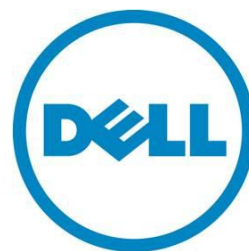

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

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Introduction

Most Dell PowerConnect switches today include a stacking feature that allows multiple switches to operate as a single unit. These stacks include up to six Dell PowerConnect 8132/8132F/8164/8164F switches in any combination, use up to four links between stack members, and use any port type on the front panel to create these links

A single switch in the stack (known as the Master switch) manages all the units in the stack and uses a single IP address, which allows the user to manage every port in the stack from this one address. This IP address is copied from the Master to the Standby when the Standby is created. If for any reason the Master fails and the Standby takes over as Master, the IP address of the stack remains the same, allowing continuous management of the stack.

The *new* Master unit also continues to use the *original* Master unit's MAC addresses, which helps to reduce disruptions to the network. When a failed Master re-joins the stack, it does so as a member (not a Master) unless a new Master has not had time to be elected.

Note: Dell PowerConnect 8132, 8132F, 8164, and 8164F series switches can be mixed in any combination within a stack.

This document provides an easy to use step-by-step guide on how to configure stacking for the Dell PowerConnect 8132 (Figure 1), PowerConnect 8132F (Figure 2), PowerConnect 8164 (Figure 3) and the PowerConnect 8164F (Figure 4).

Figure 1. Dell PowerConnect 8132

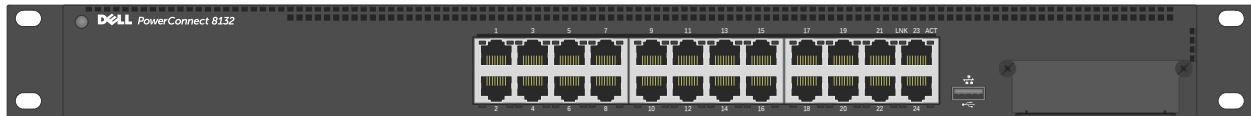


Figure 2. Dell PowerConnect 8132F

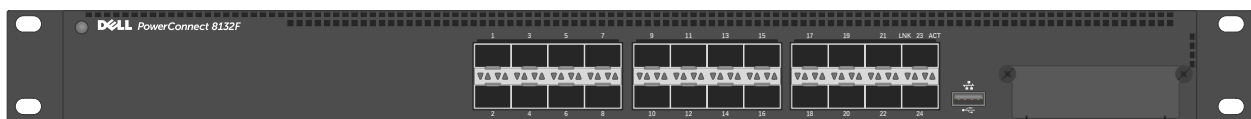


Figure 3. Dell PowerConnect 8164

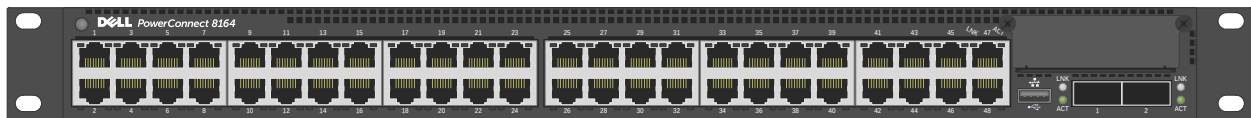
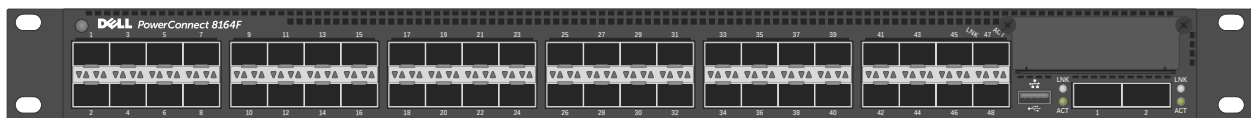


Figure 4. Dell PowerConnect 8164F



Stacking and management

An important advantage of stacking is that it provides a consolidated interface for management of multiple switches that are linked together. One switch acts as the Master, and the entire stack is managed through the management interface (Web, CLI, or SNMP) of the stack Master. After a stack is deployed in the network, operators can easily add units to the stack as their port requirements increase, with minimal administrative overhead. Additional stack members can immediately use existing configuration information such as routing and switching configurations, VLANs, ACLs, port profiles, and security certificates.

Simplified firmware updates for stack members

When switches are stacked, only the Master needs to be updated with new firmware. All members of the stack receive the firmware from the Master at the same time it is being updated, minimizing the administrator's time used for updating firmware. Also, when a switch is added to a stack, if it is running a different backup version of firmware than the active version on the stack Master, the backup firmware on the new member is automatically updated to match the Master, the backup version of firmware on the new member is activated, and the new member is rebooted.

Stacking and redundancy

By connecting a cable from the last switch in a stack back to the first switch, the operator makes sure that a stack has the protection of redundant paths for control and data traffic, including support for Link Aggregation Group (LAGs) configured across multiple switches. This means that any single point of failure (a switch or a stack cable failure) does not affect the overall operation of the remaining stack elements.

Nonstop forwarding on the stack

The Nonstop Forwarding (NSF) feature allows the forwarding plane of stack units to continue to forward packets while the control and management planes restart as a result of a power failure, hardware failure, or software fault on the stack Master and allows the standby switch to quickly takeover as the Master.

Hot add/delete and firmware synchronization

Units can be added and removed to and from the stack without cycling the power. When adding a unit, the Stack Firmware Synchronization feature automatically synchronizes the firmware version with the version running on the stack Master. The synchronization operation may result in either an upgrade or a downgrade of firmware on the mismatched stack member. In addition, the running-config on the member is updated to match the Master switch. The startup-config on the standby and member switches is not updated to match the Master switch. The hardware configuration of every switch is updated to match the Master switch (unit number, slot configuration, stack member number, and so on).

Meta-data considerations

When creating a stack, the configuration information is meta-data that is part of the hardware configuration applied at boot time before the switch firmware is started (and before the startup configuration is read). The stack information shown in the startup and running configurations is simply

copies of the stack configuration for the user's knowledge. The actual stack information used by the switch *is not* that which is stored in the startup configuration.

A *stack member* configuration is always present on stacking capable switches, so there always is a line in the configuration that says *stack* and a second line that says *member* even if there are no devices stacked. Since these are stack-capable devices, an un-stacked device is still considered a stack of one. Here is an example configuration of a device that is *not* stacked.

```
console#show run

!Current Configuration:
!System Description "PowerConnect 8164F, 5.0.0.0, Linux 2.6.27.47
!System Software Version 5.0.0.0
!Cut-through mode is configured as disabled
!
configure
slot 1/0 5      ! PowerConnect 8164F
slot 1/1 8      ! Dell 10GBase-T Card
stack                               ←
member 1 4      ! PCT8164F          ←
exit
interface out-of-band
ip address 172.25.194.24 255.255.0.0 172.25.194.254
exit
interface vlan 1
exit
username "admin" password dec68e453164a2 privilege 15 encrypted
line telnet
enable authentication enableList
exit
snmp-server engineid local 800002a203001ec9ddad5b
exit
```

Notice there is only *one* member line in the configuration. If there were multiple members in the stack then there would be multiple member lines in the configuration, such as:

```
stack
member 1 1      ! PCT8164F          ←
member 2 1      ! PCT8164F          ←
member 3 1      ! PCT8132F          ←
```

Note: A single stack member configuration is always present on stack-capable switches even if they are not part of an actual stack. The single switch is considered a *stack of one*.

How a Master is selected

A Master is elected or re-elected based on the following considerations, in order:

1. The switch is currently the Master.
2. The switch has the higher MAC address.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

3. A unit is selected as standby by the administrator, and a fail over action is manually initiated or occurs due to a Master unit failure.

Note: The terms *Master* and *Manager/Management Unit* are often used interchangeably in regards to stacking.

In most cases, a switch that is added to an existing stack becomes a stack member, and not the Management Unit. When a switch is added to the stack, one of the following scenarios takes place regarding the management status of the new switch:

If the switch has the Management Unit function enabled but another Master unit is already active, then the switch changes its configured Management Unit value to disabled.

If the Management Unit function is unassigned and there is another Management Unit in the system, then the switch changes its configured Management Unit value to disabled.

If the Management Unit function is enabled or unassigned and there is no other Management Unit in the system, then the switch becomes Management Unit.

If the Management Unit function is disabled, the unit remains a non-Management Unit.

If the entire stack is powered OFF and ON again, the unit that was the Management Unit before the reboot remains the Management Unit after the stack resumes operation.

A Unit number for the switch can be manually set. To avoid unit-number conflicts, one of the following scenarios takes place when adding a new member to the stack:

If the switch has a unit number that is already in use, then the unit added to the stack changes its configured unit number to the lowest unassigned unit number.

If the switch added does not have an assigned unit number, then the switch sets its configured unit number to the lowest unassigned unit number.

If the unit number is configured and there are no other devices using the unit number, then the switch starts using the configured unit number.

If the switch detects that the maximum number of units already exist in the stack making it unable to assign a unit number, then the switch sets its unit number to unassigned and does not participate in the stack.

After the stack is created, the `show switch` command displays the roles of each switch.

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.3
2	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.3
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.3
4	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.3
5	Stack Mbr		PCT8164	PCT8164	OK	5.0.0.3
6	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.3

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

Note that in this example Switch 1 is the Master (Mgmt Sw) and Switch 2 is the Standby (Oper Stby) ready to take over as Master in the event the Master fails.

To find the same information from the Web UI go to System > Stack Management > Stack Summary.

The screenshot shows the Dell OpenManage Switch Administrator interface. The left sidebar contains a navigation menu with options like Home, System, General, Time Synchronization, Logs, IP Addressing, Diagnostics, Green Ethernet, Management Security, SNMP, File Management, Stack Management, and Unit Configuration. The main content area is titled 'Stack Summary' and shows a 'Detail' view. A table lists the stack members:

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
4	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
5	Stack Mbr		PCT8164	PCT8164	OK	5.0.0.4	Enable	No Action	None
6	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None

How to select a Master during initial stack setup

After creating a stack it is easy to go into the settings on the Master and select any of the members to take its place as Master. The former Master becomes a regular stack member automatically.

To select a particular physical unit to be Master during initial setup, simply boot it up *completely* before powering on any of the other switches. All subsequent members added to the stack will join as regular stack members.

When using two or more switches to initially create a stack, the Master is chosen based on the highest MAC address. To find the MAC address of a switch, type `show system` from a CLI prompt:

```
console#show system
System Description: Dell Ethernet Switch
System Up Time: 0 days, 00h:12m:53s
Burned In MAC Address: A4BA.DB69.330B ←
```

Or from the Web UI, go to the System > General > System Information page:

The screenshot displays the Dell OpenManage Switch Administrator web interface. The top navigation bar includes the Dell logo, the text "OPENMANAGE™ SWITCH ADMINISTRATOR", and links for "Support | About | Log Out". The left sidebar shows a navigation tree with "System Information" selected. The main content area is titled "System Information: Detail" and contains a table of system information.

System Information	
System Name	<input type="text"/> (0 to 255 characters)
System Contact	<input type="text"/> (0 to 255 characters)
System Location	<input type="text"/> (0 to 255 characters)
System Object ID	1.3.6.1.4.1.674.10895.3044
MAC Address	001E.C9DD.AD57
System Uptime	0 days, 0 hours, 25 mins 22 secs
Date	01/12/2004 (MM/DD/YY)
Time	04:35:45 (HH:MM:SS)

Stacking scenarios

The following sections present examples in a variety of areas concerning stacking the Dell PowerConnect 8100 switches and provides step-by-step guidance using the CLI and Web UI, with screen shots as a visual guide. Consult the table of contents above for a list of examples covered in this document.

Each scenario in this document assumes that all Dell PowerConnect devices are using the same firmware revision. It is also recommended that all devices are using the latest firmware version.

Note: Upgrade the firmware to the latest revision on the units before stacking them.

Unless mentioned otherwise, all scenarios below assume the switches are using the static ports that are hard-wired into the switches, and that no modules are installed providing additional ports. However, ports from an installed expansion module are supported and may be used for stacking. The following expansion modules are supported for stacking in the Dell PowerConnect series:

Figure 5. 10Gbase-T four-port expansion module for the Dell PowerConnect 81xx and 81xxF

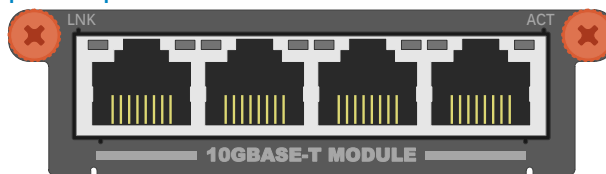


Figure 6. 40G QSFP+ two-port expansion module for the Dell PowerConnect 81xx and 81xxF

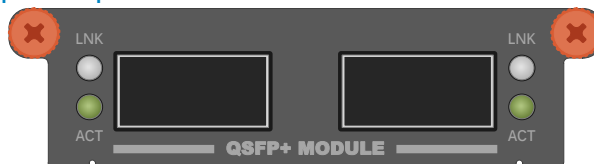
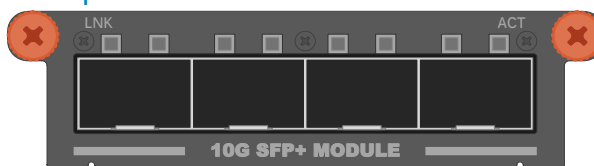


Figure 7. 10G SFP+ four-port expansion modules for the Dell PowerConnect 81xx and 81xxF



With an expansion module installed, the command `show switch stack-ports` shows the link status, link speed, and stack mode for each port in the module.

Creating a Stack

Examples below provide steps on how to create a stack. Graphics shown in this section only depict some of the possibilities of how to cable together members of a stack.

Note: While the cable pictures below come before the configuration steps, it is important not to cable the stack until instructed to do so.

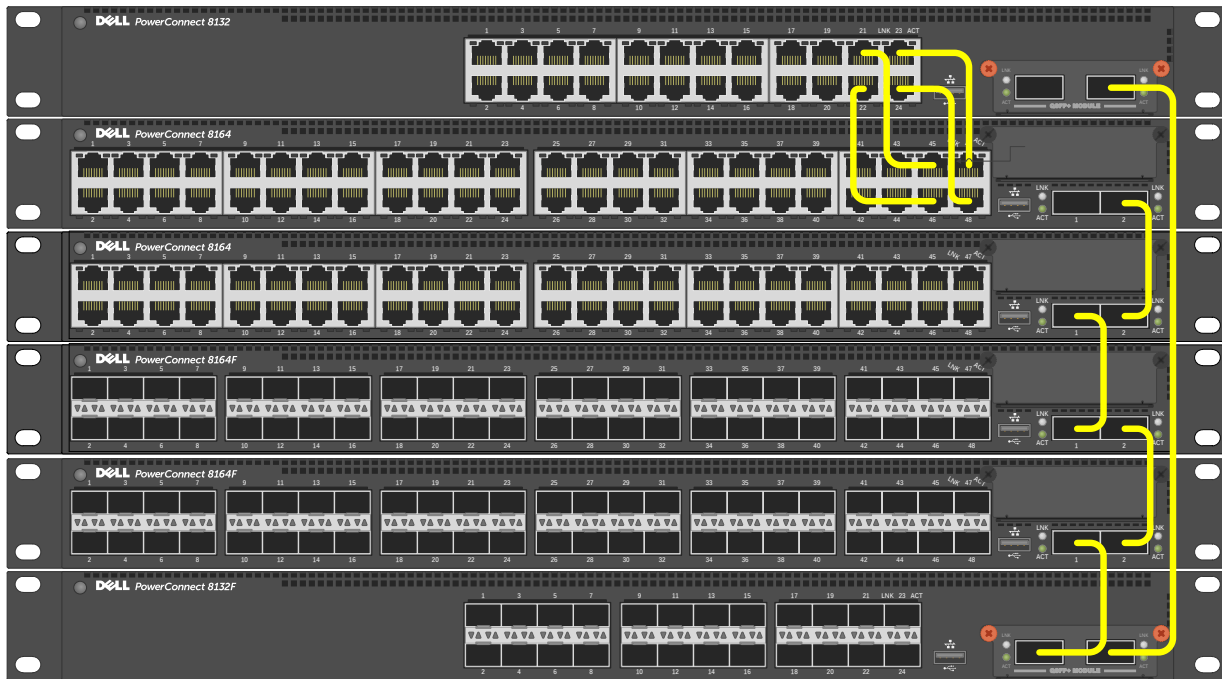
Cabling is one of the last steps and comes after configuring all switches used in the stack; however, it is necessary to know exactly each port that is going to be cabled to configure each switch correctly.

The Dell PowerConnect 8100 series switches can be stacked up to six high, supporting up to 336x10G ports when two 40G ports on each unit are configured as stacking ports. The stack can contain any combination of Dell PowerConnect 8100 and Dell PowerConnect 8100F switches.

The switches can be stacked using any Ethernet port on the front panel, which includes 40Gb QSFP+ ports, 10Gb SFP+ fiber ports, and 10Gb baseT copper ports. Each of these default to Ethernet mode and must be reconfigured as stacking ports in order to stack.

This scenario shows steps to create a stack. Figure 8 shows one example of connectivity between stack members.

Figure 8. Stacking Dell PowerConnect 8100 series switches using 40G and 10G stack links



Notice the top two switches are stacked together using four cables plugged into 10G ports. For each remaining switch in the stack, one cable from a 40G stacking port on a switch is connected to a 40G stacking port on the next switch. This process is repeated until all of the devices are connected. To complete the ring topology for the stack, one stacking port on the last switch is connected to a stacking port on the first switch.

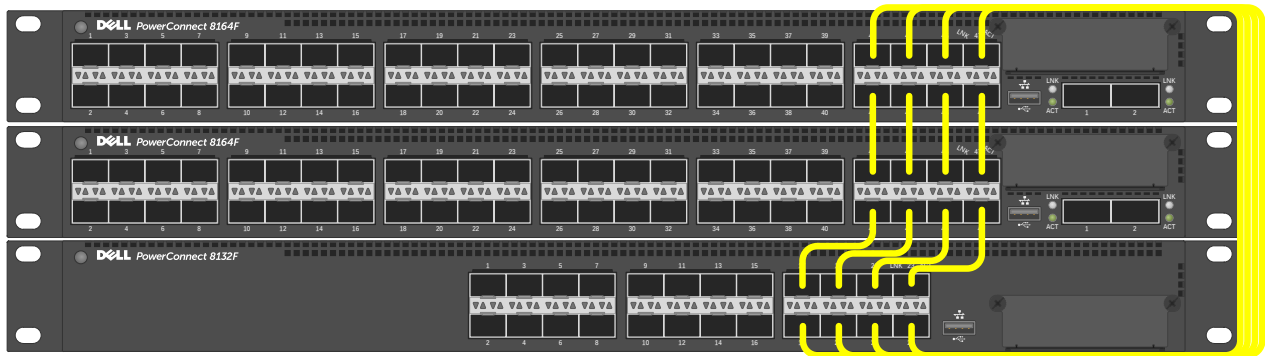
Things to consider when cabling a stack together:

- Only use interfaces with the same bandwidth to stack between members. It is not supported to mix 40G QSFP+ ports with 10G SFP+ or 10Gbase-T ports on a switch when stacking. It is okay however to use one interface type between two stack members, then a different interface type between two other stacking members as shown in Figure 8.
- A QSFP+ port is counted as one port when stacking. Therefore if stacking only two switches together, all QSFP+ ports (including those on an expansion module) can be used to stack between them when in 40G port mode.
- Up to eight ports may be used on any switch for stacking purposes.

Connecting additional cables in parallel increases the stacking bandwidth. Up to eight ports can be connected in parallel when only stacking two switches. When stacking three or more switches, up to 4 cables can be connected in parallel between members. It is recommended to have the same bandwidth between the stack members. It is also recommended to connect the stack in a ring topology for resiliency. Figure 9 shows an example of connecting four stack ports between each stacking peer.

Note: In a stack of three or more switches, Dell strongly recommends connecting the stack in a ring topology so that each switch is connected to two other switches.

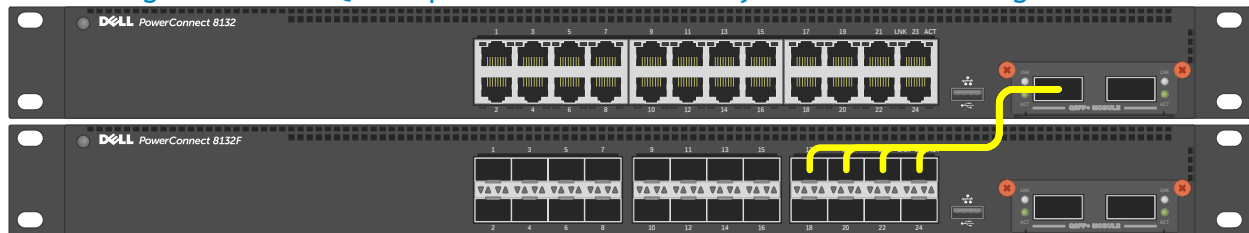
Figure 9. Stacking Dell PowerConnect 8100/8100F series switches using multiple stack links



QSFP+ quad-breakout cables

QSFP+ quad-breakout cables may also be used for stacking. This allows a 40G QSFP+ port to connect to four 10G SFP+ ports on the adjacent switch. When a breakout cable is used, the connections are considered to be four links taking up four ports.

Figure 10. QSFP+ quad-breakout cable may be used for stacking



To use a QSFP+ quad-breakout cable to stack two peers, the QSFP+ port must be set to port mode 4x10G and reloaded before setting it to stack mode (described in the next section). From the interface configuration CLI prompt, use the `hardware profile portmode 4x10g` command to set the port to this mode. The command is:

```
console(config-if-Fo5/0/1)#hardware profile portmode 4x10g
```

This command will not take effect until the switch is rebooted.

When the portmode changes on a port, so do the interface names. For example, a QSFP+ port may be named `Fo1/0/1` when in 40G mode but takes on a new identity as `Te1/1/1 through Te1/0/4` when changed to 10G mode. Therefore, if it is desired to use the QSFP+ quad-breakout cable, be sure to set the port mode to 4x10G and reload the switch *before* setting the ports to stack mode since configuration settings on one port mode does not translate to the other portmode.

Also, when in port mode 4x10G it is required that all four of the breakout ports be moved from Ethernet mode to Stack mode to use them for stacking.

Command-line interface method

Make sure all switches are at the same firmware version prior to configuring the stack, or use the Stack Firmware Synchronization (`boot auto-copy-fw`) feature to synchronize all firmware during the stack setup process to that of the Master. The `boot auto-copy-fw` command is explained below in this example.

Connect power to all switches to be stacked. Performing the command `show switch stack-ports` will provide information on the unit number for the switch, which is used in the stacking commands. It also shows Interfaces of the switch that may be used for stacking and whether they are in Ethernet or Stacking mode.

```
console#show switch stack-ports
```

Interface	Configured Stack Mode	Running Stack Mode	Link Status	Link Speed (Gb/s)
Te1/0/1	Ethernet	Ethernet	Link Down	Unknown
Te1/0/2	Ethernet	Ethernet	Link Down	Unknown
Te1/0/3	Ethernet	Ethernet	Link Down	Unknown
.
Te1/0/22	Ethernet	Ethernet	Link Down	Unknown
Te1/0/23	Ethernet	Ethernet	Link Down	Unknown
Te1/0/24	Ethernet	Ethernet	Link Down	Unknown
Fo1/1/1	Ethernet	Ethernet	Link Down	40
Fo1/1/2	Ethernet	Ethernet	Link Down	40
Te1/1/1	Ethernet	Ethernet	Detach	10
Te1/1/2	Ethernet	Ethernet	Detach	10
Te1/1/3	Ethernet	Ethernet	Detach	10
Te1/1/4	Ethernet	Ethernet	Detach	10
Te1/1/5	Ethernet	Ethernet	Detach	10
Te1/1/6	Ethernet	Ethernet	Detach	10
Te1/1/7	Ethernet	Ethernet	Detach	10
Te1/1/8	Ethernet	Ethernet	Detach	10

The example above shows a Dell PowerConnect 8132F with a QSFP+ two-port expansion module installed. The two 40G QSFP+ ports are represented by interfaces *F01/1/1* and *F01/1/2*. We will use these two interfaces for stacking in the example below.

Notice that Configured Stack Mode and the Running Stack Mode are currently both Ethernet. Perform the following commands to convert each desired port to Stack mode.

```
console#config
console(config)#stack
console(config-stack)#stack-port fortygigabitethernet 1/1/1 stack
console(config-stack)#stack-port fortygigabitethernet 1/1/2 stack
console(config-stack)#show switch stack-ports
```

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Interface	Configured Stack Mode	Running Stack Mode	Link Status	Link Speed (Gb/s)
-----	-----	-----	-----	-----
Te1/0/1	Ethernet	Ethernet	Link Down	Unknown
Te1/0/2	Ethernet	Ethernet	Link Down	Unknown
Te1/0/3	Ethernet	Ethernet	Link Down	Unknown
	.			
	.			
Te1/0/23	Ethernet	Ethernet	Link Down	Unknown
Te1/0/24	Ethernet	Ethernet	Link Down	Unknown
Fo1/1/1	Stack	Ethernet	Link Down	40
Fo1/1/2	Stack	Ethernet	Link Down	40

The Configured Stack Mode is now *Stack*, but the Running Stack Mode is still *Ethernet*. The Running Mode changes to Stack upon reloading the switch, as instructed below.

Save the configuration to the Startup-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

Configuration Saved!
```

Perform the same steps for the remaining switches. Do not forget to configure the stacking ports on the last and first switch to create a ring topology if desired. Once the switches have been configured, *remove power from all switches*.

While powered off, *bundle all of the switches together using the stack ports that were configured*. Select the switch to be the Master switch and power up that switch only allowing a few minutes to boot up completely. Verify the switch is up by logging into the CLI.

Once the Master is up, power up the next switch in line. Allow the second switch 30 seconds to boot up, then power up the third switch. Continue to power up each switch allowing 30 seconds between powering switches. This allows each adjacent switch to be active before the next one. Failure to wait may result in another switch becoming the Master. All subsequent switches will enter the stack as Member Units.

Stack Member units serial ports and management IP addresses are not accessible for managing those devices. Only the Master's management ports can be used to monitor and configure ports in the stack.

Validation

After the entire stack is created, it can be validated with the `show switch` command from the Master switch:

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

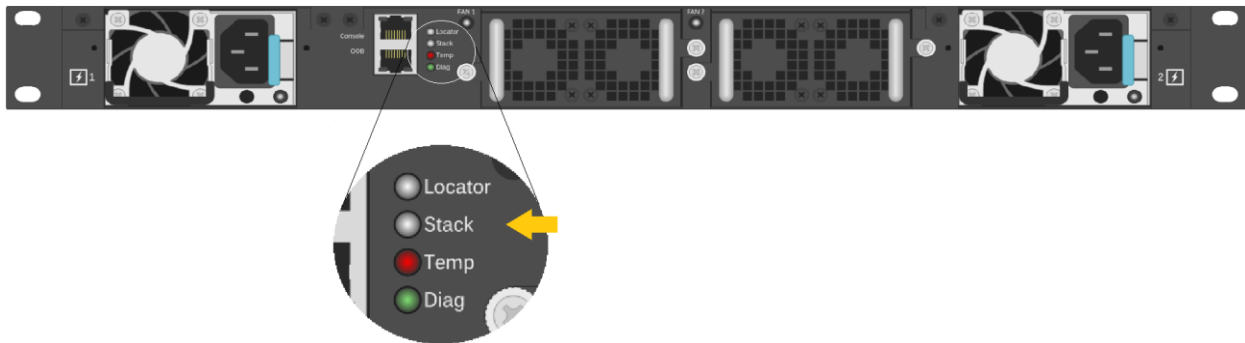
```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.3
2	Stack Mbr	Oper Stby	PCT8164	PCT8164	OK	5.0.0.3
3	Stack Mbr		PCT8132	PCT8132	OK	5.0.0.3

The `show switch stack-ports` command can also be used to see all of the ports that have been added to the stack as well as which ones are being used for stacking. To view only ports that are configured for stacking, use the command `show switch stack-ports | include Stack`.

Figure 11 shows the Stack LED that is located on the back panel of every Dell PowerConnect 8100 series switch.

Figure 11. Stacking LED for the Dell PowerConnect 8100/8100F series switch



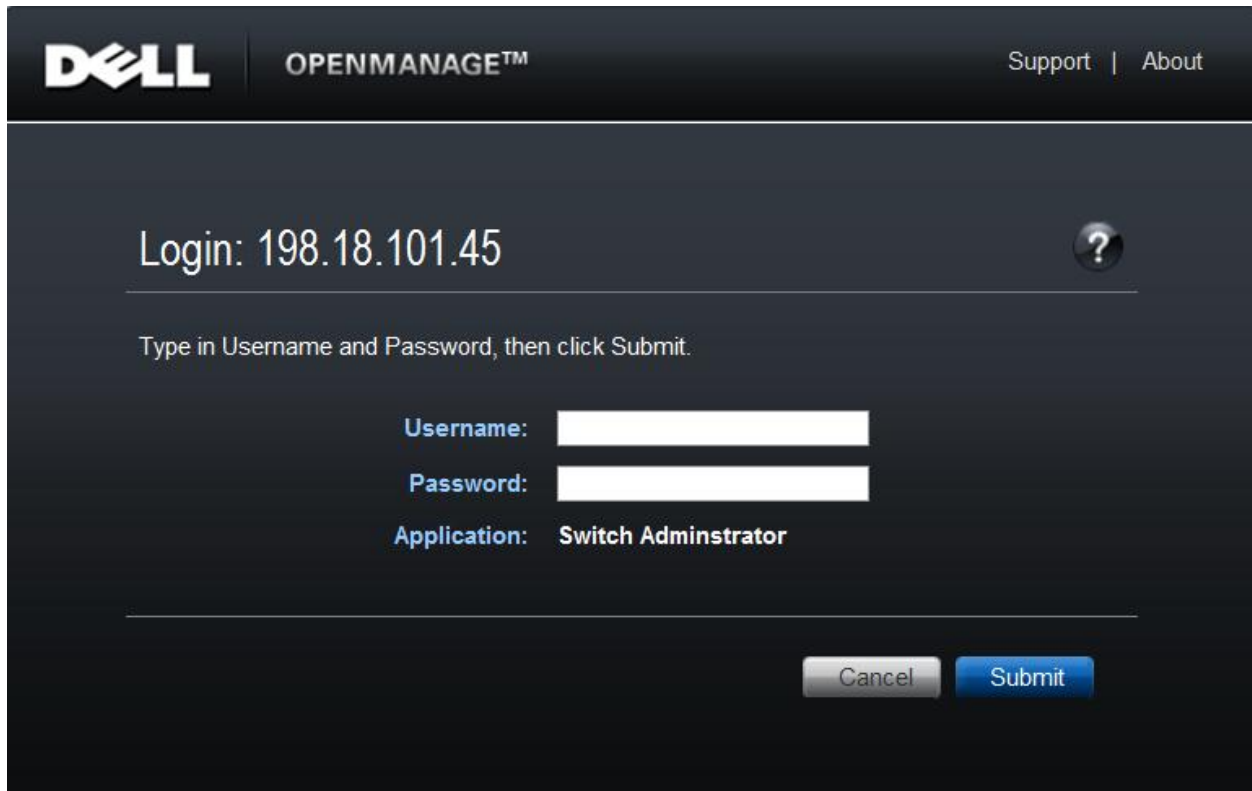
When the switch is the Master of a stack, the LED glows solid blue. If it is a stack member only, it glows a solid amber. When in stand-alone mode, the LED is off.

Note: Each stack members' role (including the Master and Standby) can be defined any time after the initial stack is created.

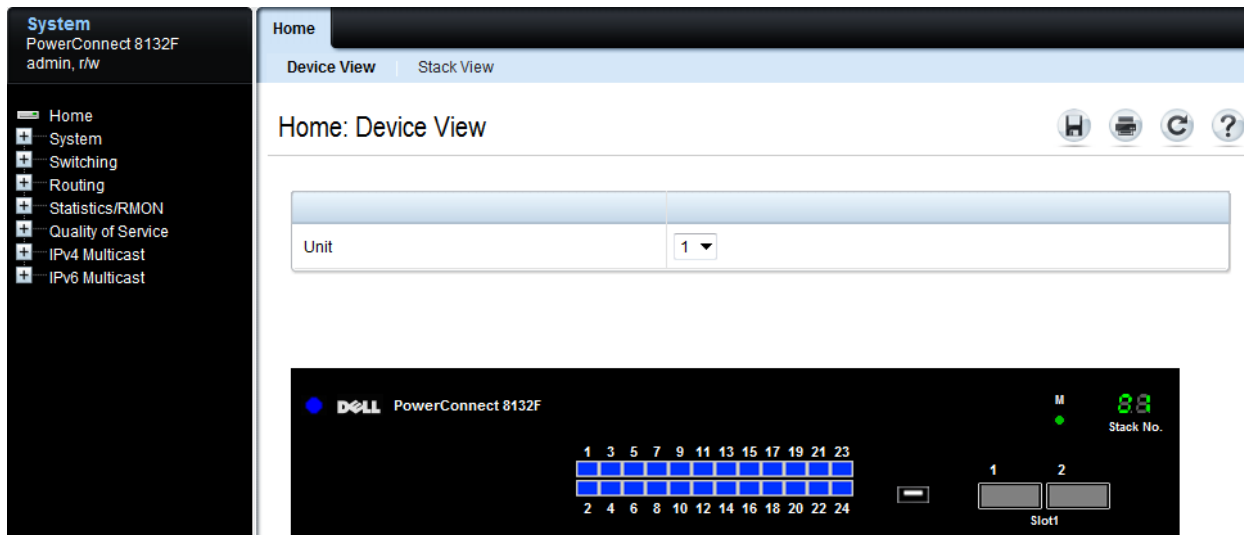
Web interface method

Make sure all switches are at the same firmware version prior to configuring the stack, or use the Stack Firmware Synchronization (`boot auto-copy-fw`) feature to synchronize all firmware during the stack setup process to that of the Master. The `boot auto-copy-fw` command is explained below in this example.

Select a switch to be Master of the stack and for managing all ports and member units with the stack. Login to the Web UI for this switch by entering the IP address of the switch into a supported Web browser. A username and password is required and should be setup beforehand on each switch. See the switch User Guide for more information regarding username, password, and Web access.



After login, the first screen to appear is the Home screen, which shows the current stacking member number. Before stacking, the single member has the Stack number of 1 (one).



The example above shows a Dell PowerConnect 8132F with a QSFP+ two-port expansion module installed in Slot 1. The two 40G QSFP+ ports are interfaces *F01/1/1* and *F01/1/2*. We will use these two interfaces for stacking in the example below.

Click System > Stack Management > Stack Port Summary to bring up the next page used to select the ports for stacking. For this example ports *F01/1/1* and *F01/1/2* are used.

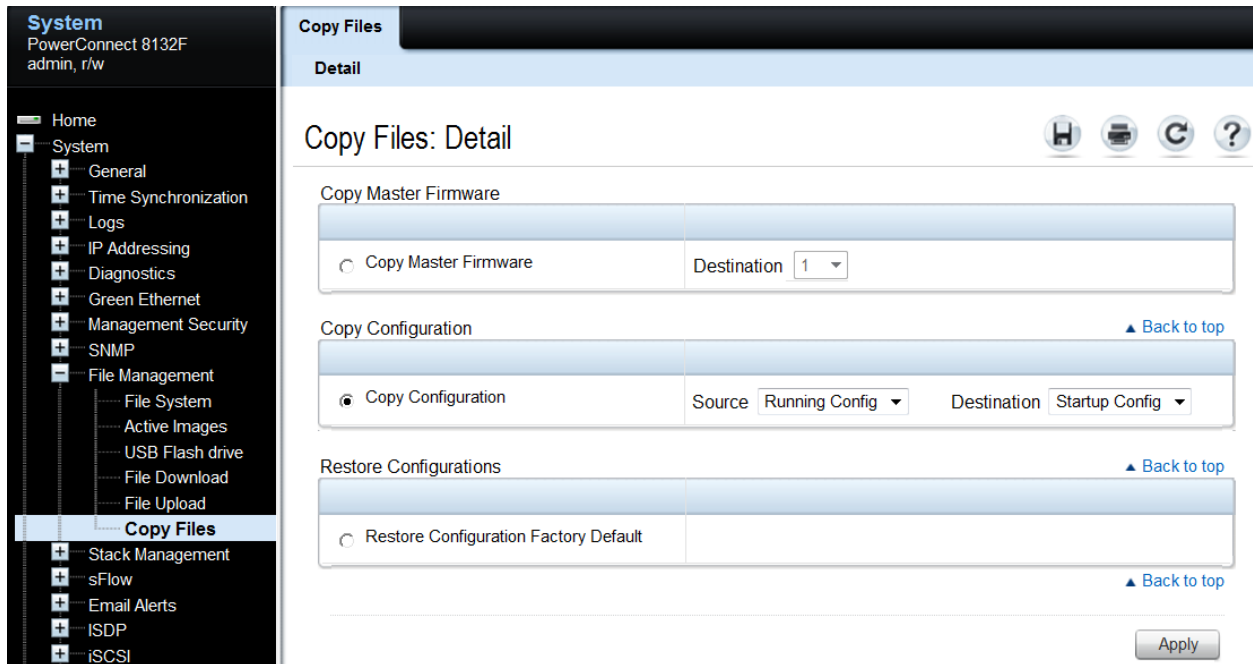
Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

Selecting the Edit check box activates the drop-down menu in the Configured Stack-mode column. Use this menu to change port modes from Ethernet to Stack.

Interface	Configured Stack-mode	Running Stack-mode	Link Status	Link Speed (Gb/s)	Edit
Te1/0/1	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/2	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/3	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/4	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/5	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/6	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/7	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/8	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/9	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/10	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/11	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/12	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/13	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/14	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/15	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/16	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/17	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/18	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/19	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/20	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/21	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/22	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/23	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/24	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Fo1/1/1	Stack	Stack	Link Down	40	<input checked="" type="checkbox"/>
Fo1/1/2	Stack	Stack	Link Down	40	<input checked="" type="checkbox"/>

Clicking Apply at the bottom of the screen will set the Configured Stack Mode to *Stack*, but the Running Stack Mode remains *Ethernet* until the switch is reloaded as instructed below.

Save the configuration to the Startup-Configuration on the System > File Management > Copy Files page.



Perform the same steps for the remaining switches. Don't forget to configure stacking ports on the last and first switch to create a ring topology if desired. Once every switch has been configured, remove power from all switches.

While powered off, cable all of the switches together using the stack ports that were configured. Select the switch that is desired to be the Master switch and power up that switch only, allowing a few minutes to boot up completely. Verify the switch is up by logging into the CLI.

Once the Master is up, power up the next switch in line. Allow the second switch 30 seconds to boot up, then power up the third switch. Continue to power up each switch allowing 30 seconds between powering switches. This allows each adjacent switch to be active before the next one. Failure to wait may result in another switch becoming the Master. All subsequent switches enter the stack as Member Units.

Stack Member units serial ports and management IP addresses are not accessible for managing those devices. Only the Master's management ports can be used to monitor and configure ports in the stack.

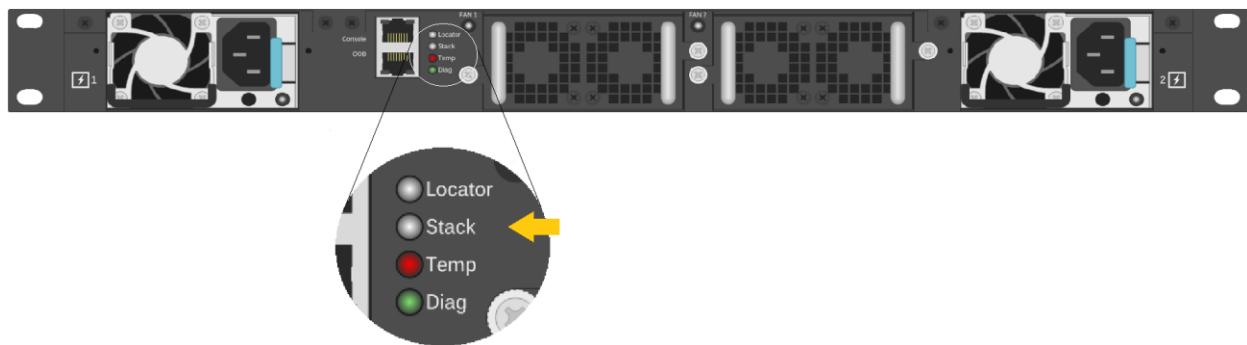
Validation

After the entire stack is created, it can be validated from the Master switch Web UI by going to System > Stack Management > Stack Summary.

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
4	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
5	Stack Mbr		PCT8164	PCT8164	OK	5.0.0.4	Enable	No Action	None
6	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None

The following figure shows shows the Stack LED that is located on the back panel of every Dell PowerConnect 8100 series switch.

Figure 12. Stacking LED for the Dell PowerConnect 8100/8100F series switch

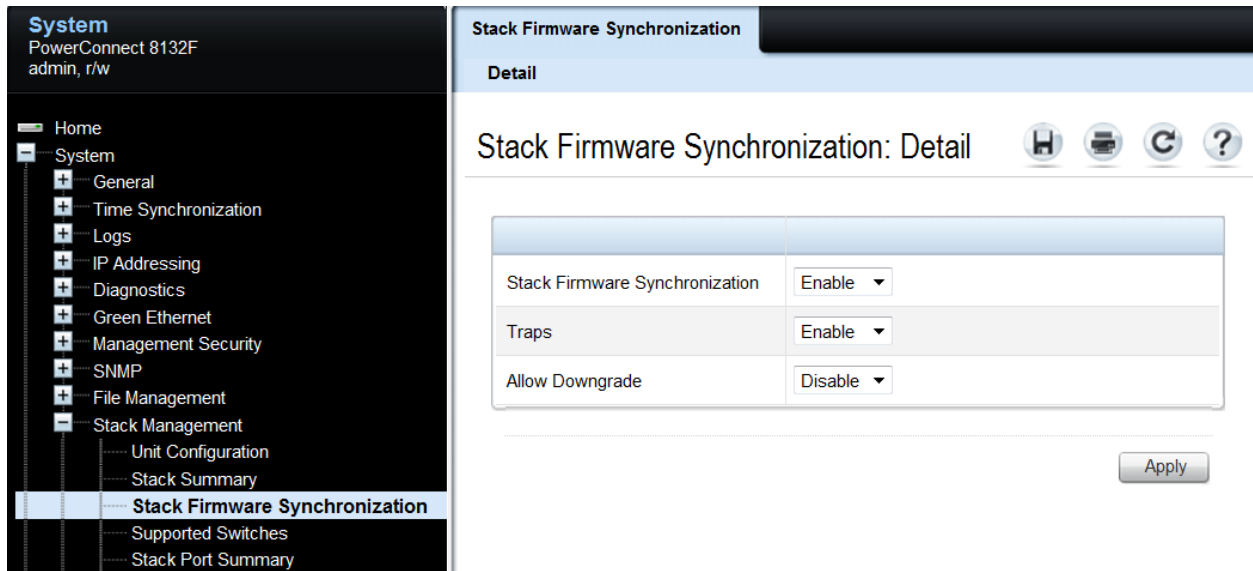


When the switch is the Master of a stack, the LED glows solid blue. If it is a stack member only, it glows solid amber. When in stand-alone mode, the LED is off.

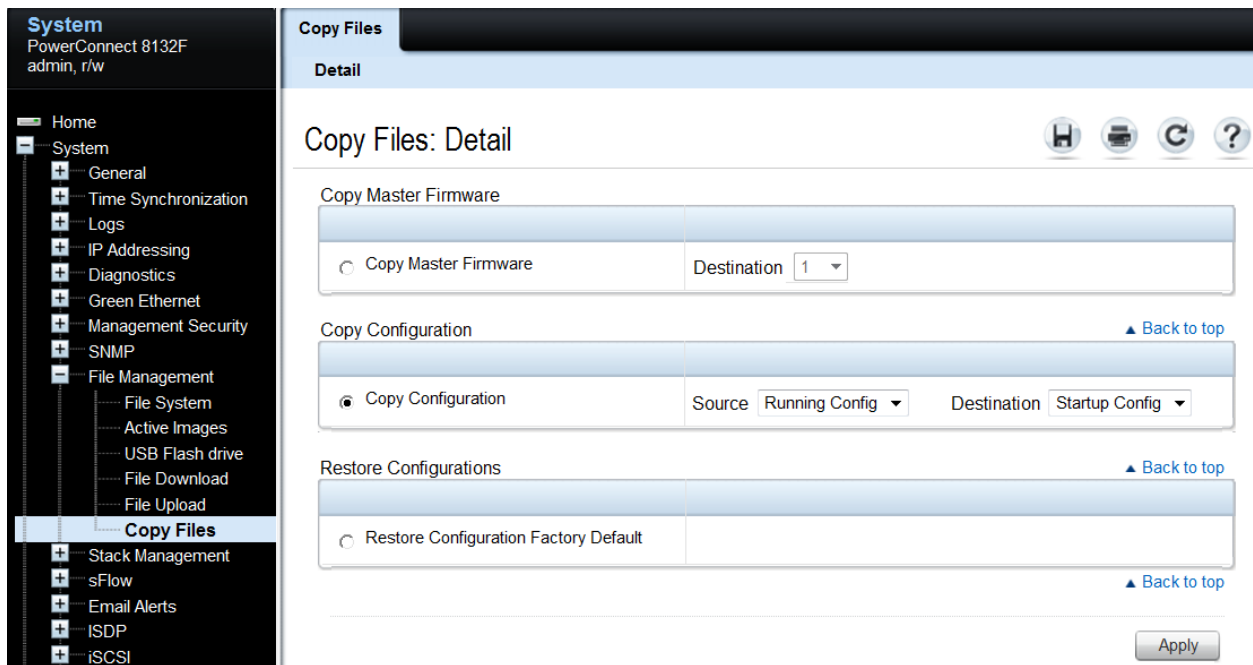
Note: Each stack members' role (including the Master and Standby) can be defined at any time after the initial stack is created.

Automatic firmware updates for new members joining the stack

For member units to work properly within a stack, they need to have the same firmware as the Master. Perform a manual update of the firmware on a new member to synchronize the firmware prior to cabling it into the stack. Or, another way to accomplish this is to configure the Master switch to use *Stack Firmware Synchronization*, which automatically upgrades firmware on new members as they join the stack. In the event the new stack member unit being added has a newer firmware version, a downgrade is also allowed. To prevent the downgrade of the new stack member unit's firmware, the Master needs to be configured with the *Allow-Downgrade* option. This allows all new member units to synchronize with the Master *only* if the firmware revision of the new members is older than that of the Master. Use the System > Stack Management > Stack Firmware Synchronization page to view and set these features.



Save the configuration to the Startup-Configuration on the System > File Management > Copy Files page.



Adding new member units to a stack

It is important that all stack member units run the same version of firmware. Make sure to either upgrade firmware on the new units to be added to match the firmware on the Master, or use the automatic firmware update method found in section [Automatic firmware updates for new members joining the stack](#).

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

The example below shows how to add a stack member to an existing stack. Before cabling a new switch into the stack, perform the commands below to setup the switch ports to be stacked. Once configured, continue to follow the instructions for cabling to complete the task. If multiple new members are to be added, complete the installation of one switch before going to the next. Complete these steps again for each switch to be added.

This example allows adding new members without preconfiguring the existing stack, though the new members themselves will need to be configured. To preconfigure a stack before connecting the new stack member, consult the *User Guide* under *Preconfiguring a Stack Member*.

Command-line interface method

Run the commands below on the switch to be added using either the console port or a telnet session.

```
console#show switch stack-ports
```

Interface	Configured Stack Mode	Running Stack Mode	Link Status	Link Speed (Gb/s)
-----	-----	-----	-----	-----
Te1/0/1	Ethernet	Ethernet	Link Down	Unknown
Te1/0/2	Ethernet	Ethernet	Link Down	Unknown
Te1/0/3	Ethernet	Ethernet	Link Down	Unknown
	.			
	.			
	.			
Te1/0/22	Ethernet	Ethernet	Link Down	Unknown
Te1/0/23	Ethernet	Ethernet	Link Down	Unknown
Te1/0/24	Ethernet	Ethernet	Link Down	Unknown
Fo1/1/1	Ethernet	Ethernet	Link Down	40
Fo1/1/2	Ethernet	Ethernet	Link Down	40
Te1/1/1	Ethernet	Ethernet	Detach	10
Te1/1/2	Ethernet	Ethernet	Detach	10
Te1/1/3	Ethernet	Ethernet	Detach	10
Te1/1/4	Ethernet	Ethernet	Detach	10
Te1/1/5	Ethernet	Ethernet	Detach	10
Te1/1/6	Ethernet	Ethernet	Detach	10
Te1/1/7	Ethernet	Ethernet	Detach	10
Te1/1/8	Ethernet	Ethernet	Detach	10

Notice the two 40G QSFP+ ports represented by interfaces *F01/1/1* and *F01/1/2*. These two interfaces will be used for stacking in the example below, though any of the interfaces listed may be used. Perform the following commands to convert each desired port to Stack mode.

```
console#config  
  
console(config)#stack  
  
console(config-stack)#stack-port fortygigabitethernet 1/1/1 stack  
  
console(config-stack)#stack-port fortygigabitethernet 1/1/2 stack  
  
console(config-stack)#show switch stack-ports | include Stack
```

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

	Stack	Stack	Link	Link
Fo1/1/1	Stack	Ethernet	Link Down	40
Fo1/1/2	Stack	Ethernet	Link Down	40

The Configured Stack Mode is now *Stack*, but the Running Stack Mode is still *Ethernet*. The Running Mode changes to Stack upon reloading the switch, as instructed below.

Save the configuration to the Startup-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
```

```
Configuration Saved!
```

Remove power from the switch.

Note: Hot insertion of units into the stack is not supported. Do not connect a new member to the stack while the new unit is powered up.

Follow the steps in the following section to properly add the stacking cables and complete the process.

Ring vs. daisy-chain topology

If the original stack is cabled in a *ring topology* where a stacking port on the last switch is connected to a stacking port on the first switch, the entire stack continues to work correctly through the process of adding a new switch regardless of where the new switch is cabled within the stack. This is due to the built-in resiliency of the ring topology that allows all switches to remain in communication with each other in the event a single link or switch is lost or removed.

When adding a switch to a *daisy-chain topology* stack, add it to one end of the stack and not in the middle. Adding to the middle requires breaking the daisy-chained stack which will cause the stack to split, creating a new Master on the group of switches that lost contact with the original Master. This would result in two stacks. Adding a new switch to the either end of the daisy-chain allows all other members to stay in constant communication and in turn allow the stack to stay intact during the process.

On a *daisy-chain* stack:

1. Configure the existing stack with new stack ports to be used to connect to the new switch.
2. Cable the new switch into the existing stack.
3. Power up the new switch. The switch will be added to the stack.

On a *ring topology* stack:

1. Plug new cables into *half* of the stack ports configured on the new switch to be added.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

2. Unplug the stacking cables from any existing member going to another existing member in the stack. Only unplug the cables from one end, leaving them plugged into the other member.

Note: Only half of the stack cables in this member will be unplugged. The cables going in the other direction to a third existing member will not be removed.

3. Plug the other end of the new cables of the switch being added into the stack ports that were unplugged in step 2.
4. Plug the remaining cable ends (removed in step 2) into the remaining stack ports configured on the new switch unit.
5. Power up the new switch. The switch will be added to the stack.

Allow a few minutes for the new switch to boot up completely.

Validation

After the entire stack is created, it can be validated with the `show switch` command from the Master switch:

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.3
2	Stack Mbr	Oper Stby	PCT8164	PCT8164	OK	5.0.0.3
3	Stack Mbr		PCT8132	PCT8132	OK	5.0.0.3
4	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.3

The example above shows a new stack member (PCT8132F) was added. The `show switch stack-ports` command can also be used to see all of the ports that have been added to the stack as well as which ones are being used for stacking.

If a switch (SW) number is configured prior to adding it to the stack and there are no other devices using that number, then the switch continues to use the same number. Otherwise, the switch sets its number to the lowest unassigned number upon joining the stack.

Note: Once added to a stack, a switch's out-of-band IP address and console port are no longer accessible. Use the IP address and console port of the Master unit for management access, since the stack now acts as a single large switch.

Repeat the above steps to add more new members to the stack.

Web interface method

The example below shows how to add a stack member to an existing stack using the Web user interface. Before cabling an additional member to a stack, perform the steps below to setup the switch to join the stack. Once configured, continue to follow the instructions for cabling to complete the task. This works best when adding one stack member at a time. If multiple new members are to be added, follow these directions and complete the install of one before going to the next. Complete these steps again for each remaining switch to be added.

Note: The example given below allows the new member to be added without preconfiguring the existing stack, though the new member itself needs to be configured. To preconfigure a stack before connecting the new stack member, consult the *User Guide* under *Preconfiguring a Stack Member*.

On the new member switch to be added to the stack, select System > Stack Management > Stack Port Summary from the main navigation menu. In this example, two 40G QSFP+ interfaces F01/0/1 and F01/0/2 will be used for stacking, though any of the interfaces shown may be used.

The screenshot shows the 'Stack Port Summary: Detail' page in the Dell PowerConnect web interface. The left sidebar shows the navigation menu with 'Stack Port Summary' selected. The main content area displays a table of interfaces with the following data:

Interface	Configured Stack-mode	Running Stack-mode	Link Status	Link Speed (Gb/s)	Edit
Fo1/0/1	Stack	Stack	Link Down	40	<input checked="" type="checkbox"/>
Fo1/0/2	Stack	Stack	Link Down	40	<input checked="" type="checkbox"/>
Fo1/1/1	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Fo1/1/2	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/1	Ethernet	Ethernet	Link Down	10	<input type="checkbox"/>
Te1/0/10	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/11	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>
Te1/0/12	Ethernet	Ethernet	Link Down	Unknown	<input type="checkbox"/>

In the *Edit* column, select the check box to allow editing on the ports to be used for stacking. Then use the drop-down menu in the *Configured Stack-mode* column to put each port in stack mode. The Configured Stack Mode is now *Stack*, but the Running Stack-mode does not show *Stack* until the switch is reloaded, as instructed below.

Save the configuration to the Startup-Configuration using the System > File Management > Copy Files page.

The screenshot shows the Dell PowerConnect 8132F web interface. The left sidebar contains a navigation tree with the following items: Home, System (General, Time Synchronization, Logs, IP Addressing, Diagnostics, Green Ethernet, Management Security, SNMP, File Management), Copy Files (File System, Active Images, USB Flash drive, File Download, File Upload), Stack Management, sFlow, Email Alerts, ISDP, and iSCSI. The 'Copy Files' section is expanded, and the 'Copy Files: Detail' page is displayed. This page has three main sections: 'Copy Master Firmware' with a radio button for 'Copy Master Firmware' and a 'Destination' dropdown set to '1'; 'Copy Configuration' with a radio button for 'Copy Configuration', a 'Source' dropdown set to 'Running Config', and a 'Destination' dropdown set to 'Startup Config'; and 'Restore Configurations' with a radio button for 'Restore Configuration Factory Default'. Each section has a 'Back to top' link. An 'Apply' button is located at the bottom right of the page.

After saving the configuration, remove power from the switch.

Note: Hot insertion of units into the stack is not supported. Do not connect a new member to the stack while the new unit is powered up.

Follow the steps in the following section to properly add the stacking cables and complete the process.

Ring vs. daisy-chain topology

If the original stack is cabled in a *ring topology*, where a stacking port on the last switch is connected to a stacking port on the first switch, the entire stack continues to work correctly through the process of adding a new switch regardless of where the new switch is cabled within the stack. This is due to the built-in resiliency of the ring topology that allows all switches to remain in communication with each other in the event a single link or switch is lost or removed.

When adding a switch to a *daisy-chain topology* stack, add it to one end of the stack and not in the middle. Adding to the middle requires breaking the daisy-chained stack, which causes the stack to split, creating a new Master on the group of switches that lost contact with the original Master. This would result in two stacks. Adding a new switch to the either end of the daisy-chain allows all other members to stay in constant communication and in turn allow the stack to stay intact during the process.

On a *daisy-chain* stack:

1. Configure the existing stack with new stack ports to be used to connect to the new switch.
2. Cable the new switch into the existing stack.
3. Power up the new switch. The switch will be added to the stack.

On a *ring topology* stack:

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1. Plug new cables into *half* of the stack ports configured on the new switch to be added.
2. Unplug the stacking cables from any existing member going to another existing member in the stack. Only unplug the cables from one end, leaving them plugged into the other member.

Note: Only half of the stack cables in this member will be unplugged. The cables going in the other direction to a third existing member will not be removed.

3. Plug the other end of the new cables of the switch being added into the stack ports that were unplugged in step 2.
4. Plug the remaining cable ends (removed in step 2) into the remaining stack ports configured on the new switch unit.
5. Power up the new switch. The switch will be added to the stack.

Allow a few minutes for the new switch to boot up completely.

Validation

After the entire stack is created, validate it with the `show switch` command from the Master switch:

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Stack Mbr	Oper Stby	PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Mgmt Sw		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
4	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None

The example above shows a new stack member (Unit 4) was added.

If a switch (SW) number is configured prior to adding it to the stack and there are no other devices using that number, then the switch continues to use the same number. Otherwise, the switch sets its number to the lowest unassigned number upon joining the stack.

Note: Once added to a stack, a switch's out-of-band IP address and console port are no longer accessible to the user. Use the IP address and console port of the Master unit for management access, since the stack now acts as a single large switch.

Repeat the above steps to add more new members to the stack.

Updating firmware on a stack

Note: Make sure to check the Release Notes and any special instructions that may have come with new firmware updates. It is important to follow instructions found in those documents if they deviate from this white paper.

Steps for upgrading the firmware on a stack of switches are similar to upgrading the firmware on a single switch. Whether downloading a new image to the Master by using the System > File Management > File Download page in the Web UI or the `copy` command in the CLI, the downloaded image is distributed to all member units of the stack. The instructions below guide the user through these steps.

Command-line interface method

To find the firmware versions the stack members are using, enter the following.

```
console#show version

Image Descriptions

  active :
  backup :

Images currently available on Flash

unit  active          backup          current-active  next-active
-----
1     5.0.0.1            4.2.0.0        5.0.0.1        5.0.0.1
2     5.0.0.1            4.2.0.0        5.0.0.1        5.0.0.1
3     5.0.0.1            4.2.0.0        5.0.0.1        5.0.0.1
4     5.0.0.1            4.2.0.0        5.0.0.1        5.0.0.1
```

Each member of the stack is updated with the latest firmware simply by updating the Master switch. The commands below demonstrate how to copy the firmware file down to the Master using a TFTP server. The stack needs access to the TFTP server on the network and the firmware file needs to be present in the download folder of the TFTP server. Perform the following command from the CLI interface. Press “y” when prompted.

```
console#copy tftp://10.10.1.10/PC8100v5.0.0.3.stk backup

Transfer Mode..... TFTP
Server IP Address..... 10.10.1.10
Source File Path..... ./
Source Filename..... PC8100v5.0.0.3.stk
Data Type..... Code
Destination Filename..... backup

Management access will be blocked for the duration of the transfer
Are you sure you want to start? (y/n) y

TFTP code transfer starting
12487236 bytes transferred...
File contents are valid. Copying file to flash...
```

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

Attempting to send the STK file to other units in the stack..

File transfer operation completed successfully.

Note: This procedure may take a few minutes longer than updating a single, non-stacked switch.

Perform another `show version` command to see the new firmware has been downloaded to all members of the stack. Notice the firmware was only copied into the *backup* image for each member.

```
console#show version
```

```
Image Descriptions
```

```
active :  
backup :
```

```
Images currently available on Flash
```

unit	active	backup	current-active	next-active
1	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.1
2	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.1
3	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.1
4	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.1

The *backup* column now shows the same values as the *active* column. The next step is to activate the image that contains the new firmware by using the `boot system backup` command.

```
console#boot system backup  
Activating image backup ..
```

```
console#show version
```

```
Image Descriptions
```

```
active :  
backup :
```

```
Images currently available on Flash
```

unit	active	backup	current-active	next-active
1	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.3
2	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.3
3	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.3
4	5.0.0.1	5.0.0.3	5.0.0.1	5.0.0.3

Notice the next-active column now shows the same version as the backup column. Next, type the `reload` command to complete the update. All switches in the stack reloads.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

```
console#reload

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

Connection to host lost.
```

The “*Connection to host lost*” message appears only if performing the reload from a telnet session. It will not appear if performing the command from a console session.

Updating and rebooting the stack takes a few minutes longer than a single switch. After reload, the firmware upgrade is complete. To validate, login to the stack Master and perform a `show version` command. For the example given the following is displayed.

```
console#show version

Image Descriptions

  active :
  backup :

Images currently available on Flash

unit  active          backup          current-active  next-active
-----
1     5.0.0.3            5.0.0.1        5.0.0.3        5.0.0.3
2     5.0.0.3            5.0.0.1        5.0.0.3        5.0.0.3
3     5.0.0.3            5.0.0.1        5.0.0.3        5.0.0.3
4     5.0.0.3            5.0.0.1        5.0.0.3        5.0.0.3
```

Notice as the backup becomes active, the active becomes the backup.

Web interface method

Find the firmware versions the stack members are using.

Select System > File Management > Active Images.

Look in the Current-Active column to find which images are enabled. In this example all three switches are currently using *image2*.

Note: It is acceptable if some units are using *image1* and others are using *image2*.

Since *image2* is active, look in the *Image 2 Version* column to see what version each stack member is at. These firmware versions being used should be the same across all stack member units.

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To find the firmware versions the stack members are using, go to System > File Management > Active Images.

The screenshot shows the Dell PowerConnect 8132F web interface. The left sidebar contains a navigation menu with the following items: Home, System, General, Time Synchronization, Logs, IP Addressing, Diagnostics, Green Ethernet, Management Security, SNMP, File Management, File System, Active Images (highlighted), USB Flash drive, File Download, File Upload, Copy Files, Stack Management, and sFlow. The main content area is titled 'Active Images: Detail' and contains a table with the following data:

Unit No.	Active Image Version	Backup Image Version	Current Active Image Version	Next Active Image
1	5.0.0.3	5.0.0.0	5.0.0.3	active
2	5.0.0.3	5.0.0.0	5.0.0.3	active
3	5.0.0.3	5.0.0.0	5.0.0.3	active
4	5.0.0.3	5.0.0.0	5.0.0.3	active
5	5.0.0.3	5.0.0.0	5.0.0.3	active

An 'Apply' button is located at the bottom right of the table.

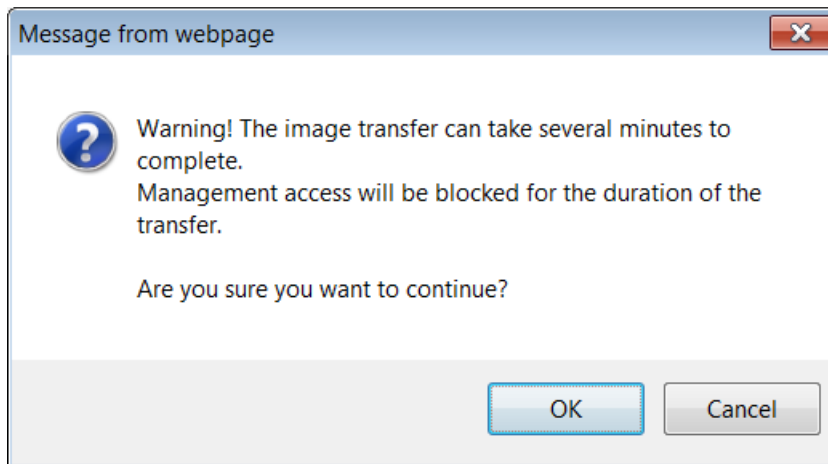
Each member of the stack will be updated with the latest firmware simply by updating the Master switch. The screenshot below demonstrate how to copy the firmware to the Master using a TFTP server. The stack needs access to a TFTP server on the network and the firmware file needs to be present in the download folder of the TFTP server.

From the System > File Management > File Download page, select the appropriate settings. The most common settings are shown here.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

The screenshot shows the Dell PowerConnect 8132F web interface. On the left is a navigation tree with 'File Download' selected. The main content area is titled 'File Download: Detail'. It contains two sections: 'File Type' and 'Download'. The 'File Type' section has a dropdown menu set to 'Firmware' and a 'Transfer Mode' dropdown set to 'TFTP'. The 'Download' section has a 'Server Address' field with '10.10.10.100', a 'Source File Name' field with 'PC8100v5.0.0.4.stk', a 'Transfer File Path' field, and an 'Image to download.' dropdown set to 'backup'. There are 'Back to top' links and an 'Apply' button at the bottom right.

Click Apply. A warning will appear.



Click OK.

Note: Be patient as this procedure may take several minutes longer than updating a single, non-stacked switch.

The following screen appears for several minutes while the firmware is being downloaded to the Master and distributed to all members of the stack.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

System
PowerConnect 8132F
admin, r/w

Home
System
General
Time Synchronization
Logs
IP Addressing
Diagnostics
Green Ethernet
Management Security
SNMP
File Management
File System
Active Images
USB Flash drive
File Download
File Upload
Copy Files
Stack Management
sFlow
Email Alerts
ISDP
iSCSI
Captive Portal

Transfer Progress
Detail

Transfer Progress: Detail

Transfer Progress

Transfer Status: Download Completed. 16288476 bytes downloaded. Image is being distributed to all units. Please wait....

Transfer Mode

Transfer Mode

Server IP Address

File Path

File Name: PC8100v5.0.0.4.stk

Local Filename: backup

Data Type: Code

Loading

Back to top

Once the file has been distributed to the entire stack, the following dialog box appears.

POWERCONNECT 8132F | Informational

i File Transfer operation is complete. Please check Transfer Status for details.

Close

Click Close.

Go back to the *Active Images* screen to confirm that the new firmware was downloaded to all members of the stack. Notice the firmware was only copied into the *backup* image for each member.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

System
PowerConnect 8132F
admin, r/w

Active Images
Detail

Active Images: Detail

Unit No.	Active Image Version	Backup Image Version	Current Active Image Version	Next Active Image
1	5.0.0.3	5.0.0.4	5.0.0.3	active
2	5.0.0.3	5.0.0.4	5.0.0.3	active
3	5.0.0.3	5.0.0.4	5.0.0.3	active
4	5.0.0.3	5.0.0.4	5.0.0.3	active
5	5.0.0.3	5.0.0.4	5.0.0.3	active

Apply

The next step is to activate the image that contains the new firmware using the drop-down menus in the Next Active Image column. In this example the *backup* image is selected for each unit.

System
PowerConnect 8132F
admin, r/w

Active Images
Detail

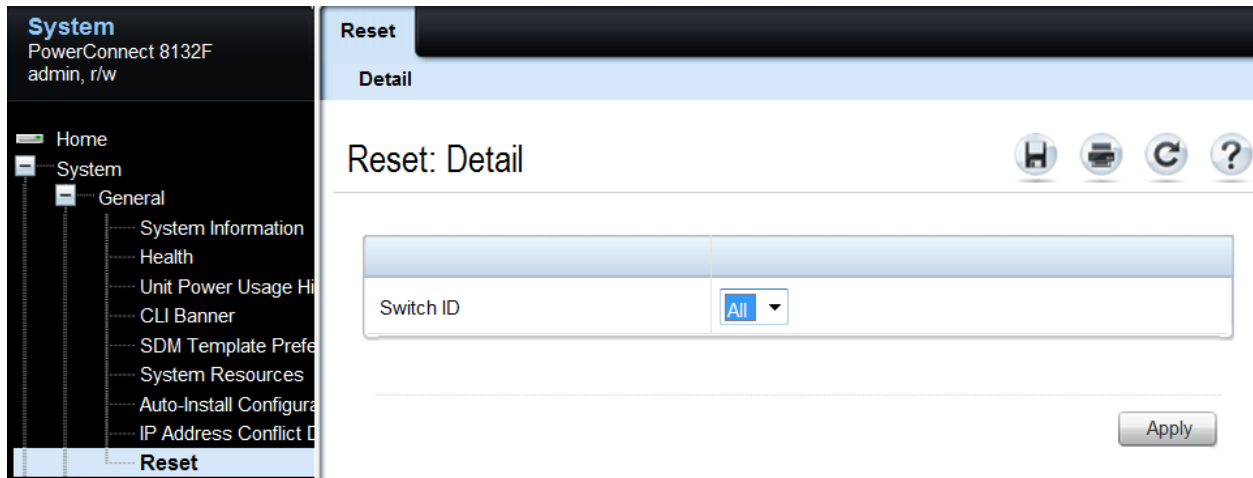
Active Images: Detail

Unit No.	Active Image Version	Backup Image Version	Current Active Image Version	Next Active Image
1	5.0.0.3	5.0.0.4	5.0.0.3	backup
2	5.0.0.3	5.0.0.4	5.0.0.3	backup
3	5.0.0.3	5.0.0.4	5.0.0.3	backup
4	5.0.0.3	5.0.0.4	5.0.0.3	backup
5	5.0.0.3	5.0.0.4	5.0.0.3	backup

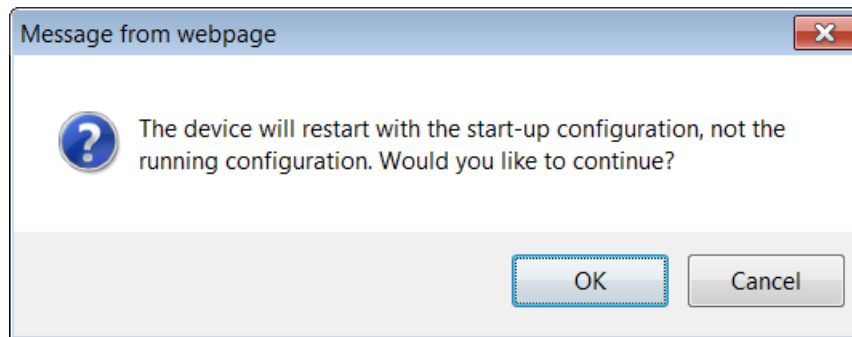
Apply

After selecting backup for each unit, click Apply.

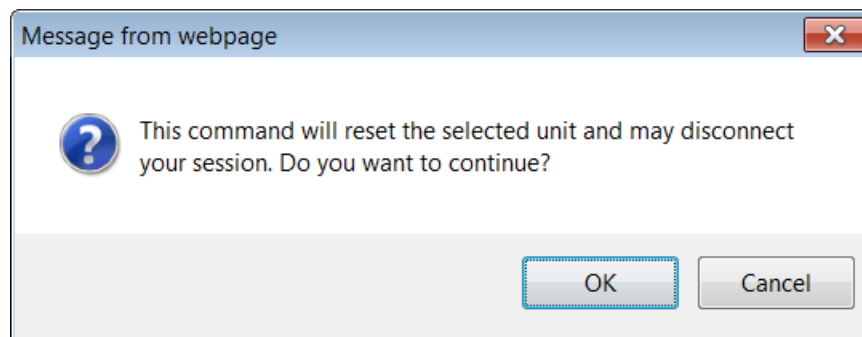
Go to the System > General > Reset page to reload the switch.



Click Apply to reload all switches in the stack. If the following screen appears, click OK.

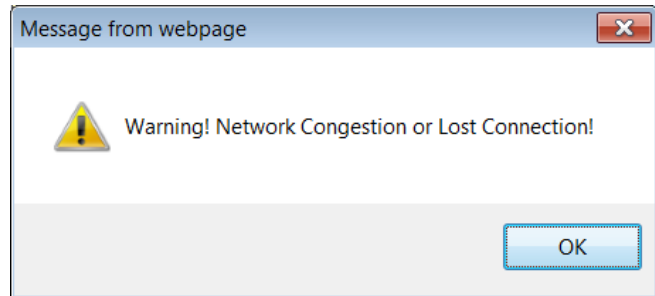
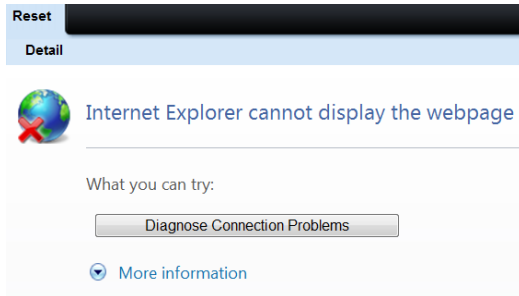


Click OK again if this screen appears.



If either of the following screens appear, they are simply notifying the user that the network has been lost. This is only temporarily while the stack reloads.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F



Click OK if prompted with the above screen. Rebooting the stack may take a few minutes longer than a single switch. After reload, the firmware upgrade is complete. To validate each switch, login again to the Web UI of the stack Master, and then go to System > File Management > Active Images.

Unit No.	Active Image Version	Backup Image Version	Current Active Image Version	Next Active Image
1	5.0.0.4	5.0.0.3	5.0.0.4	active
2	5.0.0.4	5.0.0.3	5.0.0.4	active
3	5.0.0.4	5.0.0.3	5.0.0.4	active
4	5.0.0.4	5.0.0.3	5.0.0.4	active
5	5.0.0.4	5.0.0.3	5.0.0.4	active

Notice that as the backup versions become active, the previous active versions now become the backup. This allows the administrator to toggle back to the previous image if needed for troubleshooting. Going back to the previous version is rarely ever used and must be done with extreme caution if the newer firmware has been running a long time with several configuration changes since the initial upgrade. Newer firmware can have dozens of valuable bug fixes that will not be there on the older firmware.

Removing member units

This section provides guidance on how to remove member units from a stack while minimizing traffic flow interruptions within the stack. Removing any member of a *ring topology* stack does not require a reload of any member unit in the stack.

If a unit in the stack fails, the Master unit removes the failed unit from the stack and no changes or configuration are applied to the other stack members; however, the dynamic protocols will try to re-converge as the topology could change because of the failed unit. When there are no connected ports on the failed unit, the stack will be intact without changes. The example below demonstrates how to manually remove a single member while keeping the stack intact.

Command-line interface method

Since any interface on these switches can be used for stacking, make sure to verify exactly which ports are being used for stacking so they are un-cabled and re-routed last. This information is found with the following command.

```
console#show switch stack-ports
```

Interface	Configured Stack Mode	Running Stack Mode	Link Status	Link Speed (Gb/s)
Te1/0/45	Stack	Stack	Link Up	10
Te1/0/46	Stack	Stack	Link Up	10
Te1/0/47	Stack	Stack	Link Up	10
Te1/0/48	Stack	Stack	Link Up	10
:				
Te2/0/21	Stack	Stack	Link Up	10
Te2/0/22	Stack	Stack	Link Up	10
Te2/0/23	Stack	Stack	Link Up	10
Te2/0/24	Stack	Stack	Link Up	10
:				
Te3/0/45	Stack	Stack	Link Up	10
Te3/0/46	Stack	Stack	Link Up	10
Te3/0/47	Stack	Stack	Link Up	10
Te3/0/48	Stack	Stack	Link Up	10
:				

Note: To narrow the list to only view ports configured for stacking, use the command `show switch stack-ports | include Stack`. Make sure to capitalize *Stack* since the command is case sensitive.

Look for interfaces shown to be in Stack mode. The logical stack unit number is represented in each interface name. The first number in the interface name is the logical stack unit. For example, interface `Te2/0/21` is in logical unit number 2.

A blinking LED light can be generated on the *back* of each PowerConnect 81xx to locate each physical unit. This blinking LED is useful when identifying physical units and ports for running diags, sniffing, mirroring ports, and other basic troubleshooting. It is also helpful when adding, removing, replacing or tracing cables associated with these interfaces. Use the `locate switch` command to blink the blue “Locator” LED on the switch unit you are trying to locate.

```
console#locate switch 2
```

The LED locator light on switch 2 blinks for 20 seconds. The length of time the LED continues to blink can be changed using the `locate time <ssss>` command, where *ssss* is the time in seconds for the LED to blink.

Removing the physical switch unit from the stack

Before removing a physical unit from a stack, prepare ports on the other stack member units to receive the cables and traffic that is redirected to them from the member unit being removed. Consider all

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

LAGs, VLANs, STP, ACLs, security, and so on, that needs to be configured on the new ports to accept cables, establish links, and begin to forward traffic.

Note: It is highly recommended not to continue until these things have been considered and proper preparations are made.

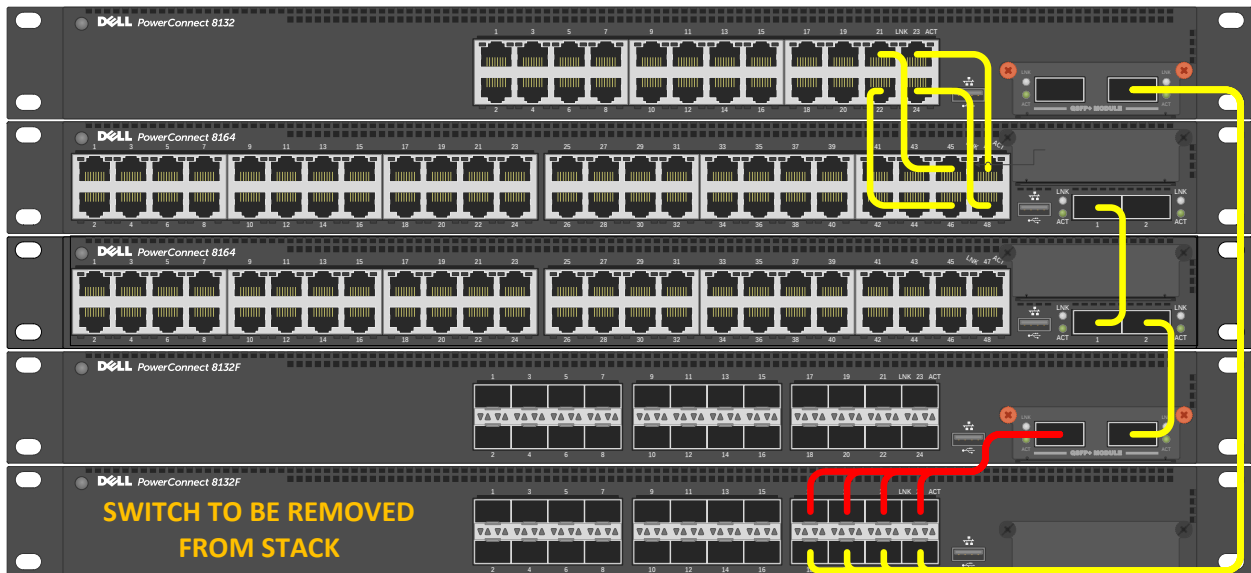
Note: Do not remove or re-route stacking cables until prompted in the last step below.

Do not remove or re-route *stacking* cables until prompted. Disconnect all other links on the member to be removed and re-route the traffic that was going through this unit so it now goes through the ports that were prepared on the remaining stack unit members.

Caution: In the next step, make sure to keep track of all ports being used for stacking that will be temporarily unplugged. They need to be re-cabled in the following step.

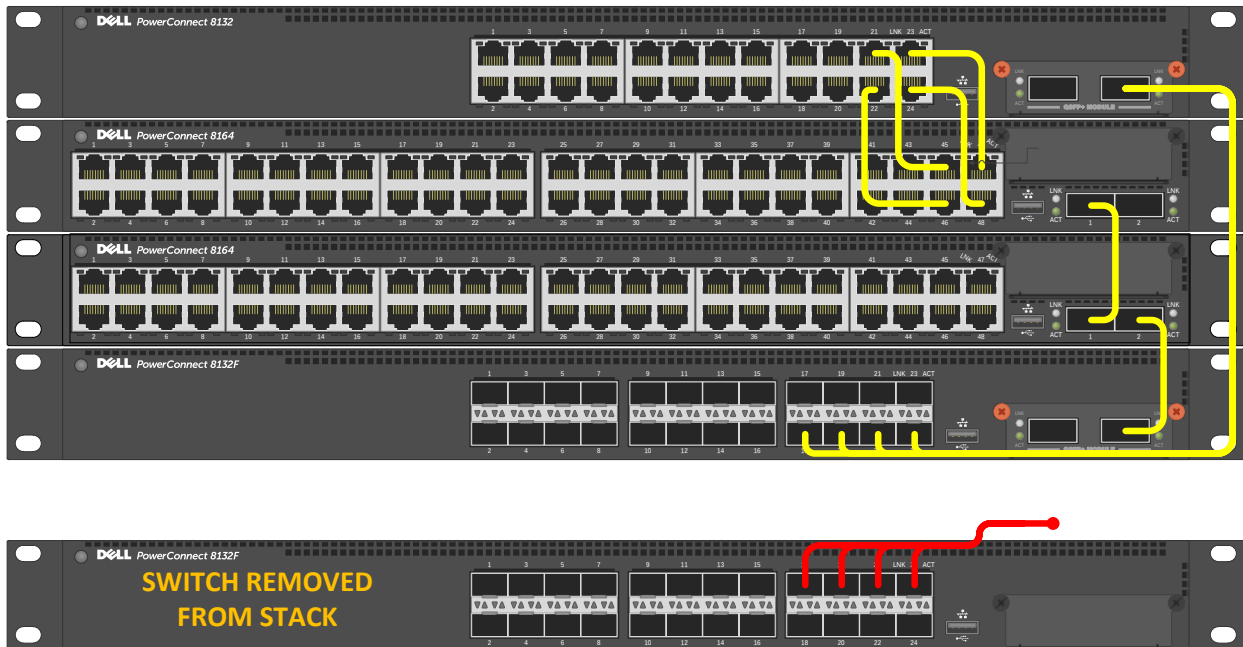
Only after re-routing the traffic through the remaining stack units, remove the stacking cables from the switch to be removed. The switch being removed does not need to be powered off. Keeping the switches power on automatically brings it to a stand-alone state as the stack cables are removed. In the example below (Figure 13), the red quad-breakout cable is removed along with the switch.

Figure 13. Cabling of five stacked units



Use the freed cables or new cables to connect the two switches together that were previously adjacent to the switch being removed. Since there are multiple interface and cable types supported for stacking, a different set of cables may be required to make this connection.

Figure 14. Removal of a stack unit



Removal of a stack unit results in one or more freed cables. In this example, there is a freed quad-breakout cable (red) that was used to link the bottom unit to the one directly above it. The second quad-breakout cable is then used to connect the top and bottom units to again complete the ring topology.

Note: A QSFP+ quad-breakout cable connects one QSFP+ 40GE port to four SFP+ 10GE ports.

Alternatively, once the unit is removed, the remaining quad-breakout cable could be replaced with a QSFP+ cable to connect the top and bottom stack members. This would free up four SFP+ interfaces, but would require the use of another QSFP+ interface. The interfaces used for stacking is based on the administrator's preference.

Validation

To validate the stack unit has been removed and that the remaining stack members are still intact, type the `show switch` command.

```

console#show switch

      Management Standby   Preconfig   Plugged-in   Switch   Code
SW   Status      Status      Model ID    Model ID     Status   Version
-----
 1   Mgmt Sw
 2   Stack Mbr   Oper Stby  PCT8164     PCT8164     OK       5.0.0.3
 3   Stack Mbr
 4   Stack Mbr   PCT8164     PCT8164     OK       5.0.0.3
 5   Unassigned PCT8132F PCT8132F Not Present 5.0.0.3
    
```

Removing units from the stack configuration

Once a unit has been physically removed, it may be desired to remove it from the configuration as well, if there are no plans on restoring it later. For the above example Unit 5 was removed; however, the `show switch` command continues to show the removed switch in the configuration.

Issuing a `no member` command in *Stack Configuration* mode deletes the removed switch from the configured stack information.

```
console(config)#stack
console(config-stack)#no member 5
console(config-stack)#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8132	PCT8132	OK	5.0.0.3
2	Stack Mbr	Oper Stby	PCT8164	PCT8164	OK	5.0.0.3
3	Stack Mbr		PCT8164	PCT8164	OK	5.0.0.3
4	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.3

Notice that Unit 5 is no longer present in the configuration. A backup of the configuration (copy running-config startup-config) is required to make the change persist after a reload.

Renumbering stack units

It may be desired to renumber switches in the stack. While this feature may be used at any time, it is most commonly used after a switch has been removed and the remaining unit numbers are no longer consecutive. While inconsecutive numbers or numbers out of order do not impact traffic in any way, keeping an order can help quickly identify individual units and ports.

A switch may be any number between 1 and 6 as long as it is not already taken by another switch. If it is desired to renumber the switch units to show units 1-2-3, instead of 1-2-4, it will require a brief reset of the stack and clear the configuration of the interfaces on the switch receiving the new number. Type the command `show switch` to see the current order of the units before renumbering.

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Stack Mbr	Oper Stby	PCT8164F	PCT8164F	OK	5.0.0.3
2	Mgmt Sw		PCT8132F	PCT8132F	OK	5.0.0.3
4	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.3

Caution: Renumbering stack units may hinder management scripts and monitoring software that collects data based on particular port traffic. Use renumbering with caution when monitoring ports and be aware that scripts and monitoring parameters may need to be modified.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

Type the `switch renumber` command to change the number of the switch.

```
console(config)#switch 4 renumber 3
The switch will be reset to perform unit renumbering
and the configuration of switch interfaces will be cleared.
Are you sure you want to renumber? (y/n)y
```

Allow a few minutes for the switch to renumber, then enter the following.

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Stack Mbr	Oper Stby	PCT8164F	PCT8164F	OK	5.0.0.3
2	Mgmt Sw		PCT8132F	PCT8132F	OK	5.0.0.3
3	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.3
4	Unassigned		PCT8164F		Not Present	0.0.0.0

The switch that was Unit #4 is now Unit #3. Unit #4 is no longer present. To remove it from the list, perform the `no member` command in Stack Configuration Mode.

```
console(config)#stack
console(config-stack)#no member 4
console(config-stack)#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Stack Mbr	Oper Stby	PCT8164F	PCT8164F	OK	5.0.0.3
2	Mgmt Sw		PCT8132F	PCT8132F	OK	5.0.0.3
3	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.3

Configuring a removed unit to be stand-alone

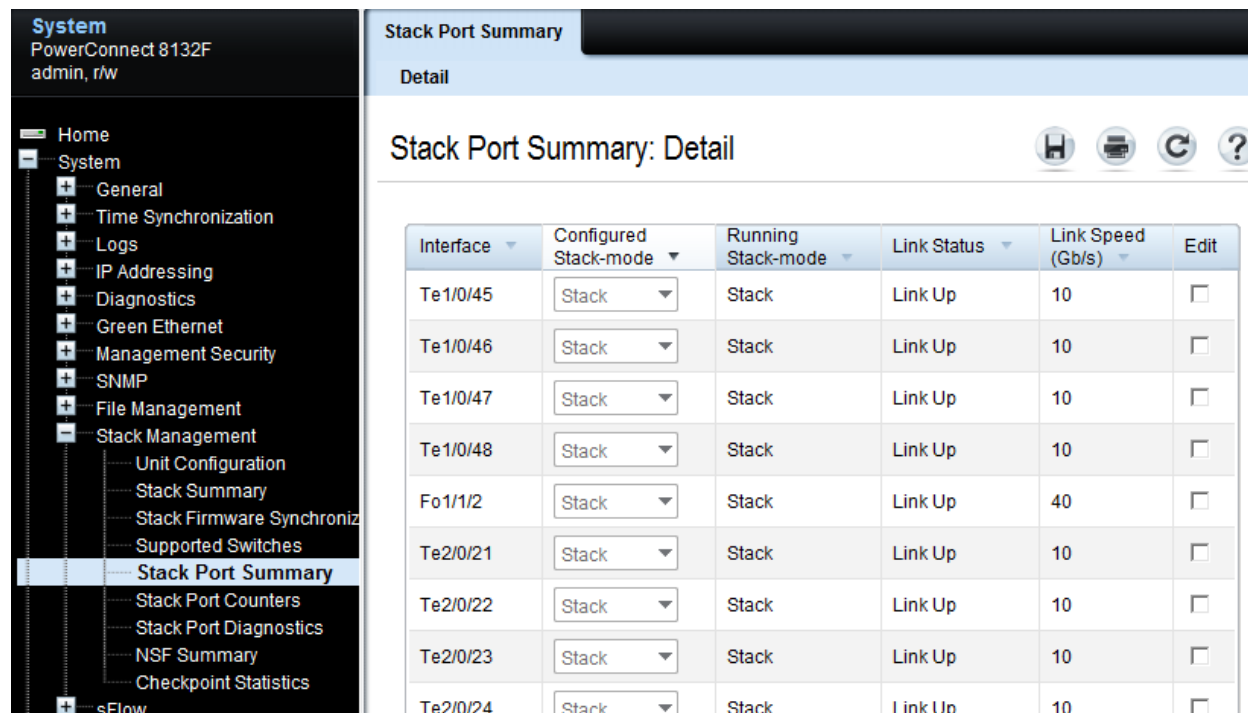
After removing a unit from a stack, the unit converts back to its original configuration that it had prior to adding it to the stack, retaining the IP address, VLAN, LAG, and other settings. This allows immediate access to the stand-alone through the out-of-band port if previously configured.

Note: A duplicate address could occur on the network if another device was assigned the IP address of the device while it was a stack member. If this occurs simply detach the device from the network and change the IP address through the console port.

Meta-data will remain on the switch until cleared or changes are made to the *stack* settings, but will not affect functions of the switch. For example, a stand-alone switch is assigned to be unit #1. Upon joining the stack it was assigned to be unit #3. When it is removed from the stack it will retain the assignment of unit #3 until changed by the administrator. For instructions on how to make this change, see [Renumbering stack](#) on [page 39](#).

Web interface method

Since any interface on the 8100 series switches can be used for stacking, make sure to verify exactly which ports are being used for stacking so they are un-cabled and re-routed last, after the normal traffic-passing cables have been re-routed. This information is found at System > Stack Management > Stack Port Summary.



The screenshot shows the Dell PowerConnect web interface. The left sidebar is titled 'System' and shows the navigation menu. The 'Stack Management' section is expanded, and 'Stack Port Summary' is selected. The main content area is titled 'Stack Port Summary: Detail' and contains a table with the following data:

Interface	Configured Stack-mode	Running Stack-mode	Link Status	Link Speed (Gb/s)	Edit
Te1/0/45	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te1/0/46	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te1/0/47	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te1/0/48	Stack	Stack	Link Up	10	<input type="checkbox"/>
Fo1/1/2	Stack	Stack	Link Up	40	<input type="checkbox"/>
Te2/0/21	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te2/0/22	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te2/0/23	Stack	Stack	Link Up	10	<input type="checkbox"/>
Te2/0/24	Stack	Stack	Link Up	10	<input type="checkbox"/>

Note: Clicking the *Configured Stack-mode* column header brings all Stack ports to the top of the list.

Look for interfaces shown to be in Stack mode. The logical stack unit number is represented in each interface name. The first number in the interface name is the logical stack unit. For example, interface Te2/0/21 is in logical unit number 2.

A blinking LED light is generated on the *back* of each Dell PowerConnect 81xx to locate each physical unit. This blinking LED is useful when identifying physical units and ports for running diags, sniffing, mirroring ports, and other basic troubleshooting. It is also helpful when needing to add, remove, replace or trace cables associated with these interfaces. Use the `locate switch` CLI command to blink the blue “Locator” LED on the switch unit you are trying to locate.

```
console#locate switch 2
```

The LED locator light on switch 2 blinks for 20 seconds. The length of time the LED continues to blink can be changed using the `locate time <ssss>` command, where *ssss* is the time in seconds for the LED to blink.

Removing the physical switch unit from the stack

Before removing a physical unit from a stack, prepare the ports on the other stack member units to receive the cables and traffic that will be redirected to them from the member unit being removed.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

Consider all LAGs, VLANs, STP, ACLs, security, and so on, that needs to be configured on the new ports in order to accept cables, establish links, and begin to forward traffic.

Note: It is highly recommended not to continue until these things have been considered and proper preparations are made.

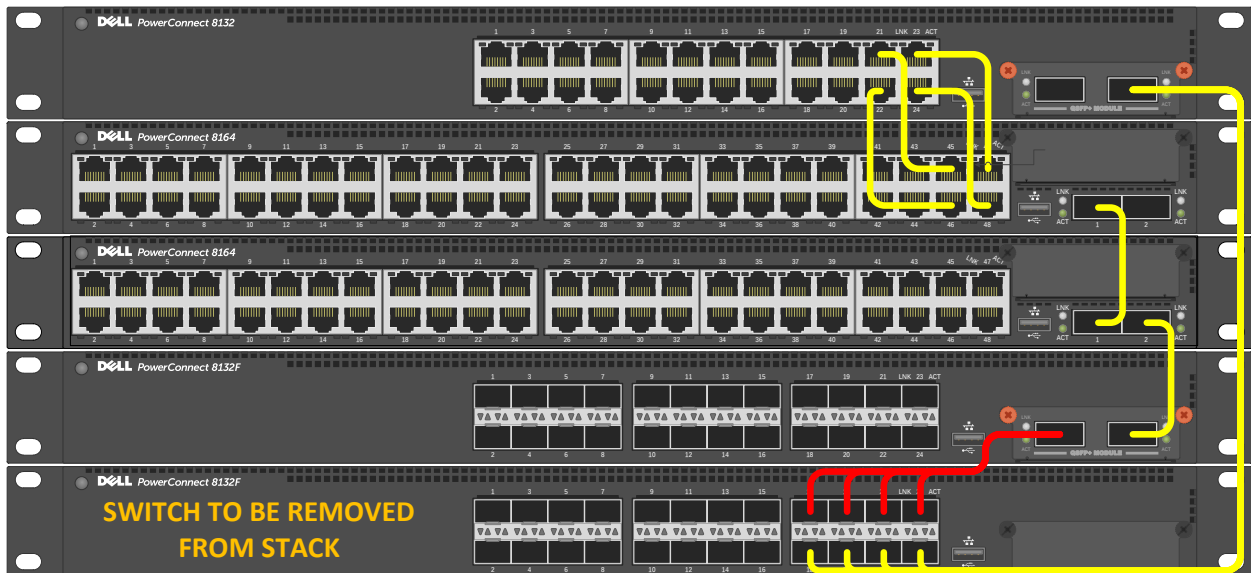
Note: Do not remove or re-route stacking cables until prompted in the last step below.

Do not remove or re-route *stacking* cables until prompted. Disconnect all other links on the member to be removed and re-route the traffic that was going through this unit so it now goes through the ports that were prepared on the remaining stack unit members.

Caution: In the next step, make sure to keep track of all ports being used for stacking that will be temporarily unplugged. They need to be re-cabled in the following step.

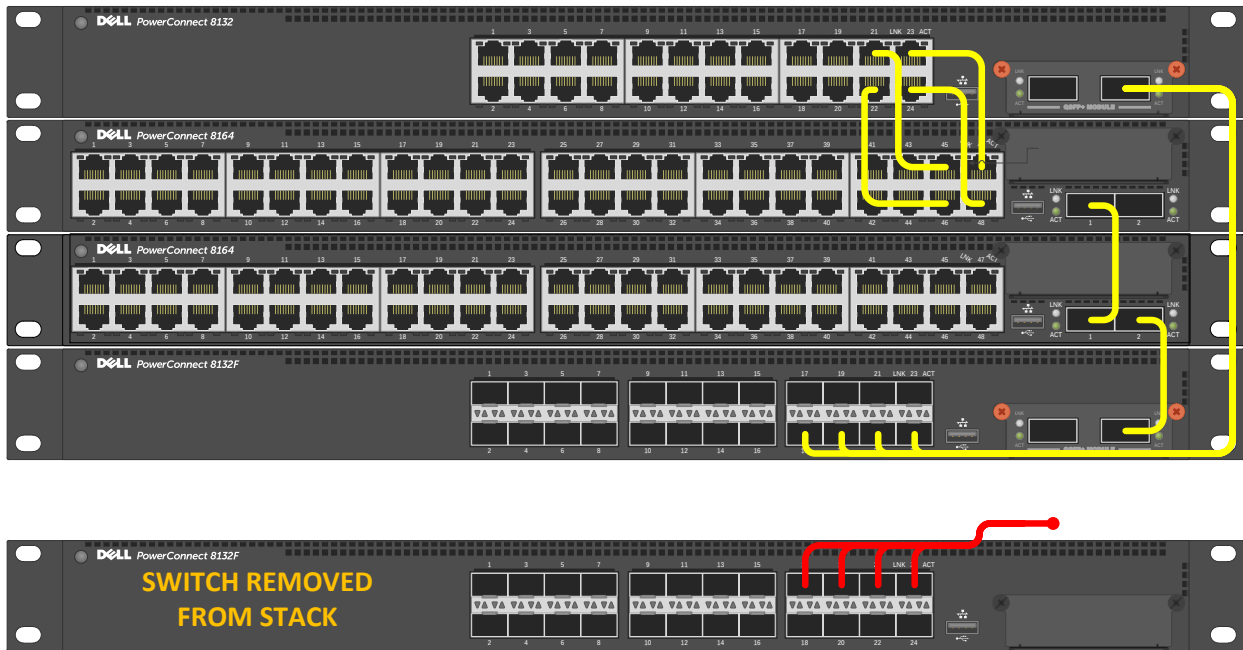
Only after re-routing the traffic through the remaining stack units, remove the stacking cables from the switch to be removed. The switch being removed does not need to be powered off. Keeping the switches powered on automatically brings it to a stand-alone state as the stack cables are removed. In the example below, the red quad-breakout cable will be removed along with the switch.

Figure 15. Cabling of five stacked units.



Use the freed cables or new cables to connect the two switches together that were previously adjacent to the switch being removed. Since there are multiple interface and cable types supported for stacking, a different set of cables may be required to make this connection.

Figure 16. Removal of a stack unit



Removal of a stack unit results in one or more freed cables. In this example, there is a freed quad-breakout cable (red) that was used to link the bottom unit to the one directly above it. The second quad-breakout cable is then used to connect the top and bottom units to again complete the ring topology.

Note: A QSFP+ quad-breakout cable is one that allows the user to connect one QSFP+ 40GE port to four SFP+ 10GE ports.

Alternatively, once the unit is removed, the remaining quad-breakout cable could be replaced with a QSFP+ cable to connect the top and bottom stack members. This would free up four SFP+ interfaces, but requires the use of another QSFP+ interface. The interfaces used for stacking is based on the user's preference.

Validation

To validate the stack unit was removed and that the remaining stack members are still intact, go to System > Stack Management > Stack Summary.

System
PowerConnect 8132F
admin, r/w

- Home
- System
 - General
 - Time Synchronization
 - Logs
 - IP Addressing
 - Diagnostics
 - Green Ethernet
 - Management Security
 - SNMP
 - File Management
 - Stack Management
 - Unit Configuration
 - Stack Summary**
 - Stack Firmware Sw

Stack Summary

Detail

Stack Summary: Detail

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8132	PCT8132	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr	Oper Stby	PCT8164	PCT8164	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8164	PCT8164	OK	5.0.0.4	Enable	No Action	None
4	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
5	Unassigned		PCT8132F		Not present	0.0.0.0	Enable	No Action	None

Removing units from the stack configuration

Once a unit has been physically removed, it may be desired to remove it from the configuration as well, if there are no plans on restoring it later. For the above example Unit 5 was removed; however, the Stack Summary screen continues to show the removed switch in the configuration.

To remove the switch from the configuration, go to the System > Stack Management > Unit Configuration screen. Select the Switch ID of the switch to be removed, and then check the *Remove Switch* check box at the bottom of the bottom of the screen.

The screenshot shows the 'Unit Configuration: Detail' page for a switch with ID 5. The 'Remove' section at the bottom has the 'Remove Switch' checkbox checked. The 'Apply' button is visible at the bottom right of the page.

Clicking *Apply* deletes the removed switch from the stack configuration on the running-configuration. Go back to the Stack Summary screen to verify the switch was removed. A backup of the configuration (copying the *running-configuration* to the *startup-configuration*) in System > File Management > Copy Files is required to make the change persist after a reload.

Renumbering stack units

It may be desired to renumber switches in the stack. While this feature may be used at any time, it is most commonly preferred after a switch has been removed and the remaining unit numbers are no longer consecutive. While inconsecutive numbers or numbers out of order do not impact traffic in any way, keeping an order can help quickly identify individual units and ports.

A switch may be any number between 1 and 6 as long as it is not already taken by another switch. If it is desired to renumber the switch units to show units 1-2-3, instead of 1-2-4, it requires a brief reset of the stack and clear the configuration of the interfaces on the switch receiving the new number. View the System > Stack Management > Stack Summary to see the current numbering of each unit.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

System
PowerConnect 8164F
admin, r/w

Home
System
+ General
+ Time Synchronization
+ Logs
+ IP Addressing
+ Diagnostics
+ Green Ethernet
+ Management Security
+ SNMP
+ File Management
+ Stack Management
+ Unit Configuration
+ **Stack Summary**

Stack Summary
Detail

Stack Summary: Detail

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
4	Stack Mbr	Oper Stby	PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None

Caution: Renumbering stack units may hinder management scripts and monitoring software that collect data based on particular port traffic. Use renumbering with caution when monitoring ports and be aware that scripts and monitoring parameters may need to be modified.

In this example there are three stack members numbered 1, 3, and 4. It may be desired to move 3 to 2, and then 4 to 3. This can be by renumbering 3 to 2 first, then renumbering 4 to 3. It is also possible to simply move 4 to 2, which is shown in the example below.

Go to System > Stack Management > Unit Configuration and select the Switch ID to change. Enter the new Switch ID into the *Change Switch ID to* field and click Apply.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

System
PowerConnect 8164F
admin, r/w

Home
System
General
Time Synchronization
Logs
IP Addressing
Diagnostics
Green Ethernet
Management Security
SNMP
File Management
Stack Management
Unit Configuration
Stack Summary
Stack Firmware Synchronizer
Supported Switches
Stack Port Summary
Stack Port Counters
Stack Port Diagnostics
NSF Summary
Checkpoint Statistics
sFlow
Email Alerts
ISDP
iSCSI
Captive Portal
Switching
Routing
Statistics/RMON
Quality of Service
IPv4 Multicast
IPv6 Multicast

Unit Configuration
Detail | Add

Unit Configuration: Detail

Unit Configuration

Switch ID	4 ▾ Change Switch ID to <input type="text" value="2"/> (1 to 12)
Management Status	Stack Unit
Unit Type	StackMember ▾
Preconfigured Model Identifier	PCT8164F
Plugged-in Model Identifier	PCT8164F
Switch Status	OK
Switch Description	PCT8164F
Detected Code Version	5.0.0.4
Detected Code in Flash	5.0.0.4
Up Time	0 days, 0 hours, 28 minutes, 59 secs

Remove [▲ Back to top](#)

Remove Switch	<input type="checkbox"/>
---------------	--------------------------

[▲ Back to top](#)

Apply

Click OK on the next screen. Allow a few minutes for the switch to renumber, then verify the new ID from the System > Stack Management > Stack Summary screen.

System
PowerConnect 8164F
admin, r/w

Home
System
General
Time Synchronization
Logs
IP Addressing
Diagnostics
Green Ethernet
Management Security
SNMP
File Management
Stack Management
Unit Configuration
Stack Summary

Stack Summary
Detail

Stack Summary: Detail

Unit ▲	Management Status ▾	Standby Status ▾	Preconfigured Model Identifier ▾	Plugged-in Model Identifier ▾	Switch Status ▾	Firmware Version ▾	NSF Unit Support ▾	SFS Status ▾	SFS Last Attempt Status ▾
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None
4	Unassigned		PCT8164F		Not present	0.0.0.0	Enable	No Action	None

The switch that was Unit #4 is now Unit #2 and Unit #4 is no longer present. To remove it from the list, select it on the System > Stack Management > Unit Configuration screen, and then select the *Remove Switch* check box at the bottom.

The screenshot shows the Dell PowerConnect 8164F configuration interface. The left sidebar contains a navigation menu with 'Unit Configuration' selected. The main content area displays the 'Unit Configuration: Detail' page for a switch with ID 4. The configuration table shows details such as Management Status (Unassigned), Unit Type (StackMember), and Preconfigured Model Identifier (PCT8164F). Below the table is a 'Remove' section with a 'Remove Switch' checkbox checked. An 'Apply' button is at the bottom right.

Unit Configuration	
Switch ID	4 <input type="text"/> Change Switch ID to <input type="text"/> (1 to 12)
Management Status	Unassigned
Unit Type	StackMember
Preconfigured Model Identifier	PCT8164F
Plugged-in Model Identifier	
Switch Status	Not present
Switch Description	PCT8164F
Detected Code Version	0.0.0.0
Detected Code in Flash	0.0.0.0
Up Time	0 days, 0 hours, 0 minutes, 0 secs

Remove

Remove Switch	<input checked="" type="checkbox"/>
---------------	-------------------------------------

Apply

Clicking *Apply* deletes the removed switch from the stack configuration on the running-configuration. Go back to the Stack Summary screen to verify the switch was removed. A backup of the configuration (copying the *running-configuration* to the *startup-configuration*) in System > File Management > Copy Files is required to make the change persist after a reload.

Configuring a removed unit to be stand-alone

After removing a unit from a stack, the unit converts back to its original configuration that it had prior to adding it to the stack, retaining the IP address, VLAN, LAG, and other settings, allowing the user to immediately access the stand-alone through the out-of-band port if previously configured.

Note: A duplicate address could occur on the network if another device was assigned the IP address of the device while it was a stack member. If this occurs simply detach the device from the network and change the IP address through the console port.

Meta-data remains on the switch until cleared or changes are made to the *stack* settings, but will not affect functions of the switch. For example, a stand-alone switch is assigned to be unit #1. Upon joining the stack it was assigned to be unit #3. When it is removed from the stack it will retain the assignment of unit #3 until changed by the administrator. For instructions on how to make this change, see [Renumbering stack](#) on [page 39](#).

Managing the standby unit

If the Master unit fails or is taken offline, a Standby unit automatically takes place as Master. During this time there is no more than a 50 ms interruption in unicast connectivity.

The commands below are used to manage your Standby unit.

Command-line interface method

To find out which unit is currently in Standby status, run the `show switch` command.

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.3
2	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.3
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.3

The *Standby Status* column shows which unit is in Standby mode. There are two standby modes: *Oper Stby* and *Cfg Stby*. *Oper Stby* is selected automatically by the Master during stack creation. If the administrator decides to select a different unit to be Standby, then it is labeled *Cfg Stby*. Both Standby modes work identically.

In this example, unit 2 is the stack standby for the Master unit. To change the standby to a different unit, use the `standby x` command. Verify the change with the `show switch` command.

```
console(config-stack)#standby 3
```

```
console#show switch
```

SW	Management Status	Standby Status	Preconfig Model ID	Plugged-in Model ID	Switch Status	Code Version
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.3
2	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.3
3	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.3

This method cannot be used to assign the current Stack Master to the Standby role and results in an error. In the event there is a need to change the role of the Master or make the Standby the Master, use the `initiate failover` command from the Command Line Interface. This command results in a warm restart of the stack Master, triggering the Standby unit to take over as a new Master switch.

```
console(config)#stack
```

```
console(config-stack)#initiate failover
```

The system has unsaved changes.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

```
Would you like to save them now? (y/n) y
```

```
Configuration Saved! Management unit will be reloaded.
```

```
Are you sure you want to failover to the backup unit? (y/n) y
```

If using the CLI through the console port, the session will no longer be valid. The console port on the new Master switch will now be activated for management. The IP and MAC addresses of the stack will remain the same with the new Master. If using a telnet session, log in using the same IP address as before.

Web interface method

In case the Master unit fails, a Standby unit is automatically configured to take place as Master. To find out which unit is currently in Standby status, go to the System > Stack Management > Stack Summary screen. The *Standby Status* column shows which unit is in Standby mode. There are two standby modes: *Oper Stby* and *Cfg Stby*. *Oper Stby* is selected automatically by the Master during stack creation. If the administrator decides to select a different unit to be Standby, then it is labeled *Cfg Stby*. Both Standby modes work identically.

The screenshot shows the Dell PowerConnect web interface. The left sidebar contains a navigation menu with the following items: Home, System (PowerConnect 8164F, admin, r/w), General, Time Synchronization, Logs, IP Addressing, Diagnostics, Green Ethernet, Management Security, SNMP, File Management (File System, Active Images, USB Flash drive, File Download, File Upload, Copy Files), Stack Management, Unit Configuration, and Stack Summary. The main content area is titled 'Stack Summary: Detail' and contains a table with the following data:

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr	Oper Stby	PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None

In this example, unit 3 is the stack standby for the Master unit. To change the standby to a different unit, go to the System > Stack Management > Unit Configuration screen.

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

System
PowerConnect 8164F
admin, r/w

Unit Configuration

Detail | Add

Unit Configuration: Detail

Unit Configuration

Switch ID	2 <input type="text"/> Change Switch ID to <input type="text"/> (1 to 12)
Management Status	Stack Unit
Unit Type	Configured Standby
Preconfigured Model Identifier	PCT8164F
Plugged-in Model Identifier	PCT8164F
Switch Status	OK
Switch Description	PCT8164F
Detected Code Version	5.0.0.4
Detected Code in Flash	5.0.0.4
Up Time	0 days, 0 hours, 33 minutes, 35 secs

Remove [▲ Back to top](#)

Remove Switch	<input type="checkbox"/>
---------------	--------------------------

[▲ Back to top](#)

Select the *Switch ID* to be assigned as the Standby. Use the *Unit Type* drop-down menu and select *Configured Standby*.

Note: Assigning the current Stack Master to the Standby role is not allowed using this method and results in an error. Instead, use the *initiate failover* method described in the next section.

Click Apply. Copying the running-configuration to the startup-configuration is not required. This setting will be persistent after a reload. Verify the new Standby switch from the Stack Summary screen.

System
PowerConnect 8164F
admin, r/w

Stack Summary

Detail

Stack Summary: Detail

Unit	Management Status	Standby Status	Preconfigured Model Identifier	Plugged-in Model Identifier	Switch Status	Firmware Version	NSF Unit Support	SFS Status	SFS Last Attempt Status
1	Mgmt Sw		PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
2	Stack Mbr	Cfg Stby	PCT8164F	PCT8164F	OK	5.0.0.4	Enable	No Action	None
3	Stack Mbr		PCT8132F	PCT8132F	OK	5.0.0.4	Enable	No Action	None

Stacking Dell PowerConnect 8100 Series Switches: 8132, 8132F, 8164, 8164F

If there is a need to change the role of the Master or make the Standby the Master, use the `initiate failover` command from the Command Line Interface. This command results in a warm restart of the stack Master, triggering the Standby unit to take over as a new Master switch.

```
console(config)#stack
```

```
console(config-stack)#initiate failover
```

```
The system has unsaved changes.
```

```
Would you like to save them now? (y/n) y
```

```
Configuration Saved! Management unit will be reloaded.
```

```
Are you sure you want to failover to the backup unit? (y/n) y
```

```
Connection to host lost. ← This message is seen in telnet sessions.
```

If using the CLI through the console port, the session will no longer be valid. The console port on the new Master switch will now be activated for management. The IP and MAC addresses of the stack remains the same with the new Master. If using a telnet session, log in using the same IP address as before.

Appendix A - Commands used in this document

All CLI commands used in this document, along with a brief description, are listed below in order of appearance. Some commands are used multiple times in the document.

Command	Definition
show run	Shows running configuration
show switch	Shows all stack members and roles
show system	Shows MAC address
hardware profile portmode 4x10g (from config-if)	Changes a QSFP+ port to 4x10G
boot auto-copy-sw (from config#)	Allows for automatic firmware updates
show switch stack-ports	Shows available ports for stacking
show switch stack-ports include Stack	Shows only ports in stack mode
stack (from config#)	Stack configuration mode
stack-port fortygigabitether 1/1/1 stack (from config-stack#)	Turns on stacking on a port
copy running-config startup-config	Backs up the running configuration
show version	Shows firmware versions on units
copy tftp://10.10.1.10/PC8100v5.0.0.3.stk backup	Example of firmware download using tftp
boot system backup	Activates the backup image to be active
reload	Reloads the stack
locate switch 2	Blinks the locate LED on rear of switch
no member 5 (from config-stack#)	Removes a unit from the stack config
switch 4 renumber 3 (from config#)	Renums a unit in the stack
standby 3 (from config-stack#)	Changes the standby to another unit
initiate failover (from config-stack#)	Causes Master to failover to the standby

Appendix B - Network switch versions

Version information for the network switches used in creating this document are as follows:

Network switch	Dell PowerConnect 8100
Software version	D.7.1.2, 5.0.0.3, 5.0.0.4

About Dell

Dell (NASDAQ: DELL) is a leading technology provider to commercial and public enterprises around the world.