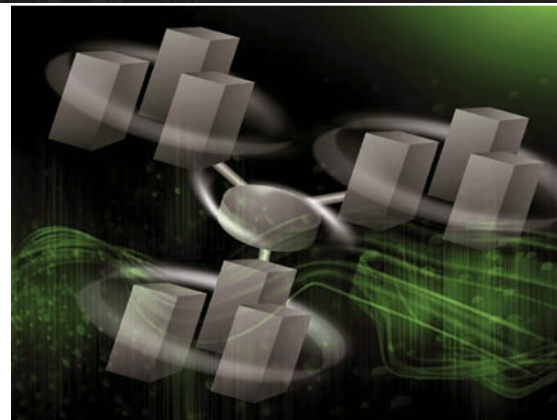


# AUTOMATING DEPLOYMENT WITH MICROSOFT CONFIGURATION MANAGER AND THE DELL DEPLOYMENT TOOLKIT



By Robert Hearn

Configuring servers in enterprise environments can be complex and time-consuming, often requiring complicated scripts. The integration of Microsoft® System Center Configuration Manager 2007 and the Dell OpenManage™ Deployment Toolkit helps simplify this process by providing easy-to-use graphical tools for the deployment of Dell™ PowerEdge™ servers.

IT administrators face many challenges that can increase the complexity of server deployment, including proliferation of disparate operating systems and applications. Many organizations have strict guidelines governing the operating systems and applications they deploy as well as the features or nonessential options, such as games, that are prohibited on their networks. IT departments need automated methods of deploying standard configurations that meet organization guidelines and expedite server rollout across their infrastructures—whether those servers are in their own data centers or half-way across the globe.

In addition, the need for business continuity often drives the need for upgrades to operating systems or hardware installed on existing servers and for rapid replacement of failed servers. Using standardized images and automated processes can help reduce the time required to restore access to enterprise resources for end users and help minimize loss of productivity. Administrators also must be able to track the status of deployed operating systems, applications, and updates to help determine which deployments were successful, which failed, and which are still in progress—information that can be critical for determining compliance with enterprise standards and software license requirements.

Microsoft System Center Configuration Manager 2007 with the certified integration of the Dell OpenManage Deployment Toolkit (DTK) helps address these requirements by providing a centralized, scalable, and customizable approach for quickly and cost-effectively deploying Microsoft Windows® operating systems and applications from a central location to Dell PowerEdge servers across enterprise networks. By removing time-consuming and potentially error-prone manual processes, Configuration Manager 2007 helps reduce administrative overhead and the cost of deploying operating systems.

## DEPLOYING AND CONFIGURING BARE-METAL SERVERS

Unlike when requisitioning preconfigured desktop and laptops, administrators often requisition servers without a specific configuration because they have a standard enterprise configuration they must deploy, and reconfiguring servers that have been preconfigured adds a step to what can be an extended deployment process. These bare-metal servers present their own set of challenges: even before installing an OS, administrators must configure the BIOS, array controller, remote access controller, baseboard management controller, and other hardware components, which for Dell PowerEdge servers is typically done using command-line utilities available in the DTK.

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Until recently, using the DTK for server configuration often required going through script files to modify environment variables. An expanding list of scripts and configuration files can create a difficult and complex process for IT administrators, especially because administrators are often generalists with many different types of responsibilities and may lack the time to learn a complicated deployment process.

The integration between Microsoft System Center Configuration Manager 2007 and the DTK helps reduce the complexity of using these command-line tools, scripts, and environment variables by presenting a graphical user interface (GUI) with drop-down lists and check boxes that include the appropriate commands and options—enabling easy point-and-click definition of server deployment and helping provide an easy method to rapidly configure bare-metal servers. By helping simplify the processes of determining the appropriate utility to use, which command-line parameters to supply, and what format the configuration file should be, PowerEdge server deployment using Configuration Manager 2007 and the DTK can become an efficient, automated task instead of a complex scripting procedure.

**CREATING RULE-BASED DEPLOYMENTS FOR ARRAY CONTROLLERS**

The Microsoft Dynamic Systems Initiative (DSI) strategy is an approach to technology that can help move enterprise IT departments toward model-based management, meaning administrators can create models (or rules) that help minimize concerns with implementation details. The integration of Microsoft System Center Configuration Manager 2007 and the DTK applies the DSI approach to tasks such as configuring array controllers. Configuring an array controller usually involves supplying a static configuration file or command-line parameters, which usually requires knowing what the target server's hardware configuration is before performing the

configuration. In enterprise IT environments, however, multiple standard configurations may be in use, and administrators may not always know the exact configuration of a particular server before trying to deploy it. Applying a rules-based deployment in this type of variable environment can help ensure successful configuration.

For example, an IT department might need to deploy a rack of Dell PowerEdge 2970 servers, each of which may have three, four, or five disk drives installed and attached to the array controller. Because the administrators may not know which configuration any single server has before deployment, they cannot apply the same static configuration file to all the servers, or some would likely fail. Instead, they can define a set of rules such as the following:

- If the server has three disk drives, configure the first two drives as a RAID-1 set and configure the third drive as a hot spare.
- If the server has four disk drives, configure the drives as two RAID-1 sets of two drives each.
- If the server has five disk drives, configure the first four drives as two RAID-1 sets of two drives each and configure the fifth drive as a hot spare.

Administrators could define this logic within the DTK; however, doing so would require writing a complicated script, and any changes to the rules would typically require rewriting the script. Instead, the integration of Configuration Manager 2007 and the DTK enables them to solve this type of problem by using the Array Builder wizard.

The Array Builder wizard provides a graphical configuration utility that helps simplify the creation of rule-based configurations for array controllers (see Figure 1). Administrators can use this utility to visually design the desired configuration for target systems by defining matching characteristics of controllers, RAID levels, logical drives, physical disk drives, local and global hot spares, and so on. The wizard even allows administrators to define different configurations based on the presence or setting of a variable on the target system.

For example, if administrators have two servers with identical hardware configurations but different logical array-controller configurations—such as a Microsoft Exchange system and a Microsoft SQL Server® system—defining a variable for each allows the Array Builder wizard to create the rules to configure both appropriately. The complexity remains hidden. Administrators can create virtually any

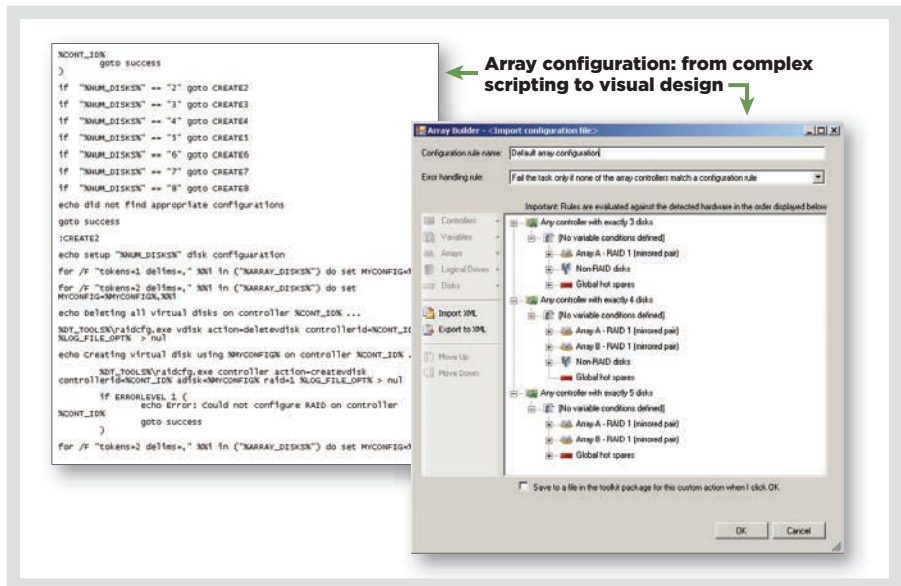


Figure 1. Complex array controller configuration scripting versus the simplified, graphical Array Builder wizard

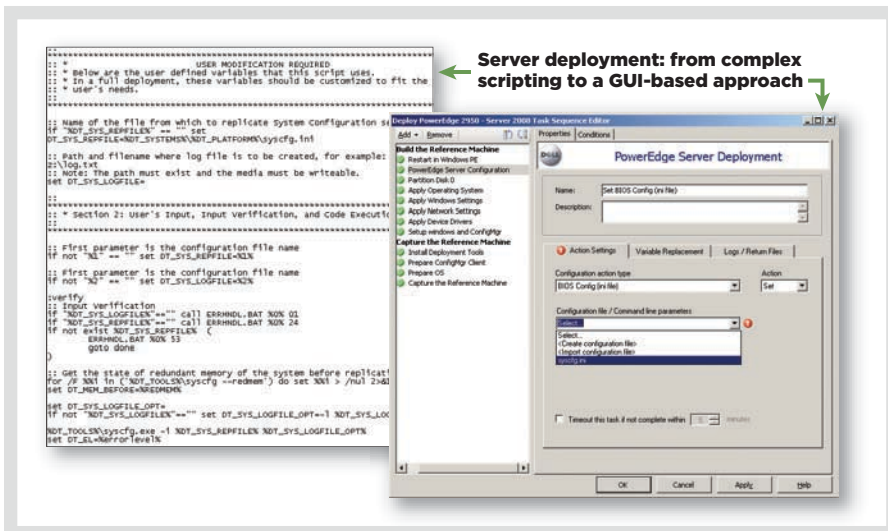


Figure 2. Complex scripting versus the simplified, graphical Task Sequence Editor

number of rules in a single configuration and use them in their deployment, or export them to XML and use them in other deployment tasks in Configuration Manager 2007. This approach helps administrators define standard best practices for configuring Dell PowerEdge servers and use those standards across the enterprise.

## SEQUENCING CONFIGURATION TASKS

Microsoft System Center Configuration Manager 2007 accomplishes these rule-based standard configurations through the extensibility of its administrator console and Task Sequence Editor (see Figure 2). The Task Sequence Editor is an integral part of the OS deployment functionality in Configuration Manager 2007, including the task sequence engine and functionality on both the management server and the client (or server) being managed.

The task sequence engine allows administrators to deploy an OS through scripted or image-based methods; provide overlays of software packages, including software updates from Microsoft and Dell; and adjust other configuration settings to create a final deployment on a particular Dell PowerEdge server. Overlaying several software components—such as a base Microsoft Windows Server® 2008 OS, hardware-specific driver packages, and

application suites—offers many combinations of deployments while helping reduce the number of system images necessary for comprehensive hardware coverage.

Minimizing the number of OS images that an IT organization must create and maintain helps reduce overall costs. The Task Sequence Editor allows administrators to combine a small number of base images into any number of deployment permutations. A change to one aspect of the task sequence such as a driver update does not invalidate the entire deployment, which may occur in a single image file deployment.

The Task Sequence Editor works by evaluating the reported status—succeeded, failed, or skipped—of each step within a task sequence as it executes. Groups of task sequences can also send status messages. Configuration Manager 2007 can take various actions depending on the status of a particular step within a sequence. In addition, auditing steps after completion or taking actions based on the result of certain steps within a task sequence during execution allows administrators to automate much of the decision-making process that they would otherwise handle manually.

## MANAGING DEVICE DRIVERS

In addition to helping simplify an array of deployment tasks, Microsoft System Center Configuration Manager 2007 also helps

simplify device driver management. Supporting the multitude of device drivers—video, LAN, disk, and so on—required across many hardware types has been a key reason that organizations have maintained large numbers of disk images to support their IT environments. Configuration Manager 2007 helps eliminate the need to host all device drivers in a single OS image. Instead, administrators can deploy a single OS image across a variety of systems, and Configuration Manager 2007 can add the appropriate drivers as part of the deployment process.

## AUTOMATING DEPLOYMENT ON DELL POWEREDGE SERVERS

The integration of Microsoft System Center Configuration Manager 2007 and the Dell OpenManage Deployment Toolkit provides a comprehensive, automated, end-to-end deployment solution based on easy-to-use graphical tools. By hiding the complexity associated with manual processes and avoiding the need for complicated scripting, Configuration Manager 2007 and the DTK help reduce overhead and cost through a centralized, scalable, and customizable approach designed to significantly simplify the deployment of Dell PowerEdge servers in enterprise environments. [U](#)

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