

Dell EMC Red Hat OpenStack NFV Solution

**Hardware Deployment Guide
Version 6.0**



Dell EMC Validated Solutions

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Notes, Cautions, and Warnings

-  A **Note** indicates important information that helps you make better use of your system.
-  A **Caution** indicates potential damage to hardware or loss of data if instructions are not followed.
-  A **Warning** indicates a potential for property damage, personal injury, or death.

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Chapter 1

Overview

Topics:

- *Intended Audience*

This guide provides information necessary to deploy the Dell EMC Red Hat OpenStack NFV Solution, on Dell PowerEdge R630 and R730xd servers with the Dell PowerEdge H730 disk controller; and the network with Dell Networking S4048T and S6010-ON switches.

Intended Audience

This guide assumes the reader is familiar with:

- OpenStack
- PowerEdge R630 and R730xd RAID and BIOS configuration
- Red Hat Enterprise Linux (RHEL)
- Red Hat OpenStack Platform (RHOSP) documentation
- Network Configuration

Chapter

2

Configuring R630 and R730xd Hardware

Topics:

- [IPMI Configuration](#)
- [Configuring Server User Information](#)
- [Configuring Server Network Settings](#)
- [Validating Server IPMI Configuration](#)
- [Infrastructure and Virtualization Node Settings](#)
- [DTK Configurator](#)

This section describes manually configuring PowerEdge R630 and R730xd server hardware for the Dell EMC Red Hat OpenStack NFV Solution with Red Hat OpenStack Platform:

- IPMI Configuration
- BIOS Configuration
- RAID Configuration



Note: The hardware configuration for the optional PowerEdge R430 and R730 servers is the same as for Compute nodes.

IPMI Configuration

You must perform configuration of the iDRAC on supported systems. Dell EMC recommends that you configure these settings from the iDRAC web interface, or directly on the node console.

Configuring Server User Information

1. Set credentials for the root user, including changing the password based upon good password standards.
2. Set privileges for the user to the Admin level, including over LAN.
3. Enable the user, if disabled.

Configuring Server Network Settings

1. Set the iDRAC IP address source to *static* IP addressing.
2. Set the iDRAC IP address, subnet mask, default gateway IP, and default VLAN (ID = 110).
3. Set the iDRAC NIC mode to *Dedicated*.
4. Configure the IPMI over LAN Setting to *Enabled*.

Validating Server IPMI Configuration

Validating that remote commands can be executed is an essential part of the IPMI setup.

1. Install the IPMI Utilities to your workstation from SourceForge:
 - a. For Linux® - <http://sourceforge.net/projects/ipmitool/>
 - b. For Windows® - <http://ipmiutil.sourceforge.net/>
 - c. Validate that you have all the requirements, and that it will run.
2. Plug your Ethernet port into a switch port that is on the same VLAN as your iDRACs.
3. Configure your NIC to use an IP address in the iDRAC network range.
4. Execute the following IPMI command, replacing "username" and "password" with the credentials for the iDRACs:

```
for i in $(seq 162 170); do ipmitool -P "password" -U "username" -I
lanplus -H 192.168.200.$i power status; done
```

This will perform a simple, non-destructive poll of the power status of the iDRAC from 192.168.200.162 to 192.168.200.170.



Note: You will need to replace the IP address range and subnet with correct information for the deployed iDRAC subnet.

- a. You can replace the keyword status with *reset*, *off*, or *on*.



Note: These may change the power state of the nodes.

5. Ensure that all machines return responses to the command.

Infrastructure and Virtualization Node Settings

The following settings should be preset from the factory on the R630; be sure to double-check them:

- [OpenStack Default BIOS Specification](#)

This section describes the settings for nodes that will be used on the Solution Admin Host (SAH), OpenStack controllers, and Compute nodes:

- [OpenStack Controller and Storage Specification](#)
- [OpenStack Compute and SAH Specification](#)

DTK Configurator

This topic contains Dell EMC Toolkit (DTK) Configurator usage instructions. The DTK Configurator enables you to create a USB key from which you can boot a Dell PowerEdge R630 or R730xd, and apply the BIOS and RAID settings.

Tested BIOS and Firmware

[Table 1: Tested BIOS and Firmware Versions](#) on page 11 lists the BIOS and firmware versions that were tested for the Dell EMC Red Hat OpenStack NFV Solution, version 6.0.



Caution: You must ensure that the firmware on all servers is up to date. Otherwise, unexpected results may occur.

Table 1: Tested BIOS and Firmware Versions

Product	Version
BIOS	2.1.7
iDRAC Firmware	2.30.30.30
Lifecycle Controller	2.30.30.30
Intel® 10G NIC	17.5.10
PERC H730 RAID Controller	25.4.0.0017
BP13G+0:1	2.23 (R630) - 3.31 (R730xd)
Power Supply Firmware	00.11.3F (R630) - 00.24.7A (R730xd)

Creating the DTK Configurator ISO

To create the DTK Configurator ISO:

1. Ensure you are running in a Linux® environment that has the following programs installed:
 - `cpio`
 - `rpm`
 - `rpm2cpio`
2. Ensure the user you are logged in as has passwordless `sudo` rights.
3. Copy the `bootimage.iso` included in the DTK configuration `tgz` file to your home directory.

- Run the following command to ensure that the loop module is loaded, so that the script has access to loopback devices:

```
$ sudo modprobe loop
```

- Copy the ISO onto a USB key using the following command:

```
$ sudo dd if=~/.bootimg.iso of=/dev/sdx bs=2048
```

Where: `/dev/sdx` is the device that was created when the USB key was inserted into the system. The USB key must be at least 512MB in size.

Customizing the ISO

This utility creates a CentOS 6.6 Live CD ISO that has the Dell EMC DTK Configurator installed. It uses `syscfg`, `raidcfg` and `racadm` to configure the system. The main customization point is `bootimg/node-config.sh`, which automatically runs when the ISO finishes booting.

iDRAC Default Settings

[Table 2: OpenStack Infrastructure and Storage Node Specification](#) on page 12 lists and describes iDRAC default `racadm` settings that will be set by the DTK Configurator:

Table 2: OpenStack Infrastructure and Storage Node Specification

Menu Choice	iDRAC Setting
iDRAC.IPMILan.Enable	Enabled
iDRAC.IPMILan.PrivLimit	4
iDRAC.IPv4.Enable	Enabled
iDRAC.Users.2.Enable	Enabled
iDRAC.Users.2.IpmiLanPrivilege	4
iDRAC.Users.2.Privilege	0x1ff
iDRAC.WebServer.Enable	Enabled

OpenStack Default BIOS Specification

[Table 3: OpenStack Default BIOS Specification](#) on page 12 lists and describes the default BIOS settings for the OpenStack servers that will be set by the DTK Configurator.

Table 3: OpenStack Default BIOS Specification

Display Name	Attribute	Settings
Boot Mode	BootMode	BIOS
Boot Sequence Retry	BootSeqRetry	Enabled
DCU IP Prefetcher	DculpPrefetcher	Enabled
DCU Streamer Prefetcher	DcuStreamerPrefetcher	Enable
Logical Processor Idling	DynamicCoreAllocation	Disabled
Integrated RAID Controller	IntegratedRaid	Enabled
Internal SD Card	InternalSdCard	Off

Display Name	Attribute	Settings
I/OAT DMA Engine	IoatEngine	Enabled
Logical Processor	LogicalProc	Enabled
Memory Operating Mode	MemOpMode	OptimizerMode
System Memory Testing	MemTest	Disabled
Node Interleaving	NodeInterleave	Disabled
OS Watchdog Timer	OsWatchdogTimer	Disabled
Adjacent Cache Line Prefetch	ProcAdjCacheLine	Enabled
Number of Cores per Processor	ProcCores	all
Execute Disable	ProcExecuteDisable	Enabled
Hardware Prefetcher	ProcHwPrefetcher	Enabled
CPU Power Management	ProcPwrPerf	MaxPerf
Turbo Mode	ProcTurboMode	Enabled
Virtualization Technology	ProcVirtualization	Disabled
QPI Speed	QpiSpeed	MaxDataRate
Alternate RTID (Requestor Transaction ID) Setting	RtidSetting	Disabled
SR-IOV Global Enable	SriovGlobalEnable	Enabled
System Profile	SysProfile	PerfOptimized

OpenStack Controller and Storage Specification

[Table 4: OpenStack Controller and Storage Node Specification](#) on page 13 lists and describes OpenStack Controller and Storage Node parameters that differ from [OpenStack Default BIOS Specification](#) on page 12. Controller nodes are sometimes referred to as Infrastructure nodes.

Table 4: OpenStack Controller and Storage Node Specification

Display Name	Attribute	Settings
SR-IOV Global Enable	SriovGlobalEnable	Disabled

OpenStack Compute and SAH Specification

[Table 5: OpenStack Compute and SAH Specification](#) on page 13 lists and describes OpenStack Compute and SAH parameters that differ from [OpenStack Default BIOS Specification](#) on page 12.

Table 5: OpenStack Compute and SAH Specification

Display Name	Attributes	Settings
Virtualization Technology	ProcVirtualization	Enabled

Virtual Infrastructure Manager (VIM) Node Specification

[Table 6: Virtual Infrastructure Manager \(VIM\) Node Specification](#) on page 14 lists and describes VIM node parameters that differ from [OpenStack Default BIOS Specification](#) on page 12.

Table 6: Virtual Infrastructure Manager (VIM) Node Specification

Display Name	Attributes	Settings
Boot Mode	BootMode	Bios
Virtualization Technology	ProcVirtualization	Enabled

Setting RAID Profiles

[Table 7: RAID Setting Profiles](#) on page 14 lists and describes RAID setting profiles that will be created by the DTK Configurator.

Table 7: RAID Setting Profiles

Profile	Settings
RAID10	<ol style="list-style-type: none"> 1. Configure all the disks on the first controller as a single large RAID 10. 2. Mark it as the boot volume. <p>All the disks must use the same media type (SSD or HDD), and the same interface type (SAS or SATA). If they do not, array creation will fail.</p>
RAID1 and JBOD	<ol style="list-style-type: none"> 1. Configure the last two disks on the storage node as a RAID 1. 2. Mark it as bootable. 3. Configure the rest of the disks as JBOD volumes. <p>All the disks in the RAID 1 must use the same media type, and have the same interface type. On the R730xd, this should result in the boot volume being on the rear drives (assuming that the rear backplane is attached properly).</p>

PowerEdge R730xd Storage nodes are available in chassis options that support different drive configurations:

- **3.5" Drive Configuration** — Three (3) SSD journal drives, twelve (12) 3.5" OSD drives, and two (2) flex bay drives
- **2.5" Drive Configuration** — Twenty four (24) external 2.5" drives and two (2) flex bay drives

Mapping Menu Choices BIOS and RAID Settings

[Table 8: RAID and BIOS Menu Choices Mappings](#) on page 14 lists and describes the mappings of menu choices to RAID and BIOS settings.

Table 8: RAID and BIOS Menu Choices Mappings

Menu Choice	BIOS/RAID Setting
OpenStack Infrastructure (Controller)	OpenStack Controller, RAID10
OpenStack Compute	OpenStack Compute, RAID10
OpenStack Storage	OpenStack Storage, RAID1 and JBOD
OpenStack SAH	OpenStack SAH, RAID10

Running the DTK Configurator ISO

To run the DTK Configurator ISO:

1. Boot the system to be configured from the USB key.

2. Once the system finishes booting, it displays the detected RAID controllers along with their current configuration; and offers you a choice of system configurations.
 - a. Select a system configuration based upon the role that the node will play:
 - OpenStack Infrastructure (Controller)
 - OpenStack Compute
 - OpenStack Storage
 - OpenStack SAH
3. The DTK Configurator automatically configures the RAID and BIOS settings. Once finished, it will ask you to provide basic iDRAC connectivity information, including:
 - a. Whether the iDRAC should use DHCP
 - b. Or, basic IPv4 settings if not using DHCP
4. The system configures the iDRAC with some default settings plus the network settings from Step 3 above. Once it finishes applying those settings, it prompts you to reboot the system.
5. Assuming there were no errors, remove the USB key and then reboot the system.

The changes are applied, and the system is configured for its role.

Chapter

3

Dell Storage PS Series Storage Group

Topics:

- [Dell Storage PS Series Configuration Information](#)


The PS Series Storage Group can consist of one or more storage arrays with one or more storage groups.



Note: The configuration of the arrays is beyond the scope of this document. Please refer to the Dell Storage PS Series Support Website (<https://eqsupport.dell.com/secure/login.aspx>) for the latest guides, whitepapers, and best practices on how to setup your Storage Group for your application.

Dell Storage PS Series Configuration Information

Once the Storage Group(s) are setup, the information contained in [Table 9: PS Series Information Needed from Configuration](#) on page 17 must be collected to configure your storage backend.

 **Note:** The `san_thin_provision` variable should be left at the default if available; if not, then it must be set to `False`.

More information can be found at <https://access.redhat.com/documentation/en/red-hat-openstack-platform/8/dell-equallogic-back-end-guide/dell-equallogic-back-end-guide>.

Table 9: PS Series Information Needed from Configuration

[DEFAULT]	Description
<code>volume_driver = cinder.volume.drivers.eqlx.DellEQLSanISCSIDriver</code>	Dell Storage PS Series volume driver
<code>san_ip = <IP_address_of_EQLX></code>	IP address used to reach the PS Series Group through SSH
<code>san_login = <user_name></code>	User name to login to the Group manager via SSH at the <code>san_ip</code>
<code>san_password = <password></code>	Password to login to the Group manager via SSH at the <code>san_ip</code> (not used when <code>san_private_key</code> is set)
<code>san_thin_provision = <true false></code>	Enable/disable creation of thin-provisioned volumes
<code>san_ssh_port = 22</code>	Port used for SSH
<code>ssh_conn_timeout = 30</code>	Timeout value, in seconds, used by CLI commands over SSH
<code>san_private_key = <filename></code>	Filename of the private key used for SSH authentication
<code>ssh_min_pool_conn = 1</code>	Minimum number of SSH connections in the pool
<code>ssh_max_pool_conn = 5</code>	Maximum number of SSH connections in the pool
<code>eqlx_chap_login = admin</code>	Existing CHAP account name
<code>eqlx_chap_password = password</code>	Password for specified CHAP account name
<code>eqlx_cli_max_retries = 5</code>	Maximum retry count for reconnection
<code>eqlx_cli_timeout = 30</code>	Timeout for the Group Manager CLI command execution
<code>eqlx_group_name = group-0</code>	Group name to use for creating volumes

[DEFAULT]	Description
<code>eqlx_pool = default</code>	Pool in which volumes will be created
<code>eqlx_use_chap = False</code>	Use CHAP authentication for targets?

Chapter

4

Dell Storage SC Series Storage Arrays

Topics:

- [*Dell Storage SC Series Configuration Information*](#)

The SC Series can consist of one or more Dell Storage Centers with Dell Storage Enterprise Manager platform.



Note: The configuration of the cluster is beyond the scope of this document. Please refer to the Dell Storage SC Series support website, <http://www.dell.com/support/content/us/en/19/article/Product-Support/Dell-Subsidiaries/compellent>, for the latest guides, white papers, and best practices on how to setup your storage cluster.

Dell Storage SC Series Configuration Information

Once the Dell Storage SC Series with the Dell Storage Enterprise Manager platform is setup according to the [Dell EMC Red Hat OpenStack NFV Solution Reference Architecture](#), the information contained in [Table 10: SC Series Information Needed from Configuration](#) on page 20 must be collected to configure your storage backend.

More information can be found at <https://access.redhat.com/documentation/en/red-hat-openstack-platform/version-8/dell-storage-center-back-end-guide/>

Table 10: SC Series Information Needed from Configuration

[DEFAULT]	Description
Required Values	
<code>volume_backend_name = delliscsi</code>	Name given to the storage backend
<code>volume_driver = cinder.volume.drivers.dell.dell_storagecenter_iscsi.DellStorageCenterISCSIDriver</code>	Dell Storage SC Series iSCSI volume driver
<code>san_ip = <IP_address></code>	IP address of Enterprise Manager
<code>san_login = <user_name></code>	User name to log into Enterprise Manager at the <code>san_ip</code>
<code>san_password = <password></code>	Password to log into the Enterprise Manager at the <code>san_ip</code>
<code>iscsi_ip_address = <IP_address></code>	The Storage Center iSCSI IP address
<code>dell_sc_ssn = <serial_number></code>	The Storage Center serial number to use
Optional Vaules	
<code>dell_sc_api_port = <port_to_use></code>	Configured Enterprise Manager API port, default is 3033
<code>dell_sc_server_folder = <folder_name></code>	Server folder in which to place new server definitions
<code>dell_sc_volume_folder = <folder_name></code>	Volume folder in which to place created volumes
<code>iscsi_port = <port_number></code>	iSCSI port to use, if you do not wish to use the default port number 3260

Chapter

5

Configuring Your Network

Topics:

- [*Network Configuration Overview*](#)
- [*Third-Party Network Hardware*](#)
- [*Using the Workbook*](#)
- [*Dell Networking Switches*](#)
[*Default Solution Values*](#)
- [*Configuring the Dell Networking*](#)
[*S6010-ON*](#)
- [*Configuring the Dell Networking*](#)
[*S4048T*](#)

This topic describes the procedures required to configure the Dell EMC Red Hat OpenStack NFV Solution network.

Network Configuration Overview

Complete the following steps to set up your network:

1. Determine the VLANs to be used and how they are used.
2. Determine the IP ranges and associate them to a VLAN.
3. Fill in the Solution Workbook. See [Using the Workbook](#) on page 22.
4. Ensure that the cabling matches your Workbook.
5. Configure your switches per the Workbook:
 - [Dell Networking Switches Default Solution Values](#) on page 27

Third-Party Network Hardware

If you are not using Dell Networking S4048T and/or S6010-ON switches, you must program the switches to support your cloud instantiation. Your switches are expected to support the following:

- Support for IEEE 802.1Q VLAN traffic and port tagging
- Support for using one untagged and multiple tagged VLANs on the same port
- The ability to provide a minimum of 170 Gigabit Ethernet ports, in a non-blocking configuration, within the Provisioning VLAN
 - Configuration can be a single switch or a combination of stacked switches, to meet the additional requirements
- The ability to create link aggregation groups (LAGs) with a minimum of two physical links in each LAG
- If multiple switches are stacked:
 - The ability to create a LAG across stacked switches
 - Full-bisection bandwidth
 - Support for VLANs to be available across all switches in the stack
- 250,000 packets-per-second capability per switch
- A managed switch that supports both SSH and serial line configuration
- SNMP v3 support

Using the Workbook

The *Solution Workbook* is set up to enable the installers to use the same information to:

- Program the switches
- Build the configuration for each node

Using the worksheet you must complete the following tasks for each connection from Server to Switch.

On Any Page:

- If the information is indicated as *required*, then it is needed in order to ensure a successful install.
- We provide a table for you to complete, similar to [Table 11: Example VLAN Assignments](#) on page 23.



Note: When configuring your networks they must be aligned so that the tenant networks can be expanded by adding a VLAN for each OpenStack virtual network. This is accomplished by assigning all the other networks to lower VLAN numbers than that of the internal tenant network. The solution, as tested, uses a single external network for tenants. A service motion can be arranged to allow dedicated external tenant networks.

Table 11: Example VLAN Assignments

VLAN Name	Recommended VLAN
Management/Out of Band (OOB) Network	110
Provisioning Network VLAN	120
Private API Network VLAN	140
Storage Network VLAN	170
Storage Clustering Network VLAN	180
Public API Network vLAN (API, Tenants, GUI)	190
External Network VLAN for Tenants (tenants' floating IP addresses)	191
Internal Networks VLAN for Tenants	200+



Note: Management/Out of Band network ports Management 1/1 is used by the VLT for the Heart Beat and must terminate on the same vlan in the same ip range.

On the General Configuration Page:

- Fill in the information needed as required by the site.

On the Switch Configuration Pages:

- **Name** - The Port name on the switch.
- **Connector** - The type of connector used.
- **Device Name** - The name of the server/device connected to the switch. It is helpful to use a name that describes the server usage and associated bond.
- **Port** - The Network Interface Card (NIC) name and port number as the OS would generate.
- **Untagged** and **Tagged** - Used to indicate what VLAN(s) the port should be used, and how.
- **Port-channel number** - The unique number on the switch that represents the port-channel. Each pair in a server bond must have their own unique port-channel number, which is the same on both switches.
- **Mode** - The mode the port-channel will use: *balance-xor* for the OpenStack Controller Nodes and *802.3ad* for all SAH, OpenStack Compute Nodes, and Ceph Storage Nodes.

[Table 12: Dell NFV Switch Configuration Excerpt](#) on page 23 is an example from an installation, and the resulting S6010-ON and S4048T configurations.

Table 12: Dell NFV Switch Configuration Excerpt

Name	Media Type	Device Name	Port	Untagged	Tagged	Port-channel #	Mode
Dell Networking S6010-ON - Switch 1							
Te 1/0	40Gb	SAH - bond 1	10G2	-	190,191	11	802.3ad
Te 1/1	40Gb	OS Controller 1 - bond 0	10G1	-	140, 170, 200+	12	802.3ad
Te 1/2	40Gb	OS Controller 2 - bond 0	10G1	-	140, 170, 200+	13	802.3ad

Name	Media Type	Device Name	Port	Untagged	Tagged	Port-channel #	Mode
Te 1/3	40Gb	OS Controller 3 - bond 0	10G1	-	140, 170, 200+	14	802.3ad
Te 1/8	40Gb	Nova 1 - bond 0	10G1	-	140, 200+	15	802.3ad
Te 1/9	40Gb	Nova 2 - bond 0	10G1	-	140, 200+	16	802.3ad
Te 1/10	40Gb	Nova 3 - bond 0	10G1	-	140, 200+	17	802.3ad
Te 1/11	40Gb	Storage 1 - bond 0	10G1	170	-	18	802.3ad
Te 1/16	40Gb	Storage 2 - bond 0	10G1	170	-	19	802.3ad
Te 1/17	40Gb	Storage 3 - bond 0	10G1	170	-	20	802.3ad
Te 1/24	40Gb	SAH - bond 1	10G2	195	-	31	802.3ad
Te 1/25	40Gb	OS Controller 1 - bond 1	10G2	-	190,191	32	802.3ad
Te 1/26	40Gb	OS Controller 2 - bond 1	10G2	-	190,191	33	802.3ad
Te 1/27	40Gb	OS Controller 3 - bond 1	10G2	-	190,191	34	802.3ad
Te 1/32	40Gb	Nova 1 - bond 1	10G2	170	-	35	802.3ad
Te 1/33	40Gb	Nova 2 - bond 1	10G2	170	-	36	802.3ad
Te 1/34	40Gb	Nova 3 - bond 1	10G2	170	-	37	802.3ad
Te 1/35	40Gb	Storage 1 - bond 1	10G2	180	-	38	802.3ad
Te 1/40	40Gb	Storage 2 - bond 1	10G2	180	-	39	802.3ad
Te 1/41	40Gb	Storage 3 - bond 1	10G2	180	-	40	802.3ad
Fo 1/116	40Gb	Switch 3	Fo 1/50	-	120, 190	2	802.3ad
Fo 1/120	40Gb	Uplink 1 Switch 2	Fo 1/31/1	-	-	1	VLTi

Name	Media Type	Device Name	Port	Untagged	Tagged	Port-channel #	Mode
Fo 1/124	40Gb	Uplink 2 Switch 2	Fo 1/32/1	-	-	1	VLTi
Dell Networking S6010-ON - Switch 2							
Te 1/0	40Gb	SAH - bond 1	10G4	-	190,191	11	802.3ad
Te 1/1	40Gb	OS Controller 1 - bond 0	10G3	-	140, 170, 200+	12	802.3ad
Te 1/2	40Gb	OS Controller 2 - bond 0	10G3	-	140, 170, 200+	13	802.3ad
Te 1/3	40Gb	OS Controller 3 - bond 0	10G3	-	140, 170, 200+	14	802.3ad
Te 1/8	40Gb	Nova 1 - bond 0	10G3	-	140, 200+	15	802.3ad
Te 1/9	40Gb	Nova 2 - bond 0	10G3	-	140, 200+	16	802.3ad
Te 1/10	40Gb	Nova 3 - bond 0	10G3	-	140, 200+	17	802.3ad
Te 1/11	40Gb	Storage 1 - bond 0	10G3	170	-	18	802.3ad
Te 1/16	40Gb	Storage 2 - bond 0	10G3	170	-	19	802.3ad
Te 1/17	40Gb	Storage 3 - bond 0	10G3	170	-	20	802.3ad
Te 1/24	40Gb	SAH - bond 1	10G4	195	-	31	802.3ad
Te 1/25	40Gb	OS Controller 1 - bond 1	10G4	-	190,191	32	802.3ad
Te 1/26	40Gb	OS Controller 2 - bond 1	10G4	-	190,191	33	802.3ad
Te 1/27	40Gb	OS Controller 3 - bond 1	10G4	-	190,191	34	802.3ad
Te 1/32	40Gb	Nova 1 - bond 1	10G4	170	-	35	802.3ad
Te 1/33	40Gb	Nova 2 - bond 1	10G4	170	-	36	802.3ad

Name	Media Type	Device Name	Port	Untagged	Tagged	Port-channel #	Mode
Te 1/34	40Gb	Nova 3 - bond 1	10G4	170	-	37	802.3ad
Te 1/35	40Gb	Storage 1 - bond 1	10G4	180	-	38	802.3ad
Te 1/40	40Gb	Storage 2 - bond 1	10G4	180	-	39	802.3ad
Te 1/41	40Gb	Storage 3 - bond 1	10G4	180	-	40	802.3ad
Fo 1/116	40Gb	Switch 3	Fo 1/49	-	120, 190	2	802.3ad
Fo 1/120	40Gb	Uplink 1 Switch 2	Fo 1/31/1	-	-	1	VLTi
Fo 1/124	40Gb	Uplink 2 Switch 2	Fo 1/32/1	-	-	1	VLTi
Dell Networking S4048T - Switch 3							
Te 1/1	Cat5e	SAH Node	iDRAC	110	-	-	802.3ad
Te 1/2	Cat5e	OS Controller 1	iDRAC	110	-	-	802.3ad
Te 1/3	Cat5e	OS Controller 2	iDRAC	110	-	-	802.3ad
Te 1/4	Cat5e	OS Controller 3	iDRAC	110	-	-	802.3ad
Te 1/5	Cat5e	Nova 1	iDRAC	110	-	-	802.3ad
Te 1/6	Cat5e	Nova 2	iDRAC	110	-	-	802.3ad
Te 1/7	Cat5e	Nova 3	iDRAC	110	-	-	802.3ad
Te 1/8	Cat5e	Storage 1	iDRAC	110	-	-	802.3ad
Te 1/9	Cat5e	Storage 2	iDRAC	110	-	-	802.3ad
Te 1/10	Cat5e	Storage 3	iDRAC	110	-	-	802.3ad
Te 1/12	Cat5e	VIM Node	iDRAC	110	-	-	802.3ad
Te 1/16	Cat5e	SAH Node	10G	120	-	-	802.3ad
Te 1/17	Cat5e	OS Controller 1	10G	120	-	-	802.3ad
Te 1/18	Cat5e	OS Controller 2	10G	120	-	-	802.3ad
Te 1/19	Cat5e	OS Controller 3	10G	120	-	-	802.3ad
Te 1/20	Cat5e	Nova 1	10G	120	-	-	802.3ad
Te 1/21	Cat5e	Nova 2	10G	120	-	-	802.3ad
Te 1/22	Cat5e	Nova 3	10G	120	-	-	802.3ad

Name	Media Type	Device Name	Port	Untagged	Tagged	Port-channel #	Mode
Te 1/23	Cat5e	Storage 1	10G	120	-	-	802.3ad
Te 1/24	Cat5e	Storage 2	10G	120	-	-	802.3ad
Te 1/25	Cat5e	Storage 3	10G	120	-	-	802.3ad
Te 1/26	Cat5e	VIM Node	10G	120	-	-	802.3ad
Fo 1/49	40Gb	Uplink 1 Switch 1	Fo 0/116	-	120, 190	2	802.3ad
Fo 1/50	40Gb	Uplink 2 Switch 2	Fo 0/116	-	120, 190	2	802.3ad

Dell Networking Switches Default Solution Values


 **Note:** The VLT ports differ, and are defined in the example.

Table 13: Switch Port Defaults

CLI Command	Recommened Default	Example
ip address	No IP address assigned	no ip address
portmode	Hybrid mode	portmode hybrid
switchport	Enabled - after portmode hybrid executed	switchport
mtu	9252 on S4048T; 12000 on S6010-ON	mtu 9252 or mtu 12000
flowcontrol	Flow control receive on, transmit off	flowcontrol rx on tx off
spanning-tree	Rapid Spanning Tree set to Edge-Port going to servers.	spanning-tree rstp edge-port

Configuring the Dell Networking S6010-ON

The *Solution Workbook* is designed to help configure the cluster. Configurations have been generated using the workbook, for [Switch 1](#) and [Switch 2](#).

If you need to add routing to the switches that have a VLT between them, Dell EMC recommends that you use a vrrp-group, as in the following examples:

- Switch 1 vrrp-group Example

```
int vlan 190
ip address 192.168.190.2/24
vrrp-group 190
virtual-address 192.168.190.1
no shutdown
```

- Switch 2 vrrp-group Example

```
int vlan 190
ip address 192.168.190.3/24
vrrp-group 190
virtual-address 192.168.190.1
no shutdown
```

Switch 1 Configuration

```
S6010_1_R195#show running-config
Current Configuration ...
! Version 9.10(0.1)
! Last configuration change at Wed Oct 19 22:23:31 2016 by default
! Startup-config last updated at Fri Aug 26 04:08:52 2016 by default
!
boot system stack-unit 1 primary system://A
boot system stack-unit 1 secondary system://B
!
hostname S6010_1_R195
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
!
redundancy auto-synchronize full
!
username xxxx password 7 xxxxxxxxxxxxxxxxxxxx privilege 15
!
protocol spanning-tree rstp
  no disable
  bridge-priority 16384
!
vlt domain 1
  peer-link port-channel 1
  back-up destination 172.25.195.66
  primary-priority 10
  unit-id 0
!
stack-unit 1 quad-port-profile
  2,4,6,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,28,30,32
!
stack-unit 1 provision S6010-ON
!
stack-unit 1 port 2 portmode quad
!
stack-unit 1 port 4 portmode quad
!
stack-unit 1 port 6 portmode quad
!
stack-unit 1 port 8 portmode quad
!
stack-unit 1 port 9 portmode quad
!
stack-unit 1 port 10 portmode quad
!
stack-unit 1 port 11 portmode quad
!
stack-unit 1 port 12 portmode quad
```

```

!
stack-unit 1 port 18 portmode quad
!
stack-unit 1 port 20 portmode quad
!
interface fortyGigE 1/1
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/2/1
  no ip address
!
  port-channel-protocol LACP
  port-channel 11 mode active
  no shutdown
!
interface TenGigabitEthernet 1/2/2
  no ip address
!
  port-channel-protocol LACP
  port-channel 12 mode active
  no shutdown
!
interface TenGigabitEthernet 1/2/3
  no ip address
!
  port-channel-protocol LACP
  port-channel 13 mode active
  no shutdown
!
interface TenGigabitEthernet 1/2/4
  no ip address
!
  port-channel-protocol LACP
  port-channel 14 mode active
  no shutdown
!
interface fortyGigE 1/3
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/4/1
  no ip address
!
  port-channel-protocol LACP
  port-channel 15 mode active
  no shutdown
!
interface TenGigabitEthernet 1/4/2
  no ip address
!
  port-channel-protocol LACP
  port-channel 16 mode active
  no shutdown
!
interface TenGigabitEthernet 1/4/3
  no ip address
!
  port-channel-protocol LACP
  port-channel 17 mode active
  no shutdown
!
interface TenGigabitEthernet 1/4/4
  no ip address

```

```

!
port-channel-protocol LACP
port-channel 18 mode active
no shutdown
!
interface fortyGigE 1/5
no ip address
shutdown
!
interface TenGigabitEthernet 1/6/1
no ip address
!
port-channel-protocol LACP
port-channel 19 mode active
no shutdown
!
interface TenGigabitEthernet 1/6/2
no ip address
!
port-channel-protocol LACP
port-channel 20 mode active
no shutdown
!
interface TenGigabitEthernet 1/6/3
no ip address
portmode hybrid
switchport
no shutdown
!
interface TenGigabitEthernet 1/6/4
no ip address
no shutdown
!
interface fortyGigE 1/7
no ip address
shutdown
!
interface TenGigabitEthernet 1/8/1
no ip address
!
port-channel-protocol LACP
port-channel 31 mode active
no shutdown
!
interface TenGigabitEthernet 1/8/2
no ip address
!
port-channel-protocol LACP
port-channel 32 mode active
no shutdown
!
interface TenGigabitEthernet 1/8/3
no ip address
!
port-channel-protocol LACP
port-channel 33 mode active
no shutdown
!
interface TenGigabitEthernet 1/8/4
no ip address
!
port-channel-protocol LACP
port-channel 34 mode active
no shutdown

```

```

!
interface TenGigabitEthernet 1/9/1
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/9/2
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/9/3
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/9/4
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/10/1
  no ip address
!
  port-channel-protocol LACP
  port-channel 35 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/2
  no ip address
!
  port-channel-protocol LACP
  port-channel 36 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/3
  no ip address
!
  port-channel-protocol LACP
  port-channel 37 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/4
  no ip address
!
  port-channel-protocol LACP
  port-channel 38 mode active
  no shutdown
!
interface TenGigabitEthernet 1/11/1
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/2
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/3
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/4
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/12/1
  no ip address
!

```

```

port-channel-protocol LACP
port-channel 39 mode active
no shutdown
!
interface TenGigabitEthernet 1/12/2
no ip address
!
port-channel-protocol LACP
port-channel 40 mode active
no shutdown
!
interface TenGigabitEthernet 1/12/3
no ip address
shutdown
!
interface TenGigabitEthernet 1/12/4
no ip address
shutdown
!
interface fortyGigE 1/13
no ip address
shutdown
!
interface fortyGigE 1/14
no ip address
shutdown
!
interface fortyGigE 1/15
no ip address
shutdown
!
interface fortyGigE 1/16
no ip address
shutdown
!
interface fortyGigE 1/17
no ip address
shutdown
!
interface TenGigabitEthernet 1/18/1
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/2
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/3
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/4
no ip address
switchport
no shutdown
!
interface fortyGigE 1/19
no ip address
shutdown
!
interface TenGigabitEthernet 1/20/1

```



```

no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/20/2
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/20/3
no ip address
shutdown
!
interface TenGigabitEthernet 1/20/4
no ip address
shutdown
!
interface fortyGigE 1/21
no ip address
shutdown
!
interface fortyGigE 1/22
no ip address
shutdown
!
interface fortyGigE 1/23
no ip address
shutdown
!
interface fortyGigE 1/24
no ip address
shutdown
!
interface fortyGigE 1/25
no ip address
shutdown
!
interface fortyGigE 1/26
no ip address
shutdown
!
interface fortyGigE 1/27
no ip address
shutdown
!
interface fortyGigE 1/28
no ip address
shutdown
!
interface fortyGigE 1/29
no ip address
shutdown
!
interface fortyGigE 1/30
no ip address
!
port-channel-protocol LACP
port-channel 2 mode active
no shutdown
!
interface fortyGigE 1/31
no ip address
no shutdown
!

```

```

interface fortyGigE 1/32
  no ip address
  no shutdown
!
interface ManagementEthernet 1/1
  ip address 172.25.195.65/24
  no shutdown
!
interface ManagementEthernet 2/1
  no shutdown
!
interface ManagementEthernet 3/1
  no shutdown
!
interface ManagementEthernet 4/1
  no shutdown
!
interface ManagementEthernet 5/1
  no shutdown
!
interface ManagementEthernet 6/1
  no shutdown
!
interface Port-channel 1
  description VLT_Domain1
  no ip address
  channel-member fortyGigE 1/31,1/32
  no shutdown
!
interface Port-channel 2
  description Uplink_S4820T
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 2
  no shutdown
!
interface Port-channel 3
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 3
  no shutdown
!
interface Port-channel 11
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 11
  no shutdown
!
interface Port-channel 12
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 12
  no shutdown
!
interface Port-channel 13
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 13
  no shutdown

```

```

!
interface Port-channel 14
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 14
  no shutdown
!
interface Port-channel 15
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 15
  no shutdown
!
interface Port-channel 16
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 16
  no shutdown
!
interface Port-channel 17
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 17
  no shutdown
!
interface Port-channel 18
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 18
  no shutdown
!
interface Port-channel 19
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 19
  no shutdown
!
interface Port-channel 20
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 20
  no shutdown
!
interface Port-channel 31
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 31
  no shutdown
!
interface Port-channel 32
  no ip address
  portmode hybrid
  switchport
  vlt-peer-lag port-channel 32
  no shutdown
!

```

```

interface Port-channel 33
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 33
no shutdown
!
interface Port-channel 34
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 34
no shutdown
!
interface Port-channel 35
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 35
no shutdown
!
interface Port-channel 36
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 36
no shutdown
!
interface Port-channel 37
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 37
no shutdown
!
interface Port-channel 38
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 38
no shutdown
!
interface Port-channel 39
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 39
no shutdown
!
interface Port-channel 40
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 40
no shutdown
!
interface Vlan 1
!untagged Port-channel 1-3,11-17,32-34
!
interface Vlan 20
no ip address
shutdown
!
interface Vlan 110

```

```

description iDRAC-OOB
ip address 192.168.110.1/24
tagged Port-channel 2-3,11
no shutdown
!
interface Vlan 120
description Provision
ip address 192.168.120.1/24
tagged Port-channel 2-3,11
no shutdown
!
interface Vlan 140
description Private_API
ip address 192.168.140.1/24
tagged Port-channel 2-3,11-17
no shutdown
!
interface Vlan 170
description Storage
ip address 192.168.170.254/24
tagged Port-channel 3,11-14
untagged Port-channel 18-20,35-37
no shutdown
!
interface Vlan 180
description Ceph_Cluster
ip address 192.168.180.254/24
untagged Port-channel 38-40
no shutdown
!
interface Vlan 190
description NOVA_NET_Public
ip address 192.168.190.1/24
tagged Port-channel 2-3,11,32-34
no shutdown
!
interface Vlan 191
description EXT_Net
ip address 192.168.191.254/24
tagged Port-channel 2-3,32-34
untagged TenGigabitEthernet 1/6/3
no shutdown
!
interface Vlan 195
description NGN_Public
no ip address
tagged Port-channel 2-3,34
untagged TenGigabitEthernet 1/18/1-1/18/4,1/20/1-1/20/2
untagged Port-channel 31
no shutdown
!
interface Vlan 201
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 202
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 203

```

```

description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 204
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 205
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 206
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 207
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 208
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 209
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 210
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 211
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 212
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 213
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown

```

```

!
interface Vlan 214
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 215
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 216
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 217
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 218
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 219
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 220
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 221
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 222
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 223
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 224
description VM_Internal_Tenant
no ip address

```

```

tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 225
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 226
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 227
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 228
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 229
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 230
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 231
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 232
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 233
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 234
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 235

```



```

description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 236
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 237
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 238
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 239
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 240
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 241
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 242
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 243
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 244
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 245
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown

```

```

!
interface Vlan 246
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 247
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 248
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 249
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 250
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
management route 0.0.0.0/0 172.25.195.254
!
snmp-server community public rw
!
ip ssh server enable
ip ssh server version 2
!
line console 0
line vty 0
line vty 1
line vty 2
line vty 3
line vty 4
line vty 5
line vty 6
line vty 7
line vty 8
line vty 9
!
sflow collector 192.168.120.52 agent-addr 192.168.120.254
sflow collector 192.168.120.53 agent-addr 192.168.120.254
sflow enable
sflow extended-switch enable
sflow sample-rate 512
!
reload-type
boot-type normal-reload
config-scr-download enable
!
end
S6010_1_R195#

```

Switch 2 Configuration

```

S6010_2_R195#show running-config
Current Configuration ...
! Version 9.10(0.1)
! Last configuration change at Wed Oct 19 22:16:34 2016 by default
! Startup-config last updated at Fri Aug 26 03:54:03 2016 by default
!
boot system stack-unit 1 primary system://A
boot system stack-unit 1 secondary system://B
!
hostname S6010_2_R195
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
!
redundancy auto-synchronize full
!
username xxxxxx password 7 xxxxxxxxxxxxxxxxx privilege 15
!
protocol spanning-tree rstp
  no disable
  bridge-priority 20480
!
vlt domain 1
  peer-link port-channel 1
  back-up destination 172.25.195.65
  primary-priority 20
  unit-id 1
!
stack-unit 1 quad-port-profile
  2,4,6,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,28,30,32
!
stack-unit 1 provision S6010-ON
!
stack-unit 1 port 2 portmode quad
!
stack-unit 1 port 4 portmode quad
!
stack-unit 1 port 6 portmode quad
!
stack-unit 1 port 8 portmode quad
!
stack-unit 1 port 9 portmode quad
!
stack-unit 1 port 10 portmode quad
!
stack-unit 1 port 11 portmode quad
!
stack-unit 1 port 12 portmode quad
!
stack-unit 1 port 18 portmode quad
!
stack-unit 1 port 20 portmode quad
!
interface fortyGigE 1/1
  no ip address
  shutdown
!

```

```

interface TenGigabitEthernet 1/2/1
  no ip address
  !
  port-channel-protocol LACP
    port-channel 11 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/2/2
  no ip address
  !
  port-channel-protocol LACP
    port-channel 12 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/2/3
  no ip address
  !
  port-channel-protocol LACP
    port-channel 13 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/2/4
  no ip address
  !
  port-channel-protocol LACP
    port-channel 14 mode active
  no shutdown
  !
interface fortyGigE 1/3
  no ip address
  shutdown
  !
interface TenGigabitEthernet 1/4/1
  no ip address
  !
  port-channel-protocol LACP
    port-channel 15 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/4/2
  no ip address
  !
  port-channel-protocol LACP
    port-channel 16 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/4/3
  no ip address
  !
  port-channel-protocol LACP
    port-channel 17 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/4/4
  no ip address
  !
  port-channel-protocol LACP
    port-channel 18 mode active
  no shutdown
  !
interface fortyGigE 1/5
  no ip address
  shutdown
  !

```

```

interface TenGigabitEthernet 1/6/1
  no ip address
  !
  port-channel-protocol LACP
    port-channel 19 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/6/2
  no ip address
  !
  port-channel-protocol LACP
    port-channel 20 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/6/3
  no ip address
  !
  port-channel-protocol LACP
    port-channel 33 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/6/4
  no ip address
  !
  port-channel-protocol LACP
    port-channel 34 mode active
  no shutdown
  !
interface fortyGigE 1/7
  no ip address
  shutdown
  !
interface TenGigabitEthernet 1/8/1
  no ip address
  !
  port-channel-protocol LACP
    port-channel 31 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/8/2
  no ip address
  !
  port-channel-protocol LACP
    port-channel 32 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/8/3
  no ip address
  !
  port-channel-protocol LACP
    port-channel 33 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/8/4
  no ip address
  !
  port-channel-protocol LACP
    port-channel 34 mode active
  no shutdown
  !
interface TenGigabitEthernet 1/9/1
  no ip address
  shutdown
  !

```

```

interface TenGigabitEthernet 1/9/2
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/9/3
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/9/4
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/10/1
  no ip address
!
  port-channel-protocol LACP
    port-channel 35 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/2
  no ip address
!
  port-channel-protocol LACP
    port-channel 36 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/3
  no ip address
!
  port-channel-protocol LACP
    port-channel 37 mode active
  no shutdown
!
interface TenGigabitEthernet 1/10/4
  no ip address
!
  port-channel-protocol LACP
    port-channel 38 mode active
  no shutdown
!
interface TenGigabitEthernet 1/11/1
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/2
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/3
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/11/4
  no ip address
  shutdown
!
interface TenGigabitEthernet 1/12/1
  no ip address
!
  port-channel-protocol LACP
    port-channel 39 mode active
  no shutdown
!
interface TenGigabitEthernet 1/12/2

```

```

no ip address
!
port-channel-protocol LACP
port-channel 40 mode active
no shutdown
!
interface TenGigabitEthernet 1/12/3
no ip address
no shutdown
!
interface TenGigabitEthernet 1/12/4
no ip address
no shutdown
!
interface fortyGigE 1/13
no ip address
shutdown
!
interface fortyGigE 1/14
no ip address
shutdown
!
interface fortyGigE 1/15
no ip address
shutdown
!
interface fortyGigE 1/16
no ip address
shutdown
!
interface fortyGigE 1/17
no ip address
shutdown
!
interface TenGigabitEthernet 1/18/1
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/2
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/3
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/18/4
no ip address
switchport
no shutdown
!
interface fortyGigE 1/19
no ip address
shutdown
!
interface TenGigabitEthernet 1/20/1
no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/20/2

```

```

no ip address
switchport
no shutdown
!
interface TenGigabitEthernet 1/20/3
no ip address
shutdown
!
interface TenGigabitEthernet 1/20/4
no ip address
shutdown
!
interface fortyGigE 1/21
no ip address
shutdown
!
interface fortyGigE 1/22
no ip address
shutdown
!
interface fortyGigE 1/23
no ip address
shutdown
!
interface fortyGigE 1/24
no ip address
shutdown
!
interface fortyGigE 1/25
no ip address
shutdown
!
interface fortyGigE 1/26
no ip address
shutdown
!
interface fortyGigE 1/27
no ip address
shutdown
!
interface fortyGigE 1/28
no ip address
shutdown
!
interface fortyGigE 1/29
no ip address
shutdown
!
interface fortyGigE 1/30
no ip address
!
port-channel-protocol LACP
port-channel 2 mode active
no shutdown
!
interface fortyGigE 1/31
no ip address
no shutdown
!
interface fortyGigE 1/32
no ip address
no shutdown
!
interface ManagementEthernet 1/1

```



```

ip address 172.25.195.66/24
no shutdown
!
interface ManagementEthernet 2/1
shutdown
!
interface ManagementEthernet 3/1
shutdown
!
interface ManagementEthernet 4/1
shutdown
!
interface ManagementEthernet 5/1
shutdown
!
interface ManagementEthernet 6/1
shutdown
!
interface Port-channel 1
description VLT_Domain_1
no ip address
channel-member fortyGigE 1/31,1/32
no shutdown
!
interface Port-channel 2
description Uplink_S4820T
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 2
no shutdown
!
interface Port-channel 3
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 3
no shutdown
!
interface Port-channel 11
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 11
no shutdown
!
interface Port-channel 12
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 12
no shutdown
!
interface Port-channel 13
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 13
no shutdown
!
interface Port-channel 14
no ip address
portmode hybrid
switchport

```

```

vlt-peer-lag port-channel 14
no shutdown
!
interface Port-channel 15
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 15
no shutdown
!
interface Port-channel 16
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 16
no shutdown
!
interface Port-channel 17
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 17
no shutdown
!
interface Port-channel 18
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 18
no shutdown
!
interface Port-channel 19
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 19
no shutdown
!
interface Port-channel 20
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 20
no shutdown
!
interface Port-channel 31
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 31
no shutdown
!
interface Port-channel 32
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 32
no shutdown
!
interface Port-channel 33
no ip address
portmode hybrid
switchport
vlt-peer-lag port-channel 33

```

```

    no shutdown
!
interface Port-channel 34
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 34
    no shutdown
!
interface Port-channel 35
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 35
    no shutdown
!
interface Port-channel 36
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 36
    no shutdown
!
interface Port-channel 37
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 37
    no shutdown
!
interface Port-channel 38
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 38
    no shutdown
!
interface Port-channel 39
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 39
    no shutdown
!
interface Port-channel 40
    no ip address
    portmode hybrid
    switchport
    vlt-peer-lag port-channel 40
    no shutdown
!
interface Vlan 1
!untagged Port-channel 1-3,11-17,32-34
!
interface Vlan 20
    no ip address
    shutdown
!
interface Vlan 110
    description iDRAC-OOB
    ip address 192.168.110.2/24
    tagged Port-channel 2-3,11
    no shutdown
!

```

```

interface Vlan 120
description Provision
ip address 192.168.120.2/24
tagged Port-channel 2-3,11
no shutdown
!
interface Vlan 140
description Private_API
ip address 192.168.140.2/24
tagged Port-channel 2-3,11-17
no shutdown
!
interface Vlan 170
description Storage
ip address 192.168.170.253/24
tagged Port-channel 3,11-14
untagged Port-channel 18-20,35-37
no shutdown
!
interface Vlan 180
description Ceph_Cluster
ip address 192.168.180.253/24
untagged Port-channel 38-40
no shutdown
!
interface Vlan 190
description NOVA_NET_Public
ip address 192.168.190.2/24
tagged Port-channel 2-3,11,32-34
no shutdown
!
interface Vlan 191
description EXT_Net
ip address 192.168.191.253/24
tagged Port-channel 2-3,32-34
no shutdown
!
interface Vlan 195
description NGN_Public
no ip address
tagged Port-channel 2-3,34
untagged TenGigabitEthernet 1/18/1-1/18/4,1/20/1-1/20/2
untagged Port-channel 31
no shutdown
!
interface Vlan 201
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 202
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 203
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 204

```

```

description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 205
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 206
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 207
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 208
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 209
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 210
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 211
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 212
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 213
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 214
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown

```

```

!
interface Vlan 215
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 216
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 217
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 218
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 219
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 220
description NOVA_NET_Private
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 221
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 222
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 223
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 224
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 225
description VM_Internal_Tenant
no ip address

```

```

tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 226
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 227
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 228
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 229
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 230
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 231
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 232
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 233
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 234
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 235
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 236

```

```

description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 237
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 238
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 239
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 240
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 241
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 242
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 243
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 244
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 245
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 246
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown

```



```

!
interface Vlan 247
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 248
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 249
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
interface Vlan 250
description VM_Internal_Tenant
no ip address
tagged Port-channel 3,12-17
no shutdown
!
management route 0.0.0.0/0 172.25.195.254
!
snmp-server community public rw
!
ip ssh server enable
ip ssh server version 2
!
line console 0
line vty 0
line vty 1
line vty 2
line vty 3
line vty 4
line vty 5
line vty 6
line vty 7
line vty 8
line vty 9
!
sflow collector 192.168.120.52 agent-addr 192.168.120.253
sflow collector 192.168.120.53 agent-addr 192.168.120.253
sflow enable
sflow extended-switch enable
sflow sample-rate 256
!
reload-type
boot-type normal-reload
config-scr-download enable
!
end
S6010_2_R195#

```

Configuring the Dell Networking S4048T

The [Switch 3](#) configuration below is set up with redundant network trunks between the two S6010-ONs, to enable provisioning and access to the external network for the SAH installation.

The VLANs that handle the management and provisioning networks are configured with IP addresses, and routing on the S4048T is turned on. This enables the Controllers and the Director Node to control the iDRACs in each server, and monitor their states.

Switch 3 Configuration

```
! Version 9.10(0.1)
! Last configuration change at Thu Jul 21 03:08:23 2016 by default
! Startup-config last updated at Fri Jul 8 01:10:27 2016 by default
!
boot system stack-unit 1 primary system://A
boot system stack-unit 1 secondary system://B
!
hostname S4048T_R196_U20
!
protocol lldp
!
redundancy auto-synchronize full
!
protocol spanning-tree rstp
no disable
!
stack-unit 1 provision S4048T-ON
!
interface TenGigabitEthernet 1/1
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
advertise dot1-tlv port-protocol-vlan-id
advertise dot3-tlv max-frame-size
advertise management-tlv system-description system-name
advertise med
no shutdown
!
interface TenGigabitEthernet 1/2
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
advertise dot1-tlv port-protocol-vlan-id
advertise dot3-tlv max-frame-size
advertise management-tlv system-description system-name
advertise med
no shutdown
!
interface TenGigabitEthernet 1/3
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
```

```

    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/4
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/5
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/6
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/7
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/8
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med

```

```

    no shutdown
    !
interface TenGigabitEthernet 1/9
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/10
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/11
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/12
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/13
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/14
    no ip address

```

```

switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/15
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/16
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/17
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/18
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/19
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp

```

```

    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/20
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/21
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/22
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/23
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/24
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med

```

```

    no shutdown
    !
interface TenGigabitEthernet 1/25
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/26
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/27
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/28
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/29
    no ip address
    switchport
    spanning-tree rstp edge-port
    !
    protocol lldp
        advertise dot1-tlv port-protocol-vlan-id
        advertise dot3-tlv max-frame-size
        advertise management-tlv system-description system-name
        advertise med
    no shutdown
    !
interface TenGigabitEthernet 1/30
    no ip address

```

```

switchport
spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/31
  no ip address
  switchport
  spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/32
  no ip address
  switchport
  spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/33
  no ip address
  switchport
  spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/34
  no ip address
  switchport
  spanning-tree rstp edge-port
!
protocol lldp
  advertise dot1-tlv port-protocol-vlan-id
  advertise dot3-tlv max-frame-size
  advertise management-tlv system-description system-name
  advertise med
no shutdown
!
interface TenGigabitEthernet 1/35
  no ip address
  switchport
  spanning-tree rstp edge-port
!
protocol lldp

```



```

    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/36
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/37
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/38
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/39
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med
no shutdown
!
interface TenGigabitEthernet 1/40
no ip address
switchport
spanning-tree rstp edge-port
!
protocol lldp
    advertise dot1-tlv port-protocol-vlan-id
    advertise dot3-tlv max-frame-size
    advertise management-tlv system-description system-name
    advertise med

```

```

    no shutdown
    !
interface TenGigabitEthernet 1/41
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/42
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/43
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/44
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/45
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/46
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/47
    no ip address
    shutdown
    !
interface TenGigabitEthernet 1/48
    no ip address
    shutdown
    !
interface fortyGigE 1/49
    no ip address
    !
    port-channel-protocol LACP
    port-channel 2 mode active
    no shutdown
    !
interface fortyGigE 1/50
    no ip address
    !
    port-channel-protocol LACP
    port-channel 2 mode active
    no shutdown
    !
interface fortyGigE 1/51
    no ip address
    shutdown
    !
interface fortyGigE 1/52
    no ip address
    shutdown
    !
interface fortyGigE 1/53
    no ip address
    shutdown
    !
interface fortyGigE 1/54
    no ip address
    shutdown
    !

```

```

interface ManagementEthernet 1/1
 ip address 172.25.196.10/24
 no shutdown
!
interface ManagementEthernet 2/1
 no shutdown
!
interface ManagementEthernet 3/1
 no shutdown
!
interface ManagementEthernet 4/1
 shutdown
!
interface ManagementEthernet 5/1
 shutdown
!
interface ManagementEthernet 6/1
 shutdown
!
interface Port-channel 2
 no ip address
 portmode hybrid
 switchport
 no shutdown
!
interface Vlan 1
!untagged TenGigabitEthernet 1/32-1/37,1/40
!untagged Port-channel 2
!
interface Vlan 110
 no ip address
 tagged Port-channel 2
 untagged TenGigabitEthernet 1/1-1/15
 no shutdown
!
interface Vlan 120
 description Provision
 ip address 192.168.120.252/24
 tagged Port-channel 2
 untagged TenGigabitEthernet 1/16-1/31
 no shutdown
!
interface Vlan 196
 no ip address
 tagged Port-channel 2
 untagged TenGigabitEthernet 1/38-1/39
 no shutdown
!
management route 0.0.0.0/0 172.25.196.254
!
snmp-server community public rw
!
ip ssh server enable
ip ssh server version 2
!
line console 0
line vty 0
line vty 1
line vty 2
line vty 3
line vty 4
line vty 5
line vty 6
line vty 7

```

```
line vty 8
line vty 9
!
reload-type
  boot-type normal-reload
  config-scr-download enable
!
end
```

Appendix

A

References

Topics:

- [To Learn More](#)

Additional information can be obtained at <http://www.dell.com/nfv> or by e-mailing nfv@dell.com.

If you need additional services or implementation help, please contact your Dell EMC sales representative.

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