



Dell Networking C9000 Series

Switch Configuration Guide for Dell PS Series SANs

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Revisions

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1 Introduction

This document illustrates how to configure the Dell Networking C9000 series chassis for use with Dell™ PS Series storage while using Dell best practices. Optional steps are provided in section 3 to enable Data Center Bridging (DCB).

If you are following the **Rapid EqualLogic Configuration** steps at <http://en.community.Dell.com/techcenter/storage/w/wiki/3615.rapid-equallogic-configuration-portal>, use sections 1 and 2, or 1 and 3 in this Switch Configuration Guide.

For more information on PS Series SAN design recommendations, see the PS Series *Configuration Guide* at: www.Delltechcenter.com/page/equallogic+configuration+guide.

1.1 Document conventions

Table 1 lists the formatting conventions used in this document.

Table 1 Document conventions

Format	Description	Example
Bold	User input	Dell> enable
<i>Italic</i>	Placeholder or variable	<i>your password</i>
< <i>Italic</i> > < <i>brackets</i> >	Separate variables	< <i>ip address</i> > < <i>mask</i> >

1.2 Audience

This switch configuration guide describes an optimal configuration following Dell best practices for a PS Series iSCSI SAN and is intended for storage or network administrators and deployment personnel.

1.3 Switch details

Table 2 provides an overview of the chassis configuration.

Table 2 Switch specifications

Dell Networking C9010	
Switch vendor	Dell
Switch model	C9010
Switch firmware	9.9.0.0 or later



Note: For proper functionality, the chassis must be at the firmware version shown in Table 2 before proceeding with this configuration. Using previous firmware versions may have unpredictable results.

The latest firmware updates and documentation can be found at: www.force10networks.com. This site requires a login.



1.4 Cabling diagram

The cabling diagram shown below represents the Dell recommended method for deploying your servers and PS Series arrays.

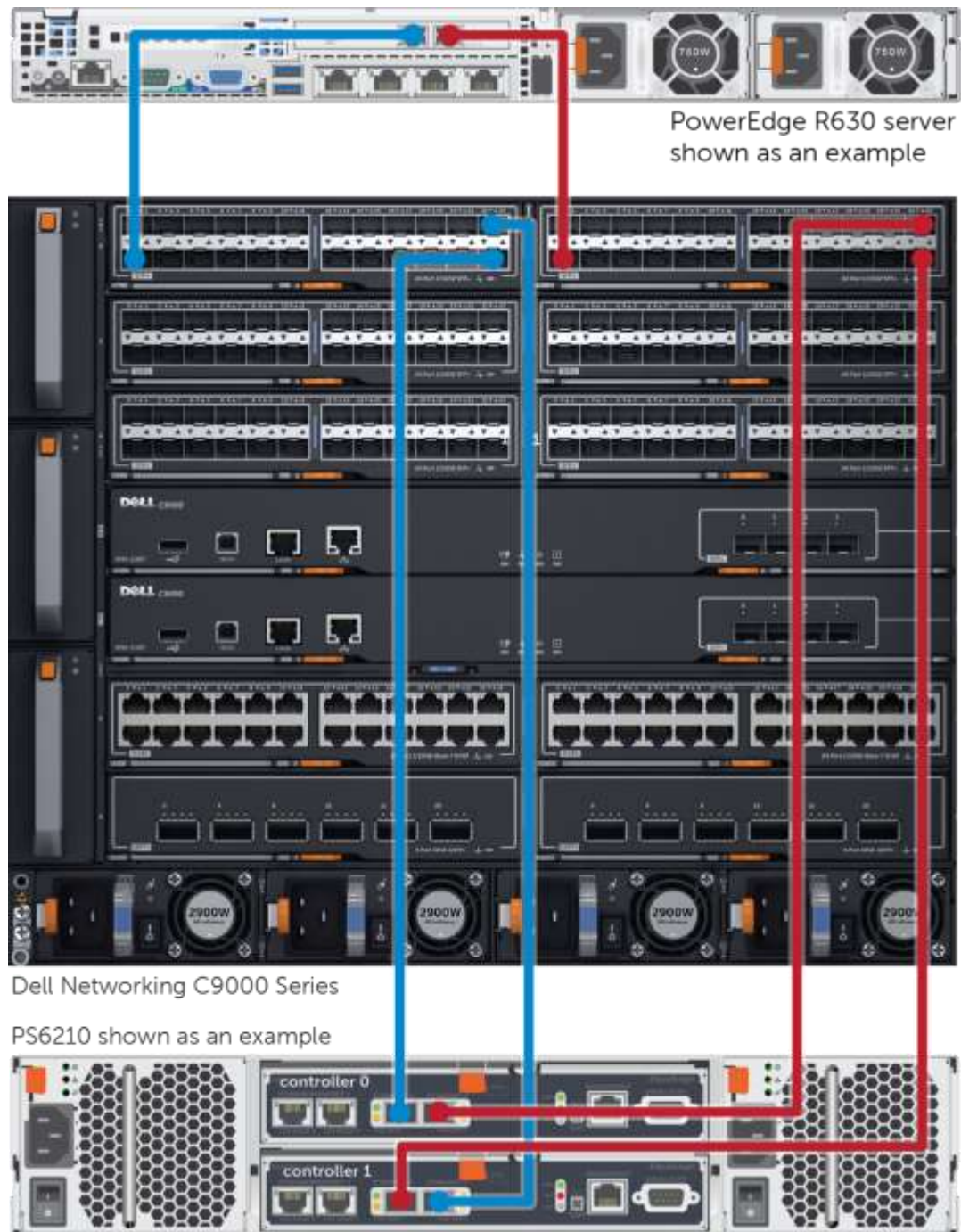


Figure 1 Cabling diagram

2 Dell recommended switch configuration

Follow these steps to configure the C9000 Series chassis.

2.1 Hardware configuration

1. Power on the chassis.
2. Connect a serial cable to the serial port of each RPM.
3. Using PuTTY or another terminal utility, open a serial connection session to RPM 0.
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.

2.2 Delete startup configuration

Note: This example assumes a chassis at its default configuration settings. Using the `delete startup-config` 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. The enable mode password is **calvin**.

```
Dell>enable
Dell#delete startup-config
Proceed to delete startup-config [confirm yes/no]yes
Dell#reload
System configuration has been modified. Save? [yes/no]no
Proceed with reload [confirm yes/no]yes
```

Note: The switch will reboot.

2.3 Configure out of band (OOB) management ports

```
Dell>enable
Dell>#configure
```

Set the IP address for RPM 0:

```
Dell(conf)#interface ManagementEthernet 0/0
Dell(conf-if-ma-0/0)#ip address <ipaddress> <mask>
Dell(conf-if-ma-0/0)#no shutdown
Dell(conf-if-ma-0/0)#exit
```



Set the IP address for RPM 1:

```
Dell(conf)#interface ManagementEthernet 1/0  
Dell(conf-if-ma-1/0)#ip address <ipaddress> <mask>  
Dell(conf-if-ma-1/0)#no shutdown  
Dell(conf-if-ma-1/0)#exit
```

Set the virtual IP address:

```
Dell(conf)#virtual-ip <ipaddress> <mask>
```

2.4 Configure route for OOB management port (optional)

```
Dell(conf)#management route X.Y.Z.0 /24 A.B.C.1
```

Note: *X.Y.Z.0* is the network your management system is connecting from and *A.B.C.1* is the gateway for the switch. If your management system is on the same subnet as the switch, the previous step may be omitted. The example above assumes a class C subnet mask.

2.5 Configure login credentials

```
Dell(conf)#username admin privilege 15 password 0 yourpassword  
Dell(conf)#enable password level 15 0 yourpassword
```

2.6 Enable switch ports

Option 1: Enable ports individually by entering the port number.

```
Dell(conf)#interface tengigabitethernet 0/0  
Dell(conf-if-te-0/0)#switchport  
Dell(conf-if-te-0/0)#exit  
Dell(conf)#exit
```

Option 2: Enable multiple ports all at once using the 'range' parameter.

Note: This example configuration shows details for configuring linecards 0 and 1. Use the proper port range for your SAN environment.

```
Dell(conf)#interface range tengigabitethernet 0/0-23 , tengigabitethernet 1/0-23  
Dell(conf-if-range-te-0/0-23,te-1/0-23)#switchport
```

2.7 Enable Jumbo Frames

```
Dell(conf-if-range-te-0/0-23,te-1/0-23)#mtu 12000
```



2.8 Configure flow control

```
Dell(conf-if-range-te-0/0-23,te-1/0-23)#flowcontrol rx on tx off
```

2.9 Configure spanning tree on edge ports

```
Dell(conf-if-range-te-0/0-23,te-1/0-23)#spanning-tree rstp edge-port
Dell(conf-if-range-te-0/0-23,te-1/0-23)#exit
Dell(conf)# protocol spanning-tree rstp
Dell(conf-rstp)#no disable
Dell(conf-rstp)#exit
Dell(conf)#interface range tengigabitethernet 0/0-23 , tengigabitethernet 1/0-23
Dell(conf-if-range-te-0/0-23,te-1/0-23)#no shutdown
Dell(conf-if-range-te-0/0-23,te-1/0-23)#exit
Dell(conf)#exit
```

2.10 Save configuration

```
Dell#copy running-config startup-config
```

```
Dell#reload
```

2.11 Configure additional linecards

Repeat the commands from sections 2.2–2.10 to configure additional linecards.

Note: The preceding procedure places all switch ports in the default VLAN. If you prefer to place ports in a non-default VLAN, refer to the documentation for your switch.



3 Configure Data Center Bridging (DCB) (optional)

To enable DCB mode on the switch, use the following procedures.

Note: You must complete the Dell recommended switch configuration steps in sections 2.1 to 2.11 before configuring the chassis for DCB mode.

Note: This example shows configuration details for linecards 0 and 1. Use the proper linecard numbers for your SAN environment.

3.1 Disable 802.3x flowcontrol on SFP+ ports

```
Dell#configure
Dell(conf)#interface range tengigabitethernet 0/0-23 , tengigabitethernet 1/0-23
Dell(conf-if-range-te-0/0-23,te-1/0-23)#no flowcontrol rx on tx off
Dell(conf-if-range-te-0/0-23,te-1/0-23)#exit
```

3.2 Enable DCB

```
Dell(conf)#dcb enable
```

3.3 Create tagged VLAN for all ports

```
Dell(conf)#interface vlan vlan-id
```

Note: You must supply a VLAN id. The valid range is 2-4093.

```
Dell (conf-if-vl-vlan-id*)#tagged tengigabitethernet 0/0-23
Dell (conf-if-vl-vlan-id*)#tagged tengigabitethernet 1/0-23
Dell (conf-if-vl-vlan-id*)#mtu 12000
Dell (conf-if-vl-vlan-id*)#exit
```

3.4 Configure DCB Map policies

```
Dell(conf)#dcb-map profile-name
Dell(conf-dcbmap-profile-name*)#priority-group 0 bandwidth 50 pfc off
Dell(conf-dcbmap-profile-name*)#priority-group 1 bandwidth 50 pfc on
```

Note: The sum of the bandwidth-percentages must be equal to 100.

```
Dell(conf-dcbmap-profile-name*)#priority-pgid 0 0 0 0 1 0 0 0
Dell(conf-dcb-profile-name*)#exit
```



3.5 Apply DCB Map policy to switch ports

Note: For this document example, the DCB Map is applied to the front-end ports of linecards 0 and 1. Apply the DCB map to linecard ports used in your network environment.

```
Dell(conf)#interface range tengigabitethernet 0/0-23 , tengigabitethernet 1/0-23  
Dell(conf-if-range-te-0/0-23,te-1/0-23)# dcb-map profile-name  
Dell(conf-if-range-te-0/0-23,te-1/0-23)#exit
```

3.6 Apply DCB Map policy to linecard backplane ports

Note: For this document example, the DCB Map is applied to the backplane ports of linecard 0 and 1. Apply the DCB to linecards used in your network environment.

```
Dell(conf)# dcb-map linecard 0 backplane all profile-name  
Dell(conf)# dcb-map linecard 1 backplane all profile-name  
Dell(conf)#exit
```

3.7 Save configuration and Reload

```
Dell#copy running-config startup-config  
Proceed to copy the file [confirm yes/no]: yes
```

```
Dell#reload  
Proceed with reload [confirm yes/no]yes
```

3.8 Configure additional linecards

Repeat the commands from section 3 to configure DCB on additional linecards. Be sure to use the proper linecard port range and linecard backplane ports. Consult the Dell C9000 user documentation for further information on setting up DCB.



4 Reverting from DCB to non-DCB configuration (optional)

One method to revert from a DCB-configured chassis to a non-DCB-configured chassis is to delete the current configuration (startup-config) and follow the steps in section 2. If deleting the current configuration is not an option, use the following procedure to unconfigure DCB and enable standard flow control.

Note: This is a disruptive operation that requires downtime. The arrays will temporarily lose communication with each other. Power off all arrays and hosts connected to the SAN before proceeding with these steps.

4.1 Disable DCB

```
Dell#configure
Dell (conf) #no dcb enable
Dell (conf) #exit
```

4.2 Remove DCB policies and apply standard flow control

```
Dell#configure
Dell (conf) #no dcb-map linecard 0 backplane all profile-name
Dell (conf) #no dcb-map linecard 1 backplane all profile-name
Dell (conf) #interface range tengigabitethernet 0/0-23 , tengigabitethernet 1/0-23
Dell (conf-if-range-te-0/0-23,te-1/0-23) #no dcb-map profile-name
Dell (conf-if-range-te-0/0-23,te-1/0-23) #flowcontrol rx on tx off
Dell (conf-if-range-te-0/0-23,te-1/0-23) #exit
Dell (conf) #exit
```

4.3 Revert to default VLAN ID on switch and arrays

Once DCB is disabled on the switch, the PS Series arrays will no longer use the VLAN ID that was configured when DCB was enabled. The arrays will revert to the default or native VLAN. Therefore, a valid VLAN must be configured for all host servers, switches, and PS Series array members. A valid VLAN can use the default or native VLAN ID (typically 0 or 1) or a specific VLAN can be configured (for example, VLAN 100). If a non-default VLAN is configured, then any ports connected to the arrays must be configured as "untagged".

Note: Host NICS must also be updated with matching VLAN information.

Use the following steps to configure the native VLAN on the switch.

```
Dell#configure
Dell (conf) #no interface vlan vlan-id
Dell (conf) #exit
```



4.4 Save configuration

```
Dell#copy running-config startup-config
```

4.5 Reload

```
Dell#reload
```

```
System configuration has been modified. Save? [yes/no]yes
```

```
Proceed with reload [confirm yes/no]yes
```

Note: The switch will reboot.

4.6 Verify DCB status

```
Dell#show dcb
```

The following status is displayed:

```
DCB Status: Disabled, PFC Queue Count: 2
```

4.7 Configure additional switch

Repeat the commands from section 4 to disable DCB on any additional linecards.



A Additional resources

Dell.com/support is focused on meeting your needs with proven services and support.

DellTechCenter.com is an IT community where you can connect with Dell customers and Dell employees for the purpose of sharing knowledge, best practices, and information about Dell products and your installations.

Referenced or recommended Dell publications:

- Dell PS Series *Configuration Guide*:
<http://en.community.Dell.com/techcenter/storage/w/wiki/equallogic-configuration-guide.aspx>
- *Dell Storage Compatibility Matrix*:
<http://en.community.dell.com/techcenter/storage/w/wiki/5069.dell-storage-compatibility-matrix>
- For PS Series best practices white papers, reference architectures, and sizing guidelines for enterprise applications and SANs, refer to:
<http://en.community.dell.com/techcenter/storage/w/wiki/2660.equallogic-technical-content>

