



By David Troeger
Weijia (John) Zhang, Ph.D.

INSTALLING MICROSOFT WINDOWS SERVER 2008 DRIVERS ON DELL POWEREDGE SERVERS

Upgrading Dell™ PowerEdge™ servers to the Microsoft® Windows Server® 2008 OS also typically requires selecting, installing, and troubleshooting device drivers. Using tested and validated drivers and following best practices can help administrators ensure optimal performance in their environments.

A fundamental challenge for successfully installing Microsoft Windows Server 2008 on Dell PowerEdge servers is locating and installing optimal device drivers for the system. Device drivers—the software components that act as the essential glue for binding the server environment to an OS—are available in two types: those available in the OS are known as in-box drivers, while those not available in the OS are known as out-of-box drivers.

Administrators can choose from several methods when installing Windows Server 2008 device drivers, and from several sources for obtaining drivers that are not native to the OS. In addition, administrators need to be aware of symptoms caused by unsuccessful installations and the resolutions for fixing or working around errors that may occur. Recognizing the differences between both types of drivers, the methods available for planning driver upgrades, the priorities necessary to assess system needs, and the processes for troubleshooting unexpected results can help ensure a successful installation of drivers when upgrading PowerEdge servers to Windows Server 2008.

OBTAINING IN-BOX AND OUT-OF-BOX DRIVERS

Administrators responsible for maintaining environments employing PowerEdge servers may find that the device drivers they need are already available in Windows Server 2008. The availability of these in-box

drivers helps provide a seamless experience from OS installation to first use of the system. However, in some cases recent out-of-box drivers may also become available, and these drivers can contain updates or fixes that help increase the performance of systems running Windows Server 2008. In addition, although default in-box drivers support many devices, out-of-box versions can offer advanced features and extended management capabilities.

Dell typically factory installs the latest available in-box and out-of-box drivers on PowerEdge servers. Administrators can also take advantage of the following resources available for locating and accessing device drivers:

- **Dell Web site:** Administrators can visit DELL.COM to see recent PowerEdge server releases available with Dell factory-installed operating systems, which contain updated in-box and out-of-box drivers for servers.
- **Dell support Web site:** The Dell support Web site at support.dell.com is routinely updated with the latest drivers for PowerEdge servers. Figure 1 illustrates the process for locating and downloading drivers on this site.
- **Dell OpenManage™ Systems Management CD:** In addition to systems management tools and documentation, this CD contains a set of device drivers that support PowerEdge servers. It also contains

Related Categories:

Dell OpenManage
Dell PowerEdge servers
Device drivers
Microsoft
Microsoft Windows Server 2008
Operating system deployment
Operating system migration
Visit DELL.COM/PowerSolutions
for the complete category index.

a device driver extraction tool that allows administrators to obtain drivers based on custom filters.

- **Vendor Web sites:** Vendor Web sites often have resources that can be helpful for some devices, such as tape storage systems. Frequently, vendors provide advanced management tools for the device drivers they support.

The Dell support Web site organizes device drivers into component-level groups. These categories help administrators not only identify specific device drivers, but also determine priority when considering an upgrade. For example, chipset, storage, and network device drivers may require frequent attention because they can be critical for the system to function properly. Other types such as drivers for audio and communication (modem) devices may be less important, depending on the environment, but can be helpful to address specific needs. Figure 2 lists some of the primary categories Dell uses to organize device drivers.

When identifying an out-of-box driver, administrators can evaluate whether to apply the update depending on the importance level—urgent, recommended, or optional—assigned to each driver download. The importance level is based on the following guidelines:

- **Urgent:** Dell highly recommends applying urgent driver updates as soon as possible; these updates typically contain changes to enhance server reliability and availability. Administrators can evaluate the update to determine the feasibility of changes for a specific environment.
- **Recommended:** Dell recommends applying recommended driver updates during the next scheduled update cycle; these updates typically contain feature enhancements or changes to help keep PowerEdge system software current and compatible with other modules such as firmware, BIOS, other drivers, and software.

- **Optional:** Dell recommends that administrators review specifics about an optional driver update to determine applicability to specific systems. These updates typically contain changes that affect only certain configurations or provide new features that may or may not apply to a specific environment.

For systems running 24/7, evaluating whether a device driver update is necessary can be critical to help avoid unnecessary problems.

INSTALLING AND TROUBLESHOOTING DRIVERS

After locating appropriate device drivers for a system, administrators can choose from several methods to install them. The method chosen for any driver depends on the needs of a specific environment:

- **Windows Server 2008 Load Driver option:** This option is typically best suited for RAID controller drivers during OS installation.

- **Dell OpenManage Systems Management CD:** Administrators can use this CD to install updated and optimal Dell-supported drivers when installing an OS. The Dell OpenManage software also provides self-extracting packages to update drivers directly.
- **Third-party customized deployment tool:** Third-party tools can be particularly useful when performing one-to-many OS installations.
- **Windows Server 2008 Device Manager snap-in:** This utility is typically best suited for installing driver updates that are not critical for OS installation. Devices that are missing drivers display a yellow exclamation point in this utility.
- **Windows Server 2008 driver auto-search feature:** Administrators can use this feature to install out-of-box drivers when performing an unattended installation of device drivers during OS installation.

Dell employs a rigorous process to develop and release device drivers that

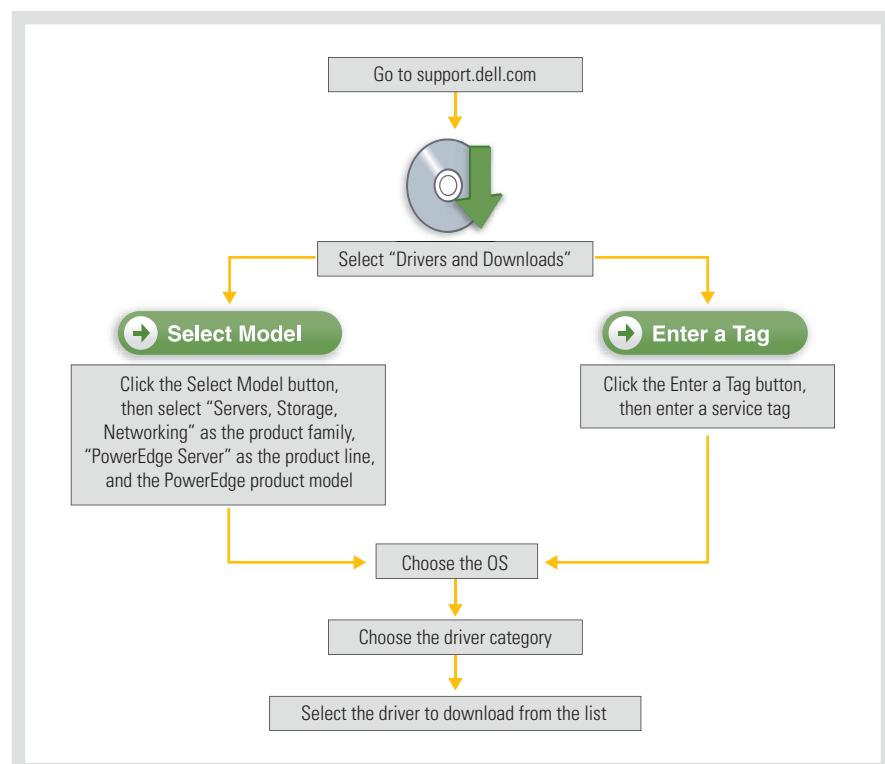


Figure 1. Process for locating and downloading device drivers on the Dell support Web site

Driver or device category	Device support
Audio	Although audio devices generally are not used in PowerEdge servers, these out-of-box device drivers are available in case an audio device is installed.
CD/DVD	Although default drivers for CD and DVD drives generally are available in Microsoft Windows® operating systems, out-of-box drivers can be useful for special optical drives that may require fixes.
Chipset	Although chipset drivers are generally available as in-box drivers, these out-of-box drivers can be critical to help system devices and motherboards function properly. Administrators may need to frequently evaluate drivers for these devices.
Communication	These out-of-box drivers are for modem devices.
Fibre Channel	These drivers are only needed when a PowerEdge server is connected to a Dell PowerVault™ storage device.
Network	Although drivers for network adapters include in-box drivers for network interface cards, out-of-box driver updates often provide additional features and bug fixes.
SAS RAID Controller	Serial Attached SCSI (SAS) RAID drivers generally are available for recent platforms that support SAS-based disk drives. This category includes drivers for the SAS-based PowerEdge Expandable RAID Controller (PERC) 5, PERC 6, and so on.
SAS Non-RAID Controller	These drivers are for SAS devices in non-RAID mode.
SCSI Non-RAID Controllers	These drivers are available for legacy SCSI devices.
SCSI RAID Controllers	These legacy storage drivers are available for SCSI RAID controllers.
Tape Backup	Although these drivers are available for tape devices, many third-party vendors also provide drivers for these devices that include additional management features.
Video	Although Windows Server 2008 provides in-box drivers for default VGA devices, device-specific, out-of-box drivers can enhance graphics and display quality.

Figure 2. Example Dell categories for out-of-box device drivers

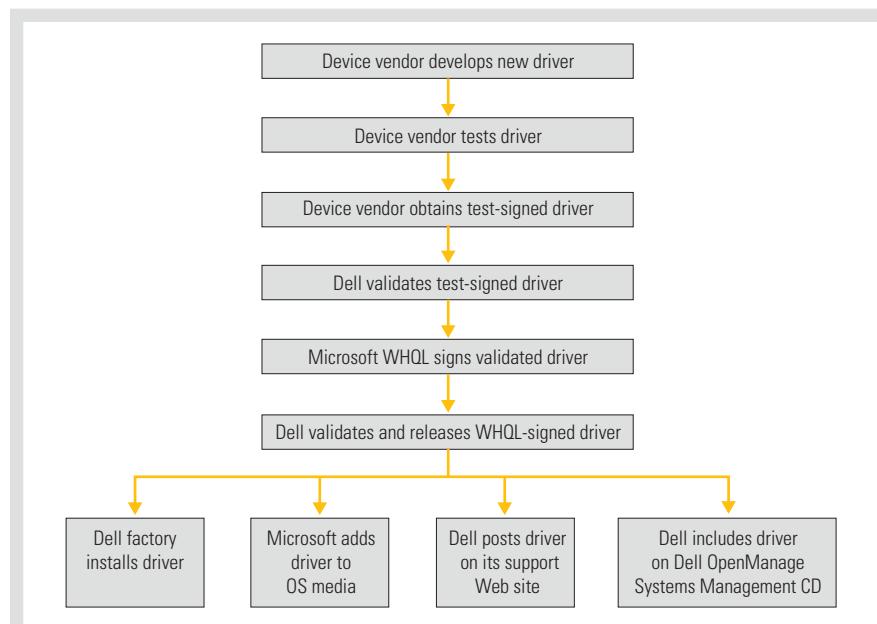


Figure 3. Life cycle for developing, testing, validating, and releasing device drivers

can optimize the performance of PowerEdge servers. Driver releases for Windows Server 2008 are usually Windows Hardware Quality Labs (WHQL) signed and have typically been tested and validated by both Dell and Microsoft (see Figure 3). Despite these processes and proper evaluation and planning of driver installation, however, errors can occur. In the event that driver installation does not go as planned, administrators can use Figure A in the supplemental online-only section of this article, available at DELL.COM/PowerSolutions, to help them resolve or work around typical problems.

PLANNING SUCCESSFUL DEVICE DRIVER INSTALLATIONS

Device drivers are an essential part of IT environments, and administrators have multiple methods at their disposal for locating and installing them. By installing the appropriate in-box or out-of-box device drivers and following the best practices outlined in this article, administrators can help ensure that their Dell PowerEdge servers continue to perform optimally after upgrading to Microsoft Windows Server 2008. 

David Troeger is an OS development manager for the Dell Server OS Engineering team. He is a Project Management Professional whose career has focused on maximizing the performance of software on rapidly evolving hardware technologies.

Weijia (John) Zhang, Ph.D., is a senior software engineer consultant in the Dell Product Group with a focus on systems management and software deployment. Before joining Dell, he worked on thermal modeling software for a small British company and on a content syndication and notification server at a startup in Austin, Texas. He has a Ph.D. in Physics with a focus on computer-based science education from the University of Nebraska at Lincoln.