



Dell Networking N2000 Series

Switch Configuration Guide for EqualLogic SANs

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Revisions

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1 Introduction

This document illustrates how to configure Dell™ Networking N2000 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 from this guide for LAG, or sections 1 and 3 from this guide for stack configuration.

For more information on EqualLogic SAN design recommendations, see the EqualLogic Configuration Guide at: <http://en.community.dell.com/dell-groups/dtcmmedia/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 N2000 Series	
Switch vendor	Dell
Switch model	Dell Networking N2000 series – N2024, N2048
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.

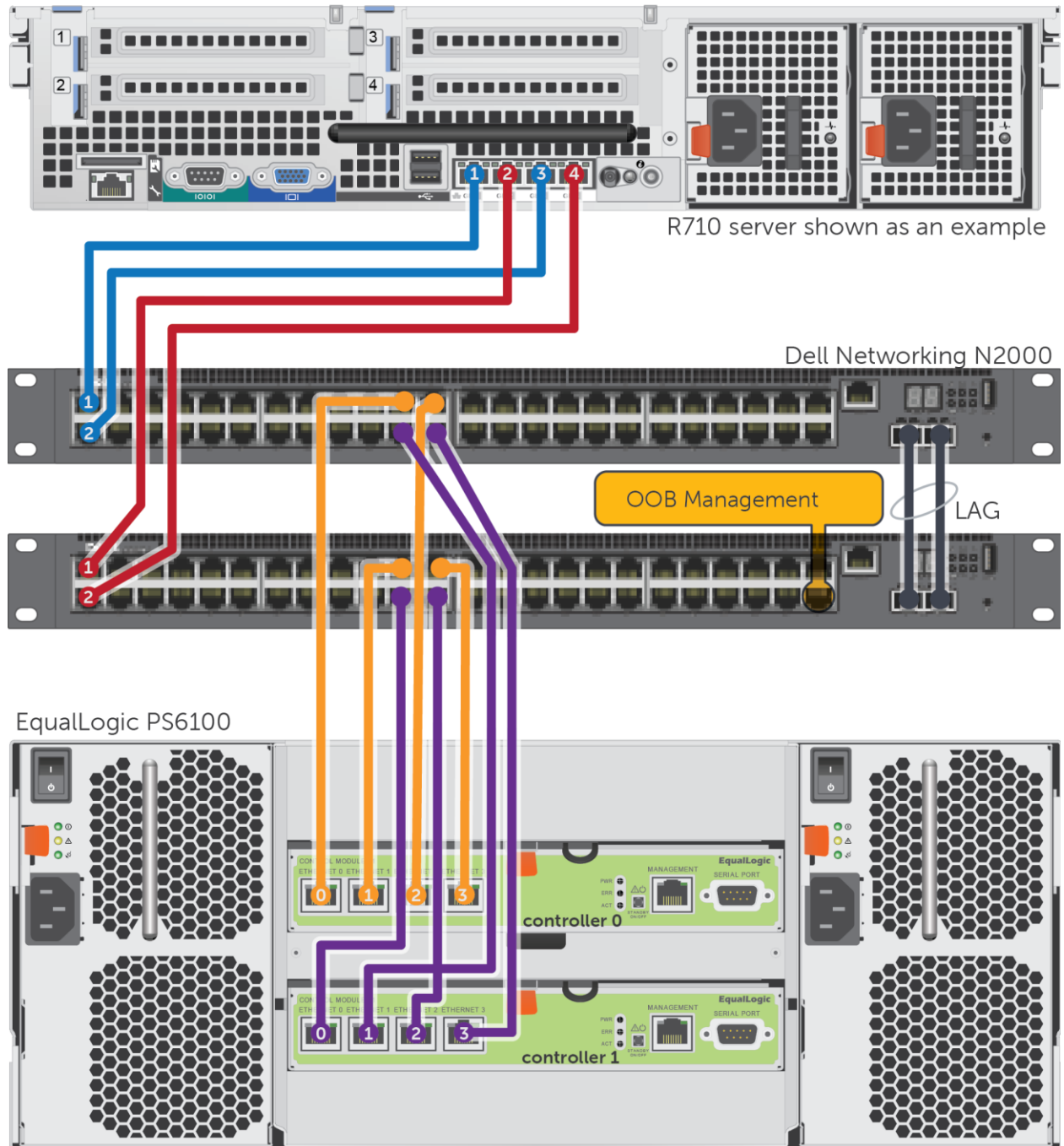


Figure 1 Cabling diagram

2 Dell recommended switch configuration

These steps show you how to configure two Dell Networking N2000 switches with a Link Aggregation Group (LAG). The switches are interconnected using the fixed 10GbE 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 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 optical cables between the fixed 10GbE module on the front of the N2000 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 Configure out-of-band management port (Optional)

This section will configure a 1GbE port to be used as a dedicated out-of-band (OOB) management port. It is recommended to perform this step. If you skip this step, then all configuration and monitoring must be performed via the serial ports.

Note: In the configuration below, Vlan 50 is used for management. Use any valid non-default vlan in your setup. The IP address provided should be accessible from your management system (and not connected to the SAN). The switch port used in this configuration should be connected to a LAN or management network.

```
console>enable

console#configure

console(config)#vlan 50

console(config-vlan50)#exit

console(config)#interface vlan 50

console(config-if-vlan50)#ip address ipaddress mask

console(config-if-vlan50)#exit

console(config)#interface gigabitethernet 1/0/port number

console(config-if-Gi1/0/port number)#switchport access vlan 50

console(config-if-Gi1/0/port number)#exit
```

Note: If your management system is in the same subnet as the switch, omit the step below.

```
console(config)#ip default-gateway gateway
```

Warning! Notice! The configured default gateway will not take effect until an interface belonging to the same subnet as the configured Gateway is created and activated.

```
console(config)#exit
```

2.4 HTTP and Telnet authentication

```
console#configure

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
```

2.5 Enable iSCSI optimization feature

This feature, enabled by default, is activated only when EqualLogic arrays are detected, however, Dell recommends manually configuring these steps too. This feature, when enabled 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

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

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(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 two fixed 10GbE SFP+ ports on the front of the switch 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 instead 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 Configure out-of-band management port (Optional)

This section configures a 1GbE port to be used as a dedicated out-of-band management port. It is recommended to perform this step. If you skip this step, then all configuration and monitoring must be performed through the serial ports.

Note: In the configuration below, Vlan 50 is used for management. Use any valid non-default vlan in your setup. The IP address provided should be accessible from your management system (and not connected to the SAN). The switch port used in this configuration should be connected to a LAN or management network.

```
console>enable

console#configure

console(config)#vlan 50

console(config-vlan50)#exit

console(config)#interface vlan 50

console(config-if-vlan50)#ip address ipaddress mask

console(config-if-vlan50)#exit

console(config)#interface gigabitethernet 1/0/port number

console(config-if-Gi1/0/port number)#switchport access vlan 50

console(config-if-Gi1/0/port number)#exit
```

Note: If your management system is in the same subnet as the switch then omit the step below.

```
console(config)#ip default-gateway gateway
```

Warning! Notice! The configured default gateway will not take effect until an interface belonging to the same subnet as the configured Gateway is created and activated.

```
console(config)#exit
```

3.2 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

```

3.3 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 3.6.

```

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

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

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(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](http://support.dell.com) is focused on meeting your needs with proven services and support.

[DellTechCenter.com](http://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>

