Brocade B8000

Switch Configuration Guide for EqualLogic SANs

Dell Storage Engineering
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Revisions

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1 Introduction

This document illustrates how to configure the Brocade B8000 switch for use with EqualLogic™ PS Series storage using Dell™ best practices. The recommended configuration uses link aggregation groups (LAGs) for inter-switch connections.

For more information on EqualLogic SAN design recommendations, see the EqualLogic Configuration Guide at: www.delltechcenter.com/page/equallogic+configuration+guide.

1.1 Audience

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

1.2 Switch details

The table below provides an overview of the switch configuration.

Table 1 Switch specifications

Brocade B8000	
Switch vendor	Brocade
Switch model	B8000
Switch firmware	V7.1.2

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: http://www.brocade.com. This site requires a login.

1.3 Cabling diagram

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

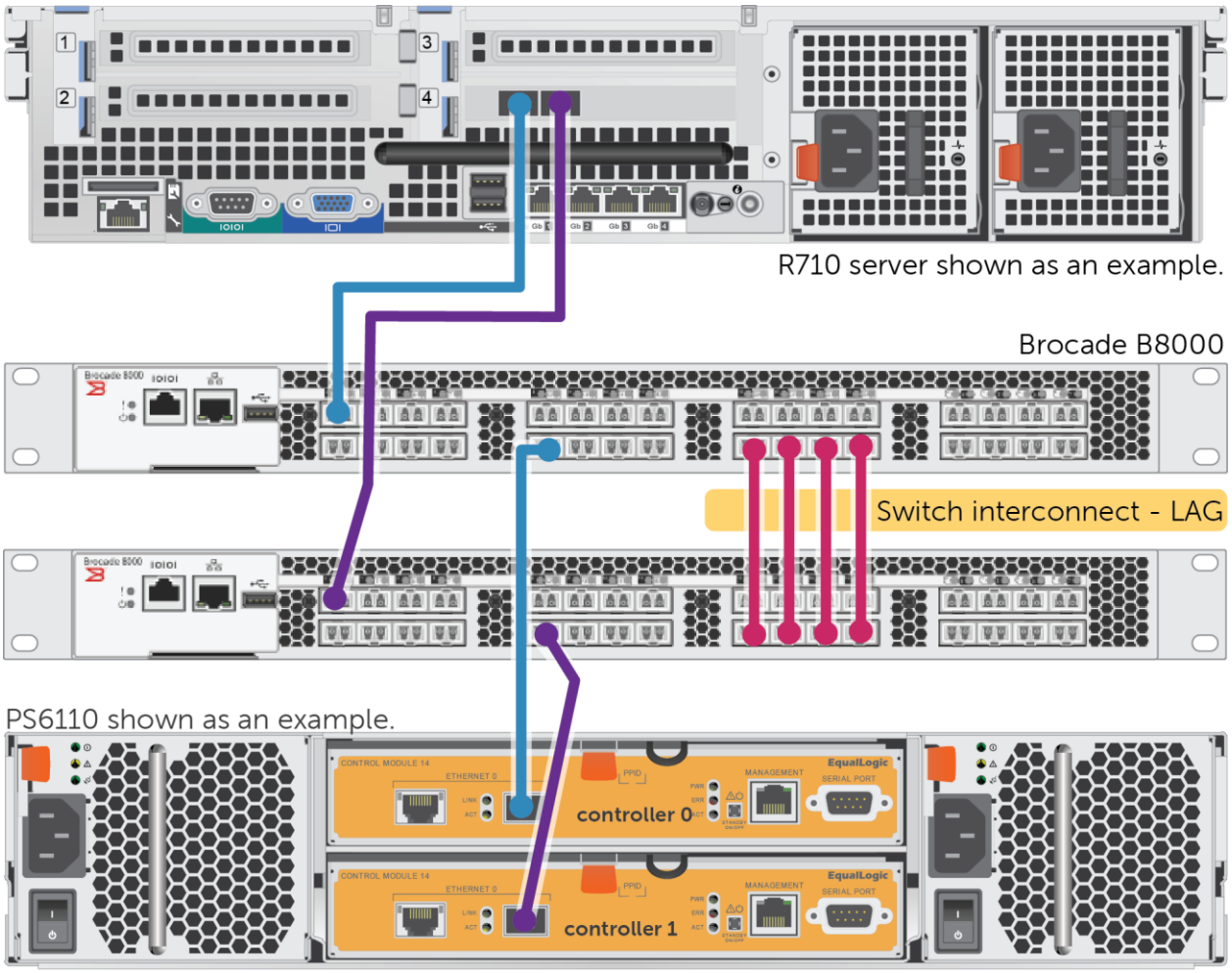


Figure 1 Cabling diagram

2 Dell recommended switch configuration

These steps show you how to configure two Brocade B8000 switches with a LAG interconnect. The switches are interconnected using four of the 10Gb ports configured as the LAG links.

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). For a converged network (LAN and SAN traffic) sharing the same switch fabric using DCB, follow Section 3 along with the section below.

2.1 Hardware configuration

1. Power on both switches
2. Connect a serial cable to the management port.
3. Using any 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. This will be used as your LAG link.

2.2 Delete startup configuration

Note: This example assumes a switch at its default configuration settings. Using the "write erase" command sets the startup configuration file to its default settings. You should always backup your configuration settings prior to performing any configuration changes

```
DL_8000_0000_M:admin>cmsh
```

Note: cmsh is the CEE CLI to configure CEE features and ports in B8000

```
DL_8000_0000_M#write erase

Erase the startup config file (y/n): y

DL_8000_0000_M#exit

DL_8000_0000_M:admin>reboot

Warning: This command would cause the switch to reboot

and result in traffic disruption.

Are you sure you want to reboot the switch [y/n]? y
```

Note: The switch will reboot.

2.3 Configure Port Channel

```
DL_8000_0000_M:admin>cmsh

DL_8000_0000_M#configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.

DL_8000_0000_M(config)#interface port-channel 1

DL_8000_0000_M(conf-if-po-1)#mtu 9208

DL_8000_0000_M(conf-if-po-1)#switchport

DL_8000_0000_M(conf-if-po-1)#switchport mode trunk

DL_8000_0000_M(conf-if-po-1)#no shutdown

DL_8000_0000_M(conf-if-po-1)#exit
```

2.4 Configure Ports for LAG

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/20

no DL_8000_0000_M(conf-if-te-0/20)#mtu 9208

DL_8000_0000_M(conf-if-te-0/20)#channel-group 1 mode active type standard

DL_8000_0000_M(conf-if-te-0/20)#no shutdown

DL_8000_0000_M(conf-if-te-0/20)#lacp timeout long

DL_8000_0000_M(conf-if-te-0/20)#qos flowcontrol tx on rx on

DL_8000_0000_M(conf-if-te-0/20)#no lldp iscsi-priority-bits

DL_8000_0000_M(conf-if-te-0/20)#exit

DL_8000_0000_M(config)#interface tengigabitethernet 0/21

no DL_8000_0000_M(conf-if-te-0/21)#mtu 9208

DL_8000_0000_M(conf-if-te-0/21)#channel-group 1 mode active type standard

DL_8000_0000_M(conf-if-te-0/21)#no shutdown

DL_8000_0000_M(conf-if-te-0/21)#lacp timeout long

DL_8000_0000_M(conf-if-te-0/21)#qos flowcontrol tx on rx on

DL_8000_0000_M(conf-if-te-0/21)#no lldp iscsi-priority-bits
```

```
DL_8000_0000_M(conf-if-te-0/21)#exit
DL_8000_0000_M(config)#interface tengigabitethernet 0/22
no DL_8000_0000_M(conf-if-te-0/22)#mtu 9208
DL_8000_0000_M(conf-if-te-0/22)#channel-group 1 mode active type standard
DL_8000_0000_M(conf-if-te-0/22)#no shutdown
DL_8000_0000_M(conf-if-te-0/22)#lacp timeout long
DL_8000_0000_M(conf-if-te-0/22)#qos flowcontrol tx on rx on
DL_8000_0000_M(conf-if-te-0/22)#no lldp iscsi-priority-bits
DL_8000_0000_M(conf-if-te-0/22)#exit
DL_8000_0000_M(config)#interface tengigabitethernet 0/23
no DL_8000_0000_M(conf-if-te-0/23)#mtu 9208
DL_8000_0000_M(conf-if-te-0/23)#channel-group 1 mode active type standard
DL_8000_0000_M(conf-if-te-0/23)#no shutdown
DL_8000_0000_M(conf-if-te-0/23)#lacp timeout long
DL_8000_0000_M(conf-if-te-0/23)#qos flowcontrol tx on rx on
DL_8000_0000_M(conf-if-te-0/23)#no lldp iscsi-priority-bits
DL_8000_0000_M(conf-if-te-0/23)#exit
```

2.5 Configure Global LLDP settings to disable DCB

The below commands are issued to disable dcbx-tlv and iscsi-app tlv.

```
DL_8000_0000_M(config)#protocol lldp
DL_8000_0000_M(conf-lldp)#no advertise dcbx-iscsi-app-tlv
DL_8000_0000_M(conf-lldp)#no advertise dcbx-tlv
DL_8000_0000_M(conf-lldp)#exit
```

2.6 Enable Jumbo MTU

You must perform this step for each individual port that is connected to a storage controller or a host interface port.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#mtu 9208

DL_8000_0000_M(conf-if-te-0/0)#exit

DL_8000_0000_M(config)#
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller.

2.7 Enable Switchport

You must perform this step for each individual port that is connected to a storage controller or a host interface port.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#switchport

DL_8000_0000_M(conf-if-te-0/0)#switchport mode access

DL_8000_0000_M(conf-if-te-0/0)#no shutdown

DL_8000_0000_M(conf-if-te-0/0)#exit
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller.

2.8 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.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#qos flowcontrol tx on rx on

DL_8000_0000_M(conf-if-te-0/0)#exit
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller.

2.9 Configure Spanning tree on edge ports

```
DL_8000_0000_M(config)#protocol spanning-tree rstp

DL_8000_0000_M(conf-rstp)#exit
```

You must perform the below steps for each individual port that is connected to a storage controller or a host interface port.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#spanning-tree edgeport

DL_8000_0000_M(conf-if-te-0/0)#exit
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller

2.10 Disable LLDP iSCSI priority on Switch Ports

You must perform this step for each individual port that is connected to a storage controller or a host interface port.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#no lldp iscsi-priority-bits

DL_8000_0000_M(conf-if-te-0/0)#exit

DL_8000_0000_M(config)#exit
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller.

2.11 Save configuration

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

2.12 Configure additional switch

Repeat the commands from Sections 2.1 through 2.11 to configure the second 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 switch for DCB mode

Note: This section enables DCB for implementing a converged network (LAN and SAN traffic sharing the same switch fabric). Hosts connecting to EqualLogic iSCSI storage must have a supported Converged Network Adapter (CNA).

3.1 Configure vlan

```
DL_8000_0000_M#configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.

DL_8000_0000_M(config)#interface vlan 100
```

Note: The above configuration use vlan id as 100 for iSCSI traffic. You must supply a valid VLAN id in the range is 2-4093. Replace your vlan id in all the following sections where vlan id 100 is used.

```
DL_8000_0000_M(conf-if-vl-100)#exit
```

3.2 Configure Global LLDP settings

The below commands enable iSCSI-TLV, DCBx TLV and assign iSCSI traffic to priority 4 globally. Optional TLVs can also be enabled as shown below.

```
DL_8000_0000_M(config)#protocol lldp

DL_8000_0000_M(conf-lldp)#advertise dcbx-iscsi-app-tlv

DL_8000_0000_M(conf-lldp)#advertise dcbx-tlv

DL_8000_0000_M(conf-lldp)#iscsi-priority-bits list 4

DL_8000_0000_M(conf-lldp)#advertise optional-tlv system-name

DL_8000_0000_M(conf-lldp)#advertise optional-tlv system-capabilities

DL_8000_0000_M(conf-lldp)#advertise optional-tlv system-description

DL_8000_0000_M(conf-lldp)#exit
```

3.3 Configure edge ports for DCB

You must perform this step for each individual port that is connected to a storage controller or a host interface port.

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/0

DL_8000_0000_M(conf-if-te-0/0)#switchport mode converged

DL_8000_0000_M(conf-if-te-0/0)#switchport converged allowed vlan add 100

DL_8000_0000_M(conf-if-te-0/0)#cee default
```

Note: Applies the cee-map "default" to the switch ports.

```
DL_8000_0000_M(conf-if-te-0/0)#exit
```

Note: Repeat the above commands for all interfaces connected to Host or Storage controller.

3.4 Configure Port channel

```
DL_8000_0000_M(config)#interface port-channel 1

DL_8000_0000_M(conf-if-po-1)#switchport trunk allowed vlan all

DL_8000_0000_M(conf-if-po-1)#exit
```

3.5 Configure LAG ports

```
DL_8000_0000_M(config)#interface tengigabitethernet 0/20

DL_8000_0000_M(conf-if-te-0/20)#cee default

DL_8000_0000_M(conf-if-te-0/20)#exit

DL_8000_0000_M(config)#interface tengigabitethernet 0/21

DL_8000_0000_M(conf-if-te-0/21)#cee default

DL_8000_0000_M(conf-if-te-0/21)#exit

DL_8000_0000_M(config)#interface tengigabitethernet 0/22

DL_8000_0000_M(conf-if-te-0/22)#cee default

DL_8000_0000_M(conf-if-te-0/22)#exit

DL_8000_0000_M(config)#interface tengigabitethernet 0/23

DL_8000_0000_M(conf-if-te-0/23)#cee default
```

```
DL_8000_0000_M(conf-if-te-0/23)#exit
```

3.6 Configure DCB policies for iSCSI

The following section configures iSCSI traffic for Class of Service (CoS) 4 and iSCSI traffic PGID as 1 with PFC enabled for the default CEE map

```
DL_8000_0000_M(config)#cee-map default

DL_8000_0000_M(conf-ceemap)#priority-table 2 2 2 2 1 2 2 2

DL_8000_0000_M(conf-ceemap)#priority-group-table 2 weight 50

DL_8000_0000_M(conf-ceemap)#priority-group-table 1 weight 50 pfc
```

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

```
DL_8000_0000_M(conf-ceemap)#exit

DL_8000_0000_M(config)#exit
```

3.7 Save configuration

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

3.8 Configure additional switch

Repeat the commands from Sections 3.1 through 3.6 to configure the second switch.

Additional resources

Support.dell.com 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 EqualLogic Configuration Guide: http://en.community.dell.com/techcenter/storage/w/wiki/equallogic-configuration-guide.aspx
- Dell EqualLogic Compatibility Matrix: http://en.community.dell.com/techcenter/storage/w/wiki/2661.equallogic-compatibility-matrix.aspx

For EqualLogic best practices white papers, reference architectures, and sizing guidelines for enterprise applications and SANs, refer to Storage Infrastructure and Solutions Team Publications at:

- http://dell.to/sM4hJT