HP ProLiant DL380 G5 High Availability Storage Server

installation instructions
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1 Preparing for installation

These instructions are intended for professionals who will be installing, setting up, and configuring the HP ProLiant DL380 G5 High Availability Storage Server. Experience with Microsoft® administrative procedures and system and storage configurations is required.

The DL380 High Availability Storage Server solution consists of two HP ProLiant DL380 G5 Storage Servers and one Modular Smart Array (MSA) 2012sa storage device configured in an active/passive or active/active cluster. The following instructions allow you to set up a basic active/passive or active/active cluster using a shared Quorum disk and basic file shares.

About this document

This document provides instructions for creating three types of cluster configurations, depending on your storage server hardware configuration:

• To set up an active/passive cluster with the default hardware configuration (2 NIC ports on each storage server), see “Setting up an active/passive cluster” on page 13.
• To set up an active/active cluster with the default hardware configuration, first set up an active/passive cluster as described in “Setting up an active/passive cluster” on page 13, then complete additional steps as described in “Setting up an active/active cluster” on page 29.
• To set up an active/active cluster with an additional NIC adapter on each storage server for the highest availability and redundancy, see “Adding components for optimal availability and redundancy” on page 33.

Related documentation

The following documents [and websites] provide related information:

• HP ProLiant Storage Server user guide
• HP StorageWorks 2012sa Modular Smart Array user guide
• HP Rack Rail Kit installation instructions
• HP ProLiant Server troubleshooting guide
• HP Integrated Lights-Out 2 User Guide
• Network Attached Storage (NAS) from HP StorageWorks: http://www.hp.com/go/NAS
• HP ProLiant Storage Server NAS File and Print Solutions: http://www.hp.com/go/storageservers

You can find these documents from the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

Check kit contents

Unpack the HP ProLiant DL380 G5 High Availability Storage Server and confirm that the following components are included:

• 2 HP ProLiant DL380 G5 Storage Servers
System components

The following figures show components, controls, and indicators located on the front and rear panels of the DL380 G5 Storage Server and MSA 2012sa. For more detailed information about specific system components, see the HP ProLiant Storage Server user guide and HP StorageWorks 2012sa Modular Smart Array user guide.

Figure 1 DL380 G5 front panel

Table 1 DL380 G5 front panel components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DVD-RW drive</td>
</tr>
<tr>
<td>2</td>
<td>Video connector</td>
</tr>
<tr>
<td>3</td>
<td>USB connectors (2)</td>
</tr>
<tr>
<td>4</td>
<td>Systems Insight Display</td>
</tr>
<tr>
<td>5</td>
<td>Hard disk drive (HDD) bays</td>
</tr>
<tr>
<td>6</td>
<td>Quick release levers</td>
</tr>
</tbody>
</table>
Table 2 DL380 G5 rear panel components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T-10/T-15 Torx screwdriver</td>
<td>12</td>
<td>USB connectors (2) (Black)</td>
</tr>
<tr>
<td>2</td>
<td>External option blank</td>
<td>13</td>
<td>Serial connector</td>
</tr>
<tr>
<td>3</td>
<td>NIC 2 connector</td>
<td>14</td>
<td>Mouse connector (Green)</td>
</tr>
<tr>
<td>4</td>
<td>NIC 1 connector</td>
<td>15</td>
<td>Keyboard connector (Purple)</td>
</tr>
<tr>
<td>5</td>
<td>Power supply bay 2</td>
<td>16</td>
<td>Expansion slot 1</td>
</tr>
<tr>
<td>6</td>
<td>Power supply LED</td>
<td>17</td>
<td>Expansion slot 2</td>
</tr>
<tr>
<td>7</td>
<td>Power supply bay 1</td>
<td>18</td>
<td>Expansion slot 3</td>
</tr>
<tr>
<td>8</td>
<td>Power cord connectors (Black)</td>
<td>19</td>
<td>Expansion slot 4 (populated with an HP SC08Ge Host Bus Adapter)</td>
</tr>
<tr>
<td>9</td>
<td>UID LED button</td>
<td>20</td>
<td>Expansion slot 5</td>
</tr>
<tr>
<td>10</td>
<td>iLO 2 connector</td>
<td>21</td>
<td>NIC/iLO 2 activity LED</td>
</tr>
<tr>
<td>11</td>
<td>Video connector (Blue)</td>
<td>22</td>
<td>NIC/iLO 2 link LED</td>
</tr>
</tbody>
</table>

Figure 2 DL380 G5 rear panel
### Table 3 MSA 2012sa front panel components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-12</td>
<td>Drive modules</td>
</tr>
<tr>
<td>13</td>
<td>Enclosure ID</td>
</tr>
<tr>
<td>14</td>
<td>Drive module LEDs</td>
</tr>
<tr>
<td>15</td>
<td>Status LEDs</td>
</tr>
</tbody>
</table>

### Table 4 MSA 2012sa rear panel components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power switch</td>
</tr>
<tr>
<td>2</td>
<td>Host ports</td>
</tr>
<tr>
<td>3</td>
<td>MUI (Service) port</td>
</tr>
<tr>
<td>4</td>
<td>CLI port</td>
</tr>
<tr>
<td>5</td>
<td>Ethernet port</td>
</tr>
<tr>
<td>6</td>
<td>Expansion port</td>
</tr>
</tbody>
</table>
Gather configuration information

Before you begin the process of installing and configuring the hardware, you will need the following configuration information. For easy reference during installation, fill in the Value columns with the appropriate values for your network.

**Table 5 Configuration information**

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes</th>
<th>Server 1 Value</th>
<th>Server 2 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local network information</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public-facing static IP address</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public-facing subnet mask IP address</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public-facing default gateway IP address</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public-facing DNS Server IP address</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain name on which the cluster will reside</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster service account name and password</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster management IP address</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster name</td>
<td>If unknown, contact your network administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Assigned network information</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private static IP address</td>
<td>Reserved</td>
<td>10.24.3.254</td>
<td>10.24.3.253</td>
</tr>
<tr>
<td>Private subnet mask IP address</td>
<td>Reserved</td>
<td>255.255.255.0</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>MSA Controller A static IP address</td>
<td>Assigned during manufacturing</td>
<td></td>
<td>10.24.3.1</td>
</tr>
<tr>
<td><strong>iLO 2 settings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iLO 2 management IP address</td>
<td>By default, iLO 2 obtains the IP address and subnet mask from DNS/DHCP servers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default iLO 2 remote management settings</td>
<td>Located on the iLO 2 Network Settings tag attached to the storage server</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2 Setting up an active/passive cluster

If your DL380 High Availability Storage Server is already fully racked and cabled, move ahead to “Power on the storage components and log in” on page 14.

Install the hardware

1. Install the storage server rail kits and storage servers into a server rack by following the HP Rack Rail Kit Installation Instructions. Go to http://www.hp.com/support/manuals, click Disk Storage Systems, and select your storage server to download this document.

2. Install the MSA rail kit and MSA into the server rack by following the instructions provided in the HP StorageWorks 2012sa Modular Smart Array User Guide. Go to http://www.hp.com/support/manuals, click MSA Disk Arrays, and then click HP StorageWorks 2000sa Modular Smart Array to download this document.

Make the physical connections

In order to accurately describe the physical connections between the storage components in this document, the storage servers are designated as Server 1 and Server 2. The two controllers of the MSA are designated as Controller A and Controller B.

Each storage server includes an HP SC08Ge Host Bus Adapter (HBA) in expansion slot 4 with two external mini SAS 4x connectors, referred to as HBA Port 0 and HBA Port 1. In addition, each MSA controller includes two host ports, labeled on the MSA as SAS Port 0 and SAS Port 1.

Connect the storage servers to the MSA

Using the four mini SAS cables provided, connect Server 1 and Server 2 to the MSA as described below.

1. Connect Server 1 HBA Port 0 to MSA Controller B SAS Port 0.
2. Connect Server 1 HBA Port 1 to MSA Controller A SAS Port 0.
3. Connect Server 2 HBA Port 0 to MSA Controller A SAS Port 1.
4. Connect Server 2 HBA Port 1 to MSA Controller B SAS Port 1.
Connect the storage servers and MSA to the network

After connecting the storage servers to the MSA, make the following power and network connections.

1. Connect the Server 1 NIC 1 connector to the network.
2. Connect the Server 2 NIC 1 connector to the network.
3. Using the crossover cable, connect the Server 1 NIC 2 connector to MSA Controller A NIC 1 connector.
4. Connect the power cords to power outlets.

Power on the storage components and log in

**IMPORTANT:**
Because the process of configuring the storage servers includes modifying storage server IP addresses, HP recommends that you initially access the storage servers using either the direct connect or iLO 2 remote management method. If you use the Remote Desktop access method to change the storage server IP addresses, you may be disconnected from the storage server and unable to continue the cluster installation process.

1. Power on the storage components in the following order: MSA, Server 1, and then Server 2.
   When powering on the storage servers for the first time, an HP ProLiant Storage Server installation process is initiated. This process takes approximately 10–15 minutes and requires no user interaction.

**NOTE:**
If using the direct connect access method, move on to step 3 of “Set static IP addresses for each network connection” on page 15.

2. Locate the iLO 2 Network Settings tag attached to both storage servers and record the default user name, password, and DNS name for each server.
3. From a remote computer, open a standard Web browser and enter the iLO 2 IP address of Server 1.
4. Using the default user information provided on the iLO 2 Network Settings tag, log on to Server 1.
5. Open a 2nd Web browser window and repeat the preceding steps for Server 2.
Set static IP addresses for each network connection

For proper operation of the cluster, each storage server requires both a private heartbeat network connection between the two servers as well as a public facing network connection for file serving purposes. Each NIC adapter must be set with a static IP address that does not register itself with the network DNS server.

1. On the iLO 2 Status Summary page of Server 1, click Launch to open the iLO 2 Integrated Remote Console.

![Status Summary](image)

Figure 6 Launch the iLO2 Integrated Remote Console

2. On the iLO 2 Integrated Remote Console tab, click the button labeled CAD and then click the Ctrl-Alt-Del menu item.

3. Log in to the Server 1 desktop using the default user name Administrator and password hpinvent.

4. Click Cancel to dismiss the Rapid Startup Wizard and close or minimize the HP Storage Server Management console.

5. On the Server 1 desktop, click Start > Settings > right-click Network Connections and then click Open.
6. Determine which connection is the private connection:
   a. Right-click one of the connections and select **Status**.
   b. Select the **Support** tab.

   The connection status of the private connection will indicate **Limited or no connectivity**; the connection status of the public-facing connection will list network information such as **IP Address** and **Subnet Mask**.

   ![Private connection status](image1)

   **Figure 7 Private connection status**

   ![Public connection status](image2)

   **Figure 8 Public connection status**

   c. After identifying the private and public connections, click **Close** to dismiss the connection status dialog boxes.

7. Right-click the private network connection and select **Properties**.

8. Uncheck all items on the **General** tab except for **HP Network** and **Internet Protocol (TCP/IP)**.

9. Select **Internet Protocol (TCP/IP)** and then click **Properties**.
10. Select the **Use the following IP address** radio button and enter the following configuration information:
   - IP address: 10.24.3.254
   - Subnet mask: 255.255.255.0

![Image of Internet Protocol (TCP/IP) Properties]

**Figure 9 Setting the private connection static IP address**

11. Click **Advanced**, select the **DNS** tab, and uncheck the **Register this connection's addresses in DNS** box.

12. Click **OK** twice and then click **Close** to dismiss the **Connection Properties** dialog box.
   
   The Server 1 private static IP address is now set.

13. Right-click the public-facing network connection and select **Properties**.

   **NOTE:**
   
   Do not uncheck any items on the **General** tab.

14. Select **Internet Protocol (TCP/IP)** and then click **Properties**.
15. Select the **Use the following IP address** radio button and enter the Server 1 public static IP address, Subnet mask, Default gateway, and Preferred DNS server as assigned by your network administrator. Refer to your network configuration information as identified earlier.

![Internet Protocol (TCP/IP) Properties](image)

**Figure 10 Setting the public connection static IP address**

16. Click **Advanced**, select the **DNS** tab, and uncheck the **Register this connection's addresses in DNS** box.

17. Click **OK** twice and then click **Close** to dismiss the **Connection Properties** dialog box.

  The Server 1 public static IP address is now set.

18. Repeat the preceding steps on Server 2, setting both the private network static IP address and public-facing static IP address. For the Server 2 private network static IP address settings, enter the following configuration information:

   - IP address: 10.24.3.253
   - Subnet mask: 255.255.255.0

  For the Server 2 public network IP address settings, enter the Server 2 public static IP address, Subnet mask, Default gateway, and Preferred DNS server as assigned by your network administrator.

**Join both storage servers to the domain**

1. On the Server 1 desktop, right-click **My Computer** and select Properties.
2. On the **Computer Name** tab, click **Change**.

![Figure 11 Computer Name tab of System Properties](image)

3. On the **Computer Name Changes** dialog box, in the **Computer name** field, enter a unique name for the server.

4. Click the **Domain** radio button and type the name of the domain on which the cluster will reside and then click **OK**.

![Figure 12 Computer Name Changes dialog box](image)

5. When prompted for credentials, enter the default user name **Administrator** and password **hpinvent** and then click **OK**.
Click **OK** to accept the domain changes.

Click **Yes** to restart the server.

Repeat the preceding steps for Server 2.

---

**Log in to the MSA**

Use the HP StorageWorks MSA Storage Management Utility to log in to the MSA.

---

**NOTE:**

The following procedures can be completed by using the either direct connect, Remote Desktop, or iLO 2 access methods. If using the Remote Desktop connection method, establish the connection using the Server 1 public-facing IP address.

---

1. Connect to Server 1 using direct connect, iLO 2, or a Remote Desktop connection to the configured Server 1 public-facing IP address.

2. On the Server 1 desktop, select **Start > Run**, enter `http://10.24.3.1`, and then click **OK**.

3. When prompted, click **Add** to add the MSA to the list of trusted sites that Internet Explorer maintains.

4. Log in to MSA Controller A with the default user name **manage** and password **!manage** and click **Login**.

---

**Set up the Quorum disk**

All clusters must have a shared disk called the Quorum disk. The Quorum disk is the shared storage used by the cluster nodes (Server 1 and Server 2) to coordinate the internal cluster state. This physical disk is required for all cluster operations.

Use the HP StorageWorks MSA Storage Management Utility to set up and configure the Quorum disk, a single virtual disk that will be available to both storage servers.

---

**WARNING!**

Do not use the Quorum disk to store additional data.

---

**IMPORTANT:**

Creating virtual disks can be a lengthy process. Each terabyte of disk space requires approximately two hours of initialization time.

---

1. In the HP StorageWorks MSA Storage Management Utility, click **Manage**, then click **Create a VDisk**.

2. Under **Virtual Disk Creation Method**, select the **Manual Virtual Disk Creation** radio button.

3. In the **Enter Virtual Disk Name** field, type a name for the virtual disk.
4. In the Select Virtual Disk RAID Level list, select a RAID level that provides the best data protection for the number of disks in the enclosure. A minimum of two disks is required. HP recommends using RAID level 6 for the Quorum disk.

5. Click Create New Virtual Disk.

6. Under Select Drives to Add to Virtual Disk, check all available drives and then click Continue.

7. Under Configure Volumes for Virtual Disk, select the following:
   - How Many Volumes: 1
   - Create Volumes of Equal Size?: No
   - Present Volumes to All Hosts?: Yes
   - Automatically Assign LUNs?: Yes
   - Would You Like to Name Your Volumes?: Yes

8. Click Create Virtual Disk.
9. After the virtual disk is created, on the Add volumes to virtual disk page, enter a volume size between 512MB and 1024MB and the volume name and then click Add Volumes.

**NOTE:**
After the cluster is fully set up, you can set up and configure data volumes.

Map the quorum disk volume

After the Quorum disk has been created, add a mapping for the Quorum disk volume.

1. Click Volume Management.
3. Under Add or Modify a Mapping for Volume <name>, make the following selections:
   - In the Host WWN / Nickname list, select All Other Hosts
   - In the LUN field, type 1.
   - In the Access list, select read-write
   - Under Ports, check all check boxes (A0, A1, B0, B1)
4. Click Map It.

![Figure 16 Map the quorum disk volume](image)

5. Log off of the HP StorageWorks MSA Storage Management Utility.

Establish the private connection between Server 1 and Server 2

After the Quorum disk has been set up on the MSA, establish the private connection between Server 1 and Server 2 by disconnecting the crossover cable from the MSA Controller A NIC 1 and reconnecting it to Server 2 NIC 2. This will enable the physical private network heartbeat connection between the two storage servers that is required to set up the cluster. After making this connection, the crossover cable should connect Server 1 NIC 2 to Server 2 NIC 2.

Install the MPIO Driver on both storage servers

1. Open Windows Explorer on Server 1 and navigate to `C:\hpnas\Components\SANConnect\MPIO\HP MPIO FULL FEATURED DSM FOR MSA2000 DISK ARRAYS\V2.2.0.24\INSTALL`
2. Double-click SETUP.EXE and follow the on-screen instructions

NOTE:
Accept the unsigned driver on the dialog box that appears beneath the MPIO installer dialog box.

3. When prompted at the end of the installation wizard, select Yes, I want to restart my computer now and click Finish.
4. Repeat the preceding steps for MPIO Driver installation on Server 2.
5. When prompted at the end of the installation wizard on Server 2, select No, I want to restart my computer later and click Finish.
6. Shut down Server 2 completely by clicking Start > Shut Down and then clicking OK.

NOTE:
If you are accessing Server 2 through iLO 2, the Integrated Remote Console tab remains visible during shut down. You can use the Integrated Remote Console tab Power button and menu options to power the server back on at a later time during the cluster installation process.

7. After Server 1 restarts, confirm the MPIO installation:
   a. Log in to Server 1.
   b. On the Server 1 desktop, click Start > Programs > Hewlett-Packard > MSA2000 > MPIO Configuration.
   c. At the command prompt, type dev.
   d. Confirm that the device is listed, there are 2 paths, and that the policy is RoundRobin.
   e. Close the command prompt window.

NOTE:
The default MPIO policy is RoundRobin. Other policies are available and are described in the README.TXT file in the installation path listed above.

Initialize and format the Quorum disk
1. On the Server 1 desktop, right-click My Computer and select Manage.
2. In the console tree, click Disk Management.

NOTE:
The Initialize and Convert Wizard may be displayed. If so, click Cancel to close it.
3. Right-click the Quorum disk, and then click **Initialize Disk**.

**NOTE:**

If the Quorum disk does not appear in the lower-right area of the Computer Management console, right-click **Disk Management** and select **Rescan Disks**.

![Computer Management Console](image)

**Figure 17** Initialize the quorum disk

4. In the **Initialize Disk** dialog box, select the disk to initialize and then click **OK**.

The disk is initialized as a basic disk.
5. In the storage allocation area, right-click and select **New Partition**.

![Disk allocation area](image)

**Figure 18 Create new partition**

6. Complete the **New Partition Wizard** with the following settings:
   - **Primary** partition type
   - 500 MB partition size
   - Assign drive letter **Z**
   - Formatted as **NTFS**
   - Name the volume **Quorum**
   - Do not check **Quick format** or **Compression**

**NOTE:**

Before moving on to the next task, ensure that the disk has been completely initialized and formatted. After the disk has been completely initialized and formatted, the storage allocation area should indicate the volume name, size, and state (*Healthy*, for example).

---

### Run the Cluster Administrator

In clustering terminology, cluster nodes refer to the servers themselves. For the following procedures, Node A represents Server 1 and Node B represents Server 2.

### Create the Cluster

1. Click **Start > Programs > Administrative Tools > Cluster Administrator**.

   The **Open Connection to Cluster** dialog box opens.

2. In the **Action** list, select **Create new cluster** and then click **OK**.

3. On the New Server Cluster Wizard **Welcome** page, click **Next**.
4. On the **Cluster Name and Domain** page, type or select the domain in which the cluster will be created, type a unique name for the cluster, and then click **Next**.

![Figure 19 Set cluster domain and name](image1)

5. On the **Select Computer** page, type or accept the name of Server 1 in the **Computer name** field, and then click **Next**.

The Cluster Administrator assesses configuration details of the new cluster. If there are problems with the cluster configuration, click **View Log** and **Details** to troubleshoot the issue.

![Figure 20 Analyzing cluster configuration](image2)

6. After Cluster Administrator successfully analyzes the cluster configuration, click **Next**.

7. On the **IP Address** page, type the cluster management IP address as assigned by your network administrator and then click **Next**.
8. On the **Cluster Service Account** page, type the cluster service account user name and password as assigned by your network administrator.

![Image of Cluster Service Account page]

9. On the **Proposed Cluster Configuration** page, review the configuration information and then click **Next**.

10. After the cluster creation tasks are completed, click **Next** and then click **Finish**.

   The cluster is created with a single node (Server 1).

11. Power on Server 2 and do not continue until the Server 2 log in prompt appears.

   **NOTE:**
   
   If you are accessing Server 2 through iLO2, click **Momentary Press** to power on the server.

![Image of iLO2 Integrated Remote Console Virtual Power Button]

12. After Server 2 has completely started, return to the Server 1 desktop. On the Cluster Administrator **File** menu, click **New > Node**.

13. On the Add Nodes Wizard **Welcome** page, click **Next**.
14. On the Select Computer page, type the name of Server 2 in the Computer name field, click Add, and then click Next.

The Cluster Administrator assesses configuration details of the new cluster. If there are problems with the cluster configuration, click View Log and Details to troubleshoot the issue.

**NOTE:**
If the warning message Cannot find a shareable quorum resource appears on the analysis page, click Back to return to the Select Computer page, click Advanced and select the Advanced (minimum) configuration, click OK and complete the Add Nodes Wizard.

15. On the Cluster Service Account page, type the cluster service account user name and password as assigned by your network administrator.

16. After the cluster creation tasks are completed, click Next and then click Finish.

Server 2 is added to the cluster.

**Verify that the active/passive cluster is operational**

In order to test cluster functionality, move the cluster group from the active node to the passive node. This prevents clients from accessing cluster resources through that node. In this event, all resources owned by this node fail over to the other node in the server cluster.

1. In the console tree, expand the Groups node and select Cluster Group.

2. Right-click and select Move Group.

3. Verify that the cluster group is moved to the other node.
3 Setting up an active/active cluster

The following procedures allow you to change an active/passive cluster to a basic active/active cluster with a shared quorum disk, a file share on Server 1, and a file share on Server 2.
Before completing the following procedures, set up an active/passive cluster as described in “Setting up an active/passive cluster” on page 13.

Create additional volumes in the MSA

For the purposes of this document, the volumes created in the MSA for the active/active cluster are basic file shares. The example figures are labeled as NFS and CIFS to reflect NFS and CIFS file share resources.

1. Use the HP StorageWorks MSA Storage Management Utility to log in to the MSA (see “Log in to the MSA” on page 20 for login instructions).
2. Click Manage, then click Volume Management.
3. Click Add volume.
4. Under Add Volumes to Virtual Disk, enter a volume size between 512MB and 1024MB, the volume name (for example, NFS for an NFS file share), a LUN number, and then click Add Volume.

Figure 23 Adding a volume in the MSA

5. Repeat the preceding step, adding another volume, such as an additional file share volume. At this point, there should be 3 volumes on the MSA: the quorum disk and the two volumes created for the active/active cluster configuration.
6. Map the two newly-created volumes as described in “Map the quorum disk volume” on page 22.
7. Log off of the HP StorageWorks MSA Storage Management Utility.

Initialize and format the disks

1. Log in to the Server 1 desktop.
2. Initialize and format one of the newly-created disks as described in “Initialize and format the Quorum disk” on page 23 with the following exceptions: provide a unique name for the volume and assign any available drive letter.

3. Log in to the Server 2 desktop.

4. Initialize and format the remaining newly-created disk as described in “Initialize and format the Quorum disk” on page 23 with the following exceptions: provide a unique name for the volume and assign any available drive letter.

Add cluster resources

1. Return to the Server 1 desktop.

2. Click Start > Programs > Administrative Tools > Cluster Administrator.

4. Enter a name, description, select a resource type, and then click Next.

![New Resource Wizard](image)

**Figure 24 New Resource Wizard**

5. On the Possible Owners page, ensure that both cluster nodes are listed in the Possible owners list and then click Next.

![Possible Owners page](image)

**Figure 25 Possible Owners page**
6. On the Dependencies page, move all available resources to the Resource dependencies list and then click Next.

![Dependencies page](image)

**Figure 26 Dependencies page**

7. On the final page of the New Resource Wizard, enter the requested resource details, click Finish, and then click OK.

8. Right-click the newly-added resource in Cluster Administrator and then click Bring Online.

   The resource is added to Server 1 of the cluster and is brought online.


10. Add the other resource to Server 2 of the cluster by right-clicking the newly-created cluster group, selecting New > Resource and completing the New Resource Wizard.

11. Right-click the newly-added cluster group in Cluster Administrator and then click Bring Online

   The cluster is now running in an active/active configuration, with file share resources on both cluster nodes.

**Verify that the active/active cluster is operational**

In order to test cluster functionality, move one cluster group from one active node to the other active node. This prevents clients from accessing cluster resources through that node. In this event, all resources owned by this node fail over to the other node in the server cluster.

1. In the console tree, expand the Groups node and select Cluster Group.

2. Right-click and select Move Group.

3. Verify that all resources are moved to the other cluster node.
4 Adding components for optimal availability and redundancy

Configuring the HP ProLiant DL380 G5 High Availability Storage Server for optimal performance, availability, and redundancy requires the purchase of an additional NIC adapter on each storage server and an additional Ethernet crossover cable. HP recommends using the HP NC360T PCI Express Dual Port Gigabit Server Adapter (412648-B21) for optimal active/active performance.

Install the additional equipment and set up the cluster as follows:

1. Install the hardware and make additional connections as described in “Install the hardware” on page 13 and “Install additional NIC adapters and make additional physical connections” on page 33.
2. Team the private connection NIC adapters and public connection NIC adapters on both storage servers using the HP Network Configuration Utility. For more information on teaming, see the Teaming adapters section of the HP ProLiant Network Configuration Utility Online Help.
3. Set static IP addresses for each teamed network connection on both storage servers using the configuration information provided in Table 5 on page 11.
4. Create the quorum disk as described in “Set up the Quorum disk” on page 20.
5. Create additional volumes as described in “Create additional volumes in the MSA” on page 29.
6. Initialize and format disks as described in “Initialize and format the disks” on page 29.
7. Add cluster resources as described in “Add cluster resources” on page 30.
8. Verify active/active cluster functionality as described in “Verify that the active/active cluster is operational” on page 32.

Install additional NIC adapters and make additional physical connections

In addition to setting up the active/passive cluster hardware configuration as described in “Make the physical connections” on page 13, complete the following additional hardware installation steps. In order to accurately describe the physical connections between the storage components, the ports on the additional NIC adapter are designated as NIC 3 and NIC 4.

1. Install the additional NIC adapter in an available expansion slot on Server 1 and Server 2.
2. Connect the Server 1 NIC 3 connector to the network.
3. Connect the Server 2 NIC 3 connector to the network.
4. Ensure that the Server 1 NIC 2 is connected to the Server 2 NIC 2 with the an Ethernet crossover cable.
5. Using the additional Ethernet crossover cable, connect the Server 1 NIC 4 connector to the Server 2 NIC 4 connector.