Software Defined Networking (SDN) in Azure Stack HCI training: Lab for Module 0: Orientation and overview

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Applies to

SDN training: Module 0: Orientation and overview

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Revision History

Release Date	Changes
April 05, 2024	Initial release.

Contents

SDN LAB: OVERVIEW

Summary

These lab documents within this SDN training are designed to help understand the core architecture while exploring troubleshooting principles for components within Windows Software Defined Networking.

This lab has been designed to work in conjunction with GitHub -SdnNested as well as GitHub -SdnDiagnostics.

Deploy SDN Environment

There are a couple methods to deploy an SDN environment in preparation for this learning course. Please refer to the deployment methods below for what works best for you. Post deployment, there should be the following architecture:

- VM0
- SDN-HOST01 (Hyper-V Server)
- SDN-HOST02 (Hyper-V Server)
- SDN-NC01 (Network Controller)
- SDN-NC02 (Network Controller) **
- SDN-NC03 (Network Controller) **
- SDN-MUX01 (Software Load Balancer MUX)
- SDN-MUX02 (Software Load Balancer MUX)
- SDN-GW01 (RAS Gateway)
- SDN-GW02 (RAS Gateway)
- SDN-DC01 (Domain Controller and TOR Router)

** indicates that the resource is optional, however some labs may not be available when running a single NC node cluster.

Deploy SdnNested Lab (Recommended)

This method is preferred, as the lab modules will reference the deployment configuration and settings used by SdnNested. Installation instructions for a nested SDN deployment can be found at GitHub -SdnNested. Read through the deployment documentation and deploy the environment, while taking the default configuration when using the Azure_E8_v3 configuration. Follow Steps 0, 1 and 2 to deploy the infrastructure.

Step 3 to deploy tenant environment is not required currently. The lab documentation will walk through manually creating the appropriate tenant resources to provide you with hands-on experience that a customer would typically be doing.

After deployment of the lab, refer to Install Tools to ensure the appropriate tools have been installed.

Deploy SDN on Custom Environment

Leverage an already pre-existing (non-production) SDN environment or deploy a new environment leveraging one of the following methods:

- Deploy SDN using Windows Admin Center - Azure Stack HCI | Microsoft Learn
- Deploy an SDN infrastructure using SDN Express - Azure Stack HCI | Microsoft Learn
- Create an Azure Stack HCI cluster using Windows Admin Center - Azure Stack HCI | Microsoft Learn

In this scenario, the lab will be slightly different due to different naming conventions, physical network configuration, etc. You will need to account for these unique factors as you work through the lab modules.

Connect to SDN Lab Environment

Once you have successfully deployed your lab, you will need to connect to VM0 / LabHost and read through the README.txt that is located on the desktop. There are detailed instructions on how to start/stop the lab, credentials, etc.

Install Tools

There are a few tools that are required as part of the labs included in this training. If you deploy the lab manually using Bring Your Own Lab (BYOL) steps, you will need to perform the steps manually below.

Install SdnDiagnostics

1. Connect to SDN-NC01 or SDN-DC01 and load PowerShell.
2. Install and SdnDiagnostics module from PowerShell Gallery.

```
Install-Module -Name SdnDiagnostics

# If the module already installed, then update the module
Update-Module -Name SdnDiagnostics
```

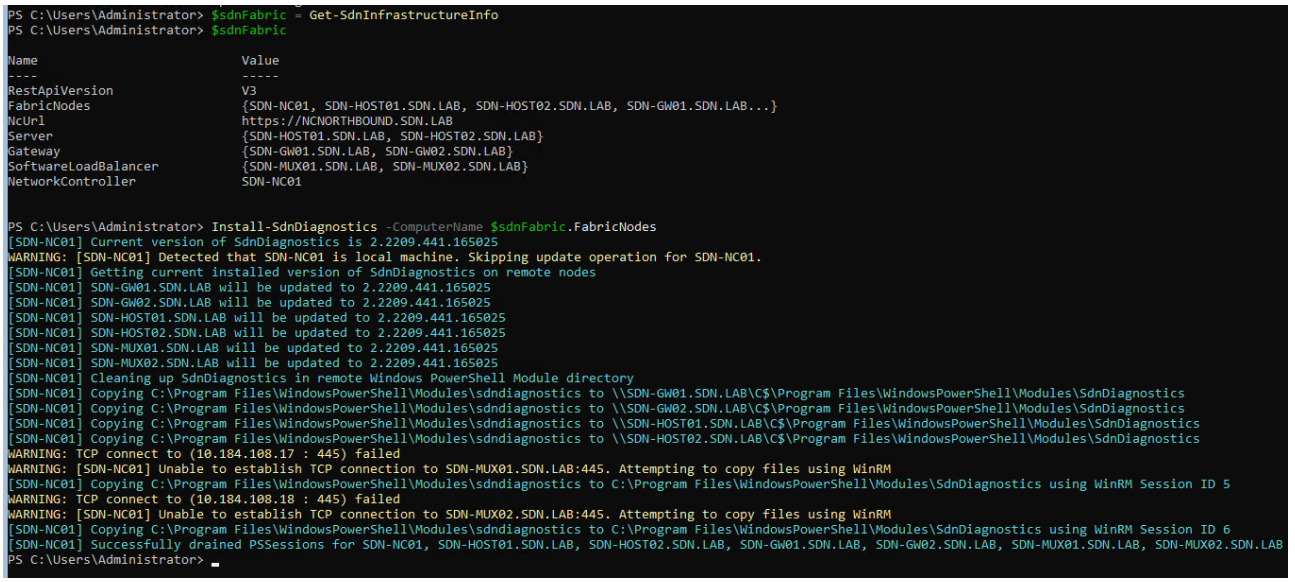
3. Import and verify the module has successfully been imported.

```
Import-Module -Name SdnDiagnostics

Get-Module -Name SdnDiagnostics
```

4. Seed out the module to the other SDN nodes within the environment. This will ensure that the version of SdnDiagnostics module is consistent across the SDN fabric. If using DC01 or another remote node, then -NetworkController and -Credential parameters may be required in the script below.

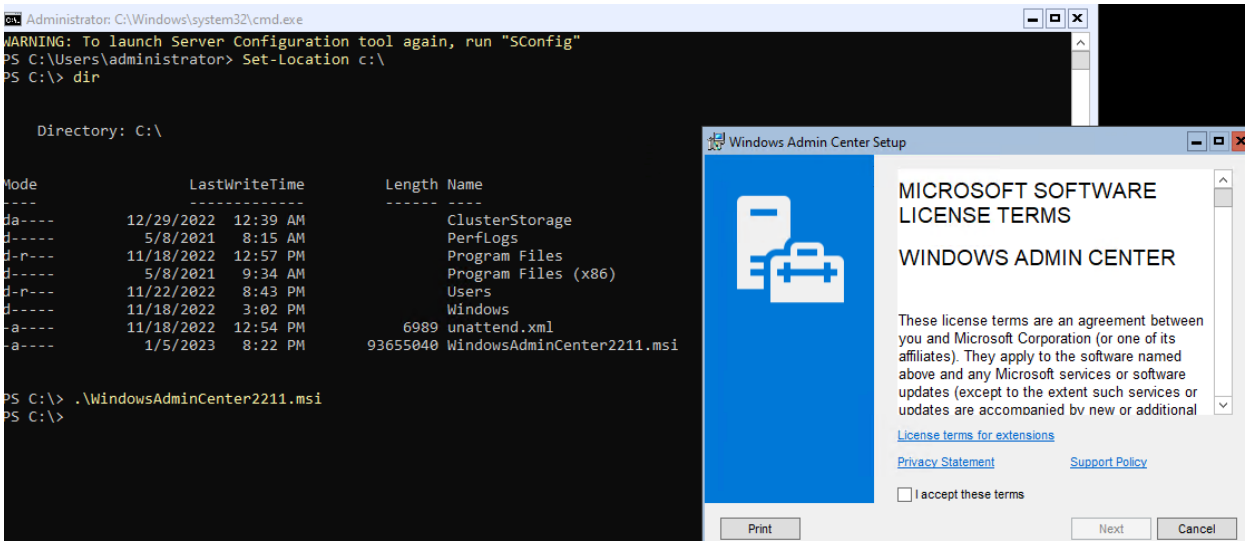
```
$sdnFabric = Get-SdnInfrastructureInfo
Install-SdnDiagnostics -ComputerName $sdnFabric.FabricNodes
```



Install Windows Admin Center

If Windows Admin Center has not been installed on your environment or you are running a build older than 2211, please perform the following steps:

1. Download Windows Admin Center
    a. Download Link: https://go.microsoft.com/fwlink/p/?linkid=2194936
2. Copy the WindowsAdminCenter*.msi to \\SDN-HOST01.SDN.LAB\c$
3. Via Hyper-V Manager, Connect to SDN-HOST01 and login as the SDN.LAB\Administrator account.
4. Change location to C:\ using **Set-Location -Path c:** and launch the MSI by typing **.\WindowsAdminCenter*.msi**



5. Proceed through installation, and then define the following settings:
    - Port: 443
    - Generate a self-signed SSL certificate. This certificate will expire in 60 days.
    - Redirect HTTP port 80 traffic to HTTPS: $true
2. Once installation is complete, navigate to https://sdn-host01.sdn.lab from your VM0 / Lab Host.

Install or Update SDN Extensions

Ensure that all relevant SDN extensions have been installed.

1. Navigate to Settings

2. Go to Extensions -> Available Extensions and install the following. Some may be listed in Preview.
    a. Network Controller tools and SDN Virtual networks
    b. Network Security Groups
    c. SDN Gateway connections
    d. SDN Infrastructure
    e. SDN Load balancers
    f. SDN Logical networks
    g. SDN Public IP Addresses
    h. SDN Route Tables
3. If you do not see the extension in Available extensions, go to Installed extensions and make sure it's listed as **Installed**.
4. Ensure that under Installed Extensions, that all the extensions are updated. If any extensions show **Update available**, please update, including ones not related to SDN.

5. If you get errors related SSL/TLS connection closed when navigating SDN resources, review Troubleshooting SDN Windows Admin Center Certificates - Microsoft Community Hub for remediation steps.

Connect to SdnFabric Cluster

1. Within Windows Admin Center, navigate to Cluster Manager and select +Add.
    - Cluster Name: sdnfabric.sdn.lab
2. Navigate to SDN Infrastructure, which will install some features automatically on the backend, such as RSAT tools.
3. Specify the domain credentials when prompted. Select to use credentials for all further requests.
4. When prompted for Network Controller node name, specify SDN-NC01.SDN.LAB.
5. Refresh the page, which will refresh the resources under Networking.

Install Network Controller REST Certificate to DC01

Some of the labs have you perform REST operations against NC from DC01, however may fail if you do not have the REST certificate installed to Cert:\LocalMachine\Root.

1. Connect to SDN-DC01 via Hyper-V Manager
2. Launch PowerShell ISE as administrator and run the following commands:

```
$domainCreds = Get-Credential -UserName 'SDN.LAB\Administrator' -Message
'Provide Credentials'
$cerFile = Invoke-Command -ComputerName 'SDN-NC01.SDN.LAB' -Credential
$domainCreds -ScriptBlock {
    $cert = Get-ChildItem -Path cert:\localmachine\my | ? Subject -ieq
'CN=NCNorthBound.SDN.LAB'
    $certFile = Export-Certificate -Type CERT -Cert $cert -FilePath
"C:\RestCert.cer"
    return $certFile
}

$session = New-PSSession $cerFile.PSComputerName -Credential $domainCreds
Copy-Item -FromSession $session -Path $cerfile.FullName -Destination C:\
Import-Certificate -FilePath C:\RestCert.cer -CertStoreLocation
Cert:\LocalMachine\Root
```

Install Other Tools

Additional tools should be installed to VM0 / LabHost that will be used for the labs.

- Wireshark: Wireshark · Download

- Network Monitor 3.4: Download Microsoft Network Monitor 3.4 (archive) from Official Microsoft Download Center
- Visual Studio Code: Visual Studio Code - Code Editing. Redefined