

# iDRAC8/7 with Lifecycle Controller Version 2.63.60.61

Release Notes

## Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# Overview

The Integrated Dell Remote Access Controller (iDRAC) is designed to make server administrators more productive and improve the overall availability of Dell servers.

iDRAC alerts administrators to server issues, helps them perform remote server management, and reduces the need for physical access to the server. Additionally, iDRAC enables administrators to deploy, monitor, manage, configure, update, and troubleshoot Dell EMC servers from any location without using any agents. It accomplishes this regardless of the operating system or hypervisor presence or state.

iDRAC also provides an out-of-band mechanism for configuring the platform, applying firmware updates, saving or restoring a system backup, or deploying an operating system, either by using a GUI or a remote scripting language, such as Redfish or RACADM.

## Version

iDRAC8/7 with Lifecycle Controller 2.63.60.61

## Release date

May 2019

## Previous version

- 2.62.60.60
- 2.61.60.60
- 2.60.60.60
- 2.52.52.52
- 2.50.50.50
- 2.41.40.40
- 2.40.40.40
- 2.35.35.35
- 2.32.31.30
- 2.30.30.30

## Importance

Urgent: Dell highly recommends applying this update as soon as possible. The update contains changes to improve the reliability and availability of your Dell system.

## Platforms affected

13<sup>th</sup> generation platforms:

- PowerEdge C4130
- PowerEdge C6320
- PowerEdge C6320p
- PowerEdge FC430
- PowerEdge FC630
- PowerEdge FC830
- PowerEdge M630
- PowerEdge M830
- PowerEdge R230
- PowerEdge R330
- PowerEdge R430
- PowerEdge R530
- PowerEdge R530XD
- PowerEdge R630
- PowerEdge R730
- PowerEdge R730XD
- PowerEdge R830
- PowerEdge R930
- PowerEdge T130
- PowerEdge T330
- PowerEdge T430
- PowerEdge T630
- Precision Rack 7910

12<sup>th</sup> generation platforms:

- PowerEdge FM120
- PowerEdge M420
- PowerEdge M520
- PowerEdge M620
- PowerEdge M820
- PowerEdge R220
- PowerEdge R320
- PowerEdge R420
- PowerEdge R520
- PowerEdge R620
- PowerEdge R720
- PowerEdge R720xd
- PowerEdge R820

- PowerEdge R920
- PowerEdge T320
- PowerEdge T420
- PowerEdge T620

# What is supported

## License requirements

- Software licensing has replaced hardware licensing.
- Many features in Lifecycle Controller are licensed. You must install the appropriate license to use these features.

For more information, see the iDRAC 2.60.60.60 User's Guide and the Dell Lifecycle Controller GUI 2.60.60.60 User's Guide available at [www.dell.com/idracmanuals](http://www.dell.com/idracmanuals).

## Supported managed server operating systems and hypervisors

### Microsoft Windows

- Server 2012 R2 Foundation Edition
- Server 2012 R2 Essentials Edition
- Server 2012 R2 Standard Edition
- Server 2012 R2 Datacenter Edition
- Server 2016 Essentials Edition
- Server 2016 Standard Edition
- Server 2016 Datacenter Edition
- WinPE 5.0 64-bit
- WinPE 10

### RedHat

- RHEL 6.9
- RHEL 7.5

### SLES

- SLES 12 SP3

### Ubuntu

- Ubuntu 16.04.4
- Ubuntu 18.04

### VMware

- ESXi 6.5 U2
- ESXi 6.7

### Citrix

- XenServer 7.1 CU1

## Supported web browsers

- Microsoft Internet Explorer 11
- Microsoft EDGE
- Safari version 8.0.8
- Safari version 9.0.3
- Mozilla Firefox version 57
- Mozilla Firefox version 58
- Google Chrome version 62
- Google Chrome version 63

## Java support

- Java — Oracle version

## New and enhanced features

### iDRAC and LC firmware

- Added support for firmware updates through HTTPS

## Monitoring and Alerting

- 122519 and 125310: Removed the following attributes and properties from the Hardware Inventory in SupportAssist collection:
  - SHA26 password
  - Password salt
  - iDRAC user keys
  - IPMI LAN
- 114728: Fixed the low memory state that resulted in unavailability of iDRAC.

## Important notes

- 1 The drivers exposed by LC are present in a read-only drive labeled OEMDRV and the drive is active for 18 hours. During this period:
  - You cannot install any DUPs.
  - LC cannot invoke CSIOR.
- However, if an AC power cycle (cold boot) is performed, the OEMDRV drive is automatically deleted.
- 2 CPLD firmware update has no impact on Trusted Platform Module enablement.
- 3 Depending on the virtual storage device attached through iDRAC, that is, USB drive or CD/DVD .ISO file, LC displays **Virtual Floppy** or **Virtual CD** respectively.
- 4 If Test Network Connection fails for a valid address, try configuring the network settings again. If the issue persists, restart the system and retry the operation.
- 5 When you reset or update the iDRAC, you must reboot LC if it is launched already. If you fail to reboot, LC may behave unexpectedly.
- 6 On PowerEdge FC630, PowerEdge FC830, and PowerEdge FC430 systems, part replacement is not supported if a single PERC (FS332) is replaced with a dual PERC (FD332) or vice-versa.
- 7 After performing a firmware update or rollback operations from LC, the host is rebooted by default. Reboot the host server again to display the updated firmware versions in the View Current Versions wizard.
- 8 When you update a 12th generation PowerEdge server backplane-expander firmware for PowerEdge R920 firmware to version 0.33 or 2.03, the comparison page displays only one expander entry. However, firmware for both the expanders is updated.
- 9 Fibre channel NIC cards with two or four ports are displayed as a single port card in Lifecycle Controller. However, all ports are updated when a firmware update is performed.
- 10 The option to enable or disable the disk cache policy for SWRAID controllers is supported only on SWRAID controller driver version 4.1.0-0025 or later.
- 11 ResetKeys under Action in the SecureBoot resource is available only on systems with supported BIOS.
- 12 The SecureBoot navigation link is available under Computer System only if the SecureBoot feature is supported by the BIOS installed on the system.
- 13 Rollback is not supported for CPLD.
- 14 The certificate warning message that is displayed during an HTTPS transaction is due to the server presenting a certificate issued by an entity that is not trusted by the system, or certificate that is presented by the server is expired.

# Limitations

- If Flex Address is enabled on Chassis Management Controllers (CMC), iDRAC and LC do not display the same MAC addresses. To view the chassis-assigned MAC address, use the iDRAC web interface or the CMC web interface. Go to **General > Network Settings**.
- Lifecycle Controller may go into an infinite loop when a network operation is tried with an incorrect NFS share name. Restart Lifecycle Controller and retry the operation with the correct NFS share name details.
- If NPAR is enabled, LC might show unexpected behavior when configuring network settings. Disable NPAR option and execute the network setting configurations. To disable the NPAR option, go to **System Setup > Device Setting**.
- The process of retrieving IPv6 address from the DHCP server with VLAN connection takes a few minutes. Wait for a few minutes and check the **Network Settings** page to view the assigned IPv6 address.
- Deployment of Windows Server operating systems using LC may fail with one of the following message:
  - Windows installation cannot continue because a required driver could not be installed.
  - Product key required.
  - Windows cannot find the software license terms.

This happens when the Windows setup copies the driver to the scratch space (X: drive) and the scratch space becomes full. To resolve this issue, do any of the following:

- Remove all the installed add-on devices before starting the OS installation. After the OS installation is complete, connect the add-on devices and manually install the remaining drivers using Dell Update Packages (DUPs).
- To avoid physically removing the hardware, disable the PCIe slots in the BIOS.
- Increase scratch space size beyond 32 MB using `DISM set-scratchspace` command when creating customized deployment. For more details, see Microsoft's documentation.
- LC supports the following characters for username and password:

<b>Alphabets</b>	a-z, A-Z
<b>Numbers</b>	0-9
<b>Special characters</b>	- , _ . .

- If LC is open or running while you are updating iDRAC firmware using a tool other than LC, you may notice unexpected behavior. Use Lifecycle Controller after the firmware is successfully updated.
- If the iDRAC firmware update is interrupted, you may have to wait up to 30 minutes before attempting another firmware update.
- From LC UI, only Windows systems can be deployed by using software RAID controller.
- Firmware update is supported only for LAN on Motherboards (LoM), Network Daughter Cards (NDC), and network adapters from Broadcom, QLogic, and Intel, and some of the QLogic and Emulex fiber channel cards. For the list of supported fiber channel cards, see the LC 2.60.60.60 User's Guide available at [dell.com/idracmanuals](http://dell.com/idracmanuals).
- After the CPLD firmware is updated on modular systems, the firmware update date is displayed as 2000-01-01 on the **View Current Versions** page. The update date and time is displayed according to the time zone configured on the server.
- On some modular systems, after a firmware update, the Lifecycle Log displays the time-stamp as 1999-12-31 instead of the date on which the firmware update was performed
- While viewing the current hardware inventory, some properties related to devices installed in PowerEdge VRTX system are not displayed.
- LC can import and view an iDRAC license but cannot export or delete the iDRAC license. The iDRAC license can be deleted from iDRAC GUI.
- The iSCSI offload attribute can be enabled only on two of the four available ports. If a card, which has this attribute enabled on two of its ports, is replaced with another card that has the attribute enabled on the other two ports, an error occurs. The firmware does not allow the attribute to be set because it is already set on the other two ports.
- Windows operating systems support both the manual and unattended installation features. However, Lifecycle Controller supports the unattended installation feature for Windows and RHEL-7 operating systems only.

- VLAN Configuration is not supported on all vendor FC cards and the following Emulex cards.
  - Emulex OneConnect OCe14102-U1-D 2-port PCIe 10GbE CNA
  - Emulex OneConnect OCm14104-U1-D 4-port 10GbE rNDC CNA
  - Emulex OneConnect OCm14102-U5-D 2-port 10GbE Mezz CNA
  - Emulex OneConnect OCm14102-U4-D 2-port 10GbE bNDC CNA
  - Emulex OneConnect OCe14102-N1-D 2-port PCIe 10GbE NIC
  - Emulex OneConnect OCm14104-N1-D 4-port 10GbE rNDC CNA
  - Emulex OneConnect OCm14102-N5-D 2-port 10GbE Mezz CNA
  - Emulex OneConnect OCm14102-N6-D 2-port 10GbE bNDC CNA
- LC displays two or more drive names for some CDs or DVDs, such as the ones containing operating systems.
- Network operations such as Update, Export, or Import may take more time than expected. The delay may occur because the source or destination share is not reachable or does not exist, or due to other network issues.
- If the operating system (OS) selected for installation and the OS on the media used are different, LC displays a warning message. However, while installing Windows OS, the warning message appears only when the bit count (x86 or x64) of the OS does not match. For example, if Windows Server 2008 x64 is selected for installation and Windows Server 2008 x86 media is used, the warning is displayed.
- LC does not support OS deployment on Dell Precision Workstation R7920.
- When NPAR is enabled, the port numbers displayed on the LC Network Settings page (**Settings > Network Settings**) do not match the port numbers displayed on the Device Settings page (**System Setup > Advanced Hardware Configuration > Device Settings**).
- Lifecycle Controller supports OS deployment on bootable devices (systems without a RAID controller) in the BIOS mode only.
- In the Spanish help page, the word **encrypted** is incorrectly translated as **scripted** in Step 3 OS deployment.
- Operating system installation might fail if the server has only PCIe NVMe SSD drives and if you have selected BIOS as boot mode. If server has both RAID and non-RAID hard disks (NVMe SSD), it displays the RAID configuration option. However, the non-RAID disks are not displayed on RAID configuration page.
- When you update the firmware on a Broadcom NetXtreme and QLogic BCM57xx and BCM57xxx (previously known as Broadcom NetXtreme ||) adapters, the following issue occurs: After installing the QLogic-specific firmware update package on the BCM57xx or BCM57xxx adapter family, the rollback version is not available if the previously installed firmware was provided by a legacy shared firmware update package. However, if the legacy shared firmware version is available as a rollback version for the Broadcom NetXtreme adapter, then the same version will be available for the QLogic BCM57xx and BCM57xxx adapters.  
The issue occurs because separate firmware update packages are provided for the Broadcom NetXtreme adapters and QLogic BCM57xx and BCM57xxx adapters due to the acquisition of the Broadcom NetXtreme || cards by QLogic. Prior to the acquisition, a common shared firmware update package was provided.
- The following Intel cards do not support firmware rollback and may not display all the ports on the Comparison page while updating the firmware:
  - Intel Ethernet Converged Network Adapter X710 - Quad Port
  - Intel Ethernet Converged Network Adapter X710 - Dual Port
  - Intel Ethernet Converged Network Adapter XL710
  - Intel Ethernet 10G 4P X710/1350 rNDC
  - Intel Ethernet 10G 4P X710 SFP + rNDC
  - Intel Ethernet 10G 4P X710-k bNDC
  - Intel Ethernet 10G 2P X710-k bNDC
  - Intel Ethernet 40G 2P XL710 QSFP + rNDC
  - Intel Gigabit I350-t LOM
  - Intel(R) Ethernet 10G X520 LOM
  - Intel(R) Ethernet 10G 2P X550-t Adapter
- While installing the operating system on 12th generation PowerEdge servers by using LC UI, ensure that the virtual media is attached on the server before BIOS boot.
- On NANO operating system, you cannot install a firmware or driver DUP if it is in .exe format.
- During the RAID Configuration, on the Step 3 of 5: Select Physical Disk page, the scroll bar of Select Physical Pool table is not displayed. To view the scroll bar:
  - Hover your mouse over the right edge of the table.

- Press Tab until the table is selected.

This issue is observed when you select the RAID level as 0, 5, 6, 10, 50, or 60.

- When using Internet Explorer or Google Chrome to access the HTML5 virtual console from a Windows OS, the floating menu at the top of the window may not be displayed.

# Known Issues — To be fixed in future releases

## 1 Description

Some of the supported components are not displayed on the **Firmware Update > View Current Versions** page.

### Workaround

Restart the system and open View Current Versions page.

**Systems affected:** All systems supported by this release.

Tracking number: N/A

## 2 Description

If a Mellanox card is present in the system, then under Network Settings, the port number must be displayed as Port 1 and Port 2 because it is a dual port. But, the port number is displayed as Port 1 for both the ports or the port numbers are not displayed.

### Workaround

To distinguish between the port numbers, see the MAC address or the Device Settings. You can access Device Settings in the following methods:

- During Post, press F2, and select System Setup.
- On the Lifecycle Controller Home page, click System Setup, and then click Advanced Hardware Configuration.

**Systems affected:** All systems supported by this release.

Tracking number: N/A

## 3 Description

After you successfully update the firmware of a CPLD on a modular server, and then perform a firmware update operation of a component that requires a system restart (such as BIOS), the server is automatically and repeatedly restarted.

### Workaround

Perform a Power Cycle operation on the server.

**Systems affected:** All systems supported by this release.

Tracking number: N/A

## 4 Description

On 12<sup>th</sup> generation of PowerEdge servers, while deploying the operating system by selecting the UEFI boot mode, an error message is displayed when you click **Finish**. This error occurs if you try to connect the optical drive or virtual media after you launch Lifecycle Controller.

### Workaround

Reboot the server and ensure that you connect the optical drive or virtual media before launching Lifecycle Controller.

**Systems affected:** All systems supported by this release.

Tracking number: N/A

## 5 Description

ValueName regex does not match the schema definition for some of the properties in the BIOS Attribute Registry and the Boot Sources Registry returned by Redfish API.

#### **Workaround**

Defer the regex check for the ValueName returned for BIOS Attribute Registry and the Boot Sources Registry against the schema.

**Systems affected:** All systems supported by this release.

Tracking number: 97643

#### 6 **Description**

Using remote RACADM, a hardware inventory export operation to a local share fails. This issue occurs only with OpenManage 9.1.0.

#### **Workaround**

Use one of the following methods to export the hardware inventory:

- Use an earlier version of OpenManage, such as OpenManage 8.5.
- Export the hardware inventory using firmware RACADM to a NFS or CIFS share.
- Use local RACADM.

**Systems affected:** All systems supported by this release.

Tracking number: 83908

#### 7 **Description**

iDRAC firmware update using RACADM fails and incorrect version information is displayed with OpenManage 9.1.0.

#### **Workaround**

Update the firmware using other methods such as iDRAC web interface or using DUPs through the operating system.

**Systems affected:** All systems supported by this release.

Tracking number: 83577, 84851

#### 8 **Description**

While deploying OS using LC UI, if the current boot mode is set to UEFI and you change the boot mode to BIOS and click Finish on the last LC UI page, an error is displayed stating that the boot mode could not be set. The system reboots after you click OK. However, on next boot to LC UI, the boot mode is changed to BIOS and the boot device selected during OS deployment is discarded.

#### **Workaround**

Before deploying OS using LC UI, change the boot mode to BIOS from BIOS setup (F2 at POST).

**Systems affected:** All systems supported by this release.

Tracking number: 98665

#### 9 **Description**

When you change the Virtual Console, Virtual Media, or the RFS settings using the iDRAC web interface, the Message ID for RAC1195 Summary may not display the complete IPv6 address information.

#### **Workaround**

Use the browser IP details and RACADM log details for getting the IPV6 address.

**Systems affected:** All systems supported by this release.

Tracking number: 103471

#### 10 **Description**

If you launch the iDRAC virtual console with HTML5 plugin through CMC, a blank screen may be displayed.

#### **Workaround**

- Try launching the virtual console again.
- From CMC, access the iDRAC web interface and then launch the virtual console from the iDRAC web interface.

**Systems affected:** All systems supported by this release.

Tracking number: 105420

11 **Description**

If the system has both Emulex OCm14102 and Emulex LPm16002, and if you want to update the firmware from version 02.00.04 or earlier to a newer version, update the firmware for Emulex LPm16002 first. After the firmware update for Emulex LPm16002 is complete, you can update the firmware for Emulex OCm141102.

**Workaround** N/A

**Systems affected:** All systems supported by this release.

Tracking number: 106560

12 **Description**

The description for P4510 and P4610 Intel PCIe SSD drives is displayed as 'Express Flash NVMe P4500/P4600' instead of 'Express Flash NVMe P4510/P4610'.

**Workaround** N/A

**Systems affected:** All systems supported by this release.

Tracking number: 114392

13 **Description**

iDRAC firmware update from the OS may fail with an error about virtual device being unreachable because of BitLocker or other security software.

**Workaround** Retry the update.

**Systems affected:** PowerEdge R820

Tracking number: 114604

14 **Description**

While updating a firmware through Lifecycle Controller GUI using HTTPS share, the address field displays no information.

**Workaround** Enter the address [downloads.dell.com](https://downloads.dell.com) and proceed.

**Systems affected:** All systems supported by this release.

Tracking number: 128848

15 **Description**

Firmware update using [downloads.dell.com](https://downloads.dell.com) fails, while using HTTP as Network share and Proxy type in Lifecycle Controller GUI.

**Workaround**

Use any one of the following methods to update the firmware:

- use the SOCKS4 and SOCKS5 proxy type in Lifecycle Controller GUI using HTTP as network share
- use the HTTPS network share in Lifecycle Controller GUI to download and update the firmware from [downloads.dell.com](https://downloads.dell.com)
- use the iDRAC GUI

**Systems affected:** All systems supported by this release.

Tracking number: 130690

16 **Description**

While performing a repository update job, all firmware updates that are included in the repository are successful, however, the repository update job displays as failed in the job queue.

**Workaround** No action is required as all the firmware updates are successful.

**Systems affected:** All systems supported by this release.

Tracking number: 130966

17 **Description**

In Lifecycle Controller GUI, firmware update fails when only IPv6 address is provided.

**Workaround**

- Use the iDRAC GUI
- In Lifecycle Controller GUI use the IPv4 address instead of IPv6

**Systems affected:** All systems supported by this release.

Tracking number: 131586

18 **Description**

Firmware updates using the action Simple Update with OS deployment pack through Remote Share in Redfish interface is not functional.

**Workaround**

Use the iDRAC GUI or other interfaces to perform the update.

**Systems affected:** All systems supported by this release.

Tracking number: 133826

19 **Description**

Lifecycle Controller operations that are applied through System Services Manager may exceed the on-screen timeout limit.

**Workaround**

If the on-screen timeout is exceeded, warm reboot the host.

**Systems affected:** All systems supported by this release.

Tracking number: 133500

20 **Description**

Firmware update using FTP with SOCKS4 proxy type not working on iDRAC GUI.

**Workaround**

Perform the firmware update using RACADM or WSMAN interface using the same protocol.

**Systems affected:** All systems supported by this release.

Tracking number: 133897

# Installation

## Installation instructions

- From the Windows host operating system (managed node), run the Dell Update Package for Windows and follow the instructions on the update wizard.
- From the Linux host operating system (managed node), run the Dell Update Package for Linux from the shell prompt. Follow the instructions displayed on the console.
- From the management station, remotely update the firmware using the iDRAC web interface:
  - a Extract the firmware image self-extracting file to the management station.
  - b Open the iDRAC web interface using a supported web browser.
  - c Log in as an administrator.
  - d Go to **Overview > iDRAC Settings > Update and Rollback > Update**. The **Firmware Update** page is displayed.
  - e Click **Browse**, select the .d7 firmware image file that you extracted (step 1), or the Dell Update Package (DUP) for Windows, and click **Upload**.
  - f Wait for the upload to complete. After the upload is completed, the **Update Details** section displays the firmware file uploaded to iDRAC and the status.
  - g Select the firmware file and click **Install** or **Install and Reboot**. If it is a DUP, **Install** dynamically changes to **Install and Reboot** and at the same time the **Install Next Reboot** is activated. When you click **Install and Reboot** or **Install Next Reboot**, the message **Updating Job Queue** is displayed.
  - h Click **OK**. The **Job Queue** page is displayed, where you can view and manage the firmware update.

For more information, see the iDRAC User's Guide available at [dell.com/idracmanuals](http://dell.com/idracmanuals).

## Upgrade

N/A

## Uninstallation

N/A

# Lifecycle Controller Remote Services — client tools

Use the OpenWSMAN CLI client tool to send WS-MAN commands to Lifecycle Controller.

## OpenWSMAN CLI

OpenWSMAN CLI is an open source Linux WS-MAN client. OpenWSMAN CLI source code and installation details are available at <http://sourceforge.net/projects/openwsman/files/wsmancli>.

Sample OpenWSMAN CLI Command (Enumeration Operation):

```
wsman enumerate http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SystemView
-h (idrac ip address) -P 443 -u (idrac user) -p (idrac password) -v -j utf-8
-y basic -R -o -m 256 -N root/dcim -c cert_name.cer -V
```

**NOTE:** Lifecycle Controller uses a self-signed certificate for HTTPS (SSL) communication. Self-signed certificates are not accepted by the OpenWSMAN CLI client and WS-MAN commands do not work without these options: `-c`, `-v`, and `-V`. See the OpenWSMAN CLI Readme for details on these options.

# Accessing documents from Dell Support site

## Latest Release Notes

To access the latest Release Notes for this version, follow these steps:

- 1 Go to [www.dell.com/idracmanuals](http://www.dell.com/idracmanuals).
- 2 Click **iDRAC8**.
- 3 Click the link for this version of iDRAC.
- 4 Click **Manuals & documents**.

## Using direct links

You can directly access the documents using the following links:

**Table 1. Direct links for documents**

URL	Product
<a href="http://dell.com/idracmanuals">dell.com/idracmanuals</a>	iDRAC and Lifecycle Controller
<a href="http://dell.com/cmcmmanuals">dell.com/cmcmmanuals</a>	Chassis Management Controller (CMC)
<a href="http://dell.com/openmanagemanuals">dell.com/openmanagemanuals</a>	Enterprise System Management
<a href="http://dell.com/serviceabilitytools">dell.com/serviceabilitytools</a>	Serviceability Tools
<a href="http://dell.com/OMConnectionsClient">dell.com/OMConnectionsClient</a>	Client System Management
<a href="http://dell.com/OMConnectionsEnterpriseSystemsManagement">dell.com/OMConnectionsEnterpriseSystemsManagement</a>	OpenManage Connections Enterprise Systems Management

## Using the product selector

You can also access documents by selecting your product.

- 1 Go to [www.dell.com/manuals](http://www.dell.com/manuals).
- 2 In the **Choose from all products** section, click **View products**.
- 3 Click **Software and Security** and then click the required link.
- 4 To view the document, click the desired product version.

## Contacting Dell EMC

Dell EMC provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical support, or customer service issues, see [www.dell.com/contactdell](http://www.dell.com/contactdell).

If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or the product catalog.