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Compaq Computer Corporation

Contents

Rapid Deployment Guide for the ProLiant DL380 G2 Packaged Cluster Using the Rapid Deployment Pack V1.20

Abstract: This guide details the steps required to deploy a ProLiant DL380 G2 Packaged Cluster using the ProLiant Essentials Rapid Deployment Pack V1.20 on Microsoft Windows 2000 Advanced Server. This guide supplements the ProLiant Essentials Rapid Deployment Pack, and assumes that an existing deployment infrastructure already exists. The purpose of this guide is to provide a turn-key cluster deployment solution for the ProLiant DL380 G2 Packaged Cluster. When the process completes, the system is ready for a production environment.

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Notice

Rapid Deployment Guide for the ProLiant DL380 G2 Packaged Cluster Using the Rapid Deployment Pack V1.20
White Paper prepared by High Availability

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Introduction

Server deployment can be a time-consuming task, especially if you need to deploy hundreds of servers quickly and reliably. As a key component of the Adaptive Infrastructure strategy, the ProLiant Essentials Rapid Deployment Pack was developed to automate repetitive tasks such as configuring and deploying servers. The implementation of a rapid deployment infrastructure significantly reduces IT costs associated with server deployment and redeployment. Key benefits include improved overall consistency of configurations across multiple servers and reduced IT resource requirements during large-scale deployments.

This guide explains, in detail, the steps needed to deploy a ProLiant DL380 G2 Packaged Cluster using the ProLiant Essentials Rapid Deployment Pack V1.20 for Windows 2000 Advanced Server. These steps include deploying a hardware configuration, deploying Windows 2000 Advanced Server, configuring the Smart Array Cluster Storage enclosure, and deploying the Microsoft Cluster Service to each node.

Note: This guide discusses sample scripts and configuration files used for cluster deployment with the ProLiant Essentials Rapid Deployment Pack. These files are contained in SoftPaq *SP21872.EXE*. The SoftPaq can be downloaded from the following locations. www.hp.com/proliant/highavailability or www.hp.com/manage/rapiddeploy

The sample scripts and configuration files are also located on the ProLiant Essentials Rapid Deployment Pack V1.20 distribution.

Purpose

This guide is intended to be a supplement to the ProLiant Essentials Rapid Deployment Pack. The purpose of this guide is to provide a turn-key cluster deployment solution for the ProLiant DL380 G2 Packaged Cluster. By following the steps in this guide, a ProLiant DL380 G2 Packaged Cluster can be deployed without any intervention, and when the process completes, the cluster is ready for a production environment.

Assumptions and Intended Audience

This guide assumes that an existing deployment infrastructure already exists in the environment, and is intended to complement the ProLiant Essentials Rapid Deployment Pack. This guide covers the deployment of Microsoft Windows 2000 Advanced Server and Microsoft Cluster Services on a ProLiant DL380 G2 Packaged Cluster using the ProLiant Essentials Rapid Deployment Pack.

Note: For more information on correctly configuring a deployment infrastructure for use with this guide, please refer to the *Implementing a Deployment Infrastructure* white paper on the ProLiant Essentials Rapid Deployment Pack CD.

This paper assumes that the reader has knowledge of the following topics and products:

- Microsoft Windows 2000 Advanced Server
- Microsoft Cluster Services
- ProLiant Essentials Rapid Deployment Pack
- Dynamic Host Configuration Protocol (DHCP) or Bootstrap Protocol (BOOTP)
- Pre-Boot Execution Environment (PXE)

Please see the "Additional Information" section of this paper to find additional information relating to these topics.

Deployment Components

Before deploying a ProLiant DL380 G2 Packaged Cluster, it is important to understand the components involved in the deployment process. The ProLiant Essentials Rapid Deployment Pack facilitates the deployment process through a combination of hardware and software. This guide centers on a ProLiant DL380 G2 Packaged Cluster deployment running Microsoft Windows 2000 Advanced Server and Cluster Services.

Additionally, Remote Insight Lights-Out Edition (RILOE) can be used to monitor the deployment process on the target server and recover from issues that may occur during the deployment process. For more information on RILOE, please see the "Additional Information" section in this guide.

ProLiant DL380 G2 Packaged Cluster

The ProLiant DL380 G2 Packaged Cluster is a simple and affordable high availability solution powered by ProLiant servers and Smart Array technology.

Its features include:

- A complete, 8U cluster package
- Industry standard ProLiant servers and Smart Array storage components
- Redundant controllers on the Smart Array Cluster Storage and redundant server features on the ProLiant DL380 G2

Hewlett-Packard sets a new standard for performance and value in the enterprise with the ProLiant DL380 G2 Packaged Cluster. Consisting of two ProLiant DL380 G2 server nodes and a shared storage cabinet, pre-packaged in a cost-effective and space-efficient fixture, the ProLiant DL380 G2 Packaged Cluster provides the most affordable clustering solution for Windows NT Server 4.0, Enterprise Edition, Windows 2000 Advanced Server, Novell NetWare, and Linux.

The ProLiant DL380 G2 Packaged Cluster complements any IT investment by providing high uptime for business critical applications. Specifically designed to ensure outstanding performance and seamless integration throughout the entire enterprise, the ProLiant DL380 G2 Packaged Cluster offers an excellent return on investment by drastically reducing downtime.

ProLiant Essentials Rapid Deployment Pack

The ProLiant Essentials Rapid Deployment Pack combines the remote deployment capabilities of the Altiris eXpress Deployment Server with the power and flexibility of the SmartStart Scripting Toolkit, integrated with the Altiris product through the ProLiant Integration Module (PIM) for Altiris eXpress Deployment Server.

The Altiris eXpress Deployment Server is a GUI-based hardware deployment and software distribution tool that provides remote console capabilities for both imaging and scripting. Altiris has also developed enhancements within their base product for Hewlett-Packard products, such as integration with RILOE and the new ProLiant BL servers.

The ProLiant Integration Module contains sample configuration events, batch files, support software, and the SmartStart Scripting Toolkit enabling Hewlett-Packard customers to deploy ProLiant servers quickly and easily. The PIM makes deployment of ProLiant servers using Altiris eXpress Deployment Server simple. It encapsulates all the necessary steps of configuring and deploying ProLiant servers into easy-to-use events that the user can simply drag and drop to deploy one or many servers.

This guide provides instructions for using the ProLiant Integration Module for Altiris eXpress to deploy ProLiant DL380 G2 Packaged Clusters using these integrated tools, custom scripts, and configuration events.

ProLiant DL380 G2 Packaged Cluster Deployment

There are three stages in the deployment of a ProLiant Cluster, depicted here in **Figure 1**.

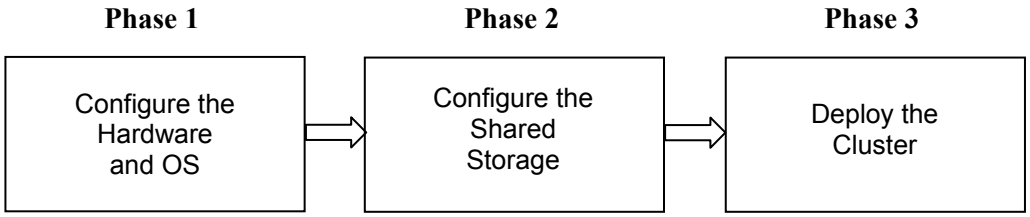

Figure 1. Phases of cluster deployment

In Phase 1, typically each cluster node is configured separately. This includes the configuration of the internal storage and the operating system as well as related service packs and Support Packs.

Phase 2 consists of configuring the external storage using an array configuration tool and then creating the Windows NTFS partitions. Each partition is then formatted assigned a drive letter.

Phase 3 is the deployment of the final component, Microsoft Cluster Services, to each node.

Using the Rapid Deployment Pack V1.20 for Cluster Deployment

The guide will demonstrate how to combine these three phases of cluster deployment into a turn-key solution using the Rapid Deployment Pack V1.20. The next several sections in this guide detail the steps necessary to utilize the Rapid Deployment Pack to create a drag-and-drop deployment event for the ProLiant DL380 G2 Packaged Cluster. The following list describes the major steps in this process using the Rapid Deployment PackV1.20:

- Choose an operating system installation path (scripted OS or imaged OS installation)
  - Configure the reference server and external storage
  - Capture the reference server hardware, OS image, and external storage configuration
- Create additional directory structures and edit cluster-specific configuration files on the deployment server
- Create the deployment event in the Altiris eXpress Console
- Import computers and deploy the events

After completing these tasks, you will have a complete deployment event for the Rapid Deployment Pack V1.20 to deploy a ProLiant DL380 G2 Packaged Cluster.

Choosing an Operating System Installation Path

Using the Rapid Deployment Pack provides many options for deploying ProLiant DL380 G2 Packaged Clusters. The operating system can be deployed utilizing the Windows unattended installation feature or by using an OS image captured by the Rapid Deployment Pack.

Scripted OS Installation

Microsoft Windows 2000 supports a completely unattended installation of the operating system. In a fully scripted operating system installation deployment scenario, the installation of the OS is managed utilizing this capability as well as a customized Altiris deployment event provided by the PIM. By editing the unattended installation text file and the event that deploys the operating system, you can customize the operating system installation to your specifications including service packs, Support Packs, Microsoft Security updates and more. See "Appendix B" in this guide for an example of an unattended installation text file.

IMPORTANT: Scripted installations of Windows 2000 require an administrator-level password stored in plain-text form within the answer file (*unattend.txt* or other similar file). There is no way to encrypt this password for scripted installations. For this reason, we recommend that you protect server administrator passwords in the following ways:

- Ensure that only authorized persons have access to the eXpress share, where the answer files are located, and ensure that you have a separate user account for accessing the eXpress share than for the rest of the deployment server.

- Immediately change the Administrator password after server installation using the appropriate utility from the Microsoft resource kit.

Imaged OS Installation

In order to expedite the deployment process for large-scale cluster deployments, the use of operating system images can reduce the amount of bandwidth required to transfer OS files and the length of time taken to land the OS on each cluster node. For the ProLiant DL380 G2 Packaged Cluster, the reference configuration consists of a single DL380 G2 connected to the Smart Array Cluster Storage. This reference configuration is then captured for use in the deployment of ProLiant DL380 G2 Packaged Clusters.

Building and Capturing a Reference Configuration

Baseline hardware, storage, and Windows OS configurations can be captured using the ProLiant Essentials Rapid Deployment Pack. The results of capturing a reference configuration are hardware and storage configuration files and a Windows image. These files are then used in the deployment event for the Rapid Deployment Pack to completely deploy a ProLiant DL380 G2 Packaged Cluster.

Building the Reference Configuration

To create the reference configuration, do the following tasks:

- Configure the server hardware and internal storage
- Install Windows 2000 Advanced Server, selecting the cluster option during component install
- Install related hot fixes and service packs for the OS
- Configure the Smart Array Cluster Storage
- Deploy the Altiris Client (AClient)

Once these tasks have been completed, the Rapid Deployment Pack provides the tools to capture the hardware and storage configuration and a Windows OS image. The following steps provide more detail on the requirements for configuring the reference server and storage in preparation for capture.

1. Assemble one node and the Smart Array Cluster Storage following the cabling guide included in the documentation for the ProLiant DL380 G2 Packaged Cluster.

IMPORTANT: The cluster documentation states that NIC 1 on each server node should be used for the cluster interconnect (the cluster heartbeat). For capture and deployment using the Rapid Deployment Pack, *you must use NIC 1 for the public network*. Failure to cable the NICs in this way will prevent communication with the deployment server.

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2. Use the Rom-Based Setup Utility (RBSU) to configure the system in preparation for installation of the OS.

Note: Do not use the SmartStart CD to setup your reference node.

---

3. Install Windows 2000 Advanced Server with the requirements specified in steps 4-7 and any others specific to your environment.
4. During the Windows portion of setup, the **Windows Component Wizard** appears. Select **Cluster Service**. Installing this component during setup copies the cluster binaries to the `c:\winnt\cluster` directory of the server. These files are necessary later in the deployment process.
5. Choose the **Typical Settings** for the network interface cards (NICs) during the installation. Maintaining the default network configuration is important to the deployment process as changing them will prevent a successful installation of the cluster.

IMPORTANT: Do *not* elect to join a domain at this time.

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6. After Windows 2000 Advanced Server has been installed, install the latest Windows 2000 service pack and security updates.
7. Install the latest Windows 2000 Support Packs.
8. Create logical drives in the Smart Array Cluster Storage enclosure using the Array Configuration Utility (ACU).

Note: When creating logical drives, Microsoft recommends that the cluster Quorum disk drive be at least 500MB in size. Refer to Microsoft Knowledge Base Article Q280345 for more information.

IMPORTANT: Do *not* create Windows partitions on the shared storage at this time.

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9. Deploy the Altiris Client to the reference server.

Deploying the Altiris Client

The final step in setting up the reference server is to deploy the Altiris Client (AClient). The AClient is the client software that connects machines to the Altiris eXpress Deployment Server. The AClient is essential to cluster deployment and allows for capturing the configuration of the reference server and storage.

The following steps detail how to deploy the Altiris Client to the reference server.

1. From the Altiris eXpress Deployment Server Console, click **Tools→Remote Client Installer**. You can also click the corresponding icon on the tool bar.
2. Click **Add** on the **Altiris Remote Client Installer** window to add the AClient software to the deployment server. The **Default Logon Credentials** window opens. Supply or accept the default administrator-level username and password for the reference server.

Note: If this is the first time that the **Remote Client Installer** has been used, complete steps 6-9 next and then return to step 3. These steps establish the default AClient settings used when a Windows image is deployed and configured. If the Remote Client Installer has already been configured previously, proceed to step 3.

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3. The next window shows the computers that are seen on the network. Select the reference server and press **OK** to continue.
4. The **Altiris Remote Client Installer** window now reflects the addition of the reference server. Select the reference server in the **Altiris Remote Client Installer** window and click **Properties**.
5. The **Individual Logon Credentials** window opens. Supply an administrator-level user name and password for the reference server. Now click the **Client Settings** button to configure the AClient properties.
6. The first screen prompts for the destination of the AClient files on the target system, and whether or not the changing of Security IDs (SIDs) is enabled. Use the default for the AClient file location and be sure the **Enable Changing of Security ID** checkbox is checked. Click **Next** to continue.
7. In the next window, verify that the **Use Altiris SIDgen utility to make SID changes** option is selected and click **Next** to continue. Using **Microsoft Sysprep** is also supported for deployment.

8. The next screen asks where to install the AClient on the target server. Accept the default and click **Next**.
9. Click **Finish** on the next window to close the **Altiris Client Service Wizard**.

Note: If this was the first time to configure the Altiris Client, return to step 3 in this section to continue.

10. Return to the **Altiris Remote Client Installer** window. Highlight the reference server in the list and click **Install**.
11. On the **Confirm Selection** pop-up, select **Install all items** and click **OK** to continue.
12. Once the installation of the client has completed, close the **Remote Client Installer** window.

Capturing the Reference Configuration

After configuring the reference server and storage, use the ProLiant Essentials Rapid Deployment Pack to capture this configuration. The ProLiant Integration Module for the Rapid Deployment Pack includes events to capture the hardware, storage, and Windows image from the reference configuration. The capture event used here creates three files, each necessary for ProLiant DL380 G2 Packaged Cluster deployment using the Rapid Deployment Pack V1.20:

- Hardware configuration file
- Array configuration file
- Windows OS image

The following steps outline how to capture these files from the reference configuration for use in deploying ProLiant DL380 G2 Packaged Clusters.

1. In the Altiris eXpress Deployment Server Console, open the folder labeled **SmartStart Toolkit and OS Imaging Events** in the **Events** window.
2. Double-click the **Capture Hardware Configuration and Windows Image** event in the **SmartStart Toolkit and OS Imaging Events** folder. This opens the properties window for the event.
3. Select **Run Script** under the **Task** heading and click **Edit**.
4. The **Script Task Properties** window opens. Under the **Run this script** bullet is the embedded script to gather the system configuration from the ROM-Based Setup Utility (RBSU) on the reference and the logical drive configuration from the Smart Array 5i and Smart Array Cluster Storage controllers.
5. If it is present, delete the entire line starting with `set osfile=...` Otherwise, skip this step.
6. The script initially sets the filenames for the hardware configuration file captured from the RBSU and the array configuration file captured from the array controller(s). Change the default filenames to names that reflect the server configuration to be captured. For the purposes of this guide, the filenames are *380G2-H.INI* and *380G2-A.INI*. The script with the changes is:

```
rem Capture Hardware Configuration
rem bootwork unload
set hwrfile=380G2-H.INI
set aryfile=380G2-A.INI
call f:\deploy\tools\scripts\getcfg.bat
```

The script, *getcfg.bat* is part of the ProLiant Integration Module and does not require any changes.

Note: Because this script runs in an MS-DOS environment, the 8.3 standard for all filenames applies. For example, a valid filename would be *12345678.123*.

7. Once all of the changes have been made, click **OK** to close the **Script Task Properties** window.
8. In the **Event Properties** window, select **Create Image** under the **Task** heading then click **Edit**.
9. The **Disk Imaging Task Properties** window opens. Change the default image name to reflect the server to be imaged. For the purposes of the guide, the image is renamed to *380g2.img*. The image filename should read:

```
.\images\380g2.img
```

10. After the image name is set, click **OK** to close the **Disk Imaging Task Properties** window, then click **OK** to close the **Event Properties Window**.
11. Drag-and-drop the **Capture Hardware Configuration and Windows Image** event in the **Events** pane onto the reference server listed in the **Computers** pane.
12. The next screen shows the **Schedule Computers for Event** window. The default is to run the event immediately. Accept the default and click **OK** to run the event.

At this point, the reference server reboots to capture the Windows image, hardware, and array information.

Note: If the reference server has never gone through a PXE boot, a message may appear on the reference server when it is rebooted to execute the script. This message refers to the lack of a PXE boot stamp. Simply click **OK** to allow the reference server to reboot; the PXE boot stamp will be applied once the script is executed.

Preparing the Deployment Environment

A properly configured deployment infrastructure includes the correct directory structure and file location on the deployment server.

Directories and File Locations

For deploying ProLiant DL380 G2 Packaged Clusters, at least four directories must be added to the existing directory structure. Do the following to complete the directory structure configuration needed for deploying clusters with the Rapid Deployment Pack V1.20.

1. On the deployment server, browse to **c:\Program Files\Altiris\eXpress\Deployment Server**. Create a subdirectory under the **deploy** directory called **clusters**.
2. Under the **clusters** directory, create the subdirectories common and a directory named for each cluster to be deployed. For this guide, a cluster folder called **MYCLUS1** has been placed under the **clusters** directory.
3. Under the **common** directory, create the subdirectories **scripts** and **tools**.
4. Download the SoftPaq and place all of the script files in the **.\clusters\common\scripts** directory. Place the executables from the SoftPaq in the **.\clusters\common\tools\ directory**.

Note: For each cluster being deployed, a separate directory must exist under **clusters** with the same name as the that intended for the cluster.

The scripts called by the Rapid Deployment Pack event to be created later require that all configuration files, OS images, and tools be located in the directories indicated in **Figure 2**. Each of the files listed here are used in the deployment process.

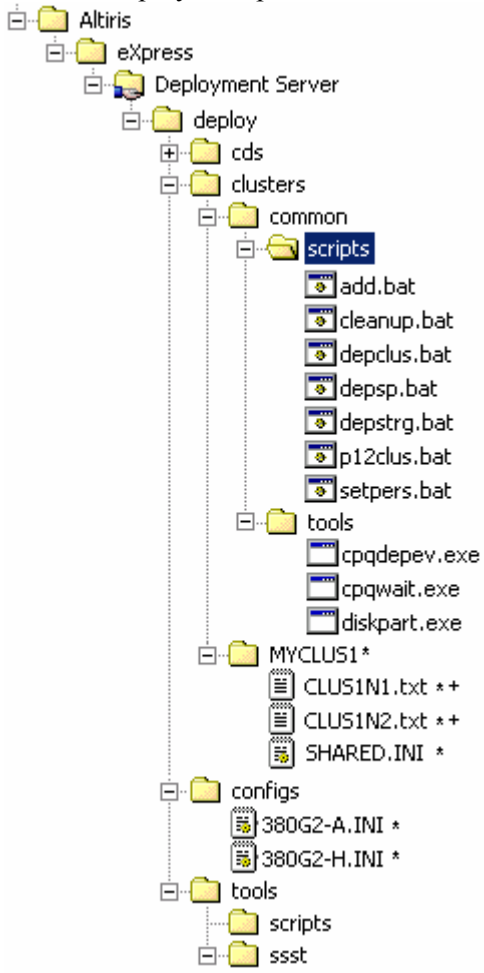

Figure 2. Directory structure for cluster deployment with the Rapid Deployment Pack V1.20

Note: Items marked with a * must follow DOS 8.3 naming conventions.

Items marked with a + are only required for scripted Windows installations.

In the **deploy** directory on the deployment server, the **cds**, **configs**, and **tools** directories are created and populated during the install of Rapid Deployment Pack V1.20.

The following list describes each deployment specific directory and its contents:

- **cds** – This directory contains the installation CDs for the operating systems when an unattended OS deployment is used. It also contains the Support Packs from HP.
- **clusters** – The clusters directory created specifically for deploying ProLiant Clusters contains a common directory for cluster-specific scripts and tools provided in SoftPaq *SP21872.EXE*. The cluster name directory, here called **MYCLUS1**, contains the unattended installation text files required for each node in a scripted OS installation and the shared storage configuration file required regardless of deployment type.

- **configs** – This directory contains the configuration files captured from the reference server.
- **tools** – This directory has two subdirectories. The first is the **scripts** directory, which holds all of the scripts used by the ProLiant Integration Module. The second subdirectory is the **ssst** directory, which holds all of the SmartStart Scripting Toolkit tools.

Configuration Files

Computer Import File

Altiris eXpress Deployment Server provides a mechanism to import computers into its database before they have been recognized on the network. Using a pre-built import file, cluster nodes can be imported into the system and assigned events before they are ever turned on. From the perspective of remote deployment, this feature eases the deployment process.

Use this mechanism to import each cluster node into the Altiris computer database in order to deploy a ProLiant DL380 G2 Packaged Cluster using the Rapid Deployment Pack. Please refer to "Appendix B" for the format of the import file to use to import each node.

Note: A template for use in importing DL380 G2 cluster nodes, called *nodeimport.txt*, is also available in the SoftPaq distribution and the Rapid Deployment Pack V1.20 CD.

The computer import file must contain the following for each node imported into the database:

- Node name
- Serial number
- Logon domain for the cluster
- Cluster name to which each node will belong
- Default IP address for NIC2
- Default gateway for NIC2

The template supplies a private IP address and default gateway for the second NIC in each node. These values are specified in the import file to avoid disabling the NICs if they are connected via a crossover cable and use DHCP. Determine the values of the other node properties listed here and have them available for use in the next section. If you wish to specify a static IP address for NIC1 in your cluster nodes do so in the import file following the template on the deployment server.

Creating the Computer Import File

1. Make a copy of the sample import file, *nodeimport.txt* and place it on the deployment server.
2. Open this copy and edit the appropriate fields with the information for your cluster.
3. All other fields specified in the template but not listed in this section are optional. If electing not to supply these fields during import, delete the default field data, leaving all trailing commas.

After creating the deployment event, please refer to the section "Importing Nodes and Deploying the Cluster" in this guide for the steps to use this import file to import the cluster nodes.

Shared Storage Configuration File

For a cluster, configuration of the shared storage can only occur after the hardware and operating system have been deployed to at least one node. The hardware and storage configuration capture

process captures both the internal and the external storage array information of a reference server. To satisfy the requirements for cluster deployment, a separate file containing the shared storage array information must be created.

Creating the Shared Storage Configuration File

The capture process completed in "Capturing the Reference Configuration" will have created an array configuration file with the internal and external array configurations. Because of cluster deployment requirements (discussed in "ProLiant DL380 G2 Packaged Cluster Deployment" in this guide) the internal array must be configured first. Then after configuring the server, the Smart Array Cluster Storage can be configured. Two separate array configuration files are necessary to accomplish this.

1. Make a copy of the captured array configuration file in the **configs** directory on the deployment server. In this guide, this file is called *380G2-A.INI*.
2. Rename the copied file to indicate its use as for the shared storage. This guide uses *SHARED.INI* as the name of the shared storage configuration file.
3. Open the original array file (here called *380G2-A.INI*), and remove everything in the section starting with:

   ```
   ;Controller specifications
   ;Smart Array Cluster Storage Ext 1 Connected to
   ```

   Be sure to *only* remove the information pertaining to the *external storage*.
4. Save and close the internal array configuration file (*380G2-A.INI*).
5. Open the shared storage array configuration file (here called *SHARED.INI*), and remove everything following the section starting with:

   ```
   ;Controller specifications
   ;Controller Compaq Smart Array 5i
   ```

   Be sure to *only* remove the information pertaining to the *internal storage*.
6. Save and close the external array configuration file (*380G2-A.INI*).
7. Now move this file from the **configs** directory and place it in the cluster directory in **clusters** on the deployment server. This directory is called **MYCLUS1** in this guide.

Please see "Appendix B" for examples of the internal and shared storage array configuration files.

Unattended Text File for Scripted Windows Installations

If using scripted Windows installations for OS deployment, each node needs its own unattended installation text file. This file must have the same name as the computer name specified in the import file with the *.txt* file extension. For example, a node in the cluster deployed in this paper is named **CLUS1N1**. Its corresponding unattended installation file is called *CLUS1N1.txt*. This file must be in the clusters directory for your cluster on the deployment server.

Note: Unattended installation text files are only for scripted OS deployments.

The **configs** directory on the Altiris Deployment Server contains a base Windows 2000 unattended installation text file. The file is divided into sections demarcated by brackets [ ]. Execute the following steps to customize the unattended installation text files for cluster deployment.

1. Make two copies of this text file and place them in the directory named for the cluster to be deployed in the **clusters** directory on the deployment server.

2. Rename each text file to the node name specified in the import file. In this guide, the files are called *CLUS1N1.txt* and *CLUS1N2.txt* and they reside in the **MYCLUS1** directory.
3. Once these files are in the correct directory, open each and add or update the following sections listed here. Please update each section noted by [ ] with information specific to your deployment configuration.

```
[GuiUnattended]
       AdminPassword=*
[Identification]
       DomainAdmin=*
       DomainAdminPassword=*
       JoinDomain=*
[UserData]
       ComputerName=*
       FullName=*
       OrgName=*
[Components]
       Cluster=On
```

4. Fields marked with an * need to be updated with information specific to your cluster deployment scenario.
5. SNMP trap destinations and community strings can be set at this time in the unattended installation text file.

Creating the Cluster Deployment Events

This section details the steps to create both a Scripted and Imaged OS Deployment Event. Each subsection represents a task in the event for deploying a ProLiant DL380 G2 Packaged Cluster. Every task in the deployment event that calls a Rapid Deployment Pack provided script has an embedded script. These embedded scripts usually contain variables whose values must be customized for each cluster deployment. However, the scripts provided with the Rapid Deployment Pack do not require any changes after being called by these embedded scripts.

Where indicated, make the necessary changes to filenames, paths, and variables and the deployment event will be ready for use to deploy a cluster.

Note: Each of the scripts described in this section are listed in their entirety in "Appendix B".

1. In the Altiris eXpress Deployment Server Console , right-click on the white space in the **Events** pane shown here in **Figure 3**. Select **New Folder**.
2. Change the name of this event folder to **Packaged Cluster Deployment Events**. This folder will contain any events to deploy ProLiant DL380 G2 Packaged Clusters.

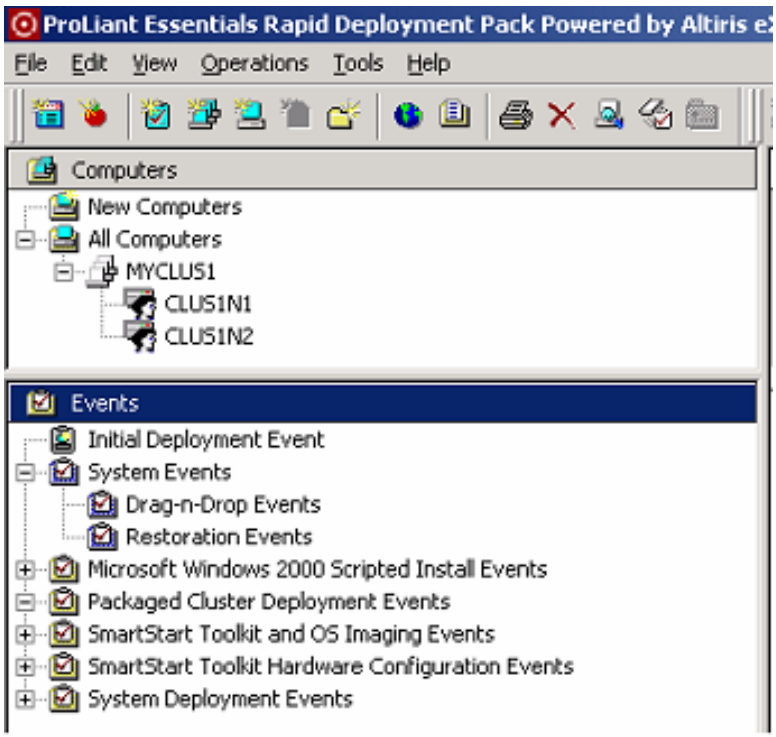

Figure 3. Events pane in the Altiris eXpress Server console

3. If using scripted OS installations during cluster deployment, proceed to the next section, "Creating the Scripted OS Deployment Event". If imaged OS installations will be used during cluster deployment, proceed to "Creating the Imaged OS Deployment Event" in this guide.

Creating the Scripted OS Deployment Event

1. In the Altiris eXpress Deployment Server Console, expand the events folder named **Microsoft Windows 2000 Scripted Install Events**.
2. Right-click on **ProLiant ML/DL Scripted Install for Microsoft Windows 2000** event and select **Copy**.
3. Right-click on the **Packaged Cluster Deployment Events** folder and select **Paste**.
4. In the **Packaged Cluster Deployment Events** folder, right-click on **ProLiant ML/DL Scripted Install for Microsoft Windows 2000** event and select **Rename**. For this guide, the event is named **Scripted OS Packaged Cluster Deployment**.

Deploying the Hardware Configuration

1. Double-click on the **Scripted OS Packaged Cluster Deployment Event** to open the **Event Properties** window shown here in **Figure 4**.

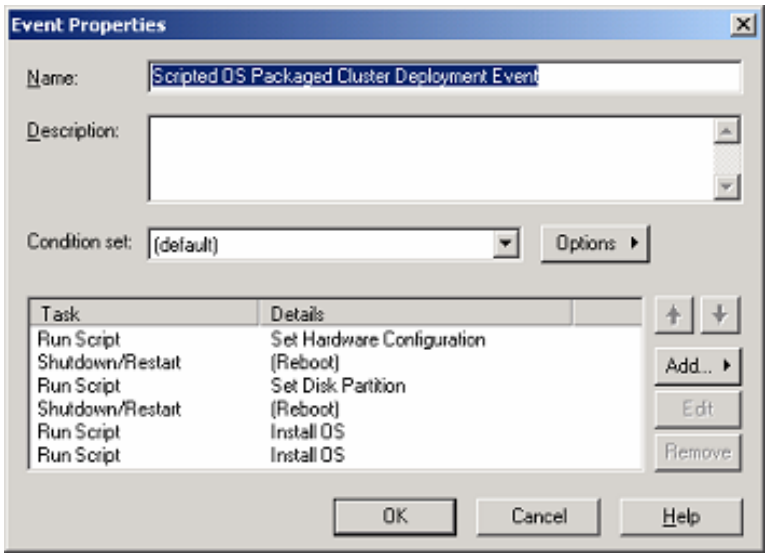

Figure 4. Event Properties window

2. This window shows all the tasks in this event. Click on the first task, **Run Script** and select **Edit**.

3. This opens the **Script Task Properties** window shown here in **Figure 5**.

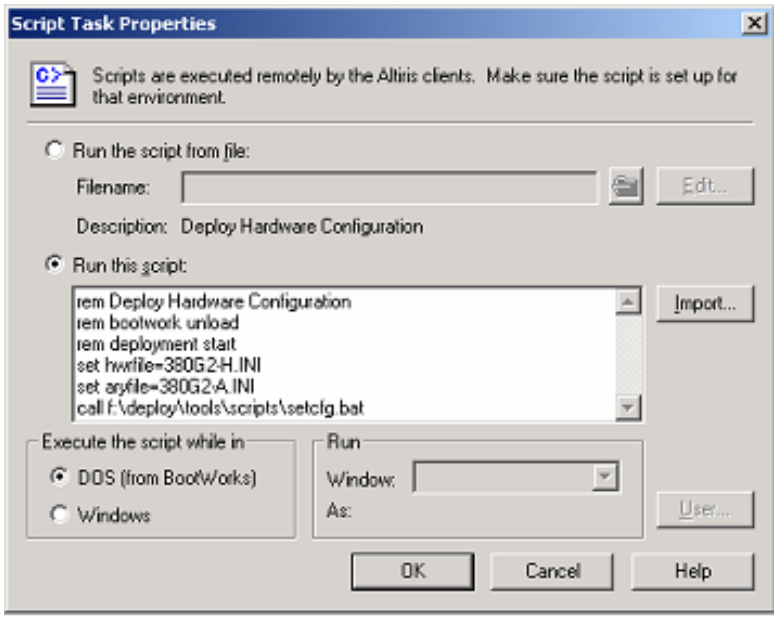

Figure 5. Set hardware configuration Script Task Properties window

4. Under the **Run this script** bullet is the embedded script to deploy the system configuration to the RBSU and the logical drive configuration to the Smart Array 5i array controller on the cluster node. In this script, change the default values for hwrfile and aryfile to the names of the hardware and internal storage configuration files for your cluster deployment. For this guide, the filenames are *380G2-H.INI* and *380G2-A.INI*.
5. If it is present, delete the entire line starting with `set osfile=...` The script with changes is:

```
rem Deploy Hardware Configuration
rem bootwork unload
rem deployment start
set hwrfile=380G2-H.ini
set aryfile=380G2-A.ini
call f:\deploy\tools\scripts\setcfg.bat
```

   Please note the call to *setcfg.bat*. This script is part of the ProLiant Integration Module and does not require any changes.

Note: Make sure that the filename specified for the `aryfile` is the file that contains *only* the local drive array configuration.

6. Click **OK** to close the **Script Task Properties** window.

Set Disk Partition

The Rapid Deployment Pack comes with a partition file that specifies a 2 GB partition for the boot drive on a target server. Once the OS is installed to this partition, the partition is expanded to span the full size of the drive. No changes need to be made to this task.

Install OS

1. In the **Event Properties** window for the **Scripted OS Packaged Cluster Deployment Event** click on the next task, **Run Script** (Install OS) and select **Edit**.
2. This opens the **Script Task Properties** window. Under the Run this script bullet is the embedded script to specify the unattended installation file for the node being deployed. First, add a variable called `ClusterName` to specify the name of the cluster being deployed, in this case, `MYCLUS1`.
3. Change the value for the variable `unattendfile` to the following:

   ```
   ..\clusters\%ClusterName%\%NODENAME%.txt
   ```

   Using the Altiris provided environment variable NODENAME specifies the unattended installation text file for the node in the cluster directory on the deployment server.
4. The embedded script should now look similar to this:

   ```
   rem Install OS
   rem bootwork unload
   set ss=ss.550
   set os=w2k
   set ClusterName=MYCLUS1
   set unattendfile=..\clusters\%ClusterName%\%NODENAME%.txt
   call f:\deploy\tools\scripts\w2k.bat
   ```
5. Click **OK** to close the **Script Task Properties** window.

Install OS (Part 2)

This task calls *winnt.exe* and supplies the unattended installation file to the application so that it can install Windows 2000 on each node. No changes need to be made to this task.

Complete the Cluster Deployment Event

Install OS (Part 2) is the last task specific to a scripted OS deployment. Proceed to "Completing the Cluster Deployment Event" in this guide to complete the Packaged Cluster Deployment Event for a scripted OS installation.

Creating the Imaged OS Deployment Event

The process for creating an imaged OS deployment event for the ProLiant DL380 G2 Packaged Cluster is nearly identical to that of the Scripted OS Deployment Event but with two significant differences. In the imaged OS deployment, the hardware configuration and OS image captured previously is used to deploy new clusters. Additionally, there is no need for an unattended installation file.

1. In the Altiris eXpress Deployment Server Console , expand the events folder named **SmartStart Toolkit and OS Imaging Events**.
2. Right-click on **Deploy Hardware Configuration and Windows Image** and select **Copy**.
3. Right-click on the **Packaged Cluster Deployment Events** folder and select **Paste**. This adds a new event to the **Packaged Cluster Deployment Events** folder named **Deploy Hardware Configuration and Windows Image**.
4. The next step is to rename the event. Right-click on **Deploy Hardware Configuration and Windows Image** and select **Rename**. For this guide, the event is named **Imaged OS Packaged Cluster Deployment**.

Deploying the Hardware Configuration

1. In the Altiris eXpress Deployment Server Console, double-click on the **Imaged OS Packaged Cluster Deployment Event** to open the **Event Properties** window.
2. This window shows the tasks in this event. Click on the first task, **Run Script** and select **Edit**.
3. This opens the **Script Task Properties** window. Under the **Run this script** bullet is the script that will be run to deploy the system configuration to the RBSU and the logical drive configuration to the Smart Array 5i array controller. Change the default filenames for the *hwrfile* and *aryname* variables to the names of the files specified during the capture of the reference configuration. For this guide, the filenames are changed to *380G2-H.INI* and *380G2-A.INI*.
4. If it is present, delete the entire line starting with `set osfile=...` The script with changes is:

```
rem Deploy Hardware Configuration
rem bootwork unload
rem deployment start
set hwrfile=380G2-H.ini
set aryfile=380G2-A.ini
call f:\deploy\tools\scripts\setcfg.bat
```

   Please note the call to *setcfg.bat*. This script is part of the ProLiant Integration Module and does not require any changes.

Note: Make sure that the filename specified as the `aryfile` is the file that contains *only* the local drive array configuration.

5. Click **OK** to close the **Script Task Properties** window.

Deploying the OS Image

1. In the **Event Properties** window for the **Imaged OS Packaged Cluster Deployment Event**, highlight **Deploy Image** under the **Task** heading then click **Edit**.

2. Change the default filename for the Windows image. The image specified must be a valid Windows 2000 Advanced Server image for the target server. The image used for this guide is named *380g2.img*.

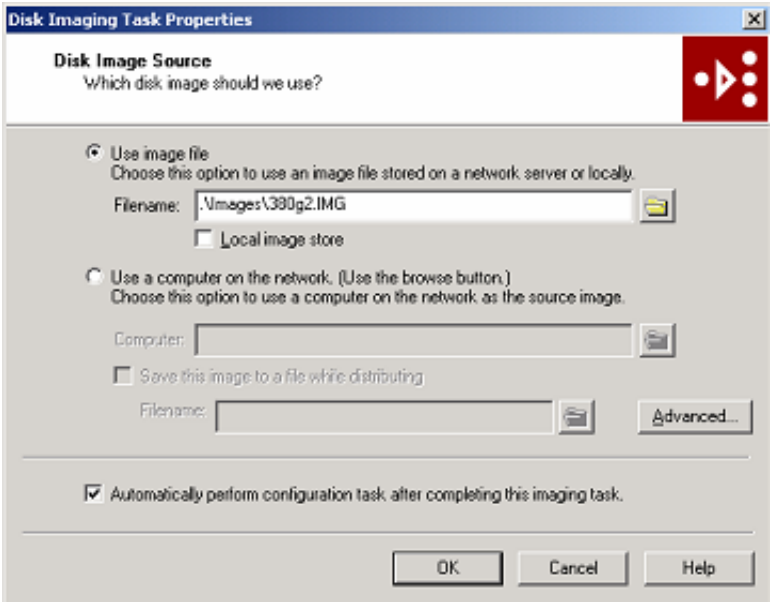

Figure 6. Disk Imaging Task window

It is also possible to browse to the location of the image file by clicking on the "folder" button to the right of the **Filename:** field.

3. Make sure that the **Automatically perform configuration task after completing this imaging task** checkbox is checked. By checking this box, Altiris will automatically change the Security Identifier (SID) on each server that uses this image, allowing each server to join a domain, a requirement for Microsoft cluster services.
4. Select **OK** to close the **Image Properties** window.

Complete the Cluster Deployment Event

The **Deploy OS Image** task is the last task specific to an imaged OS deployment event. Proceed to "Completing the Cluster Deployment Event" in this guide to complete the Packaged Cluster Deployment Event for an imaged OS installation.

Completing the Cluster Deployment Event

From this point on, regardless of the OS installation method used, all of the remaining tasks need to be added to the deployment event.

Copying Files

1. In the **Packaged Cluster Deployment Event** folder, double-click the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**. This will open the **Event Properties** window for that event.
2. Click **Add.. → Copy File to..** to add another task to this event.
3. The **Send Files to Computers** window opens. Choose the **Copy Directory** option.

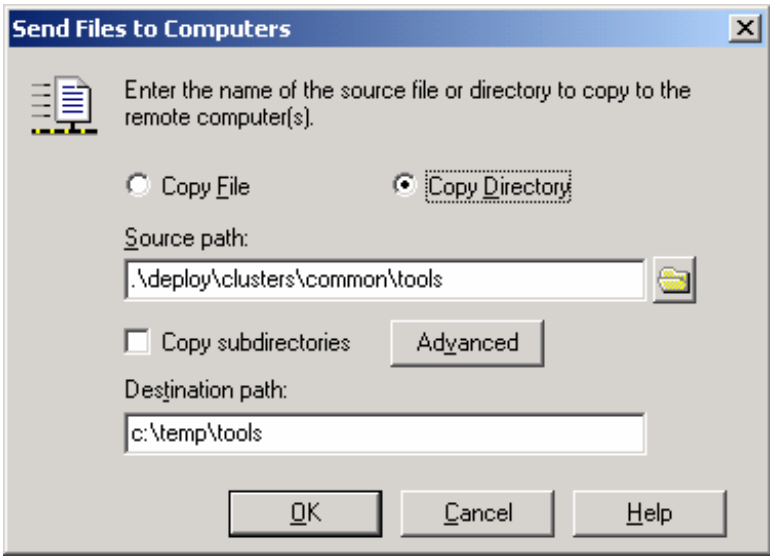

Figure 7. Send Files to Computers window

4. Click on the folder icon to the right of the **Source Path** field. Browse to the following location on the deployment server:

   ```
   .\Altiris\eXpress\Deployment Server\deploy\clusters\common\tools
   ```

5. In the **Destination Path** field enter:

   ```
   C:\temp\tools
   ```

   This will copy the tools *cpqwait.exe*, *cpqdepev.exe*, and *diskpart.exe* to a temporary directory on the cluster node. These tools are used during the deployment process and will be deleted at the completion of the cluster deployment.

IMPORTANT: *Diskpart.exe* is a Microsoft Resource Kit tool. This tool can be found at Microsoft's Download Center. Connect to http://www.microsoft.com/downloads/ and search for *diskpart.exe* for Windows 2000 or follow this link:

http://www.microsoft.com/downloads/release.asp?releaseid=31167.

Please download this tool and place it in the directory specified in step 4 on the Deployment Server. Verify that the version downloaded is for Windows 2000.

---

6. Click **OK** to close the **Send Files to Computers** window.

Setting Persistent Variables - setpers.bat

1. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** and select **Run Script..** from the menu to add another task to this event.
2. This opens the **Script Task Properties** window. Several variables are required in the embedded script run by this task. Each variable's name and value is described here. Determine the values for each of these variables for your deployment environment then proceed to Step 3 in this section.
   - **AXSERVER:** Altiris eXpress Server name. This variable does not need to be changed, as the Altiris environment variable %DSSERVER% will supply it to the called script, *setpers.bat*.
   - **CLUSNAME:** Name of the cluster, which must also be the name of the cluster folder on the Altiris eXpress Server.
   - **CLUSIPAD:** This variable is for the IP address for the cluster.
   - **CLUSIPNM:** This is the IP net mask for the cluster IP address.
   - **ADMINACC:** This must be a domain-level administrator account.
   - **PASSWORD:** This must be the password for the domain-level administrator account.
   - **CLUSDOMAIN:** Set the value of this variable to the domain of which the nodes and the cluster will be members.
   - **LOGONCNT:** The number of times for the system to automatically login throughout the deployment process. Set this number to **four (4)** for deploying the ProLiant DL380 G2 Packaged Cluster.

IMPORTANT: This embedded script requires a domain administrator-level password. After the deployment process has completed, keep this event in a secure place, or remove the password from this script until necessary. Additionally, while this domain administrator-level password is set as an environment variable on each cluster node, a final cleanup task is a part of the complete Packaged Cluster Deployment event and will remove this value from each node's environment.

---

3. In the **Run this script** section, enter in the following embedded script, updating all variables to values specific to your environment. The script should look similar to this:

```
@echo off
rem Set Persistent Variables
set AXSERVER=%DSSERVER%
set CLUSNAME=MYCLUS1
set CLUSIPAD=140.110.225.10
set CLUSIPNM=255.255.0.0
set ADMINACC=Administrator
set PASSWORD=password
set CLUSDOMAIN=altiris
set LOGONCNT=4
c:\temp\tools\cpqwait -t 30
call \\%AXSERVER%\express\deploy\clusters\common\scripts\setpers.bat
```

This script calls *setpers.bat. Setpers.bat* updates the environment variables of the cluster node to accomplish several tasks such as automatic logon, setting the domain name and tool paths, and other tasks. Please refer to "Appendix B" for a full list of the environment variables updated with this script. *Setpers.bat* is provided with the SoftPaq and does not need to be changed.

4. In the section **Execute the script while in…**, select **Windows**.
5. The script needs a domain level account to execute. Provide the appropriate user account information by clicking **User** button in the **Script Task Properties** window and filling in the fields as necessary.
6. **Figure 8** shows the **Script Task Properties** window for this task after completing the embedded script. Click **OK** to close the **Script Task Properties** window.

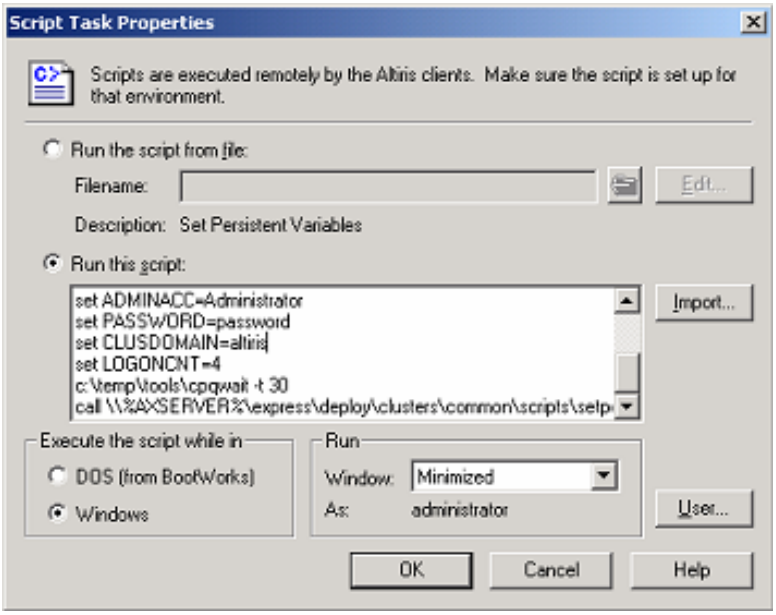

Figure 8. Script Task Properties window for the persistent variables task

7. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** and select **Shutdown/Restart** from the menu. This task will reboot the node so that the environment variables can be loaded into memory for use during deployment
8. This opens the **Client Reboot Options** window. Select **Reboot**.
9. Click **OK** to close the **Client Reboot Options** window.

Initializing the State Machine – p12clus.bat

During deployment, only one cluster node can configure the shared storage for use in the cluster. All other nodes must wait until the storage has been configured and the cluster has been formed before joining the cluster. To begin Phase 2 of the deployment process, *p12clus.bat* designates one of the nodes as the primary node and the other as secondary.

1. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** Select **Run Script..** from the menu to add another task to the event.

2. This opens the **Script Task Properties** window. In the **Run this script** section, enter in the following embedded script.

```
rem Initialize State Machine
c:\temp\tools\cpqwait -t 30
call %ScriptPath%\p12clus.bat
```

3. In the section **Execute the script while in…**, select **Windows**.
4. The script needs a domain level account to execute. Provide the appropriate user account information by clicking **User** button in the **Script Task Properties** window and filling in the fields as necessary.
5. Click **OK** to close the **Script Task Properties** window.

Deploying the Shared Storage Configuration– depstrg.bat

The next task in the deployment event configures the shared storage. Because the storage component must be run in DOS each node will reboot to run this task. Both nodes run this script, but because only one node needs to configure the shared storage, the secondary node, determined in *p12clus.bat*, will wait inside a loop in the *depstrg.bat* script until the primary node has completed the formation of the cluster. Then, the secondary node will join the cluster formed by the primary node.

1. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** and select **Run Script..** from the menu to add another task to this event.
2. This opens the **Script Task Properties** window. Three variables are required in the embedded script run by this task. Each variable's name and value is described here.
   - **SVRNAME:** This is the name of the cluster node the script is currently running on. This variable does not need to be changed as the Altiris environment variable `%NODENAME%` will supply it to the called script, *depstrg.bat*.
   - **CLUSNAME:** This is the name of the cluster being deployed, which must also be the name of the cluster folder on the Altiris eXpress Server.
   - **ARYNAME:** This is the name of the external storage array configuration file. It should be a file of type *.ini*.

   Determine the values for each of these variables for your deployment environment.
3. In the **Run this script** section, enter in the following embedded script, updating all variables to values specific to your environment. The script should look similar to this:

```
rem Deploy Shared Storage Configuration
rem bootwork unload
SET SVRNAME=%NODENAME%
SET CLUSNAME=MYCLUS1
SET ARYNAME=SHARED.INI
call f:\deploy\clusters\common\scripts\depstrg.bat
```

   This script calls *depstrg.bat*. *Depstrg.bat* deploys the storage array configuration to the Smart Array Cluster Storage box using the information contained in the array file, here called *SHARED.INI*. Please refer to "Appendix B" for this script. *Depstrg.bat* is provided by the SoftPaq and does not need to be changed.
4. In the section **Execute the script while in…**, make sure **DOS (from BootWorks)** is selected.

5. **Figure 9** shows the **Script Task Properties** window for this task after completing the embedded script. Click **OK** to close the **Script Task Properties** window.

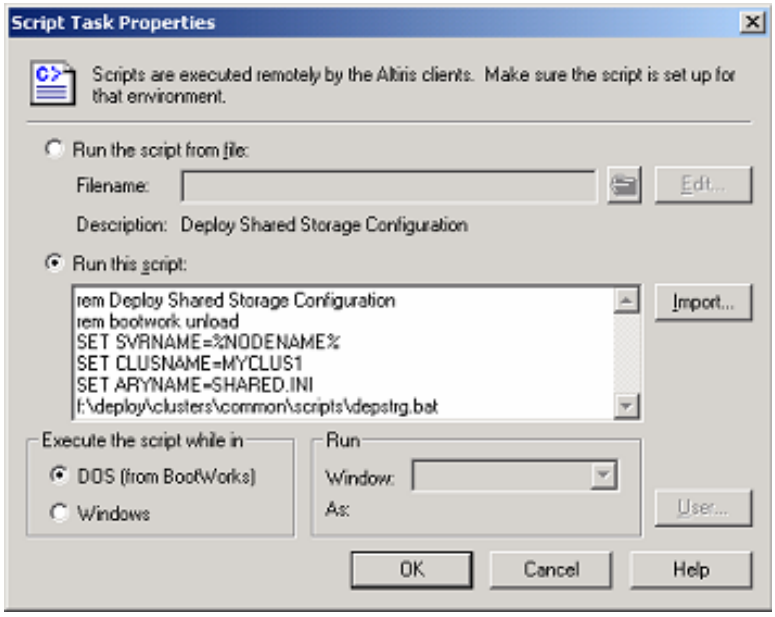

Figure 9. Script Task Properties window for deploying the shared storage

Deploying the Shared Partitions – depsp.bat

In order to continue to manage the state of each node during deployment, *p12clus.bat* is called again. When it runs, it will configure the Windows partitions on the shared storage using another script, *depsp.bat*. Please refer to "Appendix B" for this script. *Depsp.bat* is provided with the SoftPaq and does not need to be changed.

1. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** and select **Run Script..** from the menu to add another task to this event.
2. This opens the **Script Task Properties** window. In the **Run this script** section, enter in the following embedded script:

```
rem Deploy Shared Partitions
c:\temp\tools\cpqwait -t 30
call %ScriptPath%\p12clus.bat
```

3. In the section **Execute the script while in…**, select **Windows**.
4. The script needs a domain level account to execute. Provide the appropriate user account information by clicking **User** button in the **Script Task Properties** window and filling in the fields as necessary.
5. Click **OK** to close the **Script Task Properties** window.
6. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add.**. and select **Shutdown/Restart** from the menu. This ensures that disk signatures for the new partitions can be successfully read by both nodes by rebooting during deployment.
7. This opens the **Client Reboot Options** window. Select **Reboot**.

8. Click **OK** to close the **Client Reboot Options** window.

Deploying the Cluster – depclus.bat

Once the partitions have been set on the shared storage, a cluster can be formed. The primary node will reach this task first and run *depclus.bat* to form the cluster. Once the primary node has completed the formation of the cluster, the secondary node will be released from its waiting stage in *depstrg.bat*. The secondary node will then join the cluster when it executes *depclus.bat*. Please refer to "Appendix B" for this script. *Depclus.bat* is provided with the SoftPaq and does not need to be changed.

1. In the **Event Properties** window for the **Scripted** or **Imaged OS Packaged Cluster Deployment Event**, click **Add..** and select **Run Script..** from the menu to add another task to this event.
2. This opens the **Script Task Properties** window. In the **Run this script** section, enter in the following embedded script:

```
rem Deploy the Cluster
c:\temp\tools\cpqwait -t 30
call %ScriptPath%\depclus.bat
```

3. In the section **Execute the script while in…**, select **Windows**.
4. The script needs a domain level account to execute. Provide the appropriate user account information by clicking **User** button in the **Script Task Properties** window and filling in the fields as necessary.
5. Click **OK** to close the **Script Task Properties** window.

Cleaning Up – cleanup.bat

This task will remove all deployment related files from the cluster nodes and deletes the environment variables added by *setpers.bat*. Please refer to "Appendix B" for this script. *Cleanup.bat* is provided with the SoftPaq and does not need to be changed.

1. In the **Event Properties** window, click **Add..** and select **Run Script..** from the menu to add another task to this event.
2. This opens the **Script Task Properties** window. In the **Run this script section**, enter in the following embedded script.

```
rem Cleanup Tasks
call %ScriptPath%\cleanup.bat
```

3. In the section **Execute the script while in…**, select **Windows**.
4. Click **OK** to close the **Script Task Properties** window.

Importing Nodes and Deploying the Cluster

The deployment event is now complete and ready to be deployed to computers intended for the cluster. At this time, import the computers using the import file discussed in the "Computer Import File" section of this guide.

1. Open the Altiris eXpress Deployment Server console.
2. Click **File→ Import/Export→ Import Computers..** and specify the import file created in the "Computer Import File" section of this guide. This will update the Altiris database with the information for the computers to be used as cluster nodes.
3. Click **OK** on the confirmation window.
4. If an event was specified for any node in the import file, that event will be placed in the run queue for that computer, and will execute at the time specified in the import file.
5. If no event was specified in the import file and you would like to deploy the cluster now or schedule it for the future, do so now.
6. Select the **Scripted** or **Imaged OS Packaged Cluster Deployment Event** from the **Events** pane on the Altiris eXpress Server console and drag it on to the cluster group. This group is called **MYCLUS1** in this guide.
7. The **Schedule Computers for Event** window opens. The default is to run the event immediately. Accept the default or specify a time to run this event. Click **OK** close the window.
8. The cluster nodes must be completely cabled and all physical drives must be in place in the nodes and the shared storage. Do so by following the cabling guide included in the ProLiant DL380 G2 Packaged Cluster.

IMPORTANT: The cabling guide included with the cluster documentation states that NIC 1 on each server node should be used for the cluster interconnect (the cluster heartbeat). For deployment using the Rapid Deployment Pack, *you must connect the cluster interconnect using NIC2* on each node and *use NIC1 for the public network*. Failure to cable the NICs in this way will prevent communication with the deployment server.

---

9. At this point, power on each of the cluster nodes to be deployed.

Once this event has completed on both nodes, a ProLiant DL380 G2 Packaged Cluster will be available for use in a production environment.

Additional Notes

Included with the 1.20 distribution of the Rapid Deployment Pack are two complete packaged cluster deployment events, Imaged OS Packaged Cluster Deployment Template and Scripted OS Packaged Cluster Deployment Template. The event file called *PKGDDeploymentEvents.bin* can be imported in the Altiris eXpress Deployment console. These completed sample events can be used as a template when creating your own deployment events for the ProLiant DL380 G2 Packaged Cluster.

Execute the following steps to import these events into the Altiris eXpress Deployment Server:

1. Open the Altiris eXpress Deployment Server console.
2. Right-click in the **Events** pane. Select **Import...** from the menu.
3. The **Import Event** window opens. Check the box Import to Event Folder and enter Packaged Cluster Deployment Event Templates in the field next to it.
4. Click on the **Browse** button in the **Import Event** window. Browse to the file *PKGDDeploymentEvents.bin*. This file can be found in the SoftPaq for use with this guide.
5. Click **OK** to close the **Import Event** window.
6. A folder called **Packaged Cluster Deployment Event Templates** will now be in the **Events** pane of the Altiris eXpress Deployment Server console.

Summary

This guide has explained the steps needed to deploy a ProLiant DL380 G2 Packaged Cluster using the ProLiant Essentials Rapid Deployment Pack for Windows 2000 Advanced Server.

You should now have a complete Packaged Cluster Deployment Event ready and available to deploy packaged clusters with a simple drag-and-drop onto computers in the Altiris database or computers on the network waiting to be imported into the database. This deployment event will deploy a hardware configuration, a Windows 2000 operating system (or image), configure the Smart Array Cluster Storage enclosure, and deploy the Microsoft Cluster Service on each node.

Additional Information

HP offers a complete choice of services to ensure the success of your ProLiant server deployment program. From professional consultative services to responsive telephone support services, the expertise of HP Global Services is available to support the implementation and operation of your ProLiant Essentials Rapid Deployment Pack infrastructure.

Deployment Services

There are several Deployment Services available to assist with analyzing, building, deploying, and maintaining operating system and application infrastructures.

- Assessment Services provide the first step in effective planning, deploying, and maintaining standardized operating systems and application infrastructures on a best practice foundation.
- Planning and Design Services provide the expertise and resources required to define blueprints for building custom, automated deployment architectures.
- Implementation Services enable businesses to optimize resources while minimizing the time needed to cost-effectively deploy and maintain server platforms.
- Standard Build Frameworks provide packaged server platform builds that eliminate hours of research, scripting and testing platform builds for standardized, best practice deployment of operating systems and applications.

Deployment Server Installation and Start-up CarePaq Service

HP professionals will jumpstart your deployment infrastructure by installing your Rapid Deployment Pack software on a ProLiant ML, DL or BL Server. In addition, they will deploy your first server and provide an onsite orientation regarding the use the Rapid Deployment Pack.

Software Technical Support CarePaq Services

Technical Support CarePaq services provide easy access to experts for post-warranty questions regarding use of the Rapid Deployment Pack. CarePaq services are available in easy to purchase and convenient to use 5, 10, and 25 incident packages with one to two hour response times.

Online Resources

For information about the ProLiant DL380 Packaged Cluster, refer to:

www.hp.com/servers/proliant/highavailability

Information about the ProLiant Essentials Rapid Deployment Pack can be found at:

www.compaq.com/manage/rapiddeploy

At this web site, the following documentation is available:

- For information about the sever deployment process, refer to the *ProLiant Integration Module for Altiris eXpress User Guide*.
- For information about maximizing the use of the ProLiant Integration Module for Altiris eXpress for your individual environment, refer to *Implementing a Deployment Infrastructure*.
- For a list of servers that support PXE booting and at what level they support PXE, refer to *Rapid Deployment Pack Support Matrix*.

For specific help with the Altiris eXpress Deployment Server, refer to:

www.altiris.com

Appendix A – Troubleshooting

This Appendix hopes to provide solutions to common problems or issues that could arise during deployment of the ProLiant DL380 G2 Packaged Cluster using the Rapid Deployment Pack V1.20.

Table 10. Troubleshooting Deployment of ProLiant DL380 G2 Packaged Clusters

Problem	Cause/Solution
Node waits indefinitely at PXE Boot for instruction from the deployment server during initial deployment.	The PXE Configuration default setting is to wait indefinitely. Set the PXE Configuration to execute immediately or use default time out.
Clustering information is not sent to Insight Manager 7.	Scripted installs of the Management agents cannot activate the clustering information agent because no cluster is installed at the time they are. Make the clustering information agent active in the Compaq Management Agents control panel.
Cluster nodes cannot PXE boot.	PXE is only enabled by default on NIC1 for DL380 G2 servers. Ensure that NIC2 in each node is cabled as the heartbeat/cluster interconnect and NIC1 in each node is cabled as the public network (visible to the deployment server).
Not correctly including the Windows 2000 Service Pack 2 update in the Windows 2000 Distribution.	Refer to the Microsoft Support Website http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnw2kmag01/html/custominstall.asp for information on correctly slipstreaming your **w2k\i386** directory with a Service Pack.
The task starts, but the script never gets executed.	Scripts need sufficient user rights to execute on the cluster nodes. Ensure that the correct domain administrator level account is specified in the Script Task Properties window of each task to be run in Windows.
The exact reason for the failure of the deployment event cannot be determined.	The only error code displayed by Altiris is a number specific to the deployment server. To see exactly which segment of a task failed to complete during the event, open the **Status Detail** window by clicking the button on the **Event Schedule Properties** window on the Altiris eXpress Deployment Server console of the event running on the node where the failure occurred.
Nodes cannot access the eXpress share on the deployment server.	There is a password required to access the deployment server eXpress share point. This password is entered into the Boot Disk Creator screen during configuration of boot disks or PXE images. The password is saved in encrypted form within the boot image configuration as a .PWL file. Verify that this password is correct.
During deployment, the node continually prompts that a PXE Boot Stamp has not been found.	Change the AClient properties to reflect that you do not want to be prompted for a BootWorks floppy.
Attempting cluster deployment after a failed attempt does not create the shared storage.	If a previous deployment fails before completion, state files are left on the deployment server that could disrupt the deployment process if attempted again from the beginning. On the deployment server in the folder *DeploymentServer*\eXpress\deploy\clusters*ClusterName*, delete any files with the following extensions prior to attempting deployment again: *.s0*, *.s1*, *.s2*, *.ext*.

Computers are not added to the Altiris database in the computer group specified in the import file.	Verify that the computer import file being used follows the format specified in "Appendix B" of this paper. If using the computer import file included with the 1.20 release of the Rapid Deployment Pack, update your file according to the *nodeimport.txt* file included with this release.
Deployment fails during the imaging task.	Ensure that there is no existing configuration on the shared storage before beginning deployment.
It is unclear as to what information can be specified in the computer import file.	As an alternative method to using the import file to import computers, manually specify information in the **New Computer Accounts** window. Open this dialog in the Deployment Server by going to **File → New → Computer** and clicking the **Add** button. However, in order to use this method for cluster deployment, you must add the new computers to a group named for the cluster to be created. See the section "Directories and File Locations" in this paper for more information.

Appendix B – Sample Configuration Files and Scripts

Configuration Files

Internal Storage Array File - 380G2-A.INI

```
Action = Configure
Method = Custom

;Controller specifications
;Controller Compaq Smart Array 5i
Controller        = Slot 0
ReadCache         = 100
WriteCache        = 0
RebuildPriority   = Low
ExpandPriority    = Low

;Array specifications
Array             = A
Drive             = 2:0,2:1
OnlineSpare       = No
;Unused Space remaining 7

;Drive Specifications
LogicalDrive      = 1
RAID              = 1
Size              = 8670
; Blocks Per dr =17756160, Offset =0
; Blocks = 17756160
Sectors           = 32
StripeSize        = 128
ArrayAccelerator  = Enabled
```

Shared Storage Array File - SHARED.INI

```
Action = Configure
Method = Custom

;Controller specifications
;Smart Array Cluster Storage Ext 1 Connected to
;Controller Compaq Smart Array 5i
Controller        = Slot 0
ReadCache         = 50
WriteCache        = 50
RebuildPriority   = Low
ExpandPriority    = Low

;Array specifications
Array             = A
Drive             = 1:0,1:1
OnlineSpare       = No
;Unused Space remaining 7

;Drive Specifications
LogicalDrive      = 1
RAID              = 1
Size              = 498
; Blocks Per dr =1020000, Offset =0
; Blocks = 1020000
Sectors           = 32
```

```
StripeSize        = 128
ArrayAccelerator  = Enabled

;Drive Specifications
LogicalDrive      = 2
RAID              = 1
Size              = 8175
; Blocks Per dr =16744320, Offset =1020000
; Blocks = 16744320
Sectors           = 32
StripeSize        = 128
ArrayAccelerator  = Enabled

;Array specifications
Array             = B
Drive             = 1:2,1:3,1:4,1:5
OnlineSpare       = No
;Unused Space remaining 7

;Drive Specifications
LogicalDrive      = 3
RAID              = ADG:2
Size              = 17351
; Blocks Per dr =17768416, Offset =0
; Blocks = 35536800
Sectors           = 32
StripeSize        = 16
ArrayAccelerator  = Enabled
```

Unattended Installation Text file - CLUS1N1.txt

```
; Base Cluster Node Unattended Install Script for Windows 2000

[Data]
       AutoPartition=1
       MsDosInitiated="0"
       UnattendedInstall="Yes"

[Display]
       AutoConfirm=1
       BitsPerPel=16
       ConfigureAtLogon=0
       VRefresh=60
       Xresolution=800
       Yresolution=600

[GuiRunOnce]
       "C:\$oem$\ntcsp\setupc.exe /f /silent /use-first-csp:1989"
       "cmd /c rmdir /s /q c:\drivers"
       "C:\Altiris\aclient\aclient.exe C:\Altiris\aclient\aclient.inp -silent -install"
       "C:\Altiris\aclient\aclient.exe C:\Altiris\aclient\aclient.inp -silent -stop"
       "C:\$oem$\cpqreb~1.exe /yes"

[GuiUnattended]
       AdminPassword=password
       AutoLogon=Yes
       AutoLogonCount=1
       OEMSkipRegional=1
       OemSkipWelcome=1
       TimeZone=20

[Identification]
       DomainAdmin=Administrator
       DomainAdminPassword=password
       JoinDomain=altiris

[LicenseFilePrintData]
       AutoMode=PerServer
```

```
        AutoUsers=999

[MassStorageDrivers]
        "Adaptec Ultra160 Family Manager Set"=OEM
        "Compaq Integrated Dual Channel Wide Ultra2 SCSI Controller"=OEM
        "Compaq Integrated Wide Ultra2 SCSI Controller"=OEM
        "Compaq Drive Array Controllers"=OEM
        "Compaq Smart Array Controllers"=OEM
        "Compaq Smart Array 53xx Controller"=OEM
        "Compaq Smart Array 5i Controller/Compaq Smart Array 532 Controller"=OEM
        "Integrated Ultra ATA-100 Dual Channel Controller (Windows 2000)"=OEM
        "Integrated Ultra ATA-100 IDE RAID Controller (Windows 2000)"=OEM
        "IDE CD-ROM (ATAPI 1.2)/PCI IDE Controller"=RETAIL
        "Symbios Logic C8100 PCI SCSI Host Adapter"=RETAIL
        "Symbios Logic C896 PCI SCSI Host Adapter"=RETAIL
        "Symbios Logic C8xx PCI SCSI Host Adapter"=RETAIL

[NetOptionalComponents]
        SNMP=1
        WBEMSNMP=1
        SimpTCP=1

[SNMP]
        Community_Name=Public
        Traps=Localhost

[TerminalServices]
        ApplicationServer=0
        PermissionsSetting=0

[Networking]
        InstallDefaultComponents=Yes

[OEMBootFiles]
        ADPU160M.SYS
        CPQ32FS2.SYS
        CPQARRAY.SYS
        CPQARRY2.SYS
        CPQCISSM.SYS
        MEGAIDE.SYS
        TXTSETUP.OEM

[Proxy]
        Proxy_Enable=0
        Use_Same_Proxy=0

[RegionalSettings]
        Language=00000409
        LanguageGroup=1

[Unattended]
        DriverSigningPolicy=Ignore
        ExtendOemPartition=1
        FileSystem=ConvertNTFS
        KeyboardLayout="US"
        NtUpgrade=No
        OemFilesPath=C:
        OemPnPDriversPath=drivers\net;drivers\scsi
        OemPreinstall=Yes
        OemSkipEula=Yes
        OverwriteOemFilesOnUpgrade=No
        TargetPath=\WINNT
        UnattendMode=FullUnattended
        Win9xUpgrade=No

[UserData]
        ComputerName=CLUS1N1
        FullName=Compaq
```

```
        OrgName=HASE

[Components]
        Cluster=On
        TSClients=On
        TSEnable=On
        iis_pwmgr=Off
        iis_inetmgr=Off
        iis_www=Off
        iis_ftp=Off
```

Scripts

The following lists the embedded scripts and the batch files called by these scripts for use in the deployment of a ProLiant DL380 G2 Packaged Cluster. They are listed in the order in which they are called in the complete deployment event used by Altiris eXpress Deployment Server. For the sake of organization, the task type is the header for each section, followed by the embedded script and then the batch file called, if applicable.

Set persistent variables – setpers.bat

```
@echo off
rem Set Persistent Variables
set AXSERVER=%DSSERVER%
set CLUSNAME=MYCLUS1
set CLUSIPAD=140.110.225.10
set CLUSIPNM=255.255.0.0
set ADMINACC=Administrator
set PASSWORD=password
set CLUSDOMAIN=altiris
c:\temp\tools\cpqwait -t 30
call \\%AXSERVER%\express\deploy\clusters\common\scripts\setpers.bat


@echo off
:: ============================================================
:: SETPERS.BAT - This script sets persistent environment variables
::               for the Windows phase of the deployment process.
:: ============================================================
:: ============================================================
:: Required Variables:
::     NOTE: String variables should be all UPPERCASE to avoid
::           string comparison failures (DOS limitation).
::
::     %CLUSNAME%  Defines the name that will be assigned to
::                 the cluster being created.
::
::     %CLUSIPAD%  Defines the IP address that will be assigned
::                   to the cluster.
::
::     %CLUSIPNM%  Defines the net mask of the ip address
::                 assigned to the cluster.
::
::     %ADMINACC%  Specfies the administrator level account to be
::                 used for the deployment process.
::
::     %PASSWORD%  Admin password used for auto logon.
::
::     %CLUSDOMAIN%  Domain the administrator account is a
::                   member of.
::
::     %LOGONCNT%  Number of times to automatically login.
::
:: ============================================================
```

```
:start
:: ============================================================
:: Check to ensure we received the required variables.
:: ============================================================
if "%CLUSNAME%"=="" goto err1
if "%CLUSIPAD%"=="" goto err2
if "%CLUSIPNM%"=="" goto err3
if "%ADMINACC%"=="" goto err4
if "%PASSWORD%"=="" goto err5
if "%CLUSDOMAIN%"=="" goto err6
if "%LOGONCNT%"=="" goto err7

:: ============================================================
:: Set the registry key to control automatic logon
::
:: This section creates all the values under registry key:
:: HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
:: ============================================================
echo HKEY_LOCAL_MACHINE> c:\temp\setenv.ini
echo Software\Microsoft\Windows NT\CurrentVersion\Winlogon>> c:\temp\setenv.ini
echo BEGIN>> c:\temp\setenv.ini
echo AutoAdminLogon=REG_SZ 1 >> c:\temp\setenv.ini
echo AutoLogonCount=REG_DWORD %LOGONCNT% >> c:\temp\setenv.ini
echo DefaultDomainName=REG_SZ %CLUSDOMAIN%>> c:\temp\setenv.ini
echo DefaultPassword=REG_SZ %PASSWORD%>> c:\temp\setenv.ini
echo END>> c:\temp\setenv.ini

:: ============================================================
:: Set the persistent environment variables for the deployment process
:: This section creates all the values under registry key:
:: HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Control\Session Manager\Environment
:: ============================================================
echo HKEY_LOCAL_MACHINE>> c:\temp\setenv.ini
echo SYSTEM\ControlSet001\Control\Session Manager\Environment>> c:\temp\setenv.ini
echo BEGIN>> c:\temp\setenv.ini
echo AdminAccount=REG_EXPAND_SZ %ADMINACC%>> c:\temp\setenv.ini
echo AdminPassword=REG_EXPAND_SZ %PASSWORD%>> c:\temp\setenv.ini
echo ClusterName=REG_EXPAND_SZ %CLUSNAME%>> c:\temp\setenv.ini
echo ClusterIPAddress=REG_EXPAND_SZ %CLUSIPAD%>> c:\temp\setenv.ini
echo ClusterIPNetMask=REG_EXPAND_SZ %CLUSIPNM%>> c:\temp\setenv.ini

:: ============================================================
:: Set path related variables
:: ============================================================
echo ClusterPath=REG_EXPAND_SZ \\%AXSERVER%\express\deploy\clusters\%CLUSNAME%>>
c:\temp\setenv.ini
echo ClusterCommon=REG_EXPAND_SZ \\%AXSERVER%\express\deploy\clusters\common>>
c:\temp\setenv.ini
echo LogPath=REG_EXPAND_SZ \\%AXSERVER%\express\deploy\clusters\%CLUSNAME%>>
c:\temp\setenv.ini
echo ScriptPath=REG_EXPAND_SZ \\%AXSERVER%\express\deploy\clusters\common\scripts>>
c:\temp\setenv.ini
echo ToolPath=REG_EXPAND_SZ c:\temp\tools>> c:\temp\setenv.ini
echo DeployPath=REG_EXPAND_SZ \\%AXSERVER%\express\deploy>> c:\temp\setenv.ini
echo END>> c:\temp\setenv.ini

:: ============================================================
:: Configure the registry
:: ============================================================
c:\temp\tools\cpqdepev.exe -s c:\temp\setenv.ini
goto done

:: ============================================================
:: Set error codes
:: ============================================================
::
:: ============================================================
:: Missing required CLUSNAME variable
```

```
:: ============================================================
:err1
set ErrCode=-2
goto done
:: ============================================================
:: Missing required CLUSIPAD variable
:: ============================================================
:err2
set ErrCode=-3
goto done
:: ============================================================
:: Missing required CLUSIPNM variable
:: ============================================================
:err3
set ErrCode=-4
goto done
:: ============================================================
:: Missing required ADMINACC variable
:: ============================================================
:err4
set ErrCode=-5
goto done
:: ============================================================
:: Missing required PASSWORD variable
:: ============================================================
:err5
set ErrCode=-6
goto done
:: ============================================================
:: Missing required CLUSDOMAIN variable
:: ============================================================
:err6
set ErrCode=-7
goto done
:: ============================================================
:: Missing required LOGONCNT variable
:: ============================================================
:err7
set ErrCode=-8
goto done

:done
```

Initialize the State Machine – p12clus.bat

```
rem Initialize State Machine
c:\temp\tools\cpqwait -t 30
call %ScriptPath%\p12clus.bat


@echo off
:: ============================================================
:: P12CLUS.BAT - This script determines the primary and secondary
::              nodes of the cluster.
::
:: Storage State Information
:: ---------------------------------------------
:: s0 is netgotiating sentinel state
:: s1 is storage hardware configuration
:: s2 is waiting for storage and cluster creation to finish
:: ============================================================

:start
:: ============================================================
:: Check for the existence of the state files
:: ============================================================
if exist %ClusterPath%\%COMPUTERNAME%.s1 goto s1
if exist %ClusterPath%\%COMPUTERNAME%.s2 goto s2
```

```
if exist %ClusterPath%\*.s1 goto s2

:: ============================================================
:: Create the sentinel file that will be used to determine which
:: node will lead the configuration of the storage and cluster.
:: ============================================================
set SentinelStamp=%COMPUTERNAME%-%TIME%
echo %SentinelStamp%> %ClusterPath%\sscfg.s0
attrib +r %ClusterPath%\sscfg.s0
goto s0

:s0
cls
:: ============================================================
:: State s0 - Negotiating Sentinel State
:: Determine primary node and create sentinel file.
:: ============================================================
for /F "usebackq delims=;" %%i IN (`type %ClusterPath%\sscfg.s0`) do set
sentinelcheck=%%i
if "%SentinelCheck%" NEQ "%SentinelStamp%" goto S2
echo %COMPUTERNAME%-%TIME%>%ClusterPath%\%COMPUTERNAME%.s1
echo %COMPUTERNAME%-%TIME%>%ClusterPath%\clus.ext

:s0a
:: ============================================================
:: State s0a - Storage Hardware configuration (Create LUNs)
:: Reboot to begin configuring shared storage.
:: ============================================================
echo Configuring Shared Storage....
goto done

:s1
:: ============================================================
:: State s1 - Storage Hardware Configuration (Create Windows
:: partitions)
:: Call depsp.bat to create Windows partitions, format drives, and
:: assign drive letters.
:: ============================================================
echo Starting shared storage Windows partition creation....
call %ScriptPath%\depsp.bat

:: ============================================================
:: Completed Shared Storage Configuration
:: Remove shared storage configuration state file.
:: ============================================================
attrib -r %ClusterPath%\sscfg.s0
del %ClusterPath%\sscfg.s0
goto done

:s2
:: ============================================================
:: State s2 - Waiting for the primary node to complete the
:: configuration of the shared storage and formation of the
:: cluster. The secondary node(s) will reboot and wait in DOS.
:: ============================================================
echo Shared storage configuration and cluster have been created by primary node.
echo c: >%ClusterPath%\%COMPUTERNAME%.s2
goto done

:done
```

Deploy Shared Storage Configuration– depstrg.bat

```
rem Deploy Shared Storage Configuration
rem bootwork unload
SET SVRNAME=%NODENAME%
SET CLUSNAME=MYCLUS1
SET ARYNAME=SHARED.INI
```

```
call f:\deploy\clusters\common\scripts\depstrg.bat


@ECHO OFF
:: ============================================================
::  DEPSTRG.BAT - This script sets up the shared storage for the
::               cluster.
:: ============================================================
:: ============================================================
:: Required Variables:
::     NOTE: String variables should be all UPPERCASE to avoid
::           string comparison failures (DOS limitations).
::
::     %CLUSNAME%  Defines the cluster name
::
::     %SVRNAME%   Name of the node currently running this script
::
::     %ARYNAME%   The array file for the shared storage
::                 configuration.
::
:: ============================================================

:START
:: ============================================================
:: Check to ensure we received the required variables.
:: ============================================================
if "%CLUSNAME%"=="" goto err1
if "%SVRNAME%"=="" goto err2
if "%ARYNAME%"=="" goto err3

SET TOOLSPATH=F:\DEPLOY\TOOLS\SSST
SET CLUSPATH=F:\DEPLOY\CLUSTERS\%CLUSNAME%
SET CLUSTOOL=F:\DEPLOY\CLUSTERS\COMMON\SCRIPTS

:: ============================================================
::     Check for the existence of %SVRNAME%.s1. The exsistence
::     of this file determines is this is the primary or
::     secondary node.
:: ============================================================
IF NOT EXIST %CLUSPATH%\%SVRNAME%.s1 GOTO STRGWAIT

:DEPSTRG
:: ============================================================
::     This section deploys the shared storage.
:: ============================================================
%TOOLSPATH%\ACR.EXE /i %CLUSPATH%\%ARYNAME%
GOTO DONE

:STRGWAIT
CLS
@ECHO Waiting for the other node to deploy the storage and form the cluster
:: ============================================================
::     This section acts as timer waiting for the other node to
::     finish deploying the shared storage arrays
:: ============================================================
SET D=0
SET T=0
SET H=0
SET TH=0
SET TENTH=0

:TIMER
CALL %CLUSTOOL%\add.bat %D% %T% %H% %TH% %TENTH%
IF %TENTH%%TH%%H%%T%%D% == 05000 GOTO TIMER
IF NOT EXIST %CLUSPATH%\clus.ext GOTO DONE
SET D=0
SET T=0
SET H=0
```

```
SET TH=0
SET TENTH=0
GOTO TIMER

:ERROR
:: ============================================================
:: Set error codes
:: ============================================================
::
:: ============================================================
:: Missing required CLUSNAME variable
:: ============================================================
:err1
set ErrCode=-2
goto done
:: ============================================================
:: Missing required SVRNAME variable
:: ============================================================
:err2
set ErrCode=-3
goto done
:: ============================================================
:: Missing required ARYNAME variable
:: ============================================================
:err3
set ErrCode=-4
goto done

:DONE

@ECHO OFF
:: ============================================================
:: ADD.BAT - This script increments a five digit number
:: ============================================================
:: ============================================================
::     This script increments a five digit number. Five single
::   digit numbers are passed to the script through environment
::   variables.
:: ============================================================
:START
if %D%==9 goto TENS
if %D%==8 set D=9
if %D%==7 set D=8
if %D%==6 set D=7
if %D%==5 set D=6
if %D%==4 set D=5
if %D%==3 set D=4
if %D%==2 set D=3
if %D%==1 set D=2
if %D%==0 set D=1
GOTO DONE

:TENS
set D=0
if %T%==9 goto HUNDREDS
if %T%==8 set T=9
if %T%==7 set T=8
if %T%==6 set T=7
if %T%==5 set T=6
if %T%==4 set T=5
if %T%==3 set T=4
if %T%==2 set T=3
if %T%==1 set T=2
if %T%==0 set T=1
GOTO DONE

:HUNDREDS
set T=0
```

```
if %H%==9 GOTO THOUSANDS
if %H%==8 set H=9
if %H%==7 set H=8
if %H%==6 set H=7
if %H%==5 set H=6
if %H%==4 set H=5
if %H%==3 set H=4
if %H%==2 set H=3
if %H%==1 set H=2
if %H%==0 set H=1
GOTO DONE

:THOUSANDS
set H=0
if %TH%==9 GOTO TENTHOUSANDS
if %TH%==8 set TH=9
if %TH%==7 set TH=8
if %TH%==6 set TH=7
if %TH%==5 set TH=6
if %TH%==4 set TH=5
if %TH%==3 set TH=4
if %TH%==2 set TH=3
if %TH%==1 set TH=2
if %TH%==0 set TH=1
GOTO DONE

:TENTHOUSANDS
set TH=0
if %TENTH%==9 set TENTH=0
if %TENTH%==8 set TENTH=9
if %TENTH%==7 set TENTH=8
if %TENTH%==6 set TENTH=7
if %TENTH%==5 set TENTH=6
if %TENTH%==4 set TENTH=5
if %TENTH%==3 set TENTH=4
if %TENTH%==2 set TENTH=3
if %TENTH%==1 set TENTH=2
if %TENTH%==0 set TENTH=1
GOTO DONE

:DONE
```

Deploying the Shared Partitions – depsp.bat

```
@echo off
:: ================================================================
:: DEPSP.BAT - This script deploys the Windows partitions to the
::             shared storage.
::
:: (1) Partition drives
:: (2) Assign drive letters starting with E:
:: (3) Format new drives
:: ================================================================

:start
set dpscript=c:\temp\%COMPUTERNAME%%RANDOM%.dps
set outfile=c:\temp\%COMPUTERNAME%%RANDOM%.out

:scan
:: ================================================================
:: Scan for new drives
:: ================================================================
echo rescan > %dpscript%
echo Scanning for disks...
%ToolPath%\diskpart -s %dpscript%

:: ================================================================
:: List available disks
```

```
::
:: Diskpart.exe lists the disks availble and redirects the
:: output to a file called outfile.
:: ============================================================
echo list disk> %dpscript%
cls
echo Getting disk drive list...
%ToolPath%\diskpart -s %dpscript%>%outfile%

:: ============================================================
:: Create Disk Partition and Drive Letter Script
::
:: This creates a script for diskpart.exe that will assign
:: partitions to the disks listed in the outfile.
::
::     skip=10  Means skip the first 10 lines of the output
::              generated by diskpart's list disk.  The C drive
::              and its information is included in the first 10
::              lines.
::
::     tokens=2 Means that we are looking at field or column 2 of
::          diskpart list disk.  This is the disk number.
:: ============================================================
echo Creating disk partitioning script...
for /F "usebackq skip=10 tokens=2" %%i IN (`type %outfile%`) do (
       echo select disk %%i>>%dpscript%
       echo clean>>%dpscript%
       echo create partition primary>>%dpscript%
       echo assign>>%dpscript%
       )

:: ============================================================
:: (1) Create Partitions and (2) Assign drive letters
:: ============================================================
echo Partitioning drives...
%ToolPath%\diskpart -s %dpscript%

:: ============================================================
:: List available volumes to know what disks need formatting
:: ============================================================
echo list volume> %dpscript%
echo Getting volume list...
%ToolPath%\diskpart -s %dpscript%>%outfile%

:: ============================================================
:: (3) Format Disks
::
:: This creates a script for diskpart.exe that selects each new
:: partition and says 'yes' to format it with NTFS.
::
::     skip=11  Means skip the first 10 lines of the ouput
::              generated by diskpart list volume.
::
::     tokens=3 Means that we are looking at field or column 3
::              of diskpart list volume.  This is the drive
::              letter.
:: ============================================================
set yesfile=c:\temp\yes.res
set FormatScript=c:\temp\format.bat
echo Creating disk formatting script...
for /F "usebackq skip=11 tokens=3" %%i IN (`type %outfile%`) do (
       echo format %%i: /fs:ntfs /v:Disk%%i /q>>%FormatScript%
       :: ======================================================
       :: We need a y response for each disk.
       :: ======================================================
       echo y>>%yesfile%
       ::echo set ErrCode=%%errorlevel%%>>%FormatScript%
       ::echo if %%ErrCode%% GTR 0 exit %%ErrCode%%>>%FormatScript%
```

```
       )

echo Formatting disks...
call %FormatScript% < %yesfile%

:: ============================================================
:: Cleaning up
:: ============================================================
del %FormatScript%
del %yesfile%
del %outfile%
del %dpscript%
goto done

:done
```

Deploying the Cluster – depclus.bat

```
rem Deploy the Cluster
c:\temp\tools\cpqwait -t 30
call %ScriptPath%\depclus.bat


@echo off
:: ============================================================
::  DEPCLUS.BAT - This script deploys the cluster.
:: ============================================================

:start
:: ============================================================
:: Create cluster unattended installation script
:: ============================================================
echo Creating cluster unattended installation script
set cluscfguas=C:\temp\cluscfg.uas
echo [Cluster]>%cluscfguas%
echo Account=%AdminAccount%>>%cluscfguas%
echo Password=%AdminPassword%>>%cluscfguas%
echo Domain=%DefaultDomainName%>>%cluscfguas%
echo IPAddr=%ClusterIPAddress%>>%cluscfguas%
echo Subnet=%ClusterIPNetMask%>>%cluscfguas%
echo LocalQuorum=No>>%cluscfguas%
echo Name=%ClusterName%>>%cluscfguas%
echo Network="Public", All, 2 >>%cluscfguas%
echo Network="Private", Internal, 1 >>%cluscfguas%
echo Quorum=E:>>%cluscfguas%

:: ============================================================
:: Check to see if this is the primary node
:: ============================================================
if exist %ClusterPath%\%COMPUTERNAME%.s1 goto c1
if exist %ClusterPath%\%COMPUTERNAME%.s2 goto c2
goto done

:c1
:: ============================================================
:: State c1 - Primary node creates the cluster
:: ============================================================
:: ============================================================
:: Set the private interconnect network
:: ============================================================
netsh interface ip set address name="Local Area Connection 2" static 1.1.1.1
255.255.255.0

:: ============================================================
:: Begin Cluster Creation / Configuration
:: ============================================================
echo Forming the Cluster
c:\winnt\cluster\cluscfg.exe -act form -u %cluscfguas%
```

```
del %ClusterPath%\clus.ext

:cluscreatewait
:: ================================================================
:: Wait for other nodes to join the cluster
:: ================================================================
%ToolPath%\cpqwait.exe -t 60
echo Waiting for other nodes to join the cluster
if exist %ClusterPath%\*.s2 goto cluscreatewait
del %ClusterPath%\%COMPUTERNAME%.s1
goto done

:c2
:: ================================================================
:: State c2 - Secondary node joins the cluster
:: ================================================================
:: ================================================================
:: Set the private interconnect network
:: ================================================================
netsh interface ip set address name="Local Area Connection 2" static 1.1.1.2
255.255.255.0

:: ================================================================
:: Begin Cluster Join
:: ================================================================
echo Joining the Cluster
c:\winnt\cluster\cluscfg.exe -act join -u %cluscfguas%
del %ClusterPath%\%COMPUTERNAME%.s2

:clusjoinwait
:: ================================================================
:: Wait for all nodes to join the cluster
:: ================================================================
%ToolPath%\cpqwait.exe -t 60
if exist %ClusterPath%\*.s1 goto clusjoinwait
goto done

:done
```

Cleaning Up – cleanup.bat

```
rem Cleanup Tasks
call %ScriptPath%\cleanup.bat


@echo off
:: ================================================================
:: CLEANUP.BAT - This script cleans up all installation files and
::              registry settings copied to the server.
:: ================================================================

:: ================================================================
:: Clean the registry
:: ================================================================
if exist c:\temp\setenv.ini %ToolPath%\cpqdepev.exe -d c:\temp\setenv.ini

:: ================================================================
:: Delete the files
:: ================================================================
if exist c:\temp rmdir /S /Q c:\temp

:done
```

Computer Import File

```
; Sample Altiris Deployment Server Database import file
;
; Note: Comment lines are denoted by a semicolon as the first character.
;       Quotes around fields are optional.
;
;      You can populate your computer database by using the following format.
;      It can then be imported into Deployment Server from the command line or
;             File, New Computer, Import or with File, Import/Export, Import Computers.
;      This would work well from a spreadsheet exported to a comma delimited file.
;
;      For some fields, this input format supports multiple IP Addresses, delimited by
;      a ";" within the field.  These fields are marked with a "(;)".   For example the
;      gateway field could read ,30.11.11.2,  or ,30.11.11.2;30.11.11.3;30.11.11.4, .
;
;      ** For the Deployment Server to read the import text correctly, place a final
;      hard return at the end of the file.
;
;MYCLUS1
;------------
380G2A,,D129FRW1K509,,380G2A,1,ALTIRIS,,1,,,,,,,,,,,,,,,HASE,HP,,,,,,,,,,,,,MYCLUS1,
,,,,15.15.15.1,255.0.0.0
380G2B,,D130FRW1K002,,380G2B,1,ALTIRIS,,1,,,,,,,,,,,,,,,HASE,HP,,,,,,,,,,,,,MYCLUS1,
,,,,15.15.15.2,255.0.0.0
;
;Computer Import Template – (from imprtdb55.txt on the deployment server)
;Name,MAC Address 1,Serial Number,Asset Tag,Computer Name,Domain(B),Domain/Workgroup
Name,Domain Controller Name(ignored),DHCP(B),IP
Address(;),Netmask(;),Gateway(;),Preferred DNS(;),Alternate DNS,Alternate 2
DNS,Preferred WINS,Alternate WINS,Hostname,Domain Suffix,Use Preferred Tree(B),Preferred
Server,Preferred Tree,Netware User,NDS Context,Run
Scripts(B),User,Organization,Key,Password Never Expires(B)(ignored),Cannot Change
Password(B)(ignored),Must Change Password(B)(ignored),Username(ignored),Full
Name(ignored),Groups(ignored),Password(ignored),Contact,Department,Email,Mailstop,Phone,
Site,Computer Group,Event,Event Start Time,NIC2 MAC Address,DHCP(B),IP
Address(;),Netmask(;),Gateway(;),DNS(;),WINS(;),Domain Suffix
```

Appendix C – Hardware and Software Configuration

Table 1.

Hardware Configuration

2 ProLiant DL380 G2 Servers	**Dual Intel 1.266 GHz P3 Processor**
	256 MB Memory
	2 - 9.1 GB Disks (Slots 1-2)
	Array Configuration
	Array A – 2 - 9.1 GB Disks
	1 Logical Drive
	9.1GB RAID 1+0
Smart Array Cluster Storage	**6 - 9.1GB Hard Drives (Slots 1-6)**
	Array Configuration
	Array A – 2 - 9.1 GB Disks
	2 Logical Drives
	498 MB RAID 1+0
	8.1 MB RAID 1+0
	Array B - 4 - 9.1 GB Disks
	1 Logical Drive
	17.3GB RAID ADG

Table 2.

Software Configuration

Windows 2000 Advanced Server with Service Pack 2
Support Paq (CSP) located on SmartStart 5.40
ProLiant Essentials Rapid Deployment Pack 1.2

Table 3.

Naming Conventions

Cluster Nodes	Node 1 – **CLUS1N1**
	Node 2 – **CLUS1N2**
Cluster Name	**MYCLUS1**
Windows Domain	**ALTIRIS**
Cluster IP Address	**140.110.225.10**
Cluster Net Mask	**255.255.0.0**