

# Dell EMC Networking ONIE Quick Start Guide

An introduction to ONIE on Dell EMC Networking devices

## Abstract

Dell EMC Networking ONIE quick start guide. This guide provides the essentials needed to update and prepare a switch for a networking OS installation.

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## Revisions

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## Acknowledgements

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# 1 Introduction

The concept of Open Networking is a core element of Dell EMC Networking's strategy and mission. Open Networking embraces the disaggregation of the traditional locked-down and proprietary networking stack. Dell EMC accomplishes this effort by using standards-based building blocks that use open source where possible.

The Open Network Install Environment, or ONIE, is an open-source project within the Open Computer Project that provides an installation environment for bare metal networking switches. ONIE also provides the option to install different network operating systems on a common set of networking hardware. ONIE is like any operating system boot loader for Windows or Linux. ONIE uses the same Grand Unified Bootloader (GRUB) structure that is commonly found in Linux distributions.

---

**Note:** For information about the Open Network Install Environment, see <http://onie.org/>. See <https://www.opencomputerproject.org/> for information about the Open Computer Project.

---

Within the Dell EMC Networking portfolio, any switch model that contains a "-ON" suffix, such as the Dell EMC Networking Z9100-ON and the Dell EMC Networking S4148U-ON, have ONIE enabled.

This guide covers the menu options that are available within ONIE and the operations that can be performed on each menu. The Dell EMC Networking S4148U-ON and the Dell EMC Networking S4048-ON are used to demonstrate the specified operations within ONIE. However, all operations that are performed can also be done on all data center switches that end in "-ON".

The steps in this document were validated using the specified Dell EMC Networking switches and operating systems. Also, the steps can be leveraged for other Dell EMC Networking switch models utilizing the same networking ONIE version.

## 2 ONIE Operations

This section covers the operations available within each ONIE menu. Review the various functions that are listed in Table 1 to assist with navigating to the necessary menu. The **ONIE: Install OS** section and the **ONIE: Update** section will allow for an automatic (zero-touch) process and a manual process.

---

**Note:** See section [4 ONIE: Install OS](#) and section [7 ONIE: Update](#) for more information.

---

Table 1 ONIE Menu Options

ONIE menu selection	Actions performed
<a href="#">ONIE: Install OS</a>	<ul style="list-style-type: none"><li>• Installs an OS image using the ONIE Discovery Service</li><li>• OS Install overwrites previously installed images and OS configurations</li><li>• ONIE Discovery Service enabled by default</li></ul>
<a href="#">ONIE: Rescue</a>	<ul style="list-style-type: none"><li>• Manual installation of an OS image</li><li>• Manually update ONIE</li><li>• Firmware updates</li><li>• Access to Linux OS</li><li>• ONIE Discovery Service disabled by default</li><li>• Manual install of diagnostics</li></ul>
<a href="#">ONIE: Uninstall OS</a>	<ul style="list-style-type: none"><li>• Erases any installed OS</li><li>• Does not delete ONIE or diagnostics</li></ul>
<a href="#">ONIE: Update ONIE</a>	<ul style="list-style-type: none"><li>• Uses ONIE Discovery Process to update ONIE version</li><li>• ONIE Discovery Service enabled by default</li><li>• Manual update of ONIE</li></ul>
<a href="#">ONIE: Embed mode</a>	<ul style="list-style-type: none"><li>• Allows for install of ONIE on the switch without ONIE</li></ul>
<a href="#">EDA-DIAG</a>	<ul style="list-style-type: none"><li>• Runs system diagnostics</li><li>• Verify or update individual BIOS/CPLD/FPGA firmware</li></ul>

To ensure that the latest firmware and software is configured on the switch, perform the following steps:

1. Check ONIE version and update if necessary, using the instructions within the [ONIE: Update](#) section.
2. Install the latest firmware versions, using the steps within the [ONIE: Rescue](#) section.
3. Install the latest diagnostics OS and required diagnostics tools, using the steps provided with the [Diagnostics](#) section.
4. Optionally, select the [ONIE: Uninstall OS](#) menu to remove an existing networking OS.
5. Navigate to the [ONIE: Install OS](#) menu and follow the commands in the **ONIE: Install OS** section to install the switch Operating System.

---

**Note:** See the [Diagnostics](#) section to resolve any issues or errors that occur.

---

### 3 ONIE menu

To access the ONIE menu use the following steps:

1. First make a serial connection to the switch.

---

**Note:** For specific connection information download and reference the switch's Installation Guide on [support.dell.com](http://support.dell.com).

---

2. Once the connection has been made to the switch, power on the switch or reload.

As the switch boots, it will pause at the GRUB menu if the switch is loaded without an OS or has OS10 installed. If the switch has OS9 installed, press `ESC` during the autoboot process.

---

**Note:** Depending on pre-existing conditions, such as the type of operating system installed, other options may be provided within this menu.

---



Figure 1 GRUB menu with installed OS

The EDA-DIAG and ONIE selections display only if an operating system was not previously installed.



Figure 2 GRUB Menu with no OS

3. Use the down arrow key to select ONIE and press the Enter key.

---

**Note:** On the next step, you must use an up/down arrow key or make your selection within 5 seconds of seeing the menu, or else the default selection will run automatically.

---

4. Once ONIE is selected the sub menus will be displayed.

---

**Note:** See Table 1 for information on each menu.

---



Figure 3 ONIE sub menu

## 4 ONIE: Install OS

There are multiple ways in which an Operating System can be installed using ONIE. The default setting is to have ONIE auto-discovery enabled. With ONIE auto-discovery enabled an automatic (zero-touch) install from a USB flash drive or HTTP/TFTP server can be performed. Another option is to stop the discovery process and install the Operating System manually. For each of the remote installations to work properly, an IP address is needed on the switch. The default is DHCP. If a DHCP server is not available, then an IP address must be manually assigned, see [Appendix A](#) for this process.

---

**Note:** Once the **ONIE: Install OS** option has been selected, an operating system installation may be necessary regardless of any existing network operating systems that have been installed.

---

### 4.1 Automatic (zero-touch) install

Automatic (zero-touch) installs of an operating system image are supported on Dell EMC ONIE-enabled devices. After a device successfully enters the **ONIE: Install OS** menu, auto-discovery obtains the hostname, domain name, management interface IP address, and the IP address of one or more DNS name servers on your network from the DHCP server and DHCP options. The ONIE auto-discovery process locates the stored software image and then starts the installation. Once completed, ONIE then reboots the device with the new operating system image.

If a USB drive was previously inserted, auto-discovery searches the USB storage supporting the FAT32 or EXT2 file system. It also searches for HTTP or TFTP servers if a USB installer file is not found. The auto discovery method repeats until a successful software image installation occurs and reboots the switch.

#### 4.1.1 HTTP/TFTP

For sites that require multiple operating system installs, the use of a less specific file name and file path ensures that all the switches in the network install the same OS. Use of file path that includes the device MAC address and the full onie-installer name, ensures that only a specific device receives the intended operating system.

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

The process that ONIE uses for auto discovery will go through the following sequence until it finds a valid installer file:

1. Local USB DRIVE with <onie-installer> file.
2. http://onie-server/<onie-installer>.
3. http://<ipv4>/<onie-installer>.
  - a) IPv4 addresses are determined by pinging the IPv4 broadcast address, 255.255.255.255.
4. http://<ipv6>/<onie-installer>.
  - b) IPv6 addresses are determined by an IPv6 ping to "all nodes" link local multicast address, ff02::1.
5. tftp://onie-server/<MAC>/onie-installer-x86\_64-dellemc\_s4100\_c2338-r0

This repeats until manually stopped or an onie-installer file is found.

---

**Note:** For information on the auto discovery process, see the [Open Computer Project](#). The content within this document is specific to Dell EMC Networking as where the Open Computer Project documentation is more generic.

---



Perform the following steps for an HTTP/TFTP zero touch installation:

1. Install a Linux web server, such as Apache, that a switch can access once it has obtained its IP address from a DHCP server.
2. Copy the operating system installer file to the path shared by the web server, such as `/var/www/html`, and rename it **onie-installer** or another qualified file name.

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

3. Create a DNS entry to resolve **onie-server** to the Linux web server address.

---

**Note:** This only applies if DNS is used to identify the onie-server.

---

4. Test web access to the operating systems installer file by entering `http://<server-ip-address>/<onie-installer>` into the web browser's URL field on a system in the same IP subnet. The directory displays the installer file.
5. Click on the file to download a local copy. The test passes when the file successfully downloads.
6. Perform the following steps on each switch to be installed with an operating system:
  - a. With ONIE installed on the switch with no operating system, connect the Out-of-Band (OOB) port to the network containing the web server.
  - b. Power the switch on. The switch automatically starts the auto-discovery and zero-touch installation.
  - c. Once the switch installs the operating system, it reboots to the `OS login:` prompt. The installation is complete.

## 4.1.2 USB

There are two prerequisites for using a USB drive to install an operating system utilizing the automatic zero-touch option.

- The USB drive needs to be in a FAT32 or EXT2 format.
- The file name needs to be a qualified name that starts with "onie-installer".

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

## 4.2 Manual install

To perform a manual installation, enter the `onie-discovery-stop` command to stop the auto-discovery process.

### 4.2.1 HTTP/TFTP/FTP

To install an operating system manually, boot into the **ONIE: Install OS** menu.

From the ONIE prompt, use the following command to download and apply the update over the network. The following example shows the use of TFTP; however, HTTP or FTP can also be used.

```
onie-nos-install tftp://<ip address>/PKGS_OS10-Enterprise-10.4.0E.R3S.250-x86_64.bin
```

## 4.2.2 USB

You can manually install the OS image using a USB drive.

---

**Note:** Verify that the USB drive supports a FAT 32 or EXT2 file system.

---

1. Plug the USB drive with the desired operating system into the USB port on the device.
2. Enter the following command to create a USB mount location on the system:

```
ONIE:/ # mkdir /mnt/media
```

3. Validate the specific file path for the USB drive on the switch with the `blkid` command. The USB drive is highlighted in the command output below.

```
ONIE:/ # blkid
/dev/sda4: UUID="c4e653fd-b843-452f-9c9d-64429a3f945e"
/dev/sda3: LABEL="EDA-DIAG" UUID="bc182a2d-aa35-49b2-8510-08dd956dd057"
/dev/sda2: LABEL="ONIE-BOOT" UUID="17760947-e561-4eb7-87b4-4d0ad9254c3a"
/dev/sdb1: LABEL="THUMBDRIVE" UUID="14A6-FEE0"
/dev/sda1: LABEL="EFI System" UUID="90AE-9B38"
```

4. Mount the USB drive. The `vfat` option is used for FAT32 formatted drives.

```
ONIE:/ # mount -t vfat /dev/sdb1 /mnt/media
```

5. Install the software from the USB drive, where `/mnt/media` specifies the path where the USB partition is mounted.

```
ONIE:/ # onie-nos-install /mnt/media/<image_file>
```

## 5 ONIE: Rescue

Four operations can be performed within the **ONIE: Rescue** mode:

- Operating system installations
- ONIE updates
- Diagnostics installs
- Firmware updates

---

**Note:** ONIE updates and operating system installations are covered in the **ONIE: Update** section and the **ONIE: Install OS** section. The same process applies in **ONIE: Rescue** mode for those two operations.

---

### 5.1 Installing or Updating DIAG OS

To update your existing diagnostics, or DIAGs, boot into **ONIE: Rescue** mode and follow the steps below to upgrade the DIAGs using TFTP.

---

**Note:** This process can also be run from **ONIE: Install OS** mode as well.

---

The `onie-syseeprom` command shows the current DIAG version. If a newer version is available, use this section to update the switch to the current DIAG version.

---

**Note:** For current DIAG versions refer to switch specific release notes.

---

This process updates the diagnostics (DIAGs) operating system, refer to [EDA-DIAG Tools Upgrade](#) section to verify and update the DIAG tools.

```
ONIE:/ # onie-syseeprom -g 0x2E
3.33.3.0-1
```

Use the following steps to update the DIAG OS:

1. Boot into **ONIE: Rescue** mode.
2. Enter the following command to activate the diag installer:

```
ONIE:/ # touch /tmp/diag_os_install_mode
```

3. Run the installer file.

---

**Note:** Ensure that the file location is accessible over the network.

---

```
ONIE:/ # onie-nos-install tftp://<ip address>/diag-installer-x86_64-
dell EMC_<model>_c2338-r0-<version>-<date>.bin
```

A successful installation displays the following content:

```
ONIE:/ # onie-nos-install tftp://<ip address>/diag-installer-x86_64-
dell EMC_s4100_c2338-r0-3.33.3.1-6-2018-02-05.bin
discover: Rescue mode detected. No discover stopped.
Info: Fetching tftp://<ip address>/diag-installer-x86_64-
dell EMC_s4100_c2338-r0-3.33.3.1-6-2018-02-05.bin ...
```

```

diag-installer-x86_6 100% |*****| 164M
0:00:00 ETA
ONIE: Executing installer: tftp://<ip address>/diag-installer-x86_64-
dellemc_s4100_c2338-r0-3.33.3.1-6-2018-02-05.bin
Ignoring Verifying image checksum ... OK.
cur_dir / archive_path /var/tmp/installer tmp_dir /tmp/tmp.bSyRpb
Preparing image archive ...sed -e '1,/^\^exit_marker$/d' /var/tmp/installer
| tar xf - OK.
Diag-OS Installer: platform: x86_64-dellemc_s4100_c2338-r0
  Found EDA-DIAG partition at (/dev/sda3)
  /tmp/diag_os_install_mode does not exist, installer would run in update
mode

Diag OS Installer Mode : UPDATE

EDA-DIAG dev is /dev/sda3

Mounted /dev/sda3 on /tmp/tmp.voifbf
Update mode: Copying rootfs.....

Preparing /dev/sda3 EDA-DIAG for rootfs install
untaring into /tmp/tmp.voifbf

rootfs copy done
Success: Support tarball created: /tmp/tmp.voifbf/onie-support.tar.bz2
Updating diag-os ver in system-eepram
Diagos ver 3.33.3.1-6
Deleting TLV 0x2e: Diag Version
Adding TLV 0x2e: Diag Version
Programming passed.
TlvInfo Header:
  Id String: TlvInfo
  Version: 1
  Total Length: 180
TLV Name Code Len Value
-----
Product Name 0x21 9 S4148U-ON
Part Number 0x22 6 0943V5
Serial Number 0x23 20 CN0943V5282987BQ0005
Base MAC Address 0x24 6 E4:F0:04:6B:04:42
Manufacture Date 0x25 19 11/26/2017 20:15:14
Device Version 0x26 1 1
Label Revision 0x27 3 A00
MAC Addresses 0x2A 2 256
Manufacturer 0x2B 5 28298
Country Code 0x2C 2 CN
Vendor Name 0x2D 8 Dell EMC
Service Tag 0x2F 7 4S0RPK2
Vendor Extension 0xFD 4 0x00 0x00 0x02 0xA2
Platform Name 0x28 30 x86_64-dellemc_s4148u_c2338-r0
ONIE Version 0x29 10 3.33.1.1-6

```

```
Diag Version          0x2E  10  3.33.3.1-6
CRC-32                0xFE   4  0x474D58A6
Checksum is valid.
```

```
INSTALLER DONE...
Removing /tmp/tmp.bSyRpb
ONIE: NOS install successful: tftp://100.67.2.65/diag-installer-x86_64-
dellemc_s4100_c2338-r0-3.33.3.1-6-2018-02-05.bin
ONIE: Rebooting...
```

## 5.2 Firmware Updates

To update the firmware, BIOS/CPLD perform the following steps:

1. Boot the switch into **ONIE: Rescue** mode.

---

**Note:** The install package must be first downloaded from [support.dell.com](http://support.dell.com) and accessible via http/tftp/ftp.

---

2. Enter the following command to install the package:

```
onie-self-update tftp://<ip address>/onie-firmware-x86_64-
dellemc_s4100_c2338-r0.3.33.5.1-19.bin
```

Verify that installation was successful. See the [Diagnostics](#) section to resolve any issues encountered with the firmware update or with the individual components.

## 6 ONIE: Uninstall OS

The uninstallation of the operating system is not required, however, if the installation of an operating system is not successfully completed or if there are additional issues, use the **ONIE: Uninstall OS** function to resolve any issues.

When the **ONIE: Uninstall OS** option is selected, ONIE automatically goes through and deletes any existing operating system on the switch. ONIE and diagnostics are not deleted.

---

**CAUTION:** Before deleting the operating system, verify that this is the wanted action as there is no way to stop the process once this menu option has been selected.

---

## 7 ONIE: Update

Use the **ONIE: Update** menu to update ONIE. To manually update ONIE, run the `onie-discovery-stop` command and disable the auto discovery function.

When in the CLI prompt of **ONIE: Update**, enter the following command to verify the ONIE version:

```
ONIE:/ # onie-sysinfo -v
3.33.1.1-6
```

If a different version of ONIE is required, perform the following steps to update ONIE:

1. Navigate to [support.dell.com](http://support.dell.com) and select the specific Dell EMC networking device.
2. Select **Drivers and downloads, Dell Networking <switch> ONIE v<version>**, and then select the option to view the full driver details.
3. Locate and click to download the **onie-updater-x86\_64-dell\_-<version>** file.

---

**Note:** The onie-updater file is in the .zip file.

---

### 7.1 Automatic (zero-touch) update

Automatic, or zero-touch, updates of the ONIE image is supported on Dell EMC ONIE-enabled devices. After a device successfully boots to **ONIE: Update**, auto-discovery obtains the hostname, domain name, management interface IP address, and the IP address of one or more DNS name servers from the DHCP server and DHCP options. The ONIE auto-discovery process locates the stored software image and then starts the installation. Once the updates are complete, ONIE reboots the switch and the update is complete.

If a USB drive has been previously inserted, auto-discovery searches the USB drive supporting the FAT32 or EXT2 file system. It also searches for HTTP or TFTP servers if a USB updater file is not found. The auto-discovery method repeats until a successful software image update occurs and reboots the switch.

#### 7.1.1 HTTP and TFTP

For sites that require multiple ONIE updates, the use of a generic file name and file path ensures that all the switches in the network installs the update. Use of a specific file name and file path that includes the device MAC address, ensures that only a specific device receives the intended update.

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

ONIE uses the following auto-discovery process sequence until it finds a valid onie-updater file:

1. Local USB drive with <onie-updater>.
2. `http://onie-server/<onie-updater>`.
3. `http://<ipv4>/<onie-updater>`.
  - a) IPv4 addresses are determined by pinging the IPv4 broadcast address, 255.255.255.255.
4. `http://<ipv6>/<onie-updater>`.
  - b) IPv6 addresses are determined by an IPv6 ping to "all nodes" link local multicast address, ff02::1.
5. `tftp://onie-server/<MAC>/onie-updater-x86_64-dellemc_s4100_c2338-r0`

This process repeats until it is either manually stopped or an <onie-updater> file is found.

---

**Note:** For more information on this process, see [Open Computer Project](#). The content of this document is specific to Dell EMC Networking, as where the Open Computer Project documentation is generic.

---

For HTTP or TFTP zero-touch installation, perform the following steps:

1. Install a Linux web server, such as Apache, that a switch can access after it has obtained an IP address from a DHCP server.
2. Copy the ONIE updater file to the path shared by the web server, such as `/var/www/html`, and rename it to **onie-updater** or another qualified file name.

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

3. Create a DNS entry to resolve **onie-server** to the Linux web server address.

---

**Note:** This only applies if DNS is used to identify the onie-server.

---

4. Test web access to the onie-updater file by entering `http://<server-ip-address>/<onie-updater>` into the web browser's URL field on a system that is in the same IP subnet. The directory displays the updater file.
5. Click on the file to download a local copy. The test passes when the file successfully downloads.
6. To update ONIE, perform the following steps on each switch:
  - a. With ONIE installed on the switch, connect the OOB port to the network containing the web server.
  - b. Turn on the switch and select **ONIE: Update**. The switch automatically starts the auto-discovery and zero-touch installation.
  - c. Once the ONIE update is complete, ONIE reboots the switch.

## 7.1.2 USB

The following are prerequisites for using a USB drive to install an operating system using the automatic zero-touch option:

- The USB drive needs to be in a FAT32 or EXT2 format
- The file name needs to be a qualified onie-updater file name for the switch.

---

**Note:** For a listing of qualified file names used by ONIE auto-discovery, see [Appendix C](#).

---

## 7.2 Manual update

To manually install the update, stop the auto-discovery process using the `onie-discovery-stop` command.

### 7.2.1 HTTP, TFTP, and FTP

To update ONIE manually, enter the following command to download and apply the update over the network.

---

**Note:** The following example uses TFTP, however, HTTP or FTP can also be used.

---

```
ONIE:/ # onie-self-update tftp://<ip address>/onie-updater-x86_64-  
dell EMC_s4100_c2338-r0
```



## 7.2.2 USB

The ONIE update can be manually installed using a USB drive.

---

**Note:** Before you continue, verify that the USB drive supports a FAT32 or EXT2 file system.

---

1. Plug the USB drive into the USB port on the device.
2. Enter the following command to create a USB mount location on the system:

```
ONIE:/ # mkdir /mnt/media
```

3. Validate the specific file path for the USB drive on the switch with the `blkid` command. The USB drive is highlighted in the command output below.

```
ONIE:/ # blkid
/dev/sda4: UUID="c4e653fd-b843-452f-9c9d-64429a3f945e"
/dev/sda3: LABEL="EDA-DIAG" UUID="bc182a2d-aa35-49b2-8510-08dd956dd057"
/dev/sda2: LABEL="ONIE-BOOT" UUID="17760947-e561-4eb7-87b4-4d0ad9254c3a"
/dev/sdb1: LABEL="THUMBDRIVE" UUID="14A6-FEE0"
/dev/sda1: LABEL="EFI System" UUID="90AE-9B38"
```

4. Mount the USB drive. The `vfat` option is used for FAT32 formatted drives.

```
ONIE:/ # mount -t vfat /dev/sdb1 /mnt/media
```

5. Enter the following command to install the software from the USB drive.

---

**Note:** Replace `/mnt/media` with the file path where the USB partition is mounted.

---

```
ONIE:/ # onie-nos-install /mnt/media/<image_file>
```

## 8 ONIE: Embed mode

The **ONIE: Embed** mode is used to fully reinstall ONIE. This option is rarely used as ONIE is usually pre-installed on Dell EMC Networking devices. If use of **ONIE: Embed** is required, see the **ONIE Recovery** procedure included in the ONIE .zip file for your specific switch which is available from the Drivers and Downloads section of [support.dell.com](http://support.dell.com).

## 9 EDA-DIAG

The EDA-DIAG within ONIE is used to validate hardware or to determine the current BIOS, CPLD, or FPGA versions. EDA-DIAG is also used if the ONIE firmware installation procedure fails, by upgrading the BIOS, CPLD, or FPGA images individually.

---

**Note:** Not all switches have FPGA images.

---

The Dell EMC Networking S4048-ON and Dell EMC Networking S3048-ON use a different form of ONIE Diagnostics called DCLI.

---

**Note:** If using the DCLI diagnostics, see [Appendix B](#).

---

The information in this section outlines the upgrade procedures for EDA-DIAG.

---

**Note:** To ensure that the latest procedure is used, reference the most current release notes from [support.dell.com](http://support.dell.com).

---

When EDA-DIAG boots to Linux, a username and password is required. Enter **root** for the user name and **calvin** for the password.

### 9.1 EDA-DIAG upgrade

To upgrade the EDA-DIAG, navigate to [support.dell.com](http://support.dell.com) for the latest diagnostic OS code. Compare the version listed against the software version installed and upgrade if the version installed is not the most current version.

---

**Note:** See [Installing or Updating DIAG OS](#) for information about diagnostic installation and updates.

---

When logging into the diag module, the Diag OS version displays:

```
dellemc-diag-os login: root
Password:
Last login: Mon Jul 23 22:18:21 UTC 2018 on ttyS0
Linux dellemc-diag-os 3.15.10 #1 SMP Thu Jan 18 22:15:12 PST 2018 x86_64
```

```
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
```

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
```

```
Diag OS version S4100 DIAG OS 3.33.3.1-6
```

```
Build date/time Mon Feb 5 04:56:02 PST 2018
```

```
Build server build-eqx-03
```

```
Build by netbuild
```

```
Kernel Info:
```

```
Linux 3.15.10 #1 SMP Thu Jan 18 22:15:12 PST 2018 x86_64 GNU/Linux
```

```
Debian GNU/Linux 8 \n \l
```

To verify the version within ONIE, enter the following command:

```
ONIE:/ # onie-syseeprom -g 0x2E
3.33.3.1-6
```

## 9.2 Hardware diagnostics

Use the `edatool` command to test the hardware. The `edatool` command determines the tool versions installed and performs hardware diagnostics. The `edatool` command references the versions installed and determines whether an upgrade is required.

---

**Note:** If `edatool` does not run, see the [EDA-DIAG tools upgrade](#) section for information on installing diagnostic tools.

---

```
root@dellemc-diag-os:~# edatool
*****
*   Diagnostics Application   *
*****
Dell-EMC Diag edatool version 1.4, package 3.33.4.1-1 2017/05/12
Dell-EMC Diag cpldupgradetool - version 1.1 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag cputool - version 1.1 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag eepromtool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag fantool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag gpiotool - version 1.4 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag i2ctool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag ledtool - version 1.0 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag lpctool - version 1.0 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag memtool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag nputool - version 1.0 sdk-6.5.7 package 3.33.4.1-1
2017/05/12
Dell-EMC Diag nvramtool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag opticstool - version 1.0 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag pcitool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag phytool - version 1.1 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag plttool - version 1.5 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag psutool - version 1.4 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag rtctool - version 1.1 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag smbiostool - version 1.2 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag storagetool - version 1.1 package 3.33.4.1-1 2017/05/12
Dell-EMC Diag temptool - version 1.4 package 3.33.4.1-1 2017/05/12
Testing PCI devices:
+ Checking PCI 00:00.0, ID=1f0f8086 ..... Passed
+ Checking PCI 00:01.0, ID=1f108086 ..... Passed
+ Checking PCI 00:02.0, ID=1f118086 ..... Passed
+ Checking PCI 00:03.0, ID=1f128086 ..... Passed
:
```

## 9.3 EDA-DIAG tools upgrade

Upgrade diagnostic tools when a new version is available or if the Diag operating system has been upgraded. To install or upgrade diagnostic tools:

1. Download the diagnostic tools from [support.dell.com](http://support.dell.com) and unzip.
2. Copy the dn-diags-sssss-DiagOS-`vvvvv-ddddd`.deb file to the switch.

```
root@dellemc-diag-os:~# ls
dn-diags-S4100-DiagOS-3.33.4.1-6-2018-01-21.deb
```

3. Run the `dpkg` command to upgrade the tools.

```
root@dellemc-diag-os:~# dpkg --install dn-diags-S4100-DiagOS-3.33.4.1-6-2018-01-21.deb
Selecting previously unselected package dn-diags-s4100-on.deb.
(Reading database ... 19769 files and directories currently installed.)
Preparing to unpack dn-diags-S4100-DiagOS-3.33.4.1-6-2018-01-21.deb ...
Unpacking dn-diags-s4100-on.deb (3.33.4.1-6) ...
Setting up dn-diags-s4100-on.deb (3.33.4.1-6) ...
Platform detected S4148U [12]
Copying config dir contents
Copying bin dir contents
```

## 9.4 EDA-DIAG BIOS upgrade

Upgrade the BIOS image using the steps within the [ONIE: Rescue Firmware update](#) section. If this process is unsuccessful, use the following steps to upgrade the individual BIOS component using the `smbiostool` command:

1. Check the current switch BIOS version with the following command:

```
root@dellemc-diag-os:~# smbiostool -biosversion
3.33.0.0-4
```

2. Compare with available firmware version for the specific switch on [support.dell.com](http://support.dell.com).
3. Download and uncompress the file.
4. Run the following command to update BIOS:

```
root@dellemc-diag-os:~# smbiostool -biosupdate <filename>
```

## 9.5 EDA-DIAG CPLD upgrade

To update the CPLD, see the [ONIE: Rescue Firmware update section](#). If this process is unsuccessful, use the following steps to upgrade the individual CPLD component.

The CPLD versions can be checked with the following command:

```
root@dellemc-diag-os:~# cpldupgradetool --cpldver
System CPLD Version 1.1
Master CPLD Version 1.0
Slave CPLD Version 0.7
```

To upgrade CPLD from EDA-DIAG:

1. Download the latest version of the CPLD image from [support.dell.com](http://support.dell.com).
2. Use the following command to copy the CPLD image to the switch:

```
root@dell EMC-diag-os:~# cpdupgradetool --write --image=s41x8_1.1_1.0_0.7.vme
```

## 9.6 EDA-DIAG SMF-MSS upgrade

The SmartFusion-Microcontroller Subsystem (SMF-MSS) can be verified or upgraded from the EDA-DIAG, however, each switch may have a specific procedure for this update.

---

**Note:** See the Hardware Diagnostic Guide specific to your switch, to update the SMF-MSS.

---

A switch that does not have an SMF-MSS image will not have the `smarttool` command available for use. To verify the SMF-MSS version, enter the following command:

```
root@dell-diag-os:~# smarttool -gmv /dev/ttyS0
MSS image version is - V2.4
```

## 9.7 Exit EDA-DIAG

To exit back to the ONIE menu, run the following command:

```
root@dell EMC-diag-os:~# reboot
```

## A Manually assign an IP address

To manually assign an IP address:

1. Enter the following command to stop the ONIE discovery process:

```
onie-discovery-stop
```

2. If a DHCP server is not used, configure the IP address and subnet mask on the management port, where x.x.x.x represents your internal IP address.

```
ifconfig eth0 x.x.x.x netmask 255.255.255.0 up
```

3. Use the following command to verify that the IP address has been assigned to eth0:

```
ONIE:/ # ifconfig
eth0      Link encap:Ethernet  HWaddr 14:18:77:E0:69:31
          inet addr:100.67.170.221  Bcast:100.67.170.255
Mask:255.255.255.0
          inet6 addr: fe80::1618:77ff:fee0:6931/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:28 errors:0 dropped:0 overruns:0 frame:0
          TX packets:13 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:11176 (10.9 KiB)  TX bytes:2712 (2.6 KiB)
          Memory: dfe60000-dfe7ffff
```

4. If the server is in a separate subnet, add a default route using the following command:

```
ONIE:/ # route add default gw 100.67.170.254
```

5. Verify the default route was successfully created.

```
ONIE:/ # route -n
Kernel IP routing table
Destination Gateway      Genmask         Flags Metric Ref    Use Iface
0.0.0.0     100.67.170.254  0.0.0.0         UG    0      0      0 eth0
100.67.170.0 0.0.0.0         255.255.255.0  U    0      0      0 eth0
```

---

**Note:** This process is not persistent and will need to be reconfigured after a reboot.

---

## B DCLI diagnostics

This section applies to the Dell EMC Networking S3048-ON and the Dell EMC Networking S4048-ON. These switches use the DCLI diagnostics. All other switches use the EDA diagnostics.

**Note:** See [Diagnostics](#) for information on the EDA diagnostics.

```
GNU GRUB  version 2.02~beta2+e4a1fe391

+-----+
| *ONIE: Install OS |
| ONIE: Rescue      |
| ONIE: Uninstall OS |
| ONIE: Update ONIE |
| ONIE: Embed ONIE  |
| PLATFORM-DELL-DIAG |
+-----+

Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands
before booting or `c' for a command-line.
The highlighted entry will be executed automatically in 2s.
```

Figure 4 ONIE sub menu with DCLI Diagnostics

PLATFORM-DELL-DIAG boots to DCLI prompt. No login/password.

DCLI supports CPLD image upgrades but not BIOS upgrades.

CPLD/FPGA versions are shown with following command:

```
DCLI-> showSystemInfo
***** S4048ON SYSTEM INFO *****

Software Info:
    SW Name           : Dell Networking OS
    SW Version        : 1.0(0.14)

Board Info:
    Board Revision    : 0x2
    Board Service Tag : 59D7VS1

CPLD Info:
    System CPLD Version : 15.2
    Master CPLD Version  : 12
```



```

Slave CPLD Version      : 5

Packed CPLD image Info:
  Packed System CPLD Version : 15.2
  Packed Master CPLD Version  : 12
  Packed Slave CPLD Version   : 5

PPId Info:
  PPId                      : TW0J09D32829849Q0048
  PPId Revision              : X01

SysEeprom Info:
  Base MAC Address          : 34:17:eb:f2:52:c4
  Country Code              : TW
  Part Number               : 0J09D3
  Manufacturer              : 28298
  Manufacture Date          : 10/03/2014 13:39:37
  Product Name              :

```

## B.1 DCLI upgrade

To verify the current version of DIAGs installed:

1. Access the **Platform-DIAGs** menu.
2. From the DIAGs DCLI command prompt, enter the `showSystemInfo` command to verify the current version. The version of the DIAGs is also presented during the loading process.

---

**Note:** This example was done using the Dell EMC Networking S4048-ON. For current DCLI diagnostic versions, see the Release Notes specific to your switch.

---

If a newer version of DIAGs is needed, update the DIAGs using the following steps:

3. Login to **ONIE: Update** sub menu.
4. Run the `onie-discover-stop` command to disable the onie auto discovery process.
5. Ensure that the most current version of the `INSTALLER-DND-SK-x.x.x.x.bin` file has been downloaded from the support site and placed in the TFTP server.

---

**Note:** Download the `INSTALLER-DND-SG-<version>.bin` file from [support.dell.com](http://support.dell.com). Navigate to the specific Dell EMC networking device page. Go to Drivers and downloads > Dell Networking Diagnostics for <switch> Open Networking Switch and then select view full driver details.

---

6. Run the following command to download and install the file:

```

ONIE:/ # onie-nos-install tftp://<ip address>/INSTALLER-DND-SK-
<version>.bin

```

The following output should be expected:

```

ONIE:/ # onie-nos-install tftp://<ip address>/INSTALLER-DND-SK-
1.0.0.14.bin
Discover: Rescue mode detected. No discover stopped.

```

```
Info: Fetching tftp://100.67.2.65/INSTALLER-DND-SK-1.0.0.14.bin ...
random: nonblocking pool is initialized
INSTALLER-DND-SK-1.0 100% |*****| 27143k
0:00:00 ETA
ONIE: Executing installer: tftp://100.67.2.65/INSTALLER-DND-SK-
1.0.0.14.bin
Verifying image checksum ... OK.
Preparing image archive from /var/tmp/installer ... Done.
Mounting /dev/sda3...mkfs.fat 3.0.26 (2014-03-07)
Done.
Copying Images ...Done.
Installing Menu Entry ...Done
All Done
ONIE: NOS install successfull: tftp://100.67.2.65/INSTALLER-DND-SK-
1.0.0.14.bin
ONIE: Rebooting...
```

## B.2 Hardware diagnostics

To run hardware diagnostics, enter the `testall` command.

```
DCLI-> testall
Dell Networking OS S4048-ON BOARD DIAGNOSTIC [0]
:
```

## B.3 DCLI BIOS upgrade

DCLI does not support BIOS image upgrades. Return to **ONIE: Rescue** mode to upgrade the BIOS.

## B.4 DCLI CPLD upgrade

From the DCLI prompt:

1. Enter the `upgradeCPLDImage` command to start the CPLD upgrade:

```
DCLI-> upgradeCPLDImage
Upgrade CPLD Image [YES/NO]: YES
```

```
WARNING: Please do not POWERCYCLE or POWER OFF the system!
CPLD upgrade started ... (May take upto 10 minutes!) yes
CPLD Upgrade done, comment = Diamond Deployment Tool 3.7
CREATION DATE: Fri Sep 23 09:09:14 2016
```

2. When the upgrade is done, manually power-cycle the switch using the `powercycle` command.

```
DCLI-> powercycle
Power cycling the device ...
```

## B.5 Exit DLCI

DLCI->reload

---

**Note:** Do not enter 'exit' from the DLCI prompt or the switch, otherwise you will need to power cycle the switch.

---

## C Qualified ONIE file names

The following file names are for the Dell EMC Networking S4048-ON. The s4000 field differs from switch to switch.

Note: To reach a larger grouping of switches, Dell EMC recommends the use of a more generic file name.

ONIE install OS:

- onie-installer-x86\_64-dell\_s4000\_c2338-r0
- onie-installer-x86\_64-dell\_s4000\_c2338
- onie-installer-dell\_s4000\_c2338
- onie-installer-x86\_64-bcm
- onie-installer-x86\_64
- onie-installer

ONIE update:

- onie-updater-x86\_64-dell\_s4000\_c2338-r0
- onie-updater-x86\_64-dell\_s4000\_c2338
- onie-updater-dell\_s4000\_c2338
- onie-updater-x86\_64-bcm
- onie-updater-x86\_64
- onie-updater

## D Validated hardware and software versions

The following tables list the hardware and components used to configure and validate the example configurations in this guide.

### D.1 Dell EMC networking switches

Table 2 Versions

Qty	Item	OS/Firmware version	
1	Dell EMC Networking S4148U-ON	ONIE software	3.33.1.1-4
		DIAG OS	3.33.3.0-1
		DIAG tools	3.33.4.1-6
		Firmware	3.33.5.1-19
1	Dell EMC Networking S4048-ON	ONIE software	3.21.5.3
		DIAG OS	1.0.0.14
		Firmware	3.21.5.3

## E Technical support and resources

All future switches and software are available at [support.dell.com](http://support.dell.com).

Switch	Description	Link	Comments
Dell EMC Networking S3048-ON	Open Networking Troubleshooting Guide	<a href="https://www.dell.com/support/manuals/us/en/19/force10-s3048-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/force10-s3048-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=K3KR6">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=K3KR6</a>	.zip Onie_installer Onie_recovery Onie_recovery_notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=X1GJP">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=X1GJP</a>	.zip INSTALLER-DND-SG-x.x.x.x.bin System Release Notes
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=0PFJH">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=0PFJH</a>	.zip BIOS.zip CPLD.zip Onie_FW_updater Release Notes
Dell EMC Networking S4048-ON	Open Networking Troubleshooting Guide	<a href="https://www.dell.com/support/manuals/us/en/19/force10-s4048-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/force10-s4048-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us</a>	HTML

	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TPNCP">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TPNCP</a>	.zip Onie_installer Onie_recovery Onie_recovery_notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GK22T">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GK22T</a>	.zip INSTALLER-DND SK-x.x.x.x.bin Release Notes
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=V4DJ1">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=V4DJ1</a>	.zip BIOS.zip CPLD.zip Onie_FW_updater Release Notes
Dell EMC Networking S4048T-ON	Open Networking Hardware Diagnostic Guide	<a href="https://topics-cdn.dell.com/pdf/networking-s4048t-on_specifications_en-us.pdf">https://topics-cdn.dell.com/pdf/networking-s4048t-on_specifications_en-us.pdf</a>	.pdf
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=XTDTN">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=XTDTN</a>	zip Onie_installer Onie_recovery Onie_recovery_notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D7F0N">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D7F0N</a>	.zip Diag-installer S4048T Release Notes
	Diagnostic tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=YGX5J">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=YGX5J</a>	.zip Dn-diags-S4048T-DiagOS.xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=98CDR">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=98CDR</a>	.zip Onie-firmware

			BIOS CPLD
Dell EMC Networking S4112-ON and Dell EMC Networking S4112T-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/manuals/us/en/19/networking-s4112f-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/networking-s4112f-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=78N0W">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=78N0W</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=Y1T02">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=Y1T02</a>	.zip Diag-installer
	Diagnostic tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=M0PFV">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=M0PFV</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=N45G5">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=N45G5</a>	.zip Onie-firmware BIOS CPLD
Dell EMC Networking S4128-ON and Dell EMC Networking S4128T-ON	Open Networking Hardware Diagnostic Guide	<a href="https://downloads.dell.com/manuals/all-products/esuprt_ser_stor_net/esuprt_networking/networking-s4128f-on_specifications_en-us.pdf">https://downloads.dell.com/manuals/all-products/esuprt_ser_stor_net/esuprt_networking/networking-s4128f-on_specifications_en-us.pdf</a>	.pdf



	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=CH1RW">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=CH1RW</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5</a>	.zip Diag OS Installer
	Diagnostic tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FT8DP">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FT8DP</a>	.zip Onie-firmware BIOS CPLD
Dell EMC Networking S4148F-ON, Dell EMC Networking S4148T-ON, and Dell EMC Networking S4148FE-ON	Open Networking Hardware Diagnostic Guide	<a href="https://downloads.dell.com/manuals/allproducts/esuprt_ser_stor_net/esuprt_networking/networking-s4148f-on_specifications_en-us.pdf">https://downloads.dell.com/manuals/allproducts/esuprt_ser_stor_net/esuprt_networking/networking-s4148f-on_specifications_en-us.pdf</a>	.pdf
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=CH1RW">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=CH1RW</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostic OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5</a>	.zip Diag OS Installer
	Diagnostic tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb

	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FT8DP">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FT8DP</a>	.zip Onie-firmware BIOS CPLD
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	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=TJ9N5</a>	.zip Diag OS Installer
	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=GXXTV</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
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Dell EMC Networking S4248FB-ON and Dell EMC Networking S4248FBL-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/manuals/us/en/19/networking-s4248fb-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/networking-s4248fb-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us</a>	HTML

	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=C2W9R">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=C2W9R</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=1DWN8">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=1DWN8</a>	.zip Diag OS Installer
	Diag Tools for S4248FB/FBL-ON	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=MN65P">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=MN65P</a>	.zip Dn-diags-S4200-DiagOS-xxxxx.deb
	Diag Tools for S4248FBL-ON	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=4CD1C">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=4CD1C</a>	.zip Dn-diags-S4248FBL-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FF98P">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=FF98P</a>	.zip Onie-firmware BIOS CPLD
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	ONIE Software; Diagnostic OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=3D0V5">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=3D0V5</a>	.zip Onie-updater Diag-installer
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	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=18VXM">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=18VXM</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D4J38">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D4J38</a>	.zip Diag OS Installer
	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=21JT1">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=21JT1</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=34V0J">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=34V0J</a>	.zip Onie-firmware BIOS CPLD
Dell EMC Networking S5148F-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/manuals/us/en/19/networking-s5148f-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/networking-s5148f-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D3YRM">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=D3YRM</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=V9C6J">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=V9C6J</a>	.zip Diag OS Installer

	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=KMTRX">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=KMTRX</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=F2R2C">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=F2R2C</a>	.zip Onie-firmware BIOS CPLD
Dell EMC Networking S6000-ON	Open Networking Troubleshooting Guide	<a href="https://www.dell.com/support/manuals/us/en/19/force10-s6000-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/force10-s6000-on/on-troubleshooting-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us</a>	HTML
	ONIE Software; Diagnostics OS; Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=H8TWD">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=H8TWD</a>	.zip ONIE Updater ONIE Recovery Diag OS BIOS Updater Release Notes
Dell EMC Networking S6010-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/manuals/us/en/19/networking-s6010-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/networking-s6010-on/generic-on-hw-diag-pub/about-this-guide?guid=guid-09038dc8-cfd0-438d-bda2-fab9792eb801&amp;lang=en-us</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=2HCXN">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=2HCXN</a>	.zip ONIE Updater

			ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=4178G">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=4178G</a>	.zip Diag OS Installer
	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=09J4V">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=09J4V</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=7Xfv8">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=7Xfv8</a>	.zip Onie-firmware BIOS CPLD
Dell EMC Networking S6100-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/home/us/en/04/product-support/product/networking-s6100-on/manuals">https://www.dell.com/support/home/us/en/04/product-support/product/networking-s6100-on/manuals</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/n/19/drivers/driversdetails?driverId=PPX8P">https://www.dell.com/support/home/us/n/19/drivers/driversdetails?driverId=PPX8P</a>	.zip ONIE Updater ONIE Recovery Release Notes
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	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/n/19/drivers/driversdetails?driverId=9MGPP">https://www.dell.com/support/home/us/n/19/drivers/driversdetails?driverId=9MGPP</a>	.zip Dn-diags-S4100-DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=W8RCG">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=W8RCG</a>	.zip Onie-firmware BIOS CPLD

Dell EMC Networking Z9100-ON	Open Networking Hardware Diagnostic Guide	<a href="https://www.dell.com/support/manuals/us/en/19/networking-z9100/z9100-on-hw-diag-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us">https://www.dell.com/support/manuals/us/en/19/networking-z9100/z9100-on-hw-diag-pub/about-this-guide?guid=guid-99f0717c-c76f-43c4-9307-e0f56f8fc9fb&amp;lang=en-us</a>	HTML
	ONIE Software	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=H2P74">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=H2P74</a>	.zip ONIE Updater ONIE Recovery Release Notes
	Diagnostics OS	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=K9D2F">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=K9D2F</a>	.zip Diag OS Installer
	Diagnostic Tools	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=JMFJV">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=JMFJV</a>	.zip Dn-diags-S4100- DiagOS-xxxxx.deb
	Firmware updater	<a href="https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=C3N00">https://www.dell.com/support/home/us/en/19/drivers/driversdetails?driverId=C3N00</a>	.zip Onie-firmware BIOS CPLD

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