

# Microsoft SharePoint Server 2013 on Dell PowerEdge R630 with Microsoft Hyper-V Virtualization Deployment Guide



# Notes, cautions, and warnings



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# Abbreviations

**Table 1. Abbreviations**

<b>Abbreviations</b>	<b>Definition</b>
bNDC	blade Network Daughter Card
CLI	command-line interface
CMC	Chassis Management Controller
CPLD	complex programmable logic device
Dell RACADM	Dell Remote Access Controller Admin
DCB	Data Centre Bridging
EULA	End User License Agreement
FCOE	Fibre Channel over Ethernet
FC	Fibre Channel
HBA	Host Bus Adapter
iDRAC8	integrated Dell Remote Access Controller
IOA	I/O aggregator
LUN	logical unit number
OOB Network	Out-of-band Network
PMUX	Programmable MUX
SAN	Storage Area Network
VLT	Virtual Link Trunking
VLTi	VLT interconnect
VMM	Virtual Machine Manager

Abbreviations	Definition
WWN	World Wide Name
SNMP	Simple Network Management Protocol

## Audience

This guide is intended for IT professionals and administrators who want to deploy Microsoft SharePoint solution for up to 5,000 users on PowerEdge R630 with Microsoft Hyper-V.



## Overview

This guide provides guidelines to implement Microsoft SharePoint Server 2013 using Hyper-V on Dell PowerEdge R630 servers, as specified in the Reference Architecture – *Microsoft SharePoint Server 2013 on Dell PowerEdge R630*.

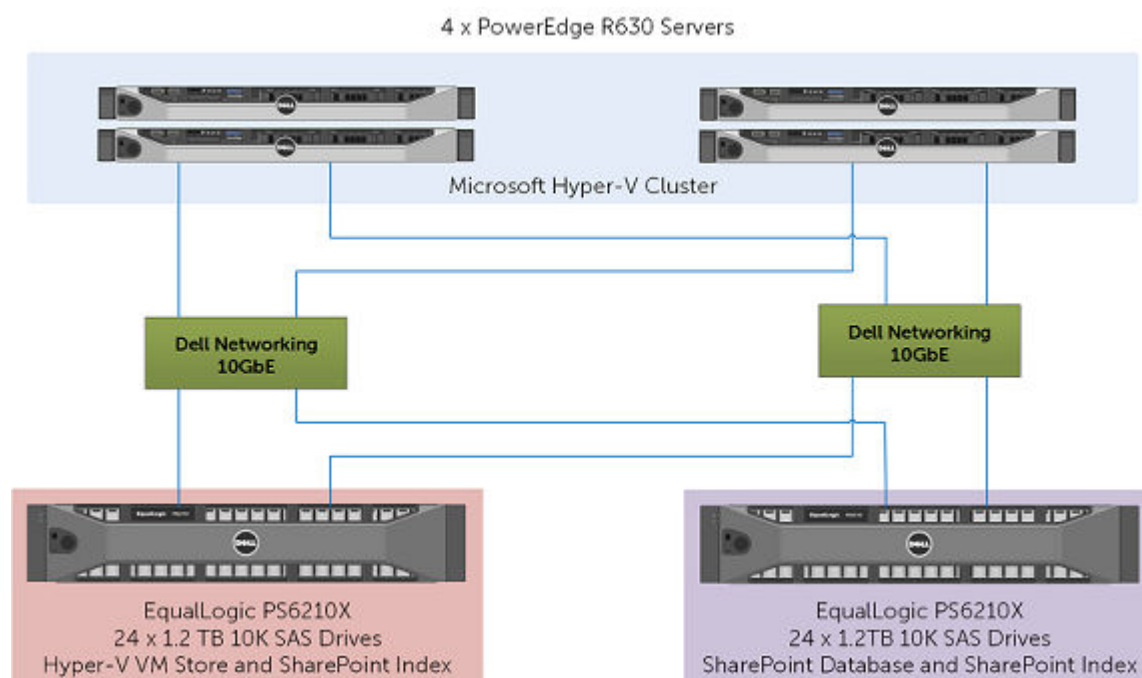


Figure 1. SharePoint 2013 on Dell PowerEdge R630

## Solution requirements

The following are the hardware and software requirements for deploying Microsoft SharePoint solution on PowerEdge R630 with Microsoft Hyper-V.

### Hardware requirements

The following table lists the hardware requirements:

**Table 2. Hardware requirements**

Components	Hardware Requirements	
Virtualization hosts	4 x Dell PowerEdge R630 Servers	
	Processor	2 x Intel Xeon E5-2660 v3 Family
	Memory	128 GB; 8 x 16GB DDR3 DIMMs
	HDD	2 x 600GB 15K SAS in RAID 1 for OS volume
	Network	<ul style="list-style-type: none"> <li>Broadcom 57800 dual port SFP+ NDC</li> <li>Broadcom 57810 dual port SFP+ Add-on NIC</li> </ul>
	OS	Windows Server 2012 R2 Data Center Edition
Storage arrays	2 x EqualLogic PS6210X with 24 x 1.2 TB 10K SAS Drives per array in RAID 10 configuration	
Networking	<ul style="list-style-type: none"> <li>2 x Dell Networking S4048-ON for Local Area Networking (LAN)</li> <li>2 x Dell Networking S4048-ON for iSCSI Storage Area Networking (SAN)</li> </ul>	

## Software requirements

The following table lists the software requirements:

### Software Requirements

**Table 3. Software Requirements**

Components	Software Requirements
Hypervisor	Microsoft Windows Server 2012 R2 Hyper-V
Virtual Machine Management	Microsoft System Center 2012 R2 Virtual Machine Manager

### Software Requirements for SharePoint farm VMs

The following table lists the software requirements for the SharePoint farm VMs:

**Table 4. Software requirement for SharePoint farm VMs**

Components	Software Requirements	
SharePoint Front End Servers	OS	Windows Server 2012 R2 Data Center Edition
	SharePoint	SharePoint Server 2013 Standard Edition
SharePoint Application Servers	OS	Windows Server 2012 R2 Data Center Edition
	SharePoint	SharePoint Server 2013 Standard Edition
SharePoint Database Servers	OS	Windows Server 2012 R2 Data Center Edition
	SQL	SQL Server 2012 SP1 Enterprise Edition CU3

## Firmware requirements

This solution is deployed using the firmware versions listed in the following table.

**Table 5. PowerEdge R630 servers**

Components	Version
BIOS	1.3.6
System CPLD	1.0.1
Integrated Dell Remote Access Controller (iDRAC)	2.15.10.10
Lifecycle Controller	2.15.10.10
PERC H730 Mini	25.2.2-0004
Broadcom 57800 Driver	7.12.2.0

Components	Version
Broadcom 57810 Driver	7.12.2.0

**Table 6. Dell EqualLogic storage and switches**

Components	Version
Dell Networking S4048-ON	9.9
Dell EqualLogic PS6210X	7.0.0

## End to end IO connectivity

PowerEdge R630 has several network connectivity options. Apart from Network Daughter Card (NDC) connectivity, PowerEdge R630 also offers expansion through three PCIe slots. In this reference architecture, to build HA for the network connections, a Broadcom 57800 dual port 10GbE SFP+ NDC and an additional Broadcom 57810 dual port 10GbE PCIe add-on NIC are used. As shown in the following figure, the network connection redundancy is achieved by connecting Port 0 of NDC and add-on NICs to LAN fabric, Port 1 of NDC, and add-on NIC to SAN fabric.

The LAN and SAN fabrics are separated to provide isolation between the data and application traffic. The two TOR switches in each fabric are lagged together through an inter-switch-link (ISL), which provides 80-Gb bandwidth between the two switches. The solution provides four 10GbE uplinks from each switch to link into an existing core network infrastructure. As shown in the following figure, a native Windows network team is created with Port 0 of NDC and add-on NIC connections. A Hyper-V virtual switch is then deployed with the teamed NIC, and network Quality of Service (QoS) is enabled to make sure that the Live Migration, Cluster and VM management networks are allocated minimum bandwidth weight. This configuration enables traffic throttling when specific network traffic requires the bandwidth. For the application network connections in the VMs, virtual network adapters are configured with VLAN IDs to provide network traffic isolation at the LAN fabric.

For the SAN connectivity in the host Operating System and the VMs that require in-guest iSCSI connections, two Hyper-V virtual switches are deployed, each with Port 1 of NDC and add-on NIC connections.

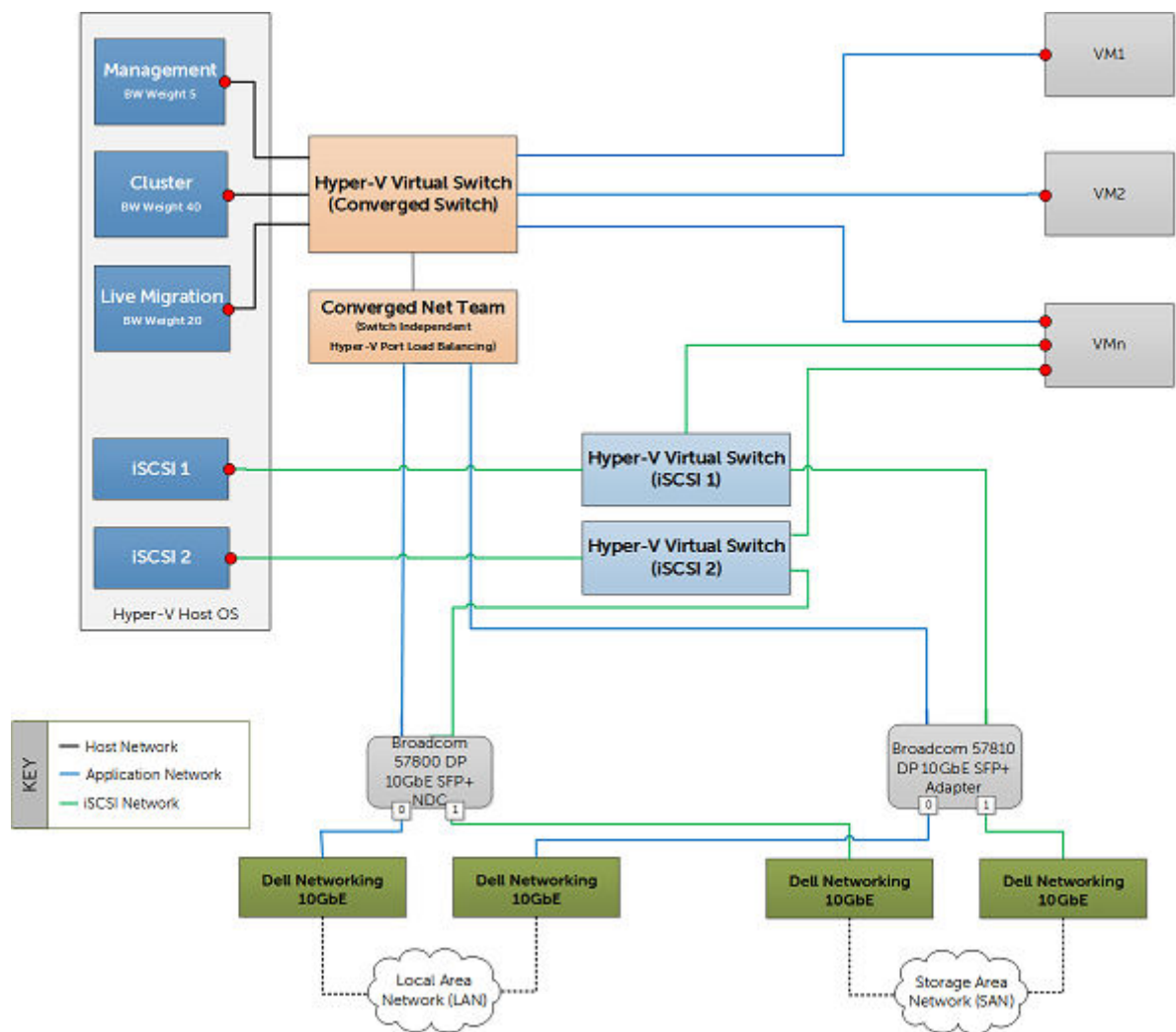


Figure 2. End to end connectivity

# Microsoft SharePoint 2013 on the Dell PowerEdge R630 with Hyper-V virtualization — deployment workflow

This section outlines the complete deployment sequence of deploying Microsoft SharePoint on the Dell PowerEdge R630 with Hyper-V virtualization.

1. Complete the solution requirements. See [Solution requirements](#).
2. Configure the components that are part of the solution. See [Configuring components](#)
3. Install the virtualization infrastructure, see [Installing virtualization infrastructure](#).
4. Deploy Microsoft SharePoint 2013 on Dell PowerEdge R630 server with Hyper-V virtual infrastructure. See [Microsoft SharePoint 2013 server on Dell PowerEdge R630](#)
5. Verify the deployment. See [Verifying the deployment](#).

## Configuring components

Before you deploy Microsoft SharePoint solution with Microsoft Hyper-V, you must set up and configure the following components:

1. Dell Networking S4048-ON switches. See [Configuring Dell Networking S4048-ON switches](#).
2. Dell PowerEdge R630 servers. See [Configuring PowerEdge R630 servers](#).
3. Dell EqualLogic Storage. See [Configuring Dell EqualLogic Storage](#).

## Configuring Dell Networking S4048-ON switches

### About this task

To configure the Dell Networking S4048-ON top and S4048-ON bottom switch, perform the following steps:

### Steps

1. Access the switch console (CLI).  
To access the console, connect one end of the serial cable to the console port on the S4048-ON top and bottom switch, and the other end to the terminal server (Laptop).
2. Open the switch console using the HyperTerminal (terminal emulator application).
3. Configure out of band (OOB) management port.  

```
FTOS>enable
FTOS>#config
FTOS (conf)#interface ManagementEthernet 1/1
FTOS (conf-if-ma-1/1)#no shutdown
FTOS (conf-if-ma-1/1)#ip address ipaddress mask
FTOS (conf-if-ma-1/1)#exit
```
4. Configure login credentials.  

```
FTOS (conf)#username admin privilege 15 password 0 yourpassword
FTOS (conf)#enable password level 15 0 yourpassword
```
5. Enable switch ports.  

```
FTOS#configure
FTOS (conf)#interface range tengigabitethernet 1/1 - 1/48
FTOS (conf-if-range-te-1/1-1/48)#switchport
FTOS (conf-if-range-te-1/1-1/48)#no shutdown
FTOS (conf-if-range-te-1/1-1/48)#exit
FTOS (conf)#exit
```
6. Enable MTU Settings Frames.  

```
FTOS#configure
FTOS (conf)# interface range tengigabitethernet 1/1 - 1/48
FTOS (conf-if-range-te-1/1-1/48)#mtu 12000
```
7. Configure spanning tree on edge ports .  

```
FTOS (conf-if-range-te-1/1-1/48)#spanning-tree rstp edge-port
FTOS (conf-if-range-te-1/1-1/48)#exit
```

**8. Configure port channel for LAG .**

The following commands configure the switch interconnect as a LAG.

```
FTOS(conf)#interface Port-channel 1
FTOS(conf-if-po-1)#mtu 12000
FTOS(conf-if-po-1)#switchport
FTOS(conf-if-po-1)#no shutdown
FTOS(conf-if-po-1)#exit
```

**9. Configure QSFP ports for LAG .**

The following commands assigns 40Gb QSFP ports to the Port Channel.

```
FTOS(conf)#interface range fortyGigE 1/49-1/50
FTOS(conf-if-range-fo-1/49-1/50)#no ip address
FTOS(conf-if-range-fo-1/49-1/50)#mtu 12000
FTOS(conf-if-range-fo-1/49-1/50)#no shutdown
FTOS(conf-if-range-fo-1/49-1/50)#flowcontrol rx on tx off
FTOS(conf-if-range-fo-1/49-1/50)#port-channel-protocol lacp
FTOS(conf-if-range-fo-1/49-1/50-lacp)#port-channel 1 mode active
FTOS(conf-if-range-fo-1/49-1/50-lacp)#exit
FTOS(conf-if-range-fo-1/49-1/50)#exit
FTOS(conf)#exit
```

**10. Configure VLAN 10 for host management network.**

```
configure
interface vlan 10
description "host-management"
ip address 172.168.32.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```

**11. Configure VLAN 20 for Cluster network.**

```
configure
interface vlan 20
description "Cluster"
ip address 172.168.64.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```

**12. Configure VLAN 30 for Live Migration.**

```
configure
interface vlan 30
description "Live Migration"
ip address 172.168.96.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```

**13. Configure VLAN 50 for Application Network.**

```
configure
interface vlan 50
description "Application Network"
ip address 172.168.96.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```



**14. Configure VLAN 60 for Front End Network.**

```
configure
interface vlan 60
description "Front End Network"
ip address 172.168.96.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```

**15. Configure VLAN 70 for SQL Private Network.**

```
configure
interface vlan 70
description "SQL Private Network"
ip address 172.168.96.1/19
tagged port-channel 1
tagged tengigabitethernet 1/1 - 1/48
no shutdown
exit
```

**16. Run the following command to save the configuration.**

```
FTOS#copy running-config startup-config
```

**Next steps**

Repeat the steps to configure the second switch.

## Configuring Dell Networking S4048-ON switches for SAN iSCSI traffic

**About this task**

To configure the Dell Networking S4048-ON top and S4048-ON bottom switch, perform the following steps:

**Steps**

**1. Access the switch console (CLI).**

To access the console, connect one end of the serial cable to the console port on the S4048-ON top and bottom switch, and the other end to the terminal server (Laptop).

**2. Open the switch console using the HyperTerminal (terminal emulator application).**

**3. Configure out-of-band (OOB) management port using the following command:**

```
FTOS>enable
FTOS>#config
FTOS(conf)#interface ManagementEthernet 1/1
FTOS(conf-if-ma-1/1)#no shutdown
FTOS(conf-if-ma-1/1)#ip address <ipaddress mask>
FTOS(conf-if-ma-1/1)#exit
```

**4. Configure login credentials using the following command:**

```
FTOS(conf)#username admin privilege 15 password 0 <yourpassword>
FTOS(conf)#enable password level 15 0 <yourpassword>
```

**5. Enable switch ports using the following command:**

```
FTOS#configure
FTOS(conf)#interface range tengigabitethernet 1/1 - 1/48
FTOS(conf-if-range-te-1/1-1/48)#switchport
FTOS(conf-if-range-te-1/1-1/48)#no shutdown
FTOS(conf-if-range-te-1/1-1/48)#exit
FTOS(conf)#exit
```

6. Enable Jumbo Frames using the following command:  

```
FTOS#configure
FTOS(conf)# interface range tengigabitethernet 1/1 - 1/48
FTOS(conf-if-range-te-1/1-1/48)#mtu 12000
```
7. Configure flow control using the following command:  

```
FTOS(conf-if-range-te-1/1-1/48)#flowcontrol rx on tx off
```
8. Configure spanning tree on edge ports using the following command:  

```
FTOS(conf-if-range-te-1/1-1/48)#spanning-tree rstp edge-port
FTOS(conf-if-range-te-1/1-1/48)#exit
```
9. Configure port channel for LAG using the following command:  

```
FTOS(conf)#interface Port-channel 1
FTOS(conf-if-po-1)#mtu 12000
FTOS(conf-if-po-1)#switchport
FTOS(conf-if-po-1)#no shutdown
FTOS(conf-if-po-1)#exit
```
10. Save the configuration using the following command:  

```
FTOS#copy running-config startup-config
```

#### Next steps

Repeat the steps to configure the second switch.

## Verifying Dell Networking S4048-ON switch configuration

#### About this task

Perform the following steps to verify the Dell networking S4048-ON configuration.

#### Steps

1. Run the following command to confirm the VLT domain is **Up**:  

```
show vlt brief
```
2. Run the following command to confirm Port-Channel 1 is **Up**:  

```
show interfaces
```
3. Run the following command to confirm that the Port-Channel 1 is tagged on the VLAN interfaces (10,20,30):  

```
show VLAN
```

## Configuring PowerEdge R630 servers

This configure the PowerEdge R630 servers, perform the following tasks:

1. Configure BIOS on the server. See [Configuring BIOS on PowerEdge R630 server](#)
2. Configure iDRAC IPv4 address on the server. See [Configuring iDRAC IP4 Address on PowerEdge R630 servers](#)

### Configuring BIOS on PowerEdge R630 server

1. Turn on or restart the server.
2. To enter System Setup, press F2 immediately after you see the following message:  

```
<F2>=System Setup
```
3. Ensure that the logical processor is enabled by performing the following steps:

- a. In **System Setup**, click **System Setup Main Menu** → **System BIOS** → **Processor Settings**.
- b. On the **Processor Settings** screen, verify that **Processor Settings** is set to **Enabled**.
4. Ensure that Virtualization Technology is enabled by performing the following steps:
  - a. In **System Setup**, click **System Setup Main Menu** → **System BIOS** → **Processor Settings**.
  - b. On the **Processor Settings** screen, check **Virtualization Technology** is set to **Enabled**.

## Configuring iDRAC IP4 Address on PowerEdge R630 servers

1. Turn on the managed system.
2. Press F2 immediately after you see the following message:  
`<F2> = System Setup`
3. In the **System Setup Main Menu** page, click **iDRAC Settings**, and press Enter.
4. In the **iDRAC Settings** page, click **Network**.
5. In the **IP4 SETTINGS** section, enter the following information.
  - **Starting IP Address**
  - **Starting Gateway**
  - **Starting Subnet Mask**
6. Click **Back**, and then in the **System Setup** page, click **Finish**.
7. Click **Yes** when the confirmation message is displayed.

## Configuring Dell EqualLogic Storage

Perform the following steps to configure Dell EqualLogic Storage.

1. Configure the array. See [Configuring array and creating group](#)
2. Configure RAID policy. See [Configuring RAID Policy](#)
3. Configure array controller eth 1 ports. See [Configure array controller eth1 ports](#)
4. Create volumes. See [Creating Volumes](#)

### Configuring array and creating group

#### Steps

1. Connect one end of the serial cable to storage, and the other end to the serial port on the server (workstation).
2. Open the console using the HyperTerminal (terminal emulator application).
3. In the console, configure the serial connection settings as follows:
  - **Bits per second** – 9600
  - **Data bits** – 8
  - **Parity** – None
  - **Stop bits** – 1
  - **Flow control** – None
4. When prompted to login, enter the default credentials to log in to storage.
5. When prompted: `Would you like to configure the array now?`, Type `Y`.  
Wait for the initialization process complete.
6. When prompted for `Member Name [ ]:`, type a name for the storage array.
7. When prompted for `Network interface [eth0]:`, type `eth0`, and press Enter.

8. When prompted for IP address for network interface [ ]: type the IP address for the selected array.
9. When prompted for Netmask [255.255.255.0]: type the appropriate network mask address.
10. When prompted with Default Gateway [10.10.0.1]: type the appropriate default gateway address.
11. When prompted for Group name [ ]: type the name of the new group you want to create.
12. When prompted for the Group IP address [ ]: type the IP address of the new group on the SAN.
13. If prompted with do you want to create a new group (yes|no) [yes]:, press Enter.
14. When prompted, Do you want to use the group settings shown above (yes|no) [yes]: Type yes.
15. Enter your password for managing group membership and press Enter.
16. Retype the password for confirmation and press Enter.
17. Enter your password for the default group administration (grpadmin) account and press Enter.
18. Retype the password for confirmation and press Enter.

#### Next steps

After the array is added to the new group, use the Group Manager GUI to set the RAID policy, configure array controller ports, and create volumes.

## Configuring RAID Policy

#### About this task

Complete the following steps for each member.

#### Steps

1. In the Group Manager, from the left navigation pane, click a member.
  2. When prompted, select Yes to configure RAID for the member, and then click **Next**.
  3. On the **General** page, enter the name of the RAID policy, and click **Next**.
  4. To configure storage in RAID 10, on the **RAID** page, in the **RAID policy** section, select the **RAID 10** option.
  5. After the storage initiation complete, click **Next**.
  6. On the **Summary** page, click **Finish**.
- Wait until initialization of the disks with the selected RAID setting are configured.

## Configure array controller eth1 ports

1. From the left pane, click the member, and then select the **Network** tab.
2. Select the **Network** tab, double-click **eth1**.
3. In the **Modify IP settings of network interface** dialog box, enter the appropriate IP address, subnet mask, and then click the check box next to **Enable interface** and click **OK**.

## Creating Volumes

#### Steps

1. In the Group Manager, click **Volumes** on the left pane.
2. In **Activities** section, click **Create Volumes**.
3. On the **General** page, do the following, and then click **Next**.
  - a. In the **Name** box, type the name of the volume.

- b. In the **Description** box, type the description for the volume.
  - c. In the **Storage pool assignment** table, select the storage pool.
4. On the **Space** page, in the **Volume size** field, enter the volume size.
5. On the **iSCSI access** page, perform the following tasks, and click **Next**.
  - a. Select the **Define one or more basic access points** option as the access type for the volume.
  - b. Select the **Yes** option to allow simultaneous access to the volume from more than one iSCSI initiator.
6. Perform the following tasks, and click **Next**.
  - a. To define the access points, in the **Define one or more access points** section, click **Add**.
  - b. In the **New Basic Access Point dialog** box, enter the following details of the destination server to which storage volumes are mapped, and click **OK**.
    - **CHAP account name**
    - **iSCSI initiator name**
    - **IP address**
7. On the **Sector size** page, select **512 bytes per sector (group default)** option and click **Next**.
8. On the **Summary** page, click **Finish**.

#### **Next steps**

Repeat the steps to create the second storage.

# Configuring solution for virtualization – Windows Server 2012 R2 Hyper-V

## Installing virtualization infrastructure

To set up virtualization, perform the following tasks:

- Configure virtual disk for OS deployment on Dell PowerEdge R630 servers. See [Configuring Virtual Disk for OS deployment in Dell PowerEdge R630 servers](#)
- Complete the prerequisites to install Windows Server. See [Configuring prerequisites to install Windows Server](#)
- Install Windows Server 2012 R2 OS on the Dell PowerEdge R630 server. See [Installing Windows Server 2012 R2 operating system in the Dell PowerEdge R630 server](#)
- Install network drivers on Windows Server 2012 R2. See [Installing Network Drivers on Windows Server 2012 R2](#)
- Enable Hyper-V in Windows Server 2012 R2. See [Enabling Hyper-V in Windows Server 2012 R2](#)
- Set up NIC teaming in Windows Server 2012 R2. See [Setting up NIC teaming in Windows Server 2012 R2](#)
- Configure network in Windows Server 2012 R2. See [Configuring vEthernet switch in Windows Server 2012 R2](#)
- Configure vEthernet switch on Windows Server 2012 R2. See [Configuring vEthernet switch in Windows Server 2012 R2](#)
- Installing EqualLogic HIT KIT on Windows Server 2012 R2. See [Installing EqualLogic HIT KIT on Windows Server 2012 R2](#)
- Add the Dell Power Edge R630 servers to the domain. See [Adding the Dell PowerEdge R630 servers to the domain](#)
- Add volumes to the Dell PowerEdge R630 servers. See [Adding volumes in the Dell PowerEdge R630 servers](#)
- Enable failover clustering on Windows Server 2012 R2. See [Enabling failover clustering in Windows Server 2012 R2](#)
- Create cluster. See [Creating cluster](#)

## Configuring Virtual Disk for OS deployment in Dell PowerEdge R630 servers

1. Log in to iDRAC and launch the virtual console.
2. From the menu, select **Power** → **Power on the system**.
3. In the message – You are about to execute a server control action. Are you sure you want to continue?, click **Yes**.
4. During system start, once you see this message press <CTRL> + <R> to Run configuration utility, press <CTRL> + <R> to run the RAID configuration utility.

5. In the configuration utility, select PERC H730 Mini and press **F2** to enable operations.
6. From the drop-down list, select **Create New VD**.
7. Set RAID Level to **RAID-1**, select physical disks, set the basic settings, use default virtual disk size, virtual disk name, and then click **OK**.
8. In the message – It is recommended that all newly created logical drives be initialized unless you are attempting to recreate a previous configuration and recover data as initialization is a destructive process. Are you sure you want to skip initialization?, click **OK**.  
The virtual disk is created.
9. Exit setup.
10. Restart the server.

## Configuring prerequisites to install Windows Server

### Mapping to virtual disk

1. Log in to iDRAC.
2. In the **System** page, click **Console/Media** tab, and then click **Launch Virtual Console**.
3. In the virtual console, select **Connect Virtual Media**, and then select **Map CD/DVD**.
4. In **Drive/Image File**, provide the drive location and click **Map Device**.

### Setting boot device and loading the OS executable files

1. In the virtual console, select **Next Boot**, and then select **Virtual CD/DVD/ISO**.
2. In the message - The selected device is set as the boot device for the next boot until another user changes the selected boot device. Therefore, it is recommended to reboot the server immediately after saving this selection. Click OK to save the selection., click **OK**.  
Virtual CD/DVD/ISO is set as the boot device.
3. Restart the server.

## Installing Windows Server 2012 R2 operating system in the Dell PowerEdge R630 server

1. Power on the server and press any key only after you see the message Booting from Virtual CD.  
Press any key to boot from CD or DVD.  
  
The Windows server setup is displayed.
2. Provide language preference, time and currency format, keyboard or input method, and then click **Next**.
3. In Windows Setup, click **Install now**.
4. Provide the product key and then click **Next**.
5. Select OS - Windows Server 2012 R2 Datacenter (Server with GUI) and then click **Next**.
6. In **License terms**, select **I accept the license terms** and then click **Next**.
7. In installation type, select **Custom: Install windows only (advanced)**.
8. Select **Drive0 Unallocated Space** and click **New** to create the partition and then click **Next** twice.

In the message – To ensure that all Windows features work correctly, Windows might create additional partitions for system files, click **OK**.

9. Once the installation is complete, in **Setting page**, set the user name and password details.

## Installing Network Drivers on Windows Server 2012 R2

1. Log in to the PowerEdge R630 server.
2. Copy the Broadcom 57800 and Broadcom 57810 network drivers for 64-bit Windows driver to a location on the PowerEdge R630 server.
3. Run the network driver installer.
4. In the welcome screen, click **Next**.
5. In **License Agreement**, select **I accept the terms in the license agreement** and then click **Next**.
6. In **Custom Setup**, select the default settings and click **Next**.
7. In **Ready to Install the Program**, click **Install**.
8. In **InstallShield Wizard**, click **Finish**.
9. To view the network card, in the Windows desktop, click **Start**, select **Run**, and then type `ncpa.cpl`. The Network Connections page will display all the NIC cards.

## Connecting volumes on the server

### About this task

Complete the steps to create and map each volume to the server.

### Steps

1. On the destination server, on the Start screen, click the **Search** icon and type `iSCSI initiator` in the **Search** box.
2. When you see the following message, click **Yes**.

The Microsoft iSCSI service is not running. The service is required to be started for iSCSI to function correctly. To start the service now and have the service start automatically each time the computer restarts, click the Yes button.
3. In the **iSCSI Initiator Properties** dialog box, click **Target** tab, and then in the **Target** box, type the IP address of EqualLogic group. Click **Quick Connect**.

The volume is connected the server.
4. In the **Quick Connect** dialog box, click **Done**.

## Adding volumes in the Dell PowerEdge R630 servers

1. Log in to the Dell PowerEdge R630 server, and in **Run**, type `diskmgmt.msc`.
2. In **Disk Management**, perform the following steps:
  - a. Right-click new disk, and set the value of disk to **Online**.
  - b. Right-click disk and initialize disk.
  - c. Right-click disk and select **New Simple Volume**.
3. In **New Simple Volume Wizard**, click **Next**.
4. In **Specify volume size in MB**, use the default disk size, and then click **Next**.
5. In **Assign Driver Letter or Path**, select **Do not assign a driver letter or driver path**, and then click **Next**.



6. In **Format Partition**, select **Format this volume with the following settings:** and set **File system** to **NTFS**, **Allocation unit size** to **Default**, **Volume label** to **Quorum**, select **perform a quick format** and then click **Next**.
7. In **Completing the New Simple Volume Wizard**, click **Finish**.
8. Repeat steps 1 – 7 to create the second volume for storing the VHD files of the virtual machines.

## Enabling Hyper-V in Windows Server 2012 R2

1. In **Server Manager**, on **Dashboard**, click **Manage** → **Add Roles and Features**.
2. In **Add Roles and Features Wizard**, click **Before you begin**, and then click **Next**.
3. In **Installation Type**, click **Role-based or feature-based Installation**, and then click **Next**.
4. In **Server Selection**, select **Select a server from the server pool** and in the server pool, select server and then click **Next**.
5. In **Server Roles**, select **Hyper-V** and then click **Next**.
6. In **Add Roles and Features Wizard**, select **Include management tools (if applicable)**, and then click **Add Features**.
7. In **Server Roles**, click **Hyper-V** and then click **Next**.
8. In **Hyper-V**, click **Next**.
9. In **Virtual Switches**, click **Next**.
10. In **Migration**, click **Next**.
11. In **Default Stores**, keep default settings and then click **Next**.
12. In **Confirmation**, review the roles you have selected, select **Restart the destination server automatically if required**, and then click **Install**.
13. In **Results**, once the roles and features are installed and the server restarts, click **Close**.

## Setting up NIC teaming in Windows Server 2012 R2

1. In **Server Manager**, select **Local Server**.
2. In **Properties**, click **NIC Teaming status** – **Disabled**.
3. In **NIC Teaming**, from **TASKS**, select **New Team**.
4. In **New team**, provide team name, for example **ConvergedNet Team**, select the NICs that you want to include in the team, in **Additional properties**, set **Teaming mode** to **Switch Independent** and **Load balancing mode** to **Hyper-V Port**, and then click **OK**.
5. Check if the NICs are active.

## Configuring LAN network in Windows Server 2012 R2

### About this task

In the Dell PowerEdge R630 server , start Windows PowerShell and run the following commands.

### Steps

1. Create a new VM switch:  

```
New-VMSwitch -AllowManagementOS 1 -Name ConvergedNetSwitch -
MinimumBandwidthmode weight -Verbose
NetAdapterName: ConvergedNet Team
```
2. Create VM network adapter for Cluster:

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name Cluster -Verbose
```

**3. Create VM network adapter for Live Migration:**

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name LiveMigration -Verbose
```

**4. Create VM network adapter for Management Network:**

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name Management -Verbose
```

**5. Create VM network adapter for Application:**

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name Application -Verbose
```

**6. Create VM network adapter for Front End:**

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name Front End -Verbose
```

**7. Create VM network adapter for SQL Private:**

```
Add-VMNetworkAdapter -ManagementOS -SwitchName ConvergedNetSwitch -Name SQL Private -Verbose
```

**8. Set VLAN access properties for the Management Network Adapter:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName ConvergedNetSwitch -Access -VlanId 25
```

**9. Set VLAN access properties for the Cluster Network Adapter:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName Cluster -Access -VlanId 20
```

**10. Set VLAN access properties to LiveMigration:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName LiveMigration -Access -VlanId 30
```

**11. Set VLAN access properties to Application:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName Application -Access -VlanId 26
```

**12. Set VLAN access properties to Front End:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName Public -Access -VlanId 27
```

**13. Set VLAN access properties to SQL Private:**

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName SQL Private -Access -VlanId 28
```

**14. Set minimum bandwidth reservation for Management Network Adapter:**

```
Set-VMNetworkAdapter -ManagementOS -Name ConvergedNetSwitch -MinimumBandwidthWeight 5
```

**15. Set minimum bandwidth reservation for Cluster network adapter:**

```
Set-VMNetworkAdapter -ManagementOS -Name Cluster -MinimumBandwidthWeight 40
```

**16. Set minimum bandwidth reservation for Live Migration network adapter:**

```
Set-VMNetworkAdapter -ManagementOS -Name LiveMigration -MinimumBandwidthWeight 20
```



**NOTE:** Under Network Connections, view vEthernet (ConvergedNetSwitch) and adapters for cluster and live migration.

# Configuring network adapter for SAN traffic

## About this task

In the Dell PowerEdge R630 server, start Windows PowerShell and run the following commands

### Steps

1. Create network adapter from the first Network Card using the following command:  
`New-VMSwitch -Name iSCSI_Switch1 -NetAdapterName <NICPortname> -Notes "SAN connectivity"`
2. Create network adapter from the second Network Card using the following command:  
`New-VMSwitch -Name iSCSI_Switch1 -NetAdapterName <NICPortname> -Notes "SAN connectivity"`

# Configuring vEthernet switch in Windows Server 2012 R2

1. In **Network Connections**, right-click **vEthernet (ConvergedNetSwitch)** and in the drop-down list, select **Properties**.
2. In **vEthernet (ConvergedNetSwitch) Properties**, configure IPV4 protocol properties, include IP address and DNS server details and then click **OK**.
3. Test the network connection: ping the VLAN 10 network.

# Installing EqualLogic HIT KIT on Windows Server 2012 R2

1. Download the Host Integration Tools (HIT) KIT from <https://eqlsupprt.dell.com> . You will need a valid support account to access the download page
2. After download is complete, double-click on the HIT KIT installation file.  
The **Dell EqualLogic Host Integration Tools – <version number>** is displayed.
3. On the Welcome page, click **Next**.
4. On the **Licence Agreement** page, read and accept the licence agreement. Click **Next**.
5. On the **Destination Folder** page, retain the default folder location, and click **Next**.
6. On the **Setup Type** page, select **Complete** option, and click **Next**.
7. On the **Ready to Install the Program** page, click **Install** to begin the installation process.  
Wait for the installation to complete.
8. On the **InstallShield Wizard Completed** page, click **Finish**.
9. When you see the message to restart you system to changes to take effect, click **Yes**.
10. Repeat the steps to install HIT KIT on all the SharePoint and database virtual machines.

# Adding the Dell PowerEdge R630 servers to the domain

1. In the Dell PowerEdge R630 server, in **System Properties**, on the **Computer Name** tab, click **Change**.
2. In **Computer Name/Domain Changes**, provide a name to the server. For example, `HyperVH3`.
3. Under **Member of**, select **Domain** and type domain name, for example `hyperv.lab`, and then click **OK**.
4. In **Windows Security**, provide domain administrator's user name and password, and then click **OK**.  
After the PowerEdge R630 server is added to the domain, a welcome message is displayed.
5. In the welcome message, click **OK** and restart the server.

# Enabling failover clustering in Windows Server 2012 R2

1. In Server Manager, select **Manage**, and then select **Add Roles and Features**.
2. In **Add Roles and Features Wizard**, In **Before you begin**, select **Next**.
3. In **Installation Type**, select **Role-based or feature-based Installation**, and then click **Next**.
4. In **Server Selection**, select **Select a server from the server pool** and in the server pool, select server and then click **Next**.
5. In **Server Roles**, click **Next**.
6. In **Features**, select **Failover Clustering** and then click **Next**.
7. In **Add Roles and Features Wizard** pop-up, add features that are required for failover clustering, select **Include management tools (if applicable)**, and then click **Add Features**.
8. In **Features**, click **Next**.
9. In **Confirmation**, review the roles you have selected, select **Restart the destination server automatically if required**, and then click **Install**.
10. In **Results**, once the **Failover Clustering** role is installed, click **Close**.



**NOTE:** Repeat the preceding tasks for the remaining Hyper-V hosts.

## Creating cluster

1. [Validating configuration](#)
2. [Creating a Hyper-V host cluster in VMM](#)

### Validating configuration

1. In **Failover Cluster Manager**, select **Validate Configuration**.
2. In **Validate a Configuration Wizard**, do the following:
  - a. In **Before you Begin**, click **Next**.
  - b. In **Select Servers**, add all the cluster nodes and then click **Next**.
  - c. In **Testing Options**, select **Run all tests (recommended)**.
  - d. In **Confirmation**, click **Next**.
  - e. In **Failover Cluster Validation Report**, clear **Create the cluster now using the validated nodes**, to view report, click **View Report**, and then click **Finish**.

### Creating a Hyper-V host cluster in VMM

1. Before you begin, create a host group in VMM. See [Creating host groups in VMM](#).
2. Create a Hyper-V host cluster in VMM. See [Creating a Hyper-V host cluster in VMM](#).

### Creating host groups in VMM

#### About this task

To configure host groups in VMM, perform the following steps:

#### Steps

1. Create host group structure in VMM:
  - a. Open the **Fabric** workspace
  - b. In the **Fabric** pane, expand **Servers**, and then do either of the following:
    - Right-click **All Hosts**, and then click **Create Host Group**.

- Click **All Hosts**. On the **Folder** tab, in the **Create** group, click **Create Host Group**.

VMM creates a new host group that is named **New host group** with the host group name highlighted.

- Type a new name, and then press **Enter**.
- Configure host group properties in VMM.
    - In **Fabric**, expand **Servers**, **All Hosts**, and then click the host group that you want to configure.
    - On the **Folder** tab, in the **Properties** group, click **Properties**.
    - Configure any of the following settings:

**Table 7. Host groups settings**

Tab	Settings
<b>General</b>	Configure the host group name, location, description, and allow unencrypted BITS file transfers.
<b>Placement Rules</b>	VMM automatically selects the ideal host to deploy virtual machines. However, you can specify placement rules. By default, a host group uses the placement settings from the parent host group.

## Creating a Hyper-V host cluster in VMM

- In VMM, select **Fabric** → **Servers**.
- On the **Home** tab, in **Create group**, click **Create**, and then click **Hyper-V Cluster**.
- In **Cluster Wizard**, on the **General** tab, provide cluster name and administrator user credentials, and then click **Next**.
- In **Nodes**, perform the following steps and then click **Next**:
  - In **Host group**, select the host group that contains the Hyper-V hosts that you want to cluster.
  - In **Available hosts**, select the Hyper-V host that you want to cluster and then click **Add**.  
The hosts that you have added are moved to **Hosts to cluster**.
  - (Optional) Select **Skip cluster validation tests**.
- In **Storage**, select the disks you want to cluster.
- In **Virtual Switches**, click **Next**.
- In **Summary**, confirm settings and then click **Finish**.
- When the job is complete, verify the cluster status.

# Microsoft SharePoint 2013 server on Dell PowerEdge R630

This section outlines the complete deployment sequence of virtualized Microsoft SharePoint 2013 on the Dell PowerEdge R630 solution.


1. Prepare VMs for SharePoint. See [Preparing virtual machines for SharePoint](#).
2. Install Windows Server 2012 R2 operating system. See [Installing Windows Server 2012 R2 operating system in the virtual machine](#).
3. Configure the SharePoint 2013 database server. See [Configuring the SharePoint database servers](#).
4. Install SharePoint prerequisite files. See [Installing SharePoint 2013 SP1 prerequisite files](#).
5. Install SharePoint Server. See [Installing SharePoint Server 2013 SP1](#).
6. Configure the SharePoint Server. See [Configuring SharePoint Server 2013 SP1](#).

## Preparing virtual machines for SharePoint

This section details the network and storage specifications along with their configuration for preparing the VMs. Additionally, the section provides the Windows PowerShell scripts to create Web Front End (WFE), application , and database virtual machines for SharePoint farm deployment.

### Network specifications

To isolate the network traffic, four different LAN network connections are created and assigned with different VLANs on the host machine.

 **NOTE:** The VLAN IDs used in the deployment guide represents the implementation of SharePoint farm infrastructure as mentioned in the following table. The VLAN IDs can be customized based on your existing environment.

The following table lists the network specifications for the virtual machines:

**Table 8. LAN and SAN specifications**

Network	LAN	VLAN	SAN
SharePoint front-end servers	1 x network adapters for management	25	2 x Virtual adapters for SAN connectivity
	1 x Application	26	
	1 x public connectivity	27	

Network	LAN	VLAN	SAN
SharePoint application servers	1 x network adapters for management	25	2 x Virtual adapters for SAN connectivity
	1 x Application	26	
SharePoint database servers	1 x network adapters for management	25	2 x Virtual adapters for SAN connectivity
	1 x Application	26	
	1 x SQL cluster private connectivity	28	

This environment uses virtual adapter created on 10 G physical port to map the storage volumes directly to the SharePoint application and database servers for better performance.

## Storage specifications

For ease of management and better application performance, four content databases are created to store four site collections. Each of the data and log files of the content databases are stored in respective storage volumes. The following table lists the storage specifications for the Hyper-V cluster and the SharePoint environment.

**Table 9. Storage specifications**

Servers	Number of volumes	Size of each volume
<b>Hyper-V cluster</b>		
Clustered shared volume for hosting VMs	1	1 TB
<b>SharePoint database servers</b>		
Content database	4	650 GB
Content database logs	4	100 GB
Search database	1	200 GB
Usage Database	1	200 GB
Temp DB	6	50 GB
Other SharePoint Databases (SharePoint Configuration and Admin Content)	1	100 GB
Quorum volume	1	1 GB
<b>SharePoint application server</b>		
Application servers	1 volume per server	200 GB
<b>SharePoint web server</b>		
WFE servers	1 volume per server	200 GB

## Configuring the virtual machines

The following table summarizes the number of virtual machines required for deploying the SharePoint infrastructure.

**Table 10. Summary of the SharePoint farm VMs**

Application Role	Number of VMs
SharePoint Web front-end	2
SharePoint application Server	2
SQL for SharePoint databases	2
Virtual Load balancer appliances	2

The following sections provide details about the WFE, APP, DB virtual machine specifications and the respective Windows PowerShell scripts for creating the virtual machines.

### Configuring WFE virtual machines

#### About this task

This section lists the WFE virtual machine specifications and provides the steps to create WFE VMs.

**Table 11. SharePoint front-end server specifications**

Component	Details	
SharePoint front-end servers	2 x Hyper-V virtual machines	
	Processor	4 x virtual processors
	Memory	16GB
	OS VHDX	1 x 160GB stored on the VM store array
	Data volumes	1 x 200GB volume per VM
	Network	3 x network adapters for management, SQL application and public connectivity

Perform the following steps to create the WFE1 virtual machine for the specifications mentioned in the table:

#### Steps

1. Create fixed VHD for better IO performance.

```
$VHDPPath="C:\ClusteredStorage\volumel\HDD\WFE1.vhdx"  
New-VHD -SizeBytes 160GB -Path $VHDPPath -Fixed
```

2. Create a WFE1 virtual machine.

```
$VMPPath="C:\ClusteredStorage\volumel\VMs\WFE1"  
New-VM -Name SP -Path $VMPPath -MemoryStartupBytes 16GB -BootDevice CD -  
SwitchName Management -VHDPPath $VHDPPath
```

3. Configure the WFE1 virtual machine.

```
Set-VMProcessor -VMName WFE1 -Count 4  
Add-VMNetworkAdapter -VMName WFE1-Name Application  
Add-VMNetworkAdapter -VMName WFE1-Name LAN  
Connect-VMNetworkAdapter -VMName WFE1 -Name Application -SwitchName  
Application
```



```
Connect-VMNetworkAdapter -VMName WFE1 -Name Application -SwitchName LAN
Set-VMNetworkAdapterVlan -VMName WFE1 -VMNetworkAdapterName Management -
Access -VlanId 25
Set-VMNetworkAdapterVlan -VMName WFE1 -VMNetworkAdapterName Application -
Access -VlanId 26
Set-VMNetworkAdapterVlan -VMName WFE1 -VMNetworkAdapterName LAN -Access -
VlanId 27
```

4. Add network adapter to SharePoint WFE virtual machine for SAN connectivity using the following command:

```
Add-VMNetworkAdapter -VMName WFE1 -SwitchName iscsi_switch1
Add-VMNetworkAdapter -VMName WFE1 -SwitchName iscsi_switch2
```

5. Repeat steps 1 through 4 to create WFE2 virtual machine by changing the name to WFE2.

### Next steps

Next, configure the SharePoint application virtual machines after configuring the WFE virtual machines.

## Configuring APP virtual machines

### About this task

This section lists the APP virtual machine specifications and provides the steps to create APP VMs.

**Table 12. SharePoint application server specifications**

Component	Details	
SharePoint application servers	2 x Hyper-V virtual machines	
	Processor	4 x virtual processors
	Memory	8GB
	OS VHDX	1 x 160GB stored on the VM store array
	Data volumes	1 x 200GB volume per VM
	Network	3 x network adapters for management, SQL application and public connectivity

Perform the following steps to create APP1 virtual machine for the specifications mentioned in the table:

### Steps

1. Create fixed VHD for better IO performance.

```
$VHDPATH="C:\ClusteredStorage\volume1\HDD\APP1.vhdx"
New-VHD -SizeBytes 160GB -Path $VHDPATH -Fixed
```

2. Create an APP1 virtual machine.

```
$VMPATH="C:\ClusteredStorage\volume1\VMs\APP1"
New-VM -Name SP -Path $VMPATH -MemoryStartupBytes 8GB -BootDevice CD -
SwitchName Management -VHDPATH $VHDPATH
```

3. Configure the APP1 virtual machine.

```
Set-VMProcessor -VMName APP1 -Count 4
Add-VMNetworkAdapter -VMName APP1 -Name Application
Connect-VMNetworkAdapter -VMName APP1 -Name Application -Name Application
Connect-VMNetworkAdapter -VMName APP1 -Name Application -Name Management
Set-VMNetworkAdapterVlan -VMName APP1 -VMNetworkAdapterName Management -
Access -VlanId 25
Set-VMNetworkAdapterVlan -VMName APP1 -VMNetworkAdapterName Application -
Access -VlanId 26
```

4. Add network adapter to APP virtual machine for SAN connectivity using the following command:  

```
Add-VMNetworkAdapter -VMName APP1 -SwitchName iscsi_switch1
```

```
Add-VMNetworkAdapter -VMName APP1 -SwitchName iscsi_switch2
```
5. Repeat steps 1 through 4 to create APP2 virtual machine by changing the name to APP2.

#### Next steps

Next, configure the DB virtual machines after configuring the WFE and APP virtual machines.

### Configuring DB virtual machines

#### About this task

This section lists the database virtual machine specifications and provides the steps to create DB VMs.

**Table 13. SharePoint database servers specification**

Component	Details	
SharePoint database servers	2 x Hyper-V virtual machines	
	Processor	6 x virtual processors
	Memory	64GB
	OS VHDX	1 x 160GB stored on the VM store array
	Data volumes	4 x 650GB volume for SharePoint Content DB 4 x 100GB volume for SharePoint Content Log 6 x 50GB volume for temp DB 1 x 200GB volume for search DB 1 x 200GB volume for usage DB 1 x 100GB volume for other SharePoint DB
	Quorum volume	1 x 1GB for the cluster Quorum configuration
	Network	3 x network adapters for management, SQL application, and SQL cluster private connectivity 2 x virtual adapters for SAN connectivity

Perform the following steps to create DB1 virtual machine for the specifications mentioned in the table:

#### Steps

1. Create fixed VHD for better IO performance.  

```
$VHDPATH="C:\ClusteredStorage\volume1\HDD\DB1.vhdx"
```

```
New-VHD -SizeBytes 160GB -Path $VHDPATH -Fixed
```
2. Create a DB1 virtual machine.  

```
$VMPATH="C:\ClusteredStorage\volume1\VMs\DB1"
```

```
New-VM -Name SP -Path $VMPATH -MemoryStartupBytes 64GB -BootDevice CD -
```

```
SwitchName Management -VHDPATH $VHDPATH
```
3. Configure the DB1 virtual machine.  

```
Set-VMProcessor -VMName DB1 -Count 6
```

```
Add-VMNetworkAdapter -VMName DB1-Name Application
```

```
Add-VMNetworkAdapter -VMName DB1-Name SQLPrivate
```

```

Connect-VMNetworkAdapter -VMName DB1 -Name Application -SwitchName
Application
Connect-VMNetworkAdapter -VMName DB1 -Name Management -SwitchName Management
Connect-VMNetworkAdapter -VMName DB1 -Name SQLPrivate -SwitchName SQLPrivate
Set-VMNetworkAdapterVlan -VMName DB1 -VMNetworkAdapterName Management -
Access -VlanId 25
Set-VMNetworkAdapterVlan -VMName DB1 -VMNetworkAdapterName Application -
Access -VlanId 26
Set-VMNetworkAdapterVlan -VMName DB1 -VMNetworkAdapterName SQLPrivate -
Access -VlanId 28

```

4. Add network adapter to DB virtual machine for SAN connectivity using the following command:

```

Add-VMNetworkAdapter -VMName DB1 -SwitchName iscsi_switch1
Add-VMNetworkAdapter -VMName DB1 -SwitchName iscsi_switch2

```

5. Repeat steps 1 through 4 to create DB2 virtual machine by changing the name to DB2.

#### Next steps

The configuration of SharePoint WFE, APP, and DB servers is now complete.

## Installing Windows Server 2012 R2 operating system in the virtual machine

To install Windows Server 2012 R2 operating system on the virtual machine, perform the steps provided in the section [Installing Windows Server 2012 R2 operating system in the Dell PowerEdge R630 server](#)

### Connecting volumes on the virtual machines

To connect the volumes on the virtual machines, perform the steps provided in the section [Connecting volumes on the server](#)

### Initializing and formatting the storage volumes

The storage volumes are formatted with 64 K allocation unit to maximize the disk performance. Run the following Windows PowerShell commands to initialize and format the storage volumes on all the SharePoint and database servers:

 **NOTE:** Ensure that both the database servers are assigned the same drive letter for a LUN.

1. Get newly added storage volumes.

```
Get-Disk | where-object Isoffline -eq $True
```

2. Initialize the disk.

```
Initialize-Disk -Number 1 -PartitionStyle MBR
```

3. Partition the disk.

```
New-Partition -DiskNumber 1 -DriveLetter 'E' -UseMaximumSize
```

4. Format the volume.

```
Format-Volume -DriveLetter 'E' -FileSystem NTFS -AllocationUnitSize 65536 -
Confi
rm:$false
```

5. Repeat steps 1 through 4 for all the storage volumes that are assigned to the server.


## Renaming and adding servers to a domain

To rename and add servers to a domain, see the section [Adding the Dell PowerEdge R630 servers to the domain](#)

## Load Balancing for SharePoint 2013 SP1


In a test environment, a KEMP LoadMaster (Vers:7.1-26-15) was used to load balance the SharePoint 2013 SP1 infrastructure.

### Prerequisites

 **NOTE:** Customers can use their existing load balancing solution to load balance SharePoint 2013 SP1.


### Steps

1. Log in to the KEMP admin console and go to **Virtual Services** → **View/Modify Services** → **Add New**.
2. Type the IP address for the service in the **Virtual Address** field. Enter the port, protocol, and service name, and then click **Add this Virtual Service**.
3. Ensure that **Force L7** check box is selected, but the **L7 Transparency** check box is clear.
4. Since SharePoint 2013 SP1 does not require persistence anymore, make sure that the **Persistence Options** is set to **None**.
5. For the **Load method/Scheduling method**, select **Round-Robin**.

 **NOTE:** Under **Real Servers**, configure the health checks. Make sure the KEMP LoadMaster set to use **HTTPS** protocol. This together with Checked Port: **443** and URL: **"/owa"**. Click the **Set URL** button to save the settings.

6. Click the **Add New** button under **Real Servers**. Add your SharePoint 2013 SP1 client servers. When all servers are added, click the **Back** button.
7. When the configuration is complete, press the **Back** button.

The services should then show up as green if the protocols are available.

 **NOTE:** Ensure that the virtual service IP address of the load balancer has a DNS entry made in the DNS server.

### Next steps

This completes the configuration of the KEMP load balancer.

## Configuring the SharePoint database servers

### About this task

To configure the SharePoint database servers, perform the following tasks:

### Steps

1. Install and configure Windows failover clustering. See [Installing and configuring Windows cluster](#).
2. Install SQL Server failover clustering. See [Installing SQL Server 2014 failover cluster](#).

## Connecting volumes on the virtual machines

To connect the volumes on the virtual machines, perform the steps provided in the section [Connecting volumes on the server](#)

## Installing and configuring Windows cluster

To configure failover clustering in Windows Server 2012 R2, perform the following:

1. Enable failover clustering in Windows Server 2012 R2. For more information, see [Enabling failover clustering in Windows Server 2012 R2](#)
2. Create cluster. For more information, see [Creating cluster](#).

## Installing SQL Server 2014 failover cluster

### Prerequisites

Before you begin, ensure that the SQL Server installation media is ready to start the installation

### About this task

Install an SQL Server cluster instance in following sequence:

1. Run the setup in the first node.
2. After the initial installation in the first node, run **setup.exe** in all the other nodes where you want to install the SQL Server clustered instance.

### Installing SQL Server failover cluster in the first node

#### About this task

Perform the following steps to install SQL Server failover cluster in the first node:

#### Steps

1. Run Setup.exe as Administrator.  
The **SQL Server Installation Center** window is displayed.
2. Select **Installation** in the left pane and click **New SQL Server failover cluster installation** to start the installation.
3. In the **Product key** window, enter the product key and click **Next >**.
4. In the **License Terms** window, select **I Accept the license terms** and click **Next >**.  
The installation wizard runs a validation in the **Global Rules** window to determine problems and report, if any.
5. In the **Microsoft Update** window, select **Use Microsoft Update to check for updates (recommended)** and click **Next >**.
6. Click **Next >** to install the failover cluster.
7. In the **Install Failover Cluster Rules** window, review and resolve the reported errors before you continue with the next steps, if any. Click **Next>**.
8. In the **Setup Role** window, select **SQL Server Feature Installation** and click **Next >**.
9. In the **Feature Selection** window, select **Database Engine Services** and **Management Tools — Basic**, and then click **Next >**.
10. In the **Feature Rules** window, ensure that all the rules have passed, and then click **Next >**.
11. In the **Instance Configuration** window, enter the SQL Server instance network name in **SQL Server Network Name**. Click **Next >**.
12. In the **Cluster Resource Group** window, specify SQL Server cluster resource group name and click **Next >**.
13. In the **Cluster Disk Selection** window, proceed with the default cluster disk selection and click **Next >**.
14. In the **Cluster Network Configuration** window, select the **IPv4** network and configure the IP address.

15. In the **Server Configuration** window, enter the respective domain accounts and passwords for the SQL Server agent and SQL Server engine. On the **Collation** tab, click **Customize** and select **Latin1\_General** for **Collation Designation**. On the **Collation** tab, select **Accent-sensitive, Kana-sensitive, Width-sensitive** and click **OK**.
16. In the **Server Configuration** tab of the **Database Engine Configuration** window, select **Windows authentication mode** and click **Add** to enter the SQL server administrators. In the **Database Engine Configuration** window, click the **Data Directories** tab and define the paths for disks or path of the root or system databases directory, user databases, log files, backup and TempDB to store the files corresponding to the SQL database. Click **Next >**.
17. In the **Feature Configuration** window, click **Next >**.
18. In the **Ready to Install** window, review all the displayed configurations and click **Install**.  
The wizard displays the installation progress and prompts you with the **Complete** window after the installation is over. This completes the initial installation in the first node.
19. In the **Complete** window, verify that all the items are successfully installed, and then click **Close**.  
Now, add the other nodes to the SQL Server failover clustered instance.

## Installing SQL Server 2014 failover cluster in the second node

### About this task

Perform the following steps to install SQL Server failover cluster in the second node:

#### Steps

1. Run the SQL Server setup as Administrator to add SQL Server clustered instance in another node.
2. Select **Installation** in the left pane and click **Add node to a SQL Server failover cluster**.
3. In the **Product key** window, confirm the product key again and click **Next >**.
4. In the **License Terms** window, accept the license terms and click **Next >**.
5. In the **Microsoft Update** window, select **Use Microsoft Update to check for updates (recommended)** and click **Next >**.
6. In the **Node Rules** window, review and resolve the reported errors before proceeding, if any. Click **Next>**.
7. In the **Cluster Nodes Configuration** window, select the SQL Server instance that you want to add to the node.
8. In the **Cluster Network Configuration** window, select the **IPv4** network and configure the IP address.
9. In the **Service Accounts** window, enter and confirm the SQL Server agent and SQL Server engine passwords.
10. In the **Feature Rules** window, review all the displayed rules and click **Next >**.
11. In the **Ready to Add Node** window, confirm the settings and click **Install**.  
The wizard displays the installation progress and prompts you with the **Complete** window after the installation is over.
12. Click **Close** to exit the installation wizard.

#### Next steps

The SQL Server failover cluster installation is now complete.

## Configuring SQL Server 2014

### About this task

Perform the following steps to get optimum database performance:

### Steps

1. Open SQL Server Management Studio, click **New Query** on the menu.
2. Configure SQL Server memory settings. See [Configuring SQL Server memory settings](#).
3. Configure SQL Server MAXDOP settings. See [Configuring SQL Server MAXDOP settings](#).
4. Move temp database to another volume. See [Moving temp database to another volume](#).
5. Add additional temp DB data files. See [Adding new temp DB data files](#).

## Configuring SQL Server memory settings

Run the following SQL query to set the maximum memory:

```
sp_configure 'show advanced options', 1;
GO
RECONFIGURE;
GO
sp_configure 'max server memory', 49152;
GO
RECONFIGURE;
GO
```

## Configuring SQL Server MAXDOP settings

Run the following SQL query to set the MAXDOP settings to 1:

```
USE Master ;
GO
EXEC sp_configure 'show advanced options', 1;
GO
RECONFIGURE WITH OVERRIDE;
GO
EXEC sp_configure 'max degree of parallelism', 1;
GO
RECONFIGURE WITH OVERRIDE;
GO
```

## Moving temp database to another volume

### About this task

To isolate the temp DB IO operations from other databases, the temp DB is moved to a different volume.

Perform the following steps to move the temp database to another volume:

### Steps

1. Open SQL Server Management Studio, click **New Query** on the menu.
2. Run the following SQL query to move the temp DB files.

```
USE master;
GO
ALTER DATABASE tempdb
MODIFY FILE (NAME = tempdev, FILENAME = 'E:\SQLData\tempdb.mdf');
GO
ALTER DATABASE tempdb
MODIFY FILE (NAME = templog, FILENAME = 'E:\SQLLog\templog.ldf');
GO
```
3. Restart SQL Server service.

## Adding new temp DB data files

Run the following SQL query to add temp DB data file:

```
ALTER DATABASE tempdb ADD FILE ( NAME = N'tempdev2',  
FILENAME = N'D:\Data\tempdev2.ndf' , SIZE = 512MB , FILEGROWTH = 256MB)  
GO
```

Repeat the query mentioned by changing the name and path of the remaining four volumes.

## Configuring prerequisites to install SharePoint 2013 SP1

### About this task

Perform the following tasks to install SharePoint Server 2013 SP1:

#### Steps

1. Download all the prerequisite files for SharePoint Server 2013 SP1 on Windows Server 2012 R2. See [Downloading SharePoint 2013 SP1 prerequisites](#).
2. Run Windows PowerShell scripts to install the prerequisite files. See [Installing SharePoint 2013 SP1 prerequisite files](#).

### Downloading SharePoint 2013 SP1 prerequisites

To install the SharePoint 2013 SP1 prerequisites, download the prerequisite files mentioned in the following table and copy the prerequisite files to the **SharePoint prerequisiteinstallerfiles**.


The following table provides the complete list of SharePoint 2013 SP1 prerequisites files and the downloadable links:

 **NOTE:** Before downloading the prerequisite files into the **SharePoint prerequisiteinstallerfiles**, create a folder such as, **C:\software\SharePoint** and store the SharePoint bits in this folder and the prerequisite files in the **SharePoint\prerequisiteinstallerfiles** folder.

**Table 14. SharePoint 2013 SP1 prerequisite files**

Prerequisite files	Download links
Microsoft SQL Server 2008 R2 SP1 Native Client	<a href="http://download.microsoft.com/download/9/1/3/9138773A-505D-43E2-AC08-9A77E1E0490B/1033/x64/sqlncli.msi">http://download.microsoft.com/download/9/1/3/9138773A-505D-43E2-AC08-9A77E1E0490B/1033/x64/sqlncli.msi</a>
Microsoft Sync Framework Runtime v1.0 SP1 (x64)	<a href="http://download.microsoft.com/download/E/0/0/E0060D8F-2354-4871-9596-DC78538799CC/Synchronization.msi">http://download.microsoft.com/download/E/0/0/E0060D8F-2354-4871-9596-DC78538799CC/Synchronization.msi</a>
Windows Server App Fabric	<a href="http://download.microsoft.com/download/A/6/7/A678AB47-496B-4907-B3D4-0A2D280A13C0/WindowsServerAppFabricSetup_x64.exe">http://download.microsoft.com/download/A/6/7/A678AB47-496B-4907-B3D4-0A2D280A13C0/WindowsServerAppFabricSetup_x64.exe</a>
Cumulative Update Package 1 for Microsoft AppFabric 1.1 for Windows Server (KB2671763)	<a href="http://download.microsoft.com/download/7/B/5/7B51D8D1-20FD-4BF0-87C7-4714F5A1C313/AppFabric1.1-RTM-KB2671763-x64-ENU.exe">http://download.microsoft.com/download/7/B/5/7B51D8D1-20FD-4BF0-87C7-4714F5A1C313/AppFabric1.1-RTM-KB2671763-x64-ENU.exe</a>
Windows Identity Foundation (KB974405)	<a href="http://download.microsoft.com/download/D/7/2/D72FD747-69B6-40B7-875B-C2B40A6B2BDD/Windows6.1-KB974405-x64.msu">http://download.microsoft.com/download/D/7/2/D72FD747-69B6-40B7-875B-C2B40A6B2BDD/Windows6.1-KB974405-x64.msu</a>



Prerequisite files	Download links
Microsoft Identity Extensions	<a href="http://download.microsoft.com/download/0/1/D/01D06854-CA0C-46F1-ADBA-EBF86010DCC6/rtm/MicrosoftIdentityExtensions-64.msi">http://download.microsoft.com/download/0/1/D/01D06854-CA0C-46F1-ADBA-EBF86010DCC6/rtm/MicrosoftIdentityExtensions-64.msi</a>
Microsoft Information Protection and Control Client	<a href="http://download.microsoft.com/download/9/1/D/91DA8796-BE1D-46AF-8489-663AB7811517/setup_msipc_x64.msi">http://download.microsoft.com/download/9/1/D/91DA8796-BE1D-46AF-8489-663AB7811517/setup_msipc_x64.msi</a>
Microsoft WCF Data Services 5.0	<a href="http://download.microsoft.com/download/8/F/9/8F93DBBD-896B-4760-AC81-646F61363A6D/WcfDataServices.exe">http://download.microsoft.com/download/8/F/9/8F93DBBD-896B-4760-AC81-646F61363A6D/WcfDataServices.exe</a>
Microsoft WCF Data Services 5.6	<a href="http://download.microsoft.com/download/1/C/A/1CAA41C7-88B9-42D6-9E11-3C655656DAB1/WcfDataServices.exe">http://download.microsoft.com/download/1/C/A/1CAA41C7-88B9-42D6-9E11-3C655656DAB1/WcfDataServices.exe</a>  <b>NOTE:</b> Ensure that after downloading, rename WcfDataServices.exe to WcfDataServices56.exe .

## Installing SharePoint 2013 SP1 prerequisite files

### About this task

In Windows Server 2012 R2, run the following Windows PowerShell scripts as Administrator:

### Steps

1. Install roles and features on Windows Server 2012 R2.



**NOTE:** To run the Windows PowerShell script, ensure that you provide the Windows 2012 R2 media path in the code and save the code with .ps1 extension.

```
$windows2012R2Path="D:\sources\sxs"
Import-Module ServerManager
Add-WindowsFeature Net-Framework-Features -Source
$windows2012R2Path
```

2. Install all the prerequisites by running the following script:



**NOTE:** To run the PowerShell script, ensure that you provide the SharePoint install path in the code.

```
$SharePoint2013Path="C:\software\SharePoint"
Start-Process "$SharePoint2013Path\PrerequisiteInstaller.exe" -ArgumentList
"/SQLNCLI:$SharePoint2013Path\PrerequisiteInstallerFiles\sqlncli.msi
/IDFX:$SharePoint2013Path\PrerequisiteInstallerFiles\Windows6.1-KB974405-
x64.msu
/IDFX11:$SharePoint2013Path\PrerequisiteInstallerFiles
\MicrosoftIdentityExtensions-64.msi
/Sync:$SharePoint2013Path\PrerequisiteInstallerFiles\Synchronization.msi
/AppFabric:$SharePoint2013Path\PrerequisiteInstallerFiles
\WindowsServerAppFabricSetup_x64.exe
/KB2671763:$SharePoint2013Path\PrerequisiteInstallerFiles\AppFabric1.1-RTM-
KB2671763-x64-ENU.exe
/MSIPCCClient:$SharePoint2013Path\PrerequisiteInstallerFiles
\setup_msipc_x64.msi
/WCFDataServices:$SharePoint2013Path\PrerequisiteInstallerFiles
\WcfDataServices.exe
/WCFDataServices56:$SharePoint2013Path\PrerequisiteInstallerFiles
\WcfDataServices56.exe"
```

The **Microsoft SharePoint 2013 Products Preparation Tool** displays the prerequisite installation is in progress. After the installation is complete, reboot the server.

#### Next steps

The prerequisite installation needs to be done on all the SharePoint web and application servers.

## Installing SharePoint Server 2013 SP1

#### Prerequisites

After all the prerequisites for installing SharePoint Server 2013 SP1 are installed and configured as specified in [Configuring prerequisites to install SharePoint 2013 SP1](#), install SharePoint 2013 Server SP1.

The following tables specify all the user accounts required for SharePoint 2013 SP1:

**Table 15. User accounts for SQL Server**

Name	Description	Local rights	Domain rights
SQL_Admin	The SQL Server service account is used to run SQL Server	Local administrator on the SQL Server	Domain user

**Table 16. User accounts for SharePoint Server**

Name	Description	Local rights	Domain rights
SP_Farm	The server farm account is used to set up and perform other administrative tasks.	Local administrator on all the SharePoint Servers	Domain user
		SecurityAdmin and DB_Creator rights on the SQL instance	
Web_App	The pool account is used to run the Web application pools	None	Domain user
SP_SearchService	The services account is used to run the Service application pool	None	Domain user
SP_Others	Generic services	None	Domain user
SP_UserProfiles	User profile	None	Domain user Replicate Directory Changes permission on the domain.

#### About this task

Perform the following tasks to install SharePoint Server 2013 SP1.

#### Steps

1. Copy the following configuration code in Notepad and save the file as **config.xml**.



**NOTE:** Specify the SharePoint 2013 SP1 Product ID in the config.xml script, and then copy the file to the SharePoint installation folder.

```
<Configuration>  
<Package Id="sts">
```

```

    <Setting Id="LAUNCHEDFROMSETUPSTS" Value="Yes"/>
  </Package>
  <Package Id="spswfe">
    <Setting Id="SETUPCALLED" Value="1" />
  </Package>
  <PIDKEY Value="<Type SharePoint 2013 PID>" />
    <Display Level="Basic" CompletionNotice="no" />
  <Setting Id="SERVERROLE" Value="APPLICATION" />
  <Setting Id="USINGUIINSTALLMODE" Value="0" />
  <Setting Id="SETUP_REBOOT" Value="Never" />
  <Setting Id="SETUPTYPE" Value="CLEAN_INSTALL" />
  <INSTALLLOCATION Value="D:\Program Files\Microsoft Office Servers
\15.0" />
  <DATADIR Value="D:\Data"/>
  <Logging
    Type="Verbose"
    Path="D:\SharePoint 2013 Install Logs"
    Template="Setup-Custom-ConfigXML-*.txt"
  />
</Configuration>

```

2. Run the following Windows PowerShell command to start SharePoint installation.



**NOTE:** Ensure to specify the SharePoint path in the code.

```

$SharePointpath="C:\software\SharePoint"
Start-Process $SharePointpath\setup.exe -ArgumentList "/config config.xml" -
Wait

```

### Next steps

Install SharePoint Server 2013 SP1 on all the SharePoint servers.

## Configuring SharePoint Server 2013 SP1

### About this task

Complete the following tasks to configure SharePoint Server 2013 SP1:

#### Steps

1. Create a SharePoint farm. See [Creating a SharePoint farm](#).
2. Add servers to the SharePoint farm. See [Adding servers to the SharePoint farm](#).
3. Configure search index in the SharePoint application server. See [Configuring search topology](#).

### Creating a SharePoint farm

#### About this task

Perform the following steps to create a farm by using Windows PowerShell commands:


#### Steps

1. Load the SharePoint module.  

```
Add-PsSnapin Microsoft.SharePoint.PowerShell -ErrorAction SilentlyContinue
```
2. Create a SharePoint farm.  


```
New-SPConfigurationDatabase -DatabaseName "SharePoint_Config" -
DatabaseServer
"DatabaseClustername" -AdministrationContentDatabaseName
"SharePoint_AdminContent" -
Passphrase (ConvertTo-SecureString "EnterPassphrase" -AsPlaintext -Force) -
FarmCredentials (Get-Credential)
```

At the Window prompt, type the farm administrator domain credentials.

 **NOTE:** You can change the Database Server name and Passphrase as per your environment.

3. Complete the configuration.

```
Install-SPHelpCollection -All
Initialize-SPResourceSecurity
Install-SPService
Install-SPFeature -AllExistingFeatures
New-SPCentralAdministration -Port <type a port number> -WindowsAuthProvider
"NTLM"
Install-SPApplicationContent
```

 **NOTE:** Ensure to perform steps 1 through 3 only once in the SharePoint farm that hosts the central administration site.

### Next steps

The installation of SharePoint Server and creating a SharePoint farm is complete and you can now add the second application server and two WFE servers to the SharePoint farm.


## Adding servers to the SharePoint farm

### About this task

Perform the following steps to add a server to an existing SharePoint 2013 farm:

#### Steps

1. Open a PowerShell window as Administrator.
2. Load the SharePoint module.

 **NOTE:** Ensure that you use the same database name and passphrase used of creating a SharePoint farm.

```
Add-PsSnapin Microsoft.SharePoint.PowerShell -ErrorAction SilentlyContinue
Connect-SPConfigurationDatabase -DatabaseServer " DatabaseClustername " -
DatabaseName
"SharePoint_Config" -Passphrase (ConvertTo-SecureString "EnterPassphrase" -
AsPlainText -Force)
Initialize-SPResourceSecurity
Install-SPService
Install-SPFeature -AllExistingFeatures
```

### Next steps

The servers are now added to the farm and you can distribute the services that run on each server to allocate and distribute the load.

## Adding managed accounts

The following section provides the commands to add the domain user account as SharePoint managed account.

```
$cred = Get-Credential
New-SPManagedAccount -Credential $cred
```

At the Window prompt, provide the credentials for the SharePoint managed accounts.

## Creating a web application

Run the following Windows PowerShell commands to create a web application:

```
$siteName = "Site Name"
$port = 80
```

```

$hostHeader = <"Type the host header">

$url = <"Type the url">

$appPoolName = <"Type the Site Name">

$managedAccount = <"domain\username">

$dbServer = <"Clustered Database Server Name">

$dbName = <"Type the content DB name">

$allowAnonymous = $true

$authenticationMethod = "NTLM"

$ssl = $false

New-SPWebApplication -Name $siteName -Port $port -HostHeader $hostHeader -URL
$url
$url -ApplicationPool $appPoolName -ApplicationPoolAccount
(Get-SPManagedAccount "$managedAccount") -DatabaseName $dbName
-DatabaseServer $dbServer -AllowAnonymousAccess: $allowAnonymous
-AuthenticationMethod $authenticationMethod -SecureSocketsLayer:$ssl

```

Run the following Windows PowerShell commands to create site collection:

```

$url = <"Type the site url">
$contentDatabase = <"Type the content DB name">
$websiteName = <"Type the site name">
$description = <"Type the team site">
$template = "STS#0"
$primaryLogin = "domain\user"
$primaryEmail = "user@domain.com"

New-SPSite -Url $url -ContentDatabase $contentDatabase -Name $websiteName -
Description
$description -Template $template -OwnerAlias $primaryLogin -OwnerEmail
$primaryEmail

```

Run the Windows PowerShell commands again to create additional sites.

## Configuring service application

Perform the following steps to configure user profile service application in SharePoint 2013 SP1:

1. Configure SharePoint 2013 SP1 search topology. See [Configuring search topology](#).
2. Create a user profile service application by using Central Administration. See [Creating user profile](#).
3. Set up managed metadata service. See [Creating managed metadata service](#).
4. Enable the session state service. See [Enabling session state](#).

### Configuring search topology

#### About this task

To configure SharePoint search topology on the application servers, perform the following steps:

#### Steps

1. Log in to the first application server and open the Windows PowerShell command as Administrator.
2. Load the Powershell snap-in.

```
Add-PSSnapin Microsoft.SharePoint.PowerShell -ErrorAction SilentlyContinue
```

**3. Create a search service application.**

```
$App1 = "APP1"
$APP2 = "APP2"
$WFE1 = "WEB1"
$WFE2 = "WEB2"
$SearchAppPoolName = "SharePoint_SearchApp"
$SearchAppPoolAccountName = "Domain\User"
$SearchServiceName = "SharePoint_Search_Service"
$SearchServiceProxyName = "SharePoint_Search_Proxy"
$DatabaseName = "SharePoint_Search_AdminDB"
```

**4. Create a search service application pool.**

```
$spAppPool = New-SPServiceApplicationPool -Name $SearchAppPoolName -Account
$SearchAppPoolAccountName -Verbose
```

**5. Start search service instance on all SharePoint servers.**

```
Start-SPEnterpriseSearchServiceInstance $App1 -ErrorAction SilentlyContinue
Start-SPEnterpriseSearchServiceInstance $App2 -ErrorAction SilentlyContinue
Start-SPEnterpriseSearchServiceInstance $WFE1 -ErrorAction SilentlyContinue
Start-SPEnterpriseSearchServiceInstance $WFE2 -ErrorAction SilentlyContinue
```

**6. Ensure that the search service is running on all the SharePoint servers.**

```
Get-SPEnterpriseSearchServiceInstance -Identity $APP1
Get-SPEnterpriseSearchServiceInstance -Identity $APP2
Get-SPEnterpriseSearchServiceInstance -Identity $WFE1
Get-SPEnterpriseSearchServiceInstance -Identity $WFE2
```

**7. Create search service application.**

```
$ServiceApplication = New-SPEnterpriseSearchServiceApplication -Name
$SearchServiceName -ApplicationPool $spAppPool.Name -DatabaseName
DatabaseName
```

**8. Create search service proxy.**

```
New-SPEnterpriseSearchServiceApplicationProxy -Name $SearchServiceProxyName
-SearchApplication $ServiceApplication
```

**9. Create a new topology.**

```
$ssa = Get-SPEnterpriseSearchServiceApplication
$newTopology = New-SPEnterpriseSearchTopology -SearchApplication $ssa
```

**10. Create one admin component.**

```
New-SPEnterpriseSearchAdminComponent -SearchTopology $newTopology -
SearchServiceInstance $App1
```

**11. Create two content processing components for HA.**

```
New-SPEnterpriseSearchContentProcessingComponent -SearchTopology
$newTopology -SearchServiceInstance $App1
New-SPEnterpriseSearchContentProcessingComponent -SearchTopology
$newTopology -SearchServiceInstance $App2
```

**12. Create two analytics processing components for HA.**

```
New-SPEnterpriseSearchAnalyticsProcessingComponent -SearchTopology
$newTopology -SearchServiceInstance $App1
New-SPEnterpriseSearchAnalyticsProcessingComponent -SearchTopology
$newTopology -SearchServiceInstance $App2
```

**13. Create two crawl components for HA.**

```
New-SPEnterpriseSearchCrawlComponent -SearchTopology $newTopology -
SearchServiceInstance $App1
New-SPEnterpriseSearchCrawlComponent -SearchTopology $newTopology -
SearchServiceInstance $App2
```

**14. Create two query processing components for HA.**

```
New-SPEnterpriseSearchQueryProcessingComponent -SearchTopology $newTopology -SearchServiceInstance $WFE1
New-SPEnterpriseSearchQueryProcessingComponent -SearchTopology $newTopology -SearchServiceInstance $WFE2
```

**15. Create search components.**

```
New-SPEnterpriseSearchIndexComponent -SearchTopology $newTopology -SearchServiceInstance $APP1 -IndexPartition 0
New-SPEnterpriseSearchIndexComponent -SearchTopology $newTopology -SearchServiceInstance $APP2 -IndexPartition 0
New-SPEnterpriseSearchIndexComponent -SearchTopology $newTopology -SearchServiceInstance $APP2 -IndexPartition 1
New-SPEnterpriseSearchIndexComponent -SearchTopology $newTopology -SearchServiceInstance $APP1 -IndexPartition 1
```

**16. Activate the search topology.**

```
Set-SPEnterpriseSearchTopology -Identity $newTopology
```

**17. Verify the search topology once the configuration is complete.**

```
Get-SPEnterpriseSearchTopology -SearchApplication $ssa
```

**Next steps**

The creating and configuring a SharePoint 2013 SP1 search service application is now complete and you can follow these steps to extend support for a bigger size farm.


## Creating user profile

### About this task

Perform the following steps to create a user profile service application by using the SharePoint Central Administration website:

#### Steps

1. Open SharePoint 2013 Central Administration and click **Application Management**.
2. In the **Application Management** section, click **Manage service applications**.
3. On the **Manage Service Applications** page, click the **Service Applications** tab to activate the menu.
4. On the menu, click **New**, and then select **User Profile Service Application** from the list of service applications to create.
5. In the **Create New User Profile Service Application** dialog box, in the **Name** field, type a name for the user profile service application.
6. In the **Application Pool** section, select **Create a new application pool** and type the application pool name.
7. In the **Application Pool** section, for the **Select a security account for this application pool** option, select **Configurable** and choose an existing managed account.
8. In the **Profile Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the database name.
9. In the **Profile Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.
10. In the **Synchronization Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the name of the database.
11. In the **Synchronization Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.
12. In the **Social Tagging Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the name of the database.
13. In the **Social Tagging Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.

14. In the **Profile Synchronization Instance** section, select application server name.
  15. Retain the other settings to the default values and click **Create** to create user profile service application.
  16. In the **Site Naming Format** section, select **User name (do not resolve conflicts)**.
  17. In the **Default Proxy Group** section, select **Yes**.
  18. In the **Yammer Integration** section, select **Use on-premise SharePoint social functionality**.
  19. Click **Create**.  
The user profile service application is successfully created.
  20. Navigate to **Application Management** → **Service Application** → **Manage Services on server** to configure the user profile.
  21. Start the **User Profile Synchronization Service**.
  22. At the User Profile Synchronization Service prompt, type the password and click **OK**.
  23. Navigate to **Central Administration** → **Application Management** → **Manage Service Application** → **User Profile Service** → **Configure Synchronization Connection** to configure synchronization connection.
  24. Click **Create New Connection**.
  25. In the **Add new synchronization connection**, do the following:
    - a. Type the connection name in the **Connection Name** field.
    - b. Select **Active Directory** in the **Type** field.
    - c. In the **Connection Settings** section, type the domain name in the **Forest name** field.
    - d. In the **Connection Settings** section, type the domain user name in the **Account name** field.
    - e. Type the password and port value as 389.
    - f. Click **Populate Containers**.
-  **NOTE:** Ensure that the replicate directory changes permission has been granted to the search application domain user name on your domain.
26. Navigate to **Central Administration** → **Application Management** → **Manage service applications**.
  27. Select **User Profile Service**.
  28. Click **Start Profile Synchronization** in **Synchronization**.
  29. Select **Start Full Synchronization** and click **OK**.

## Creating managed metadata service

### About this task

Perform the following steps to create and configure the managed metadata service in central administration.

### Steps

1. Navigate to **Central Administration** → **Application Management** → **Manage Service applications**.
2. On the **Manage Service Applications** page, click the **Service Applications** tab to activate the menu.
3. On the menu, click **New**, and then select **Managed Metadata Service**.
4. In the **Create New Managed Metadata Service** dialog box, in the **Name** field, type a name, database server name, database name, and select **Windows authentication (recommended)**.
5. In the **Application Pool** section, select **Create a new application pool** and type the application pool name.
6. In the **Application Pool** section, for the **Select a security account for this application pool** option, select **Configurable** and select an existing managed account.
7. Click **OK** to create a managed metadata service.



## Enabling session state

Run the following Windows PowerShell command to create a session database and activate the session database service:

### Example

```
Enable-SPSessionStateService -DatabaseServer<Database Server Name> -DatabaseName  
<Database Name> -SessionTimeout 120
```

## Moving content databases to another volume

### About this task

Perform the following tasks to move the content databases in your SharePoint 2013 farm by using Windows PowerShell.

### Steps

1. Detach the content databases from a web application.  
Load the SharePoint PowerShell snap-in and run the following Windows PowerShell command:
2. Detach the content databases from the SQL server by performing the following:
  - a. In SQL Server Management Studio, open the source SQL server instance, and then expand the **Databases** node.
  - b. Right-click the content database, click **Tasks** → **Detach**. Repeat this step for each content database that you want to move.
3. Move the content databases to a new location by performing the following:
  - a. Locate the .mdf and .ldf files for the content databases by using Windows Explorer.
  - b. Select the .mdf and .ldf files for the database that you want to move and either copy or move them to the destination directory.
4. Attach the content databases to the same instance of SQL Server by performing the following:
  - a. In SQL Server Management Studio, open the destination SQL Server instance.
  - b. Right-click the **Databases** node, click **Tasks** → **Attach**.
  - c. In the **Attach Database** dialog box, browse to the location you transferred the .mdf and .ldf files and select the .mdf file for the database that you want to attach. Click **OK**.
5. Repeat steps 1 through 4 for each content database that you are want to move..
6. Attach the content databases to the web application.  
Load the SharePoint PowerShell snap-in and run the following Windows PowerShell command:

```
Mount-SPContentDatabase "<ContentDB>" -DatabaseServer "<DBServer>" -  
WebApplication <http://SiteName>
```

### Next steps

This completes the movement of the content databases to another volume.


## Creating user profile

### About this task

Perform the following steps to create a user profile service application by using the SharePoint Central Administration website:

### Steps

1. Open SharePoint 2013 Central Administration and click **Application Management**.
2. In the **Application Management** section, click **Manage service applications**.

3. On the **Manage Service Applications** page, click the **Service Applications** tab to activate the menu.
  4. On the menu, click **New**, and then select **User Profile Service Application** from the list of service applications to create.
  5. In the **Create New User Profile Service Application** dialog box, in the **Name** field, type a name for the user profile service application.
  6. In the **Application Pool** section, select **Create a new application pool** and type the application pool name.
  7. In the **Application Pool** section, for the **Select a security account for this application pool** option, select **Configurable** and choose an existing managed account.
  8. In the **Profile Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the database name.
  9. In the **Profile Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.
  10. In the **Synchronization Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the name of the database.
  11. In the **Synchronization Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.
  12. In the **Social Tagging Database** section, in the **Database Server** field, type the name of the database server. In the **Database Name** field, type the name of the database.
  13. In the **Social Tagging Database** section, for the **Database authentication** option, select **Windows authentication (recommended)**.
  14. In the **Profile Synchronization Instance** section, select application server name.
  15. Retain the other settings to the default values and click **Create** to create user profile service application.
  16. In the **Site Naming Format** section, select **User name (do not resolve conflicts)**.
  17. In the **Default Proxy Group** section, select **Yes**.
  18. In the **Yammer Integration** section, select **Use on-premise SharePoint social functionality**.
  19. Click **Create**.  
The user profile service application is successfully created.
  20. Navigate to **Application Management** → **Service Application** → **Manage Services on server** to configure the user profile.
  21. Start the **User Profile Synchronization Service**.
  22. At the User Profile Synchronization Service prompt, type the password and click **OK**.
  23. Navigate to **Central Administration** → **Application Management** → **Manage Service Application** → **User Profile Service** → **Configure Synchronization Connection** to configure synchronization connection.
  24. Click **Create New Connection**.
  25. In the **Add new synchronization connection**, do the following:
    - a. Type the connection name in the **Connection Name** field.
    - b. Select **Active Directory** in the **Type** field.
    - c. In the **Connection Settings** section, type the domain name in the **Forest name** field.
    - d. In the **Connection Settings** section, type the domain user name in the **Account name** field.
    - e. Type the password and port value as 389.
    - f. Click **Populate Containers**.
-  **NOTE:** Ensure that the replicate directory changes permission has been granted to the search application domain user name on your domain.
26. Navigate to **Central Administration** → **Application Management** → **Manage service applications**.

27. Select **User Profile Service**.
28. Click **Start Profile Synchronization** in **Synchronization**.
29. Select **Start Full Synchronization** and click **OK**.

# Verifying the deployment

## About this task

Once the deployment is complete, you can refer to the following steps to verify that SharePoint 2013 SP1 is installed successfully:

## Steps

1. Run the following Windows PowerShell command and ensure that the sharepoint\_config status is online.  
`Get-spfarm`
2. Open the **Central Administration** page from any of the SharePoint servers and make sure the page is accessible.
3. Shut down one of the WFE server and access the web application.
4. Shut down the active database server and access the web application.

## Verifying the Microsoft Hyper-V virtualization deployment

After the deployment is complete, you may follow these steps to verify the deployment of Hyper-V virtualization:

1. Create VMs.
2. Migrate VMs across the cluster and check if the migration is progressing without any interruption.
3. Shut down one of the hosts and check if the VMs located on that host are migrating within the cluster.
4. Power off one of the network switches S4048-ON and ensure that the VMs are running without any network loss.

## Additional Resources

[Dell Services](#) and Dell certified channel partners provide consulting solutions to help customers plan, deploy, and manage even the most advanced and complex SharePoint Server configurations.

## Appendix A

- [DellTechCenter.com](http://DellTechCenter.com)
- Prerequisites for creating Hyper-V clusters: Complete all the prerequisites required for creating hyper-v clusters in VMM, for more information, see Microsoft documentation at <https://technet.microsoft.com/en-us/library/gg610630.aspx>.
- [Reference Architecture - Microsoft SharePoint Server 2013 on Dell PowerEdge R630](#)
- [Dell PowerEdge R630](#)
- [Dell Equallogic PS6210](#)
- [Overview of farm virtualization and architectures for SharePoint 2013](#)
- [Best practice configurations for the SharePoint 2013 virtual machines and Hyper-V environment](#)
- [Configuring Dynamic Optimization in VMM](#)

## Appendix B

The following table represents an example of 4 PowerEdge R630 server cluster along with switches and storage used in the solution.

**Table 17. Sample naming and IP addressing scheme example for switches and storage**

Device Name	OOB Management IP	Hostname
S4048-ON-Top (LAN)	192.168.100.105	S4048-ON-Top
S4048-ON-Bottom (LAN)	192.168.100.106	S4048-ON-Bottom
S4048-ON-Top (Storage)	192.168.100.107	S4048-ON-Top
S4048-ON-Bottom (Storage)	192.168.100.108	S4048-ON-Bottom
Dell EqualLogic Storage	192.168.100.109	

**Table 18. Sample naming and IP addressing scheme for Servers**

Device Name	OOB Management IP	Hostname	Cluster	Live Migration
R630 1 to 4	192.168.100.115 to 192.168.100.119	HyperVHost1 to HyperVHost4	172.168.64.116	172.168.96.116 to 172.168.96.120