

Time-Savings Validation for Dell Server Deployment with Altiris Deployment Solution

Altiris® Deployment Solution™ is designed to reduce administrative time and management costs by enabling a complete server build to be captured as a simple drag-and-drop job. Once created, the job can be easily executed again and again simply by dragging and dropping it onto one or more servers in the Altiris console—with no further involvement by the administrator. This article examines independent testing conducted by KeyLabs to verify that Altiris Deployment Solution can help reduce the time administrators spend deploying servers from hours to minutes.

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Altiris and Dell jointly commissioned KeyLabs in November 2004 to empirically substantiate that Altiris Deployment Solution can help dramatically reduce the time that an administrator spends deploying and repurposing servers. To evaluate this claim, KeyLabs compared the administrative time required to deploy Dell™ servers using three popular build methods: manual server deployment, the Dell OpenManage™ Server Assistant (DSA) CD, and Altiris Deployment Solution for Dell Servers.

Altiris Deployment Solution is designed to automate the server build process, so an administrator can start or schedule the build process and then move on to other tasks—without having to physically attend installation functions. The objective of the KeyLabs study was to quantify how much deployment time Altiris Deployment Solution could eliminate for server administrators, compared with traditional server build methods. This article summarizes the methodology and findings of that study; the full-length version of the study documentation is available at

www.dell.com/downloads/global/solutions/Deployment%20Comparison%20for%20Dell%20PowerEdge%20Servers.pdf.

KeyLabs test methodology

This section briefly describes the test methodology KeyLabs employed, including the types of server builds that were deployed and the techniques used to deploy these builds.

Tested builds

Dell PowerEdge™ 2650 servers were used as the hardware platform for this study because this type of server is one of the most popular PowerEdge server models. Using this Dell server hardware, the KeyLabs team defined two server builds for testing:

- **Server Build 1:** Microsoft® Windows® 2000 Advanced Server with Microsoft SQL Server 2000
- **Server Build 2:** Red Hat® Enterprise Linux® AS 3 with LAMPP (Linux, Apache, MySQL, PHP, and Perl)

For each build, KeyLabs testers adhered to the following configuration steps:

1. Configure BIOS, Dell Remote Access Controller (DRAC), and RAID components (set a RAID-5 configuration).
2. Install the OS and apply any OS updates or patches; apply any Dell-specific drivers to support RAID and network interface card (NIC) components.
3. Install other applications and service packs (Microsoft SQL Server 2000 or LAMPP).
4. Install Dell OpenManage Server Administrator (OMSA).
5. Apply Dell Update Packages to update server components, including the BIOS, Embedded Server Management (ESM) firmware, DRAC, and so forth.

Deployment methods

KeyLabs used three deployment techniques and measured the administrative time required for each technique.

Manual server deployment. Administrators cycle through CDs, software installation screens, BIOS configuration screens, and so forth as needed to install and configure each server. No efficiencies are gained as additional servers are deployed—that is, each server deployed requires fundamentally the same amount of administrative time because administrators must go through the same installation steps as the previous server builds, even if previous servers are the same model of server.

Deployment using the Dell OpenManage Server Assistant CD. The DSA CD is a bootable CD that ships with every Dell PowerEdge server and helps automate OS deployment by automatically scripting the OS installation to include Dell-specific drivers. This CD does not provide setup assistance for the BIOS, DRAC, and baseboard management controller (BMC) components, nor does it help with post-OS tasks such as applying hardware updates or installing applications. This approach helps reduce OS installation times somewhat, but administrators must repeat the same tasks for each server deployed.

Deployment using Altiris Deployment Solution. This method is designed to automate server builds. Using Altiris Deployment Solution requires an initial time investment to install the Altiris environment and to create and test server build jobs. After that process is completed, however, Altiris Deployment Solution enables hands-free, remote provisioning of one or more servers—including hardware, OS, and application configuration.

Special testing considerations for Altiris Deployment Solution Altiris Deployment Solution requires a specific infrastructure: a dedicated Altiris server and a back-end Microsoft SQL Server 2000 database. To facilitate hands-free functionality, many advanced deployment features such as pre-provisioning (the ability to assign

a server build to a Dell Service Tag for a server that has not yet been physically added to the LAN) and rip-and-replace (the ability to dynamically provision blade servers based on their location in a chassis) require the use of an Altiris Preboot Execution Environment (PXE) server.

The installation and configuration of Altiris Deployment Solution—including the PXE server configuration—took KeyLabs approximately 45 minutes. In addition to this installation time, KeyLabs built two jobs, one for Server Build 1 and one for Server Build 2, as defined earlier in this article. Unlike the manual and DSA CD installation methods, Altiris Deployment Solution required an initial investment of approximately six to seven hours before the two server builds in the study could be deployed. Figure 1 conveys the breakdown for this time requirement.

Test environment

Data was compiled for server deployments of various sizes, including deployments of 1 server, 25 servers, 50 servers, and 100 servers. The KeyLabs team isolated physical-layer setup concerns from the study—that is, the time required to unbox, cable, and rack-mount the servers was not recorded. Administrative time was recorded only for provisioning tasks that servers have in common regardless of form factor, including hardware component configuration, OS deployment, and application installation.

A standard Fast Ethernet (100 Mbps) network infrastructure was used—the study did not determine the relative impact of network latencies across the various test cases. The servers tested did not rely on remote storage such as storage area networks or network attached storage. Even though Altiris Deployment Solution can be configured to support such storage systems, the tested servers were configured with internal disk arrays.

Results of the KeyLabs study

KeyLabs testers determined that Altiris Deployment Solution can enable significant reductions in the administrative time required to deploy servers when compared with manual server deployments or server

Task	Time (hours:minutes)
Altiris Deployment Solution installation	0:15
Altiris Deployment Solution configuration and testing (for example, PXE server and Boot Disk Creator)	0:30
Creation and testing of Server Build 1 (Windows) job	3:00
Creation and testing of Server Build 2 (Linux) job	3:00
Total setup time*	6:45

**The KeyLabs engineer who performed the Altiris testing had completed basic Altiris product training. Time spent on the initial server build may be slightly longer or shorter for other organizations, depending on the staff's level of Altiris training and experience.*

Figure 1. Altiris Deployment Solution setup time for both server builds

BENEFITS OF ALTIRIS DEPLOYMENT SOLUTION

Looking beyond the scope of the study described in this article, the KeyLabs team noted several enterprise IT benefits enabled by Altiris Deployment Solution:

- **Build consistency:** In a manual server build, every keystroke represents a potential difference that can translate into an improperly configured server and, ultimately, downtime. The automation provided by Altiris Deployment Solution is designed to eliminate build discrepancies by helping ensure that every server is built exactly the same way—leading to high availability and easy troubleshooting if a problem occurs.
- **Detailed server history:** Altiris maintains a complete build history of each server's deployment and subsequent management. All status messages returning from the managed server are recorded—including status messages from custom Linux shell scripts, VBScript, and batch files. After a server is deployed, all subsequent management is recorded in the job history, including such tasks as software updates, installations, and configuration tasks (IP address changes, server renaming, and so forth). The manual and DSA CD installation methods do not provide this benefit.
- **Cross-platform support:** The efficiencies discussed in this article are gained in both Microsoft Windows and Red Hat Enterprise Linux server environments—both are managed using the same conventions from the Altiris console.
- **Role and scope security:** The security features of Altiris Deployment Solution can limit access to servers and management capabilities based on a user's role. Altiris Deployment Solution can also provide a complete audit trail detailing who configured what and when.
- **Scheduled execution:** Servers can be tagged for immediate provisioning or scheduled for later deployment during off-peak periods, days or months in advance. As a result, deployment jobs can be assigned and set to execute long before the server hardware arrives on site.
- **Quick recovery:** The recovery process for each server can be significantly reduced by leveraging the same jobs that are used to deploy servers. Jobs can be quickly and easily modified to help recover failed servers or quickly provision additional servers with the same build configuration as a failed server.
- **Resource archiving and reuse:** By building and maintaining Altiris jobs, administrators are enabled to collect a robust archive of images, scripts, software packages, and so forth that can be easily reused. This resource pool can be leveraged by jobs and other projects beyond the initial server deployment. No such archive is compiled for the manual or the DSA CD installation method.

deployments that leverage the DSA CD. KeyLabs found that, once the initial time was invested to set up the Altiris Deployment Solution infrastructure, administrative time-savings could be compounded exponentially. Simply dragging and dropping server build jobs onto groups of 5, 10, 25, 50, or more servers in the Altiris console took the administrator only a few seconds and the jobs could execute completely unattended.

As shown in Figures 2 and 3, the Altiris server deployment methodology began to generate significant time-savings after the deployment of the third server when compared with the manual installation process; it generated time-savings after the deployment of the fourth server when compared with the DSA CD. This reduction in time was similar for both Windows and Linux environments.

Both Figures 2 and 3 show that the administrative time for the manual and DSA deployment methods increased with each server build, whereas the time for Altiris Deployment Solution decreased after the first server build. Figures 4 and 5 show the actual time spent for each tested server build and deployment method; Figure 4 compares time spent deploying one server, while Figure 5 compares the time spent deploying 25 servers. In both Figures 4 and 5, comparative data for Altiris Deployment Solution shows the administrative time required after the initial server build was completed, as described in Figure 1.

As previously described, Altiris Deployment Solution can require up to three hours to create and test a comprehensive server deployment job. Once that job is created, however, KeyLabs testers found that it requires only five seconds to execute automatically and consistently on one or more servers.

Actual build time for an Altiris job can vary dramatically depending on how the job is built. For example, instead of executing application installations for Dell OMSA and Microsoft SQL Server directly from a network share, the KeyLabs team built jobs to first copy the needed installation files to each server. This step added significant time that slowed deployment speed for each server—contributing more than 30 minutes to the Altiris Deployment Solution

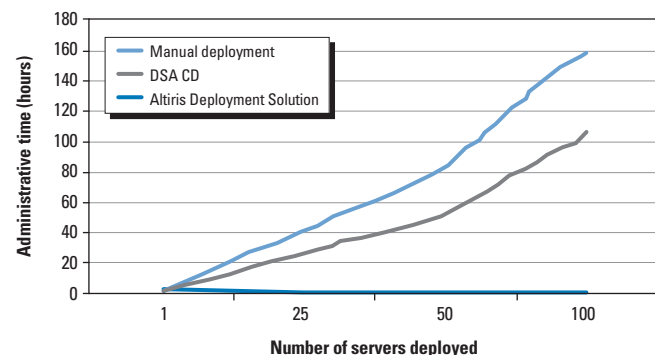


Figure 2. Comparing administrative time for three types of server deployment using Server Build 1 (Windows environment)

build times listed in Figure 4—but it also helped ensure that a failed network connection would not cause the installation to hang. If the file copy failed, the Altiris console would indicate the failure without starting the application installation.

Once a job begins executing, build status is indicated in real time on the Altiris console. Administrators are not required to be physically present at any servers. Jobs can be configured to send an e-mail message or call into other messaging systems for problem notifications or status updates. Administrators can view the console to determine when server deployments are complete, and they can remotely control servers to verify manually that servers are ready for production. To further reduce manual verification times, Altiris server deployment jobs can be configured to automatically run customer-defined test scripts as a final task. These scripts can be used to exercise a server or validate its configuration. Altiris utilities can be called within customer scripts to send custom status messages to the Altiris console and build logs.

In this study, once the initial server build was completed as described in Figure 1, the 25-server deployment using Altiris Deployment Solution was launched with only a few seconds of administrative time, and all 25 servers were ready for production about four hours later—without additional involvement by the administrator. As tested by KeyLabs, a Server Build 1 deployment to 25 Dell PowerEdge 2650 servers using Altiris Deployment Solution reduced administrative time by approximately 90 percent when compared with the manual installation method (see Figure 5).

Improved deployment efficiency with Altiris Deployment Solution

The KeyLabs study described in this article, commissioned jointly by Altiris and Dell, verified that Altiris Deployment Solution can effectively reduce server provisioning time. In addition, advanced

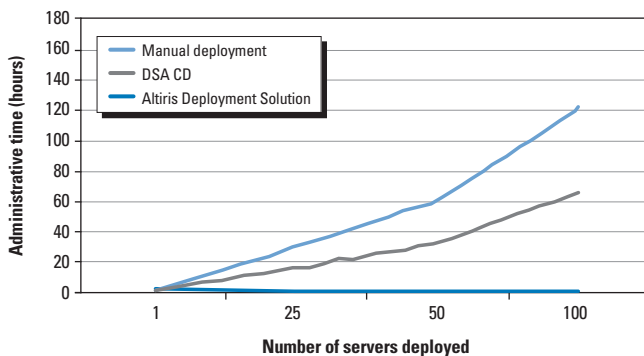


Figure 3. Comparing administrative time for three types of server deployment using Server Build 2 (Linux environment)

Server build	Manual installation (hours:minutes)	Dell OpenManage Server Assistant CD (hours:minutes)	Altiris Deployment Solution*	
			Administrative time (hours:minutes)	Total build time (hours:minutes)
Server Build 1	2:28	2:06	0:05	1:35
Server Build 2	1:43	1:35	0:05	1:15

* This method also required an initial setup time of 6 hours and 45 minutes to install Altiris Deployment Solution and create Server Build 1 and Server Build 2.

Figure 4. Comparing administrative deployment time for one Dell PowerEdge 2650 server

Server build	Manual installation (hours:minutes)	Dell OpenManage Server Assistant CD (hours:minutes)	Altiris Deployment Solution*	
			Administrative time (hours:minutes)	Total build time for all 25 servers (hours:minutes)
Server Build 1	41:15	26:15	0:05	4:15
Server Build 2	30:25	16:32	0:05	3:55

* This method also required an initial setup time of 6 hours and 45 minutes to install Altiris Deployment Solution and create Server Build 1 and Server Build 2.

Figure 5. Comparing administrative deployment time for 25 Dell PowerEdge 2650 servers

Altiris features such as pre-provisioning and blade server rip-and-replace can further extend the time-savings enabled by Altiris Deployment Solution. By automating the server build process, Altiris Deployment Solution streamlines the installation and configuration of Dell servers—significantly enhancing the efficiency of routine systems management tasks and freeing administrators to support business-critical applications. ➔

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FOR MORE INFORMATION

Deployment Comparison for Dell PowerEdge Servers:

www.dell.com/downloads/global/solutions/Deployment%20Comparison%20for%20Dell%20PowerEdge%20Servers.pdf

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