

Dell™ Update Packages for Linux Operating Systems User's Guide

Notes and Notices



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



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

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Getting Started With Dell Update Packages

Overview

Dell™ Update Packages (DUPs) allow administrators to update a wide range of system components simultaneously and apply scripts to similar sets of Dell systems, to bring system software components up to the same version levels.

By using DUPs, you can perform the following functions:

- Apply an individual update to a system by using an interactive command line interface (CLI)
- Execute multiple updates for your system by using a script comprised of non-interactive commands that you write using the CLI feature
- Leverage your operating system's scheduling and software distribution utilities to apply updates remotely to any number of servers

Each DUP (Dell Update Package) is designed to update a single software component on your system. This product feature allows you to select and apply just the updates that you want for your system, thus minimizing the resources required to transport the DUP across your network.

DUPs improve your ability to update your systems effectively. For example, each DUP contains pertinent information about when Dell issued the package, which systems the DUP is designed to support, and what functional enhancements are contained in the update or which problems were fixed.

Each DUP contains the execution logic to verify that the update will work on your system. When using DUPs, you are not required to use any Dell OpenManage™ software applications, and you do not have to create alternative media. Each DUP also carries a digital signature to ensure reliable and trusted authentication. See "Verifying the Digital Signature" for more information.

You can use DUPs interactively, which is ideal for applying a limited number of updates. When you execute a package interactively, it first displays a scrollable view of the package release notes. You may view these notes before optionally continuing with the execution of the package. You can also use

DUPs in non-interactive mode to facilitate rapid deployment for an experienced user, to accommodate large environments with multiple systems, or to process multiple updates per system.

This guide is designed to familiarize you with Linux DUPs so that you can begin applying them to simplify the system software maintenance on your Dell systems. The "Using Dell Update Packages" section of this guide provides several sample scenarios for using DUPs.

Server Update Utility and DUPs

Dell OpenManage Server Update Utility (SUU) is a DVD-based application that is used to identify and apply the latest updates to your system. It is both a Graphical User Interface (GUI) and a Command Line Interface (CLI) based application. SUU compares the versions of components currently installed on your system with the update components packaged on the *Dell Server Updates* DVD and then displays a comparison report of the versions and provides the option of updating the components. You can use SUU to update your system or view the updates available for any system listed in the repository. The *Dell Server Updates* DVD is available as part of the Dell OpenManage subscription service kit.

Linux DUPs can be downloaded from the Dell Support site at support.dell.com. They are also available in the repository on the *Dell Server Updates* DVD. The **repository** folder in the *Dell Server Updates* DVD contains Windows and Linux DUPs, **Catalog.xml** (that contains information about both Windows and Linux DUPs), and the **DellSoftwareBundleReport.html**. SUU uses DUPs to update the system components.

Update Options

You can update your system components using any one of the two options listed below:

Element Update—To update an *individual* system software component (element) to a specific version. Use DUP to perform element updates.

System Update—To update all elements on your system. Dell recommends that you use SUU to automatically:

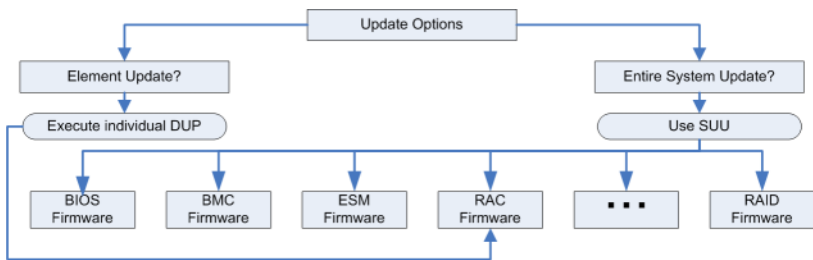
- inventory the Dell firmware and drivers on that system
- compare the installed configuration with the content on the *Dell Server Updates DVD*
- report on discrepancies and recommend updates, including any prerequisites that may impact the update sequence
- update and (if needed) reboot the system



NOTE: See the *Server Update Utility User's Guide* available on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation DVD* for information on how SUU identifies and applies updates to your entire system.

Figure 1-1 illustrates when you should use SUU and DUPs while performing updates:

Figure 1-1. SUU and DUPs



Supported Operating Systems

DUPs are tested and qualified for the following operating systems:

- Red Hat® Enterprise Linux® WS, ES, and AS(version 4.5) (both x86_32 and x86_64)
- Red Hat Enterprise Linux 5 server Update 2 (both x86_32 and x86_64)
- SUSE® Linux Enterprise Server 9 SP4 (x86_64)

- SUSE Linux Enterprise Server 10 SP2 (x86_64)
- VMware® ESX Server™ version 3.0.3 Update 1 and version 3.5 Update 2
- Citrix® XenServer version 5.0 Dell Edition



NOTE: For the latest information about the various systems and operating systems that DUPs are supported on, see the *Dell Systems Software Support Matrix*. This guide is available on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation* DVD. The *Dell Systems Software Support Matrix* has information about the various Dell systems, the operating systems supported by these systems, and the Dell OpenManage components that can be installed on these systems.



NOTE: The Dell OpenManage systems management software kit is now available on a single DVD titled *Dell Systems Management Tools and Documentation*.

OpenIPMI Requirements

Certain DUPs may require the latest OpenIPMI Linux device drivers to be installed on your system. If you are prompted during installation to obtain the latest drivers, see the Dell Support website at support.dell.com, or visit the support site for your Linux operating system to download the latest drivers.

Using DUPs in the DTK Pre-Operating System Environment

The Dell OpenManage Deployment Toolkit (DTK) includes utilities, sample scripts, and other tools for configuring and deploying Dell systems. DTK is released in two versions: the Linux version is distributed as an Embedded Linux-based ISO, and the Windows® Preinstallation Environment (Windows PE) version is distributed as a package of Dell-provided content with instructions on how to integrate with a standard Windows PE image. Booting the CD created from the ISO image creates a **Toolkit** folder which contains subdirectories with the necessary files to perform deployment tasks.



NOTE: Currently, DUPs are supported only in the DTK embedded Linux environment.

The bootable DTK embedded Linux environment is required for bare-metal (or pre-operating system) DUP execution and is bootable from many types of media and does not require the local disk. It allows users to use Linux DUPs for change management.

Users can boot to the system under the DTK embedded Linux Environment and execute the package from either a network drive, a USB device supporting Linux file systems, or a CD drive, with the following options:

Interactive Mode:

```
./packagename
```

Non-Interactive Mode:

```
./packagename -q
```

or

```
./packagename -q -r
```

A successful update will return the exit code to either 0, 2 or 6.



NOTE: For dependencies and information on running DUPs in the Dell-provided embedded Linux environment and in a customized embedded Linux environment and for information on the required files and tools, see the *Dell OpenManage Deployment Toolkit User's Guide* on the Dell Support website at support.dell.com. The required minimum kernel version is 2.6.9-42.

Dell-Qualified and Dell-Enabled Packages

A DUP can be applied as a Linux operating system DUP for a system in one of the following ways:

- The DUP that you are applying *matches* the Dell-qualified operating systems.
- The DUP that you are applying can be *enabled* to work with the running kernels and operating systems in your environment. See "Dell-Enabled Path" for more information.

Before You Begin

DUPs support Dell systems running the operating systems listed in the "Overview" section. You must be able to log on to the system with an account that has root (administrator) privileges.

How to Obtain DUPs from the Dell Support Website

- 1 Log on to support.dell.com.
- 2 Click **Drivers and Downloads**.
- 3 Enter your service tag or choose your product model.
- 4 Select your product family and product line.
- 5 Select your operating system, language, category, and the update importance. A list of applicable updates are displayed.
- 6 Click **Download Now**.
- 7 You can also download a different file format from the column labeled **File Title**. Select a file format for your DUP and single-click its filename. If you want to download more than one file type, you must do so one at a time.
- 8 To complete the download of your file, follow the directions on the screen.

Before installing DUPs, read the information provided, both online and in the download package. Ensure that the updates you selected are both necessary and appropriate for your system. You may also need to complete some or all of the following steps:

- 1 Add executable privileges to the package filename. Type the following command:

```
chmod +x packagename.bin
```
- 2 Verify that the package meets the prerequisites for performing an update. To perform the check from the CLI, type the following command at the command line prompt:

```
./packagename.bin -c
```
- 3 Determine a methodology for performing the updates.
 - Single update method: Run the DUP from the command line in interactive mode to perform the update.
 - Script method: Use this method if you have a requirement for running one or more updates from a script on one or more systems in non-interactive mode.

Installation Order of DUPs

If you are installing multiple DUPs, install the updates that require a reboot at the end. Dell recommends the installation order as described in Table 1-1.

Table 1-1. Update Packages: Recommended Installation Order

Installation Order	System Software Components
1	Linux device driver
2	Device firmware
3	ESM firmware
4	BIOS



NOTE: If you have updated the BIOS, the changes to the BIOS do not take effect until you reboot your system.



NOTE: To ensure a single reboot, you must install the ESM firmware update before the BIOS update.

Important Tips to Remember for Using DUPs

- Prepare repair disks before you perform any updates.
- Download the currently installed version of drivers, BIOS, and firmware so that you have a backup plan in case any issues arise.
- Ensure that you have a backup of operating system files or system configuration files stored on a system other than the one you are updating.
- Ensure that the updates are planned for and performed by the system administrator who knows which applications could be affected.
- Before updating all systems, perform the upgrade on one nonessential system to test the update.
- Do not run other applications while executing DUPs.
- Do not shut down the system while an update is in progress.
- Ensure that the system reboots without power interruption after performing a BIOS update.
- Do not close any terminal console windows used for performing the DUP CLI execution, while DUP executions are in progress.

Other Documents You Might Need

- The *Dell OpenManage Server Administrator Compatibility Guide* under Dell OpenManage Server Administrator on the Dell Support website at support.dell.com, or on the *Dell Systems Management Tools and Documentation* DVD that came with your system. The guide summarizes all systems management releases that precede the current release date.



NOTE: DUPs do not require the Dell OpenManage Server Administrator to be installed on your system.

- The *Server Update Utility User's Guide* on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation* DVD which provides information on how to identify and apply updates to your system. Server Update Utility (SUU) is one of the applications used to update your Dell system or to view updates available for any supported system. SUU compares the versions of components currently installed on your system with update components packaged on the *Dell Server Updates* DVD. It then displays a comparison report of the versions and provides an option of updating the components.
- The *Dell OpenManage Deployment Toolkit (DTK) User's Guide* on the Dell Support website at support.dell.com. The guide provides information on how to execute Linux DUPs in the Dell–provided or in the customized embedded Linux environment including the required dependencies.
- The *Dell OpenManage IT Assistant User's Guide* on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation* DVD. Dell OpenManage IT Assistant allows you to load DUPs and System Update Sets into a central repository, then compare the packages to the versions of the software currently running on your enterprise systems. You can then decide whether to update systems that are not in compliance, either immediately or according to a schedule you define. You can use SUU with IT Assistant to update multiple systems in a single session.
- The *Dell Systems Software Support Matrix* on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation* DVD. This document has information about the various Dell systems, the operating systems supported by these systems, and the Dell OpenManage components that can be installed on these systems.

Obtaining Technical Assistance

If at any time you do not understand a procedure described in this guide, or if your product does not perform as expected, different types of help are available. For more information see "Getting Help" in your system's *Installation and Troubleshooting Guide* or the *Hardware Owner's Manual*.

Additionally, Dell Enterprise Training and Certification is available; see www.dell.com/training for more information. This service might not be offered in all locations.

Using Dell Update Packages

Before You Begin

This section is designed to help you get the most out of Dell™ Update Packages (DUPs). Updating the system software on your Dell systems should be a key element of your company's overall change management policies and procedures. Maintaining the system software on your Dell systems helps ensure trouble-free operation.

Before you apply any update to your system, you may want to carefully plan your update strategy, based on the conditions that are necessitating the update. Many reasons may exist for making the decision to update your Dell system, such as:

- Correcting a security concern
- Correcting a problem on your system, based on a recommendation from Dell support personnel
- Updating a system software component to a minimum level required by an application
- Gaining access to a new feature or improved performance
- Updating all system components as part of your company's periodic maintenance process

Each of the preceding update situations entails different levels of urgency, but all require a certain level of planning to ensure a successful update with minimal disruption to your applications and users. The following subsections help you develop the system update strategy that best fits your needs, your company's policies and procedures, and the tools available to you.

Develop Your System Update Plan

You may want or need to update your system for many reasons, as mentioned in the preceding section. This update requirement may be classified as either planned or unplanned.

Planned updates occur as a part of your regular cycle of maintaining your systems with up-to-date BIOS, firmware, and drivers. Many IT organizations establish a regular schedule for performing the updates, which are integrated with the planned maintenance functions. The frequency of these updates varies from company to company; however, it is not uncommon for companies to adopt quarterly or semiannual update schedules. Irregular but still planned updates may occur whenever a system is retasked with a new application or the operating system is either upgraded or changed. Any time that you have scheduled planned outage or downtime for your system may be a good time to consider upgrading the system software components.

Unplanned updates typically occur as a result of applying a critical upgrade to your system to avoid data loss, service interruption, or security threats. You may, for example, be advised to apply an update in response to a call you have placed to a Dell support professional. Although the urgency of applying such an update is greater than a planned update, you know that you must apply careful thought and consideration to ensure a successful update with minimal disruption to your users. The key to success is always having a well-planned strategy for all possible scenarios.

Acquiring DUPs

Dell provides a number of aids to help you determine whether or not your system requires an update. You can locate the DUP for your system on the Dell Support website at support.dell.com. For instructions, see "How to Obtain DUPs from the Dell Support Website."

Update Packages Component and System Compatibility

After you locate your DUP, read the summary information to determine whether or not you should download the update and apply it to your system. You can run the DUP and read the summary information by using the command line interface option `--version`. For more information on the `--version` option, see "Command Line Interface Reference." This information is provided to help you determine whether the update is appropriate for your system and your specific environment.

Executing DUPs

You can run DUPs from the console in both interactive and non-interactive modes.

Interactive Mode

In the interactive mode, you issue a command, and the interface prompts you for permission to continue executing the command. When you execute a package interactively, it first displays a scrollable view of the release notes for the package. You may view these notes before continuing with the execution of the package.

The DUP may be executed from a local console attached to the target server or from an administrator's workstation by using a remote shell, such as *ssh*. Once a package has been delivered to the target system, administrators can execute the package in its simplest form by typing *./packagename.bin* from the working directory, where *packagename* is the model and component-specific name of the package. This syntax assumes that the *.bin* file has the appropriate permissions set and that a user account with root privileges executes the update. Once underway, the DUP will echo its progress and status to the console (stdout) and log its activity to */var/log/messages*.

The following example shows the command for applying a BIOS DUP to a Dell system in interactive mode:

```
chmod +x ./PE1650-BIOS-LX-A10.bin
./PE1650-BIOS-LX-A10.bin
```

The DUP application writes the following messages to the screen. Interactive mode requires Y/N responses to continue with update and reboot.

```
Collecting inventory...
Running validation...
BIOS
The version of this Update Package is newer than the
currently installed version.
Software application name: BIOS
Package version: A10
Installed version: A9
Continue: Y/N?
Y
Y entered; update was forced by user
Executing update...
WARNING: DO NOT STOP THIS PROCESS WHILE BIOS UPDATE IS
IN PROGRESS.
STOPPING MAY CAUSE YOUR SYSTEM TO BECOME UNSTABLE!
Update successful.
```

Would you like to reboot your system now?

N

The system should be restarted for the update to take effect.

Version Information

One of the most informative commands uses the `--version` option.

An actual example that retrieves extensive version information for a DUP is as follows:

```
[root@localhost 1027]# ./PE1650-BIOS-LX-A10.bin --
version
Dell Update Package 2.x
Copyright (c) 2003-2004 Dell Inc. All rights reserved.
Release Title:
    Dell Server System BIOS, A10
Release Date:
    November 21, 2003
Release ID:
    R60452
Supported System(s):
    PowerEdge 1650
Prerequisite(s):
    BIOS A05
Description:
    PowerEdge 1650, BIOS, A10
Supported Device(s):
    Server System BIOS
Fixes / Enhancements:
* Added support for version 2.8 of the onboard RAID
  controller (PERC3/Di) firmware.
* Corrected issues affecting the Preboot Execution
  Environment (PXE).
* Corrected problems which cause the system to power
  up at unexpected times.
* Corrected problems with the Remote BIOS Update
  feature.
* Corrected issues in BIOS USB Support.
* Corrected issues in Embedded Server Management support.
```

Non-Interactive Mode

Non-interactive mode is essential when executing a script for applying DUPs to multiple systems. When applying DUPs to multiple systems, you cannot answer yes or no during script execution. Your script specifies **-q** for non-interactive mode; often script writers add **-f** for force and **-r** for reboot if a reboot is required for the type of update being performed.

In the following command example, the command applies a BIOS DUP without any user confirmation, forces the execution in the case of a downgrade from a more recent BIOS version, and reboots the system after the DUP is applied. This command is executed provided the DUP satisfies all the system and version requirements.

```
./PE2850-ESM_FRMW_LX_R92394.bin -q -f -r
```

For more information on the command line interface (CLI), see "Command Line Interface Reference."

Verifying the Digital Signature

A digital signature is used to authenticate the identity of the signer of a file and to certify that the original content of the file has not been modified since it was signed.

If you do not already have it installed on your system, you must install the Gnu Privacy Guard (GPG) to verify a Linux DUP digital signature. To use the standard verification procedure, perform the following steps:

- 1 Get the Dell Linux public GnuPG key, if you do not already have it. You can download it by navigating to lists.us.dell.com and clicking the **Dell Public GPG key** link.
- 2 Import the public key to your gpg trust database by running the following command:

```
gpg --import <Public Key Filename>
```



NOTE: You must have your private key to complete the process.

3 To avoid a distrusted-key warning, validate the public key by its fingerprint before you use it.

a Type the following command:

```
gpg --edit-key 23B66A9D
```

b Within the GPG key editor, type `fpr`. The following message appears:

```
pub 1024D/23B66A9D 2001-04-16 Dell, Inc.  
(Product Group) <linux-security@dell.com>  
Primary key fingerprint: 4172 E2CE 955A 1776  
A5E6 1BB7 CA77 951D 23B6 6A9D
```

If the fingerprint of your imported key is the same as the key owner's, you have a correct copy of the key. You can verify the key's owner in person, over the phone, or by any other means that guarantees that you are communicating with the key's true owner.

c While still in the key editor, type `sign`.

d Answer the list of trust-validation questions that appears and create a passphrase to use as your secret key.

You must import and validate the public key only once.

4 Obtain the Linux DUP and its associated signature file from the Dell Support website at support.dell.com/support/downloads.



NOTE: Each Linux DUP has a separate signature file, which is shown on the same web page as the DUP. You need both the DUP and its associated signature file for verification. By default, the signature file is named the same as the DUP filename with a `.sign` extension. For example, if a Linux DUP is named `PE1850-BIOS-LX-A02.BIN`, its signature filename is `PE1850-BIOS-LX-A02.BIN.sign`. To download the files, right-click the download link and use the "Save Target As..." file option.

5 Verify the DUP:

```
gpg --verify <Linux Update Package signature  
filename> <Linux Update Package filename>
```

The following example illustrates the steps that you follow to verify a 1425SC BIOS DUP:

- 1 Download the following two files from support.dell.com:

- PESC1425-BIOS-LX-A01.bin.sign
- PESC1425-BIOS-LX-A01.bin

- 2 Import the public key by running the following command line:

```
gpg --import <linux-security-publickey.txt>
```

The following output message appears:

```
gpg: key 23B66A9D: "Dell Computer Corporation  
(Linux Systems Group) <linux-  
security@dell.com>" not changed  
gpg: Total number processed: 1  
gpg: unchanged: 1
```

- 3 Validate the Dell public key, if you haven't done so previously, by typing the following command:

```
gpg --edit-key 23B66A9D
```

At the command prompt, type the following commands:

```
fpr  
sign
```

Answer the validation questions.

- 4 Verify the PESC1425 BIOS package digital signature by running the following command:

```
gpg --verify PESC1425-BIOS-LX-A01.bin.sign  
PESC1425-BIOS-LX-A01.bin
```

The following output message appears:

```
gpg: Signature made Thu 14 Apr 2005 04:25:37 AM  
IST using DSA key ID 23B66A9D  
gpg: Good signature from "Dell Computer  
Corporation (Linux Systems Group) <linux-  
security@dell.com>"
```



NOTE: If you have not validated the key as shown in step 3, you will receive additional messages:

```
gpg: WARNING: This key is not certified with a
trusted signature!
gpg: There is no indication that the signature
belongs to the owner.
Primary key fingerprint: 4172 E2CE 955A 1776
A5E6 1BB7 CA77 951D 23B6 6A9D
```

Compatibility Concerns

DUPs are designed to confirm that all prerequisites are satisfied before applying the update to your system. Each DUP checks to ensure the following:

- The logged-on user has root privileges.
- The DUP to be applied in the command is compatible with your target system.
- The DUP to be applied in the command is compatible with the operating system running on your system.
- The device associated with the DUP is present on your system.
- The minimum required versions of related system software are running on your system.

DUPs are designed with built-in error handling capabilities to ensure that the preceding requirements are validated. If the conditions are not met, no update occurs. DUPs also check for dependencies between BIOS and certain ESM packages. The application design allows you to create groups of DUPs and apply them to a wide range of systems. Additionally, if you only want to verify that a given package can be applied to your system, you can invoke the package by using the following CLI command:

```
./Packagename.bin -c
```

This command executes the dependency rules within the DUP, issues any warnings, exits without applying the update to your system, and writes the results to the console. You can also use the DUP to set an exit code to perform decisions within your scripts.

Effects of Applying the Updates on a Running System

System Reboot Required

Certain packages, such as those that update the system BIOS, require a reboot for the new software to take effect. After you apply an update that requires a reboot, you must restart the system to complete the update.

You have the option of choosing to defer the reboot until another time as long as you do not turn off the system. This feature is primarily intended to allow you to apply any number of updates together and perform the system reboot after the last update has been applied. If this process is interrupted, for example, through a power interruption, you must repeat the updates. Therefore, Dell recommends that you schedule updates for a time when the reboot can take place immediately after you apply the last update.

Impact on Users and Applications

Generally, you can apply the updates to a running system because they consume few system resources. Be sure to read the information contained in the DUP before applying the update to determine if applying the update may cause a service interruption to your users or applications. When in doubt, always apply updates at a time when no critical applications or users require the system.

Specifying the Order of Multiple Updates

When applying multiple updates at the same time, be sure to use the order indicated in "Installation Order of DUPs." As previously noted in "System Reboot Required," you may defer rebooting the system until after running the last of multiple DUPs.

Saving Console Output

As the DUPs are executed, messages are printed to the console. To redirect console output, use the following syntax with interactive commands:

```
./packagename.bin | tee -a logname.log
```

The `| tee` specifies the output from the DUP to be sent to both the console and to a log file. The `-a` switch ensures that output is appended to a file, protecting any previous log file output from being overwritten.

The following are two example commands that redirect output to a log file:

```
./PE2600-BIOS-LX-A01.bin | tee -a /var/bioslogs.log  
./PE2600-BIOS-LX-A01.bin -q | tee -a  
/var/bioslogs.log
```

If you run these commands in the order shown above, the first command directs its interactive mode output to be appended to the log file. The second command directs its non-interactive mode output to be appended to the end of the same log file.

Delivering DUPs to Your Systems

The DUP application does not provide scheduling and delivery of the packages to multiple systems. You must rely on third-party or native operating system applications to accomplish script execution and distribution on multiple systems.

Using Software Distribution Applications With DUPs

Many IT organizations use internally developed or purchased software distribution applications to remotely install and update software.

Updating Many Systems

For large environments that consist of hundreds or perhaps thousands of systems, remote software distribution applications provide the best solution. Many of these tools can effectively leverage the DUP and provide the convenience of installing and updating a variety of software, such as operating systems and applications, in a heterogeneous environment.

Network file shares also are an effective method of making DUP accessible in a distributed environment. When a DUP begins execution, it first copies the contents of the package to a temporary location on the system's local drive. This process ensures that the update can be completed even if the connection to the network share is lost for any reason.

Stand-alone Systems and Firewalls

For systems that are not connected to the Internet or that have firewalls which block user downloads, you need to download your DUP from support.dell.com by using a system that does have access to the Internet, such as your desktop or portable computer. You can make DUP available to your system by copying them onto removable media that your system supports (such as CD, USB devices, tape, and so on).

Confirming the Update

To ensure that DUPs were applied to your system, review the console output that was generated during execution. See "Troubleshooting" for detailed information about the messages.

If you want to revert to a previous (older) version of the software after updating to a newer version, you must download the appropriate DUP from support.dell.com and install it. To install the previous version from a script, use `-q` (unattended) mode. In addition, you must use the CLI `-f` option, which forces the downgrade.



NOTE: If your system loses power during the update process, you must perform the updates again.



NOTE: DUPs for Linux can also be found in the repository on the *Dell Server Updates* DVD that contains the updated BIOS, and firmware components for Dell systems. The Dell OpenManage™ Server Update Utility (SUU) is an application for identifying and applying updates to your system. You can use SUU to update your Dell system or to view updates available for any system supported by SUU. It compares the versions of components currently installed on your system with update components packaged on the *Dell Server Updates* DVD and then displays a comparison report of the versions and provides the option of updating the components. See the *Server Update Utility User's Guide* available on the Dell Support website at support.dell.com or on the *Dell Systems Management Tools and Documentation* DVD for more information.

Typical Usage Scenarios

Scenario One — Retasking a System

You are the system administrator for a large company. Your group requires an additional system to support a new financial analysis package, and you have access to a Dell system that is no longer in use, from another department within the company. Because the Dell system has an older operating system installed on it, you plan to upgrade the operating system before installing the new financial application. You also plan to install the most current BIOS and ESM firmware offered by Dell, as well as install the Dell OpenManage Server Administrator systems management software.

To prepare the system to run the company's new financial software, perform the following general steps:

- 1 Use the *Dell Systems Management Tools and Documentation* DVD that came with the Dell system to install the most current version of the Red Hat® Enterprise Linux® AS operating system.
- 2 Log on to support.dell.com, select **Drivers and Downloads** and enter the Dell hardware service tag for the Dell system. Otherwise, you can also select the **Model**.
- 3 Locate the BIOS and ESM firmware DUPs for the Dell system and download them.

Additionally, download the Server Administrator application.

- 4 Start to verify the signature of the packages by first downloading the following two files from support.dell.com:
 - PE2850-BIOS-LX-A20.bin.sign
 - PE2850-BIOS-LX-A20.bin
- 5 Import the public key by running the following command line:

```
gpg --import <linux-security-publickey.txt>
```

The following output message appears:

```
gpg: key 23B66A9D: "Dell Computer Corporation  
(Linux Systems Group) <linux-security@dell.com>"  
not changed  
gpg: Total number processed: 1  
gpg: unchanged: 1
```

- 6 Verify the public key by typing the following command:

```
gpg --edit-key 23B66A9D
```

Then at the command prompt, type the following commands:

```
fpr  
sign
```

- 7 Verify the PE2850 BIOS package digital signature by running the following command:

```
gpg --verify PE2850-BIOS-LX-A02.bin.sign PE2850-  
BIOS-LX-A02.bin
```

The following output message appears:

```
gpg: Signature made Thu 14 Apr 2005 04:25:37 AM  
IST using DSA key ID 23B66A9D  
gpg: Good signature from "Dell Computer  
Corporation (Linux Systems Group) <linux-  
security@dell.com>"
```

- 8 Copy the files that you downloaded to a directory where you want to store all the packages for the Dell system, for example, to the `/home/updates/2850/bin` directory.

- 9 Create a simple script that executes the following packages one-by-one in this order:

- ESM system firmware
- BIOS

Use the CLI `-q` option on each line in the script for these packages so that you can schedule the process by using the task manager. On each line of the file, you also include `| tee -a /var/log/upgrade.log` to check the results of the execution. Use the CLI `-r` option for the last line (BIOS) of the script.

- 10 You analyze the log file, find that the packages installed successfully, and note that the system was rebooted. You then install Server Administrator.

At this point, the Dell system is running the most current operating system, system BIOS, and system firmware. You are now ready to install the financial application for your division.

Scenario Two — BIOS Update for 200 Systems

You are the system administrator for a large business with over 500 stores. Every store location has a Dell system that is used to manage the company's inventory and billing systems. About 200 of these stores are running on Dell systems. The latest BIOS update available on support.dell.com is designed to dynamically regulate the system's cooling fan speeds, which allows the systems to run quieter and consume less energy. Because you remotely

manage these systems, you have invested in a software distribution tool that allows you to schedule remote software installation and updates. You also have a planned 4-hour service window each weekend when you can perform any maintenance functions necessary on the company's systems.

To roll out the BIOS update to the company's Dell systems, you perform the following general steps:

- 1 Log on to **support.dell.com**, select **Drivers and Downloads** and enter the Dell hardware service tag for the Dell system. Otherwise, you can also select the **Model**.
- 2 Select **BIOS** as the category.
- 3 Download the new BIOS DUP for the Dell system.

```
chmod +x packagename.bin
```

- 4 Use the software distribution tool to create an update task that delivers the BIOS DUP to all the systems in the network.

The update task is a script that invokes the BIOS DUP and uses the CLI `-r -q > redirect_output.log` options to ensure that the system is rebooted when necessary.

Because this BIOS DUP executes only on a Dell system, you can plan on distributing this to all systems regardless of the system model type. The DUP does not affect other systems.

- 5 Use the software distribution tool to schedule the BIOS update task to run on all systems at 2:00 A.M. this coming Saturday, which falls within the allotted 4-hour maintenance window.
- 6 On Sunday morning, you log in to your system and check the execution results report within the software distribution tool and determine that 180 of your 200 systems successfully applied the BIOS update.
- 7 The attempted BIOS update on the remaining 20 systems returned the information that the update was not required.
- 8 Log on to one of the 20 systems and check the BIOS package's `redirect_output.log` file.

You confirm that on these 20 systems, the BIOS version was already up-to-date because these systems were those most recently purchased from Dell.

You have successfully completed the BIOS update process for the company.

Command Line Interface Reference

Using the CLI

This section provides information for using the command line interface (CLI) for Dell™ Update Packages (DUPs).

CLI Options

You can display information about CLI options by typing the DUP name and either `-h` or `--help` at a command line prompt. For example, type the following command to get a help screen about the CLI options:

```
./packagename.bin -h or --help
```

The console displays all of the command line options and provides help for each choice.

Table 3-1 provides a list of the CLI options, a description of each option, and the command syntax.

Table 3-1. CLI Options: Usage

CLI Option	CLI Task Description	Command Syntax
(no option; run command without options) Run commands in interactive mode.	Apply the DUP in interactive mode; if the DUP is valid and can be applied, interacts with the user, asking questions.	<code>./packagename.bin</code>
<code>-h</code> or <code>--help</code> Help option	Display command line options and help information. The <code>--help</code> option executes before all other <code>--</code> options.	<code>./packagename.bin -h</code> <code>./packagename.bin --help</code>
	NOTE: This option exits after displaying the requested information; no DUP verification or updates occur.	

Table 3-1. CLI Options: Usage (continued)

CLI Option	CLI Task Description	Command Syntax
-c Check option	Determine if the update can be applied to the target system.	<code>./packagename.bin -c</code>
-f Force option	Force a downgrade or update to an older version. The <code>-q</code> option is required when using the <code>-f</code> option. NOTE: Before downgrading the software to a previous version, see the documentation for the previous version.	<code>./packagename.bin -q -f</code>
--list List package contents option	Display all files that are contained in the DUP. NOTE: This option exits after displaying the requested information; no DUP verification or updates occur.	<code>./packagename.bin --list</code>
-q Run command in non-interactive mode	Execute the DUP silently without user intervention. When <code>-q</code> is not specified, the DUP is in the interactive mode.	<code>./packagename.bin -q</code>
-r Reboot option	Reboot the system, if required, after performing the update. The reboot does not occur: <ul style="list-style-type: none"> • If the DUP fails or is not applicable to the target system. • If the DUP does not require the target system to be rebooted. The <code>-q</code> option is required with this option.	<code>./packagename.bin -r -q</code>

Table 3-1. CLI Options: Usage (continued)

CLI Option	CLI Task Description	Command Syntax
<code>--rebuild</code> Rebuild option	Automatically rebuild a DUP to support Linux operating system kernels in addition to the supported kernels. See "Rebuilding Packages."	<code>./packagename.bin --rebuild</code>
<code>-v, --version</code> Display version option	Display the version, fixes, enhancements, and release date; lists systems to which the DUP can be applied. NOTE: This option exits after displaying the requested information; no DUP verification or updates occur.	<code>./packagename.bin -v</code> <code>./packagename.bin --version</code>
<code>--extract <path></code>	Extract all files contained in the DUP to the path you specify. If the directory specified in the path does not exist, it is created. If the path contains spaces, use quotation marks around the <code><path></code> value. NOTE: This option exits after extracting the requested files; no DUP verification or updates occur.	<code>./packagename.bin --extract /update</code> <code>./packagename.bin --extract "/update files"</code>

Exit Codes for CLI

After running DUPs, the exit codes described in Table 3-2 are set.

The exit codes help you determine and analyze the execution results after you run DUPs.

Table 3-2. Exit Codes

Value	Message Name	Display Name	Description
0	SUCCESSFUL	Success	The update was successful.
1	UNSUCCESSFUL (FAILURE)	Unsuccessful	An error occurred during the update process; the update was not successful.
2	REBOOT_REQUIRED	Reboot required	You must restart the system to apply the updates.
3	DEP_SOFT_ERROR	Soft dependency error	<p>Some possible explanations are:</p> <ul style="list-style-type: none">• You attempted to update to the same version of the software.• You tried to downgrade to a previous version of the software. <p>To avoid receiving this error, provide the /f option.</p>
4	DEP_HARD_ERROR	Hard dependency error	<p>The required prerequisite software was not found on your system. The update was unsuccessful because the server did not meet BIOS, driver, or firmware prerequisites for the update to be applied, or because no supported device was found on the target system. The DUP enforces this check and blocks an update from being applied if the prerequisite is not met, preventing the server from reaching an invalid configuration state.</p> <p>The prerequisite can be met by applying another DUP, if available. In this case, the other package should be applied before the current one so that both updates can succeed. A DEP_HARD_ERROR cannot be suppressed by using the /f switch.</p>

Table 3-2. Exit Codes (continued)

Value	Message Name	Display Name	Description
5	QUAL_HARD_ERROR	Qualification error	<p>The DUP is not applicable to the system. Some possible explanations are:</p> <ul style="list-style-type: none">• The operating system is not supported by the DUP.• The system is not supported by the DUP.• The DUP is not compatible with the devices found in your system. <p>A QUAL_HARD_ERROR cannot be suppressed by using the /f switch.</p>
6	REBOOTING_SYSTEM	Rebooting system	The system is being rebooted.

Table 3-2. Exit Codes (continued)

Value	Message Name	Display Name	Description
7	RPM_VERIFY_FAILED	RPM verification has failed	<p>The Linux DUP framework uses RPM verification to ensure the security of all DUP dependent Linux utilities. If security is compromised, the framework displays a message and an RPM Verify Legend, and then exits with exit code 9.</p> <p>RPM produces output <i>only</i> if there is a verification failure. The format of the output is:</p> <pre>.SM5DLUGT 'utility name'</pre> <p>For example, if the <i>fmt</i> command is compromised, the framework displays the message:</p> <pre>rpm verify failed: .M..... /usr/bin/fmt</pre> <p>RPM Verify Output Legend:</p> <ul style="list-style-type: none">.- Verification test passedS- File Size differsM- Mode differs (includes permissions and file type)5- MD5 sum differsD- Device major/minor number mismatchL- ReadLink(2) path mismatchU- User ownership differsG- Group ownership differsT- mTime differs

Rebuilding Packages

Overview

When you download a Dell™ Update Package (DUP) from the Dell Support website at support.dell.com, you want to apply it to a specific target system. The DUP application checks for two general compatibility criteria between a package and the target system to which you are applying it:

- Is the system on which you are trying to apply the DUP running a Dell-supported Linux operating system?
- If the system on which you are trying to apply the DUP is running a Dell-supported Linux operating system, is the system also running a Dell-supported Linux kernel version?

Dell-Qualified Path

The Dell-qualified path can be described in the following steps:

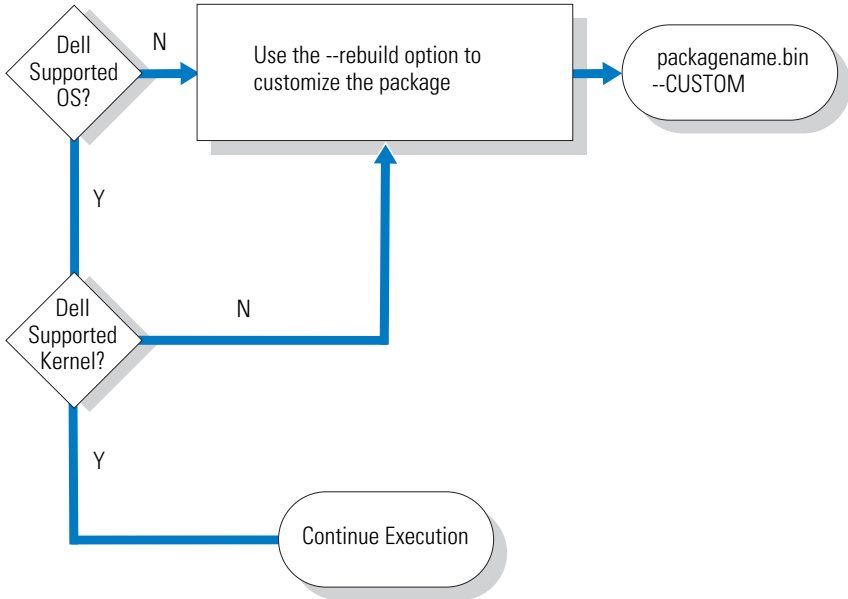
- 1 You download a DUP from support.dell.com.
- 2 The DUP meets all compatibility and dependency checks for the target Dell system.
- 3 The supported version of the Linux operating system and kernel version for which the DUP was created, match the running operating system version and the running kernel version on the target system.
- 4 Continue applying the DUP to your system.

Dell-Enabled Path

The Dell-enabled path allows you to customize DUPs to run on target systems that do not have supported operating systems or supported kernels. When you try to apply a package to a system, if the operating system or kernel is not supported, the DUP application displays a message to that effect.


The Dell-enabled path allows you to customize a DUP by using the `--rebuild` option. The prerequisites for using the `--rebuild` option are described in "Setting Up a Test System for Rebuilding a Package." The Dell-enabled path is described by the flow diagram in Figure 4-1.

Figure 4-1. Dell-Enabled Path for Rebuilding Packages



The Dell-enabled path can be described in the following steps:

- 1 Download a DUP from support.dell.com.
- 2 When you try to apply the DUP to your system, the DUP application discovers that your target system does not have a Dell-supported operating system.
- 3 The DUP allows you to rebuild a customized package for your unsupported operating system and issues a disclaimer that this customized package is not supported or warranted.

- 4 The DUP checks to make sure that the kernel, for the package you are trying to apply to your target system, is supported. If the kernel is not supported, you must follow the "Dynamic Kernel Support" procedures and other procedures found later in this section to build a customized package.
-  **NOTE:** It is recommended that the `--rebuild` option be executed on a test system having the same configuration.
- 5 When you have successfully built a custom package for the operating system and kernel that are running on your target system, read the warning messages before applying the package to your target system.
 - 6 Specifically, the supported version of the Linux operating system and the kernel version for which the package was created, match the running operating system version and running kernel version on the target system.
 - 7 Continue applying the package to your system.

Dynamic Kernel Support

The kernel-dependent driver built into the DUP must be compatible with the kernel on the system to which you are applying the package.

When you download a DUP from support.dell.com, the packages contain precompiled driver modules for a limited set of kernels and their corresponding GNU C compiler (GCC) versions. If the kernel that is running on the system(s) to which you want to apply the DUP is not one of the supported kernels, then the package will not work on your system. You can rebuild your package by using your running kernel source and `binutils.rpm`, and then apply the rebuilt package to any target systems that have the same running kernel, as the one where you rebuilt your package.

Customers typically run three or four different kernels across thousands of servers on their network. Applying updates to systems running these different kernel versions becomes difficult if you have to meet these prerequisites on each server across the network. When building customized packages, you can set up a test system for rebuilding packages that meets the prerequisites for rebuilding packages. See "Prerequisites for the Test System."

Determining Whether Your Package Is Supported

Rebuilding a supported kernel does not require any prerequisites. In this case, the standard DUP is used and the rebuild process completes successfully.

Rebuilding an unsupported kernel requires prerequisites. See "Prerequisites for the Test System."

DUP execute on a given target system and can determine if the running kernel is supported by the package you are trying to apply to your system. In cases where the currently running kernel is not supported, the DUP application tries to rebuild the package. If the prerequisites are not present for an unsupported kernel, the rebuild fails and the DUP application issues one of the following error messages:

```
Update Package is unable to build a device driver for the running kernel because the required kernel source files are not installed. See "Rebuilding Packages" in the Update Packages User's Guide for more information.
```

or

```
Update Package does not support the running kernel. See "Rebuilding Packages" in the Update Packages User's Guide for more information.
```

The above messages indicate that the running kernel is not supported by the DUP that you attempted to apply to your Dell system. You can proceed with the update in one of the following ways:

- Install the prerequisites for compiling customized packages for the running kernel directly on the system to which the package is being applied, rebuild the package on the system, and then reapply the rebuilt package.
- Rebuild the package on a test system that meets the prerequisites for a test system, and then distribute the update to systems that have the same running kernel, model name, and configuration, across the network.

Setting Up a Test System for Rebuilding a Package

Dell recommends using a test system that has the same running kernel as the kernel that will be running on the system in the production environment.

Scenario

The following scenario covers the major steps that you would follow in determining that your downloaded package does not support the running kernel on the Dell system to which you were trying to apply the package. The scenario provides a high-level description of the steps for rebuilding the package and distributing it to the systems on which you want to use the rebuilt package.

- 1 Download the latest BIOS version from the Dell Support website at support.dell.com for a Dell system.
- 2 When trying to apply the package to the Dell system, you learn that the precompiled package that you downloaded, does not support the kernel version that is currently running on your system.
- 3 An inventory of your network's production environment shows that the same unsupported kernel is running on a total of 200 systems.
You decide to use the DUP `--rebuild` option to build a customized package. The customized package will support an additional kernel.
- 4 Select a non-production *test* system on which to rebuild this package to add support for this kernel.
- 5 On this test system, ensure that certain prerequisites are satisfied.
If the prerequisites are not satisfied, the `--rebuild` option will not work. For more information on the prerequisites, see "Prerequisites for the Test System."

Run the `--rebuild` option against the downloaded DUP to add support for the running kernel. For example, type the following command:

```
./PE2850-ESM_FRMW_LX_R92394.bin --rebuild
```

- 6 Apply the rebuilt package to a test system to ensure that the package applies without errors. For example, type the following command:

```
./PE2850--ESM_FRMW_LX_R92394.bin--CUSTOM
```

If package execution results in errors, correct the errors and rebuild and reapply the package until you get satisfactory results.

- 7 Distribute the rebuilt package to all 200 of the target systems. You can write a script to apply the package to all systems.

Prerequisites for the Test System

Prepare your test system to meet the following prerequisites for executing the `--rebuild` command. If these prerequisites are met on the test system, you can test the package on the test system, and then distribute and use the rebuilt packages on Dell systems in a production environment.

The test system, or the system on which you are going to rebuild the package, must meet the following six prerequisites:

- 1 **Kernel match:** The kernel version on the test system must match the kernel version running on the system to which the rebuilt package is to be deployed (target system or production system).


To find out the kernel version that is running on your system, type the following command:

```
uname -r
```

The system responds by displaying the kernel version, for example:

```
2.4.9-e.3smp
```

- 2 **Kernel GCC compiler match recommended:** It is recommended that you use the same GCC compiler version on both the test system and the production system.

 **NOTE:** The kernel source and `binutils.rpm` do not need to be present on the production system.

- 3 **Kernel source is installed:** The kernel source for the currently running kernel version must be installed.
- 4 **The `binutils.rpm` package is installed:** Ensure that at least some version of `binutils.rpm` is installed on the test system.

- 5 Dell OpenManage™ Server Administrator is not installed on the test system:** Ensure that the Server Administrator is not installed on the *test* system. You cannot rebuild a package on a system that has Server Administrator installed.



NOTE: It does not matter whether Server Administrator is installed on the production systems to which the rebuilt packages are to be distributed and applied. Server Administrator cannot be present on the system where the packages are rebuilt.

- 6 Dell OpenManage Server Administrator device drivers are not built into the kernel on the test system:** Ensure that the Server Administrator device drivers have not been built into the kernel. The Server Administrator device drivers are named *dcdbas* and *dell_rbu*. You cannot rebuild a package on a system that has either or both of these device drivers built into the kernel.

You can identify that a driver is built into a kernel by checking if both of the following are true:

- a** A directory for the driver exists in the `/sys/devices/platform` directory.

For the specific case of Server Administrator device drivers, type the following command and see if either *dcdbas* or *dell_rbu* is listed:

```
ls /sys/devices/platform
```

- b** A module is not loaded for the driver.

For the specific case of Server Administrator device drivers, type the following commands to see if a module for either driver is loaded:

```
lsmod | grep -i dcdbas
```

```
lsmod | grep -i dell_rbu
```

When the test system matches all the prerequisites listed above, you can rebuild the package.

Rebuilding a Package to Add Kernel Support to a Single System

The following command rebuilds the package for the currently running version of the kernel.

```
./packagename.bin --rebuild
```

Depending on your system configuration, the rebuild takes between a few seconds and a few minutes to complete. DUPs display any error messages encountered while executing the rebuild command.

The `/tmp` directory requires 6 MB or more to execute the `--rebuild` command. If the `/tmp` directory lacks space for the execution of the `--rebuild` command, the following message is displayed:

```
Archive cannot be extracted. Please ensure that there is enough space in the tmp folder.
```

When the rebuild is complete, an output package is created with the suffix `--CUSTOM`. The rebuilt package name has the syntax:

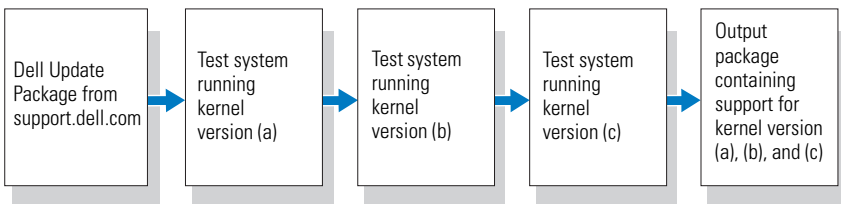
```
packagename.bin--CUSTOM
```

The package on which the `--rebuild` option was run remains unchanged.

Rebuilding the Package to Add Kernel Support for Multiple Kernel Versions

Customers typically have three or four versions of a Linux kernel running across larger networks. For each unsupported kernel, a package should be rebuilt on similar test systems. The process for creating this package is described by the following flow diagram in Figure 4-2:

Figure 4-2. Creating a Package That Supports Multiple Kernels



The package can be built on one test system that supports kernel version (a). The output from the rebuilt package for kernel (a) can be copied to another system that is running kernel (b). The package can be rebuilt on the test system running kernel (b), and then copied to the system running kernel (c). The package can be rebuilt on test system c and the resulting output package will have a package that contains support for kernel versions (a), (b), and (c).

Scenario

A customer has two thousand clusters where three different versions of the kernel, versions (a), (b), and (c), are running. The customer wants to perform an ESM upgrade. The customer downloads the **PE2850-ESM_FRMW_LX_R92394.bin** package.

PE2850-ESM_FRMW_LX_R92394.bin does not support kernels (a), (b), and (c). To build a package that supports these three additional kernels, the customer performs the following steps:

- 1 Downloads package **PE2850-ESM_FRMW_LX_R92394.bin** from **support.dell.com** on the test system running kernel version (a).
- 2 Types the following command to build support for kernel version (a):

```
./PE2850-ESM_FRMW_LX_R92394.bin --rebuild
```

If the package rebuild is successful, then a new package named **PE2850-ESM_FRMW_LX_R92394.bin--CUSTOM** is created on the test system running kernel version (a).
- 3 Copies the **PE2850-ESM_FRMW_LX_R92394.bin--CUSTOM** file using one of the system utilities such as scp, rcp, ftp, to the system running kernel version (b).
- 4 Types the following command to build support for kernel version (b):

```
./PE2850-ESM_FRMW_LX_R92394.bin--CUSTOM --rebuild
```

The output package is **PE2850-ESM_FRMW_LX_R92394.bin--CUSTOM**.

By using steps 3 and 4 iteratively, you can add additional support for as many kernels you want.

Deploying Custom Packages Across the Environment

These modified custom packages rebuilt for a custom environment can be deployed across the network. The execution behavior of the rebuilt packages will not be modified. DUPs would still check for compatibility of the package with the system to which it is being applied, and for all other prerequisites that must be met for successful package execution as discussed in the "Using Dell Update Packages" and "Command Line Interface Reference" sections.

Troubleshooting

Known Issues

The following are known issues and corrective actions for Dell™ Update Packages (DUPs) for Linux operating systems:

Diagnostic Tasks will not run while a DUP reboot is pending

It is recommended that you complete any pending updates with a reboot prior to running diagnostic tasks.

Abnormal termination of a DUP

When a DUP stop abruptly due to a power outage or abnormal termination, perform the following steps:

- 1 Remove the lock file.
- 2 Type the following command: `rm -f /var/lock/.spsetup`
- 3 Run the DUP again to reapply the update.

Error while loading shared libraries

Install the compatibility libraries from your Linux distribution if the following error is displayed: `Error while loading shared libraries: libstdc++.so.5: Cannot open shared object file: No such file or directory`. To install the compatibility libraries, use the following command: `RPM -ih compat-libstdc++-33-3.2.3-47.3.i386.rpm`

Insufficient free physical memory to load the BIOS image

BIOS updates require enough free physical memory to load the entire BIOS image into the physical memory. If there is insufficient free physical memory available on the system to load the BIOS image, the DUP for BIOS may fail. In this instance, the BIOS can be updated using the diskette method, by running the DUP after adding more memory, or by running the DUP immediately after a reboot.

Kernel panic while running storage controller firmware update packages

Linux systems running one or more applications that interact with SCSI devices in certain ways are known to cause a kernel panic situation. Therefore, it is recommended that you stop Dell OpenManage™ Server Administrator and Dell OpenManage Server Administrator Storage Management Service before running storage controller firmware DUPs.

Loss of functionality while renaming Linux DUPs

Linux DUPs can be executed even if they are renamed, but some functionality is lost. Renamed Linux DUPs with extensions that are in the Linux MIME (Multimedia Internet Message Extensions) database could fail to execute from various X-Windows desktops, for example GNOME. In this case the desktop issues a file open error message indicating that the DUP cannot be opened. This occurs if a DUP with an uppercase ".BIN" extension is renamed to one having a lowercase ".bin" extension. The ".bin" extension has an entry in the Linux MIME database which leads to the file open error.



NOTE: The `readme.txt` file, which is available on the Dell Support website at support.dell.com, provides the latest information regarding known issues.

Messages

Table 5-1 provides descriptions and solutions to messages that you may receive when running DUPs.

Table 5-1. Update Packages Message Information

Message	Description/Solution
This Update Package is not compatible with your system Your system: <Model NameN> System(s) supported by this package: <Model NameN>	Select a compatible DUP, and try the update again.
This Update Package cannot be executed under the current operating system.	DUPs support Linux operating systems and kernels supported by the <code>--rebuild</code> option as explained in "Rebuilding Packages."

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
This Update Package is not compatible with any of the devices detected in your system.	Select a compatible DUP for the device(s) you want to update, and try again.
The prerequisite software version for this update was not found. Software application name: <name> Current version: <version> Required version: <version>	The DUP you selected cannot be installed because a prerequisite requirement was not met. Install the appropriate prerequisite software version, and try the update again.
You must use the -f option to continue with the update in the non-interactive mode.	The version of this DUP is either older than or the same as the version installed. To apply the DUP, you must force execution.
The software to be updated was not found. Install the following software, and then retry the update. Software name: <name> Required version: <version>	Your system does not contain the software that matches the DUP.
The version of this Update Package is newer than the currently installed version. Software application name: <name> Package version: <version> Installed version: <version>	This message confirms the version of the currently installed software before the update is performed. (Using the interactive mode) Type Y or N when prompted to continue. (Using the CLI) Specify the -f option.
The version of this Update Package is older than the currently installed version. Software application name: <name> Package version: <version> Installed version: <version>	The DUP you selected cannot be installed because a newer version of the software already exists on the system. To install the older version: (Using the interactive mode) Type Y or N when prompted to continue. (Using the CLI) Specify the -f option.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
The version of this Update Package is the same as the currently installed version. <version> Software application name: <name> Package version: <version> Installed version: <version>	The DUP you selected cannot be installed because the same version of the software already exists on the system. (Using the interactive mode) Type Y or N when prompted to continue. (Using the CLI) Specify the -f option.
This package is not compatible with the version of Server Agent on your system. You must upgrade to Server Administrator before running this package.	Use an alternative update method from support.dell.com .
This update package requires an OpenIPMI driver. Currently no OpenIPMI driver is installed on the system.	The DUP you selected cannot be installed because you do not have an OpenIPMI driver installed on your system.
In order to assist in the <update install>, you can download and install a version of the OpenIPMI driver that meets the minimum version requirement from the Dell Support website at support.dell.com . The minimum version required is <version>.	Download and install the minimum required OpenIPMI driver from the Dell Support website.
This Update Package requires a newer version of the OpenIPMI driver than is currently installed on the system, which is version <version>.	The OpenIPMI driver that is currently installed on your system does not meet the minimum version requirements of the selected DUP.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Kernel source for the running kernel is not installed, and the currently installed OpenIPMI driver RPM was installed without the kernel source for the running kernel. In order to install OpenIPMI driver modules for the running kernel that meet the minimum version requirement, you must install kernel source for the running kernel, and then use DKMS (see man page for dkms) to install and build OpenIPMI driver modules for the running kernel. To install kernel source for the running kernel, install the <filename> RPM that is applicable to the running kernel.	<p>Install the kernel source for your running kernel, and then use the Dynamic Kernel Module Support (DKMS) framework to install and build the OpenIPMI driver modules for the running kernel.</p> <p>You must install the kernel source by installing the .rpm file required by your kernel.</p> <p>For information on using DKMS, see the man page for DKMS.</p>
Kernel source for the running kernel is installed, but the currently installed OpenIPMI driver RPM was installed without the kernel source for the running kernel. In order to install OpenIPMI driver modules for the running kernel that meet the minimum version requirement, use DKMS (see man page for dkms) to install and build OpenIPMI driver modules for the running kernel.	<p>Use DKMS to install and build the OpenIPMI driver modules required by your running kernel.</p> <p>For information on using DKMS, see the man page for DKMS.</p>

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
You must reboot the system for the update to take effect.	If you shut down or power off the system after performing an update, you will lose the update. After performing a BIOS update, do not power off the system. Reboot the system for the update to take effect.
An Update Package is already running. Wait until it is complete before proceeding with another update.	You can run only one DUP at a time.
WARNING: DO NOT STOP THIS PROCESS OR INSTALL OTHER DELL PRODUCTS WHILE <BIOS FRMW> UPDATE IS IN PROGRESS. THESE ACTIONS MAY CAUSE YOUR SYSTEM TO BECOME UNSTABLE.	Do not interrupt DUP execution.
Cannot find utilities on the system to execute package.	The package must have certain utilities to execute.
Make sure the following utilities are in the path:<path>	The utilities named must be in the path mentioned in the message.
File already exists.	The package is attempting to overwrite an existing file.
Rebuilding package <package_name> to support kernel version "kernel.x". This process may take several minutes to complete...	The DUP application is rebuilding the package to support a different kernel version.
No specific kernel version specified! Building support for current kernel...	Unable to determine current system kernel. The DUP application attempts to rebuild the package.
Cannot create directory /extract directory. Please ensure that there is enough space.	Extracting the package to this path requires more disk space than is available.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Cannot create temporary file "filename"	The package cannot create the temporary file for a technical reason, such as lack of disk space, permissions, or a pre-existing file.
Unable to create Temp Files. Please ensure that there is enough space in the tmp folder.	The package cannot create the temporary file for a technical reason, such as lack of disk space, permissions, or a pre-existing file.
Archive cannot be extracted. Please ensure that there is enough space in the tmp folder.	There may be insufficient space for the archive.
Please provide a directory name to extract to.	Provide a directory name for the extracted files.
ROOT directory cannot be used for extraction.	Create a directory for your extracted files.
Successfully extracted to "/extractdir"	The package contents were extracted to the directory you designated.
Cannot find utilities on the system to extract package. Make sure the following utilities are on the path: <path>	Locate the listed utilities and add their directory to your Path .
Rebuilding Package Failed - Error creating driver support directory.	The package could not be rebuilt because the support directory could not be created.
Rebuilding Package Failed - Error copying kernel modules.	The package could not be rebuilt because the kernel modules could not be copied.
Rebuilding Package Failed - Error re-creating archive.	The package could not be rebuilt because the archive could not be recreated.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Rebuilding Package Failed - Uninstallation of driver was unsuccessful.	The package could not be rebuilt because the driver could not be uninstalled.
Package has been rebuilt successfully.	The package rebuild was successful.
Rebuilding Package Failed - Error creating output package.	Ensure that the directory from which the package rebuild option is being executed is writable.
Rebuilding Package Failed - Error creating wrapper files.	The required wrapper files could not be created.
Output package:	The name of the output package is:
Package execution requires 'root' user privileges.	Log in with root privileges, and try the update again.
Successfully extracted to <target_directory>.	The package is being extracted to the following directory.
Rebuilding package packagename.bin to support 'uname -r'.	DUP is rebuilding the packages to support the running kernel.
This process may take several minutes to complete.	Wait for the process to complete.
Rebuilding Package Failed - Unable to extract package contents.	Unable to extract the contents of the package.
Rebuilding Package Failed - Server Administrator device driver (HAPI) is already installed on the system. Package can be rebuilt only on a system that does not have Server Administrator device driver (HAPI) installed.	Packages cannot be rebuilt on a system that has the HAPI device driver installed.
Unable to Install Dell Instrumentation Driver (HAPI).	The package cannot install the HAPI driver.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Rebuilding Package Failed - RPM Installation failed with error code=<RPM Install Error Return code>	Provides the RPM error code that prevented the package from being rebuilt.
packagename.bin: Rebuilding Package failed - Unable to extract package contents.	Ensure that there is enough space in the /tmp directory.
packagename.bin: Rebuilding Package - Kernel <kernel-version> is already supported by this package.	You do not need to rebuild this package because you have already customized the package for your kernel. You will only receive this message if you previously used the --rebuild option and then ran the rebuilt package.
packagename.bin: Rebuilding Package Failed - RPM Installation failed with error code=<LSB_Compliant RPM Install Error Return code>	Check the LSB Compliant RPM error return codes to determine the exact reason for failure.
packagename.bin: Rebuilding Package Failed - Error creating driver support directory.	Ensure that enough space is available in the /tmp directory.
packagename.bin: Rebuilding Package Failed - Error copying kernel modules.	Ensure that enough space is available in the /tmp directory.
packagename.bin: Rebuilding Package Failed - Error recreating archive.	Ensure that enough space is available in the /tmp directory.
packagename.bin: Rebuilding Package Failed - Uninstall of driver was unsuccessful.	The driver could not be uninstalled.
packagename.bin: Rebuilding Package Failed - Error creating files.	Ensure that enough space is available in the /tmp directory.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Package has been rebuilt successfully. Output package: packagename.bin:--CUSTOM.	Package is ready for distribution and execution on production systems with the same running kernel as the system on which it was rebuilt.
Package has been rebuilt successfully.	Package is ready for distribution and execution on production systems with the same running kernel as the system on which it was rebuilt.
packagename.bin: Rebuilding Package failed - Unable to extract package contents.	Ensure that enough space is available in the /tmp directory.
packagename.bin: Rebuilding Package failed - Server Administrator is installed on the system.	Packages cannot be rebuilt on a system that has Server Administrator installed. Uninstall Server Administrator from the system before using the --rebuild option.
The installed operating system version is not supported by this Update Package. To customize this package, see "Rebuilding Packages" in the Update Package User's Guide. In no event shall Dell Inc. be held liable for any direct, indirect, incidental, special, or consequential damages suffered during or after package customization and execution.	The prerequisites for rebuilding the package are present on your system, but if you apply the customized package to your system and it causes problems, you cannot hold Dell Inc. responsible.
Unable to build a device driver for the running kernel because the build environment is not installed. See "Rebuilding Packages" in the Update Package User's Guide.	Follow the steps in "Rebuilding Packages" to create the prerequisites for customizing packages.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
The running kernel is not supported. See "Rebuilding Packages" in the Update Package User's Guide.	See the "Rebuilding Packages" section. You may be able to customize your package to support the kernel you are running.
In no event shall Dell Inc. be held liable for any direct, indirect, incidental, special, or consequential damages suffered during or after package customization and execution.	Fully consider this statement before executing a customized package that was enabled by the --rebuild option.
packagename.bin: Rebuilding Package failed - Server Administrator is already installed on the system.	Packages cannot be rebuilt on a system that has Server Administrator installed. Uninstall Server Administrator from the system before using the --rebuild option.
Attempt to update BIOS or firmware to the same version. Update was unnecessary and not applied.	Re-application of BIOS or firmware DUP serves no purpose.
Inventory operation exceeded specified timeout.	Inventory operations have time-out limits as defined in the package's PIEConfig.xml file. Time-out durations are in seconds. If an operation times out, the remainder of the package update is cancelled.
Execution operation exceeded specified timeout	Execution update operations have time-out limits as defined in the package. Time-out durations are in seconds. If an operation times out, the remainder of the package update is cancelled.
/var/lock directory must exist.	Create this system directory to ensure that package updates do not execute concurrently.

Table 5-1. Update Packages Message Information (continued)

Message	Description/Solution
Unable to build a device driver for the running kernel because it is not supported on your system.	Select a compatible DUP and try again.
The Intel IMB driver is currently loaded. Please unload the driver before executing.	Unload the Intel® IMB driver before installing the selected DUP.
Warning: The shell less command is not available. When viewing Release Notes, press space to continue viewing notes, q to continue DUP processing.	Continue to view the release notes, or install the less command from operating system CDs, and re-execute the package interactively.
Press 'q' to exit DUP (--version). Press 'q' to continue with DUP execution (dup dup execution).	The Linux DUP framework uses the Linux utility, less, to display the release notes relevant to the specific firmware or driver release managed by the DUP. When viewing release notes, DUP prompts when executed with the below options: --version: Press 'q' to exit DUP (--version) All other DUP execution: Press 'q' to continue with DUP execution (dup dup execution).
Warning: Screen widths of less than <numeric value> can distort the information view.	To optionally correct this, answer <N>o to stop package execution. Widen the terminal window to the required size and then re-execute the package interactively.

DUP Message Logs

Logging occurs when you run a command for a DUP. The logs maintain information about all update activities. DUPs write to the Messages log. If you install the same package more than once on the same system, the log is appended.

Messages Log

Messages log files reside in the following default location:

`/var/log/dell/updatepackage/log`

The messages log file includes the following information:

- Date and time the DUP was launched
- Package release ID number
- The full path and filename of the support log generated by the command
- DUP type
- DUP version
- Framework version of the DUP
- Version that was previously installed on the system
- Version that the command is trying to apply to the system
- Exit code that results from execution of the command
- Whether a reboot was performed



NOTE: The support log files are intended for use by Dell support personnel. Dell encourages you to redirect the DUP output to a file of your choice.

Messages Log File

Message logs are informational messages that you can view in one of the messages files in the `/var/log` directory. The messages files in the `/var/log` directory contain messages about a wide range of events on the system. Therefore, you must scan through the log file to find the messages that are relevant to DUPs. The following two messages are from two different dates. The example dated September 10 is an example of a command that qualifies for successful execution, but requires a reboot. The example dated September 19 is an example of a command failure.

```
Sep 10 00:14:54 localhost spsetup.bin[8088]: Package
Release ID=R54734 Package Description=Dell ESM
Firmware, A22 Previous version=1.63 New Version=1.63
Support Log path=
/var/log/dell/updatepackage/log/support/R54734.log
Exit code = 2 (Reboot required)
```

```
Sep 19 17:27:05 7708sk1 spsetup.bin[7835]: Package
Release ID=R57025 Package Description=Dell ESM
Firmware, A24 Support Log path=
/var/log/dell/updatepackage/log/support/R57025.log
Exit code = 1 (Failure)
```

Support Log File Example

```
=====> Dell Update Package application started <=====
```

```
Command:-q -f
```

```
Date:Wed Nov 8 15:24:18 CST 2007
```

```
=====
```

```
Release ID: R136685
```

```
Update Package version: 5.4 (BLD_31)
```

```
Collecting inventory...
```

```
<?xml version="1.0"?>
```

```
<SVMInventory lang="en">
```

```
  <Device componentID="159" display="BIOS">
```

```
    <Application componentType="BIOS" version="A19"
display="BIOS"/>
```

```
  </Device>
```

```
  <System systemID="121"/>
```

```
  <OperatingSystem majorVersion="2.4" minorVersion=
"21" spMajorVersion="0" spMinorVersion="0"/>
```

```
</SVMInventory>
```

Running validation...

BIOS

Application: BIOS

Previous version: A19

New version: A21

The version of this Update Package is newer than the currently installed version.

Software application name: BIOS

Package version: A21

Installed version: A19

Executing update...

WARNING: DO NOT STOP THIS PROCESS OR INSTALL OTHER DELL PRODUCTS WHILE UPDATE IS IN PROGRESS.

THESE ACTIONS MAY CAUSE YOUR SYSTEM TO BECOME UNSTABLE!

The system should be restarted for the update to take effect.

=====> Update Result <=====

Update ready to be applied at reboot

Application: BIOS

Previous version: A19

New version: A21

=====

Exit code = 2 (Reboot required)

<?xml version="1.0" encoding="UTF-8"?>

```
<SoftwareComponent schemaVersion="1.0" packageID=
"R136685" releaseID="R136685" dateTime="2006-10-
06T06:36:59-05:00" releaseDate="October 06, 2006"
vendorVersion="A21" dellVersion="A21" packageType=
"LLXP" xmlGenVersion="1.0.2378">
```

...

...

```
</SoftwareComponent>
```

Wed Nov 8 15:24:40 CST 2006

Glossary

The following list defines or identifies technical terms, abbreviations, and acronyms used in this guide.

BIOS

Acronym for basic input/output system. Your system's BIOS contains programs stored on a flash memory chip. The BIOS controls the following:

- Communications between the microprocessor and peripheral devices, such as the keyboard and the video adapter
- Miscellaneous functions, such as system messages

CLI

Abbreviation for command line interface. A command line interface or CLI is a method of interacting with a computer where commands are entered as lines of text and the output is also received as text.

CLI mode

The method by which you can install Dell™ Update Packages (DUPs) from a script in silent/unattended mode.

Dell OpenManage™ Server Administrator

Server Administrator provides easy-to-use management and administration of local and remote systems through a comprehensive set of integrated management services. It resides solely on the system being managed and is accessible both locally and remotely from the Server Administrator home page. Remotely monitored systems may be accessed by dial-in, LAN, or wireless connections. Server Administrator ensures the security of its management connections through role-based access control (RBAC), authentication, and industry-standard secure socket layer (SSL) encryption.

DTK

Acronym for Dell OpenManage Deployment Toolkit. DTK includes a set of utilities for configuring and deploying Dell systems and is designed for users who need to build scripted installations to deploy large numbers of servers in a reliable fashion without having to dramatically change their current deployment processes. In addition to the command line utilities used to configure various system features, DTK also provides sample scripts and configuration files to perform common deployment tasks and documentation. These files and scripts describe the use of DTK in Microsoft® Windows® Preinstallation Environment (Windows PE) and embedded Linux environments.

device driver

A program that allows the operating system or some other program to interface correctly with a peripheral device, such as a printer.

digital signature

A digital signature is used to authenticate the identity of the signer of a document and to certify that the original content is unchanged. It is an encryption scheme for authenticating digital information and is implemented using techniques from the field of public-key cryptography.

ESM

Abbreviation for Embedded Systems Management.

firmware

Software (programs or data) that has been written onto read-only memory (ROM). Firmware can boot and operate a device. Each controller contains firmware that helps provide the controller's functionality.

GCC

The GNU Compiler Collection (GCC) is a set of programming language compilers produced by the GNU Project. It is a free software distributed by the Free Software Foundation (FSF) and is a key component of the GNU toolchain.

GNU

GNU is a free software operating system. Its name is a recursive acronym for "GNU's Not Unix", which was chosen because its design is Unix-like, but it contains no actual UNIX code. The GNU system, combined with a third-party kernel called Linux, is one of the most widely used operating systems in the world, commonly known as simply "Linux".

GNU Privacy Guard

The GNU Privacy Guard (GnuPG or GPG) is a free software replacement for the PGP suite of cryptographic software, released under the GNU General Public License.

interactive mode

The method by which you can install DUPs interactively through the CLI. In interactive mode, the text interface asks the user to confirm choices, such as whether to reboot the system now, or whether to apply the package even though the version number is the same as the one that is presently installed on the system.

ITA

Acronym for Dell OpenManage IT Assistant. ITA provides a central point of access to monitor and manage systems on a local area network (LAN) or wide area network (WAN). It helps you to identify the groups of systems that you want to manage remotely and provides a consolidated view of all systems, giving you a central launch point for managing these systems.

kernel

The term "kernel" refers to the lowest level of any operating system that provides a hardware abstraction layer, disk and filesystem control, multi-tasking, load-balancing, networking and security enforcement. A kernel is not a complete operating system. A complete system built around the Linux kernel is commonly known as the Linux operating system.

non-interactive mode

The method by which you can install DUPs non-interactively through the CLI. In non-interactive mode, the text interface executes commands without user intervention. If a command does not execute, the output is written to standard output (the Linux terminal). Non-interactive mode is required for executing scripts.

OpenIPMI

Acronym for Open Source Intelligent Platform Management Interface. The Intelligent Platform Management Interface (IPMI) specification defines a set of common interfaces to computer hardware and firmware, which system administrators can utilize to monitor the system health and manage the system. OpenIPMI consists of two main parts: a device driver that goes into the Linux kernel, and a user-level library that provides a higher-level abstraction of IPMI and generic services that can be used on any operating system.

passphrase

A string of characters longer than a password that is used to create a digital signature.

pre-operating system environment

A shell environment used to configure system hardware before a major operating system, such as Microsoft Windows or Linux, is installed.

rebuild

The `--rebuild` option is a process that modifies a DUP so that the package can support operating systems and/or running kernels for Linux operating systems beyond those that were supported and tested for the original DUP that you downloaded from support.dell.com.

repository

Repository is a database on the *Dell Server Updates* DVD that contains the updated BIOS, firmware, and driver components for Dell systems. The repository organizes these components into sets of updates for each supported system that, when applied, updates at one time all system components that require updates. Alternately, you can browse the repository for updatable systems and components without running the update application. You can access the repository for Windows and Linux systems on the *Dell Server Updates* DVD.

SUU

Acronym for Dell OpenManage Server Update Utility. SUU is one of the applications used for identifying and applying updates to your system. You can use SUU to update your Dell system or to view the updates available for any system supported by SUU. SUU compares the versions of components currently installed on your system with update components packaged on the *Dell Server Updates* DVD. It then displays a comparison report of the versions and provides the option of updating the components.

System Software Component

Software elements requiring update to a desired software version for efficient patch management. The following list includes components which are updated:

- System BIOS
- System firmware, also known as Embedded Server Management (ESM) firmware
- Dell Remote Access Controller (DRAC) firmware
- PowerEdge™ Expandable RAID Controller (PERC) firmware and device drivers
- Network interface card (NIC) drivers

For the current list, see the Dell Support website at support.dell.com.

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