Cisco Nexus 6001

Switch Configuration Guide for Dell SC Series SANs

Dell Storage Engineering
August 2015
Revisions

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<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td>August 2015</td>
<td>Initial release</td>
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1 Introduction
This document illustrates how to configure Cisco® Nexus® 6001 switches for use with Dell™ SC Series storage using Dell best practices.

For more information on SC Series SAN design recommendations, see the Storage Center System Manager Administrator's Guide and the Storage Center Deployment Guide at the Customer Portal (login required).

1.1 Document conventions
Table 1 lists the formatting conventions used in this document.

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
<th>Example</th>
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<tr>
<td><strong>Bold</strong></td>
<td>User input</td>
<td>Dell&gt;enable</td>
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<tr>
<td><em>Italic</em></td>
<td>Placeholder or variable</td>
<td>your password</td>
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1.2 Audience
This switch configuration guide describes a verified configuration following Dell best practices for a dedicated SC Series iSCSI SAN and is intended for storage or network administrators and deployment personnel.

1.3 Switch details
The table below provides an overview of the switch configuration.

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<tr>
<td><strong>Cisco Nexus 6001</strong></td>
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<td><strong>Switch vendor</strong></td>
<td>Cisco</td>
</tr>
<tr>
<td><strong>Switch model</strong></td>
<td>Nexus 6001</td>
</tr>
<tr>
<td><strong>Switch firmware</strong></td>
<td>7.1(0)N1(1b)</td>
</tr>
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**Note:** For proper functionality, the switch must be at the firmware version shown in the table above before proceeding with this configuration. Using previous firmware versions may have unpredictable results.

The latest firmware updates and documentation can be found at: [www.cisco.com](http://www.cisco.com). This site requires a login.
1.4 Cabling diagram

The cabling diagram shown below represents the Dell recommend method for deploying your servers and SC Series storage arrays.

Figure 1  Cabling diagram
2 Dell recommended switch configuration

These steps show you how to configure two Cisco Nexus 6001 switches without using any interconnect between the two switches.

**Note:** The configuration steps in this section are only recommended when the switch is used as a dedicated SAN for iSCSI traffic (not shared with LAN traffic).

2.1 Hardware configuration

1. Power on both switches.
2. Connect a serial cable to the management port.
3. Using PuTTY or another terminal utility, open a serial connection session to the switch.
4. Open your terminal emulator and configure it to use the serial port (usually COM1, but this may vary depending on your system). Configure serial communications for 9600,N,8,1 and no flow control.
5. Connect the cables between switch 1 and switch 2 as shown in Figure 1, for ports 1 and 2. This will be used as your vPC link.

2.2 Delete startup configuration

**Note:** This example assumes a switch at its default configuration settings. Using the `write erase` command will set the startup configuration file to its default settings. You should always back up your configuration settings prior to performing any configuration changes.

```
switch# write erase
Warning: This command will erase the startup-configuration
Do you wish to proceed anyway? (y/n) [n] y
switch# reload
WARNING: this command will reboot the system
Do you want to continue? (y/n) [n] y
```

**Note:** The switch will reboot.
2.3 Running the basic system configuration

The following steps use the setup utility to configure connectivity for basic management of the system.

After the switch fully reboots, the following prompts will appear:

Abort Power On Auto Provisioning and continue with normal setup? (yes/no)[n]: y

---- System Admin Account Setup ----
Do you want to enforce secure password standard (yes/no): yes
Enter the password for "admin": my password
Confirm the password for "admin": my password

---- Basic System Configuration Dialog ----

This setup utility will guide you through the basic configuration of the system. Setup configures only enough connectivity for management of the system.

Please register Cisco Nexus 6000 Family devices promptly with your supplier. Failure to register may affect response times for initial service calls. Nexus devices must be registered to receive entitled support services.

Press Enter at anytime to skip a dialog. Use ctrl-c at anytime to skip the remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): yes
Create another login account (yes/no) [n]: n
Configure read-only SNMP community string (yes/no) [n]: n
Configure read-write SNMP community string (yes/no) [n]: n
Enter the switch name: my switch name

Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: y
Mgmt0 IPv4 address: my IP address
Mgmt0 IPv4 netmask: my netmask

Configure the default gateway? (yes/no) [y]: y
IPv4 address of the default gateway: my gateway

Enable the telnet service? (yes/no) [n]: y
Enable the ssh service? (yes/no) [y]: n
Configure the ntp server? (yes/no) [n]: n
Configure default interface layer (L3/L2) [L2]: L2

Configure default switchport interface state (shut/noshut) [noshut]: noshut
Enter basic FC configurations (yes/no) [n]: n

The following configuration will be applied:

switchname my switch name
interface mgmt0
ip address my ip address my netmask
no shutdown
exit
vrf context management
ip route 0.0.0.0/0 my gateway
exit
telnet server enable
no ssh server enable

Would you like to edit the configuration? (yes/no) [n]: n
Use this configuration and save it? (yes/no) [y]: y
[########################################] 100%
Copy complete, now saving to disk (please wait)...

Log in with the credentials created in the previous steps.

**Note:** All steps in section 2.3 are required to properly disable DCB. Also, when upgrading from previous versions to this new version 7.1(0)N1(1b), the steps in section 2.3 must be performed to properly disable DCB.

```
switch# configure
switch(config)# lldp tlv-select dcbxp
switch(config)# copy running-config startup-config
switch(config)# no lldp tlv-select dcbxp
switch(config)# exit
switch# copy running-config startup-config
```

**Note:** The above steps are required due to CSCuo63486 LLDP - link err-disabled upon reload when dcbx tlv is disabled.

### 2.4 Enable link level flow control (802.3x)

You must perform this step for each individual port that is connected to a storage controller or a host interface port, or you can specify a range of ports to configure.

```
switch# configure
switch(config)# interface ethernet 1/1-48
switch(config-if-range)# priority-flow-control mode off
switch(config-if-range)# flowcontrol send off
switch(config-if-range)# flowcontrol receive on
switch(config-if-range)# exit
```

### 2.5 Configure portfast on edge ports

```
switch(config)# interface ethernet 1/1-48
switch(config-if-range)# spanning-tree port type edge
```

Warning: edge port type (portfast) should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc… to this interface when edge port type (portfast) is enabled, can cause temporary bridging loops. Use with CAUTION.
2.6 Enable VLAN

The following example uses VLAN 101 and configures a range of ports. Any valid VLAN (between 2-4094) may be substituted.

```
switch(config)# vlan 101
switch(config-vlan)# exit
switch(config)# interface ethernet 1/1-48
switch(config-if-range)# switchport access vlan 101
switch(config-if-range)# exit
```

2.7 Enable the switch ports

The following example enables a range of ports. If preferred, you may enable individual ports as needed.

```
switch(config)# interface ethernet 1/1-48
switch(config-if-range)# shutdown
switch(config-if-range)# no shutdown
switch(config-if-range)# exit
```

2.8 Configure the Nexus policy engine

The following example configures iSCSI traffic for Class of Service (CoS) 4 and Quality of Service (QoS) group 3.

2.8.1 Configure CoS for iSCSI

Repeat this step for each individual interface connected to host and array controller ports, or specify a range of ports to configure.

```
switch(config)# interface ethernet 1/1-48
switch(config-if-range)# untagged cos 4
switch(config-if-range)# exit
```

2.8.2 Define a QoS map for iSCSI

```
switch(config)# class-map type qos class-iscsi
switch(config-cmap-qos)# match cos 4
switch(config-cmap-qos)# exit
```
2.8.3 Define a QoS policy map for iSCSI

switch(config)# policy-map type qos policy-qos
switch(config-pmap-qos)# class type qos class-iscsi
switch(config-pmap-c-qos)# set qos-group 3
switch(config-pmap-c-qos)# exit
switch(config-pmap-qos)# exit

2.8.4 Define a Network QoS class map

switch(config)# class-map type network-qos class-iscsi
switch(config-cmap-nq)# match qos-group 3
switch(config-cmap-nq)# exit

2.8.5 Define a no-drop policy map and enable jumbo frames

switch(config)# policy-map type network-qos policy-nq
switch(config-pmap-nq)# class type network-qos class-iscsi
switch(config-pmap-nq-c)# mtu 9216
switch(config-pmap-nq-c)# pause no-drop
switch(config-pmap-nq-c)# exit

Note: The following steps are optional and will enable jumbo MTU for the default class (non-iSCSI traffic).

switch(config-pmap-nq)# class type network-qos class-default
switch(config-pmap-nq-c)# mtu 9216
switch(config-pmap-nq-c)# exit
switch(config-pmap-nq)# exit

2.8.6 Define a queuing class-map

switch(config)# class-map type queuing class-iscsi
switch(config-cmap-que)# match qos-group 3

2.8.7 Define a queuing policy-map

switch(config-cmap-que)# policy-map type queuing policy-queuing
switch(config-pmap-que)# class type queuing class-default
switch(config-pmap-c-que)# bandwidth percent 5
switch(config-pmap-c-que)# class type queuing class-fcoe
switch(config-pmap-c-que)# bandwidth percent 0
switch(config-pmap-c-que)# class type queuing class-iscsi
switch(config-pmap-c-que)# bandwidth percent 95
switch(config-pmap-c-que)# exit
2.9 Apply the Nexus policies

```
switch(config-pmap-que)# exit
```

```
switch(config)# system qos
switch(config-sys-qos)# service-policy type qos input policy-qos
switch(config-sys-qos)# service-policy type queuing output policy-queuing
switch(config-sys-qos)# service-policy type queuing input policy-queuing
switch(config-sys-qos)# service-policy type network-qos policy-nq
switch(config-sys-qos)# exit
```

2.10 Save the configuration

```
switch# copy running-config startup-config
```

2.11 Configure an additional switch

Repeat the commands from Sections 2.1 through 2.10 to configure the second switch.

2.12 Disabling DCB (alternative method)

**Note:** With the Cisco Nexus firmware 7.1(0)N1(1b), DCB functionality can be disabled using the configuration steps in section 2.3 of this document. As an alternative, disabling LLDP support can effectively prevent the negotiation of DCB by preventing the transmission of DCBx frames. However, disabling LLDP may also reduce functionality necessary for other protocols. **Only disable LLDP if instructed by Dell support.** The following example disables LLDP support on ports 1 through 48.

```
switch# configure

switch(config)# interface ethernet 1/1-48

switch(config-if-range)# no lldp receive

switch(config-if-range)# no lldp transmit
```
A  Additional resources

For Copilot support of Dell SC Series products:

- SC Series Customer Portal
- Email: support@compellent.com (non-emergency business hours)
- Phone: 866-EZ-STORE (866-397-8673) (United States only)
- Global online support

The Customer Portal is an online portal for existing customers. A valid portal account is required to access the Knowledge Center within the Customer Portal.

A.1  Related documentation

See the following referenced or recommended Dell publications:

- Storage Center System Manager Administrator’s Guide on the Customer Portal (requires login)
- Storage Center Deployment Guide on the Customer Portal (requires login)
- Dell Storage Compatibility Matrix
- Compellent Technical Content on Dell TechCenter includes SC Series best practices, white papers, reference architectures, and sizing guidelines for enterprise applications and SANs.

A.2  Cisco support

Visit support.cisco.com for support and information regarding Cisco networking products.