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

Dell Networking Solutions Engineering
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Important Firmware Update for PowerConnect 81xx Stacking

As of May 2013, PowerConnect 8100 switches ship with an improved “B1” CPU. These new CPUs are fully compatible and virtually identical to the original “A1” CPUs found in all prior PowerConnect 81xx switches. The only difference with the new B1 switch that will cause concern to those wanting to have both A1 and B1 switches in the same stack is the new B1 will not downgrade to the older 5.0.x.x firmware code.

If attempting to add a B1 switch to a stack running 5.0.x.x firmware (or if trying to downgrade a stand-alone B1 to 5.0.x.x firmware), be aware that the device will not update to the older firmware and will fail to be added to the stack. Furthermore, if the boot auto-copy-sw feature is enabled on the stack master with the allow-downgrade option also enabled, the new B1 switch will continue to reboot until removed from the stack.

The recommended solution to this issue is to update the switch stack to firmware version 5.1.x.x or later prior to adding any new switches to the stack. Find the latest firmware (5.1.x.x or later) at http://support.dell.com.

⚠️ Caution: Users can download the older 5.0.x.x firmware to the new B1 switch, but the firmware will not load and is not usable.

Firmware 5.0.x.x is no longer recommended

If after reading the above section, it is still desired to run 5.0.x.x on a stack (not recommended), there may be an option that will allow it depending on the CPU versions of each switch. Follow the instructions below to find the CPU versions for all 8100 switches involved and determine available options.

1. Run show version from the CLI prompt on either a stack or stand-alone switch.
2. If the stack or stand-alone is running 5.0.x.x firmware, then all switches in the stack (or standalone) contain A1 CPUs. This is because 5.0.x.x can only run on A1 CPU switches.
3. If the firmware version is 5.1.x.x, then a CPU version line is displayed
   
   CPU Version....................... XLP308H-A1
   
   which shows the CPU version in the last two characters (either A1 or B1).
4. On a stack, run show version m where m is the unit number assigned to the stack member. This will display the CPU version for that stack member. Run this command for each member.

If both A1 and B1 CPUs are among the switches you want to stack together, the only option is to upgrade to firmware 5.1.x.x or later on all switches before stacking them. If all switches are A1 CPUs, or if all switches are B1 CPUs, then they are ready to be stacked using any supported firmware. Just remember that the B1 CPUs are only compatible with firmware 5.1.x.x or later. A1 CPUs are compatible with all versions of PowerConnect 81xx firmware, including 5.0.x.x.

Note: Dell recommends that all PowerConnect switches are updated to the latest firmware.

Errors Downgrading Firmware

Before attempting to downgrade firmware on a stack to version 5.0.x.x, run the four steps above to determine each stack members CPU version. Know that all CPUs in the stack must be version A1 for the stack to
Successfully downgrade to 5.0.x.x. Attempting to downgrade to 5.0.x.x on a stack containing B1 CPUs will result in the following errors on the console:

```
L7_LOGF(L7_LOG_SEVERITY_ERROR, L7_BSP_COMPONENT_ID, "Unit %d has a %s processor, which requires firmware revision 5.1 or later.", unitIndex, cpuString);
```

When trying to downgrade a standalone B1 unit to firmware 5.0.x.x, the following error is displayed to the console:

```
This unit or members of the stack require revision 5.1 or later firmware. This level of firmware is also required when attaching these units to a stack.
```

To avoid errors, upgrade all PowerConnect 8100 stacks and stand-alone switches to 5.1.x.x or later. Dell recommends running the latest firmware available for the switch. Find the latest firmware at [http://support.dell.com](http://support.dell.com).

**Note:** Dell recommends that all PowerConnect switches are updated to the latest firmware.
1 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, using up to four links between stack members, and using 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).
1.1 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.

1.2 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.

1.3 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.

1.4 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.

1.5 Hot add/delete and firmware synchronization
Units can be added and removed to and from the stack without cycling the power on the stack. 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).

1.6 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:

```

```

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.
1.7 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.
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
```

<table>
<thead>
<tr>
<th>SW</th>
<th>Management Status</th>
<th>Standby Model ID</th>
<th>Preconfig Model ID</th>
<th>Plugged-in Model ID</th>
<th>Switch Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** 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.
1.8 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:

![System Information: Detail](image)

Figure 6 System Information: Detail
2 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 7 10Gbase-T four-port expansion module for the Dell PowerConnect 81xx and 81xxF

- Figure 8 40G QSFP+ two-port expansion module for the Dell PowerConnect 81xx and 81xxF

- Figure 9 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.
2.1 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 10 shows one example of connectivity between stack members.

![Stacking Dell PowerConnect 8100 series switches using 40G and 10G stack links](image)

**Figure 10** 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 10.
- 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 11 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 11  Stacking Dell PowerConnect 8100/8100F series switches using multiple stack links

### 2.1.1 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 12  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` 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 port mode 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.

### 2.1.2 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
```

<table>
<thead>
<tr>
<th>Interface</th>
<th>Configured Mode</th>
<th>Running Mode</th>
<th>Link Status</th>
<th>Link Speed (Gb/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel/0/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tel/0/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tel/0/3</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tel/0/22</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tel/0/23</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tel/0/24</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
</tr>
<tr>
<td>Fo1/1/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
</tr>
<tr>
<td>Fo1/1/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
</tr>
<tr>
<td>Tel/1/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/3</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/4</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/5</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/6</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
<tr>
<td>Tel/1/7</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
</tr>
</tbody>
</table>
Tel/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

+-----------------+---------+---------+----------------+-----------+
<table>
<thead>
<tr>
<th>Interface</th>
<th>Configd</th>
<th>Running</th>
<th>Stack Mode</th>
<th>Link Status</th>
<th>Link Speed (Gb/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel/0/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Tel/0/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Tel/0/3</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Tel/0/23</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Tel/0/24</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Fo1/1/1</td>
<td>Stack</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Fo1/1/2</td>
<td>Stack</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

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, cable 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.

### 2.1.2.1 Validation

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

```
console#show switch
```

<table>
<thead>
<tr>
<th>Management</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW Status</td>
<td>Status</td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>---</td>
<td>---------</td>
<td>---------</td>
<td>----------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164</td>
<td>PCT8132</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8132</td>
<td>PCT8132</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>

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

![Stacking LED for the Dell PowerConnect 8100/8100F series switch](image-url)
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.

### 2.1.3 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.

![Login screen](image)

**Figure 14** Login screen

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.

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.
Clicking Apply at the bottom of the screen with 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.

### 2.1.3.1 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.
The following figure shows the Stack LED that is located on the back panel of every Dell PowerConnect 8100 series switch.

![Stacking LED for the Dell PowerConnect 8100/8100F series switch](image)

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.

### 2.1.3.2 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.

⚠️ **Caution:** 5.0.x.x firmware will not load on a switch with the newer “B1” CPU. It is therefore recommended to upgrade all PowerConnect 8100 switches to the latest firmware. See “Important Firmware Update for PowerConnect 81xx Stacking” at the beginning of this document for more information.

![Stack Firmware Synchronization: Detail](image)

Figure 20  Stack Firmware Synchronization: Detail

Save the configuration to the Startup-Configuration on the System > File Management > Copy Files page.
2.1.3.3 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.

⚠️ **Caution:** 5.0.x.x firmware will not load on a switch with the newer “B1” CPU. It is therefore recommended to upgrade all PowerConnect 8100 switches to the latest firmware. See “Important Firmware Update for PowerConnect 81xx Stacking” at the beginning of this document for more information.

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.

2.1.3.4 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

<table>
<thead>
<tr>
<th>Interface</th>
<th>Configured Stack Mode</th>
<th>Running Stack Mode</th>
<th>Configured Link Status</th>
<th>Running Link Status</th>
<th>Speed (Gb/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te1/0/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Te1/0/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Te1/0/3</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Te1/0/22</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Te1/0/23</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Te1/0/24</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>Fo1/1/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Fo1/1/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Te1/1/1</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/2</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/3</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/4</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/5</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/6</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/7</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Te1/1/8</td>
<td>Ethernet</td>
<td>Ethernet</td>
<td>Detach</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Notice the two 40G QSFP+ ports represented by interfaces Fo1/1/1 and Fo1/1/2. 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.

closele#config

closele(config)#stack

closele(config-stack)#stack-port fortygigabitethernet 1/1/1 stack

closele(config-stack)#stack-port fortygigabitethernet 1/1/2 stack

console(config-stack)#show switch stack-ports | include Stack

<table>
<thead>
<tr>
<th>Interface</th>
<th>Configured Stack Mode</th>
<th>Running Stack Mode</th>
<th>Configured Link Status</th>
<th>Running Link Status</th>
<th>Speed (Gb/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fo1/1/1</td>
<td>Stack</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Fo1/1/2</td>
<td>Stack</td>
<td>Ethernet</td>
<td>Link Down</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

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.

### 2.1.3.5 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.
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.
2.1.3.6 Validation

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

```console
console#show switch
```

<table>
<thead>
<tr>
<th>SW</th>
<th>Management Status</th>
<th>Standby Status</th>
<th>Preconfig Model ID</th>
<th>Preconfig Model ID</th>
<th>Plugged-in Status</th>
<th>Switch Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td></td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164</td>
<td>PCT8164</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td></td>
<td>PCT8132</td>
<td>PCT8132</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>4</td>
<td>Stack Mbr</td>
<td></td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>

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.

2.1.3.7 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.

**Caution:** 5.0.x.x firmware will not load on a switch with the newer “B1” CPU. It is therefore recommended to upgrade all PowerConnect 8100 switches to the latest firmware. See “Important Firmware Update for PowerConnect 81xx Stacking” at the beginning of this document for more information.
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 F0/1/0/1 and F0/1/0/2 will be used for stacking, though any of the interfaces shown may be used.

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.
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.

2.1.3.8 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:

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.

### 2.1.3.9 Validation

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

![Stack Summary: Detail](image)

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.
2.2 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.

### 2.2.1 Command-line interface method

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

```
console# show version
```

Image Descriptions

```plaintext
active : backup :
```

Images currently available on Flash

```
<table>
<thead>
<tr>
<th>unit</th>
<th>active</th>
<th>backup</th>
<th>current-active</th>
<th>next-active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.0.0.1</td>
<td>4.2.0.0</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>2</td>
<td>5.0.0.1</td>
<td>4.2.0.0</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>3</td>
<td>5.0.0.1</td>
<td>4.2.0.0</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>4</td>
<td>5.0.0.1</td>
<td>4.2.0.0</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
</tbody>
</table>
```

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...

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

<table>
<thead>
<tr>
<th>unit</th>
<th>active</th>
<th>backup</th>
<th>current-active</th>
<th>next-active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>2</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>3</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
<tr>
<td>4</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.1</td>
</tr>
</tbody>
</table>
```

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

<table>
<thead>
<tr>
<th>unit</th>
<th>active</th>
<th>backup</th>
<th>current-active</th>
<th>next-active</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
<td>5.0.0.1</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>
```
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.

```console
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
console#show version
```

**Image Descriptions**

```
active : 5.0.0.1 5.0.0.3 5.0.0.1 5.0.0.3
backup : 5.0.0.1 5.0.0.3 5.0.0.1 5.0.0.3
```

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

```
2.2.2 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.

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

![Active Images: Detail](image1)

**Figure 25  Active Images: Detail**

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.

![File Download: Detail](image2)

**Figure 26  File Download: Detail**
Click Apply. A warning will appear.

![Message from webpage]

Warning! The image transfer can take several minutes to complete. Management access will be blocked for the duration of the transfer.

Are you sure you want to continue?

[OK] [Cancel]

Figure 27  Warning message

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.

![Transfer Progress: Detail]

Figure 28  Transfer Progress: Detail
Once the file has been distributed to the entire stack, the following dialog box appears.

![Image of PowerConnect 8132F informational message]

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

Figure 29  Transfer complete

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.

![Image of Active Images: Detail]

Figure 30  Active Images: Detail

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.
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.

![Message from webpage]

The device will restart with the start-up configuration, not the running configuration. Would you like to continue?

OK  Cancel

Figure 33  Restart with the start-up configuration

Click OK again if this screen appears.

![Message from webpage]

This command will reset the selected unit and may disconnect your session. Do you want to continue?

OK  Cancel

Figure 34  Reset selected unit

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.

![Reset]

![Message from webpage]

Warning! Network Congestion or Lost Connection!

OK

Figure 35  Warning messages – network disconnected

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.
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.

### 2.3 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.

#### 2.3.1 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
```

<table>
<thead>
<tr>
<th>Interface</th>
<th>Configured Stack Mode</th>
<th>Running Stack Mode</th>
<th>Link Status</th>
<th>Link Speed (Gb/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel/0/45</td>
<td>Stack</td>
<td>Stack</td>
<td>Link Up</td>
<td>10</td>
</tr>
<tr>
<td>Tel/0/46</td>
<td>Stack</td>
<td>Stack</td>
<td>Link Up</td>
<td>10</td>
</tr>
</tbody>
</table>
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.

2.3.1.1 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 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 (Error! Reference source not found.), the red quad-breakout cable is removed along with the switch.

![Cabling of five stacked units](image)

Figure 37  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.
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.

### 2.3.1.2 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
```

<table>
<thead>
<tr>
<th>SW</th>
<th>Status</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Management</td>
<td></td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td>PCT8132</td>
<td>PCT8132</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164</td>
<td>PCT8164</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8164</td>
<td>PCT8164</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Stack Mbr</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Unassigned</td>
<td>PCT8132F</td>
<td>Not Present</td>
<td>5.0.0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3.1.3 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
```

<table>
<thead>
<tr>
<th>Management</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW</td>
<td>Status</td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>-----------</td>
<td>------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td>PCT8132</td>
<td>PCT8132</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164</td>
<td>PCT8164</td>
<td>OK</td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8164</td>
<td>PCT8164</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>4</td>
<td>Stack Mbr</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>

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.

2.3.1.4 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
```

```
<table>
<thead>
<tr>
<th>Management</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW</td>
<td>Status</td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>-----------</td>
<td>------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
</tr>
<tr>
<td>2</td>
<td>Mgmt Sw</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>4</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>

⚠️ **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.
**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
```

<table>
<thead>
<tr>
<th>Management</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW Status</td>
<td>Status</td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------------</td>
<td>------------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>1</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK 5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Mgmt Sw</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK 5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK 5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Unassigned</td>
<td>PCT8164F</td>
<td>Not Present</td>
<td>0.0.0.0</td>
<td></td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>Management</th>
<th>Standby</th>
<th>Preconfig</th>
<th>Plugged-in</th>
<th>Switch</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW Status</td>
<td>Status</td>
<td>Model ID</td>
<td>Model ID</td>
<td>Status</td>
<td>Version</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------------</td>
<td>------------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>1</td>
<td>Stack Mbr</td>
<td>Oper Stby</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK 5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Mgmt Sw</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK 5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK 5.0.0.3</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.5 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**
2.3.2 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.

![Stack Port Summary](image)

**Figure 39 Stack Port Summary: Detail**

**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.
2.3.2.1 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. 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, be 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.

![Image of cabling for five stacked units](image-url)

**Figure 40** 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.
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.

### 2.3.2.2 Validation

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

![Stack Summary: Detail](image)
2.3.2.3 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 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.

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.

2.3.2.4 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.

![Stack Summary: Detail](image)

**Figure 44  Stack Summary: Detail**

⚠️ **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.
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.
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.

Figure 47  Unit Configuration: Detail

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.

2.3.2.5 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.
2.4 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.

2.4.1 Command-line interface method

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

```
console#show switch
```

<table>
<thead>
<tr>
<th>SW</th>
<th>Management Status</th>
<th>Standby Status</th>
<th>Preconfig Model ID</th>
<th>Plugged-in Model ID</th>
<th>Switch Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td></td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr Oper Stby</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr</td>
<td></td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
</tbody>
</table>

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
```

<table>
<thead>
<tr>
<th>SW</th>
<th>Management Status</th>
<th>Standby Status</th>
<th>Preconfig Model ID</th>
<th>Plugged-in Model ID</th>
<th>Switch Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mgmt Sw</td>
<td></td>
<td>PCT8164F</td>
<td>PCT8164F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>2</td>
<td>Stack Mbr</td>
<td></td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
</tr>
<tr>
<td>3</td>
<td>Stack Mbr Oper Stby</td>
<td>PCT8132F</td>
<td>PCT8132F</td>
<td>OK</td>
<td>5.0.0.3</td>
<td></td>
</tr>
</tbody>
</table>
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. 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.

### 2.4.2 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.

![Stack Summary: Detail](image)
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.

Figure 49  Unit Configuration: Detail

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 below.

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.
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
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.
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.

<table>
<thead>
<tr>
<th>Command</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>show run</td>
<td>Shows running configuration</td>
</tr>
<tr>
<td>show switch</td>
<td>Shows all stack members and roles</td>
</tr>
<tr>
<td>show system</td>
<td>Shows MAC address</td>
</tr>
<tr>
<td>hardware profile portmode 4x10g (from config-if)</td>
<td>Changes a QSFP+ port to 4×10G</td>
</tr>
<tr>
<td>boot auto-copy-sw (from config#)</td>
<td>Allows for automatic firmware updates</td>
</tr>
<tr>
<td>show switch stack-ports</td>
<td>Shows available ports for stacking</td>
</tr>
<tr>
<td>show switch stack-ports</td>
<td>Shows only ports in stack mode</td>
</tr>
<tr>
<td>stack (from config#)</td>
<td>Stack configuration mode</td>
</tr>
<tr>
<td>stack-port fortygigabitether 1/1/1 stack (from config-stack#)</td>
<td>Turns on stacking on a port</td>
</tr>
<tr>
<td>copy running-config startup-config</td>
<td>Backs up the running configuration</td>
</tr>
<tr>
<td>show version m</td>
<td>Shows firmware and CPU versions on units</td>
</tr>
<tr>
<td>copy tftp://10.10.1.10/PC8100v5.0.0.3.stk backup</td>
<td>Example of firmware download using tftp</td>
</tr>
<tr>
<td>boot system backup</td>
<td>Activates the backup image to be active</td>
</tr>
<tr>
<td>reload</td>
<td>Reloads the stack</td>
</tr>
<tr>
<td>locate switch 2</td>
<td>Blinks the locate LED on rear of switch</td>
</tr>
<tr>
<td>no member 5 (from config-stack#)</td>
<td>Removes a unit from the stack config</td>
</tr>
<tr>
<td>switch 4 renumber 3 (from config#)</td>
<td>Renumbers a unit in the stack</td>
</tr>
<tr>
<td>standby 3 (from config-stack#)</td>
<td>Changes the standby to another unit</td>
</tr>
<tr>
<td>initiate failover (from config-stack#)</td>
<td>Causes Master to failover to the standby</td>
</tr>
</tbody>
</table>
B  Network switch versions

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

<table>
<thead>
<tr>
<th>Network switch</th>
<th>Dell PowerConnect 8100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software version</td>
<td>5.0.0.3, 5.0.0.4, 5.1.0.0</td>
</tr>
</tbody>
</table>

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