

NetScaler SD-WAN Center 9.1

Feb 03, 2017

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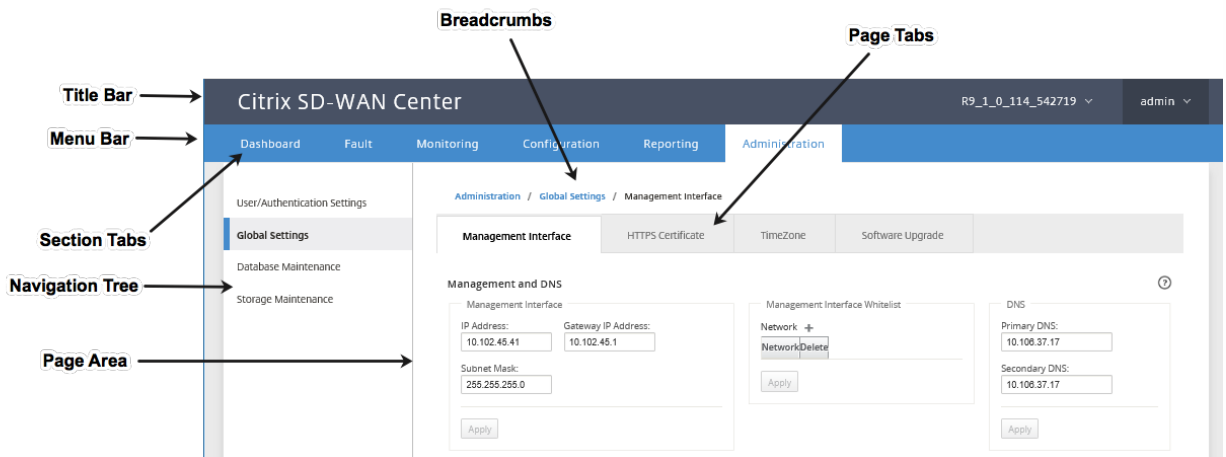
[NetScaler SD-WAN 9.1](#)

Overview

Sep 27, 2016

NetScaler SD-WAN Center is a centralized management system that enables you to configure, monitor, and analyze all the NetScaler SD-WAN appliances on your WAN. It reduces the configuration errors and the time taken to deploy SD-WAN appliances. It also provides visibility into the SD-WAN network and application performance by allowing you to generate reports and statistics across multiple NetScaler SD-WAN appliances.

The NetScaler SD-WAN Center web interface allows you to easily navigate and view various graphs and reports. It also allows you to easily configure the SD-WAN Center.



The basic navigation elements are as follows:

- **Title bar** – The dark grey bar at the top of every SD-WAN Center Web Interface page displays the software version currently running on the appliance, and the user name for the current login session. Click the down-arrow next to the version number to see the IP address and version number of the SD-WAN Center. Click the down-arrow next to the user name and select Logout to log out of SD-WAN Center.
- **Main menu bar** – The blue bar below the title bar on every SD- WAN Center Web Interface screen contains the section tabs.
- **Section tabs** – The section tabs in the blue main menu bar at the top of each page provide access to the top-level categories for the SD-WAN Center Web Interface pages and forms. Each section has its own navigation tree for navigating the page hierarchy in that section. Click a section tab to display the navigation tree and default page for that section.
- **Navigation tree** – The navigation tree for the currently selected section appears in the left pane, below the main menu bar. Click a section tab to display the navigation tree for that section. Click a branch (topic) in the tree to reveal the default page for that topic.
- **Breadcrumbs** – At the top of each page, just below the main menu bar, breadcrumbs show the navigation path to the current page. Active navigation links are blue. The name of the current page is black.
- **Page area** – The right pane displays the work area for the selected page. Select an item in the navigation tree to display the default page for that item.
- **Page tabs** – Some pages contain tabs for displaying child pages for that topic or configuration form. These are usually located at the top of the page area, just below the breadcrumbs.

- **Page area resizing** – For some pages, you can grow or shrink the width of the page area (or sections of it) to reveal additional fields in a table or form. Where this is the case, a gray, vertical resize bar appears on the right border of the page area pane, form, or table. You can roll your cursor over the resize bar until the cursor changes to a bidirectional arrow, and then click and drag the bar to the right or left to grow or shrink the width of the area.

If the resize bar is not available for a page, you can click and drag the right edge of your browser to display the full page.

NetScaler SD-WAN Center Page Hierarchy

TOP LEVEL TABS

Dashboard

Fault

PAGES

Event Viewer

Notification Settings

- **Email Alerts**

- **Error Emails**

Severity Settings

Monitoring

Network Map

Statistics

Diagnostics

System Information

Configuration

Network Discovery

- SSL Certificate
- Inventory and Status

Network Configuration

Change Management

Appliance Settings

Reporting

Administration

User/Authentication Settings

Global Settings

- Management Interface
- HTTPS Certificate
- TimeZone
- Software Upgrade

Database Maintenance

Storage Maintenance

Before You Begin

Oct 11, 2017

Before you install NetScaler SD-WAN Center on a VM, make sure that you must understand the hardware and software requirements and have met the prerequisites.

Hardware Requirements

NetScaler SD-WAN Center has the following hardware requirements.

Processor

- 4 Core, 3 GHz (or equivalent) processor or better for a server managing up to 64 sites.
- 8 Core, 3 GHz (or equivalent) processor or better for a server managing up to 128 sites.
- 16 Core, 3 GHz (or equivalent) processor or better for a server managing up to 256 sites.

Memory

- A minimum of 8GB of RAM is strongly recommended for a VM managing up to 64 sites.
- A minimum of 16GB of RAM is strongly recommended for a VM managing up to 128 sites.
- A minimum of 32GB of RAM is strongly recommended for a VM managing up to 256 sites.

Disk Space Requirements

The following table provides some guidelines for determining the disk space requirements for NetScaler SD-WAN Center data storage.

NETSCALER SD-WAN CENTER DATA STORAGE

ESTIMATED DISK SPACE REQUIREMENTS

# Client Sites	Average # WAN Links per Site	Average # Intranet/Internet Services per Site	Average # Conduits per Site	Database Size (TB) for 1 Year
32	2	2	2	1.2T
32	4	4	4	1.8T
32	8	8	8	5.3T
64	2	2	2	1.5T
64	4	4	4	2.6T

64	8	8	8	9.6T
96	2	2	2	1.8T
96	4	4	4	3.3T
96	8	8	8	14.0T
128	2	2	2	2.0T
128	4	4	4	4.1T
128	8	8	8	18.0T
192	2	2	2	2.6T
192	4	4	4	5.6T
192	8	8	8	27.0T
256	2	2	2	3.0T
256	4	4	4	7.2T
256	8	8	8	35.0T

Network Bandwidth

The following table provides some guidelines for determining network bandwidth requirements for the NetScaler SD-WAN Center VM.

NETSCALER SD-WAN CENTER DATA STORAGE

ESTIMATED NETWORK BANDWIDTH REQUIREMENTS

# Client Sites	Average # WAN Links	Average # Conduits per Site	Total VWAN Data per 5-min Poll (MB)	Bandwidth Rate to Configure per 5-min Poll (Kbps)
32	2	2	1.2	Default 1000

32	4	4	3.6	Default 1000
32	8	8	20.0	Default 1000
64	2	2	2.3	Default 1000
64	4	4	7.2	Default 1000
64	8	8	40.0	2000
96	2	2	3.5	Default 1000
96	4	4	10.8	Default 1000
96	8	8	60.0	3000
128	2	2	4.6	Default 1000
128	4	4	14.4	Default 1000
128	8	8	80.0	4000
192	2	2	6.9	Default 1000
192	4	4	21.6	2000
192	8	8	120.0	6000
256	2	2	9.2	Default 1000
256	4	4	28.8	2000
256	8	8	160	10000

Software

NetScaler SD-WAN Center can be configured on the following hypervisors –

- VMware ESXi server, version 5.5.0 or higher.
- Citrix XenServer 6.5 or higher

Browsers must have cookies enabled, and JavaScript installed and enabled.

The NetScaler SD-WAN Center Web Interface supports the following browsers:

- Google Chrome 40.0+
- Microsoft Internet Explorer 11.0.9600+
- Mozilla Firefox 41.0+

Prerequisites

Following are the prerequisites for installing and deploying NetScaler SD-WAN Center:

- The SD-WAN Master Control Node (MCN) and existing client nodes must be upgraded to the latest NetScaler SD-WAN software version.
- The DHCP server must be present and configured in the SD-WAN.
- You must have the NetScaler SD-WAN Center installation files. For instructions for downloading these files, see [Downloading the SD-WAN Center installation files](#).

Note

You cannot customize or install any third party software on SD-WAN Center. However, you can modify the vCPU, memory and storage settings.

Deploying NetScaler SD-WAN Center

May 22, 2017

You can download the NetScaler SD-WAN Center software from the Citrix website and can install it on the VMware ESXi 5.5 Server or the Citrix XenServer 6.5 Server and above.

Downloading the NetScaler SD-WAN Center Software

You can install SD-WAN Center on either a VMware ESXi or XenServer server. For a VMware ESXi server, download the NetScaler SD-WAN Center OVA template (.ova file). For XenServer download the NetScaler SD-WAN Center XVA file (.xva file).

The NetScaler SD-WAN Center installation files use the following naming convention:

cb-wvc-version_number-server.extension

where:

- *version_number* is the NetScaler SD-WAN Center release version number.
- *server* is the Virtual server type, either VMware ESXi or Citrix XenServer
- *extension* is the file name suffix.
 - *.ova* indicates an OVF template file for ESXi server.
 - *.xva* indicates an XVA file for XenServer

To download the NetScaler SD-WAN Center installation files, go to the following URL:

<http://www.citrix.com/downloads.html>

Gathering the SD-WAN Center Installation and Configuration Information

This section provides a checklist of the information you will need to complete your SD-WAN Center installation and deployment.

Information Checklist

Gather or determine the following information:

- The IP address of the ESXi server or XenServer that will host the SD-WAN Center Virtual Machine (VM).
- A unique name to assign to the SD-WAN Center VM.
- The amount of memory to allocate for the SD-WAN Center VM.
- The amount of disk capacity to allocate for the virtual disk for the VM.
- The Gateway IP Address the SD-WAN Center will use to communicate with external networks.
- The subnet mask for the network in which the SD-WAN Center VM will reside.

Installing and Configuring the NetScaler SD-WAN Center on ESXi Server

Sep 27, 2016

To install and configure the NetScaler SD-WAN Center on ESXi, do the following:

1. Gather the SD-WAN Center installation and configuration information.

For instructions, see [Gathering the SD-WAN Center Installation and Configuration Information](#).

2. Install the VMware vSphere Client.

For instructions, see [Installing the VMware vSphere Client](#).

3. Create an SD-WAN Center VM by using the OVF template.

For instructions, see [Creating the SD-WAN Center VM by using the OVF template](#).

4. View and record the SD-WAN Center management IP address.

For instructions, see [Viewing and Recording the SD-Wan Center Management IP Address on ESXi Server](#)

5. Configure the Management Interface settings.

For instructions, see [Configuring the Management Interface Settings](#).

6. Install the SD-WAN Center certificate.

For instructions, see [Installing the SD-WAN Center Certificate](#).

7. Specify the MCN and test the connection to the MCN.

For instructions, see [Specifying the MCN and Testing the Connection](#).

Installing the VMware vSphere Client

Following are basic instructions for downloading and installing the VMware vSphere client that you will use to create and deploy the SD-WAN Center Virtual Machine. For more information, see VMware vSphere Client documentation.

To download and install the VMware vSphere Client, do the following:

1. Open a browser and navigate to the ESXi server that will host your vSphere Client and SD-WAN Center Virtual Machine (VM) instance.

The VMware ESXi Welcome page appears.

VMware ESXi 5.1

Welcome

Getting Started

If you need to access this host remotely, use the following program to install vSphere Client software. After running the installer, start the client and log in to this host.

- [Download vSphere Client](#)

To streamline your IT operations with vSphere, use the following program to install vCenter. vCenter will help you consolidate and optimize workload distribution across ESX hosts, reduce new system deployment time from weeks to seconds, monitor your virtual computing environment around the clock, avoid service disruptions due to planned hardware maintenance or unexpected failure, centralize access control, and automate system administration tasks.

- [Download VMware vCenter](#)

If you need more help, please refer to our documentation library:

- [vSphere Documentation](#)

For Administrators

vSphere Remote Command Line

The Remote Command Line allows you to use command line tools to manage vSphere from a client machine. These tools can be used in shell scripts to automate day-to-day operations.

- [Download the Virtual Appliance](#)
- [Download the Windows Installer \(exe\)](#)
- [Download the Linux Installer \(tar.gz\)](#)

Web-Based Datastore Browser

Use your web browser to find and download files (for example, virtual machine and virtual disk files).

- [Browse datastores in this host's inventory](#)

For Developers

vSphere Web Services SDK

Learn about our latest SDKs, Toolkits, and APIs for managing VMware ESX, ESXi, and VMware vCenter. Get sample code, reference documentation, participate in our Forum Discussions, and view our latest Sessions and Webinars.

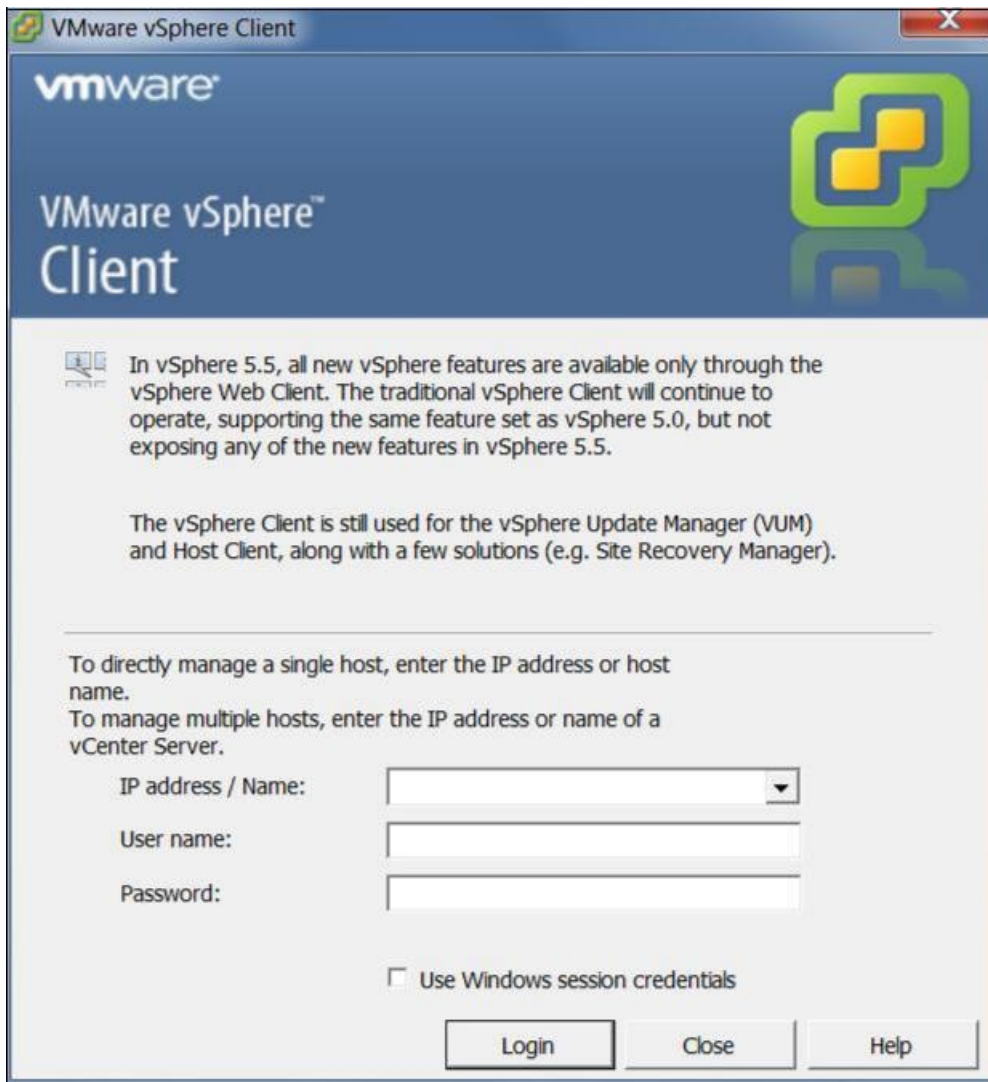
- [Learn more about the Web Services SDK](#)
- [Browse objects managed by this host](#)

2. Click the **Download vSphere Client** link to download the vSphere Client installation file.
3. Install the vSphere Client.

Run the vSphere Client installer file that you just downloaded, and accept each of the default options when prompted.

4. After the installation completes, start the vSphere Client program.

The VMware vSphere Client login page appears, prompting you for the ESXi server login credentials.

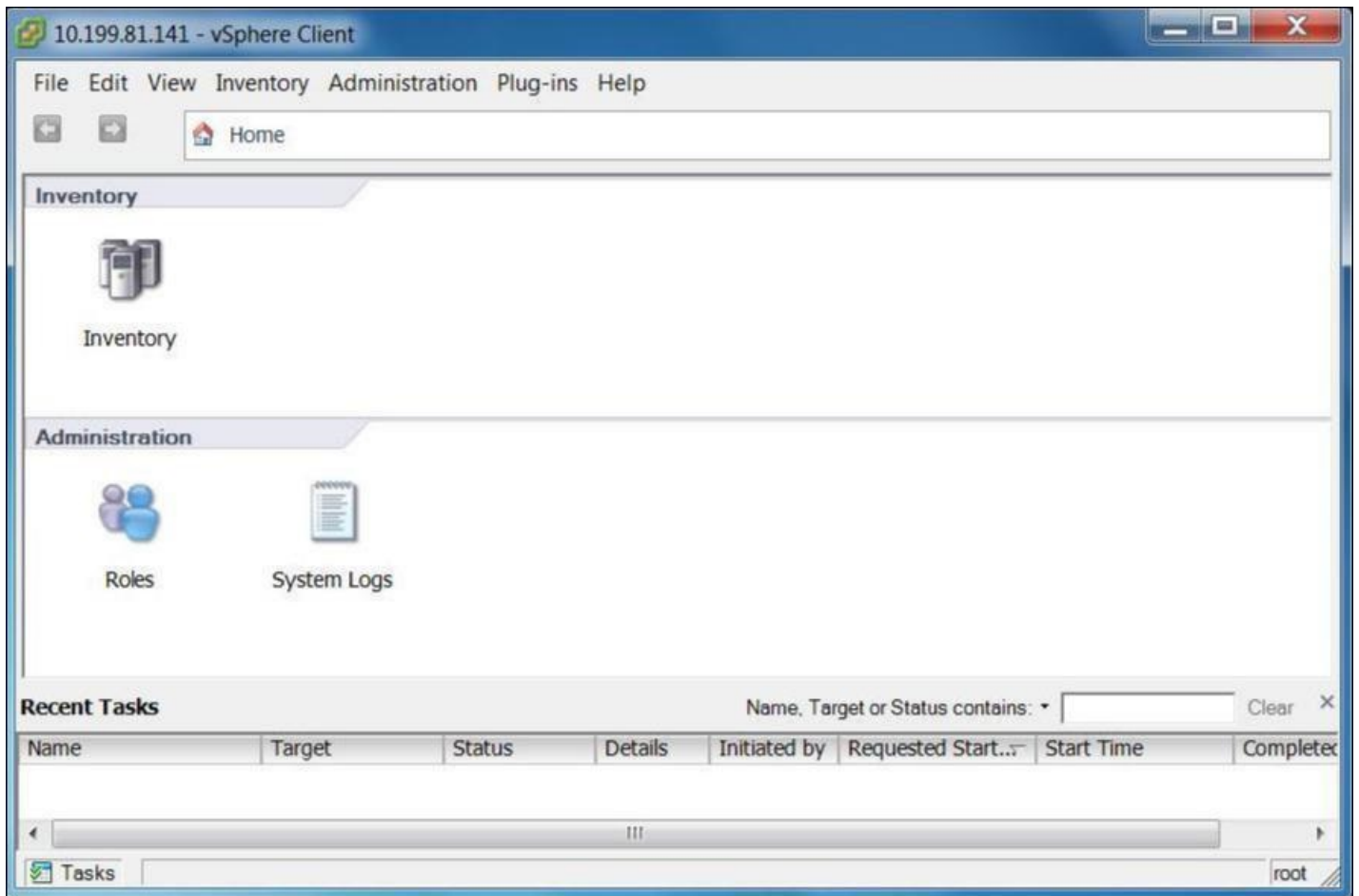


5. Enter the ESXi server login credentials:

- **IP address / Name:** Enter the IP Address or Fully Qualified Domain Name (FQDN) for the ESXi server that will host your SD-WAN Center VM instance.
- **User name:** Enter the server administrator account name. The default is root.
- **Password:** Enter the password associated with this administrator account.

6. Click **Login**.

The vSphere Client main page appears.



Creating the SD-WAN Center VM by using OVF Template

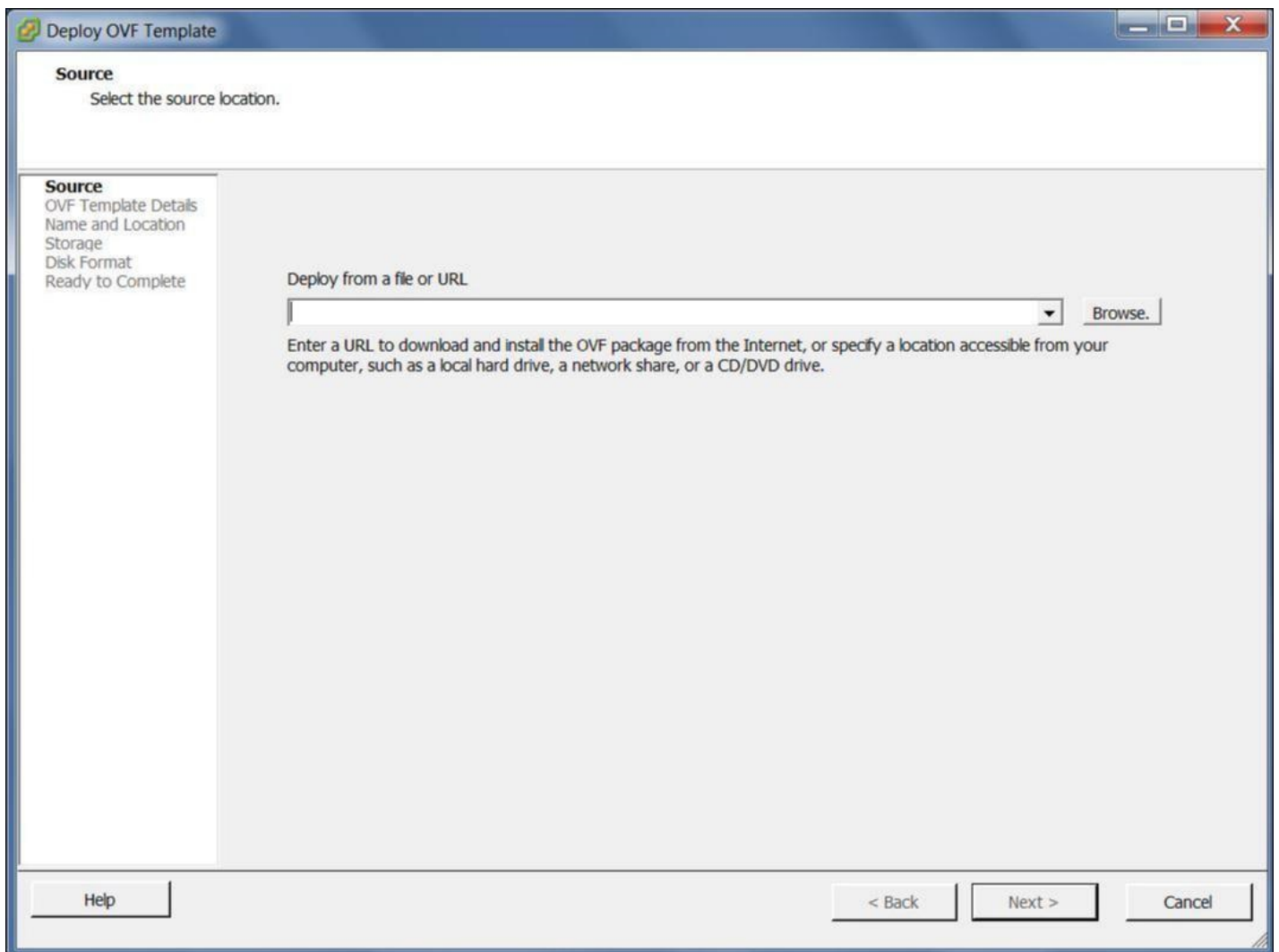
After installing the VMware vSphere client, create the SD-WAN Center virtual machine.

1. If you have not already done so, download the SD-WAN Center OVF template file (.ova file) to the local PC.

For more information, see [Downloading the NetScaler SD-WAN Center Software](#).

2. In the vSphere Client, click **File**, and then select **Deploy OVF Template** from the drop-down menu.

The **Deploy OVF Template** wizard appears.



3. Click **Browse** and select the SD-WAN Center OVF template (.ova file) that you want to install.

4. Click **Next**.

The ova file is imported and the OVF Template Details page appears.

5. Click **Next**.

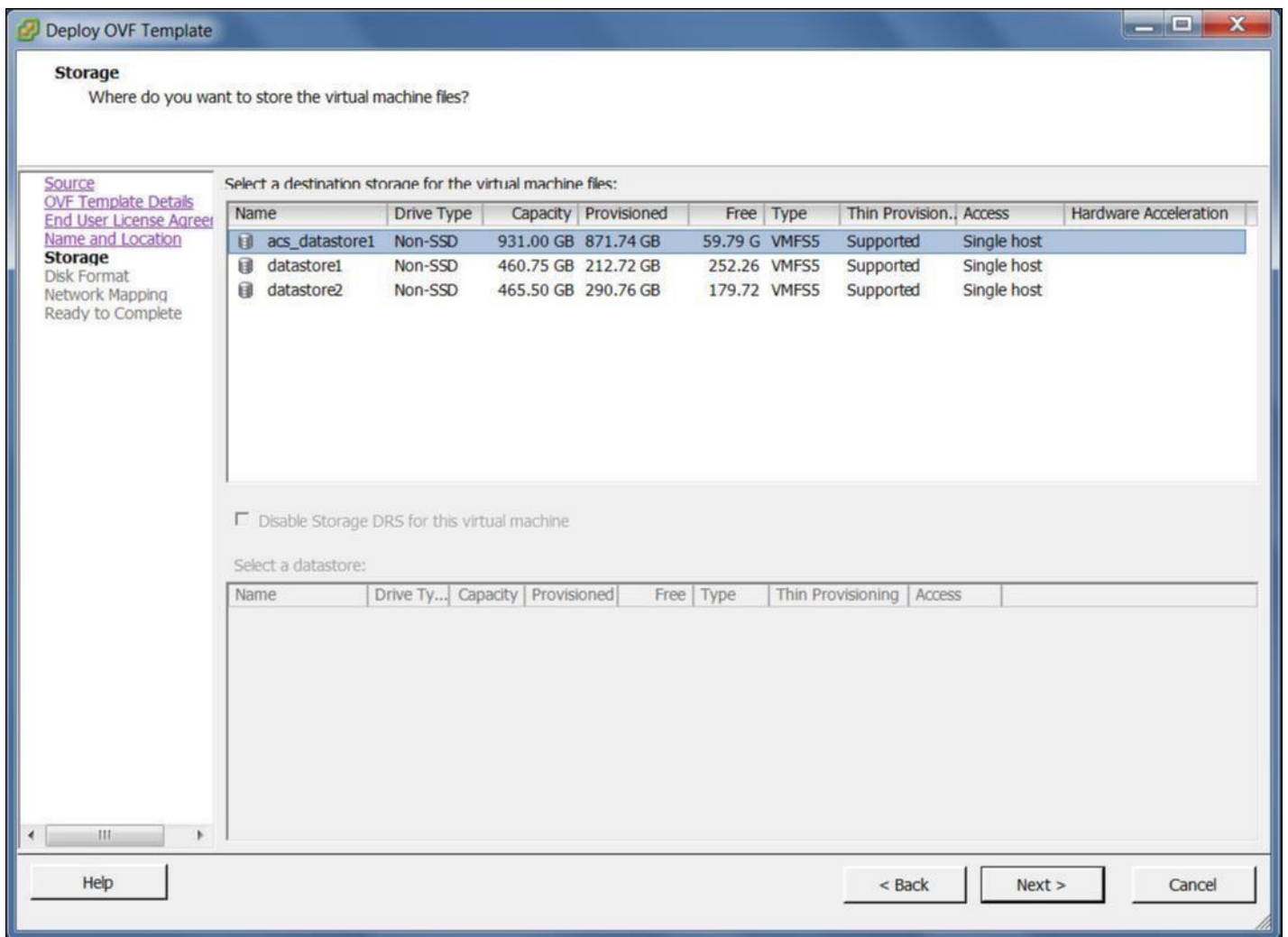
6. On the End User License Agreement page, click **Accept**, and then click **Next**.

7. On the Name and Location page, enter a unique name for the new VM (or accept the default value).

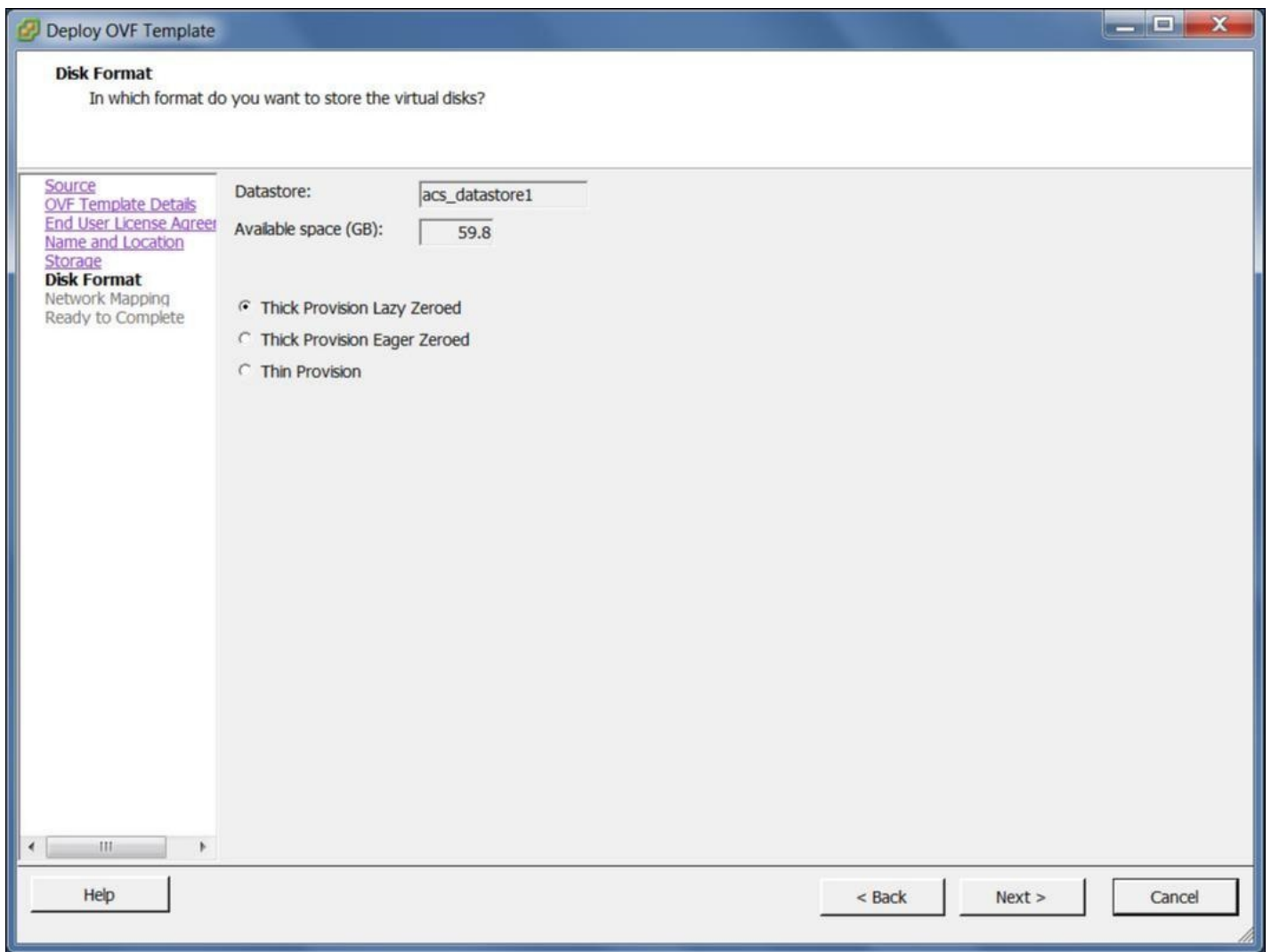
The name must be unique within the current **Inventory** folder, and can be up to 80 characters in length.

8. Click **Next**.

The Storage page appears.



9. For now, accept the default storage resource by clicking **Next**. You can also configure the datastore. For more information see [Adding and Configuring the Datastore on ESXi Server](#).



11. On the Disk Format page, accept the default settings, and click **Next**.
12. On the Network Mapping page, accept the default (VM Network) and click **Next**.
13. On the Ready to Complete page, click **Finish** to create the VM.

Note: Decompressing the disk image onto the server could take several minutes.

14. Click **Close**.

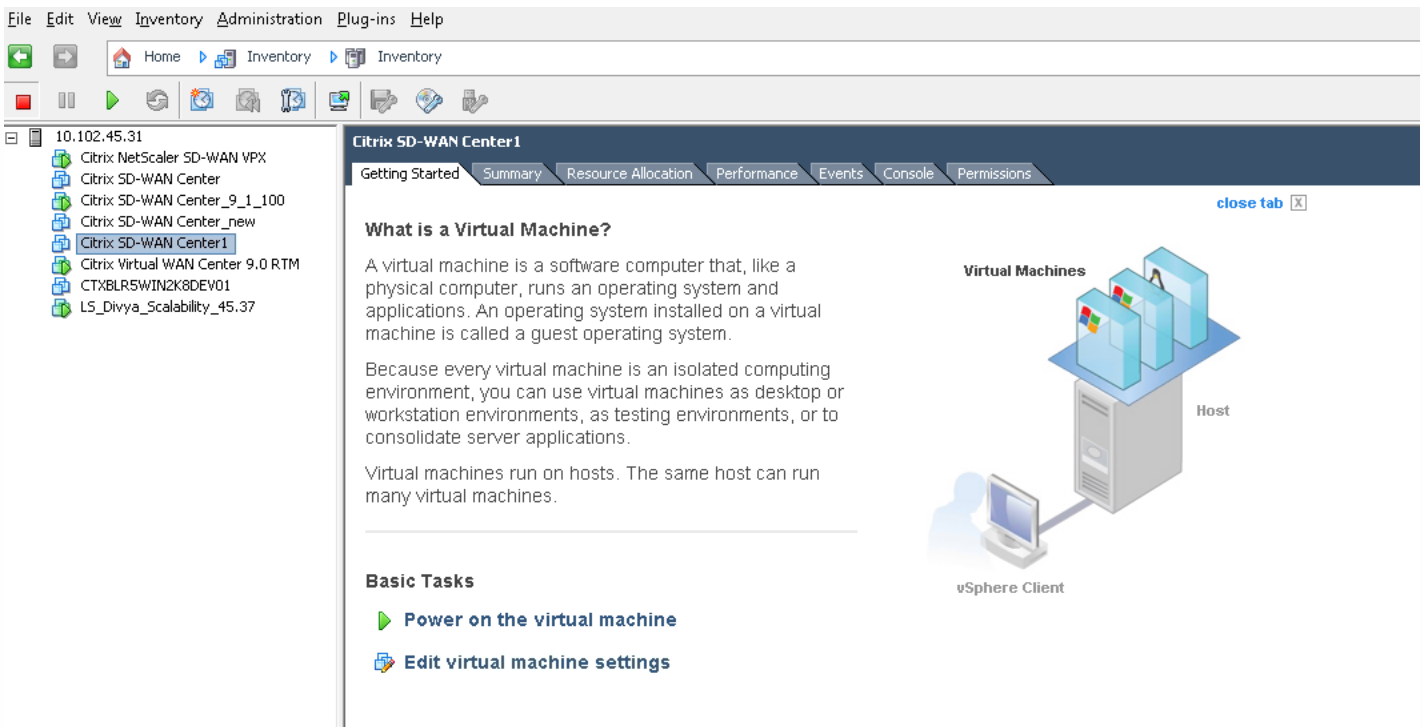
Viewing and Recording the Management IP Address on ESXi Server

The management IP address is the IP address of the SD-WAN Center VM, use this IP address to log into the SD-WAN Center Web UI.

Note: The DHCP server must be present and available in the SD-WAN.

To display the management IP address, do the following:

1. On the vSphere client Inventory page, select the new SD-WAN Center VM in the **Inventory** tree (left pane).

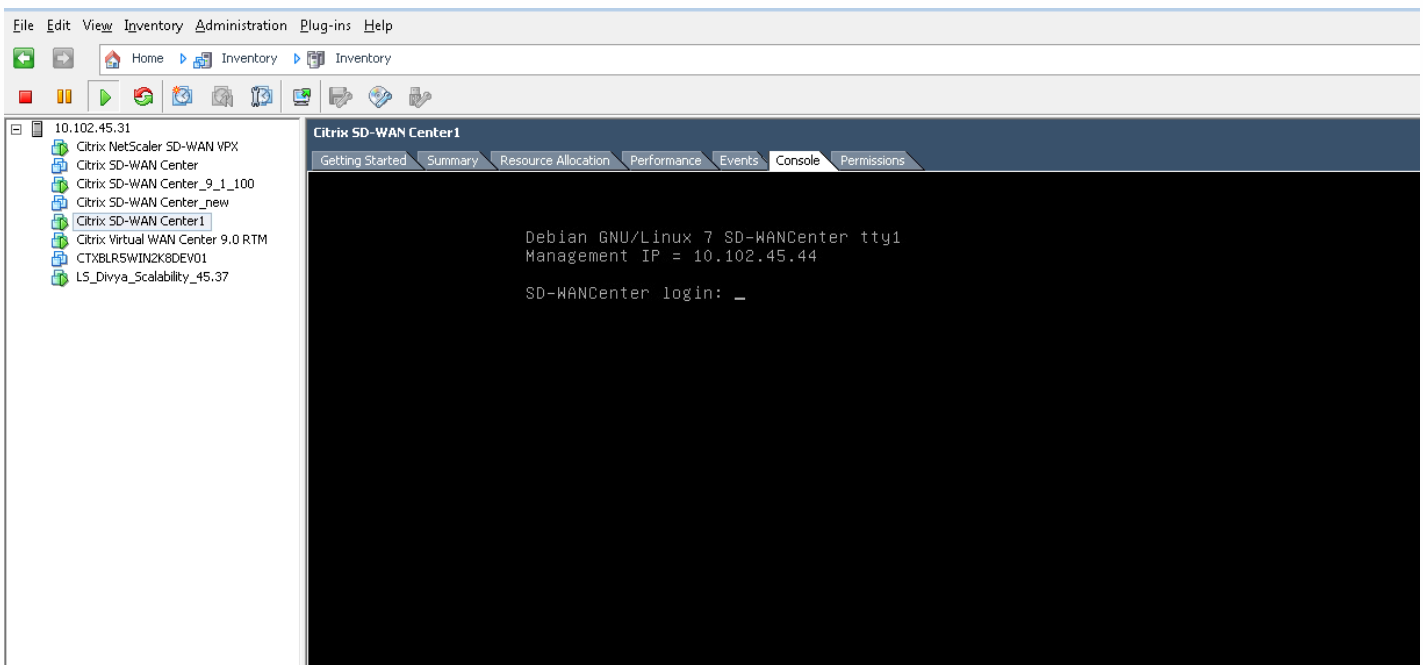


2. On the Citrix SD-WAN Center page, under Basic Tasks, click **Power on the Virtual Machine**.
3. Select the **Console** tab, and then click anywhere inside the console area to enter console mode.

This turns control of your mouse cursor over to the VM console.

Note: To release console control of your cursor, press the <Ctrl> and <Alt> keys simultaneously.

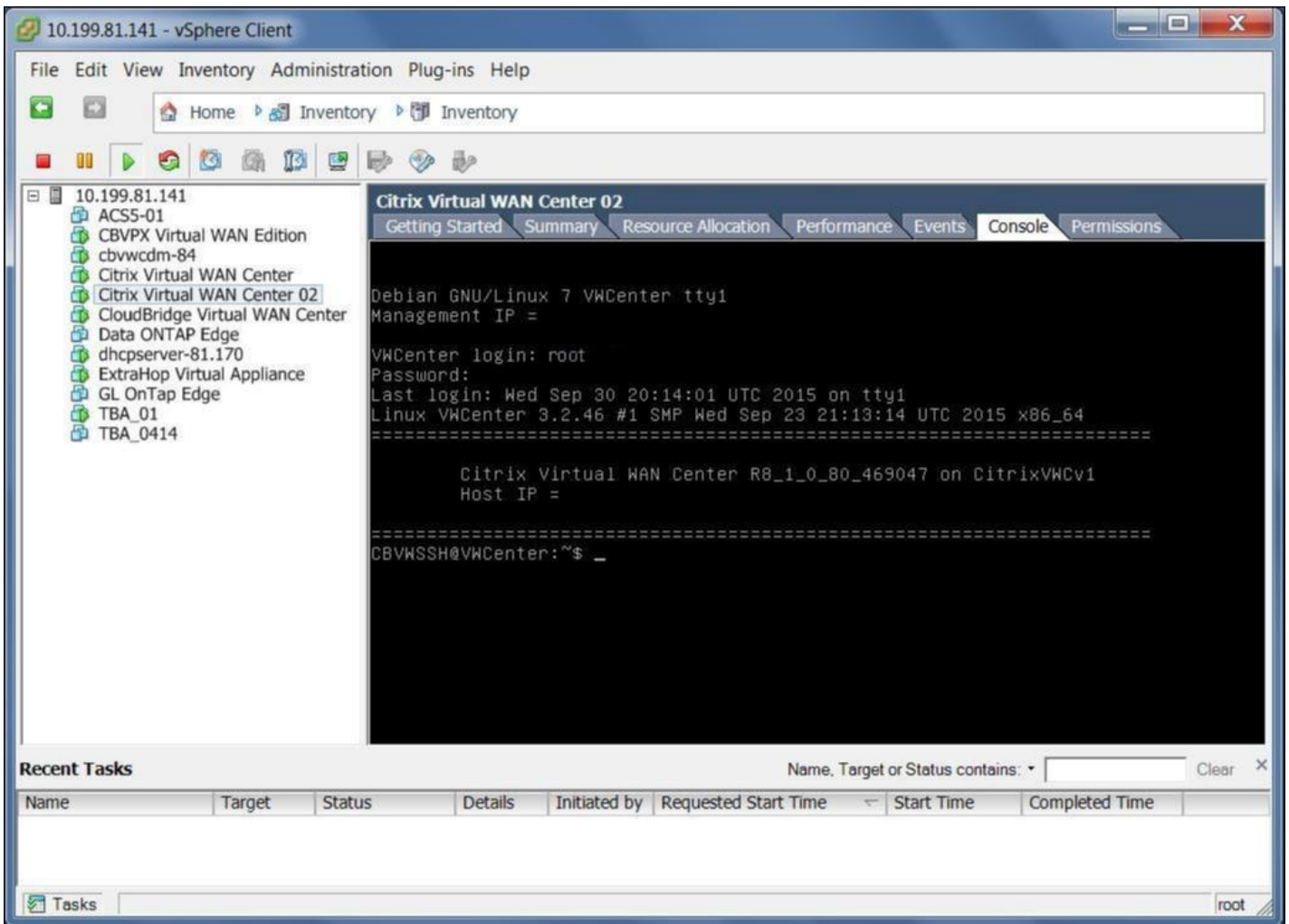
4. Press **Enter** to display the console login prompt.



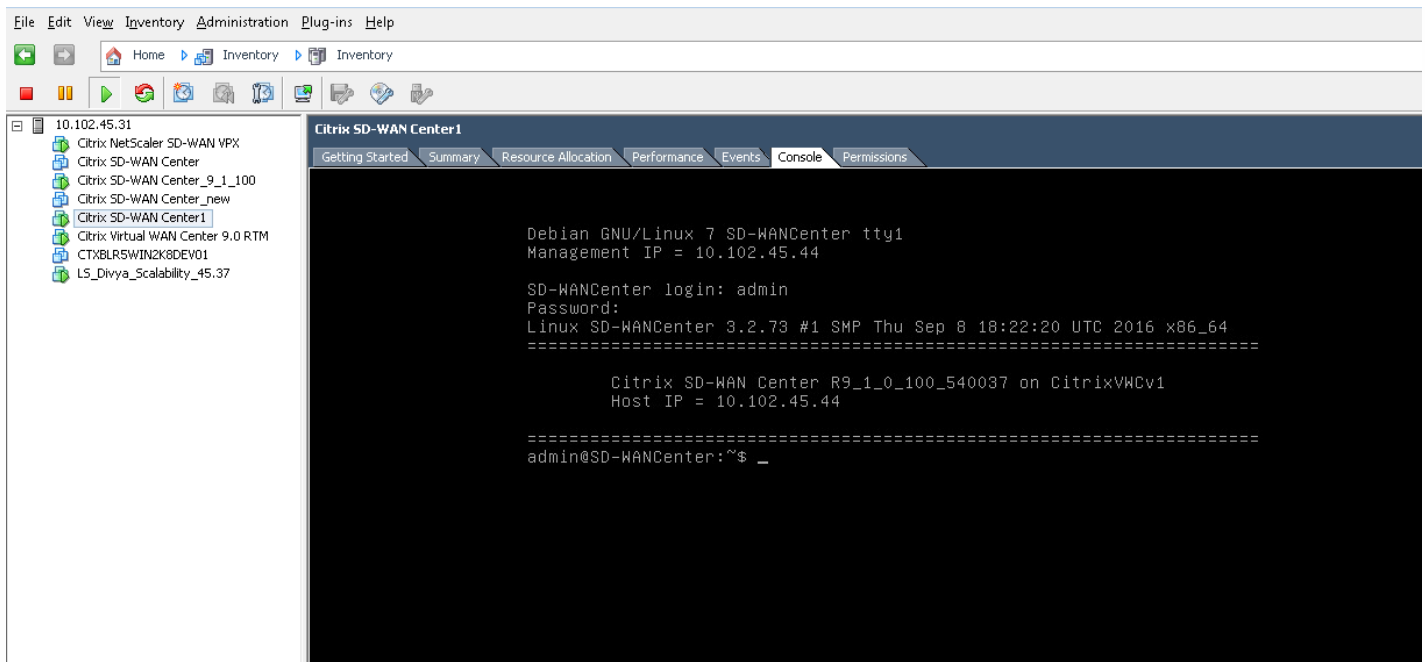
6. Log into the VM console.

The default login credentials for the new SD-WAN Center VM are as follows:

- Login: admin
- Password: password



7. Record the SD-WAN Center VM's management IP address, which is shown as the Host IP address in a welcome message that appears when you log on.

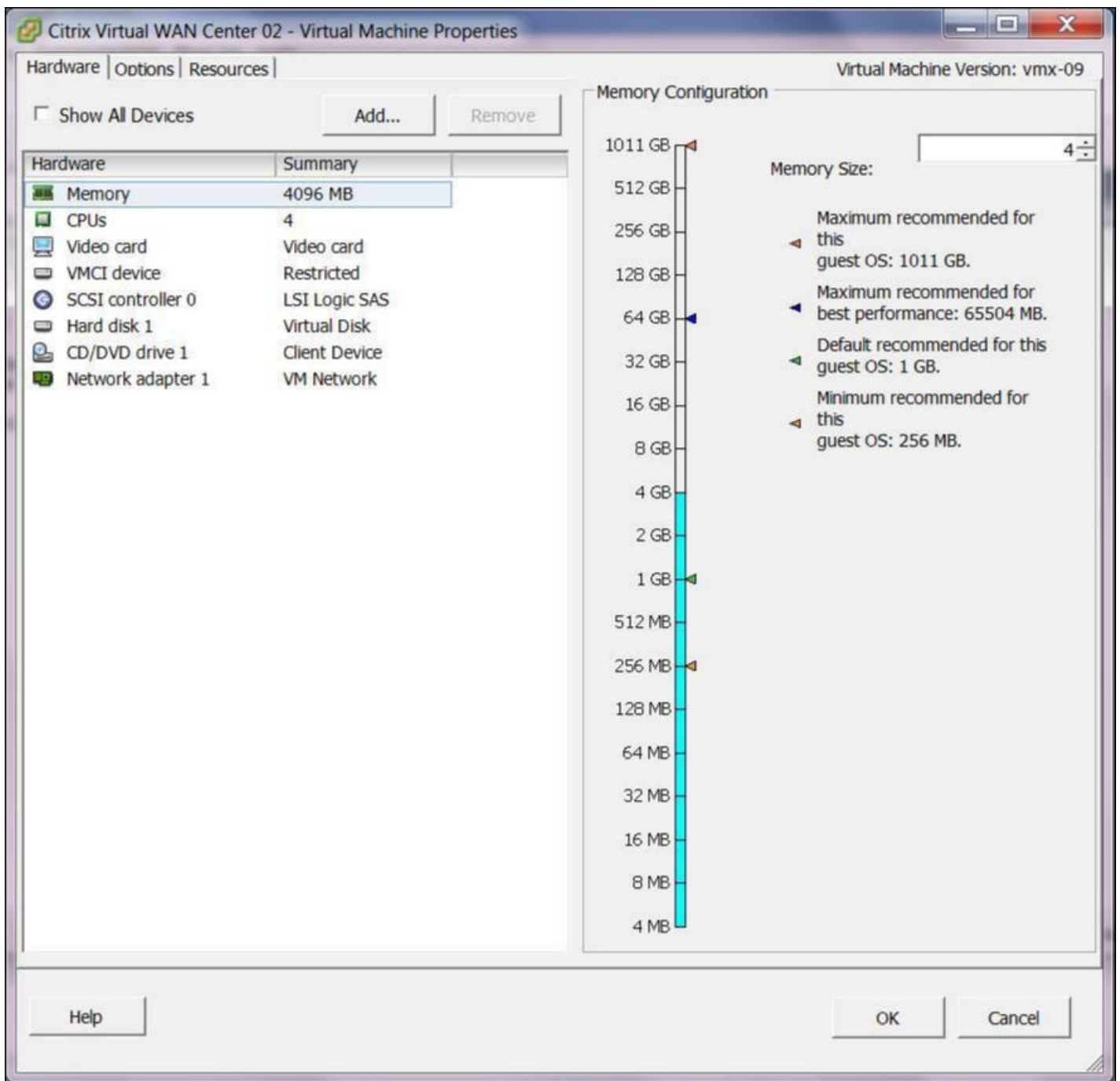


Adding and Configuring the Datastore on an ESXi Server

You can add and configure datastore to store statistics from SD-WAN center.

To add and configure the datastore

1. In the vSphere client, click the **Inventory** icon to open the Inventory page.
2. Expand the **Inventory** tree branch for the SD-WAN Center VM host server.
3. In the left pane, click + next to the IP Address for the server hosting the SD-WAN Center VM you just created.
4. Open the new SD-WAN Center VM for editing.
5. In the **Inventory** tree, right-click on the name of the SD-WAN Center VM you just created and select **Edit Setting** from the drop-down menu.

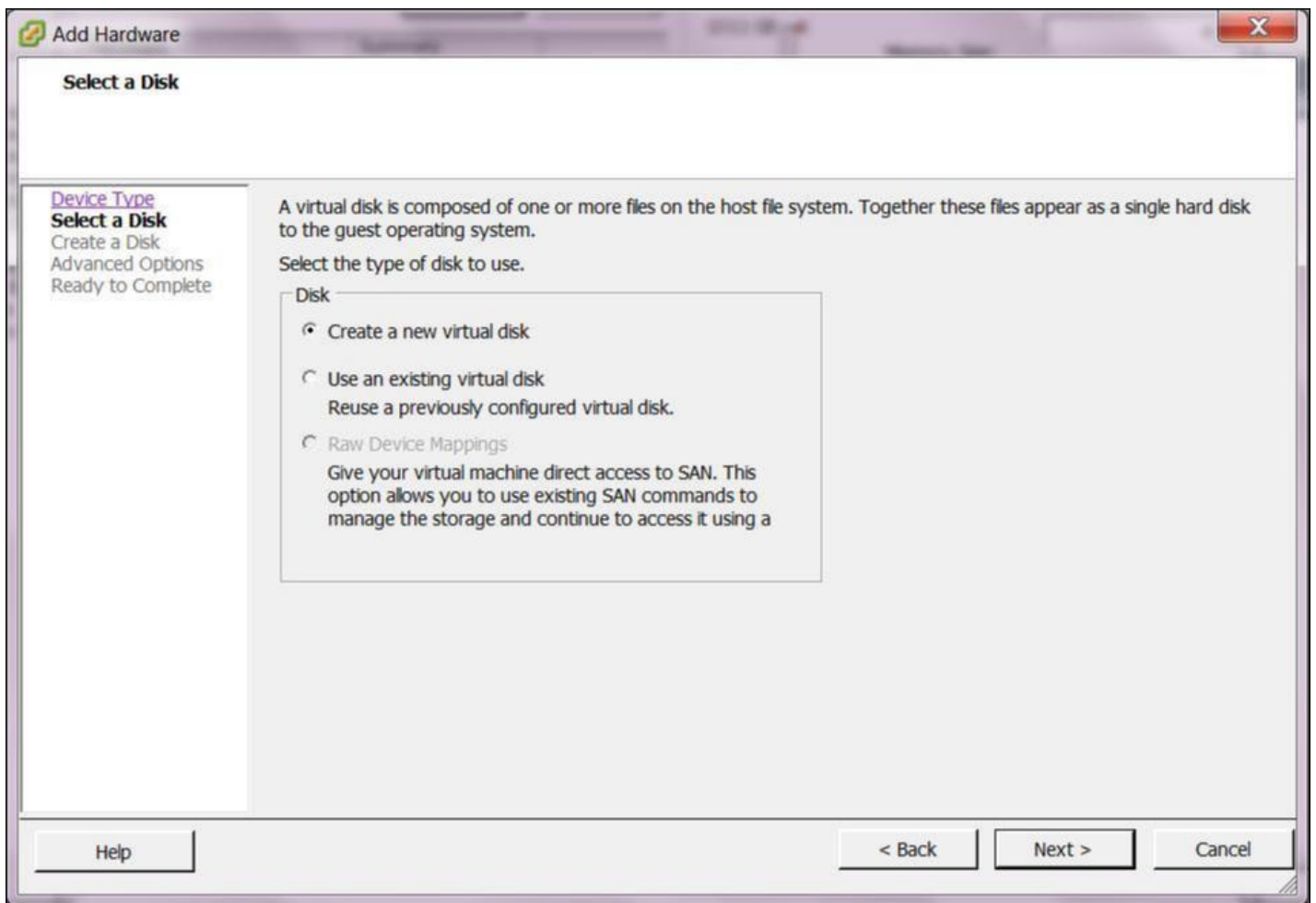


6. In the Memory Size field, enter the amount of memory to allocate for to this VM.

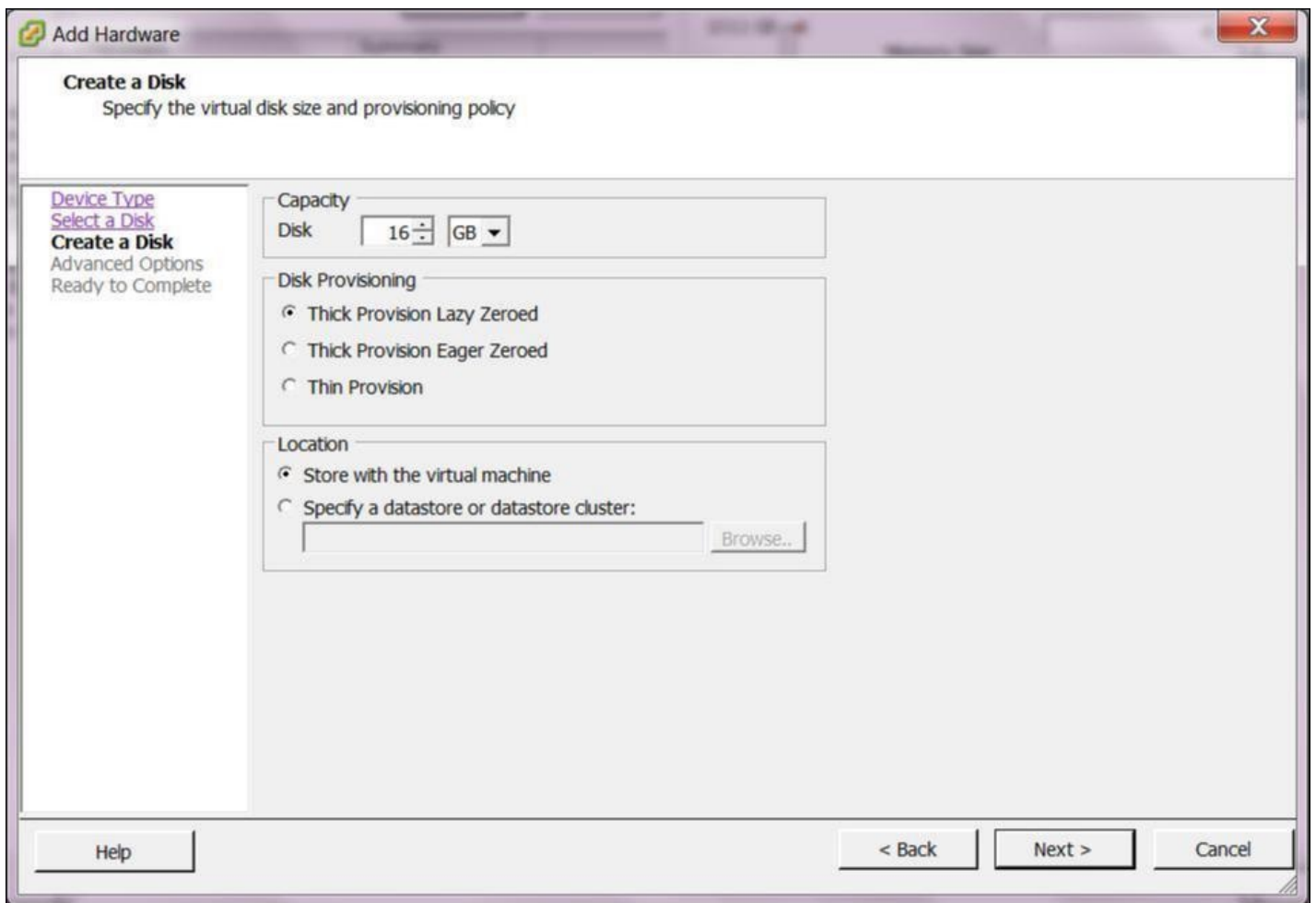
For more information, see [Memory Requirements](#).

7. Click **Add**.

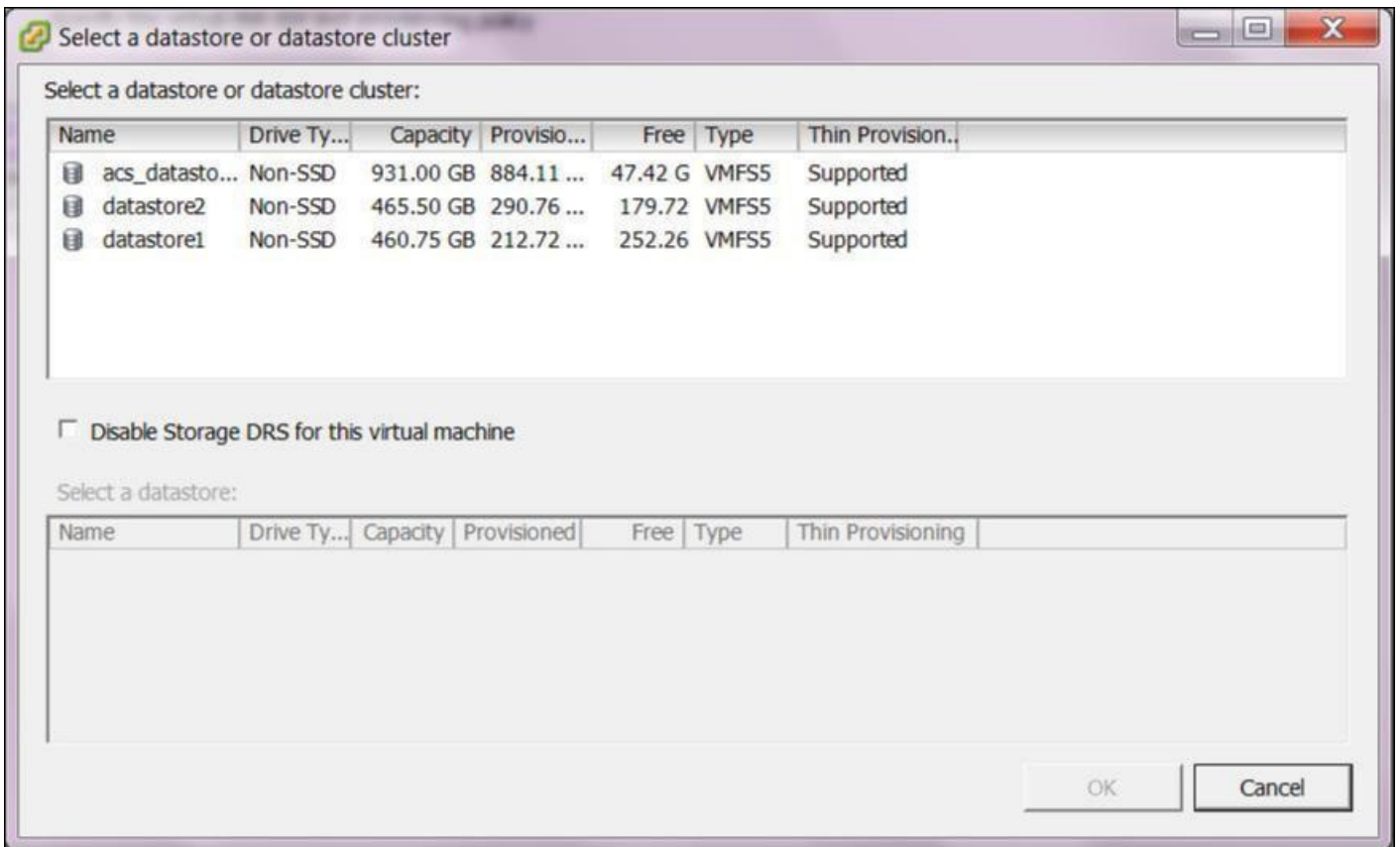
8. On the Device Type page of the Add Hardware wizard, select **Hard Disk** and then click **Next**.



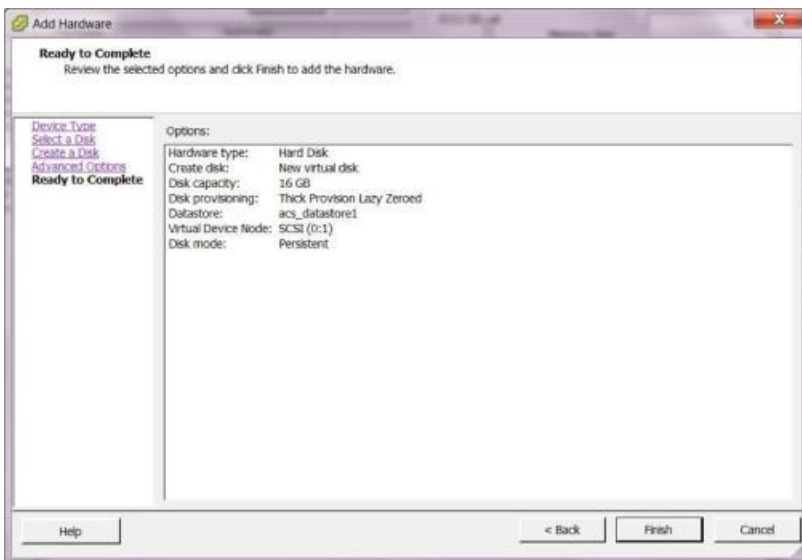
9. On the Select a Disk page, select **Create a new virtual disk** and click **Next**.



10. On the Create a Disk page, in the **Capacity** section, select the disk capacity for the new virtual disk.
11. In the Disk Provisioning section, select **Thick Provision Lazy Zeroed** (the default).
12. In the Location section, select **Specify a datastore or datastore cluster**.
13. Click **Browse**.



14. Select a datastore with sufficient available space, and click **OK**.
15. Click **Next**.
16. On the Advanced Options page, accept the **Advanced Options** default settings and click **Next**.

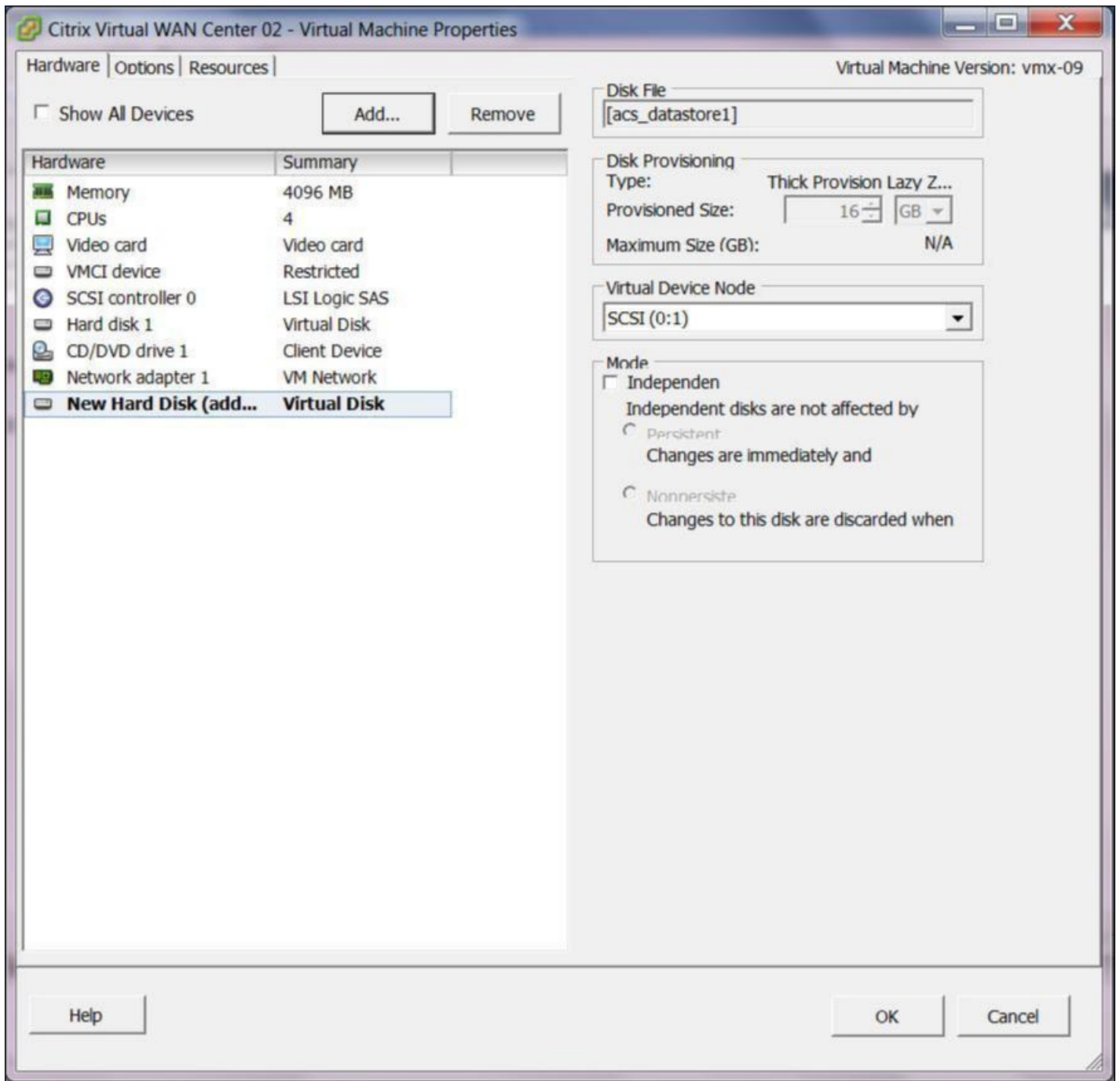


17. Click **Finish**.

This adds the new virtual disk, dismisses the Add Hardware wizard, and returns you to the Virtual Machine Properties page.

18. Click **OK**.

In the SD-WAN Center web interface, switch the active storage to the new datastore. For more information, see [Switching the Active Storage to the New Datastore](#).



Installing and Configuring the NetScaler SD-WAN Center on XenServer

Oct 06, 2016

Before installing the NetScaler SD-WAN Center virtual machine on a XenServer server, gather the necessary information as described in [Gathering the SD-WAN Center Installation and Configuration Information](#).

To install and configure the VM, perform the following tasks:

1. Install the XenServer server.

For instructions, see [Installing the XenServer](#).

2. Create an SD-WAN Center VM by using the XVA file.

For instructions, see [Creating the SD-WAN Center VM using XVA file](#).

3. Record the SD-WAN Center management IP address.

For instructions, see [Viewing and Recording the SD-WAN Center Management IP Address on XenServer](#).

4. Configure the Management Interface settings.

For instructions, see [Configuring the Management Interface Settings](#).

5. Install the SD-WAN Center certificate.

For instructions, see [Installing the SD-WAN Center Certificate](#).

6. Specify the master control node (MCN) and test the connection to the MCN.

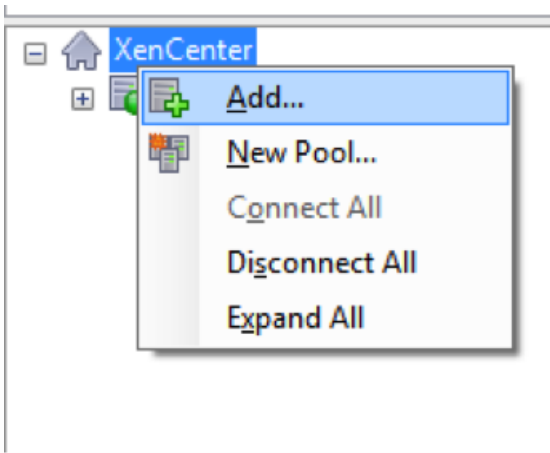
For instructions, see [Specifying the MCN and Testing the Connection](#).

Installing the XenServer Server

To install the Citrix XenServer server on which you will deploy the SD-WAN Center virtual machine, you must have XenCenter installed on your computer. If you have not already done so, download and install XenCenter.

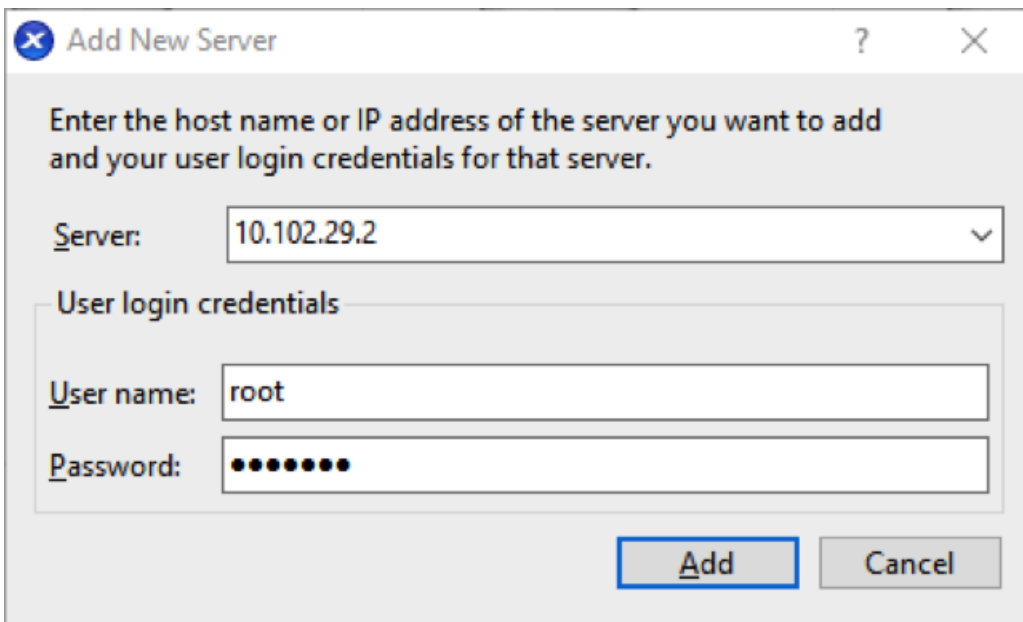
To install a XenServer server:

1. Open the XenCenter application on your computer.
2. In the left tree pane, right-click on **XenCenter** and select **Add**.



3. In the **Add New Server** window, enter the required information in the following fields:

- **Server:** Enter the IP Address or Fully Qualified Domain Name (FQDN) of the XenServer server that will host your SD-WAN Center VM instance.
- **User name:** Enter the server administrator account name. The default is root.
- **Password:** Enter the password associated with this administrator account.



4. Click **Add**.

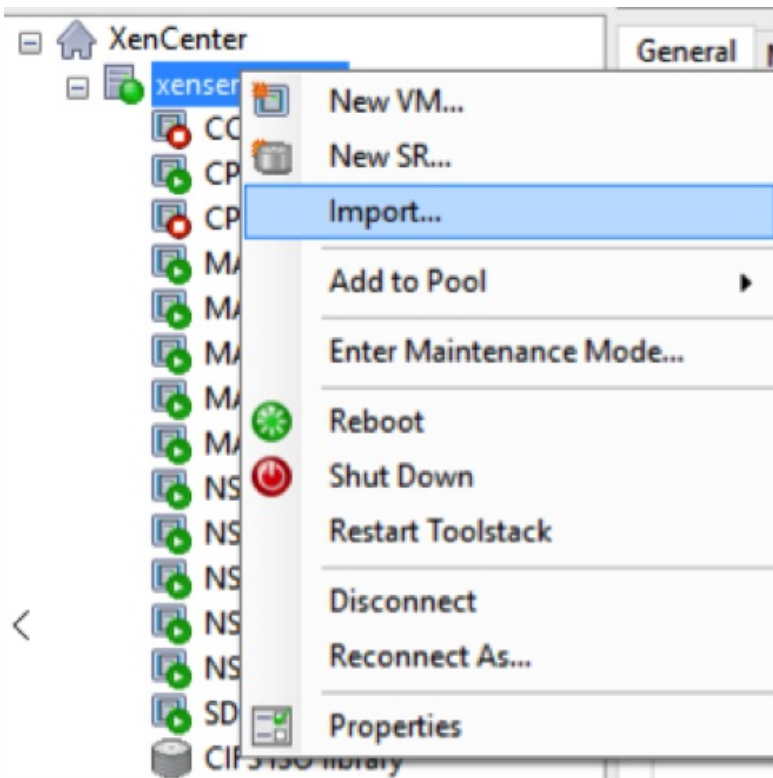
The new server's IP address appears in the left pane.

Creating the SD-WAN Center VM by using the XVA file

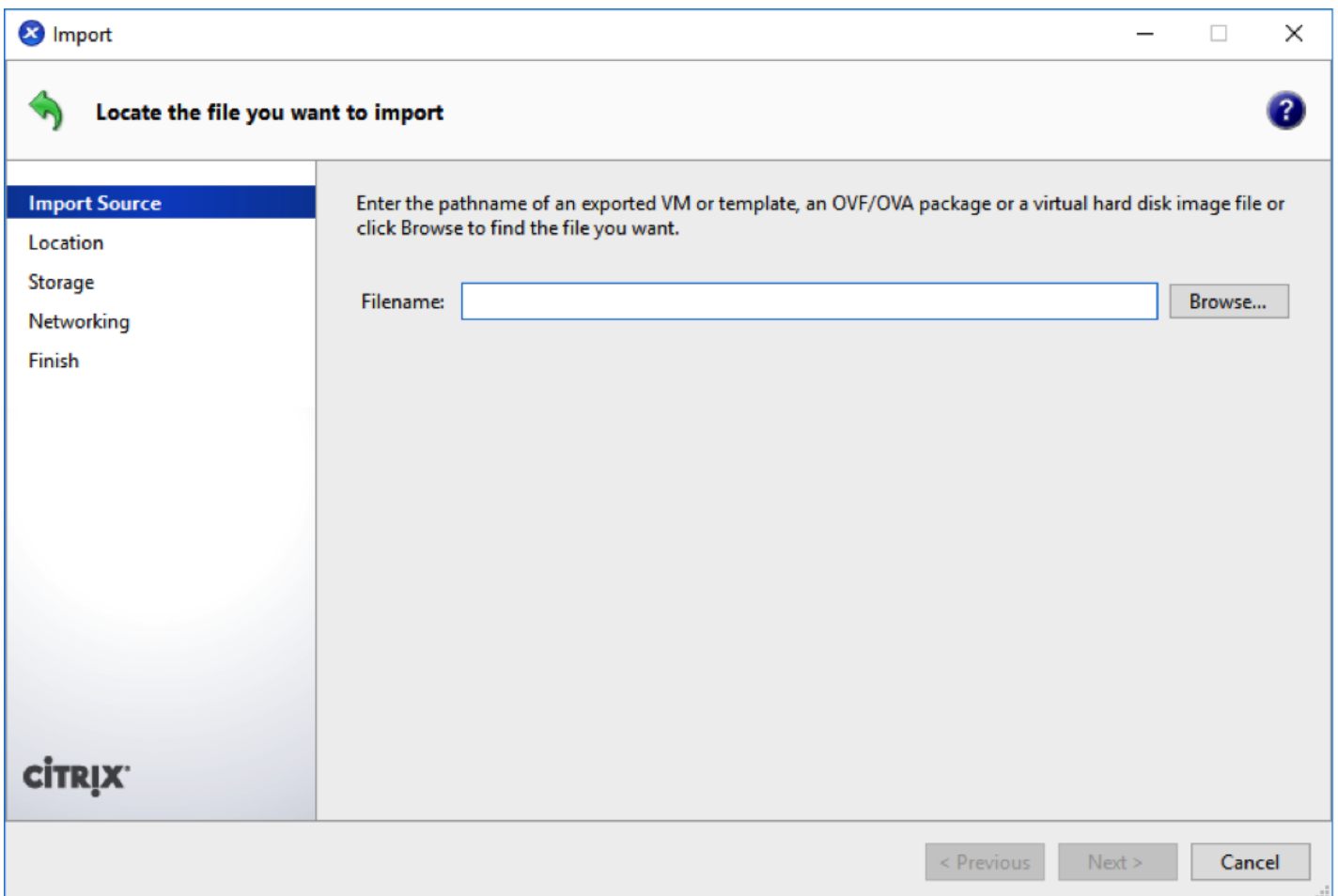
The NetScaler SD-WAN Center virtual machine software is distributed as an XVA file. If you have not already done so, download the .xva file. For more information, see [Downloading the NetScaler SD-WAN Center Software](#)

To create the SD-WAN Center VM:

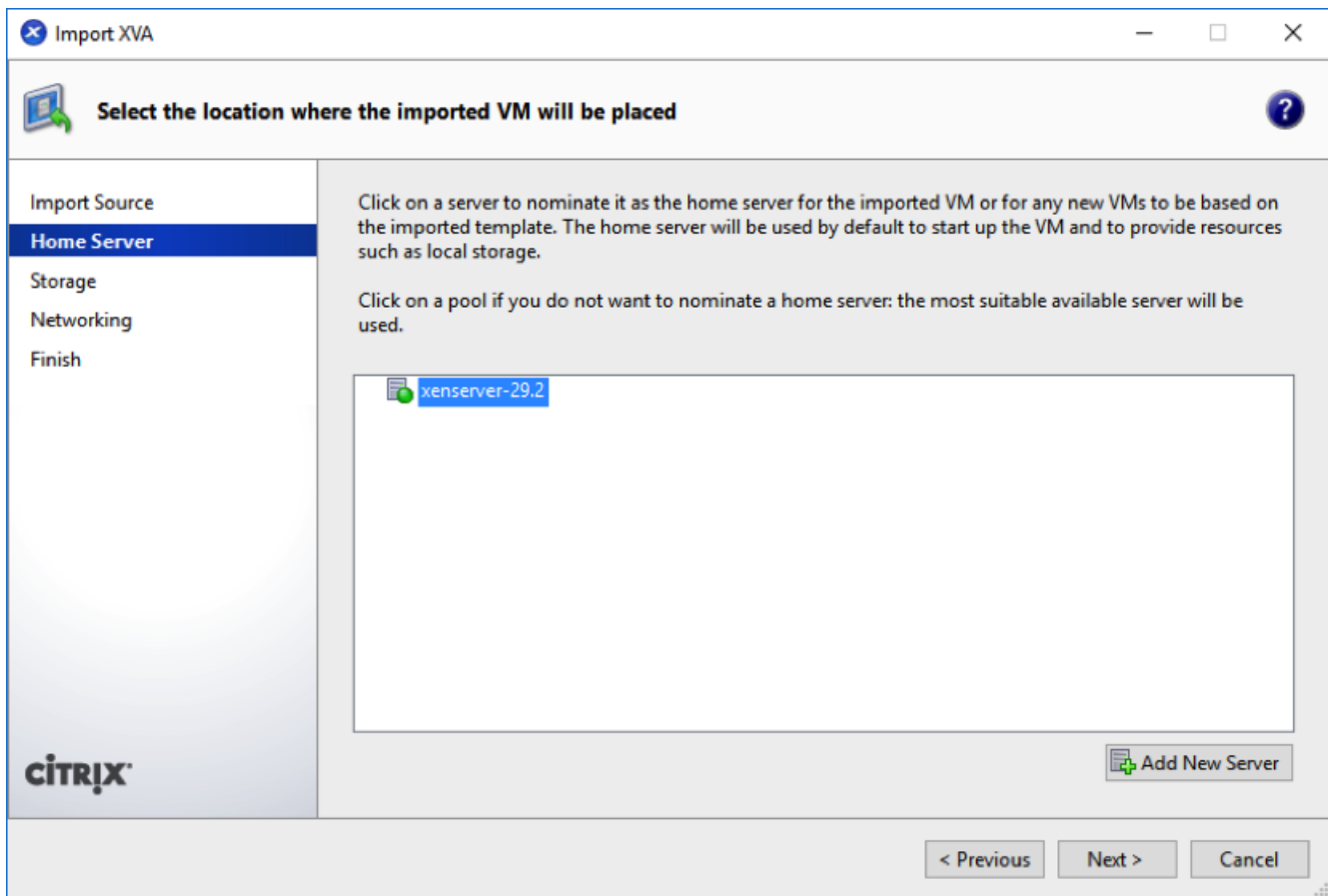
1. In XenCenter, right-click **XenServer** and click **Import**.



2. Browse to the downloaded .xva file, select it, and click **Next**.

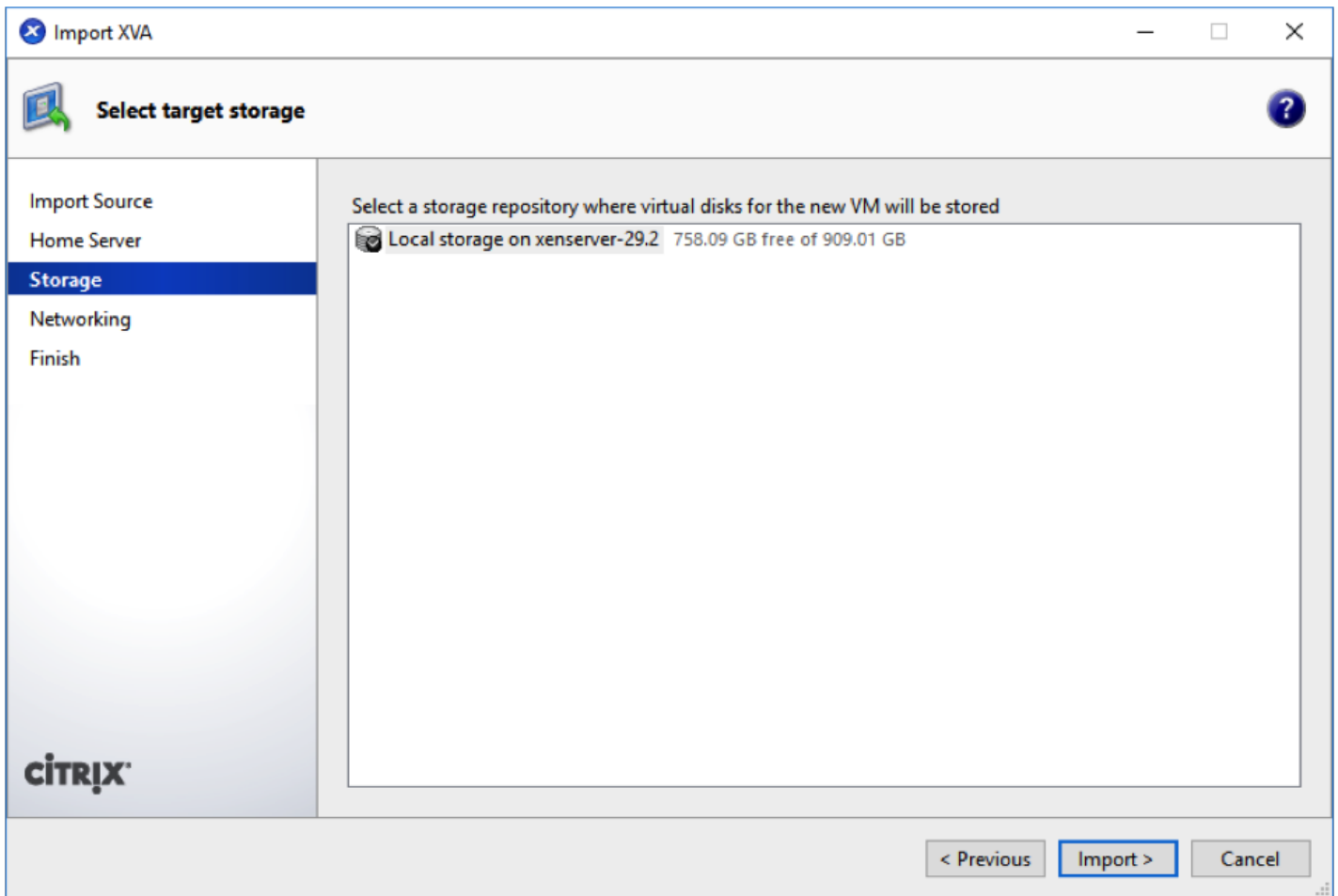


3. Select a previously created XenServer server as the location to which to import the VM, and click **Next**.



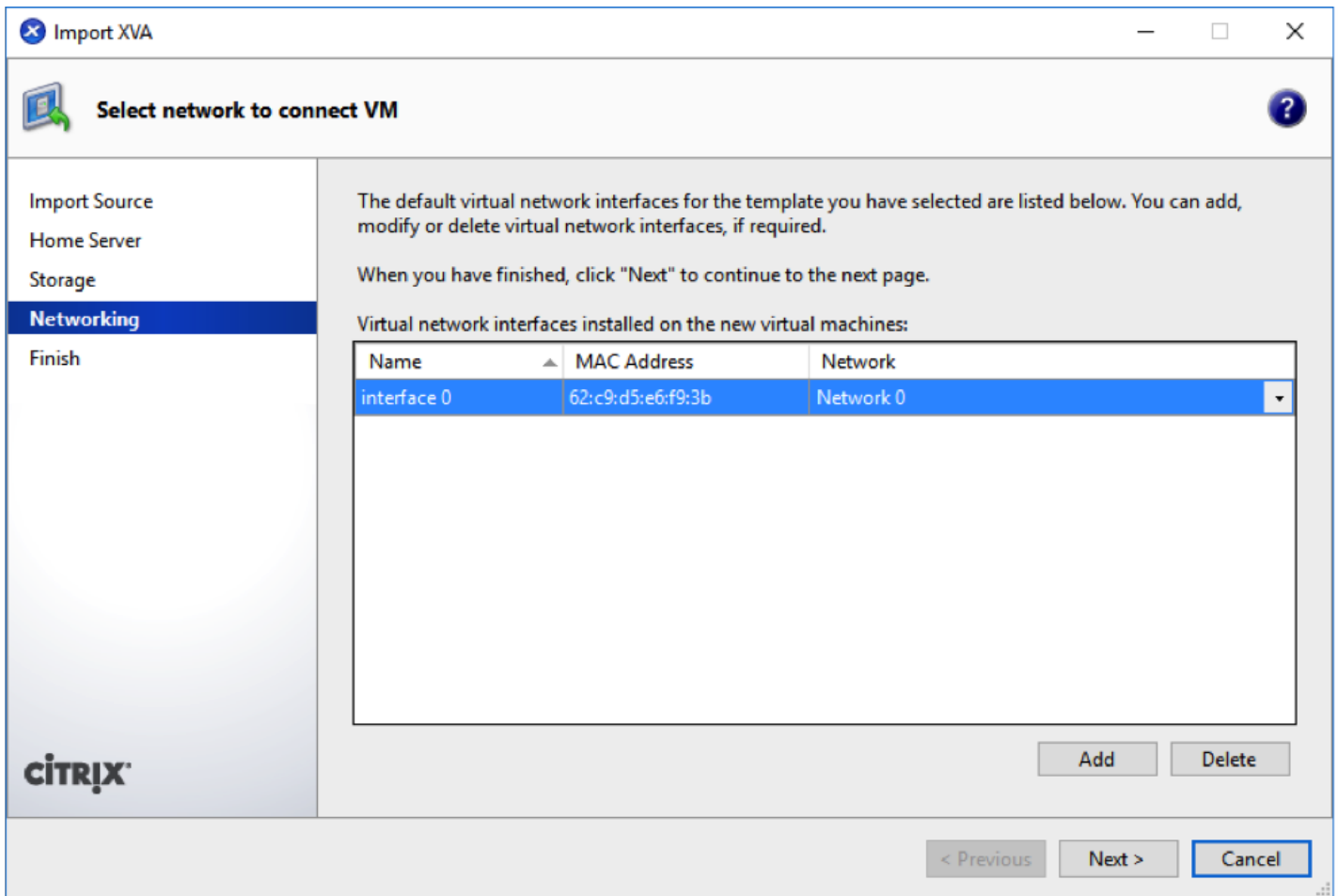
4. Select a storage repository where the virtual disk for the new VM will be stored, and click **Import**.

For now, you can accept the default storage resource. Or you can configure the datastore. For more information see [Adding and Configuring the Datastore on XenServer](#).



The imported SD-WAN Center VM appears in the left pane.

5. Select a network to which to connect the VM, and click **Next**.



6. Click **Finish**.

Viewing and Recording the Management IP Address on XenServer

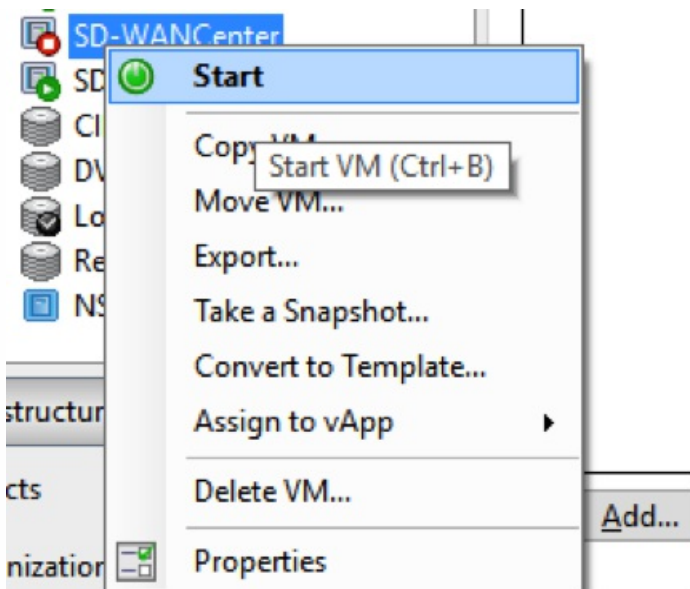
The management IP address is the IP address of the SD-WAN Center VM, use this IP address to log into the SD-WAN Center Web UI.

Note

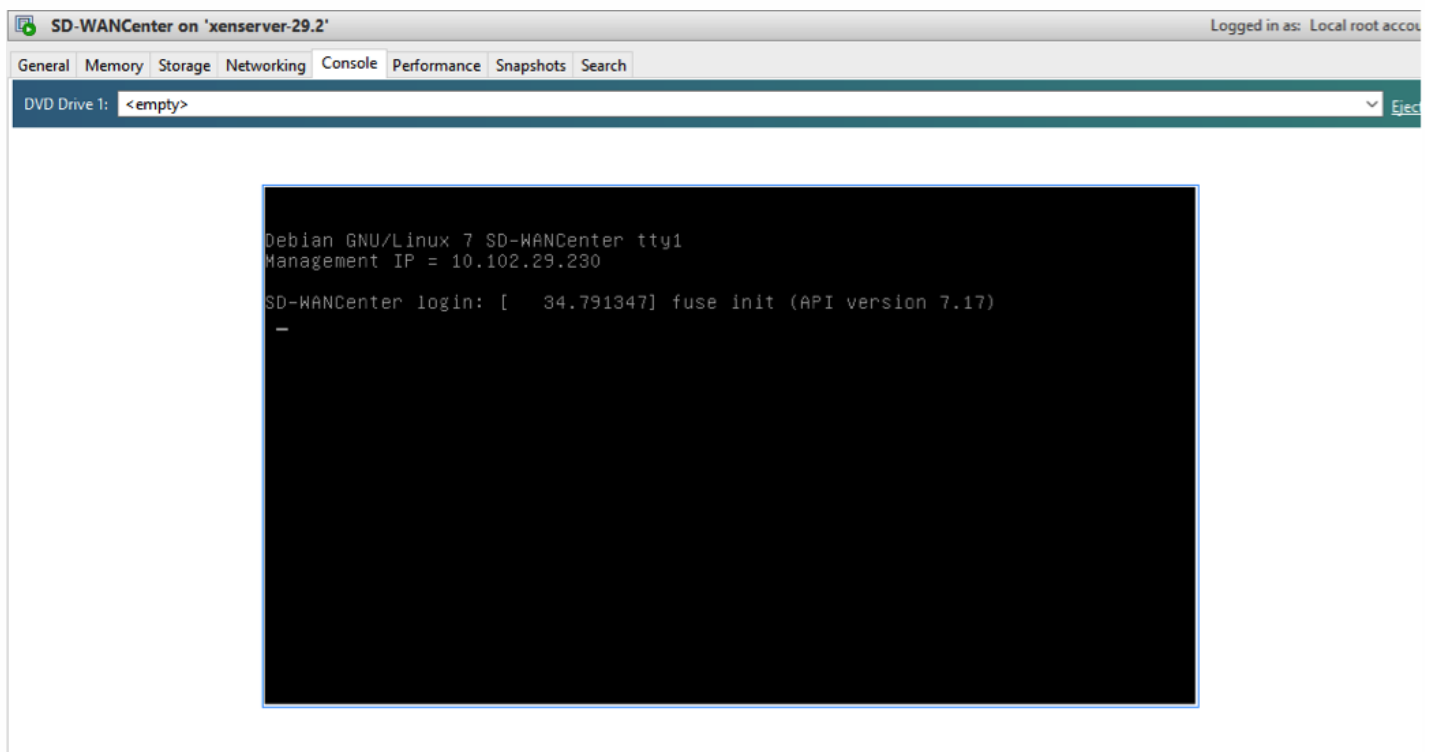
The DHCP server must be present and available in the SD-WAN.

To display the management IP Address

1. In the XenCenter interface, in the left pane, right-click the new SD-WAN Center VM and select **Start**.



2. When the VM is started, click the **Console** tab.



3. Make a note of the management IP address.

Note

The DHCP server must be present and available in the SD-WAN, or this step cannot be completed.

4. Log into the VM. The default login credentials for the new SD-WAN Center VM are as follows:

Login: admin

Password: password

Adding and Configuring the Data Storage for a XenServer Server

You can add and configure data storage to store statistics from SD-WAN center.

To add and configure the data storage

1. In XenCenter, shut down the SD-WAN Center VM.
2. On the **Storage** tab, click **Add**.

Add Virtual Disk

Enter a name, description and size for your virtual disk. The size of your disk and the home server setting of any VM the disk belongs to will affect which storage locations are available.

Name: SD-WAN Center

Description:

Size: 10.000 GB

Location: Local storage on xenserver-29.2 704.22 GB free of 909.01 GB

Add **Cancel**

3. In the **Name** field, enter a name for the virtual disk.
4. In the **Description** field enter a description of the virtual disk.
5. In the **Size** field select the size required.
6. In the **Location** field select the local storage.
7. Switch the active storage to the new data store in the SD-WAN center web interface. For more information, see [Switching the Active Storage to the new data store](#).

Configuring the Management Interface Settings

Sep 27, 2016

You can use the SD-WAN web interface to configure the management interface settings.

The management Interface settings include the following:

- SD-WAN Center Management IP Address
- Gateway IP Address
- Subnet Mask
- Primary DNS
- Secondary DNS

To configure the management interface settings

1. In the SD-WAN Center web interface, select the **Administration** tab.

By default, the **User/Authentication Settings** page appears.

The screenshot shows the SD-WAN Center web interface. The top navigation bar includes Dashboard, Fault, Monitoring, Configuration, Reporting, and Administration (selected). The left sidebar shows the navigation tree with User/Authentication Settings selected. The main content area displays the Administration / User/Authentication Settings page. A yellow banner at the top of the main content area contains a warning: "Add separate disk to store statistics from Virtual WAN when polling Virtual WANs. Click here to navigate to Administration->Storage Maintenance." Below the banner is a "Users" section with a search bar and a table of users. The table has columns for Name, Type, Level, Created, Modified, Last Login, Last Active, and Manage. Two users are listed: 'admin' (Local User, Admin level) and 'root' (Local User, Guest level). Below the table are two sections for authentication: "RADIUS Authentication" and "TACACS+ Authentication". Both sections have a checkbox to "Enable" the respective authentication method and "Apply" and "Verify..." buttons.

Name	Type	Level	Created	Modified	Last Login	Last Active	Manage
admin	Local User	Admin	2016-08-31 14:28:46	2016-08-31 14:28:46	2016-09-08 00:29:00	2016-09-08 00:29:00	⚙️
root	Local User	Guest	2016-08-31 14:32:00	2016-08-31 14:32:00	Never	No Session	⚙️

2. In the navigation tree, select **Global Settings**.

3. Configure the Management and DNS settings.

In the **Management and DNS** section, add the required information to the following fields:

- **IP Address:** Enter the IP Address for the SD-WAN Center.
- **Gateway IP Address:** Enter the Gateway IP Address the SD-WAN Center VM will use to communicate with external networks.
- **Subnet Mask:** Enter the subnet mask to define the network in which the SD-WAN Center VM resides.

4. Click **Apply**.

Note

Connectivity to the SD-WAN Center will be terminated when your changes are applied

Installing the SD-WAN Center Certificate

Jan 01, 2018

To establish a connection between the SD-WAN Center and the SD-WAN Master Control Node (MCN), download the SSL certificate from the SD-WAN Center and installing it on the MCN.

To download and install the SD-WAN certificate

1. In the SD-WAN Center web interface, on the **Configuration** tab, select **Network Discovery**.

3. On the SSL Certificate page, click **Download Certificate**.

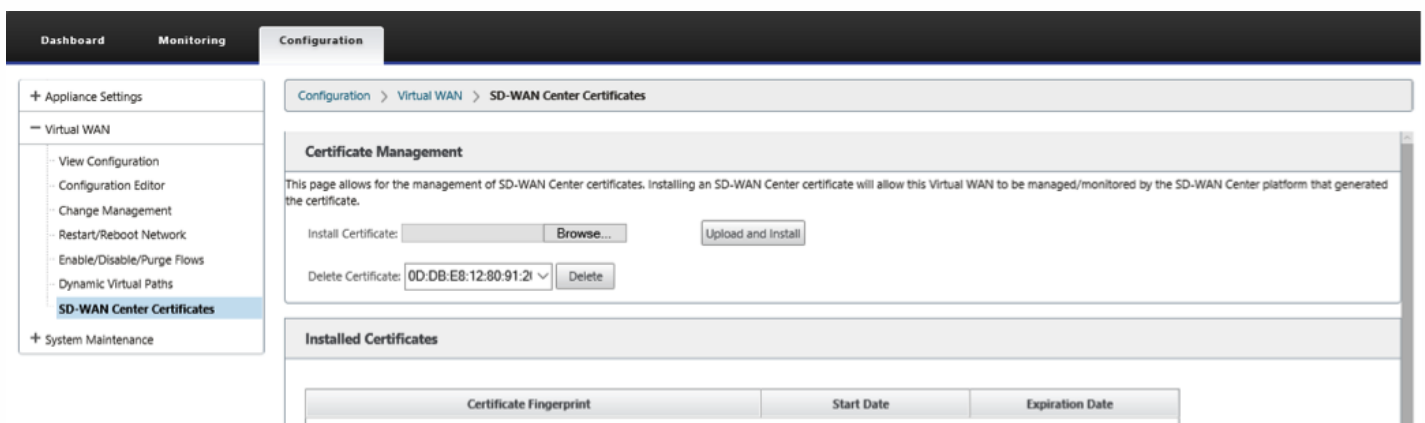
This opens a file browser on your computer for selecting the download location. Navigate to the desired location and save the certificate.

4. Log into the SD-WAN Master Control Node web interface.

5. Click the **Configuration** tab.

6. In the navigation tree (left pane), click the + icon next to the **Virtual WAN** branch.

7. Select **SD-WAN Center Certificates**.



8. On the SD-WAN Center Certificates page, next to the **Install Certificate** field, click **Browse**.

This opens a file browser on the local PC for selecting the file you want to upload. Select the certificate file you just downloaded, and click **Open**.

9. Click **Upload and Install**.

This uploads the certificate file to the master control node (MCN) and displays a success message when installation is complete.

10. Click **Continue**.

This displays the MCN Management Web Interface Dashboard page. At this point, you can log out of the MCN (optional).

Specifying the MCN and Testing the Connection

Sep 27, 2016

Once the connection is established between the SD-WAN Center and the SD-WAN Master Control Node (MCN), you can discover the MCN and test the connection.

To specify the MCN and test the connection

1. Log into the SD-WAN Center web interface.
2. Select the **Configuration** tab.
3. In the navigation tree (left pane), select **Network Discovery**.

This displays the **Network Discovery** page. By default, the **SSL Certificate** tab is preselected.

4. Select the **Discovery Settings** tab.

Configuration / Network Discovery / Discovery Settings

SSL Certificate **Discovery Settings** Inventory And Status

Master Control Node MGT IP Address:

Polling Configuration

Polling Interval (min): Bandwidth Limit (kbps):

5. In the **Master Control Node MGT IP Address** field, enter the management IP address of the associated MCN.

6. Click **Test**.

If the connection succeeds, a green check mark appears. A success message indicates that the connection is established, and that the appliance is eligible to become the MCN.

7. Click **Discover**. Once you have already discovered an MCN, this option changes to **Rediscover**.

8. After the discovery operation completes, select the **Inventory and Status** tab.

The **Inventory and Status** table displays the status information for all the discovered SD-WAN Appliances.

9. Select the **Poll** checkbox in the top left corner of the table heading.

This selects the **Poll** checkbox for each appliance listed in the table. To exclude an appliance from the polling list, clear its check box.

10. Click **Apply**.

Switching the Active Storage to the New Data storage

Sep 27, 2016

In SD-WAN Center, you can switch the active storage to the data store you created on your virtual server. This allows you to store more statistics data obtained by polling all the SD-WAN appliances in the WAN. For information on creating a datastore on ESXi server, see [Adding and Configuring the Datastore on ESXi Server](#). For information on creating a datastore on XenServer, see [Adding and Configuring the Data Storage on XenServer](#).

To specify the active storage for the SD-WAN Center VM

1. Log into the SD-WAN Center VM.

The default login credentials for the SD-WAN Center are as follows:

Login: admin

Password: password

2. Click the **Administration** tab and then click **Storage Maintenance**.

Host	File System	Type	Size (MB)	Available (MB)	Active	Migrate Data
Local*	/dev/xvda2	ext3	7416	4743	<input type="radio"/>	<input type="checkbox"/>
Local	/dev/xvdb	ext3	20480	unknown	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>

3. In the **Active** column of the Storage Systems table, select the storage you created.

4. Select **Migrate Data** and click **Apply**.

5. The **Delete All Existing Files** message appears, click **Switch**.

Delete All Existing Files ✕

Switching the active storage system will remove all existing files on the new file system.

Are you sure you wish to continue?

Switch

Cancel

This places the SD-WAN Center into **Maintenance Mode** and displays a progress bar in the main page area.

6. When the activation completes, click **Continue**.

This dismisses the progress bar and returns to the main **Storage Maintenance** page.

The SD-WAN Center Dashboard

Nov 07, 2016

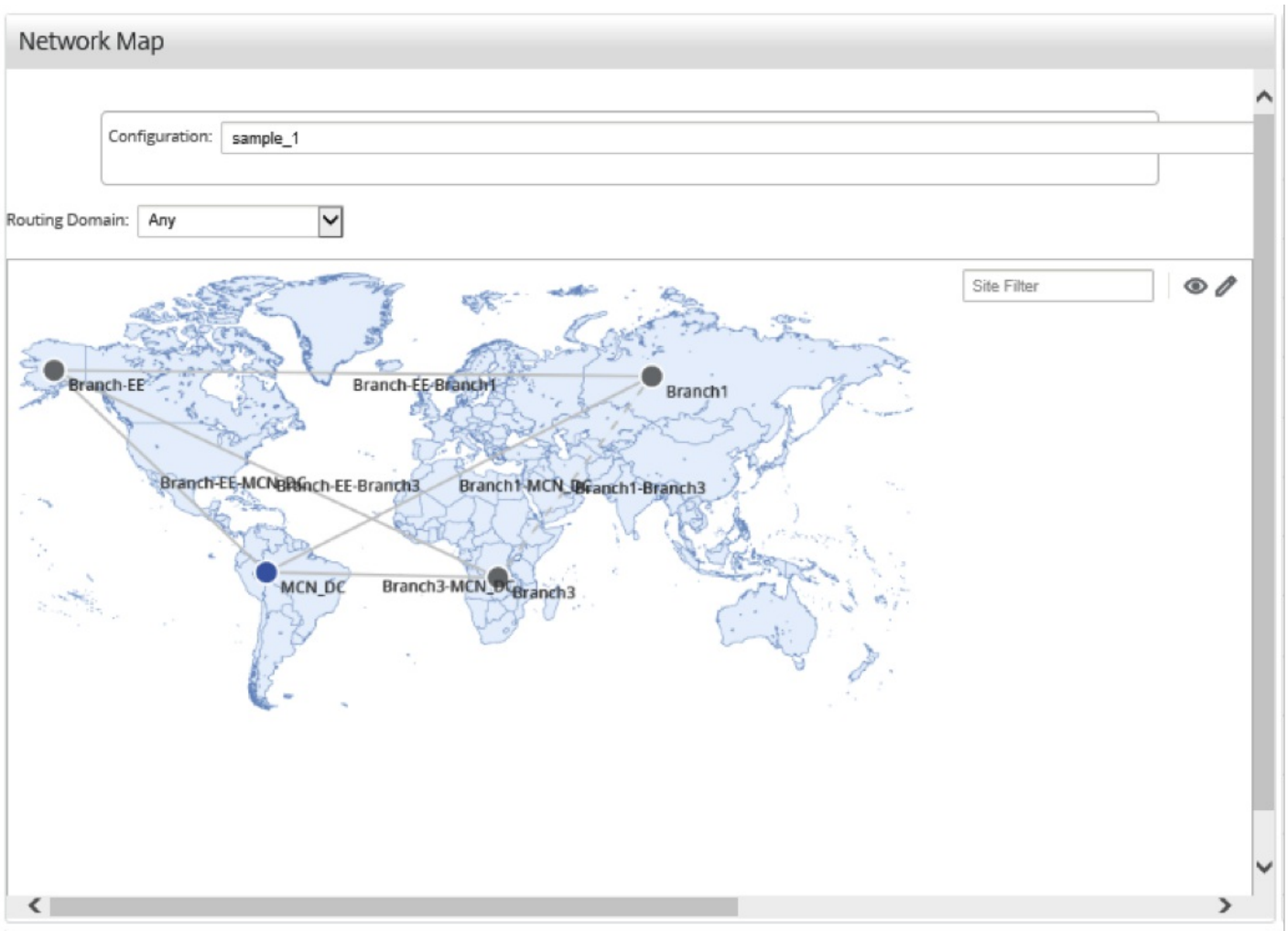
On the **Dashboard** tab, an administrator can create a custom home page that displays content collected from the Monitor tab, network maps, and other tools. The purpose is to show a subset of common operations at a glance

The SD-WAN Center **Dashboard** presents text and graphical displays for the following information:

- Graphical display of the current network map of the SD-WAN
- A table of events recorded upto a granularity of an hour
- Inventory Manager
- Virtual Path report, an average measure over the last 24 hours
- Graphical display of the Alarm Summary
- Graphical display of the current database usage
- Graphical display of the current active OS usage in Gigabytes

Network Map

The network map provides a graphical view of the SD-WAN network. The information displayed in this section is gathered from the Network Configuration tab. In order to view a network map here, you must import the network configuration and Network maps from the Master Controller Node (MCN). For more information, see [How to Import Network Configuration from MCN to SD-WAN Center](#).



Current Events

The Current Events section of the dashboard displays the events from all the discovered appliances in the network, that occurred in the last one hour. The information displayed in this section is gathered from the Fault tab. For more information, see [Events](#).

Current Events (Last 1 Hour)

Routing Domain: Any

25 / page Showing 1 - 25 of 596

Time	Site	Object Name	Object Type	Severity	Current State
09/26/16 19:49:30	SD-WAN Center	BR452:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:28	SD-WAN Center	BR425:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:27	SD-WAN Center	BR402:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:26	SD-WAN Center	BR376:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:25	SD-WAN Center	BR420:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:24	SD-WAN Center	BR408:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:21	SD-WAN Center	BR472:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:20	SD-WAN Center	BR445:0	connection_to_virtual_wan	ALERT	STATS_ERROR
09/26/16 19:49:17	SD-WAN Center	BR474:0	connection_to_virtual_wan	ALERT	STATS_ERROR

Inventory Manager

Once every 30 minutes, the Inventory Manager gathers the hardware information collected from all the SD-WAN

appliances that have been discovered by the SD-WAN Center VM. The Inventory Manager page displays this data in columns that you select and filter. The following columns are available:

- **Site:** Name of the site found in the configuration running in the MCN. If the appliance is a secondary MCN, “(secondary)” appears next to the name. The name is a link to connect to the appliance management web console.
- **Connection Status:** Connectivity state to the appliance. A red icon appears when the connection is not reachable or not authenticated.
- **Management IP:** Management IP address of the appliance. The IP address is a link to the appliance management web console.
- **Licensed Capacity:** Type of capacity licensed to the appliance. N/A if the appliance does not require a license.
- **Model:** Hardware model of the appliance
- **Serial Number:** Serial Number of the appliance.
- **BIOS Version:** BIOS version of the appliance.
- **BMC Version:** Baseboard Management Controller (BMC) firmware version of the appliance. The BMC monitors the physical state of the appliance. The BMC is currently available only for SD-WAN 1000 SE and SD-WAN 2000 SE models. An error icon next to the version indicates that the OS is not able to communicate with the BMC.
- **Days Since Memory Dump:** Time since last system-error memory dump. If the appliance dumped its memory in the past 4 days, an error icon appears next to the time. If the memory dump occurred between 5 and 10 days ago, a warning icon appears. N/A appears if no dump is available. Clicking on the time opens the log page of the SD-WAN.
- **Active OS:** The OS currently running on the appliance.
- **Backup OS:** The OS on the appliance's backup partition.
- **RAM Size (GB):** Amount of Random Access Memory currently installed on the appliance in GB.
- **Drive Type:** Type of data-storage drive installed on the appliance. The value can be SSD (Solid State Drive) or HDD (Hard Disk Drive).
- **Drive Size (GB):** Size of the data-storage drive currently installed on the appliance in GB.
- **Drive Model:** Model of the data-storage drive installed on the appliance.

The screenshot shows the 'Inventory Manager' web interface. At the top, there are buttons for 'New View', 'Open...', 'Save', and 'Save As...'. Below these is a 'Routing Domain' dropdown menu set to 'Any'. A 'Filters' section is visible with a plus sign and a search box. The main content is a table with the following columns: Site, BIOS Version, Model, Serial Number, Days Since Memory Dump, Active OS, RAM Size (GB), Drive Type, and Drive Size (GB). The table displays 7 rows of data for sites BR257 through BR263.

Site	BIOS Version	Model	Serial Number	Days Since Memory Dump	Active OS	RAM Size (GB)	Drive Type	Drive Size (GB)
BR257	4.4.1-xs100654	cbvpx	5a75dfec-fa16-0e4e-346f-8161283f65ac	N/A	4.5	4	N/A	41
BR258	4.4.1-xs100654	cbvpx	2736de4f-93e5-651f-8888-e87827f25c2b	N/A	4.5	4	N/A	41
BR259	4.4.1-xs100654	cbvpx	3e94257b-2e7c-11c7-ab8c-6cd2fc4cb05e	N/A	4.5	4	N/A	41
BR260	4.4.1-xs100654	cbvpx	978499fa-9f19-f470-3d92-7d826e46b90d	N/A	4.5	4	N/A	41
BR261	4.4.1-xs100654	cbvpx	8fcacc9e-b056-063a-56d3-b4dfed600ff4	N/A	4.5	4	N/A	41
BR262	4.4.1-xs100654	cbvpx	3d51979d-5834-d1a8-0a44-156713ef06b5	N/A	4.5	4	N/A	41
BR263	4.4.1-xs100654	cbvpx	0ea061bf-37cb-9686-19cd-b43dc3502a67	N/A	4.5	4	N/A	41

Virtual Path Report

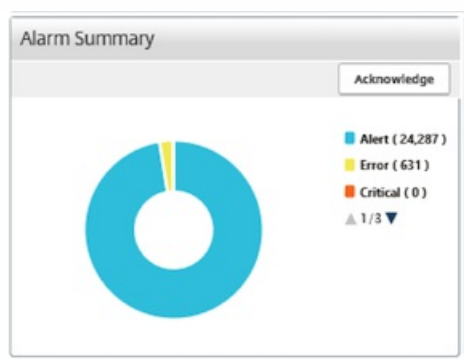
The Virtual Path Reports section of the dashboard displays virtual path level statistics for every virtual path in virtual WAN network that was measured as an average over the last 24 hours.

For more information, see [Reports](#).

Virtual Path Report (Last 24 Hours)		
Routing Domain: <input type="text" value="Any"/>		
10 / page Showing 1 - 10 of 106		<input type="text" value="Search"/>
Name ^	Worst State	Up Time (%)
BR257-DC5k	GOOD	100.0
BR258-DC5k	GOOD	100.0
BR259-DC5k	GOOD	100.0
BR260-DC5k	GOOD	100.0
BR261-DC5k	GOOD	100.0
BR262-DC5k	GOOD	100.0
BR263-DC5k	GOOD	100.0
BR264-DC5k	GOOD	100.0
BR265-DC5k	GOOD	100.0
BR266-DC5k	GOOD	100.0

Alarm Summary

The Alarm Summary section of the dashboard gives a graphical overview of the type and quantity of events. You can click on the graph to view the events on the Fault page.

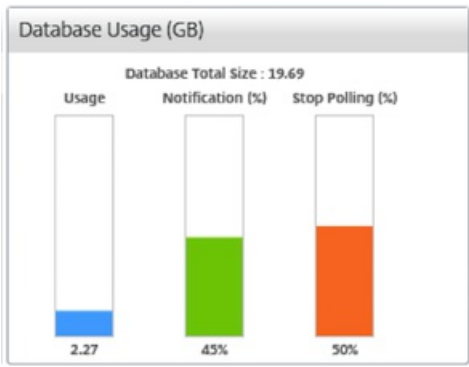


Database Usage

The Database Usage section of the dashboard displays a graphical overview of the database-resource usage and the thresholds for sending notifications or halting the collection of data. You can click on the graph to view the details on the Database Maintenance page.

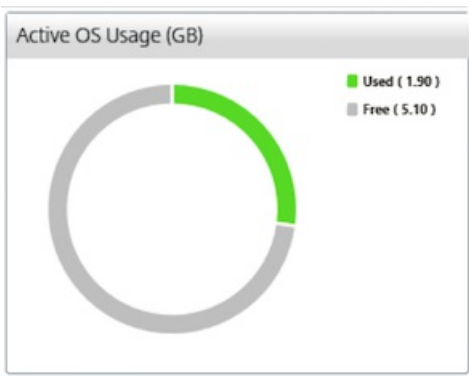
- **Usage:** Database capacity currently being used, in GB.
- **Notification:** Threshold for generating a database usage notification. The threshold is a percentage of the maximum size of the database. If an email alert is configured, an email notification is sent when the size of the database exceeds this threshold. For more information, see [Setting Notifications](#).
- **Stop Polling:** Threshold for halting statistics polling. The threshold is a percentage of the maximum size of the database. Polling stops when the size of the database exceeds this threshold.

For more information, [How to Manage Database](#).



Active OS Usage

The Active OS Usage section of the dashboard gives a graphical overview of the used and available storage space in GB. You can click on the graph to view the details in the Storage Maintenance page.



Events

Jan 05, 2017

SD-WAN Center collects event information from all the discovered appliances in the network. This event information can be filtered and viewed in the **Event Viewer** page.

The event details include the following information.

- **Time:** The time the event was generated.
- **Site:** The name of the site on which the event originated.
- **Appliance ID:** Shows whether the appliance from which the event originated is a primary (**0**) or secondary (**1**) appliance.

Note

The Appliance ID column is hidden by default. To display the column, click **Show/Hide** (gear icon) and select the **Appliance ID** checkbox from the drop-down menu

- **Object Name:** The name of the object generating the event.
- **Object Type:** The type of object generating the event.
- **Severity:** The severity level of the event.
- **Previous State:** The state of the object before the event. The state will be listed as **unknown** if not applicable.
- **Current State:** The state of the object at the time of the event.
- **Description:** A text description of the event.

Viewing events

You can view the events, filter it and also download it from the Event Viewer page.

To access the event viewer page.

In the SD-WAN Center web interface click the **Fault** tab.

The Event Viewer page appears by default.

Event Viewer

Time: September 23, 2016 2:14am Last: Hour / Day / Week / Month Mode: Relative (16 hours ago - 8 hours from now)

Routing Domain: Any

Filters: + Severity greater than info

25 / page Showing 1 - 25 of 267

Time	Site	Object Name	Object Type	Severity	Previous State	Current State	Description
09/23/16 1:32:53	DC2-201	BR2-139-WL-1->DC2-201-WL-2	wan_to_lan_path	NOTICE	BAD	GOOD	The state of wan_to_lan_path BR2-139-WL-1->DC2-201-WL-2 for Site: DC2-201 has changed from BAD to GOOD
09/23/16 1:32:53	DC2-201	BR2-139-DC2-201	virtual path	NOTICE	BAD	GOOD	The state of Virtual Path: BR2-139-DC2-201 has changed from BAD to GOOD
09/23/16 1:32:53	DC2-201	BR2-139-WL-1->DC2-201-WL-1	wan_to_lan_path	NOTICE	BAD	GOOD	The state of wan_to_lan_path BR2-139-WL-1->DC2-201-WL-1 for Site: DC2-201 has changed from BAD to GOOD

You can select and view events of a particular time frame by using the timeline controls. For more information, see, [How to use timeline controls](#).

You can also create, save and open event views. For more information, see, [How to manage views](#).

Using Filters

You can create custom filters for narrowing the Events table results.

To create and apply a filter

1. Click + icon to the right of the **Filters** section label.
2. Select a category from the drop-down menu.

The options available are:

- Size
- Object Name
- Object Type
- Severity
- Previous State
- Current State

3. Select an operator from the middle drop-down menu.

The options are as follows:

- is
- is not
- is one of
- contains

- does not contain
- less than
- less than or equal to
- greater than
- greater than or equal to

4. Enter the string or value by which to delimit the filter.

Note

This field is case sensitive.



Note

You can create and apply multiple filters.

To download the events table as a CSV file

Click the Download icon at the upper right corner of the events table.

Setting Notification

You can configure the SD-WAN center to send out email alerts about events generated on the appliances.

To configure email alerts

1. In the SD-WAN Center web interface, click the **Fault** tab.
2. Click **Notification Settings**.
3. Select **Enable Event Emails**.
4. In the **Destination Email Address** field, enter an email address to be used as the destination for all event email notifications from this system.
5. In the **Source Email Address** field, enter an email address to be used as the source email address for all event emails from this system.

This field is optional. To use the system default, leave this field empty.

6. In the **Host** field, enter the IP address or host name of the external SMTP server to be used to relay messages to the Internet.

7. In the **Port** field, enter the port to be used for the SMTP connection (default is port **25**).

Email Alerts

Email Settings

Enable Event Emails

Destination Email Address(es): Host: Port:

Source Email Address:

8. Click **Apply**.
9. Optionally, click Send Test Message to send a test email to the specified destination.
10. Click the **Severity Settings** tab.
11. From the list of event types, select the event types for which you want to receive an email notification.

Dashboard Fault Monitoring Configuration Reporting Administration			
Event Viewer			
Notification Settings			
Severity Settings			
Fault / Severity Settings			Email
Event Type	Alert if State Persists		
service	10 Seconds	<input checked="" type="checkbox"/>	WARNING
virtual_path	Alert Immediately	<input type="checkbox"/>	WARNING
wanlink	800 Seconds	<input checked="" type="checkbox"/>	CRITICAL
path	80 Seconds	<input checked="" type="checkbox"/>	INFO
dynamic_virtual_path	Alert Immediately	<input checked="" type="checkbox"/>	DEBUG
wan_link_congestion	Alert Immediately	<input type="checkbox"/>	ALERT
usage_congestion	Alert Immediately	<input checked="" type="checkbox"/>	WARNING
hard_disk		<input checked="" type="checkbox"/>	WARNING
fan		<input type="checkbox"/>	WARNING
virtual_wan		<input checked="" type="checkbox"/>	WARNING
virtual_wan_user		<input checked="" type="checkbox"/>	WARNING

12. For each event type, in the **Alert if Sate Persists** field select the time duration after which if the event persists an email notification will be sent.

13. For each event type, select the severity level from the drop-down list. Notifications are generated for events equal to or above the specified severity level for the event type.

The available options are as follows, in descending order of severity:

- EMERGENCY
- ALERT
- CRITICAL
- ERROR
- WARNING
- NOTICE
- INFORMATIONAL
- DEBUG

14. Click **Apply**.

For more information on event statistics, see [How to View Event Statistics](#).

Reports

Jan 05, 2017

SD-WAN Center can provide the following reports:

- **Sites:** Displays site level statistics for every site in the Virtual WAN. Sites rows expand to show the **Services** table filtered for the Site.
- **Service:** Displays summary statistics by service type (Virtual Path, Internet, Intranet and Pass-through) for every site in the Virtual WAN. Services rows expand to show the individual Services for the Service type.
- **Virtual Paths:** Displays Virtual Path level statistics for every Virtual Path in the SD-WAN. Virtual Paths rows expand to show the Paths contained within the Virtual Path

Note

Virtual Path data is recorded from the perspective of both endpoints, as such, each Virtual Path may have two rows identified by the Site that recorded the statistics.

- **Paths:** Displays Path level statistics for every Path in the Virtual WAN.
- **WAN Links:** Displays WAN Link level statistics for every WAN Link at each Site in the Virtual WAN. WAN Links rows expand to show a Usage Summary for each Service type for that WAN Link. Each Service type row will then expand to show usages for each Service of that type. If the WAN Link is a Private MPLS link, a second table will be shown showing the MPLS Queues for the WAN Link.
- **MPLS Queues:** The MPLS Queues rows expand to show a usage summary for each Service type for that Queue. Each Service type row will then expand to show usages for each Service of that type.
- **Classes:** Displays Class level statistics for every Class for each Virtual Path in the Virtual WAN.
- **Applications:** Displays Application wide MOS quality estimation statistics on a per Virtual Path basis. The "Average Virtual WAN MOS" field displays the average quality score calculated over all packets observed in a particular minute. "Lowest Virtual WAN MOS" displays the quality score calculated over the worst sampling period from within that particular minute.

Note

The Lowest Virtual WAN MOS is calculated using the worst latency for a single packet observed on WAN to LAN that matches the application over that minute, and the worst one second sampling of loss percentage for all flows matching the application for that minute.

To clarify the worst loss sample statement: If there are 20 flows matching the application, we would take a 1 second sample for each flow for each second calculating the loss percentage for that flow for that second. The worst of these samples that we encounter ends up being the loss percentage that we would use for calculating that Lowest Virtual WAN MOS.

- **Ethernet Interfaces:** Displays Ethernet Interface level statistics for every Interface at each Site in the Virtual WAN.
- **GRE Tunnels:** Displays statistics of every LAN GRE tunnel at each site in the WAN.
- **IPsec Tunnels:** Displays statistics of every IP security tunnel at each site in the WAN.

- **Events:** Displays summary counts of events occurring at each Site in the Virtual WAN. **Events** rows expand to show summary counts by Object Type for that Site. Each Object Type will then expand to show summary counts for each Object of that type.

Viewing Reports

On the **Reporting** tab of the SD-WAN Center web interface, you can view all reports or selected reports. You can also download reports.

You can select and view reports of a particular time frame by using the timeline controls. For more information, see, [How to use timeline controls](#).

You can also create, save and open report views. For more information, see, [How to manage views](#).

For more details on viewing different reports, see the following topics:

[How to View Bandwidth Statistics](#)

[How to View Link Performance Statistics](#)

[How to View MOS for Applications](#)

[How to View GRE Tunnel Statistics](#)

[How to View IPsec Tunnel Statistics](#)

[How to View MPLS Queues statistics](#)

[How to View Class Statistics](#)

[How to View Event Statistics](#)

[How to View Ethernet Interface Statistics](#)

The Change Management Wizard

Sep 29, 2016

The Change Management wizard guides you through the process of uploading, downloading, staging, and activating the SD-WAN software and configuration on the Master Control Node (MCN) appliance and client appliances.

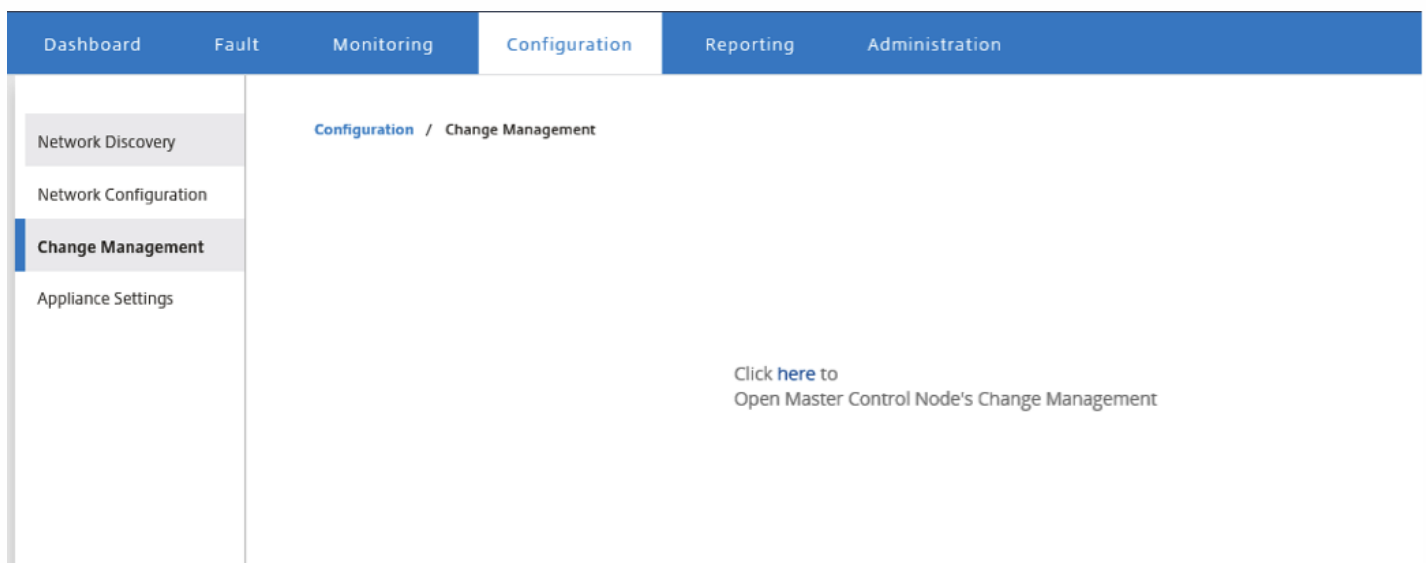
The Change Management wizard is a component of the SD-WAN Management Web Interface running on the MCN, and is not part of the SD-WAN Center. However, you can use the SD-WAN Center to connect to the specified MCN, and access the Change Management wizard.

Note

You must specify the MCN for the SD-WAN Center virtual machine before you can use SD-WAN Center to access the Change Management wizard on that MCN. For instructions, see, [Specifying the MCN and Testing the Connection](#).

To open the Change Management Wizard

1. In the SD-WAN Center web interface, click the **Configuration** tab.
2. Click **Change Management**.

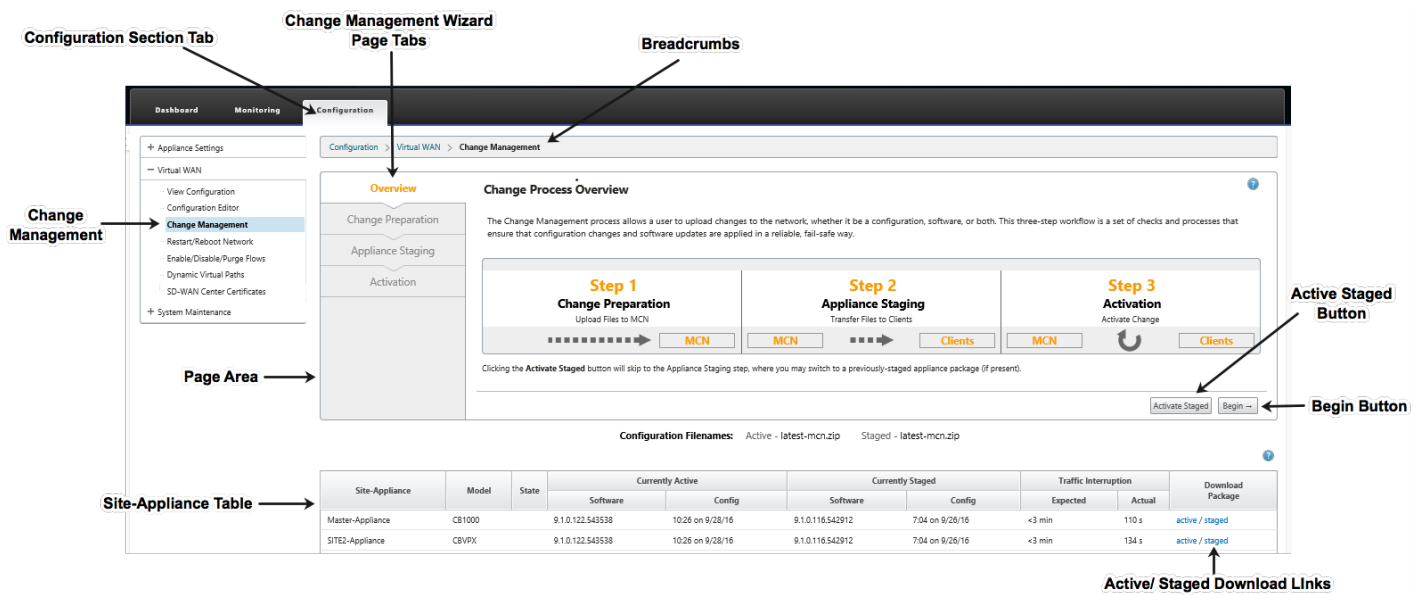


3. At the Click [here](#) to Open Master Control Node's Change Management prompt, click the [here](#) link.

The Login page for the SD-WAN Management Web Interface running on the associated MCN appears.

4. Log into the Management Web Interface on the MCN appliance.
5. Select the **Configuration** tab.
6. In the navigation tree (left pane), click + next to the **Virtual WAN** branch to expand that branch.
7. Click **Change Management**.

This displays the first page of the **Change Management** wizard, the **Change Process Overview** page, as shown in the figure below.



8. To start the wizard, click **Begin**.

Note

For complete instructions on using the wizard to upload, stage, and activate the SD-WAN software and configuration on the appliances, please see the SD-WAN 9.1.0 User Guide.

The **Change Management** wizard has the following navigation elements:

- **Page area:** Displays the forms, tables, and activity buttons for each page of the **Change Management** wizard.
- **Change Management wizard page tabs:** On the left side of the page area, on each page of the wizard, tabs are listed in the order in which the corresponding steps occur in the wizard process. When a tab is active, you can click it to return to a previous page in the wizard. An active tab displays its name in a blue font. A gray font indicates an inactive tab. Tabs are inactive until all dependencies (previous steps) have been fulfilled without error.
- **Appliance-Site table:** At the bottom of the wizard page area, this table contains information about each configured appliance site, and links for downloading the active or staged appliance packages for that appliance model and site. A package in this context is a zip-file bundle containing the appropriate SD-WAN software package for that appliance model, and the specified configuration package. The Configuration Filenames section above the table shows the package name for the current active and staged packages on the local appliance.
- **Active/Staged download links:** In the **Download Package** field (far right column) of each entry in the **Appliance-Site** table, you can click a link in an entry to download the active or staged package for that appliance's site.
- **Begin button:** Click **Begin** to initiate the **Change Management** wizard process and proceed to the **Change Preparation** tab page.
- **Activate Staged button:** If this is not an initial deployment, and you want to activate the currently staged configuration, you have the option of proceeding directly to the **Activation** step. Click **Activate Staged** to proceed directly to the **Activation** page and initiate activation of the currently staged configuration.

The Configuration Editor

Oct 06, 2016

The Configuration Editor is available as a component of the SD-WAN Center Web Interface, and in the SD-WAN Management Web Interface running on the Master Control Node (MCN) of the SD-WAN.

Note

You cannot push configurations to the discovered appliances directly from SD-WAN Center.

You can use the Configuration Editor to edit the configuration settings and to create a configuration package. When the configuration package has been created, you can export it to the MCN and install it. The changes are then reflected in the MCN.

Note

You have to log on with administrative rights to the SD-WAN Center appliance and the MCN, to edit the configurations on SD-WAN center and to export and install the configurations on the MCN.

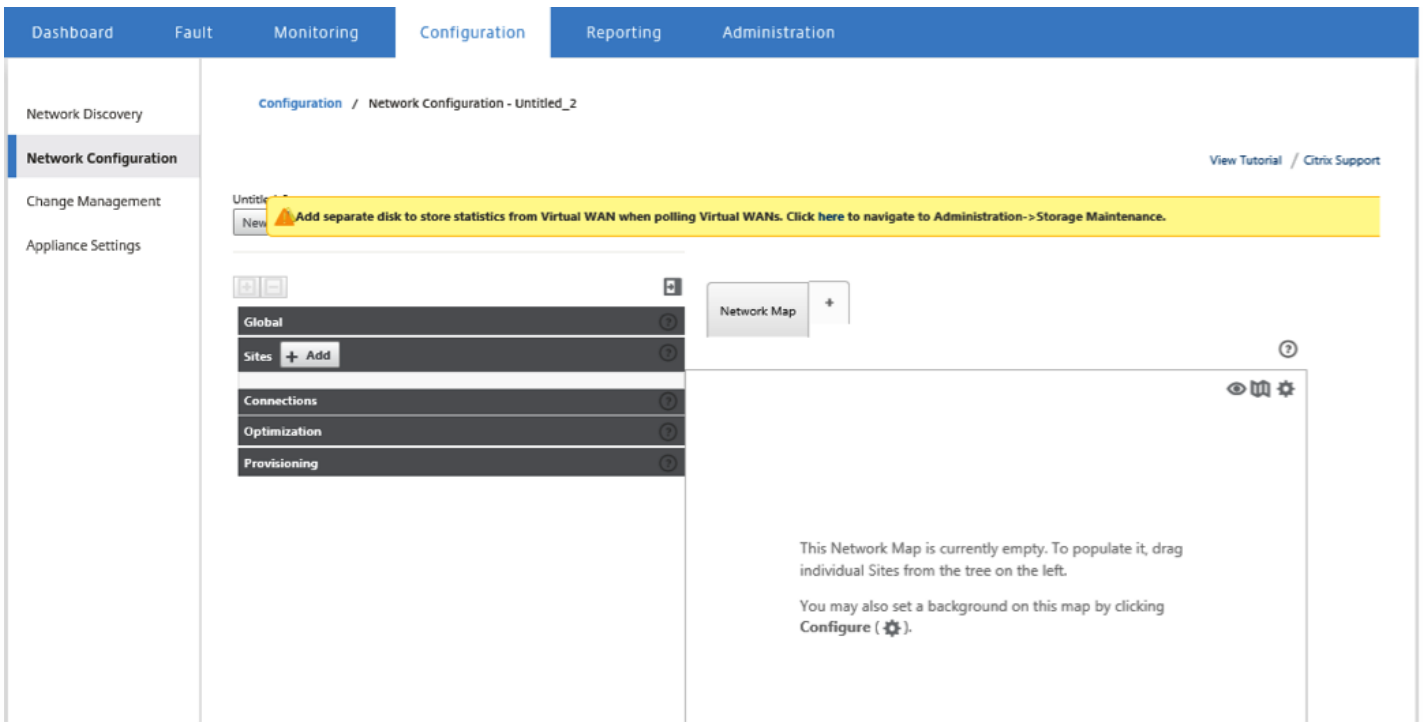
For detailed instructions on using the Configuration Editor to configure your SD-WAN, see the SD-WAN 9.0 documentation on <http://docs.citrix.com/en-us/netScaler-sd-wan/9-1.html>.

The Configuration Editor enables you to do the following:

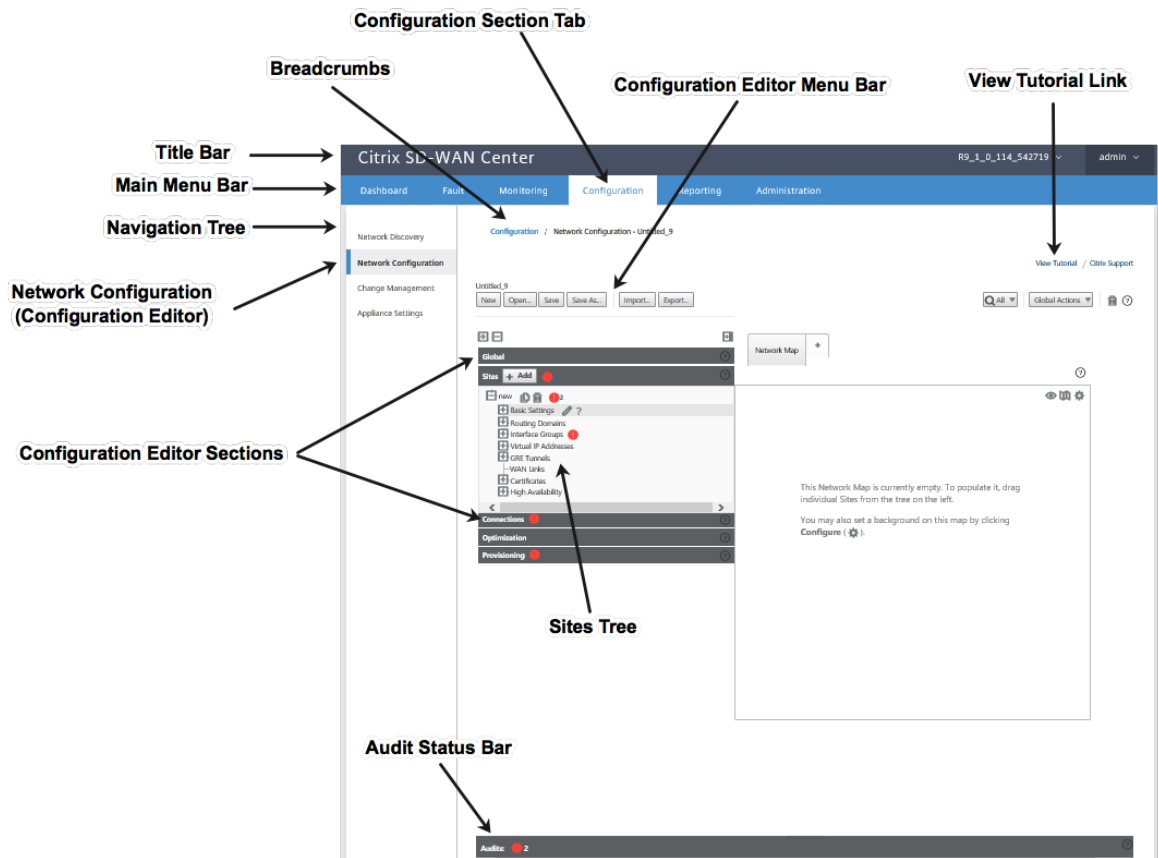
- Add and configure SD-WAN Appliance sites and connections.
- Provision the SD-WAN appliance.
- Create and define SD-WAN Configuration.
- Define and view Network Maps of your SD-WAN system.

To open the Configuration Editor

1. In the SD-WAN Center web interface, click the **Configuration** tab.
2. Click **Network Configuration**.



The below figure outlines the basic navigation and page elements of the **Configuration Editor**, and the terminology used in this guide to identify them.



The primary screen of the Configuration Editor has the following navigation elements:

- **Configuration Editor menu bar:** Contains the primary activity buttons for Configuration Editor operations. In addition,

at the far right edge of the menu bar is the **View Tutorial** link button for initiating the Configuration Editor tutorial. The tutorial walks you through a series of bubble descriptions for each element of the Configuration Editor display.

- **Configuration Editor sections tree:** The stack of dark grey bars located in the left pane of the **Configuration Editor** page area. Each grey bar represents a top-level section. There are five sections: **Global**, **Sites**, **Connections**, **Optimization** and **Provisioning**. Click a section bar to expand a section and reveal the configuration tree for that section. Click the bar again to collapse the section.
- **Section tree branches:** Click the + (plus sign) icon at the left of a section branch name in the section tree to open a section branch. Click – (minus sign) to close a branch. Each section branch includes one or more sub-branches of configuration categories and forms, which in turn can contain additional child branches and forms.
- **Sites tree:** Lists the site nodes that have been added to the configuration and are currently opened in the Configuration Editor. In the section tree, click the + icon at the left of **Sites** to open the **Sites** tree. Click + to the left of a site name to open the branch for that site. Click – (minus sign) to close a branch.
- **Audits status bar:** The dark grey bar at the bottom of the Configuration Editor page, and spanning the entire width of the Configuration Editor page. The **Audits** status bar is available only when the **Configuration Editor** is open. An Audit Alert icon (red dot or goldenrod delta) at the far left of the status bar indicates one or more errors present in the currently opened configuration. Click the status bar to display a complete list of all unresolved audit alerts for that configuration.
- **Resize bar:** The thin, grey, vertical bar on the right border of the main page area pane is available in most of the Configuration Editor pages. You can use the resize bar to grow or shrink the width of the page area to reveal or truncate content in a table, tree, or form. Roll your cursor over the resize bar until the cursor changes to a bidirectional arrow. Then click and drag the bar to the right or left to grow or shrink the area width.

If the resize bar is not available for a page area, you can click and drag the right edge of your browser to display the full page.

How-to Articles

Mar 07, 2017

NetScaler SD-WAN Center "How-to Articles" are simple, relevant, and easy to implement articles on the features of NetScaler SD-WAN Center. These articles contain procedures on how to perform certain tasks using SD-WAN Center.

Administration

[How to View and Add User Accounts](#)

[How to Configure RADIUS Authentication](#)

[How to Configuring TACACS+ Authentication](#)

[How to Manage HTTPS Certificates](#)

[How to Perform a Software Upgrade](#)

[How to Configure Date and Time](#)

[How to Manage Database](#)

[How to Configure and Export Appliance Settings to Managed Appliances](#)

Configuration

[How to Import the MCN Configuration to SD-WAN Center](#)

Analytics

[How to View Bandwidth Statistics](#)

[How to View Link Performance Statistics](#)

[How to View MOS for Applications](#)

[How to View GRE Tunnel Statistics](#)

[How to View IPsec Tunnel Statistics](#)

[How to View MPLS Queues statistics](#)

[How to View Class Statistics](#)

[How to View Event Statistics](#)

[How to View Ethernet Interface Statistics](#)

Monitoring

[How to View Log Files](#)

[How to Create and Manage Diagnostic Packages](#)

[How to Manage Memory Dumps](#)

[How to View the System Information](#)

General

[How to Use Timeline Controls](#)

[How to Manage Views](#)

Zero Touch Deployment

Jan 25, 2017

Note

The Zero Touch Deployment service is supported only on the Citrix NetScaler SD-WAN Standard Edition 410 appliance from Release 9.1.1.1.

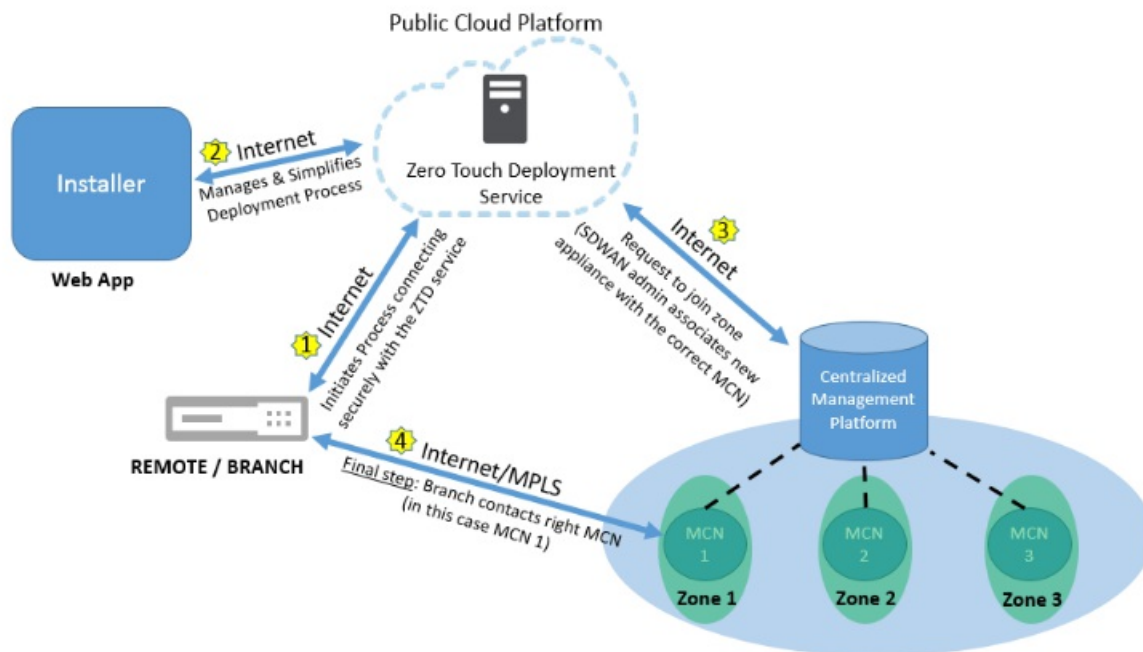
The Zero Touch Deployment service is a Citrix operated and managed cloud-based service which allows discovery of new appliances in the network at the remote or branch location. ZTD is publically accessible from any point on the customers network. The service is accessed over SSL.

In the backend, the ZTD service stores the identity of all customers who have deployed SD-WAN appliances (SD-WAN 410-SE). The service has access to a permanently updated list that associates a customer and the serial numbers of the SD-WAN appliances purchased by the customers.

ZTD High-Level Architecture and Workflow

Following is a list of roles required to implement the zero touch deployment service:

1. Installer – installs the appliance at the branch site or remote location. A user responsible for interacting with the service to approve branch appliances for an MCN and also responsible for logging into the webservice portal (either directly or indirectly) to add appliances. Installer receives an email with a link to open the activation page. The installer enters the serial number of the appliance on this activation page.
2. SD-WAN Standard Edition MCN appliance Administrator – A user responsible for SD-WAN configuration, creates MCN configuration, imports it to the SD-WAN Center, and initiates Zero Touch Deployment service for branch sites.
3. Network Administrator – A user responsible for Enterprise network settings (routing, DNS etc).



Zero Touch Deployment Service Overview and Procedure

The service setup or install is enabled through a Web Application designed for use as a wizard by an Installer or SD-WAN administrator to set up the new branch appliance. The installer receives an email with a link to access the activation page for installing the appliance locally or remotely.

- For a WebApp service setup, the SD-WAN Center administrator can connect to this Web Application through a browser on a device (laptop/workstation/mobile) connected to the internet.

The installer facilitates the appliance setup and configuration includes the following steps:

1. Validating and ensuring the new appliance is detected and connected to the zero touch deployment service.

- This step can be initiated by entering the serial number of the physical appliance. These details are fed into the zero touch deployment service. The installer does not need any specific authentication with the zero touch service, however the interaction must be secure since the serial number is passed in this interaction. No approval is required from the Web Management Interface. Once the appliance connects to the service, it downloads the configuration and the software upgrade package.

2. (Optional) Provide an address (city, state, country) as part of the installation process.
3. (Optional) Perform speed tests.

- Once the software and configuration are in place, the SD-WAN Administrator using the service setup determines whether this is a required step. Doing so, allows the configuration to understand the available bandwidth through each of the connected WAN links and will capture this in the local configuration for the site. The option of skipping this step is also available to the SD-WAN Center administrator.

4. (Optional) Identifying the ISPs that provide various links to the appliance.

- The step that might ease the SD-WAN Center administrators task of keeping track of providers at sites is, if the appliance was able to detect the name of the provider of each of the WAN links. The provider name is detected by doing an RDNS lookup based on the public IP address available for the link. After the provider is identified, this information is

captured within the configuration and reported back to the MCN so that the links can be named by provider within the config or reporting and management systems.

5. Lodging a request to join the SD-WAN network.

- Confirmation that the request is logged with the zero touch deployment service is provided back to the service setup where the SD-WAN administrator will access the Web Management Interface.

6. Downloading the software upgrade package, if needed.

- Once the appliances are accepted into the SD-WAN network, and if a software update is required (consistency over all appliances within a given network zone), the zero touch service identifies the correct software version and pushes the configuration to the newly connected appliance.

7. Downloading the new appliance configuration sourced from the MCN.

a. Similarly, a configuration file containing the MCN IP address that is in-sync with the MCN is pushed through the zero touch deployment service down to the newly connected appliance.

The steps shown above are performed in the same sequence or order by the Installer. The service setup and configuration itself must be able to communicate with the zero touch deployment service. The zero touch deployment service then communicates with the new appliance. These steps must be completed before the new appliance can connect to the MCN and for data to be transmitted across the SD-WAN network.

Prerequisites for Successful Zero Touch Deployment Service

In order for the zero touch service to function as expected, following is the list of requirements that should be met in order to use the zero touch deployment service:

1. The branch appliance should be powered up.
2. The branch appliance should be connected to the internet:
 - a. This means, the branch appliance is assigned a public IP either using DHCP (default).
 - b. IP assignment can be configured manually.
 - c. DNS is assigned to the appliance through DHCP - should be configured manually

Workflow for Zero Touch Deployment Capability

To achieve successful zero touch deployment service, you need to follow a workflow which is secure and easy for non-technical users to implement at the branch site.

Following is the ZTD deployment capability workflow:

1. The branch appliance should be powered up.
 - a. If you (SD-WAN administrator) want to upload a manual configuration and software package for the appliance, you should not connect the internet cable. Instead, you proceed to install the appropriate software and configuration. The

steps beyond this, is the standard procedure to enable the appliance to connect to the MCN. The branch appliance registers with the MCN and the MCN communicates the presence of this appliance with the Zero Touch Service in the cloud for consistency and visibility into the fact that the appliance is now on the Enterprise Domain.

2. Branch appliance needs a working internet connection plugged in.

3. Branch appliance needs to have internet connectivity set up with an IP address assigned to it, either using DHCP or manually.

a. If the branch appliance was pre-staged and deployed and configured with software package associated with it, which contains the details of the MCN, then the normal process of joining the SD-WAN Enterprise network follows including obtaining an IP address for the appliance through DHCP, or if one is provided manually.

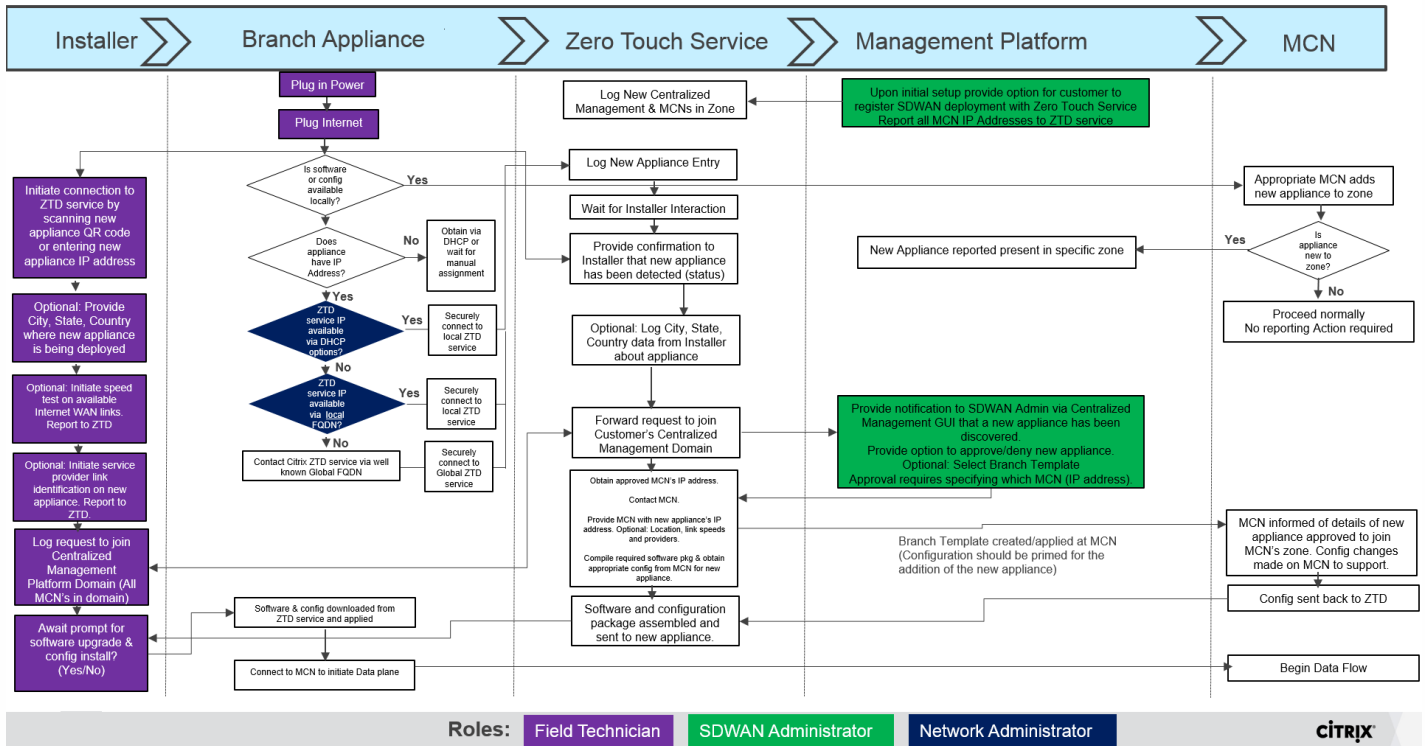
b. However, if the branch appliance does not have a pre-staged software package and configuration, and if DHCP is available to obtain an IP address, then the branch appliance obtains an IP address for itself and also scans for the ZTD service IP address within the DHCP options field. If none is found using the DHCP options field then proceed with the step below.

c. Optional: Assuming that the appliance now has IP address assigned either manually or using DHCP, the branch appliance should query a well-known, local, fully qualified domain name (FQDN). For example; ztd <enterprise domain>, use Citrix as an example *ztd.citrix.net* – The enterprise domain name itself (*citrix.net*) can be obtained by the branch appliance through DHCP. The complete enterprise domain name and the IP address of the appliance should be a pre-configured with DNS entry that is set up by the Network or DNS Administrator beforehand. The IP address that is resolved should be the IP address of a private zero touch server that the branch appliance can then connect to.

d. If the appliance fails to obtain a zero touch service IP address with the DHCP options field or by querying the well-known FQDN entry, then the appliance should query the DNS entry for the public cloud-based zero touch deployment service (eg: ztd.citrix.com). This public cloud-based zero touch IP address or DNS entry must be known to the appliance (exists in the appliance code) as part of the start-up procedure.

Once the appliance connects to the zero touch service requesting direction and approval to connect to the SD-WAN Enterprise network, the next step is performed through the Web Management Interface, as shown below. This interaction requires the use of a Citrix signed certificate in order for the ZTD service to authenticate the newly connected appliance to ensure that the appliance connecting is a Citrix appliance and is based on the serial number obtained as part of the request.

Zero Touch Deployment – End-to-End Workflow



How to Configure Zero Touch Deployment Service

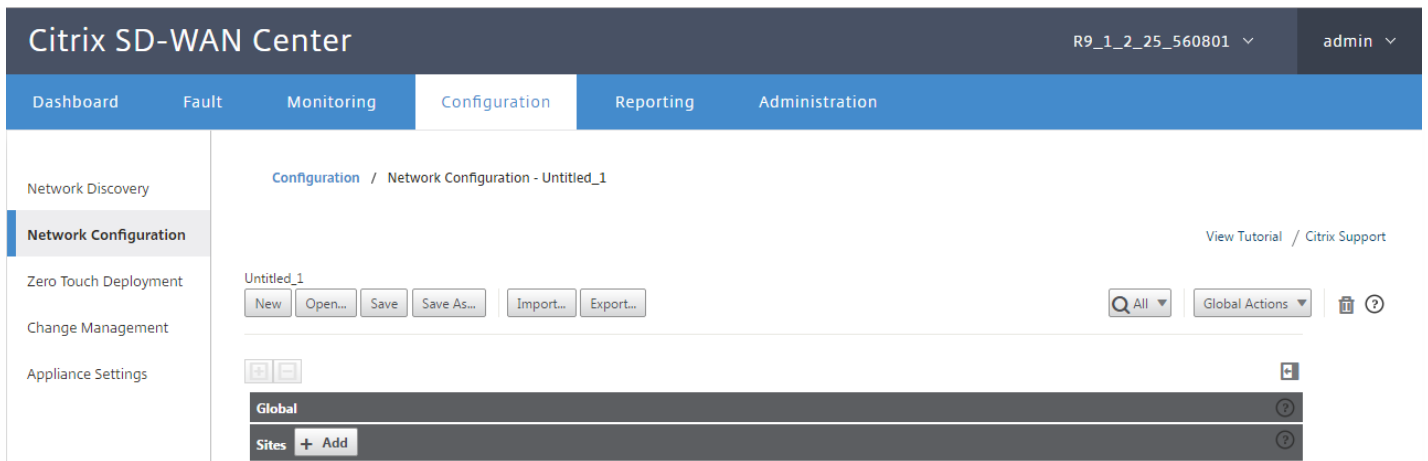
The SD-WAN Center has the functionality to accept requests from newly connected appliances to join the SD-WAN Enterprise network. The request is forwarded to the web interface through the zero touch deployment service. Once the appliance connects to the service, configuration and software upgrade packages are downloaded.

Configuration workflow:

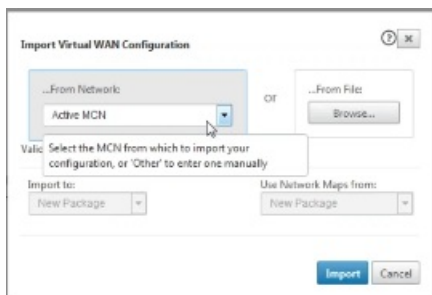
- Access SD-WAN Center > Create New site configuration or Import existing configuration and save it.
- Login to Citrix Workspace Cloud to enable ZTD service. The Zero Touch Deployment menu option is now displayed in the SD-WAN center web management interface.
- In SD-WAN Center, navigate to **Configuration > Zero Touch Deployment > Deploy New Site**.
- Select an appliance, click **Enable** and click **Deploy**.
- Installer receives activation email > Enter the serial number > **Activate** > Appliance is deployed successfully.

To configure Zero Touch Deployment service:

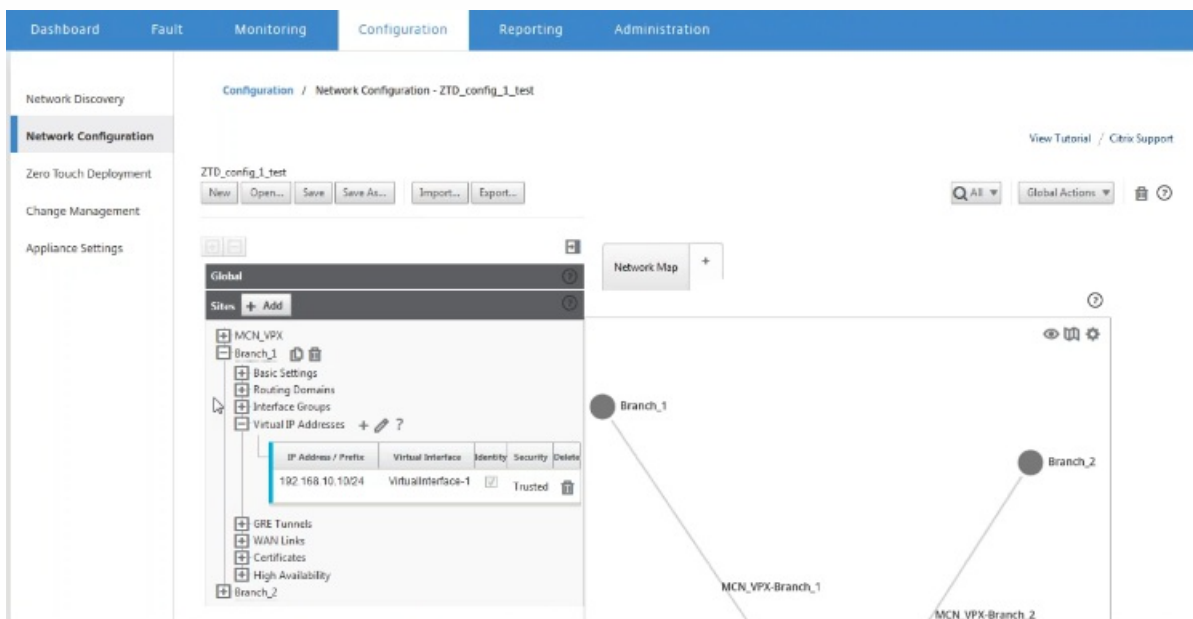
1. In the SD-WAN Center web management interface, go to **Configuration > Network Configuration > Sites**. Create a configuration for a new site and save it. You can also import an existing configuration by clicking **Import**. This configuration is applied at the MCN site and deployed at the Branch sites.



For example, you can import configuration from an active MCN to use for the ZTD service.



Import an existing configuration, for example: **ZTD_config_1_Test** and **Save** it.



For SD-WAN 410-SE appliance, from 9.1.2 release onwards, when the cloud service is up and when the appliance is connected to the cloud service, the ZTD agent is automatically installed in SD-WAN Center and the Zero Touch Deployment menu option becomes available.

2. In SD-WAN Center, go to **Zero Touch Deployment** menu. If you are not logged into the Citrix Workspace Cloud account, you are prompted to Login with **Citrix Workspace Cloud** user credentials. Upon login, the SD-WAN Center is registered with ZTD agent.

Note

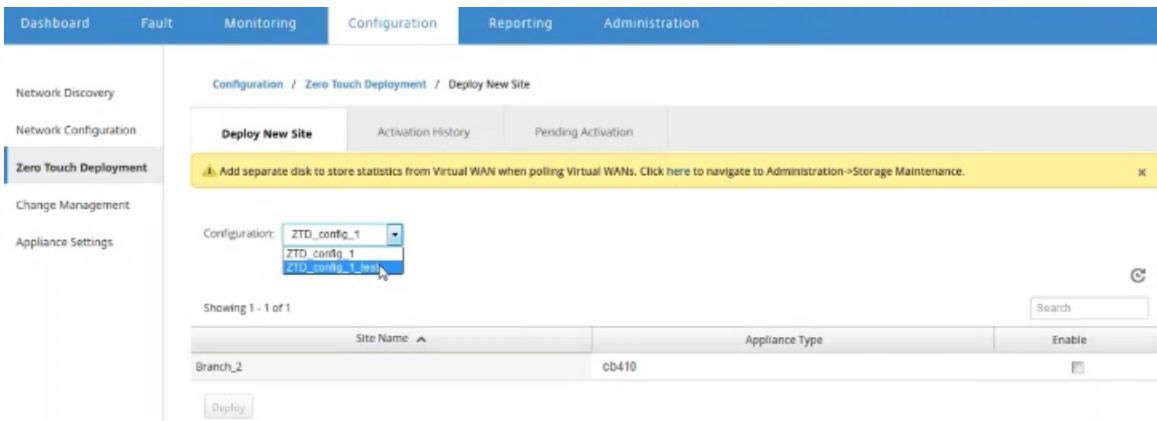
The Zero Touch Deployment menu is displayed in the SD-WAN Center web management interface only after you login to the Citrix Workspace Cloud account to activate and register the Zero Touch Deployment service.

When the appliance is powered on the bootstrap script interacts with Zero Touch Service, downloads and installs the agent.

The screenshot shows the Citrix SD-WAN Center interface. At the top, the title is "Citrix SD-WAN Center" with a user "admin" and a session ID "R9_1_2_25_560801". The navigation menu includes Dashboard, Fault, Monitoring, Configuration (selected), Reporting, and Administration. The left sidebar lists Network Discovery, Network Configuration, Zero Touch Deployment (selected), Change Management, and Appliance Settings. The main content area is titled "Configuration / Zero Touch Deployment" and features a yellow warning banner: "Add separate disk to store statistics from Virtual WAN when polling Virtual WANs. Click here to navigate to Administration->Storage Maintenance." Below this is a "Zero Touch Deployment" section with a message: "Zero Touch Deployment requires Login into Citrix Workspace Cloud." and a "Login to Citrix Workspace Cloud" button.

The screenshot shows a web browser window titled "Citrix Secure Sign In - Internet Explorer" with the URL "https://accounts.cloud.com/core/login?signin=dedcb68f04f4679fb74ac777782de826". The page is the Citrix Cloud sign-in page, featuring a "Username" field, a "Password" field, and a blue "Sign In" button. Below the button is a "Remember me" checkbox, and links for "Forgot your username or password?" and "Contact Support". At the bottom, there is a link for "Sign in with my company credentials".

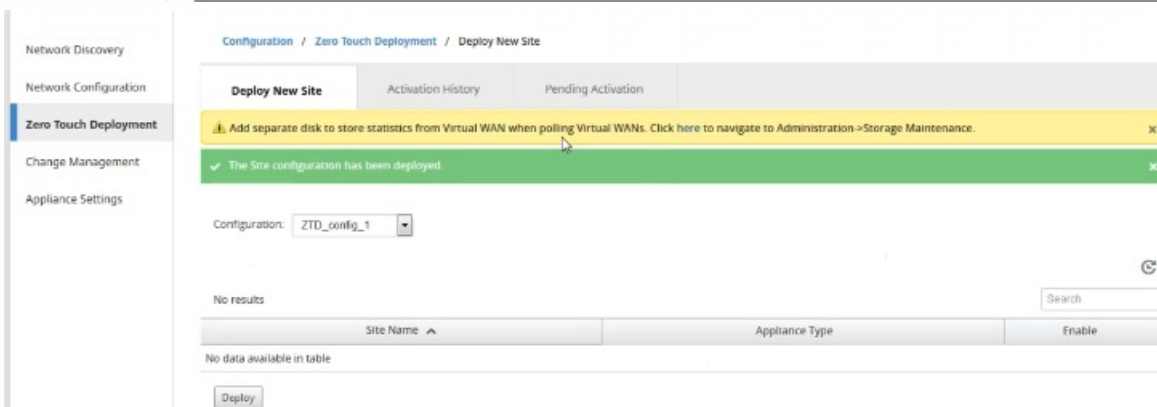
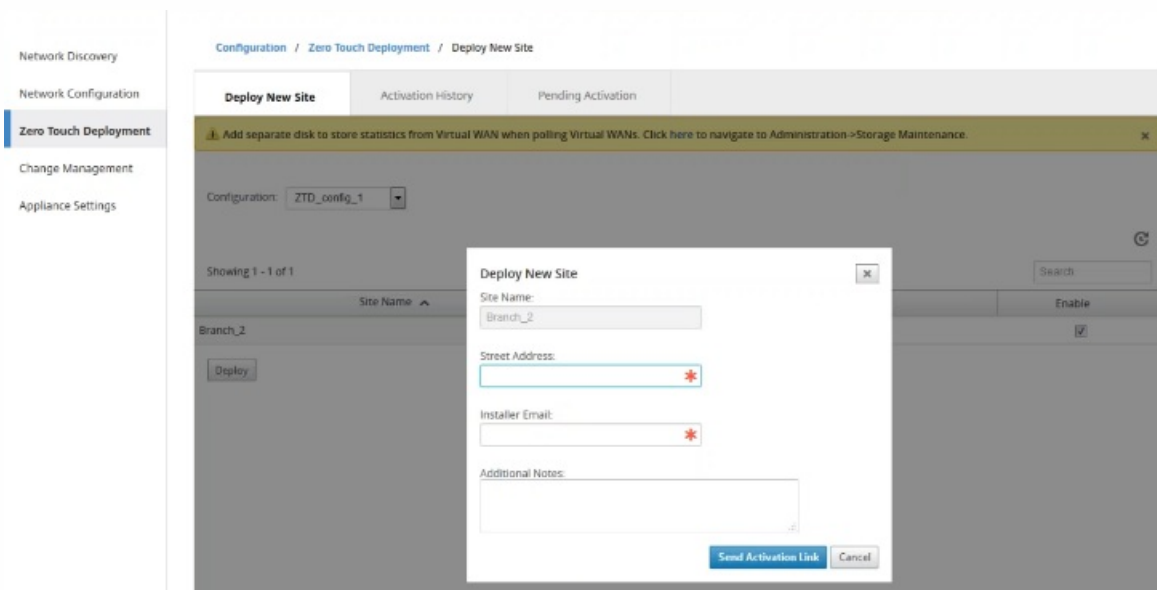
3. Navigate to the Zero Touch Deployment welcome page in SD-WAN Center, under the **Deploy New Site** tab, select the saved network configuration file.



After you select a saved configuration file, list of all the branch sites with SD-WAN 410-SE appliance configuration is displayed.

4. Select the branch sites you want to configure, click **Enable**, and then **Deploy**. The **Deploy New Site** window is displayed. Provide the branch site **Street Address** and the **Installer Email** address. Add additional notes, if required. Click **Send Activation Link**. A message indicating that *The Site configuration has been deployed* appears.

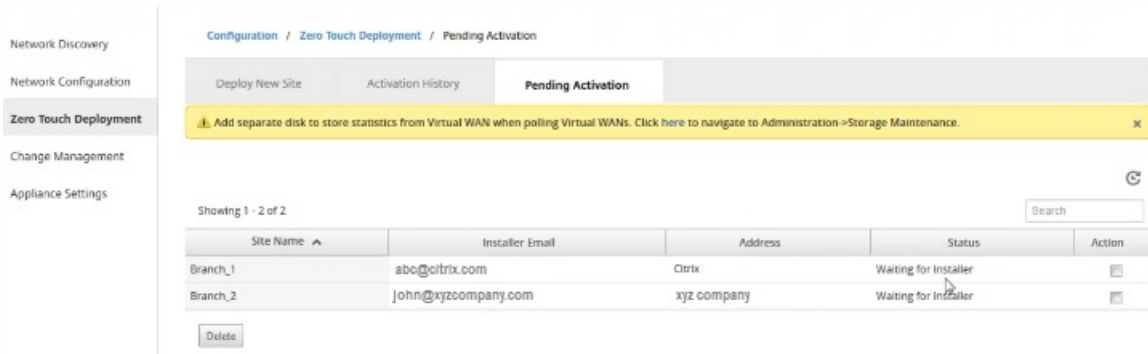
The network configuration for the selected branch sites from SD-WAN Center configuration file is copied into the Citrix Cloud Workspace when you select Deploy.



5. Select the **Pending Activation** tab. Observe the branch site information populated in the pending activation page. Notice that the **Status** is shown as **Waiting for Installer**. This status indicates that the appliance at the branch site needs to be installed.

Note

Optionally, at this stage, you can also choose to Delete the Branch sites added to the pending activation list. Once a Branch site is deleted from the pending activation page, it will become available to be deployed in the Deploy New Site tab page. Once you choose to delete the branch site from Pending activation, the activation link send to the installer will become invalid.



It should be noted that an administrator performs the steps in the SD-WAN Center web management interface. After the administrator deploys a new site and sends an activation link, the installer at the Branch site will activate the link and provide the serial number of the SD-WAN 410-SE appliance.

6. Check your mailbox to obtain the activation link received and click on the link.



Your NetScaler SD-WAN Appliance Activation Information for: Branch_2

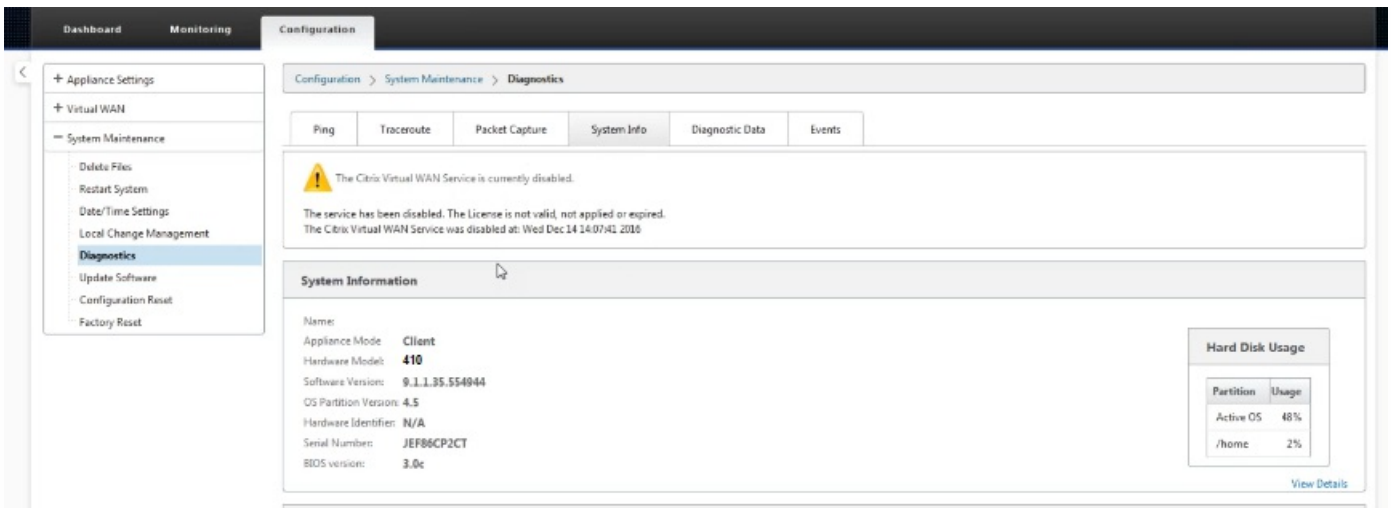
Hello,

To activate your appliance please use the following URL:
<https://10.200.24.61/root/sdwanz/v1/appliance/activate?activationcode=57de2628-03e8-4461-a43d-0f911827ed2b>

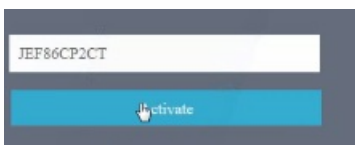
7. The page redirects to the Zero Touch Deployment Service page. Enter the **Serial Number** of the appliance and click **Activate**.



8. Go to the SD-WAN 410-SE web management interface. You can obtain the serial number of the appliance from the rear faceplate of the appliance or login to the SD-WAN 410-SE web management interface and navigate to **Configuration > System Maintenance > Diagnostics > System Info** tab. The serial number of the appliance is listed under **System Information**.

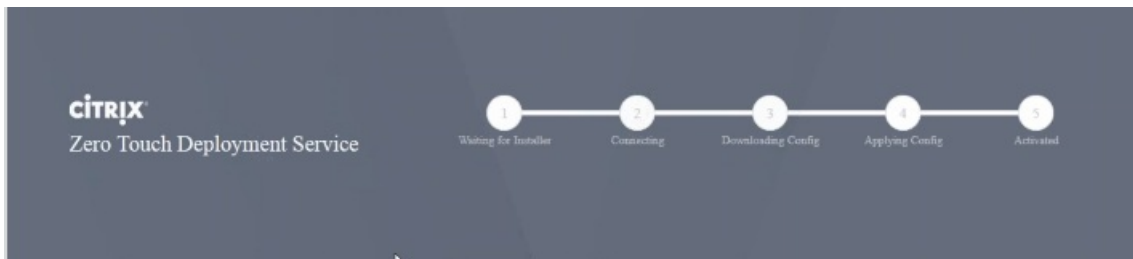


8. Enter the Serial Number of the appliance and click **Activate**.

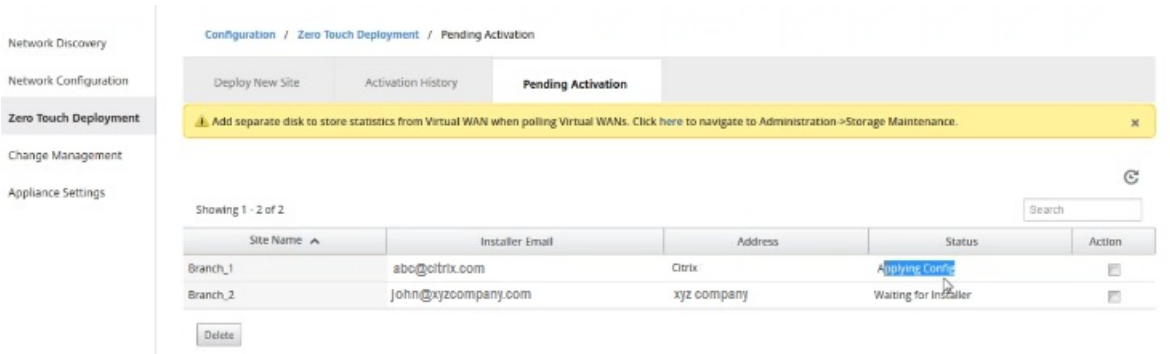


9. After you click **Activate**, the Zero Touch Deployment Service screen displays different deployment stages as seen below.

- Waiting for Installer
- Connecting
- Downloading Config
- Applying Config
- Activated



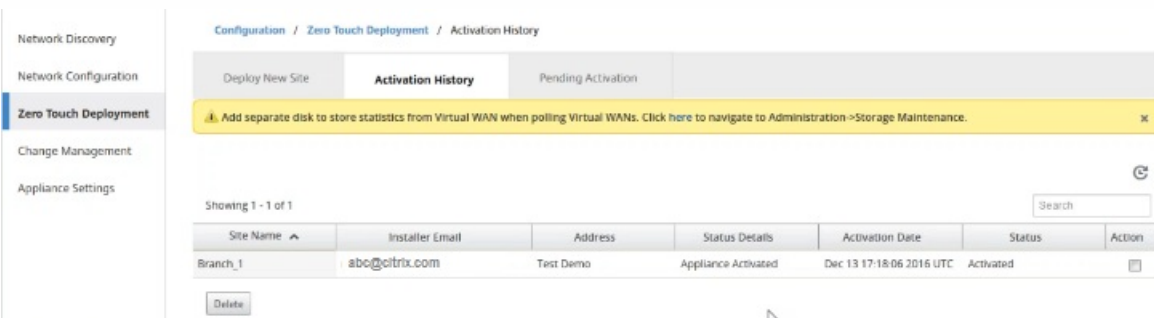
Observe that on the **Pending Activation** tab page in the SD-WAN Center web management interface, the status for Branch 1 Site is displayed as **Applying Config**.



Ensure that the Zero Touch Deployment Service has been activated. The configuration file which was copied from the SD-WAN Center to the Citrix Cloud Workspace is now applied and activated on the Branch site which has the SD-WAN 410-SE appliance deployed.



10. In the SD-WAN Center web management interface, the **Zero Touch Deployment** menu now displays the activated Branch site under the **Activation History** tab.



11. Login to SD-WAN 410-SE web management interface and view that the Virtual WAN service is enabled and the 410-SE appliance has acquired the configuration defined in the SD-WAN Center for this Branch site.

