Brocade VDX 6740

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 VDX 6740 switch for use with EqualLogic™ PS Series storage using Dell™ best practices. The recommended configuration uses Brocade 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 VDX 6740	
Switch vendor	Brocade
Switch model	VDX 6740
Switch firmware	NOS 5.0.1

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.

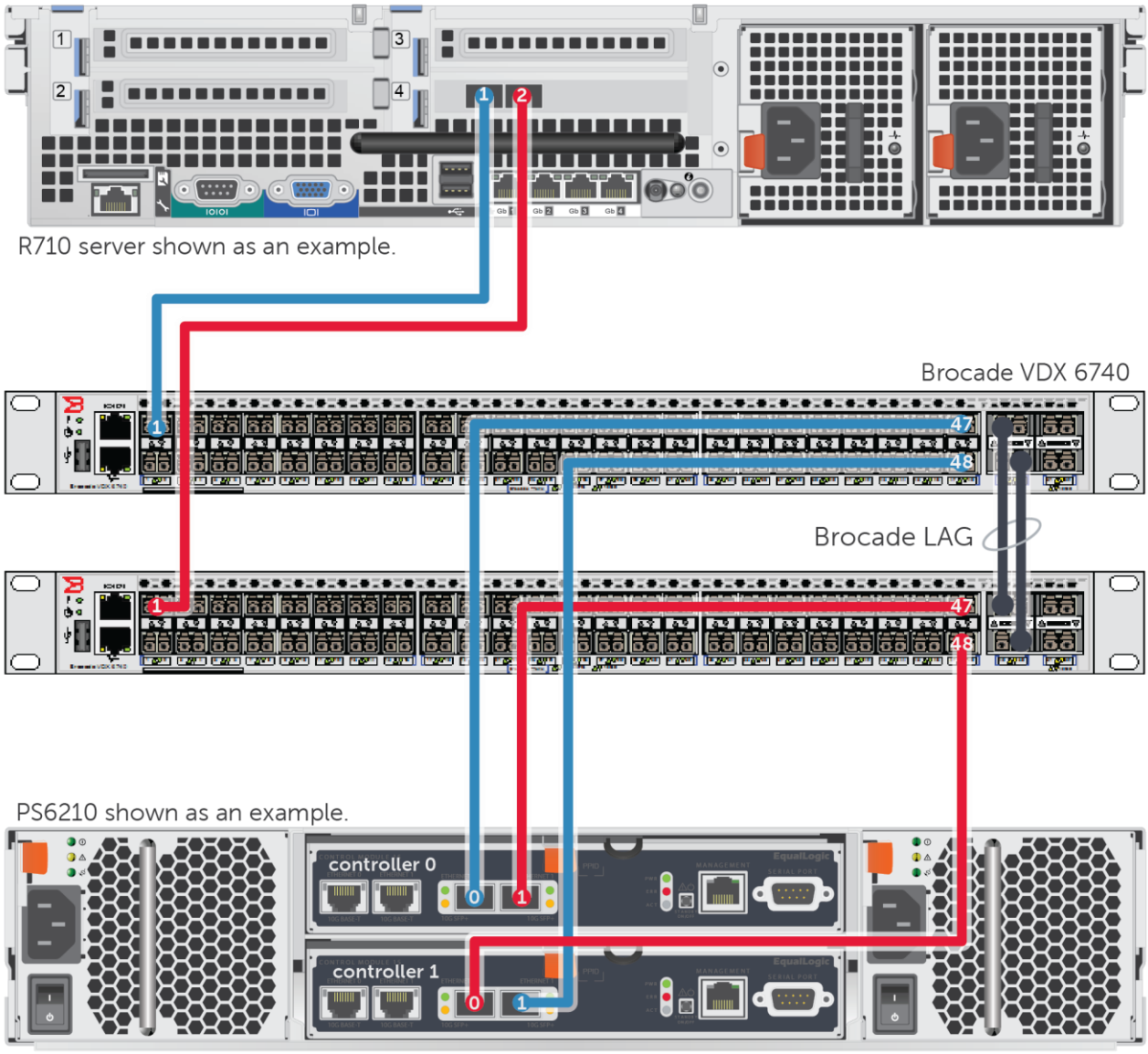

Figure 1 Cabling diagram

2 Dell recommended switch configuration

These steps show how to configure two Brocade VDX 6740 switches with a Brocade proprietary LAG interconnect. The switches are interconnected using two 40Gb ports configured as the LAG links. 40G Port Upgrade license is required to use the 40G uplinks.

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 any other traffic type).

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 Brocade LAG link.

Note: The below configuration steps assumes that the switch is configured with a unique Rbridge-id and VCS id. The LAG interconnection will fail to come up if the Rbridge-id or VCS id is conflicting. Refer to Section 4 on how to change the Rbridge-id and VCS id of the switch.

2.2 Delete startup configuration

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

```
sw0# copy default-config startup-config
This operation will modify your startup configuration. Do you want to continue?
[y/n]:y
WARN: "reload system" is required to have configuration changes take effect!
sw0# reload system
Warning: This operation will cause the chassis to reboot and
requires all existing telnet, secure telnet and SSH sessions to be
restarted.
Are you sure you want to reboot the chassis [y/n]? y
```

Note: The switch will reboot.

2.3 Configure Port Channel

```
sw0#configure
Entering configure mode terminal
sw0(config)# interface Port-channel 1
sw0(config-Port-channel-1)# mtu 9216
sw0(config-Port-channel-1)# switchport
sw0(config-Port-channel-1)# switchport mode trunk
sw0(config-Port-channel-1)# qos flowcontrol tx off rx on
sw0(config-Port-channel-1)# speed 40000
sw0(config-Port-channel-1)# no shutdown
sw0(config-Port-channel-1)# exit
```

2.4 Configure Ports for LAG

```
sw0(config)# interface FortyGigabitEthernet 1/0/49-50
sw0(conf-if-fo-1/0/49-50)# no fabric isl enable
sw0(conf-if-fo-1/0/49-50)# no fabric trunk enable
sw0(conf-if-fo-1/0/49-50)# channel-group 1 mode active type brocade
sw0(conf-if-fo-1/0/49-50)# no cee
sw0(conf-if-fo-1/0/49-50)# no lldp disable
sw0(conf-if-fo-1/0/49-50)# no shutdown
sw0(conf-if-fo-1/0/49-50)# exit
```

2.5 Configure Global LLDP settings to disable DCB

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

```
sw0(config)#protocol lldp
sw0(conf-lldp)#no advertise dcbx-iscsi-app-tlv
sw0(conf-lldp)#no advertise dcbx-tlv
sw0(conf-lldp)#exit
```

2.6 Disable Ethernet Fabric on edge ports

```
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# no fabric isl enable
sw0(conf-if-te-1/0/1-48)# no fabric trunk enable
sw0(conf-if-te-1/0/1-48)# exit
```

2.7 Enable Jumbo MTU

```
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# mtu 9216
sw0(conf-if-te-1/0/1-48)# exit
```

2.8 Enable Switchport

```
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# switchport
sw0(conf-if-te-1/0/1-48)# switchport mode access
sw0(conf-if-te-1/0/1-48)# exit
```

2.9 Enable link level flow control (802.3x)

```
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# qos flowcontrol tx off rx on
sw0(conf-if-te-1/0/1-48)# exit
```

2.10 Configure Spanning tree on edge ports

```
sw0(config)#protocol spanning-tree rstp
sw0(config-rstp)#exit
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# spanning-tree edgeport
sw0(conf-if-te-1/0/1-48)# exit
```

2.11 Disable LLDP iSCSI priority on Switch Ports

```
sw0(config)#interface TenGigabitEthernet 1/0/1-48
sw0(conf-if-te-1/0/1-48)# no lldp disable
sw0(conf-if-te-1/0/1-48)# no cee
sw0(conf-if-te-1/0/1-48)# no lldp iscsi-priority
sw0(conf-if-te-1/0/1-48)# exit
```

2.12 Save configuration

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

2.13 Configure additional switch

Repeat the commands from Sections 2.1 through 2.12 to configure the second switch.

3 Performance Tuning

In our testing of VDX 6740 with EqualLogic and using asymmetric flow control i.e. TX off RX on, the default buffer allocation of 280KB per port per queue didn't yield optimum throughput and significant TCP retransmits were observed. But NOS version 5.0.1 has additional knobs to fine tune the buffers and add additional buffer per port per queue. The following section shows how to configure the receive and transmit buffers. Our testing indicated the optimal setting as 2MB for receive queue and 2MB for transmit queue per port.

```
sw0# configure
Entering configuration mode terminal
sw0(config)# rbridge-id 1
sw0(config-rbridge-id-1)# qos tx-queue limit 2000
sw0(config-rbridge-id-1)# qos rcv-queue limit 2000
sw0(config-rbridge-id-1)# exit
sw0(config)#
```

Note: Repeat the commands to configure the buffer on the second switch.

4 Configuring VCS ID and Rbridge-ID

Refer to Brocade documentation for details on VCS and ethernet fabric. The following commands shows the steps to configure the rbridge-id and VCS id to 2 on the second switch so that it doesn't conflict with the default value of 1 on Switch 1. VDX 6740 is in Fabric Cluster mode by default and configuration change is not required for the mode.

```
sw0# show vcs
Config Mode    : Local-Only
VCS Mode       : Fabric Cluster
VCS ID         : 1
Total Number of Nodes           : 1
Rbridge-Id       WWN                              Management IP   VCS Status
Fabric Status        HostName
-----------------------------------------------------------------------------
------------------------------
2               >10:00:50:EB:1A:2D:F2:64*       77.77.77.77     Online
Online               sw0
sw0# vcs vcsid 2
This operation will change the configuration to default and reboot the switch.
Do you want to continue? [y/n]:y
```

Note: The switch will reboot.

```
sw0# vcs rbridge-id 2
This operation will change the configuration to default and reboot the switch.
Do you want to continue? [y/n]:y
```

Note: The switch will reboot.

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