Dell Networking N3000 Series

Switch Configuration Guide for EqualLogic SANs

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March 2014



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Revisions

Date	Description
March 2014	Initial release

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1 Introduction

This document illustrates how to configure Dell™ Networking 3000 Series switches for use with EqualLogic™ PS Series storage using Dell best practices. The recommended configuration uses link aggregation groups (LAGs) for inter-switch connections.

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

For more information on EqualLogic SAN design recommendations, see the EqualLogic Configuration Guide at: http://en.community.dell.com/dell-groups/dtcmedia/m/mediagallery/19852516/download.aspx.

1.1 Audience

This switch configuration guide describes an optimal 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

Dell Networking N3000 Series	
Switch vendor	Dell
Switch model	Dell Networking N3000 series – N3024, N3048
Switch firmware	6.0.1.3 and later

Note: For proper functionality, the switch must be at the switch 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: support.dell.com.

1.3 Cabling diagram

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

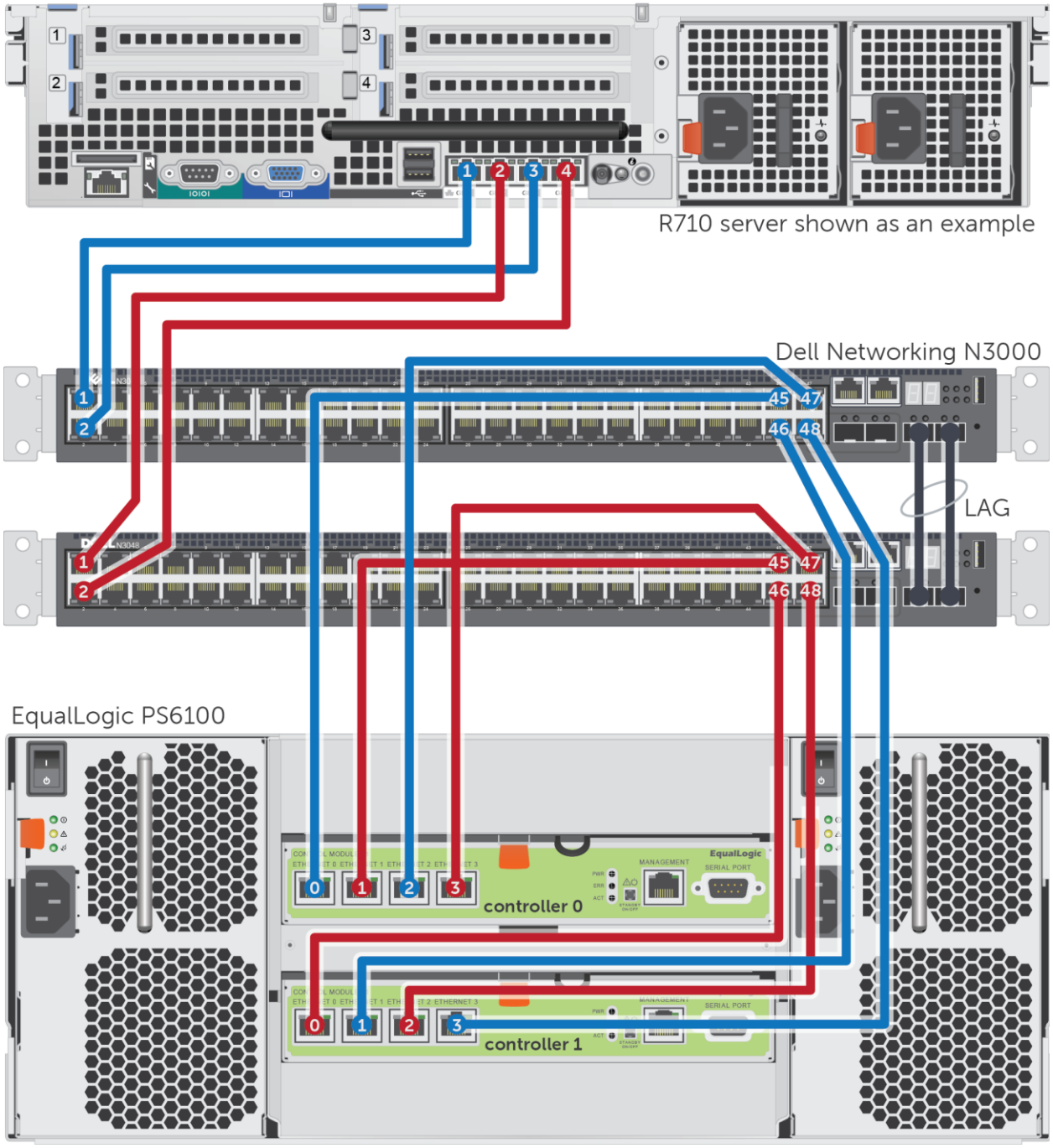


Figure 1 Cabling diagram

2 Dell recommended switch configuration

These steps show you how to configure two Dell Networking N3000 switches with a Link Aggregation Group (LAG). The switches are interconnected using the fixed 10 GbE SFP+ module on the front and the LAG is configured for Dynamic Link Aggregation Control Protocol (LACP).

2.1 Hardware configuration

1. Power on the two switches.
2. Connect a serial cable to the serial port of the first switch.
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 optical cables between the fixed 10GbE module on the front of the N3000 switches. See this configuration in Figure 1.

2.2 Delete startup configuration

Note: All configuration settings will be deleted

```
console>enable

console#reload

Are you sure you want to reload the stack? (y/n) y
```

Note: The switch will reboot.

Follow the prompts shown below when the Main Menu is displayed during the bootup process.

```
Dell Networking Boot Options

============================

Select a menu option within 3 seconds or the Operational Code will start
automatically...

1 - Start Operational Code

2 - Display Boot Menu

Select (1, 2)# 2

Boot Main Menu

==============
```

```
    1  - Start Operational Code

    2  - Select Baud Rate

    3  - Retrieve Logs

    4  - Load New Operational Code

    5  - Display Operational Code Details

    9  - Reboot

   10  - Restore Configuration to Factory Defaults

   11  - Activate Backup Image

   12  - Start Password Recovery
```

Enter choice number **10.**

```
Are sure you want to Erase Current Configuration? (Y/N): Y

Erasing Current Configuration...done.

Boot Main Menu

==============

    1  - Start Operational Code

    2  - Select Baud Rate

    3  - Retrieve Logs

    4  - Load New Operational Code

    5  - Display Operational Code Details

    9  - Reboot

   10  - Restore Configuration to Factory Defaults

   11  - Activate Backup Image

   12  - Start Password Recovery
```

Enter choice number **9** and the system will reboot. Wait for the following prompt:

```
Would you like to run the setup wizard (you must answer this question within 60
seconds)? [Y/N] N
```

2.3 HTTP and Telnet authentication

```
console>enable

console#config

console(config)#line telnet

console(config-telnet)#login authentication default

console(config-telnet)#exit

console(config)#ip http authentication local

console(config)#username admin password yourpassword privilege 15

console(config)#enable password yourpassword
```

2.4 Configure out of band (OOB) management port

```
console>enable

console>#configure

console(config)#interface out-of-band

console(config-if)#ip address ipaddress mask gateway

console(config-if)#exit

console(config)#exit
```

2.5 Enable iSCSI optimization feature

This feature, enabled by default, is activated when EqualLogic arrays are detected, however, Dell recommends manually configuring these steps too. It automatically performs the following:

- Configures jumbo frames to 9216 on all ports.
- Disables unicast storm.
- Enables spanning tree portfast on ports connected to EqualLogic arrays.
- Configures flow control on all ports.

Note: Spanning tree portfast must be manually configured for host facing ports. Refer to Section 2.8.

```
console#configure

console(config)#iscsi enable
Enabling iSCSI Optimization will enable Flow Control which may cause all the
interfaces to temporarily go down.
```

```
Are you sure you want to continue? (y/n) y

console(config)#exit
```

2.6 Enable flow control (optional)

Note: If iSCSI optimization is enabled, flow control is automatically configured on all switch ports upon detection of an EqualLogic Array. Dell recommends also manually configuring this step.

```
console#configure

console(config)#flowcontrol receive on
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to continue? (y/n)y

console(config)#exit
```

2.7 Configure Jumbo MTU for all ports

```
console(config)#system jumbo mtu 9216

console(config)# exit
```

2.8 Configure spanning tree portfast on edge ports

Note: If iSCSI optimization is enabled, spanning tree portfast is automatically configured on ports connected to EqualLogic arrays. These manual steps must be performed on switch ports connected to hosts servers.

```
console#configure

console(config)#interface range gigabitethernet all

console(config-if)#spanning-tree portfast

console(config-if)#exit
```

2.9 Configure 10GbE ports for LAG

These commands assign the fixed 10GbE SFP+ ports to the Port Channel.

```
console(config)#interface range tengigabitethernet 1/0/1-2

console(config-if)#no spanning-tree portfast
```

```
console(config-if)#channel-group 1 mode active

console(config-if)#exit

console(config)#exit
```

2.10 Save configuration

```
console#copy running-config startup-config
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n)y
```

2.11 Configure additional switch

Repeat the commands from Section 2 to configure the second switch.

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 Stack configuration (optional)

Note: If you already completed section 2 you are finished. If you wish to use a stack configuration instead of LAG, follow the instructions below in place of section 2.

Note: One advantage of stacked switches is that they can be managed as a single switch; however firmware updates will update and reboot all members of the stack simultaneously and therefore should only be done during planned downtime.

1. Connect the cables between the stacked switches. (Stacking ports are on the rear side of the switch).
2. **On both switches**, type the following commands to clear the current configuration:

```
console>enable

console#reload

Are you sure you want to reload the stack? (y/n) y
```

Note: The switch will reboot.

Follow the prompts shown below when the Main Menu is displayed during the bootup process.

```
Dell Networking Boot Options

============================

Select a menu option within 3 seconds or the Operational Code will start
automatically...

1 - Start Operational Code

2 - Display Boot Menu

Select (1, 2)# 2

Boot Main Menu

==============

    1  - Start Operational Code

    2  - Select Baud Rate

    3  - Retrieve Logs

    4  - Load New Operational Code
```

```
    5   - Display Operational Code Details

    9   - Reboot

   10   - Restore Configuration to Factory Defaults

   11   - Activate Backup Image

   12   - Start Password Recovery
```

Enter choice number **10**.

```
Are sure you want to Erase Current Configuration? (Y/N): Y

Erasing Current Configuration...done.

Boot Main Menu

==============

    1   - Start Operational Code

    2   - Select Baud Rate

    3   - Retrieve Logs

    4   - Load New Operational Code

    5   - Display Operational Code Details

    9   - Reboot

   10   - Restore Configuration to Factory Defaults

   11   - Activate Backup Image

   12   - Start Password Recovery
```

Enter choice number **9** and the system will reboot. Wait for the following prompt:

```
Would you like to run the setup wizard (you must answer this question within 60
seconds)? [Y/N] N
```

Note: All remaining configuration must be done from the switch designated as master. To determine which switch is the master unit, check the Master LED located on the front of each switch.

3.1 HTTP and Telnet authentication

```
console>enable

console#config
```

```
console(config)#line telnet

console(config-telnet)#login authentication default

console(config-telnet)#exit

console(config)#ip http authentication local

console(config)#username admin password yourpassword privilege 15

console(config)#enable password yourpassword
```

3.2 Configure out of band (OOB) management port

```
console>enable

console>#configure

console(config)#interface out-of-band

console(config-if)#ip address ipaddress mask gateway

console(config-if)#exit

console(config)#exit
```

3.3 Enable iSCSI optimization feature

This feature, enabled by default, is activated when EqualLogic arrays are detected, however, Dell recommends manually configuring these steps too. It automatically performs the following:

- Configures jumbo frames to 9216 on all ports.
- Disables unicast storm.
- Enables spanning tree portfast on ports connected to EqualLogic arrays.
- Configures flow control on all ports.

Note: Spanning tree portfast must be manually configured for host facing ports. Refer to Section 3.5.

```
console#configure

console(config)#iscsi enable
Enabling iSCSI Optimization will enable Flow Control which may cause all the
interfaces to temporarily go down.

Are you sure you want to continue? (y/n) y

console(config)#exit
```

3.4 Enable flow control (optional)

Note: If iSCSI optimization is enabled, flow control is automatically configured on all switch ports upon detection of an EqualLogic Array. Dell recommends also manually configuring this step.

```
console#configure

console(config)#flowcontrol receive on
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to continue? (y/n)y

console(config)#exit
```

3.5 Configure Jumbo MTU for all ports

```
console(config)#system jumbo mtu 9216

console(config)# exit
```

3.6 Configure spanning tree portfast on edge ports

Note: If iSCSI optimization is enabled, spanning tree portfast is automatically configured on ports connected to EqualLogic arrays. These manual steps must be performed on switch ports connected to hosts servers.

```
console#configure

console(config)#interface range gigabitethernet all

console(config-if)#spanning-tree portfast

console(config-if)#exit
```

3.7 Save configuration

```
console#copy running-config startup-config
This operation may take a few minutes.
Management interfaces will not be available during this time.

Are you sure you want to save? (y/n)y
```

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.

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/dell-groups/dtcmedia/m/mediagallery/19852516/download.aspx
- Dell EqualLogic Compatibility Matrix:
  http://en.community.dell.com/dell-groups/dtcmedia/m/mediagallery/19856862/download.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