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SIMPLIFY MANAGEMENT WITH THE DELL UNIFIED SERVER CONFIGURATOR ENABLED BY THE LIFECYCLE CONTROLLER

The new Dell™ Unified Server Configurator enabled by the Lifecycle Controller incorporates a comprehensive set of systems management features that operate in a pre-OS environment. Embedded directly in new 11th-generation Dell PowerEdge™ servers, this next-generation tool does not require media such as CDs or DVDs and offers a simplified, flexible way to perform tasks ranging from firmware updates to OS deployment to diagnostics.

Systems management is a key part of the IT administrator's job, and encompasses tasks such as installing operating systems, updating firmware to be functional and adhere to enterprise policies, configuring hardware, and maintaining IT infrastructures. Over the years, Dell has provided many tools designed to assist administrators with these tasks, including tools that shipped with multiple CDs (such as Dell OpenManage™ Server Assistant and the Dell OpenManage Deployment Toolkit) and a single CD carrying all the software tools (such as the Dell Systems Build and Update Utility). Although these tools helped simplify and streamline management of Dell systems, they also required administrators to save the CDs so the tools could be reinstalled if needed, which added clutter and storage requirements as organizations accumulated multiple versions of these tools.

The new Dell Unified Server Configurator (USC) enabled by the Lifecycle Controller is designed to overcome these challenges. Based on the Integrated Dell Remote Access Controller (iDRAC) embedded in new 11th-generation Dell PowerEdge servers, it provides a single place to perform updates, hardware configuration, OS deployment, and system diagnostics—one that functions independently of both media and platform OS. Because the USC is available even when the OS is not, it helps add flexibility when

provisioning servers and customizing them to meet specific requirements. In addition, because the tool is integrated with and embedded in the server, formatting the disk or reinstalling the OS does not remove the tool, helping save the time and costs associated with reinstalling system tools and thereby helping increase administrator productivity.

USC COMPONENTS AND ARCHITECTURE

New 11th-generation Dell PowerEdge servers introduce Embedded Management, which is designed to dramatically reduce the time required for multiple common management tasks. It comprises several interdependent components, including the new Lifecycle Controller and USC interface.

The Lifecycle Controller is a flash chip embedded in the system itself that provides persistent storage for systems management components—including, among others, the system BIOS, firmware, drivers, and Dell OpenManage tools. Administrators can access these components through the USC interface, which is also stored on the Lifecycle Controller.

The USC offers a single access point and interface for performing comprehensive platform updates, hardware configuration, OS deployments, and diagnostics (see Figure 1). Administrators can launch the application by booting the server and pressing F10.

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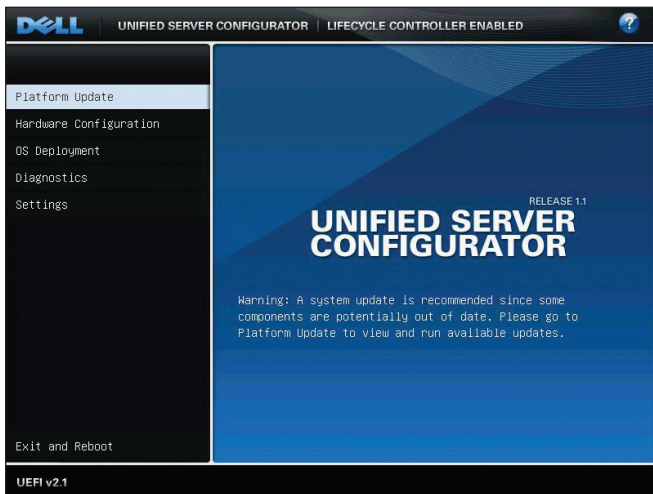


Figure 1. Main menu functions in the Dell Unified Server Configurator

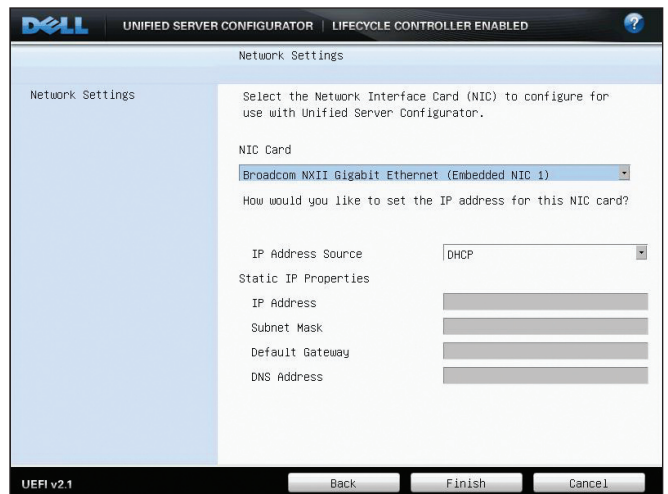


Figure 2. Network settings in the Dell Unified Server Configurator

Because the USC is managed by the iDRAC subsystem and runs in a Unified Extensible Firmware Interface (UEFI) environment, running the USC does not require booting the OS.

The UEFI specification was created to replace BIOS, but has also evolved to provide additional functionality that can support powerful applications that run without an OS. This specification includes a Trusted Computing Group protocol that supports Trusted Platform Module (TPM) measurements and secure updates and that the USC is designed to leverage. UEFI—and, therefore, the USC—also has a well-developed network stack and a strong point-and-click graphical environment designed for ease of use, helping make the USC a powerful, simplified pre-OS configuration tool.

The USC application includes built-in support for both Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), and enables administrators to configure network cards to acquire an IP address through DHCP or use static IP properties (see Figure 2). In addition, the application interface supports both text-based and SOCKS 4 proxies, enabling administrators to connect to the network through proxy servers to enable secure downloads to the server.

The USC also includes a task scheduler enabling administrators to deploy

multiple updates in batches. This batch processor—called the System Services Manager (SSM)—is automatically invoked when multiple updates are requested. The intelligence in the SSM is designed to defer reboots to the last possible point to help reduce the number of reboots required to perform updates.

The SSM also provides a way to apply OS-based Dell Update Packages (DUPs) in a synchronized way. When administrators apply a DUP through the OS, the updates are scheduled securely on the SSM for execution on next boot.

To provide assistance to administrators learning to use the USC, each USC screen includes context-sensitive help. Administrators can access the relevant help for a specific screen by clicking on the “?” button in the upper-right corner.

INTELLIGENT, EFFICIENT PLATFORM UPDATES

The USC platform update feature enables administrators to maintain the system

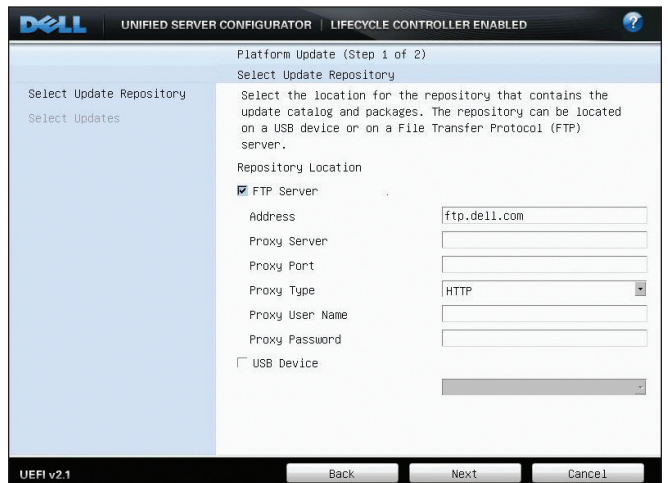


Figure 3. Update repository settings in the Dell Unified Server Configurator

firmware, diagnostics, BIOS, and drivers at the most current level, which can help maximize system performance and avoid unnecessary downtime. Operating in the UEFI environment, independently of an installed OS, helps increase the security and convenience of this process.

Administrators can perform platform updates from an FTP or local USB repository (see Figure 3); using a USB repository can help improve update efficiency during periods of network congestion. After administrators have selected a repository, the USC can automatically detect the necessary updates and provide the option of manually selecting specific components to update

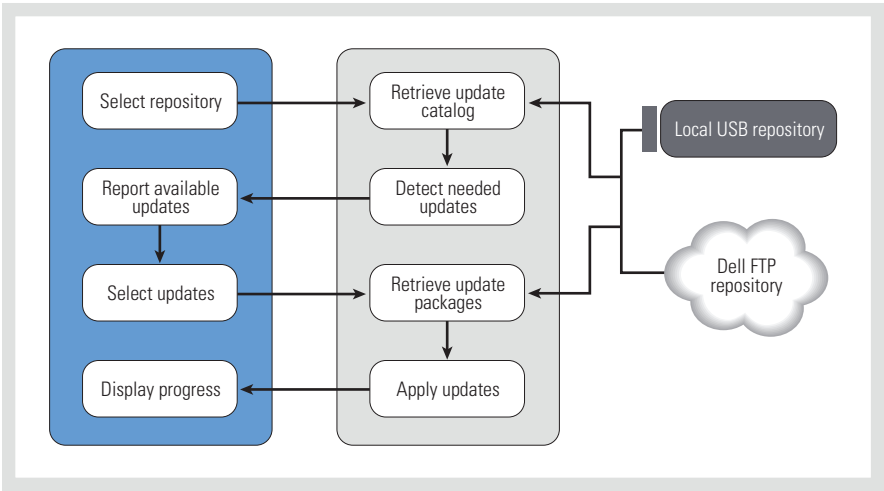


Figure 4. Platform update process using the Dell Unified Server Configurator

or deploying all identified updates. Figure 4 illustrates the update process.

Key platform update features

The USC introduces multiple platform update features not previously available in Dell systems management tools, and which are designed to simplify, automate, standardize, and secure the update process for IT administrators.

Simplified, media-less operation. The update process operates in the UEFI environment independently from an installed OS, and works on all supported servers. The update functions are designed to be immediately available

after booting the server and pressing F10, and the update process requires no external media such as CDs or DVDs—helping eliminate the time required to find or burn a disc, or to deal with problems such as an unreadable disc.

Efficient, automated inventory and update process. The inventory process starts immediately after the server boots to the USC or after an update process has completed. It collects and records the current level of the system and subsystem firmware into the system life cycle log (LCL), which contains a comprehensive history of the server, including the initial factory loading configuration.

Utilizing the data from the LCL, the USC can automatically detect the necessary and available updates from the designated repository. It then displays the data in a table format, showing both the current level and the available level (see Figure 5). By default, the update process automatically upgrades all identified components, but administrators can also manually select specific components to upgrade.

Increased standardization, consistency, and synchronization. Updates are applied to the system from the SSM batch processor. After the updates are selected from the comparison report table, the updates are registered into the system services information block (SSIB) task list, and the SSM processes and executes the task from this list. Using the SSM and the SSIB helps increase standardization, consistency, and synchronization throughout the update process.

Intelligent reboots to help reduce downtime. The purpose of system updates is typically to keep the system as current as possible, helping avoid unnecessary downtime from system failures. However, the update process itself can cause significant downtime because of the need to reboot before an update can take effect. Applying multiple updates may require several reboots, which can cause considerable disruption.

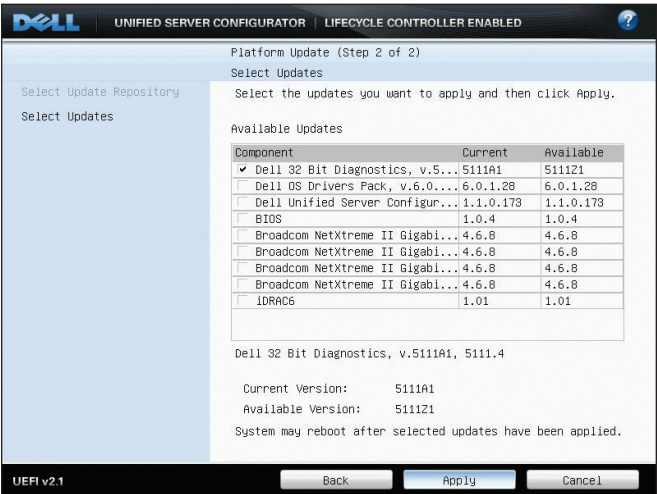


Figure 5. Available updates detected by the Dell Unified Server Configurator

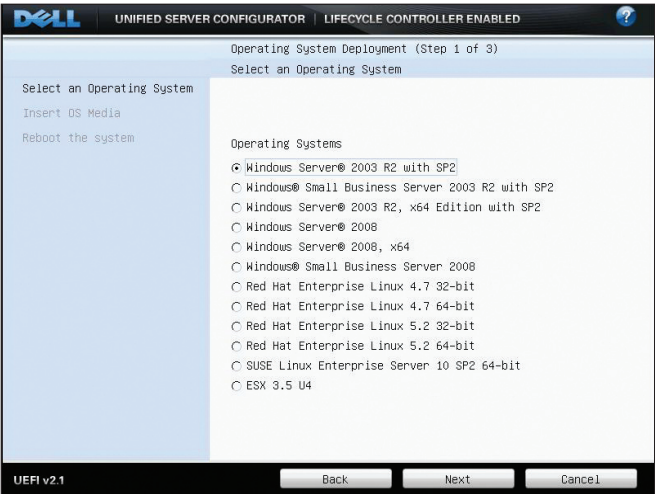


Figure 6. Supported OS installations using the Dell Unified Server Configurator

The USC update process is designed to minimize the number of reboots by using the update catalog combined with the parameters in the SSIB task list. Unless an update requires an immediate reboot, the process combines reboots, potentially enabling the server to reboot only once after the updates are completed. In addition, running the update process in the UEFI environment helps reduce boot time by avoiding the need to load a full OS.

Enhanced security. The update process is designed to ensure that the system and data are well protected, and utilizes multiple layers of security validation. For example, external data is stored temporarily in nonvolatile storage, with the data then validated using the data signature to help prevent the intrusion of contaminated data from external sources. Only validated data is staged in the USC and applied to the appropriate components. In addition, USC partitions open as read-only and only authorized programs are allowed to open them as read/write, which helps control access.

FLEXIBLE OS DEPLOYMENT

Previous Dell OS deployment tools such as Dell OpenManage Server Assistant or the Dell Systems Build and Update Utility were media based, requiring administrators to have the appropriate Dell CD or DVD on hand for the server being provisioned. If the CD or DVD was not available, or was not the correct version, administrators would need to download the appropriate image and burn it onto a disc. In addition, the OS drivers present on the CD or DVD could be outdated by the time the server was ready for deployment, requiring administrators to run post-OS DUPs to update their drivers.

The USC OS Deployment wizard provides a flexible, simplified way to install supported Microsoft® Windows® and Linux® operating systems, and does not require separate media-based deployment tools (see Figures 6 and 7; supported operating systems may vary depending on the specific server). If the

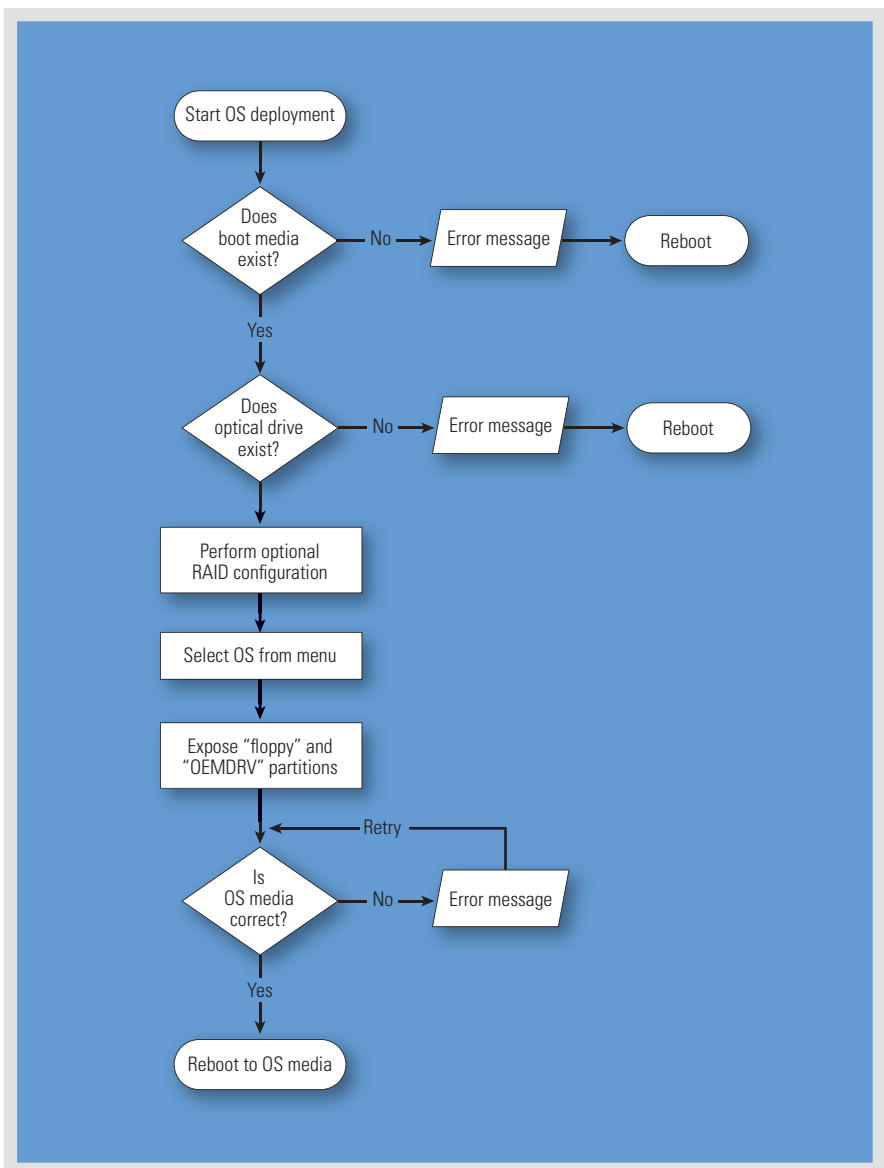


Figure 7. OS deployment process using the Dell Unified Server Configurator

server has a RAID controller, administrators can also optionally launch the USC RAID Configuration wizard during the deployment process to configure a virtual disk as the boot device.

After administrators have selected the OS to be deployed, the USC guides them through the process, including extracting the drivers necessary for OS installation and copying them to a staging directory. On Microsoft Windows operating systems, these extracted drivers are installed during the OS installation. On Linux operating systems, administrators must manually install

the extracted drivers after the OS installation is complete. After this step is complete and administrators have inserted the OS installation media, the USC verifies the contents and proceeds with the installation.

Key OS deployment features

The USC OS deployment feature is designed to be more flexible and easier to use than previous Dell systems management tools, including support for native OS installation, updatable drivers, one-to-many driver installation, and virtual disk creation.

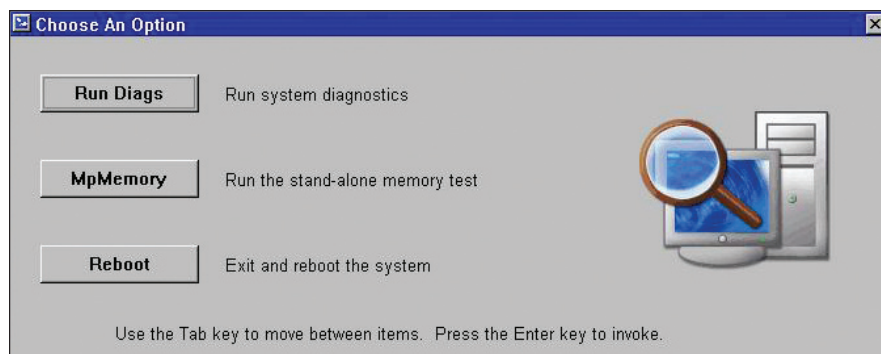


Figure 8. Diagnostic functions in the Dell Unified Server Configurator

Native OS installation. The USC uses the native installers provided by the OS installation media. This approach helps make the installation process flexible and extensible to future installer versions released for supported operating systems.

Updatable drivers. The drivers carried by the USC can be updated using the platform update feature. To help ensure that the USC has the most current available drivers, best practices recommend running the USC Platform Update wizard before OS deployment. Doing so helps avoid the need to manually check driver versions, and helps avoid inadvertently installing outdated drivers and then needing to run a post-OS DUP to update them.

One-to-many driver installation. The drivers carried by the USC are exposed on a USB drive, and can be shared across a network and used to provision multiple servers. This feature helps greatly reduce the overhead of setting up multiple servers and enables one-to-many OS deployment. Administrators can easily copy the drivers and plug them into the OS provisioning framework.

Simplified virtual disk creation. For servers that include a RAID controller, administrators can optionally launch the USC RAID Configuration wizard during the OS deployment process. This wizard first displays a list of its current controllers and the virtual disks in the system. If the necessary virtual disks are already in place, administrators can exit the wizard and continue with the OS deployment.

Otherwise, the wizard guides them through the process of configuring a new virtual disk as a boot device, including selecting a RAID controller, clearing or ignoring an existing foreign configuration, selecting RAID type and physical disks, and optionally defining advanced parameters such as stripe element size, read and write policy, and hot spare disk assignment.

EMBEDDED DIAGNOSTICS

Diagnostics enable administrators to detect system hardware and memory problems to help reduce the expenses associated with the repair and building of systems (see Figure 8). Because the USC incorporates diagnostics directly in the embedded USC partition, these features ship with the system from the factory and are not removed when administrators install an OS or reformat a drive. In addition, embedding diagnostics in the USC partition enables administrators to easily update the diagnostics using the USC platform update feature, without requiring them to reinstall the utility partition at each update. The platform update feature can automatically perform an inventory and display a comparison report table if a new version is available.

INTEGRATED SYSTEMS MANAGEMENT

The new Dell Unified Server Configurator enabled by the Lifecycle Controller is designed to provide quick and easy access to system life cycle management

capabilities in new 11th-generation Dell PowerEdge servers. Because it is embedded and integrated into the server itself, this tool does not require separate media such as Dell OpenManage CDs or DVDs and operates independently of the server OS—helping increase flexibility and save the time and costs associated with tasks such as reinstalling system tools after formatting a disk or reinstalling an OS. This powerful, simplified tool can help administrators rapidly perform systems management tasks and ultimately help increase their productivity. 

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