

Using SmartStart Scripting Toolkit with Microsoft® Automated Deployment Service



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Abstract

This guide describes how to use Microsoft® Automated Deployment Service (ADS) with HP ProLiant servers.

For detailed information about using Microsoft ADS, refer to the Microsoft ADS technical documentation at

<http://www.microsoft.com/windowsserver2003/technologies/management/ads>.

For detailed information about using SmartStart Scripting Toolkit, refer to the *SmartStart Scripting Toolkit User Guide* or the *SmartStart Scripting Toolkit Best Practices* at

<http://www.hp.com/servers/sstoolkit>.

Audience Assumptions

This guide is intended for experienced IT professionals.

Overview

ADS is a tool developed by Microsoft to help deploy and manage Microsoft Windows® 2000 and Windows Server 2003 operating systems. ADS runs on Windows Server 2003, Enterprise Edition. This document focuses on deploying HP ProLiant systems with ADS. Refer to the ADS help file for detailed information about ADS.

ADS comes with tools that bring a server from bare metal to a fully deployed Windows server operating system. A typical deployment requires the following steps:

1. Perform hardware configuration on the target server using an MS-DOS® virtual floppy image that contains HP SmartStart Scripting Toolkit server configuration tools. Hardware configuration includes setting the system time, setting the system options, and configuring storage.
2. Download the ADS Deployment Agent to the target server and partition the hard drive.
3. Transfer a previously captured operating system image from ADS to the target server.
4. Customize the target system using the Windows System Preparation (Sysprep) tool.
5. Perform post-installation configuration and installation of HP Smart Components on the target server.

This guide explains how to perform HP ProLiant server configuration using ADS, as described in step 1. HP has been working with Microsoft throughout the development of ADS to ensure the interoperability of ProLiant systems with ADS. MS-DOS virtual floppy images are used in conjunction with the HP SmartStart Scripting Toolkit to set up the system and storage option configurations. Detailed information about using the toolkit and virtual floppy images is described in the following sections of this guide.

NOTE: To ensure that HP systems work properly with ADS, change the Standard Boot Order in the ROM-Based Setup Utility (RBSU) so that the network boots before the storage controller. Set the Standard Boot Order as follows:

1. A:
2. CD-ROM
3. Network
4. Storage Controller

Using Sysprep

ADS uses the Sysprep tool to prepare the reference operating system for image capturing. Ensure that software installed on the reference system is Sysprep compliant.

The Sysprep executable, along with its documentation and other tools, is located on the Windows CD in the \support\tools\deploy1.cab file. Information about the Windows 2000 Sysprep tool can also be found at

<http://www.microsoft.com/windows2000/downloads/tools/sysprep/default.asp>.

Sample Sysprep input files (Sysprep.inf) are available from ADS in the %programfiles%\Microsoft ADS\samples\Sysprep directory.

Enabling PXE

Microsoft ADS requires the use of Preboot eXecution Environment (PXE). For information about enabling PXE on ProLiant servers, refer to the white paper, “Using PXE Technology with HP ProLiant Servers,” at

<ftp://ftp.compaq.com/pub/products/servers/management/rdp/pxe-proliant.pdf>.

Deploying on Blade Servers

For initial deployment of an operating system to a blade server, HP recommends using the ProLiant Essentials Rapid Deployment Pack. However, other methods of deployment are available. For alternative deployment options, refer to

<http://h18000.www1.hp.com/products/servers/proliant-bl/e-class/deployment.html>.

ADS Technology Center

Microsoft regularly updates the ADS Technology Center Web page with new information about ADS, including resolutions to current issues. For more information, refer to

<http://support.microsoft.com/default.aspx?scid=fh;EN-US;winsvr2003ads>.

Configuring ProLiant Servers with ADS

IMPORTANT: Be sure that you have the latest patches installed for ADS and for your operating system. For the latest ADS information, refer to the Microsoft Knowledge Base at <http://support.microsoft.com/default.aspx?scid=fh;EN-US;KBHOWTO> and search for ADS.

This section describes how to use HP SmartStart Scripting Toolkit with Microsoft ADS. The SmartStart Scripting Toolkit enables you to use scripts to configure system and storage options for new servers in an MS-DOS environment. Microsoft ADS software ships with a bootable DOS diskette image that contains a subset of MS-DOS 6.22 files. This image is used with SmartStart Scripting Toolkit utilities to configure an HP ProLiant server. The virtual floppy image is located in the %programfiles%\Microsoft ADS\bin directory in the ADS controller. Use the following command to restore the DOS environment to a physical diskette:

```
Dskimage.exe vfloppy.vfi a:
```

NOTE: Build the virtual floppy in such a way that all commands are scripted without user interaction and automatically reboot the system at the end of the execution.

For more information about SmartStart Scripting Toolkit, refer to <http://www.hp.com/servers/sstoolkit>.

Three sets of sample SmartStart Scripting Toolkit configuration files are provided with this document. These files are designed specifically to work with ACR.exe and CONREP.exe in the ADS DOS environment. To use the sample files, extract the ADS DOS environment to a diskette, copy CONREP.exe and ACR.exe from the SmartStart Scripting Toolkit to the diskette, and refer to the following instructions. Use of the samples files is optional, and the files might require modifications to work properly in different environments.

The configuration files in this document are samples only. They include techniques for detecting and reporting errors back to the ADS controller. Refer to the *SmartStart Scripting Toolkit User Guide* for more details about the configuration files.

Creating a Virtual Floppy Image for Configuring ProLiant Servers

The easiest way to create server configuration files is to capture the configuration of a reference server. The following procedure describes a general method for capturing system and storage options settings from a reference server to use with Microsoft ADS. These settings are stored in configuration files and are used later to create a virtual floppy image to use for server deployment. The configuration files captured are hardware-specific and should only be used to configure similar ProLiant systems. Refer to the “Sample Files for Initial Server Deployment” section for generic configuration files for the virtual floppy.

1. Copy ACR.exe and CONREP.exe from the SmartStart Scripting Toolkit to the diskette containing the ADS DOS environment.
2. Configure the reference system with the desired configuration settings.
3. Boot the reference system into DOS using the diskette created in step 2.

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4. Capture system and storage options settings onto the diskette by executing the following commands in the DOS environment:

```
acr.exe /c a:\array.ary  
conrep.exe /s a:\system.hwr
```

5. To create a diskette that automatically configures the system with the captured configuration, edit the autoexec.bat file on the diskette so that it contains only the following commands:

```
A:\Conrep.exe /l a:\system.hwr  
A:\Acr.exe /i a:\array.ary /o
```



CAUTION: The preceding command overwrites any existing settings.

Vfreboot.com

These commands are executed when target systems are booted with this diskette image.

6. If the diskette will be used on unconfigured systems, add the following line to the beginning of the autoexec.bat file to configure the system date.

```
date 1-1-2006
```

Unconfigured ProLiant systems have the system date set to the BIOS date and therefore might have problems connecting to the ADS Controller. The target system must have the system date set within the valid range of the ADS certificate to establish a connection. Reconfigure the system date to a correct date after the operating system is deployed.

7. Test the diskette to verify that it works on target systems by ensuring the settings in the RBSU and the storage controller are set appropriately.
8. Capture the physical diskette image to use with Microsoft ADS by entering the following command at the ADS controller:

```
%programfiles%\Microsoft ADS\bin\Dskimage.exe a: name.vfi
```

Use a meaningful file name for the diskette image captured.

9. Place the image file in the %programfiles%\Microsoft ADS\fttproot directory or the appropriate directory in the ADS controller.
10. Use the Sequence Editor to create a task for using the virtual floppy image.

Sample Files for Capturing System Settings

The Capture_Configuration folder contains a sample autoexec.bat file that can be used with the ADS DOS diskette to execute CONREP.exe and ACR.exe to capture system and storage options onto the floppy diskette. You can obtain system-specific settings for configuring similar hardware using the captured data files.

To capture system settings using the sample files:

1. Replace the autoexec.bat file on the diskette with the sample file supplied in the folder.
2. Copy ACR.exe and CONREP.exe from the SmartStart Scripting Toolkit to the diskette.

-
3. Boot the reference server with the diskette. The autoexec.bat file executes and stores the storage array option settings into array.ary and system option settings into system.hwr on the floppy diskette. These files can then be used to create a virtual floppy image that will configure servers exactly like the reference server.

To create a virtual floppy image with the captured configuration files, follow steps 5 through 10 in “Creating a Virtual Floppy Image for Configuring ProLiant Servers.”

Sample Files for Initial Server Deployment

NOTE: You must update the system date and time after the operating system is deployed to prevent potential problems.

The Initial_Deployment folder contains files for generating a generic virtual floppy image to be used on all supported servers. These batch files configure the operating system to Microsoft Windows 2000 or Server 2003 in the system settings and automatically configure the storage array depending on the number of available hard drives and current settings. The files include the following:

- **Autoexec.bat**—This file calls the HP_ADS.bat file.
- **HP_ADS.bat**—This file contains details from step 5 of the “Creating a Virtual Floppy Image for Configuring ProLiant Servers” section. First, it configures the system date to a future date so that the system can establish network connection with the ADS Controller. Then it executes CONREP.exe to configure the system options. On successful completion of CONREP.exe, the batch file executes ARRTYPE.exe to detect supported controllers and uses ACR.exe to configure the storage controller. When all commands have been executed, HP_ADS.bat reboots the system and returns the status with the log file to the ADS Controller.
- **Array.ary**—This file is used with ACR.exe to configure storage array settings. Systems with no storage RAID controllers are not required to use ACR.exe. Array.ary instructs ACR.exe to autoconfigure the first RAID controller. ACR.exe automatically configures the RAID settings depending on the available hard drives and current settings.
- **System.hwr**—This file is a configuration file for use with CONREP.exe. This file instructs CONREP.exe to set the operating system to Windows 2000 Server or Windows Server 2003.

To use these files for general ProLiant server deployment with Microsoft ADS:

1. Copy HP_ADS.bat, array.ary, and system.hwr from the folder to the diskette.
2. Copy ACR.exe, CONREP.exe, ARRTYPE.exe, and SSSTKARR.ini from the SmartStart Scripting Toolkit to the diskette.
3. Replace the autoexec.bat file on the diskette with the sample file supplied in the folder.
4. Boot the target system with the diskette to be sure that the diskette can be executed without user interaction and that it automatically configures the system correctly.

To create a virtual floppy image with these files, follow steps 8 through 10 in “Creating a Virtual Floppy Image for Configuring ProLiant Servers.”

Sample Files for Post Operating System Installation

The Post_OS_Installation folder contains files for disabling PXE on the target system. The virtual floppy image file is provided to automatically disable PXE on target systems. Optionally, you can disable PXE in RBSU after the system is deployed with an operating system. The files include the following:

- **Autoexec.bat**—This file calls the HP_ADS.bat file.
- **HP_ADS.bat**—This file contains added error detection and details from step 5 of the “Creating a Virtual Floppy Image for Configuring ProLiant Servers” section. It executes CONREP.exe with the supplied configuration files and checks the complete status for errors. When all commands have been executed, HP_ADS.bat reboots the system and returns the status with the log file to the ADS Controller.
- **System.hwr**—This file is a configuration file for use with CONREP.exe. This file instructs CONREP.exe to turn off PXE on the target system.

To use these files to turn off PXE boot after the system is deployed:

1. Copy CONREP.exe from the SmartStart Scripting Toolkit to the diskette.
2. Replace the autoexec.bat on the diskette with the one from the folder.
3. Copy HP_ADS.bat and system.hwr to the diskette.

You can create a virtual floppy image to disable the PXE boot option in RBSU on ProLiant servers. To create a virtual floppy image with these files, refer to steps 8 through 10 in the “Creating a Virtual Floppy Image for Configuring ProLiant Servers” section.

Deploying ProLiant Systems with Microsoft ADS

Deployment procedures are driven by a task sequence file with Microsoft ADS. Microsoft has defined the format of the sequence file and a list of commands to use with it. The sequence file is stored as Extensible Markup Language (XML). Microsoft ADS is shipped with a sequence editor application that can be used to create and edit the sequence file. You can also find a list of sample sequence files in the %programfiles%\Microsoft ADS\Samples\Sequences\ folder.

A typical Microsoft ADS server deployment scenario for HP ProLiant servers consists of the following steps:

NOTE: Ensure that the target system is set to the current date and time before connecting to the Microsoft ADS controller.

1. Boot to the virtual floppy as described in the preceding section to configure system date, system options, and storage options.
2. Boot the target system into the Deployment Agent environment.
3. Partition the disk to the appropriate size.
4. Transfer the captured partition image to the target server.
5. Configure the personalization file to set system-specific options, such as computer name, product key, workgroup, password, and so on.

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6. Perform post-installation configuration, such as installing HP Smart Components and updating the system time.

The previous procedures can vary depending on environment and system settings. The following is a sample of the task sequence file. Note that the sample file is not complete and shows only a portion of the steps required for deployment. The sample sequence file includes steps 1 through 4 of the procedures described in the preceding section. Refer to the comments at the beginning of each task for an explanation of the task. Refer to the ADS help file for a detailed explanation of each ADS command.

```
<!-- Boot target system to virtual floppy image -->
<!-- (named generic.vfi) to configure system and storage -->
<!-- controller options. The system will be rebooted at the -->
<!-- end of virtual floppy execution -->
<task description="Boot Virtual Floppy" timeout="300"
doesReboot="true">
    <command>/PXE/boot-vf</command>
    <parameters>
        <parameter>"\generic.vfi"</parameter>
    </parameters>
</task>

<!-- Boot the system into Deployment Agent environment for OS -->
<!-- deployment -->
<task description="Boot Deployment Agent" doesReboot="false">
    <command>/PXE/boot-da</command>
</task>

<!-- Ceate a single 5000MB partition on the logical disk to -->
<!-- store the OS -->
<task description="Partition the disk" doesReboot="false">
    <command>/BMONITOR/bmpart.exe</command>
    <parameters>
        <parameter>\device\harddisk0\partition0</parameter>
        <parameter>-init</parameter>
        <parameter>-c:5000</parameter>
        <parameter>-a</parameter>
    </parameters>
</task>
```

```
<!-- Download image of the OS (named HP_ProLiant_Image) to -->
<!-- target system -->
<task description="Download image" doesReboot="false">
  <command>/IMAGING/imgbmdeploy.exe</command>
  <parameters>
    <parameter>"HP_ProLiant_Image"</parameter>
    <parameter>\device\harddisk0\partition1</parameter>
    <parameter>-r</parameter>
    <parameter>-client</parameter>
  </parameters>
</task>
```

The sample files that are provided with Microsoft ADS are very generic and can handle most non-system-specific scenarios. ProLiant servers, however, require an extra step at the beginning of the sequence to configure system settings and storage array option settings before deploying an operating system image. This extra step can be accomplished with a virtual floppy image as shown in the first task in the preceding sample. Follow the steps in the “Creating a Virtual Floppy Image for Configuring ProLiant Servers” section to create the virtual floppy image mentioned in step 1.

Updating HP Drivers for Microsoft ADS Deployment Agent Builder

IMPORTANT: Be sure that you have the latest patches installed for ADS and for your operating system. Refer to Microsoft Knowledge Base articles 829053 and 830413 for details about known issues relating to the Deployment Agent Builder.

For the latest ADS information, refer to the Microsoft Knowledge Base at <http://support.microsoft.com/default.aspx?scid=fh:EN-US:KBHOWTO> and search for ADS.

Microsoft ADS uses a pre-operating system (Deployment Agent) environment to carry out various tasks during image deployment. The Microsoft ADS Network Boot Service component contains a Deployment Agent Builder that builds a Deployment Agent RAMDISK image dynamically. The Deployment Agent Builder first collects a list of hardware device information from the target system during the PXE boot process and then builds the RAMDISK image using the appropriate drivers.

Updating drivers for the Deployment Agent Builder is required only for supporting new hardware, such as the boot controller in the Deployment Agent environment.

Three folders in the %programfiles%\Microsoft ADS\nbs\repository directory on the server where the ADS Network Boot Service is installed supply drivers for building the RAMDISK image. The Deployment Agent Builder builds the RAMDISK image using the driver files from the User\PreSystem, Windows, and User\PostSystem folders, respectively. Copy driver files to User\PreSystem and User\PostSystem only. The Deployment Agent Builder uses the first matched driver files for building the RAMDISK. Be sure to place the downloaded driver files into the proper folder.

To supply the Deployment Agent Builder with the latest drivers:

1. Download the latest drivers from <http://www.hp.com/support/files>.
2. Execute the downloaded Smart Component installer.
3. Select **Extract** to extract the driver binary and setup files from the HP ProLiant Package Setup.
4. Select a destination for the extracted files.
5. Close the HP ProLiant Package Setup.
6. Copy all the files that were extracted from the component to the appropriate folder.
7. Restart the ADS Deployment Agent Builder service in Services.