the list of Favorite Ta<br>stem automatically atten<br>ne this computer restarts | rgets.<br>npt to restore the<br>s. | J      |
| Enable multi-path                                                    |                                                                                     |                                    |        |
| Advanced                                                             |                                                                                     | OK                                 | Cancel |

- 8. Select Microsoft iSCSI Initiator in the Local adapter text field.
- 9. In the Initiator IP field, select the IP address for the ISCSI channel.



10. In the Target portal IP, select the corresponding portal IP from the same subnet.

| dvanced Settings                                                                           |                                                                                                                                                                | ?        | ×  |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|
| General IPsec                                                                              |                                                                                                                                                                |          |    |
| Connect using                                                                              |                                                                                                                                                                |          |    |
| Local adapter:                                                                             | Microsoft iSCSI Initiator                                                                                                                                      | ~        |    |
| Initiator IP:                                                                              | 192.168.0.231                                                                                                                                                  | $\sim$   |    |
| Target portal IP:                                                                          | 10.10.0.10 / 3260                                                                                                                                              | ~        |    |
| CRC / Checksum                                                                             |                                                                                                                                                                |          |    |
| Data digest                                                                                | Header digest                                                                                                                                                  |          |    |
| To use, specify the sa<br>initiator. The name wi<br>specified.                             | il default to the Initiator Name of the system unless another name<br>iqn. 1991-05.com.microsoft:sw-onprem-01.starwind.local                                   | ns<br>is |    |
| Target secret:                                                                             |                                                                                                                                                                |          |    |
| Perform mutual au To use mutual CHAP,  RADIUS.      Use RADIUS to ger     Use RADIUS to au | thentication<br>either specify an initiator secret on the Configuration page or use<br>nerate user authentication credentials<br>thenticate target credentials |          |    |
|                                                                                            | OK Cancel                                                                                                                                                      | App      | yk |

11. Click OK. Then click OK again.

12. Repeat the steps 1-11 on the local StarWind node for all HA devices.



| iSCSI Init         | iator Prope                   | ties                                          |                                           |            |                 | × |
|--------------------|-------------------------------|-----------------------------------------------|-------------------------------------------|------------|-----------------|---|
| Targets            | Discovery                     | Favorite Targets                              | Volumes and Devices                       | RADIUS     | Configuration   |   |
| -Quick C           | Connect                       |                                               |                                           |            |                 |   |
| To disc<br>DNS na  | over and log<br>ame of the ta | on to a target usin<br>arget and then dick    | g a basic connection, t<br>Quick Connect. | ype the IP | address or      |   |
| Target             | :                             |                                               |                                           | Qu         | uick Connect    |   |
| Discove            | ered targets                  |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            | <u>R</u> efresh |   |
| Name               |                               |                                               |                                           | Status     |                 |   |
| ign.2              | 008-08.com.                   | starwindsoftware:s                            | w-azure-01-csv1                           | Connecte   | d               |   |
| iqn.2              | 008-08.com.                   | starwindsoftware:s                            | w-azure-01-witness                        | Inactive   |                 |   |
| iqn.2              | 008-08.com.                   | starwindsoftware:s                            | w-onprem-01-csv1                          | Connecte   | d               |   |
| iqn.2              | 008-08.com.                   | starwindsoftware:s                            | w-onprem-01-witness                       | Connecte   | d               |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
| To con<br>click Co | nect using a<br>onnect.       | dvanced options, se                           | elect a target and then                   |            | Connect         |   |
| To con<br>then d   | pletely disco<br>ick Disconne | nnect a target, sek<br>ct.                    | ect the target and                        |            | Disconnect      |   |
| For tar<br>select  | get properti<br>the target a  | es, including configu<br>nd click Properties. | uration of sessions,                      |            | Properties      |   |
| For co<br>the tar  | nfiguration o<br>get and the  | f devices associated<br>n click Devices.      | d with a target, select                   |            | Devices         | ] |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               |                                           |            |                 |   |
|                    |                               |                                               | OK                                        | Cance      | Apply           |   |

13. Repeat the steps 1-12 on the StarWind node in Azure, specifying corresponding local and data channel IP addresses.



| iSCSI Init        | iator Prope                    | rties                                          |                                           |            |                 | × |
|-------------------|--------------------------------|------------------------------------------------|-------------------------------------------|------------|-----------------|---|
| Targets           | Discovery                      | Favorite Targets                               | Volumes and Devices                       | RADIUS     | Configuration   |   |
| Quick C           | Connect                        |                                                |                                           |            |                 |   |
| To disc<br>DNS na | over and log<br>ame of the ta  | g on to a target usin<br>arget and then dick   | g a basic connection, t<br>Quick Connect. | ype the IP | address or      |   |
| Target            | :                              |                                                |                                           | Q          | iick Connect    |   |
| Discove           | ered targets                   |                                                |                                           |            |                 |   |
|                   | _                              |                                                |                                           |            | <u>R</u> efresh |   |
| Name              |                                |                                                |                                           | Status     |                 |   |
| iqn.20            | 008-08.com.                    | starwindsoftware:s                             | w-azure-01-csv1                           | Connecte   | d               |   |
| ign.20            | 008-08.com.                    | starwindsoftware:s                             | w-azure-01-witness                        | Connecte   | d               |   |
| ign.20            | 008-08.com.                    | starwindsoftware:s                             | w-onprem-01-csv1                          | Connecte   | d               |   |
| ign.20            | 008-08.com.                    | starwindsoftware:s                             | w-onprem-01-witness                       | Inactive   |                 |   |
| halanna           |                                |                                                |                                           |            |                 |   |
| To con            | nect using a                   | dvanced options, se                            | elect a target and then                   |            | Cognect         |   |
| CICK CC           | onnect.                        |                                                |                                           |            |                 |   |
| To con<br>then d  | pletely disco<br>lick Disconne | onnect a target, sel<br>ct.                    | ect the target and                        |            | Disconnect      |   |
| For tar<br>select | get properti<br>the target a   | ies, including configu<br>nd click Properties. | uration of sessions,                      |            | Properties      |   |
| For co<br>the tar | nfiguration o<br>rget and the  | of devices associate<br>n click Devices.       | d with a target, select                   |            | Devices         | ] |
|                   |                                |                                                |                                           |            |                 |   |
|                   |                                |                                                |                                           |            |                 |   |
|                   |                                |                                                |                                           |            |                 |   |
|                   |                                |                                                |                                           |            |                 |   |
|                   |                                |                                                | OK                                        | Cance      | <u>A</u> pply   | , |

## Multipath Configuration

1. Configure the MPIO policy for each device and specify the localhost (127.0.0.1) as the active path. Select a target located on the local server and click Devices.



| iSCSI Ini        | tiator Prop                  | erties                                          |                                            |            |                 | × |
|------------------|------------------------------|-------------------------------------------------|--------------------------------------------|------------|-----------------|---|
| Targets          | Discovery                    | Favorite Targets                                | Volumes and Devices                        | RADIUS     | Configuration   |   |
| Quick            | Connect                      |                                                 |                                            |            |                 |   |
| To dis<br>DNS n  | cover and lo<br>ame of the   | og on to a target usir<br>target and then dick  | ng a basic connection, t<br>Quick Connect. | ype the IP | address or      |   |
| Targe            | t:                           |                                                 |                                            | Q          | ick Connect     |   |
| Discov           | ered target                  | s                                               |                                            |            |                 |   |
|                  | -                            |                                                 |                                            |            | <u>R</u> efresh |   |
| Nam              | e                            |                                                 |                                            | Status     |                 |   |
| iqn.2            | 2008-08.com                  | n.starwindsoftware:s                            | w-azure-01-csv1                            | Connecte   | d               |   |
| ign.2            | 2008-08.com                  | n.starwindsoftware:s                            | w-azure-01-witness                         | Inactive   |                 |   |
| iqn.2            | 2008-08.com                  | n.starwindsoftware:s                            | w-onprem-01-csv1                           | Connecte   | d               |   |
| iqn.2            | 2008-08.com                  | 1.starwindsoftware:s                            | w-onprem-01-witness                        | Connecte   | d               |   |
|                  |                              |                                                 |                                            |            |                 |   |
| To co<br>click C | nnect using<br>Connect.      | advanced options, s                             | elect a target and then                    |            | Connect         |   |
| To co<br>then o  | mpletely dis<br>dick Disconn | connect a target, sel<br>ect.                   | ect the target and                         |            | Disconnect      |   |
| For ta<br>select | rget proper<br>the target    | ties, including config<br>and click Properties. | uration of sessions,                       |            | Properties      |   |
| For co<br>the ta | onfiguration<br>rget and th  | of devices associate<br>en click Devices.       | d with a target, select                    |            | Devices         |   |
|                  |                              |                                                 |                                            |            |                 |   |
|                  |                              |                                                 | OK                                         | Cance      | Apply           |   |

2. The Devices dialog appears. Click MPIO.



| Devices                      |                              |                             | ×                  |
|------------------------------|------------------------------|-----------------------------|--------------------|
| Name<br>Disk 2               | Address<br>Port 4: Bus       | 0: Target 1: LUN 0          |                    |
| Volume path                  | names:                       |                             |                    |
| Legacy devic                 | e name:                      | \\PhysicalDrive2            |                    |
| Device interf                | ace name:                    | \\?\mpio#disk&ven_starwind& | ∏_starwind&rev_00( |
| Configure Mu                 | iltipath IO (M               | PIO)                        |                    |
| To configure<br>selected dev | the MPIO po<br>ice, dick MPI | vlicy for a<br>O.           | MPIO               |
|                              |                              |                             | ŌK                 |

3. Select Fail Over Only as Load balance policy and then set the local path as active.



| Device Details                                                               |                                                                               |                                                                  |                                                |                                             |                          | $\times$    |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------|---------------------------------------------|--------------------------|-------------|
| MPIO                                                                         |                                                                               |                                                                  |                                                |                                             |                          |             |
| Load balance                                                                 | e policy:                                                                     |                                                                  |                                                |                                             |                          |             |
| Fail Over O                                                                  | niy                                                                           |                                                                  |                                                |                                             | ~                        |             |
| Description                                                                  | n                                                                             |                                                                  |                                                |                                             |                          | -           |
| The fail or<br>other pat<br>round-rot<br>available<br>This de <u>v</u> ice f | ver policy en<br>hs as standt<br>in approach<br>path is foun<br>has the follo | ploys one a<br>by. The star<br>upon failure<br>d.<br>wing paths: | active path a<br>ndby paths o<br>e of the acti | and designa<br>will be tried<br>we path unt | tes all<br>on a<br>il an | -<br>-<br>- |
| Path Id                                                                      | Status                                                                        | Туре                                                             | Weight                                         | Session II                                  | D                        |             |
| 0x7704<br>0x7704                                                             | Conne<br>Conne                                                                | Active<br>Standby                                                | n/a<br>n/a                                     | ffffb284e                                   | 23d4010-40<br>23d4010-40 | 000         |
|                                                                              |                                                                               |                                                                  |                                                |                                             |                          |             |
| <                                                                            |                                                                               |                                                                  |                                                |                                             |                          | >           |
|                                                                              |                                                                               |                                                                  | De                                             | tais                                        | Edit                     |             |
|                                                                              |                                                                               | 0                                                                | K                                              | Cancel                                      | Appl                     | у           |

4. Verify that 127.0.0.1 is the active path by selecting it from the list and by clicking Details.

| Mirio Paul Details                                                     |                                                             |                          | × |
|------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------|---|
| Path identifier:                                                       | 0x77040001                                                  |                          |   |
| Session identifier:                                                    | ffffb284e23d40                                              | 10-4000013700000002      |   |
| Initiator:                                                             | Microsoft iSCSI                                             | Initiator                |   |
| Connections                                                            |                                                             |                          |   |
| Connections<br>The identified path h<br>Source Portal                  | has the following connect<br>Target Portal                  | ctions:<br>Connection ID |   |
| Connections<br>The identified path h<br>Source Portal<br>0.0.0.0/25538 | as the following connect<br>Target Portal<br>127.0.0.1/3260 | Connection ID<br>0×1     |   |

5. Repeat the steps 1-4 on the second node.

6. Initialize the disks and create partitions on them using the Computer Management snap-in. Make sure that the disk devices are visible on both nodes.

NOTE: It is recommended to initialize the disks as GPT.

Creating Failover Cluster



1. Open Server Manager and select the Failover Cluster Manager item from the Tools menu.

- 2. Click the Create Cluster link in the Actions section of the Failover Cluster Manager.
- 3. Specify the servers to be added to the cluster.

| Reate Cluster Wi                                                                                                                                                | izard<br>ervers                             |                                                                   | ×                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|------------------------------------|
| Before You Begin<br>Select. Servers<br>Validation Warning<br>Access Point for<br>Administering the<br>Custer<br>Confirmation<br>Creating New Cluster<br>Summary | Add the names of all the Enter server name: | e servers that you want to have in the cluster. You must add at l | east one server. Browse Add Remove |
|                                                                                                                                                                 |                                             | < Previous Next >                                                 | Cancel                             |

4. Validate the configuration by passing the cluster validation tests.

| Create Cluster Wi                                                                                           | rard<br>n Warning                                                                                                                                                                                                                                                                                                                                                                                  | × |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Before You Begin<br>Select Servers<br>Validation Warning<br>Access Point for<br>Administering the<br>Quster | For the servers you selected for this cluster, the reports from cluster configuration validation tests<br>appear to be missing or incomplete. Microsoft supports a cluster solution only if the complete<br>configuration (servers, network and storage) can pass all the tests in the Validate a Configuration<br>wizard.<br>Do you want to run configuration validation tests before continuing? |   |
| Confirmation<br>Greating New Cluster<br>Summary                                                             | Yes. When I click Next, run configuration validation tests, and then return to the process of creating the cluster.     Ng. 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 < Brevious Next > Cancel                                                                                                                                                                                                                                                                                                                                       |   |

5. Once the validation is completed, click Finish.



| Summary     |                                                                                                                                                                                               |                                                                          |                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------|
| ing Options | Testing has completed for the tests you selected. To confir<br>you must run all tests. A cluster solution is supported by Mi<br>validation tests, and all tests succeed (with or without warm | m that your cluster solution<br>crosoft only if you run all ck<br>ings). | is supported<br>uster |
| fimation    | Node                                                                                                                                                                                          |                                                                          | -                     |
| sating      | sw-azure-01.starwind.local                                                                                                                                                                    | Validated                                                                |                       |
| mary        | sw-onprem-01.starwind.local                                                                                                                                                                   | Validated                                                                |                       |
|             | Result                                                                                                                                                                                        |                                                                          |                       |
|             | List BIOS Information                                                                                                                                                                         | Success                                                                  |                       |
|             | List Disks                                                                                                                                                                                    | Success                                                                  |                       |
|             | List Disks To Be Validated                                                                                                                                                                    | Success                                                                  |                       |
|             | List Environment Variables                                                                                                                                                                    | Success                                                                  |                       |
|             | List Fibre Channel Host Bus Adapters                                                                                                                                                          | Success                                                                  |                       |
|             | List Host Guardian Service client configuration                                                                                                                                               | Success                                                                  |                       |
|             | To view the report created by the wizard, click View Report.<br>To close this wizard, click Finish.                                                                                           | Vier                                                                     | w Report              |

6. Specify Cluster Name and IP addresses for two subnets: On-Premises and Azure networks.

| 🏶 Create Cluster Wizard                                          |                                                           |                                                                                        |                                                                          |   |  |
|------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---|--|
| Access P                                                         | oint for Administeri                                      | ng the Cluster                                                                         |                                                                          |   |  |
| Before You Begin<br>Select Servers                               | Type the name you want t                                  | o use when administering the cluster.                                                  |                                                                          | - |  |
| Access Point for<br>Administering the<br>Cluster<br>Confirmation | The NetBIOS name is<br>automatically. For ear<br>address. | imited to 15 characters. One or more IPv4<br>ch network to be used, make sure the netv | faddresses could not be configured<br>work is selected, and then type an | 1 |  |
| Creating New Cluster                                             |                                                           | Networks                                                                               | Address                                                                  |   |  |
| Summary                                                          |                                                           | 192.168.0.0/23                                                                         | 192 . 168 . 0 . 100                                                      | 1 |  |
|                                                                  |                                                           | 10.10.0.0/26                                                                           | 10 . 10 . 0 . 100                                                        |   |  |
|                                                                  |                                                           | < Previous                                                                             | Next > Cancel                                                            |   |  |

7. Make sure that all the settings are correct. Click the Previous button to make any changes.



| 💀 Create Cluster V                    | Vizard                                                                                                 |           |     | ×   |
|---------------------------------------|--------------------------------------------------------------------------------------------------------|-----------|-----|-----|
|                                       |                                                                                                        |           |     |     |
| Confirma                              | ation                                                                                                  |           |     |     |
| Before You Begin<br>Select Servers    | You are ready to create a cluster.<br>The wizard will create your cluster with the following settings: |           |     |     |
| Access Point for<br>Administering the | Cluster                                                                                                |           |     | ^   |
| Cluster                               | sw-swhc-01                                                                                             |           |     |     |
| Confirmation                          | Node                                                                                                   |           |     |     |
| Creating New Cluster                  | sw-onprem-01.starwind.local                                                                            |           |     |     |
| Summary                               | sw-azure-01.starwind.local                                                                             |           |     |     |
|                                       | Cluster registration                                                                                   |           |     |     |
|                                       | DNS and Active Directory Domain Services                                                               |           |     | ~   |
|                                       | Add all eligible storage to the cluster.                                                               |           |     |     |
|                                       | To continue, click Next.                                                                               |           |     |     |
|                                       |                                                                                                        |           |     |     |
|                                       |                                                                                                        |           |     |     |
|                                       | < Previou                                                                                              | us Next > | Can | cel |
|                                       |                                                                                                        |           |     |     |

NOTE: If the checkbox "Add all eligible storage to the cluster" is selected, the wizard will try to add all StarWind devices to the cluster automatically. The smallest device will be assigned as a Witness.

8. After the cluster creation process has been completed, the system displays a report with a detailed information.

9. Click Finish to close the wizard.

#### Adding Cluster Shared Volumes

- 1. Open Failover Cluster Manager.
- 2. Navigate to Cluster->Storage -> Disks.
- 3. Click Add Disk in the Actions panel, choose StarWind disks from the list, and click OK.
- 4. To configure a Witness drive, right-click Cluster->More Actions->Configure Cluster Quorum Settings, follow the wizard, and use the default quorum configuration.



| Failover Cluster Ma | anager                                                                                               |                                                                                                                                                                                                |                                                    |  |
|---------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--|
| e Action View       | Help                                                                                                 |                                                                                                                                                                                                |                                                    |  |
| 🔿 🖄 📷 🛛             |                                                                                                      |                                                                                                                                                                                                |                                                    |  |
| Failover Cluster Ma | nager Cluster sw-swhe                                                                                | c-01.starwind.local                                                                                                                                                                            |                                                    |  |
|                     | Configure Role                                                                                       | / of Cluster sw-swhc-01                                                                                                                                                                        |                                                    |  |
|                     | Validate Cluster                                                                                     | 1 has 0 clustered roles and 2 nodes.                                                                                                                                                           |                                                    |  |
|                     | View Validation Report                                                                               | .starwind.local Networks: Cluster Network 1                                                                                                                                                    | I, Cluster Net.                                    |  |
|                     | Add Node                                                                                             | ver: sw-onprem-01 Subnets: 2 IPv4 and 2 IPv6                                                                                                                                                   | )<br>5 <b>2D)</b> : Disable                        |  |
|                     |                                                                                                      | vents: None in the last hostorage Spaces Direct (S2                                                                                                                                            | 2D): Disable                                       |  |
|                     | Close Connection                                                                                     | vents: None in the last hdStorage Spaces Direct (S2                                                                                                                                            | 2D): Disable                                       |  |
|                     | Close Connection<br>Reset Recent Events                                                              | vents: None in the last hd\$torage Spaces Direct (S                                                                                                                                            | 2D): Disable                                       |  |
|                     | Close Connection<br>Reset Recent Events<br>More Actions                                              | vents: None in the last hdstorage Spaces Direct (S2     Configure Cluster Quorum Settings                                                                                                      | 2D): Disable                                       |  |
|                     | Close Connection Reset Recent Events More Actions View 2                                             | rents: None in the last hdstorage Spaces Direct (S2     Configure Cluster Quorum Settings     Copy Cluster Roles                                                                               | 2D): Disable                                       |  |
|                     | Close Connection Reset Recent Events More Actions View Refresh                                       | vents: None in the last hd\$torage_Spaces_Direct (S2     Configure Cluster Quorum Settings     Copy Cluster Roles     Shut Down Cluster                                                        | 2D): Disable<br>rs (nodes),<br>bus versions<br>Web |  |
|                     | Close Connection Reset Recent Events More Actions View Refresh Properties                            | rents: None in the last hd\$torage_Spaces_Direct (S2     Configure Cluster Quorum Settings     Copy Cluster Roles     Shut Down Cluster     Destroy Cluster                                    | 2D): Disable<br>rs (nodes),<br>bus versions<br>Web |  |
|                     | Close Connection<br>Reset Recent Events<br>More Actions 2<br>View 2<br>Refresh<br>Properties<br>Help | Vents: None in the last hd\$torage Spaces Direct (S2     Configure Cluster Quorum Settings     Copy Cluster Roles     Shut Down Cluster     Destroy Cluster     Move Core Cluster Resources >> | 2D): Disable<br>rs (nodes),<br>bus versions<br>Web |  |

NOTE: To avoid an unnecessary CSV overhead, configure each CSV to be owned by one cluster node. This node should also be the preferred owner of the VMs running on that node.

5. Right-click the required disk and select Add to Cluster Shared Volumes.

| Failover Cluster Manager<br>Will sw-swhc-01.starwind.local | Disks (2)<br>Search |        |                        |                          | 🔎 Queries 🔻 🔛 🔻    |
|------------------------------------------------------------|---------------------|--------|------------------------|--------------------------|--------------------|
| Nodes                                                      | Name                | Status | Assigned To            | Owner Node Disk Number   | Partition Style Ca |
| 🗸 📇 Storage                                                | Cluster Disk 1      | Online | Available Storage      |                          | 2 GPT              |
| Pools                                                      | Custer Disk 2       | Online | Disk Witness in Quorum | Take Offline             | PT                 |
| Enclosures                                                 |                     |        |                        | Add to Cluster Shared Vo | lumes              |
| IS Cluster Events                                          |                     |        |                        | 1 Information Details    |                    |
|                                                            |                     |        |                        | Show Critical Events     |                    |
|                                                            |                     |        |                        | Replication              |                    |
|                                                            |                     |        |                        | More Actions             |                    |
|                                                            |                     |        |                        | Remove                   |                    |
| <pre>deturned.com</pre>                                    |                     |        |                        | Properties               |                    |

Once the disks are added to the cluster shared volumes list, you can start creating highly available virtual machines on them.

NOTE: To avoid the unnecessary CSV overhead, configure each CSV to be owned by one cluster node. This node should also be the preferred owner of the VMs running on that node.

6. Check the Server Name Dependencies. For two different subnets, the OR dependency



type must be configured for the failover between locations.

| Failover Cluster Manager<br>File Action View Help<br>(+ +) 2 (2) (2) (2)                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul> <li>Failover Cluster Manager</li> <li>Sw-swhc-01.starwind.local</li> <li>Roles</li> <li>Nodes</li> <li>Storage</li> <li>Disks</li> <li>Pools</li> <li>Enclosures</li> <li>Networks</li> <li>Cluster Events</li> </ul> | Cluster sw-swhc-01.starwind.local<br>Summary of Cluster sw-swhc-01<br>sw-swhc-01 has 0 clustered roles and 2 nodes.<br>Name: sw-swhc-01.starwind.local<br>Current Host Server: sw-orper-01<br>Recent Cluster Events: None in the last hour<br>Witness: Ouster Disk 2<br>Configure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Name: sw-swhc-01 Properties         X           General         Dependencies         Policies         Advanced Policies           Specify the resources that must be brought online before this resource can be brought online:         AND/OR         Resource           In AND/OR         Resource         IP Address: 192.168.0.100         OR         IP Address: 10.100.100         IP Address: 10.100.100 |
|                                                                                                                                                                                                                            | Navigate  Cluster Core Resources  Name Server Name  Reme: sw-swhc-01  Reme: sw-swhc-01  Remo: sw-swhc | Insert Delete<br>(IP Address: 192.168.0.100 OR IP Address: 10.10.0.100)<br>OK Cancel Apply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## **Testing Failover**

1. Create a VM(s) on a cluster node. Use CSV to host the VM(s).



| 💻 New Virtual Machine Wizar                                                                                                                     | d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ×  |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Specify Name                                                                                                                                    | e and Location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |
| Before You Begin<br>Specify Generation<br>Assign Memory<br>Configure Networking<br>Connect Virtual Hard Disk<br>Installation Options<br>Summary | Choose a name and location for this virtual machine.<br>The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easilisentify this virtual machine, such as the name of the guest operating system or workload.<br>Name:<br>Mame:<br>You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.<br>Store the virtual machine in a different location<br>Location:<br>C:\ClusterStorage\Volume 1\<br>Rrowse<br>If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space. | ly |
|                                                                                                                                                 | < Previous Next > Enish Cancel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |

2. Open the VM settings to enable Live Migration between nodes with different processor versions.



| R Hardware                                       | ~     | Compatibility Configuration                                                                                                                                 |   |
|--------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Add Hardware                                     |       |                                                                                                                                                             |   |
| BIOS                                             |       | Processor compatibility                                                                                                                                     |   |
| Boot from Legacy Networ                          | k ada | You can limit the processor features that a virtual machine can use. This improves<br>the virtual machine's compatibility with different processor versions | 8 |
| Security                                         |       | are in warmounies compositing minimited in processor version of                                                                                             |   |
| Key Storage Drive disable                        | 10    | Mgrate to a physical computer with a different processor version                                                                                            |   |
| 1024 MB                                          |       |                                                                                                                                                             |   |
| Processor                                        |       |                                                                                                                                                             |   |
|                                                  |       |                                                                                                                                                             |   |
| Compatibility                                    |       |                                                                                                                                                             |   |
| La rearra                                        |       |                                                                                                                                                             |   |
| E IDE Controller 0                               |       |                                                                                                                                                             |   |
| 🗉 🚃 Hard Drive                                   |       |                                                                                                                                                             |   |
| VM1.vhdx                                         |       |                                                                                                                                                             |   |
| IDE Controler 1                                  |       |                                                                                                                                                             |   |
| None                                             |       |                                                                                                                                                             |   |
| SCSI Controller                                  |       |                                                                                                                                                             |   |
| E 📮 Legacy Network Adapter<br>New Virtual Switch | - 11  |                                                                                                                                                             |   |
| COM 1                                            |       |                                                                                                                                                             |   |
| None                                             |       |                                                                                                                                                             |   |
| 💭 COM 2                                          |       |                                                                                                                                                             |   |
| None                                             |       |                                                                                                                                                             |   |
| None                                             |       |                                                                                                                                                             |   |
| Management                                       |       |                                                                                                                                                             |   |
| 1 Name                                           |       |                                                                                                                                                             |   |
| VM1                                              |       |                                                                                                                                                             |   |
| Integration Services<br>Some services offered    |       |                                                                                                                                                             |   |
| Checkpoints<br>Production                        |       |                                                                                                                                                             |   |
| Smart Paging File Location                       | ~     |                                                                                                                                                             |   |

3. Install the OS on the VM.

| R failover Cluster Manager                                     |            |           |                       |                       |         |                            | - 0                    | ) ×       |
|----------------------------------------------------------------|------------|-----------|-----------------------|-----------------------|---------|----------------------------|------------------------|-----------|
| File Artists View Help                                         |            |           |                       |                       |         |                            |                        |           |
|                                                                |            |           |                       |                       |         |                            |                        |           |
| Failover Cluster Monager                                       | Roles (2)  |           |                       |                       |         |                            |                        |           |
| v 12 sw-swhc-01.starwind.local                                 | Search     |           |                       |                       | _       |                            | P Queries 🔻            | <b></b> • |
| Nodes                                                          | Name       | Statue    | Type                  | Owner Node            | Frierty | Information                |                        |           |
| v 📇 Storage                                                    | 1, VM1     | () Rumi   | ng Vitual Machine     | aw-organi-01          | Hedun   |                            |                        |           |
| Disks     Pools     Enclosures     Networks     Cluster Events | ****       | Rumi      | ng Vitual Nachine     | sw-orpren-01          | Hedun   |                            |                        |           |
|                                                                | - 🏷        | 041       |                       |                       |         |                            | Preferred Owners       | Ans.nod   |
|                                                                | Vetual Mac | fiend VMI | 0.1                   | 0                     |         |                            |                        | _         |
|                                                                | *          |           | CELLINGS.             | maning                |         | In Texa                    | 0.02.04                |           |
|                                                                |            | -         | Memory Demand         | 675 MR                |         | Assistant Memory           | 1824 MR                |           |
|                                                                |            |           | Integration Services: | 10.0.10011.16384      |         | Heatbeat:                  | OK                     |           |
|                                                                |            |           | Computer Name:        | DESKTOP-RI TEMH       |         | Operation System           | Wrotews 10 Extension 1 |           |
|                                                                |            |           | Date Created          | 10/4/2017 12:10:58 PM |         | Operating Sectors Version: | 10.0 10240             |           |
|                                                                |            |           | Version:              | 8.0                   |         |                            |                        |           |
|                                                                |            |           | Monitored Services:   |                       |         |                            |                        |           |
|                                                                |            |           | Peolication           |                       |         |                            |                        |           |
|                                                                | Summery D  | Resources | Bankention State:     | Met anabled           |         |                            |                        |           |
| Roles: VM1                                                     |            |           |                       |                       |         |                            |                        |           |

4. Perform Live Migration and VM failover between On-Premises and Azure nodes.



| Failover Cluster Manager      |                |              |                 |                         |                |                              | -                      |          | ×          |
|-------------------------------|----------------|--------------|-----------------|-------------------------|----------------|------------------------------|------------------------|----------|------------|
| File Action View Help         |                |              |                 |                         |                |                              |                        |          |            |
| 🗢 🔿 🙇 📷 📓 🖬                   |                |              |                 |                         |                |                              |                        |          |            |
| Failover Cluster Manager      | Roles (2)      |              |                 |                         |                |                              |                        |          |            |
| v 💱 sw-swhc-01.stanwind.local | Search         |              |                 |                         |                |                              | P Querie               | · • 🖬    | <b>v</b> v |
| Roles                         | News           | 0.1.1        | T               | Orace Marks             | Dist           | Manufac                      |                        | 1112     |            |
| Storage                       | Name .         | 3180.0       | T)(pe           | Owner Node              | Priority       | Information                  | and the d              |          | _          |
| All Disks                     | BI YMI         | We Migrating | witual Machine  | sw-onpreni-u i          | Medium         | Live Migrating, 64% cor      | npiered                |          |            |
| Pools                         | NM2            | (1) Running  | Virtual Machine | sw-onprem-01            | Medium         |                              |                        |          |            |
| Enclosures                    |                |              |                 |                         |                |                              |                        |          |            |
| Networks                      |                |              |                 |                         |                |                              |                        |          |            |
| Cluster Events                |                |              |                 |                         |                |                              |                        |          |            |
|                               | ~ 🖳 w          | 11           |                 |                         |                |                              | Preferred O            | where: A | ny node    |
|                               | 6.85           |              |                 |                         |                |                              |                        |          |            |
|                               | Virtual Machin | ne VM1       |                 |                         |                |                              |                        |          |            |
|                               | 1              | Status:      |                 | Stopping                |                |                              |                        |          |            |
|                               |                | CPU Us       | age:            | 0%                      | Ug             | p Time:                      | 0:00:00                |          |            |
|                               |                | Memory       | Demand:         | 0 MB                    | As             | isigned Memory:              | 0 MB                   |          |            |
|                               |                | Integrat     | ion Services:   |                         | He             | eartbeat:                    |                        |          |            |
|                               |                | Compute      | er Name:        | 10/4/2017 12:10:52 51   | . 0            | perating System:             |                        |          |            |
|                               |                | Version      | ealed:          | 8.0                     | a or           | perating system version.     |                        |          |            |
|                               |                | Monitor      | ed Services:    | VM Monitoring is only a | upported for W | Vindows Server 2012 (and lat | er) operating systems. |          |            |
|                               |                | Replication  |                 |                         |                |                              |                        |          | _          |
|                               |                | Bankeati     | an State:       | Not availant            |                |                              |                        |          | ~          |
|                               | Summary Re     | sources      |                 |                         |                |                              |                        |          |            |
|                               |                |              |                 |                         |                |                              |                        |          |            |

# Conclusion

By following the steps and recommendations presented in this document, IT professionals can leverage the benefits of combining on-premises and cloud resources while ensuring data availability and disaster recovery capabilities. This hybrid cloud setup offers flexibility and scalability for various virtualization workloads, contributing to a robust and efficient IT infrastructure.



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