



## **EMC Installation Roadmap for CX-Series and FC-Series Storage Systems**

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REV A17**

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This manual contains checklists of the tasks required to install an EMC CX-Series or FC4700-Series storage system in a configuration with a server running the AIX<sup>®</sup>, HP-UX<sup>®</sup>, IRIX<sup>®</sup>, Linux<sup>®</sup>, Novell<sup>®</sup> NetWare<sup>®</sup>, Solaris<sup>™</sup>, Tru64<sup>®</sup> UNIX<sup>®</sup>, Windows Server<sup>™</sup> 2003, or Windows<sup>®</sup> 2000 operating system.

*As part of an effort to improve and enhance the performance and capabilities of its product line, EMC from time to time releases revisions of its hardware and software. Therefore, some functions described in this roadmap may not be supported by all revisions of the software or hardware currently in use. For the most up-to-date information on product features, refer to your product release notes.*

*If a product does not function properly or does not function as described in this roadmap, please contact your EMC representative.*

**Audience**

This roadmap is intended for use by system administrators and/or service personnel during installation of CLARiiON<sup>®</sup> Fibre Channel storage systems.

Readers of this roadmap should be familiar with the following topics:

- ◆ The operating system running on the server that you are installing.
- ◆ How the operating system handles the device names of physical disks (LUNs).

## Organization

- Chapter 1 Installation checklist for an AIX server with EMC PowerPath® software.
- Chapter 2 Installation checklist for an HP-UX server with and without EMC PowerPath or VERITAS® DMP.
- Chapter 3 Installation checklist for a Linux server with and without EMC PowerPath or VERITAS® DMP.
- Chapter 4 Installation checklist for a NetWare server with EMC PowerPath software.
- Chapter 5 Installation checklists for a Solaris server with EMC PowerPath or VERITAS DMP software.
- Chapter 6 Installation checklist for a Tru64 UNIX server.
- Chapter 7 Installation checklists for a Microsoft Windows Server 2003 or Windows 2000 server with EMC PowerPath or VERITAS® DMP software.
- Appendix A Reviews the EMC process for detecting and resolving software problems, and provides essential questions that you should answer before contacting the EMC Customer Support Center.

## Conventions Used in This Guide

EMC uses the following conventions for notes and cautions.

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A note presents information that is important, but not hazard-related.

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### **CAUTION**

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**A caution contains information essential to avoid damage to the system or equipment. The caution may apply to hardware or software.**

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## Typographical Conventions

This manual uses the following format conventions

<b>This typeface</b>	<ul style="list-style-type: none"> <li>◆ Specific filenames or complete paths.</li> <li>◆ Dialog box names and menu items in text.</li> <li>◆ Selections you can make from the user interface, including buttons, icons, options, and field names.</li> <li>◆ Emphasis in cautions and warnings.</li> </ul>
<i>This typeface</i>	<ul style="list-style-type: none"> <li>◆ New terms or unique word usage in text.</li> <li>◆ Command line arguments when used in text.</li> </ul>
This typeface	<ul style="list-style-type: none"> <li>◆ Represents a system response (such as a message or prompt), a file or program listing.</li> </ul>
<b>x &gt; y</b>	Represents a menu path. For example, <b>Operations &gt; Poll All Storage Systems</b> tells you to select <b>Poll All Storage Systems</b> on the <b>Operations</b> menu.

## Finding Current Information

The most up-to-date information about the CX-Series and FC-Series storage systems is posted on the EMC Powerlink™ website. We recommend that you download the latest information before you install one of these storage systems. If you purchased your storage system from an EMC reseller and you cannot access Powerlink, the latest product information should be available from your reseller.

To access EMC Powerlink, use the following link:

<http://powerlink.emc.com>

After you log in, select **Support > Document Library** and find the documents you want.

## Where to Get Help

For questions about technical support, call your local sales office or service provider.

If you have a valid EMC service contract, contact EMC Customer Service at:

**United States:** (800) 782-4362 (SVC-4EMC)

**Canada:** (800) 543-4782 (543-4SVC)

**Worldwide:** (508) 497-7901

Follow the voice menu prompts to open a service call and select the applicable product support.

**Sales and Customer Service Contacts**

For the list of EMC sales locations, please access the EMC home page at:

<http://www.EMC.com/contact/>

For additional information on the EMC products and services available to customers and partners, refer to the EMC Powerlink™ website:

<http://powerlink.EMC.com>

**Your Comments**

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send a message to [techpub\\_comments@EMC.com](mailto:techpub_comments@EMC.com) with your opinions of this guide.

# AIX Installation Checklists

This chapter contains checklists of the tasks required to install a CLARiiON storage system in a configuration with an IBM AIX® server and PowerPath® failover software. The sections for the different configurations are

- ◆ PowerPath Configurations for AIX ..... 1-2
- ◆ PowerPath Checklist — New AIX Server and New Storage System ..... 1-6
- ◆ PowerPath Checklist — New AIX Server and Existing Storage System ..... 1-12
- ◆ PowerPath Checklist — Existing AIX Server and New Storage System ..... 1-22
- ◆ PowerPath Checklist — Existing AIX Server and Existing Storage System ..... 1-29

## PowerPath Configurations for AIX

Read this section if you are installing a AIX PowerPath configuration with a new or existing server and a new or existing storage system. A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running AIX and *not* connected to any storage system.

**existing server** - A server running AIX and that is already connected to one or more storage systems.

**new storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

**existing storage system** - A CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system that is already connected to one or more servers and is in a EMC Navisphere® domain.

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All CLARiiON storage systems connected to the server must be CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage systems. If any other type of CLARiiON storage system is connected to the server, the server cannot run AIX PowerPath.

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### Required Host Software Revisions

- ◆ AIX operating system revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ AIX PowerPath
  - For CX400, CX600, and FC-Series storage systems  
Version 3.0.0 with patch 3.0.2 or higher
  - For CX300, CX500, and CX700 storage systems  
Version 3.0.4 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath Release Notes for UNIX* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your AIX version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>).
  - On a network that is connected to the storage-system server and that you will connect to the SPs in the storage system.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere CLI version 6.X.
  - On a network that is connected to the storage-system server and that you will connect to SPs in the storage system.
- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SnapView™ and MirrorView™ software if you have this software. The following documents will help you with this planning:
  - *EMC Storage Systems CX400-Series and CX600-Series Configuration Planning Guide* (P/N 014003113)
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273)
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide* (P/N 014003087)

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## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - PCI HBA and native IBM HBA driver
  - Switches and switch management software
  - AIX operating system and HACMP (if using HACMP)
- ◆ *Removing ATF or CDE Software Before Installing Other Failover Software* (P/N 069001173)
- ◆ *PowerPath Version 4.3 Product Guide* (P/N 300-001-673)  
or  
*PowerPath Version 4.2 Product Guide* (P/N 300-001-521)  
or  
*PowerPath Version 3.0 Product Guide* (P/N 300-001-047)
- ◆ *PowerPath for AIX Version 4.3 Installation and Administration Guide* (P/N 300-000-683)  
or  
*PowerPath for AIX Version 4.2 Installation and Administration Guide* (P/N 300-000-530)  
or  
*PowerPath Version 3.0 for UNIX Installation and Administration Guide* (P/N 300-000-511)
- ◆ *EMC CX-Series Server Software for AIX Installation Guide* (P/N 300-002-044)  
or  
*EMC Navisphere Host Agent and CLI for AIX Version 6.X Installation Guide* (P/N 069001145)
- ◆ *EMC Navisphere Command Line Interface (CLI) Version 6.X Reference* (P/N 069001038)
- ◆ *EMC Storage-System Host Utilities for AIX Administrator's Guide* (P/N 069001137)
- ◆ *EMC Rails and Enclosures Field Installation Guide* (P/N 300-001-799)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082) - for SPS installation only

- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide (P/N 300-001-276, rev A02 or higher)*  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-276, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX400-Series Setup and Cabling Guide (P/N 014003105) and EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide (P/N 300-001-275, rev A02 or higher)*  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-275, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC Storage Processor Enclosure (SPE) CX600-Series Setup and Cabling Guide (P/N 014003078) and EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *FC4700-2 Setup Guide (P/N 0140373)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for IBM AIX (P/N 300-000-608)*

## PowerPath Checklist – New AIX Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure. <input type="checkbox"/> Install HBA driver. <input type="checkbox"/> Execute the following command: <b>cfgmgr</b>	HBA documentation  AIX documentation
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiON and PowerPath. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide
3 <b>Server</b> <i>Install EMC ODM Support software</i>	<input type="checkbox"/> Insert the AIX Utilities Kit CD and mount it. <input type="checkbox"/> Install EMC ODM Support using SMIT or the command line. <ul style="list-style-type: none"> <li><b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a></li> </ul>	AIX utilities administrator's guide
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI. <input type="checkbox"/> If you installed the Host Agent, edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows: <ul style="list-style-type: none"> <li>Add the following entry if it does not already exist:  <b>device auto auto</b></li> <li>Add at least one privileged user.</li> </ul>	CX-Series Server Software for AIX Installation Guide
5 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	CX-Series Server Software for AIX installation Guide

Task	With Access Logix	Reference Document
<b>6 Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath using SMIT or from the command line. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide
<b>7 Switches</b> <i>Install</i>	<p><b>For a SAN</b></p> <input type="checkbox"/> Install switches, if not already installed. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port. <input type="checkbox"/> On the server: <ul style="list-style-type: none"> <li>• Download <code>emc_cfgmgr.sh</code> from <a href="ftp://ftp.emc.com/pub/elab/powerpath/aix">ftp://ftp.emc.com/pub/elab/powerpath/aix</a>.</li> <li>• Execute the following commands  <b>cfgmgr</b></li> </ul> <input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port. <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Rails, cabinet, and switch documentation  AIX documentation  Switch documentation
<b>8 Storage System</b> <i>Install</i>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation

Task	With Access Logix	Reference Document
<b>9 Storage System</b> <b>Initialize and install software enablers</b>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a <i>non-AIX</i> host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, and/or MirrorView software, install their enablers.	Storage-system setup guide  Navisphere Manager administrator's guide and online help
<b>10 Storage System</b> <b>Cable</b>	<input type="checkbox"/> Connect the storage system to the switch or HBA ports. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.	Storage-system setup guide.  Switch documentation          Storage-system setup guide.
<b>11 Storage System</b> <b>Set up security</b>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>12 Storage System</b> <b>Set properties for PowerPath</b>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the storage system's default system type, failover mode, and array comppath values: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycomppath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system. <b>Note:</b> Setting the array comppath property to 1 (enabled) creates LUNZ devices. where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference



Task	With Access Logix	Reference Document
15 <b>Storage System Configure</b>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group	Navisphere Manager administrator's guide and online help
16 <b>Storage System Set up Event Monitor</b>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
17 <b>Server Configure devices</b>	<input type="checkbox"/> Download the following command from <a href="ftp://ftp.emc.com/pub/elab/powerpath/aix">ftp://ftp.emc.com/pub/elab/powerpath/aix</a> and execute it: <b>emc_cfgmgr.sh</b> <input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b> <input type="checkbox"/> <b>Checkpoint</b> - Verify that the server sees <b>hdisk</b> devices for the LUNs. <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clarion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 12.</li> </ul> <input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands: <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b> <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b> <input type="checkbox"/> <b>Checkpoint if the Host Agent is installed</b> - Use Navisphere Manager to verify that the LUNs are mapped to <b>hdiskpower</b> devices.	AIX documentation  PowerPath product guide  AIX documentation  PowerPath product guide  CX-Series Server Software for AIX Installation Guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
18 <b>Serve</b> <i>Make LUNs available to AIX</i>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs. If AIX does not recognize any LUNs, verify the connection to the Storage Group.	Host connectivity guide or AIX documentation
19 <b>Server</b> <i>Test PowerPath with a license key</i>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.	<p>AIX documentation</p> <p>PowerPath product guide</p>
	<input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b>	
	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	
	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is pseudo device that represents the chosen LUN.	
	<input type="checkbox"/> Start I/O to the LUN.	
	<input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	
	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled paths becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul>	
	<input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.	
	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — New AIX Server and Existing Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Install HBA driver.  <input type="checkbox"/> Execute the following command: <b>cfgmgr</b>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Install HBA driver.  <input type="checkbox"/> Execute the following command: <b>cfgmgr</b>	HBA documentation   AIX documentation
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON and PowerPath.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON and PowerPath.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide
3 <b>Server</b> <i>Install EMC ODM Support software</i>	<input type="checkbox"/> Insert the AIX Utilities Kit CD and mount it.  <input type="checkbox"/> Install EMC ODM Support using SMIT or the command line.  <b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a>	<input type="checkbox"/> Insert the AIX Utilities Kit CD, and mount it  <input type="checkbox"/> Install EMC ODM Support using SMIT or the command line.  <b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a>	AIX utilities administrator's guide

Task	With Access Logix	Without Access Logix	Reference Document
4 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath using SMIT or from the command line. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath using SMIT or from the command line <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide
5 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI. <input type="checkbox"/> If you installed the Host Agent, edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows: <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist:  <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> </ul>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI. <input type="checkbox"/> If you installed the Host Agent, edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows: <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist:  <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> </ul>	CX-Series Server Software for AIX Installation Guide
6 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	N/A	CX-Series Server Software for AIX Installation Guide

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 <b>Storage System Update software</b></p>	<p><input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it:</p> <ul style="list-style-type: none"> <li>• Access Logix</li> <li>• Navisphere SP Agent</li> <li>• Navisphere Storage Management Server Software</li> <li>• Navisphere Manager UI</li> <li>• SAN Copy driver and UI</li> <li>• SnapView driver and UI</li> <li>• MirrorView driver and UI</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or all paths to an SP are down.</p>	<p><input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it:</p> <ul style="list-style-type: none"> <li>• FLARE</li> <li>• Navisphere SP Agent</li> <li>• Navisphere Storage Management Server Software</li> <li>• Navisphere Manager UI</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or all paths to an SP are down.</p>	<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>8 Storage System</b> <b><i>Set properties for PowerPath</i></b>	<input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the initiator type, failover mode, and array comppath properties for the server's HBA ports (initiators):  <b>Initiator Type</b> to CLARiiON Open  <b>Failover mode</b> to 1  <b>Array comppath</b> to Enabled  <b>Note:</b> Setting the array comppath property to 1 (enabled) creates LUNZ devices.	<input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the initiator type, failover mode, and array comppath properties for the server's HBA ports (initiators):  <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>navicli -h <i>hostname</i> failovermode 1</b>  <b>navicli -h <i>hostname</i> arraycomppath 1</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.  <b>Note:</b> Setting the array comppath property to 1 (enabled) creates LUNZ devices.	Navisphere Manager administrator's guide and online help or Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>9 Server</b> <b>Cable to switches or storage system</b></p>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide.</p> <p>AIX documentation</p> <p>Switch documentation</p>
<p><b>10 Switches</b> <b>Zone</b></p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> If MirrorView is installed, create any required zones for it.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p>Switch management documentation</p>



Task	With Access Logix	Without Access Logix	Reference Document
<p>11 <b>Server</b> <i>Make target SPs available (cont.)</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> List the LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b></li> <li><input type="checkbox"/> Remove each LUNZ device with the following AIX command: <b>rmdev -dl hdiskn</b> where <i>n</i> is the hdisk number for the LUNZ device.</li> <li><input type="checkbox"/> Use the following Navisphere CLI command to set the array compmpath property to 0: <b>navicli -h hostname arraycompmpath 0</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> <li><input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> List the LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b></li> <li><input type="checkbox"/> Remove each LUNZ device with the following AIX command: <b>rmdev -dl hdiskn</b> where <i>n</i> is the hdisk number for the LUNZ device.</li> <li><input type="checkbox"/> Use the following Navisphere CLI command to set the array compmpath property to 0: <b>navicli -h hostname arraycompmpath 0</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> <li><input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b></li> </ul>	<p>AIX documentation</p> <p>Navisphere CLI reference</p> <p>AIX documentation</p>
<p>12 <b>Storage System</b> <i>Configure</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If the server will use an <i>existing</i> Storage Group, use Navisphere Manager to connect the server to the Storage Group.</li> <li><input type="checkbox"/> If the server will use a <i>new</i> Storage Group, use Navisphere Manager to create RAID Groups, bind LUNs, create the Storage Group, and assign LUNs to the Storage Group.</li> <li><input type="checkbox"/> Use Navisphere Manager to connect the server to the Storage Group.</li> </ul>	N/A	<p>Navisphere Manager administrator's guide and online help</p>
<p>13 <b>Storage System</b> <i>Set up Event Monitor</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Plan your monitoring configuration.</li> <li><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Plan your monitoring configuration.</li> <li><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</li> </ul>	<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
14 <b>Server</b> <i>Configure devices</i>	<p><input type="checkbox"/> Execute the following command: <b>emc_cfgmgr.sh</b></p> <p><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that the servers see <b>hdisk</b> devices for the LUNs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 8.</li> </ul> <p><input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands:  <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b></p> <p><input type="checkbox"/> <b>Checkpoint if the Host Agent is installed</b> - Use Navisphere Manager to verify that the LUNs are mapped to <b>hdiskpower</b> devices.</p>	<p><input type="checkbox"/> Execute the following command: <b>emc_cfgmgr.sh</b></p> <p><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that the servers see <b>hdisk</b> devices for the LUNs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 8.</li> </ul> <p><input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands:  <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b></p> <p><input type="checkbox"/> <b>Checkpoint if the Host Agent is installed</b> - Use Navisphere Manager to verify that the LUNs are mapped to <b>hdiskpower</b> devices.</p>	<p>AIX documentation</p> <p>PowerPath product guide</p> <p>AIX documentation</p> <p>PowerPath product guide</p> <p>CX-Series Server Software for AIX Installation Guide</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>15 Server</b> <b>Make LUNs available to AIX</b>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs.  If AIX does not recognize any LUNs, verify the connection to the Storage Group.	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs.	Host connectivity guide or AIX documentation
<b>16 Server</b> <b>Test PowerPath with a license key</b>	<b>If you have a PowerPath license key</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:   <b>powermt display dev=all class=clarion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:   <b>powermt display dev=x every=2</b>                      where <i>x</i> is pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> </ul>	<b>If you have a PowerPath license key</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:   <b>powermt display dev=all class=clarion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:   <b>powermt display dev=x every=2</b>                      where <i>x</i> is pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> </ul>	AIX documentation           PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server</b> <b>Test PowerPath</b> <b>with a license key</b> <b>(cont.)</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>The state of the uncabled paths becomes "dead."</li> <li>I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original state with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>The state of the uncabled paths becomes "dead."</li> <li>I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original state with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing AIX Server and New Storage System

Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of Application Transparent Failover (ATF) or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must

- ◆ **Back up your server configurations.**
- ◆ **Back up data on all storage systems connected to the server.**
- ◆ **Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.**

**Simply removing ATF or CDE using the uninstall procedure in the AIX ATF administrator's guide or the AIX utilities administrator's guide may not return the server to its original state, and may result in lost data.**

Task	With Access Logix	Reference Document
1 Server <i>Unmount file systems and vary off volumes</i>	<input type="checkbox"/> Unmount any file systems that reside on the storage system. <input type="checkbox"/> Vary off any volume groups that reside on the storage systems.	AIX documentation
2 Server <b>Replace CLARiiON HBA driver</b>	<b>If the CLARiiON HBA driver is installed</b> <input type="checkbox"/> Remove the <b>hdisk</b> devices for LUNs in the storage system. <input type="checkbox"/> Replace it with the IBM HBA driver.	AIX documentation HBA driver documentation
3 Server <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	Removing ATF or CDE
4 Server <i>Install EMC ODM Support software</i>	<input type="checkbox"/> Remove the DiskArray software. <b>CAUTION</b> Do <b>not</b> reboot the server. <input type="checkbox"/> Disconnect any non-FC4700 or non-CX-Series storage systems. PowerPath does not support these storage systems. <input type="checkbox"/> Insert the AIX Utilities Kit CD and mount it. <input type="checkbox"/> Install EMC ODM Support using SMIT or ODM or the command line. <b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a> <input type="checkbox"/> Reboot the server.	AIX utilities administrator's guide
5 Server <i>Replace IBM HBAs and/or Install additional HBAs</i>	<b>Note:</b> PowerPath requires IBM PCI HBAs and the driver supported by IBM for AIX. <input type="checkbox"/> If the server has IBM HBAs connected to the storage system, replace them with the IBM HBAs. <input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation
6 Server <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent and CLI</li> <li>• admsnap</li> </ul> <input type="checkbox"/> Execute the following command: <b>cfgmgr</b>	HBA driver documentation CX-Series Server Software for AIX installation Guide  AIX documentation



Task	With Access Logix	Reference Document
12 <b>Storage System</b> <i>Set up security</i>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
13 <b>Storage System</b> <i>Set properties for PowerPath</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the storage system's, and array commpath properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system. <b>Note:</b> Setting the array commpath property to 1 (enabled) creates LUNZ devices.	Navisphere CLI reference
14 <b>Server</b> <i>Cable additional or replacement HBAs to switches or storage system</i>	<input type="checkbox"/> Cable any additional or replacement HBA ports to the switch connected to the storage system or to SP ports. <input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b> <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide. AIX documentation  Switch documentation
15 <b>Switches</b> <i>Zone</i>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each new HBA port (host initiator) to the appropriate SPs. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation

Task	With Access Logix	Reference Document
16 <b>Server</b> <i>Make target SPs available</i>	<p><input type="checkbox"/> Download the following command from <a href="ftp://ftp.emc.com/pub/elab/powerpath/aix">ftp://ftp.emc.com/pub/elab/powerpath/aix</a> and execute it: <b>emc_cfgmgr.sh</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that AIX sees LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b> If AIX does not see LUNZ devices</p> <ul style="list-style-type: none"> <li>• Verify that <b>arraycommpath</b> is set to 1 as described in step 12.</li> <li>• Execute the following AIX command: <b>emc_cfgmgr.sh</b></li> </ul> <p><input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands: <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b> <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.</p> <p><input type="checkbox"/> List the LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b></p> <p><input type="checkbox"/> Remove each LUNZ device with the following AIX command: <b>rmdev -dl hdiskn</b> where <i>n</i> is the hdisk number for the LUNZ device.</p>	<p>AIX documentation</p> <p>CX-Series Server Software for AIX installation guide</p> <p>Navisphere Manager administrator's guide and online help</p> <p>AIX documentation</p>
17 <b>Storage System</b> <i>Configure</i>	<p><input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.</p> <p><input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.</p> <p><input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group</p>	Navisphere Manager administrator's guide and online help
18 <b>Storage System</b> <i>Set up Event Monitor</i>	<p><input type="checkbox"/> Plan your monitoring configuration.</p> <p><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</p>	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>19 Server</b> <b>Configure devices</b>	<p><input type="checkbox"/> Execute the following command: <b>emc_cfgmgr.sh</b></p> <p><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that the server sees <b>hdiskpower</b> devices for the LUNs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b></p> <p>If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 13.</li> </ul> <p><input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands: <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b></p> <p><u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b></p> <p><input type="checkbox"/> <b>Checkpoint if the Host Agent is installed</b> - Use Navisphere Manager to verify that the LUNs are mapped to <b>hdiskpower</b> devices.</p>	<p>AIX documentation</p> <p>PowerPath product guide</p> <p>CX-Series Server Software for AIX installation guide</p> <p>Navisphere Manager administrator's guide and online help</p>
<b>20 Server</b> <b>Make LUNs available to AIX</b>	<p><input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs. If AIX does not recognize any LUNs, verify the connection to the Storage Group.</p>	<p>Host connectivity guide or AIX documentation</p>
<b>21 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <p><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></p> <p><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</p> <p><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b></p> <p>where x is pseudo device that represents the chosen LUN.</p>	<p>PowerPath product guide</p>

Task	With Access Logix	Reference Document
21 <b>Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> Start I/O to the LUN. <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA. <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the previous steps exactly and caused any LUNs to trespass, restore the LUNs to their original state with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing AIX Server and Existing Storage System

This checklist assumes that the existing AIX server and existing storage system are already connected in a SAN or direct attach configuration. Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

**EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must**

- ◆ **Back up your server configurations.**
- ◆ **Back up data on all storage systems connected to the server.**
- ◆ **Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.**

**Simply removing ATF or CDE using the uninstall procedure in the AIX ATF administrator's guide or the AIX utilities administrator's guide may not return the server to its original state, and may result in lost data.**

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Unmount file systems and vary off volumes</i>	<input type="checkbox"/> Unmount any file systems that reside on the storage system. <input type="checkbox"/> Vary off any volume groups that reside on the storage systems.	<input type="checkbox"/> Unmount any file systems that reside on the storage system. <input type="checkbox"/> Vary off any volume groups that reside on the storage systems.	AIX documentation
2 <b>Server</b> <i>Replace CLARiiON HBA driver</i>	<b>If the CLARiiON HBA driver is installed</b> <input type="checkbox"/> Remove the <b>hdisk</b> devices for LUNs in the storage system. <input type="checkbox"/> Remove <b>CLArray</b> or <b>CLARiiON.fcp</b> . <input type="checkbox"/> Install the IBM HBA driver.	<b>If the CLARiiON HBA driver is installed</b> <input type="checkbox"/> Remove the <b>hdisk</b> devices for LUNs in the storage system. <input type="checkbox"/> Remove <b>CLArray</b> or <b>CLARiiON.fcp</b> . <input type="checkbox"/> Replace it with the IBM HBA driver	AIX documentation  HBA driver documentation
3 <b>Server</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	Removing ATF or CDE
4 <b>Server</b> <i>Install EMC ODM Support software</i>	<input type="checkbox"/> Remove the DiskArray software. <b>CAUTION</b> Do <b>not</b> reboot the server. <input type="checkbox"/> Disconnect any non-FC4700 or non-CX-Series storage systems. PowerPath does not support these storage systems. <input type="checkbox"/> Insert the AIX Utilities Kit CD and mount it. <input type="checkbox"/> Install ODM using SMIT or ODM or the command line. <b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a> <input type="checkbox"/> Reboot the server.	<input type="checkbox"/> Remove the DiskArray software. <b>CAUTION</b> Do <b>not</b> reboot the server. <input type="checkbox"/> Disconnect any non-FC4700 or non-CX-Series storage systems. PowerPath does not support these storage systems. <input type="checkbox"/> Insert the AIX Utilities Kit CD and mount it. <input type="checkbox"/> Install ODM using SMIT or ODM or the command line. <b>Note:</b> The EMC ODM Support package is available on the ftp site <a href="ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS">ftp://ftp.emc.com/pub/elab/aix/ODM_DEFINITIONS</a> <input type="checkbox"/> Reboot the server.	AIX utilities administrator's guide

Task	With Access Logix	Without Access Logix	Reference Document
5 <b>Server</b> <i>Replace IBM HBAs and/or Install additional HBAs</i>	<p><b>Note:</b> PowerPath requires IBM PCI HBAs and the driver supported by IBM for AIX.</p> <p><input type="checkbox"/> If the server has IBM HBAs connected to the storage system, replace them with the IBM HBAs.</p> <p><input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.</p> <p><b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.</p>	<p><b>Note:</b> PowerPath requires IBM PCI HBAs and the driver supported by IBM for AIX.</p> <p><input type="checkbox"/> If the server has IBM HBAs connected to the storage system, replace them with the IBM HBAs.</p> <p><input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.</p> <p><b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure</p>	HBA documentation
6 <b>Server</b> <i>Update Software</i>	<p><input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it:</p> <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul> <p><input type="checkbox"/> Execute the following command: <b>cfgmgr</b></p>	<p><input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it:</p> <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> </ul> <p><input type="checkbox"/> Execute the following command: <b>cfgmgr</b></p>	HBA driver documentation CX-Series Server Software for AIX Installation Guide  AIX documentation
7 <b>Server</b> <i>Set HBA driver parameters</i>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	Host connectivity guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>8 Storage System Update software</b>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it: <ul style="list-style-type: none"> <li>• Access Logix</li> <li>• Navisphere SP Agent</li> <li>• Navisphere Storage Management Server Software</li> <li>• Navisphere Manager UI</li> <li>• SAN Copy driver and UI</li> <li>• SnapView driver and UI</li> <li>• MirrorView driver and UI</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or all paths to an SP are down.</p>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision, update it: <ul style="list-style-type: none"> <li>• FLARE</li> <li>• Navisphere SP Agent</li> <li>• Navisphere Storage Management Server Software</li> <li>• Navisphere Manager UI</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or all paths to an SP are down.</p>	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<b>9 Storage System</b> <b><i>Set properties for PowerPath</i></b>	<b>For new or replacement HBAs</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</li> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties for the server's new or replacement HBA ports (initiators):           <pre>navicli -h <i>hostname</i> storagegroup -sethost -host <i>servername</i> -type 3  navicli -h <i>hostname</i> storagegroup -sethost -host <i>servername</i> -failovermode 1  navicli -h <i>hostname</i> storagegroup -setpath -host <i>servername</i> -arraycommpath 1</pre> <p>where  <i>hostname</i> is the IP address or network name of an SP in the storage system  <i>servername</i> is the server's name or network address</p> <p><b>Note:</b> Setting the array commpath property to 1 (enabled) creates LUNZ devices. You will have to remove the LUNZ devices later in the procedure.</p> </li> </ul>	<b>For any HBAs</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:           <pre>navicli -h <i>hostname</i> systemtype</pre> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <pre>navicli -h <i>hostname</i> systemtype -config 3</pre> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> </li> </ul>	Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
9 Storage System <i>Set properties for PowerPath (cont.)</i>	<p><b>For existing HBAs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the storage system's initiator type, failover mode, and array comppath properties for the server's HBA ports (initiators):</li> </ul> <p><b>Initiator Type</b> to CLARiiON Open</p> <p><b>Failover mode</b> to 1</p> <p><b>Array comppath</b> to Enabled</p> <p><b>Note:</b> Setting the array comppath property to 1 (enabled) creates LUNZ devices. You will have to remove the LUNZ devices later in the procedure.</p>	<p><b>For any HBAs (cont.)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the storage system's default failover mode and array comppath properties:</li> </ul> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycomppath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p><b>Note:</b> Setting the array comppath property to 1 (enabled) creates LUNZ devices. You will have to remove the LUNZ devices later in the procedure.</p>	<p>Navisphere CLI reference</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>10 Server</b> <b><i>Install PowerPath</i></b>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath from the command line or using SMIT. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath from the command line or using SMIT. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide
<b>11 Server</b> <b><i>Cable additional or replacement HBAs to switches or storage system</i></b>	<input type="checkbox"/> Cable any additional or replacement HBA ports to the switch connected to the storage system or to SP ports. <input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b> <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.	<input type="checkbox"/> Cable any additional or replacement HBA ports to the switch connected to the storage system or to SP ports. <input type="checkbox"/> Execute the following AIX command: <b>cfgmgr</b> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.	Storage-system setup guide.  AIX documentation  Switch documentation

Task	With Access Logix	Without Access Logix	Reference Document
<b>11 Server</b> <b>Cable additional or replacement HBAs to switches or storage system (cont.)</b>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	
<b>12 Switches</b> <b>Zone for additional HBAs</b>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system</li> </ul>	Switch management documentation
<b>13 Server</b> <b>Make target SPs available</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Download the following command from <a href="ftp://ftp.emc.com/pub/elab/powerpath/aix">ftp://ftp.emc.com/pub/elab/powerpath/aix</a> and execute it: <b>emc_cfgmgr.sh</b></li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that AIX sees LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b> If AIX does not see LUNZ devices <ul style="list-style-type: none"> <li>Verify that <b>arraycommpath</b> is set to 1 as described in step 9.</li> <li>Execute the following AIX command: <b>emc_cfgmgr.sh</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Download the following command from <a href="ftp://ftp.emc.com/pub/elab/powerpath/aix">ftp://ftp.emc.com/pub/elab/powerpath/aix</a> and execute it: <b>emc_cfgmgr.sh</b></li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that AIX sees LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b> If AIX does not see LUNZ devices <ul style="list-style-type: none"> <li>Verify that <b>arraycommpath</b> is set to 1 as described in step 9.</li> <li>Execute the following AIX command: <b>emc_cfgmgr.sh</b></li> </ul> </li> </ul>	AIX documentation

Task	With Access Logix	Without Access Logix	Reference Document
<b>13 Server</b> <b><i>Make target SPs available (cont.)</i></b>	<input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned with the following AIX command: <b>Isdev -Cc array</b>  <input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands: <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.  <input type="checkbox"/> List the LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b>  <input type="checkbox"/> Remove each LUNZ device with the following AIX command: <b>rmdev -dl hdiskn</b>  where <i>n</i> is the hdisk number for the LUNZ device.  <input type="checkbox"/> Execute the following AIX command: <b>emc_cfgmg.sh</b>	<input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned with the following AIX command: <b>Isdev -Cc array</b>  <input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands: <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.  <input type="checkbox"/> List the LUNZ devices with the following AIX command: <b>lscfg   grep LUNZ</b>  <input type="checkbox"/> Remove each LUNZ device with the following AIX command: <b>rmdev -dl hdiskn</b>  where <i>n</i> is the hdisk number for the LUNZ device.  <input type="checkbox"/> Execute the following AIX command: <b>emc_cfgmg.sh</b>	AIX documentation   CX-Series Server Software for AIX installation guide   Navisphere Manager administrator's guide and online help   AIX documentation

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>14 Server</b> <i>Configure devices</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If you replaced HBAs or added additional HBAs, use Navisphere Manager to disconnect and then reconnect the server and its Storage Group.</li> <li><input type="checkbox"/> Execute the following command: <b>emc_cfgmgr.sh</b></li> <li><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that the server sees <b>hdiskpower</b> devices for the LUNs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs                             <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 9.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Execute the following command: <b>emc_cfgmgr.sh</b></li> <li><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that the server sees <b>hdiskpower</b> devices for the LUNs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs                             <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 9.</li> </ul> </li> </ul>	<p>Navisphere Manager administrator's guide and online help</p> <p>AIX documentation</p> <p>PowerPath product guide</p> <p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
14 <b>Server</b> <i>Configure devices (cont.)</i>	<input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands:  <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b>	<input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility with the following AIX commands:  <u>Host Agent/</u> <b>etc/rc.agent stop</b> <b>/etc/rc.agent start</b>  <u>Server Utility</u> <b>/usr/lpp/HOSTUTIL/naviserverutil</b>	CX-Series Server Software for AIX installation guide           Navisphere Manager administrator's guide and online help
15 <b>Server</b> <i>Test PowerPath with a license key</i>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.	PowerPath product guide
	<input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>	<input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>	
	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	
	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where x is pseudo device that represents the chosen LUN.	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where x is pseudo device that represents the chosen LUN.	
	<input type="checkbox"/> Start I/O to the LUN.	<input type="checkbox"/> Start I/O to the LUN.	

Task	With Access Logix	Without Access Logix	Reference Document
<p>15 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that                             <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you did not follow the previous steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that                             <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you did not follow the previous steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	<p>PowerPath product guide</p>

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## HP-UX Installation Checklist

This chapter contains a checklist of the tasks required to install CLARiiON storage in a configuration with PowerPath, VERITAS DMP, or with no EMC failover software.

Topics are

- ◆ PowerPath Configurations for HP-UX .....2-2
- ◆ DMP Configurations for HP-UX.....2-45
- ◆ Configurations for HP-UX Without EMC Failover Software ....2-53

## PowerPath Configurations for HP-UX

Read this section if you are installing an HP-UX® PowerPath™ configuration with a new or existing server and a new or existing storage system. A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running HP-UX and *not* connected to any storage system.

**existing server** - A server running HP-UX that is already connected to one or more storage systems.

**new storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

**existing storage system** - A CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series storage system that is already connected to one or more servers and is in an EMC Navisphere® domain.

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All CLARiiON storage systems connected to the server must be CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series storage systems. If any other type of CLARiiON storage system is connected to the server, the server cannot run PowerPath.

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Topics relating to the checklists for HP-UX PowerPath configurations are

- ◆ Required Host Software Revisions..... 2-3
- ◆ Prerequisites ..... 2-3
- ◆ Documentation..... 2-4
- ◆ PowerPath Checklist - New HP-UX Server and New Storage System..... 2-7
- ◆ PowerPath Checklist - New HP-UX Server and Existing Storage System..... 2-13
- ◆ PowerPath Checklist - Existing HP-UX Server and New Storage System..... 2-26
- ◆ PowerPath Checklist - Existing HP-UX Server and Existing Storage System ..... 2-33

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## Required Host Software Revisions

- ◆ HP-UX operating system revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HP-UX PowerPath
  - For CX300, CX400, CX600, C4500, and FC4700-Series storage systems  
Version 3.0.2 or higher
  - For CX500 and CX700 storage systems  
Version 3.0.3 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for UNIX Release Notes* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your HP-UX version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server and that you will connect to the SPs in CX300, CX400, CX600, or FC4700-Series storage systems.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere CLI version 6.X.
  - On a network that is connected to the storage-system server and that you will connect to SPs in CX300, CX400, CX600, or FC4700-Series storage systems.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView/A if you have this software. The following documents will help you with this planning:
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273)
  - *EMC CX400-Series and CX600-Series Storage Systems Configuration Planning Guide* (P/N 014003113)
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide* (P/N 014003087)
  - *EMC Fibre Channel Storage System Model FC4700 Configuration Planning Guide* (P/N 014003016)

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver
  - Switches and switch management software
  - HP-UX operating system
- ◆ *PowerPath Version 4.3 Product Guide* (P/N 300-001-673)  
or  
*PowerPath Version 4.2 Product Guide* (P/N 300-001-521)  
or  
*PowerPath Version 4.1 Product Guide* (P/N 300-001-290)  
or  
*PowerPath Version 3.0 Product Guide* (P/N 300-001-047)
- ◆ *PowerPath for HP-UX Version 4.3 Installation and Administration Guide* (P/N 300-001-682)  
or  
*PowerPath for HP-UX Version 4.2 Installation and Administration Guide* (P/N 300-001-529)  
or  
*PowerPath Version 4.1 for HP-UX Installation and Administration Guide* (P/N 300-001-297)  
or

*PowerPath Version 3.0 for UNIX Installation and Administration Guide (P/N 300-000-511)*

- ◆ *EMC PowerPath Version 4.1 Quick Reference (P/N) 300-001-204)*
- ◆ *EMC Navisphere Host Agent and CLI for HP-UX Version 6.X Installation Guide (P/N 069001146)*

or

*EMC CX-Series Server Software for HP-UX Installation Guide (P/N300-002-043)*

- ◆ *EMC SnapView Installation Guide (P/N 069001193, revision A02 or higher)*
- ◆ *EMC SAN Copy Installation Guide (P/N 069001187)*
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference (P/N 069001038)*
- ◆ *EMC Rails and Enclosures Field Installation Guide (P/N 300-001-799)*
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets (P/N 014003082) - for SPS installation only*
- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide (P/N 300-001-276, rev A02 or higher)*

or

*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-276, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*

- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX400-Series Setup and Cabling Guide (P/N 014003105) and EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide (P/N 300-001-275, rev A02 or higher)*

or

*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-275, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*

- ◆ *EMC Storage Processor Enclosure (SPE) CX600-Series Setup and Cabling Guide (P/N 014003078) and EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274), rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC 2-Gigabit Disk -Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *FC4500 Setup Guide (P/N 014003102, revision A03 or higher)*
- ◆ *FC4700-2 Setup Guide (P/N 0140373)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for HP-UX (P/N 300-000-614)*



Task	With Access Logix	Reference Document
<b>5 Server</b> <b>Install PowerPath</b>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide
<b>6 Switches</b> <b>Install</b>	<b>For a SAN</b> <input type="checkbox"/> Install switches, if not already installed. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port. <input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Rails, cabinet, and switch documentation  Switch documentation
<b>7 Storage System</b> <b>Install</b>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
<b>8 Storage System</b> <b>Initialize and install software enablers</b>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install the enabler for them.	Storage-system setup guide  Navisphere Manager administrator's guide and online help



Task	With Access Logix	Reference Document
<b>13 Server</b> <i>Make target SPs available (cont.)</i>	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b> <input type="checkbox"/> Make sure again that each HBA sees only the targets (SPs) to which it is zoned with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> <input type="checkbox"/> Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	CX-Series Server Software for HP-UX Installation Guide  HP-UX documentation
<b>14 Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.	Navisphere Manager administrator's guide and online help
<b>15 Server</b> <i>Make LUNs visible</i>	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b> <input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> <b>ioscan -fnC disk</b> If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.	CX-Series Server Software for HP-UX Installation Guide  HP-UX documentation
<b>16 Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<p>17 <b>Server</b> <i>Configure PowerPath devices</i></p>	<p><input type="checkbox"/> Use the following PowerPath command to configure PowerPath: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all the paths to the LUNs: <b>powermt display dev=all class=clariion</b></p> <p>If PowerPath cannot see all the paths, verify that</p> <ul style="list-style-type: none"> <li>• you registered your PowerPath license key if you have one</li> <li>• the <b>OptionsSupported Autotrespass</b> entry is defined as described in step 3</li> <li>• the storage-system properties are set as defined in step 11.</li> </ul> <p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command: <b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file: <b>/etc/powermt.custom</b></p>	<p>PowerPath product guide</p>
<p>18 <b>Server</b> <i>Test PowerPath with a license key</i></p>	<p>If you have a PowerPath license key</p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <p><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</p> <p><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></p> <p><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</p> <p><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b></p> <p>where x is a device that represents the chosen LUN.</p> <p><input type="checkbox"/> Start I/O to the LUN.</p> <p><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</p>	<p>PowerPath product guide</p>

Task	With Access Logix	Reference Document
<p><b>18 Server</b>  <i>Test PowerPath with a license key (cont.)</i></p>	<p><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that</p> <ul style="list-style-type: none"> <li>• The state of the uncabled paths becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <p><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</p> <p><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command:</p> <p><b>powermt restore</b></p>	
<p><b>19 Server</b>  <i>Make LUNs available to HP-UX</i></p>	<p><input type="checkbox"/> Prepare the LUNs to receive data using the Logical Volume Manager (LVM).</p> <p>If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.</p>	<p>Host connectivity guide and HP-UX documentation</p>

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist - New HP-UX Server and Existing Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port or an SP port. <input type="checkbox"/> Install the HBA driver.	<input type="checkbox"/> Install the HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port or an SP port. <input type="checkbox"/> Install the HBA driver.	HBA documentation
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <input type="checkbox"/> Reboot the server to complete the installation of the drivers.	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <input type="checkbox"/> Reboot the server to complete the installation of the drivers.	Host connectivity guide and HBA documentation
3 <b>Server</b> <i>Install Host Agent</i>	<input type="checkbox"/> Install the Navisphere Host Agent and CLI. <input type="checkbox"/> Modify user login scripts.	<input type="checkbox"/> Install the Navisphere Host Agent and CLI. <input type="checkbox"/> Modify user login scripts.	CX-Series Server Software for HP-UX Installation Guide

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>3 Server</b> <i>Install Host Agent (cont.)</i></p>	<p><input type="checkbox"/> Edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows:</p> <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist: <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> <li>• For FC4500 storage systems, if you know the IP addresses of the portal storage-system SPs, add an entry with the following format for each SP to the <b>agent.config</b> file: <b>system@SP_ip_address</b> <b>where SP_ip_address is the address of the SP.</b></li> </ul> <p><input type="checkbox"/> Continue to edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows:</p> <ul style="list-style-type: none"> <li>• Comment the <b>OptionsSupported Autotrespass</b> entry as follows: <b># OptionsSupported Autotrespass</b>  The above entry will set the initiator type for the HBAs to no auto trespass when they register with the storage system:</li> <li>• Edit any other entries as desired.</li> </ul>	<p><input type="checkbox"/> Edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows:</p> <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist: <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> <li>• For FC4500 storage systems, if you know the IP addresses of the portal storage-system SPs, add an entry with the following format for each SP to the <b>agent.config</b> file: <b>system@SP_ip_address</b> <b>where SP_ip_address is the address of the SP.</b></li> </ul> <p><input type="checkbox"/> Continue to edit other entries in the Navisphere Host Agent configuration file <b>agent.config</b> file as desired.</p> <p>For a CX300, CX500, CX700, or FC4700-Series storage system, go to step 5. For an FC4500 storage system, go to 6.</p>	<p>CX-Series Server Software for HP-UX Installation Guide</p>
<p><b>4 Server</b> <i>Install admsnap</i></p>	<p><input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.</p> <p>Go to step 7.</p>	<p>N/A</p>	<p>CX-Series Server Software for HP-UX Installation Guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
5 CX400, CX600, or FC4700-Series Storage-System Without Access Logix <i>Set storage-system type</i>	N/A	<p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul> <p><input type="checkbox"/> Use the following Navisphere CLI command to set the system type to no auto trespass:</p> <p><b>navicli -h <i>hostname</i> systemtype -config a</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 7.</p>	Navisphere CLI reference
6 FC4500 Storage-System Without Access Logix <i>Set storage-system type</i>	N/A	<p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to a storage-system serial port, as described in the storage-system setup guide.</li> </ul> <p><u>From an attached or networked host</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to set the system type to no auto trespass:</p> <p><b>navicli -d <i>device</i> -h <i>hostname</i> systemtype -config a</b></p> <p>where <i>device</i> is the storage system's name <i>hostname</i> is the server's name or network address.</p>	Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<p>6 <b>FC4500 Storage-System Without Access Logix</b> <i>Set storage-system type (cont.)</i></p>		<p><u>From a serially connected laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to set the system type to no auto trespass:</p> <p><b>navicli -np -d <i>device</i> systemtype -config a</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	Navisphere CLI reference
<p>7 <b>Storage System Update software</b></p>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 2-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 2-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p>	Navisphere Manager administrator's guide and online help
<p>8 <b>Server Cable to switches or storage system</b></p>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p>	Storage-system setup guide

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>8 Server</b> <i>Cable to switches or storage system (cont.)</i></p>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide</p>
<p><b>9 Switches</b> <i>Zone</i></p>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul> <p>For a CX400, CX600, or FC4700-Series storage system, go to step 11; for an FC4500 storage system, go to step 13.</p>	<p>Switch management documentation</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>10 Storage System Register HBAs</b>	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:  <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.  For an FC4500 storage system, go to step 13.	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:  <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b>	CX-Series Server Software for HP-UX Installation Guide   Navisphere Manager administrator's guide and online help
<b>11 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System Set up security</b>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	<input type="checkbox"/> Use Navisphere Manager to define a global administrator (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>12 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System Set properties for PowerPath</b>	Perform this task <i>either</i> <ul style="list-style-type: none"> <li>across the LAN connected to the storage-system SPs <i>or</i></li> <li>from an attached host or a host networked to an attached host <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul> <p><u>From the LAN</u></p> <input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators): <b>Failover mode</b> to 1 <b>Array compath</b> to Enabled Go to step 14.	<b>CX400, CX600, or FC4700-Series</b> Perform this task <i>either</i> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul>	Navisphere Manager administrator's guide and online help o

Task	With Access Logix	Without Access Logix	Reference Document
<p>12 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System <i>Set properties for PowerPath (cont.)</i></p>	<p><u>From an attached or networked host or laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <p><b>navicli -h <i>hostname</i> storagegroup -sethost -host <i>servername</i> -failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> storagegroup -setpath -host <i>servername</i> -arraycomppath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system</p> <p><i>servername</i> is the server's name or network address</p> <p>Go to step 14.</p>	<p><u>From an attached or networked host or laptop</u></p> <p><input type="checkbox"/> Use following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycomppath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 14.</p>	<p>Navisphere CLI reference</p>
<p>13 FC4500 Storage System <i>Set properties for PowerPath</i></p>	<p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>across the LAN connected to the Navisphere portal for the storage system, <i>or</i></li> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to a storage-system serial port, as described in the storage-system setup guide.</li> </ul> <p><u>Across LAN</u></p> <p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators):</p> <p><b>Failover mode to 1</b></p> <p><b>Array comppath to Enabled</b></p>	<p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to a storage-system serial port, as described in the storage-system setup guide.</li> </ul>	<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>13 FC4500 Storage System</b> <i>Set properties for PowerPath (cont.)</i></p>	<p><u>From an attached host or networked host</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties for the server's existing HBA existing ports (initiators):</p> <p><b>navicli -d <i>device</i> -h <i>hostname</i> storagegroup -sethost -failovermode 1</b></p> <p><b>navicli -d <i>device</i> -h <i>hostname</i> storagegroup -sethost -arraycommpath 1</b></p> <p>where <i>device</i> is the storage system's name <i>hostname</i> is the server's name or network address.</p> <p><u>From a serially connected laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties for the server's existing HBA existing ports (initiators):</p> <p><b>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> --arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>). <i>servername</i> is the name of the server with the HBAs.</p>	<p><u>From an attached or networked host</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -d <i>device</i> -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -d <i>device</i> -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>device</i> is the storage system's name <i>hostname</i> is the server's name or network address.</p> <p><u>From a serially connected laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -np -d <i>device</i> failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	<p>Navisphere CLI reference</p> <p>Storage-system setup guide and Navisphere CLI reference</p>



Task	With Access Logix	Without Access Logix	Reference Document
<p><b>15 Storage System Configure</b></p>	<p><b>If the server will use an <i>existing</i> Storage Group</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to connect the server to the Storage Group.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands:   <b>ioscan -fnC disk</b>  <b>insf -e</b>                       If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.</li> </ul> <p><b>If the server will use a <i>new</i> Storage Group</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create the Storage Group, and assign LUNs to the Storage Group.</li> <li><input type="checkbox"/> Use Navisphere Manager to connect the server to the new Storage Group.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands:   <b>ioscan -fnC disk</b>  <b>insf -e</b></li> </ul>	<p>Navisphere Manager administrator's guide and online help</p> <p>HP-UX documentation</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>16 Server</b> <i>Make new LUNs visible</i></p>	<p><input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b> Now the LUNs in the Storage Group look like any other disks in the server.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.</p> <p><input type="checkbox"/> Verify that HP-UX sees device entries for all LUNs with the following HP-UX command: <b>ioscan -fnC disk</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in steps 5 and 12 or steps 6 and 13.</li> </ul>	<p><input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b> Now the LUNs look like any other disks in the server.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b></p> <p><input type="checkbox"/> Verify that HP-UX sees device entries for all LUNs with the following HP-UX command: <b>ioscan -fnC disk</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in steps 5 and 12 or steps 6 and 13.</li> </ul>	<p>CX-Series Server Software for HP-UX Installation Guide</p> <p>HP-UX documentation</p> <p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
17 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration.	<input type="checkbox"/> Plan your monitoring configuration.	Navisphere Manager administrator's guide and online help
18 <b>Server</b> <i>Configure any new PowerPath devices</i>	<input type="checkbox"/> Configure PowerPath with the following command: <b>powermt config</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  <input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command: <b>powermt save</b>  The PowerPath configuration is saved in the following file: <b>/etc/powermt.custom</b>	<input type="checkbox"/> Configure PowerPath with the following command: <b>powermt config</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b>  <input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command: <b>powermt save</b>  The PowerPath configuration is saved in the following file: <b>/etc/powermt.custom</b>	PowerPath product guide
19 <b>Server</b> <i>Test PowerPath with a license key</i>	If you have a PowerPath license key <b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.  <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.  <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b>  <input type="checkbox"/> Choose one available LUN to receive I/O for the test.	If you have a PowerPath license key <b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.  <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.  <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b>  <input type="checkbox"/> Choose one available LUN to receive I/O for the test.	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>19 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a device that represents the chosen LUN.  <input type="checkbox"/> Start I/O to the LUN.  <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.  <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.  <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a device that represents the chosen LUN.  <input type="checkbox"/> Start I/O to the LUN.  <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.  <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.  <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>20 Server</b> <b>Make LUNs available to HP-UX</b>	<input type="checkbox"/> Prepare the LUNs to receive data using the Logical Volume Manager (LVM).  If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.	<input type="checkbox"/> Prepare the LUNs to receive data using the Logical Volume Manager (LVM).	Host connectivity guide and HP-UX documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist - Existing HP-UX Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation
2 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 2-3), update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	HBA documentation CX-Series Server Software for HP-UX installation guide
3 <b>Storage System</b> <i>Update software</i>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 2-3), update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	Navisphere Manager administrator's guide and online help
4 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	HP-UX Host connectivity guide and HBA documentation
5 <b>Server</b> <i>Set storage-system type</i>	<input type="checkbox"/> Edit the Navisphere Host Agent configuration file <b>agent.config</b> to comment the <b>OptionsSupported Autotrespass</b> entry as follows:  <b># OptionsSupported Autotrespass</b>  The above entry will set the initiator type for the HBAs to no auto trespass when they register with the storage system.  <input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:  <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b>	CX-Series Server Software for HP-UX Installation Guide

Task	With Access Logix	Reference Document
<b>6 Server</b> <b>Install PowerPath</b>	<input type="checkbox"/> Insert the PowerPath installation CD and mount it. <input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Register PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a> <input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b> <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees the paths to the LUNs: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> </ul> <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide  PowerPath product guide
<b>7 Storage System</b> <b>Install</b>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
<b>8 Storage System</b> <b>Initialize and install software enablers</b>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install the enabler for them.	Storage-system setup guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<p><b>9 Storage System</b> <i>Cable to switch or server and LAN</i></p>	<p><input type="checkbox"/> Connect the storage system to the switch or HBA ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <p><input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.</p>	<p>Storage-system setup guide</p>
<p><b>10 Storage System</b> <i>Set up security</i></p>	<p><input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.</p>	<p>Navisphere security administrator's guide and Navisphere Manager online help</p>
<p><b>11 Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> From a laptop connected to the storage system, as described in the storage-system initialization or setup guide, use the following Navisphere CLI commands to set the default storage-system properties:</p> <p><b>navicli -h hostname failovermode 1</b></p> <p><b>navicli -h hostname arraycomppath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p>Storage-system initialization guide and Navisphere CLI reference</p>



Task	With Access Logix	Reference Document
14 <b>Server</b> <i>Make target SPs available (cont.)</i>	<input type="checkbox"/> Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	HP-UX documentation
15 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.  <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.  <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.	Navisphere Manager administrator's guide and online help
16 <b>Server</b> <i>Make LUNs visible</i>	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b>  If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.  <input type="checkbox"/> Verify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	CX-Series Server Software for HP-UX Installation Guide  HP-UX documentation  HP-UX documentation
17 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration.  <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>18 Server</b> <b>Configure PowerPath devices</b>	<p><input type="checkbox"/> Use the following PowerPath command to configure PowerPath:</p> <p><b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all the paths to the LUNs:</p> <p><b>powermt display dev=all class=clarion</b></p> <p>If PowerPath cannot see all the paths, verify that</p> <ul style="list-style-type: none"> <li>• you registered your PowerPath license key if you have one</li> <li>• the <b>OptionsSupported Autotrespass</b> entry is defined as described in step 5.</li> <li>• the storage-system properties are set as defined in step 11.</li> </ul> <p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command:</p> <p><b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file:</p> <p><b>/etc/powermt.custom</b></p>	PowerPath product guide
<b>19 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <p><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:</p> <p><b>powermt display dev=all class=clarion</b></p> <p><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</p> <p><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:</p> <p><b>powermt display dev=x every=2</b></p> <p>where x is a device that represents the chosen LUN.</p> <p><input type="checkbox"/> Start I/O to the LUN.</p> <p><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</p>	PowerPath product guide

Task	With Access Logix	Reference Document
<b>19 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>20 Server</b> <b>Make LUNs available to HP-UX</b>	<input type="checkbox"/> Prepare the LUNs to receive data using the Logical Volume Manager (LVM). If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.	Host connectivity guide and HP-UX documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist - Existing HP-UX Server and Existing Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <b>Unmount file systems</b>	<input type="checkbox"/> Unmount any file systems that reside on the storage system.	<input type="checkbox"/> Unmount any file systems that reside on the storage system.	HP-UX documentation
2 <b>Server</b> <b>Install additional HBAs</b>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation
3 <b>Server</b> <b>Update Software</b>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 2-3), update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 2-3), update it: <ul style="list-style-type: none"> <li>• HBA driver (Navisphere Host Agent)</li> </ul>	HBA documentation Navisphere Host Agent and CLI for HP-UX installation guide SnapView installation guide (revision A02 or higher)
4 <b>Storage System</b> <b>Update software</b>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 2-3), update it. <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 2-3), update it. <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<p>5 <b>Server</b> <i>Set HBA driver parameters</i></p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p>HP-UX Host connectivity guide and HBS documentation</p>
<p>6 <b>Server</b> <i>Set storage-system type</i></p>	<p><input type="checkbox"/> Edit the Navisphere Host Agent configuration file <b>agent.config</b> to comment the <b>OptionsSupported Autotrespass</b> entry as follows:</p> <p><b># OptionsSupported Autotrespass</b></p> <p>The above entry will set the initiator type for the HBAs to no auto trespass when Host Agent is restarted in the next step.</p> <p><input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:</p> <p><b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b></p> <p>For an FC4500 storage system, go to step 8.</p>	<p><input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:</p> <p><b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b></p> <p><input type="checkbox"/> From the server, use the following Navisphere CLI command to set the system type to no auto trespass:</p> <p><u>For a CX400, CX600, or FC4700-Series storage system</u></p> <p><b>navicli -h <i>hostname</i> systemtype -config a</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p>CX-Series Server Software for HP-UX Installation Guide</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>6 Server</p> <p><b>Set storage-system type (cont.)</b></p>		<p><u>For a FC4500 storage system</u></p> <p><b>navicli -d device systemtype -config a</b></p> <p>where <i>device</i> is the storage system's name.</p> <p>For an FC4500 storage system, go to step 8.</p>	<p>Navisphere CLI reference</p>
<p>7 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</p> <p><b>Set properties for PowerPath</b></p>	<p><b>For a server with registered HBAs</b></p> <p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>across the LAN connected to the storage-system SPs <i>or</i></li> <li>from an attached host or a host networked to an attached host <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul> <p><u>From the LAN</u></p> <p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators):</p> <p><b>Failover mode</b> to 1</p> <p><b>Array comppath</b> to Enabled</p>	<p><b>For a server with any HBAs</b></p> <p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul>	<p>Navisphere Manager administrator's guide and online help o</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System <i>Set properties for PowerPath (cont.)</i></p>	<p><u>From an attached or networked host or laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <p><b>navicli -h <i>hostname</i> storagegroup -sethost -host <i>servername</i> -failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> storagegroup -setpath -host <i>servername</i> -arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system</p> <p><i>servername</i> is the server's name or network address</p> <p><b>For a server with unregistered HBAs</b></p> <p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to the storage system, as described in the storage-system initialization or setup guide.</li> </ul> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go step 9.</p>	<p><u>From an attached or networked host or laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 9.</p>	<p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>8 <b>FC4500 Storage System</b> <i>Set properties for PowerPath</i></p>	<p><b>For a server with registered HBAs</b></p> <p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>across the LAN connected to the Navisphere portal for the storage system, <i>or</i></li> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to a storage-system serial port, as described in the storage-system setup guide.</li> </ul> <p><u>Across LAN</u></p> <p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators):</p> <p><b>Failover mode to 1</b></p> <p><b>Array comppath to Enabled</b></p> <p><u>From an attached host or networked host</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <p><b>navicli -d device -h hostname storagegroup -sethost -failovermode 1</b></p> <p><b>navicli -d device -h hostname storagegroup -sethost -arraycomppath 1</b></p> <p>where <i>device</i> is the storage system's name <i>hostname</i> is the server's name or network address.</p>	<p><b>For a server with any HBAs</b></p> <p>Perform this task <i>either</i></p> <ul style="list-style-type: none"> <li>from an attached host or a host networked to an attached host, <i>or</i></li> <li>from a laptop connected to a storage-system serial port, as described in the storage-system setup guide.</li> </ul> <p><u>From an attached or networked host</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -d device -h hostname failovermode 1</b></p> <p><b>navicli -d device -h hostname arraycomppath 1</b></p> <p>where <i>device</i> is the storage system's name <i>hostname</i> is the server's name or network address.</p>	<p>Navisphere Manager administrator's guide and online help</p> <p>Navisphere CLI reference</p>



Task	With Access Logix	Without Access Logix	Reference Document
8 <b>FC4500 Storage System</b> <i>Set properties for PowerPath (cont.)</i>	<p><u>From a serially connected laptop</u></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -np -d <i>device</i> failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>		Storage-system setup guide and Navisphere CLI reference
9 <b>Server</b> <i>Install PowerPath</i>	<p><input type="checkbox"/> Insert the PowerPath installation CD and mount it.</p> <p><input type="checkbox"/> Install PowerPath.</p> <p><input type="checkbox"/> Register PowerPath.</p> <p><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></p> <p><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></p>	<p><input type="checkbox"/> Insert the PowerPath installation CD and mount it.</p> <p><input type="checkbox"/> Install PowerPath.</p> <p><input type="checkbox"/> Register PowerPath.</p> <p><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></p> <p><input type="checkbox"/> Execute the following PowerPath command: <b>powermt config</b></p>	<p>PowerPath Release Notes and PowerPath for UNIX installation and administrator's guide</p> <p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>9 Server</b> <i>Install PowerPath (cont.)</i></p>	<p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees the paths to the LUNs:</p> <p><b>powermt display dev=all class=clariion</b></p> <p>If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in step 7 or 8.</li> </ul> <p>If you did not install any additional HBAs in the server, go to step 11.</p> <p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command:</p> <p><b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file:</p> <p><b>/etc/powermt.custom</b></p>	<p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees the paths to the LUNs:</p> <p><b>powermt display dev=all class=clariion</b></p> <p>If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in step 7 or 8.</li> </ul> <p>If you did not install any additional HBAs in the server, go to step 11.</p> <p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command:</p> <p><b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file:</p> <p><b>/etc/powermt.custom</b></p>	<p>PowerPath product guide</p>
<p><b>10 Server</b> <i>Cable additional HBAs to switches or storage system</i></p>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p>	<p>Storage-system setup guide.</p> <p>Switch documentation</p>



Task	With Access Logix	Without Access Logix	Reference Document
<p>12 <b>Server</b> <i>Make target SPs available (cont.)</i></p>	<p><input type="checkbox"/> Make sure again that each HBA sees only the targets (SPs) to which it is zoned with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b></p> <p><input type="checkbox"/> Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.</p>	<p><input type="checkbox"/> Reverify that each HBA sees only the targets (SPs) to which it is zoned with the HP-UX following commands: <b>ioscan -fnC disk</b> <b>insf -e</b></p> <p><input type="checkbox"/> Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b></p>	<p>HP-UX documentation</p> <p>Navisphere Manager administrator's guide and online help</p>
<p>13 <b>Server</b> <i>Configure PowerPath devices</i></p>	<p><input type="checkbox"/> Use the following PowerPath command to configure PowerPath: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all the paths to the LUNs: <b>powermt display dev=all class=clariion</b></p> <p>If PowerPath cannot see all the paths, verify that</p> <ul style="list-style-type: none"> <li>• you registered your PowerPath license key if you have one</li> <li>• the <b>OptionsSupported Autotrespass</b> entry is defined as described in step 6</li> <li>• the storage-system properties are set as defined in step 7 or 8</li> </ul>	<p><input type="checkbox"/> Use the following PowerPath command to configure PowerPath: <b>powermt config</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all the paths to the LUNs: <b>powermt display dev=all class=clariion</b></p> <p>If PowerPath cannot see all the paths, verify that</p> <ul style="list-style-type: none"> <li>• you registered your PowerPath license key if you have one</li> <li>• the <b>systemtype</b> is defined as described in step 6</li> <li>• the storage-system properties are set as defined in step 7 or 8</li> </ul>	<p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>13 Server</b> <b>Configure PowerPath devices (cont.)</b></p>	<p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command:</p> <p><b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file:</p> <p><b>/etc/powermt.custom</b></p>	<p><input type="checkbox"/> If PowerPath can see all the path to the LUNs, save the PowerPath configuration with the following command:</p> <p><b>powermt save</b></p> <p>The PowerPath configuration is saved in the following file:</p> <p><b>/etc/powermt.custom</b></p>	<p>PowerPath product guide</p>
<p><b>14 Server</b> <b>Test PowerPath with a license key</b></p>	<p>If you have a PowerPath license key</p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <p><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</p> <p><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:</p> <p><input type="checkbox"/> <b>powermt display dev=all class=clariion</b></p> <p><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</p> <p><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:</p> <p><b>powermt display dev=x every=2</b> where <i>x</i> is a device that represents the chosen LUN.</p> <p><input type="checkbox"/> Start I/O to the LUN.</p> <p><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</p>	<p>If you have a PowerPath license key</p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <p><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</p> <p><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:</p> <p><b>powermt display dev=all class=clariion</b></p> <p><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</p> <p><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:</p> <p><b>powermt display dev=x every=2</b> where <i>x</i> is a device that represents the chosen LUN</p> <p><input type="checkbox"/> Start I/O to the LUN.</p> <p><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</p>	<p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>14 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>15 Server</b> <b>Mount file systems</b>	<input type="checkbox"/> Mount any file systems unmounted in step 1.	<input type="checkbox"/> Mount any file systems unmounted in step 1.	HP-UX documentation

## DMP Configurations for HP-UX

Read this section if you are installing an HP-UX VERITAS DMP configuration with a new server and a new CX300, CX500, or CX700 storage system. A new server and storage system are defined as follows:

**New server** - A server running HP-UX and *not* connected to any storage system.

**New storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

Topics relating to the checklist for an HP-UX configuration with DMP software are

- ◆ Required Host Software Revisions..... 2-46
- ◆ Prerequisites ..... 2-46
- ◆ Documentation..... 2-47
- ◆ DMP Checklist - New HP-UX Server and New Storage System ..... 2-48

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## Required Host Software Revisions

- ◆ HP-UX operating system revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ VxVM 3.5 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for UNIX Release Notes* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your HP-UX version.

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## Prerequisites

- ◆ All switches must be installed.
- ◆ Storage systems must be set up, initialized (if required), and connected to switches, and any optional storage-system software (Access Logix, SnapView, MirrorView, MirrorView / A, SAN Copy) must be installed.
- ◆ Navisphere Manager must be installed.
- ◆ If any storage systems have SnapView, the admsnap utility must be installed on the servers that will be the SnapView production and secondary hosts.
- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system servers and that will be connected to the SPs in the storage system.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SnapView, SAN Copy, MirrorView, and MirrorView / A if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver
  - Switches
  - HP-UX operating system
  - VERITAS Volume Manager
- ◆ *EMC Navisphere Host Agent and CLI for HP-UX Version 6.X Installation Guide* (P/N 069001146)  
or  
*EMC CX-Series Server Software for HP-UX Installation Guide* (P/N 300-002-043)
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for HP-UX* (P/N 300-000-614)

## DMP Checklist - New HP-UX Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port or an SP port. <input type="checkbox"/> Install the HBA driver.	HBA documentation
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <b>Caution</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays. <input type="checkbox"/> Reboot the server to complete the installation of the drivers. <input type="checkbox"/> <b>Checkpoint</b> — For a SAN, verify the server connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• Only the left LED is green, which indicates that a 1-Gbit HBA port is logged in to the switch port.</li> <li>• Both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Host connectivity guide and HBA documentation
3 <b>Switches</b> <i>Connect servers and SPs</i>	<input type="checkbox"/> Verify that the servers and SPs are connected to the switch.	Documentation that ships with the switches
4 <b>Switches</b> <i>Zone</i>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each host initiator to an SP.	Switch documentation
5 <b>Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Make sure each HBA sees only the targets (SPs) to which it is zoned with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> <input type="checkbox"/> <b>Checkpoint</b> - Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	HP-UX documentation

Task	With Access Logix	Reference Document
6 <b>Server</b> <i>Install Host Agent</i>	<input type="checkbox"/> Install the Navisphere Host Agent. <input type="checkbox"/> Modify user login scripts. <input type="checkbox"/> Edit the Navisphere Host Agent configuration file ( <b>agent.config</b> ) as follows: <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist:  <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> </ul> <input type="checkbox"/> Verify that the Navisphere Host Agent configuration file ( <b>agent.config</b> ) has the following entry commented out: <b># Options Supported Autotrespass</b> (leading # is present) The above entry will set the initiator type for the HBAs to auto trespass when Host Agent is restarted later in this procedure. <input type="checkbox"/> Continue to edit other entries in the Navisphere Host Agent configuration file ( <b>agent.config</b> ) as desired. <input type="checkbox"/> Restart the Host Agent to register the HBAs with the storage system.	CX-Series Server Software for HP-UX Installation Guide
7 <b>Storage System</b> <i>Set up security</i>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
8 <b>Storage System</b> <i>Set properties</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the default failover mode and array commpath properties with the following commands: <b>navicli -h hostname failovermode 2</b> <b>navicli -h hostname arraycommpath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
9 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the host initiators to Storage Groups.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>10 Server</b> <b><i>Make LUNs visible</i></b>	<input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands: <b>/sbin/init.d/agent stop</b> <b>/sbin/init.d/agent start</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.  <input type="checkbox"/> <b>Checkpoint</b> - Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	CX-Series Server Software for HP-UX Installation Guide  HP-UX documentation
<b>11 Storage System</b> <b><i>Set up Event Monitor</i></b>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
<b>12 Server</b> <b><i>Install the CLARiiON DMP driver</i></b>	<input type="checkbox"/> Download the CLARiiON DMP driver to the server from Services on the VERITAS website. <input type="checkbox"/> Use the <b>swinstall</b> command to install the CLARiiON DMP driver on the server. <b>Note</b> Until <b>rootdg</b> is created (part of <b>vxinstall</b> command) on at least one disk, DMP displays an error message looking for the <b>config</b> daemon.	VERITAS Volume Navisphere Manager documentation
<b>13 Server</b> <b><i>Reboot</i></b>	<input type="checkbox"/> Reboot the server using the <b>reboot</b> command <ul style="list-style-type: none"> <li>• to make LUNs available to the OS</li> <li>• to make LUNs accessible via both SPs</li> </ul> <b>Important</b> If you do not set the failover mode to 2, you will see only half of the expected paths to the SPs.	VERITAS Volume Navisphere Manager documentation
<b>14 Server</b> <b><i>Configure Volume Manager</i></b>	<input type="checkbox"/> Run <b>vxinstall</b> to configure Volume Manager and place at least one LUN under VxVM control.	VERITAS Volume Navisphere Manager documentation



Task	With Access Logix	Reference Document
16 Server <i>Verify DMP Operation (cont.)</i>	<input type="checkbox"/> Verify that I/O is still running with <code>iostat -xn</code>	HP-UX documentation

## Configurations for HP-UX Without EMC Failover Software

Read this section if you are installing an HP-UX configuration with a new server that will *not* run EMC failover and a new storage system. A new server and storage system are defined as follows:

**New server** - A server running HP-UX and *not* connected to any storage system.

**New storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

Topics relating to the checklist for an HP-UX configuration without EMC failover software are

- ◆ Prerequisites ..... 2-53
- ◆ Documentation..... 2-54
- ◆ Without EMC Failover Software Checklist - New HP-UX Server and New Storage System..... 2-55

### Prerequisites

- ◆ All switches must be installed.
- ◆ Storage systems must be set up, initialized (if required), and connected to switches, and any optional storage-system software (Access Logix, SnapView, MirrorView, MirrorView / A) you have must be installed.
- ◆ If any storage systems have SnapView, the admsnap utility must be installed on the servers that will be the SnapView production and secondary hosts.
- ◆ If you will use Navisphere Manager 6.X, you must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system servers and that will be connected to the SPs the storage system.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SnapView, MirrorView, and MirrorView / A if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver
  - Switches and switch management software
  - HP-UX operating system
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125) (P/N 069001143)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for HP-UX* (P/N 300-000-614)

## Without EMC Failover Software Checklist - New HP-UX Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port or an SP port. <input type="checkbox"/> Install the HBA driver.	HBA documentation
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <input type="checkbox"/> Reboot the server to complete the installation of the drivers. <input type="checkbox"/> <b>Checkpoint</b> — For a SAN, verify the server connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Host connectivity guide and HBA documentation  Switch documentation
3 <b>Switches</b> <i>Zone</i>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each host initiator to an SP.	Switch management documentation
4 <b>Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Make sure each HBA sees only the targets (SPs) to which it is zoned with the following HP-UX commands: <b>ioscan -fnC disk</b> <b>insf -e</b> <input type="checkbox"/> <b>Checkpoint</b> - Reverify that HP-UX sees device entries for all LUNS with the following HP-UX command: <b>ioscan -fnC disk</b>	HP-UX documentation

Task	With Access Logix	Reference Document
<p>5 <b>Server</b> <i>Install Host Agent</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the Navisphere Host Agent.</li> <li><input type="checkbox"/> Modify user login scripts.</li> <li><input type="checkbox"/> Edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows:                             <ul style="list-style-type: none"> <li>• Add the following entry if it does not already exist: <b>device auto auto</b></li> <li>• Add at least one privileged user.</li> <li>• For FC4500 storage systems, if you know the IP addresses of the portal storage-system SPs, add an entry with the following format for each SP to the <b>agent.config</b> file: <b>system@SP_ip_address</b> <b>where SP_ip_address is the address of the SP.</b></li> </ul> </li> <li><input type="checkbox"/> Continue to edit the Navisphere Host Agent configuration file <b>agent.config</b> file as follows:                             <ul style="list-style-type: none"> <li>• Comment out or comment the <b>OptionsSupported Autotrespass</b> entry as follows: <u>No auto trespass</u> (for HP-UX without PV Links) <b># OptionsSupported Autotrespass</b> The above entry will set the initiator type for the HBAs to no auto trespass when Host Agent is restarted later in this procedure. <u>Auto trespass</u> (for HP-UX with PVLinks) <b>OptionsSupported Autotrespass</b> The above entry will set the initiator type for the HBAs to auto trespass when Host Agent is restarted later in this procedure.</li> <li>• Edit any other entries as desired.</li> </ul> </li> </ul>	<p>CX-Series Server Software for HP-UX Installation Guide</p>
<p>6 <b>Storage System</b> <i>Set up security</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> For Navisphere 6.X, use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.</li> </ul>	<p>Navisphere security administrator's guide and Navisphere Manager online help</p>

Task	With Access Logix	Reference Document
<p><b>7 Storage System</b> <b>Set properties</b></p>	<p><input type="checkbox"/> Use the following Navisphere CLI commands to set the default failover mode and array compath properties with the following commands:</p> <p><b>navicli -h <i>hostname</i> failovermode 0</b></p> <p><b>navicli -h <i>hostname</i> arraycompath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p>Navisphere CLI reference</p>
<p><b>8 Storage System</b> <b>Configure</b></p>	<p><input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.</p> <p><input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.</p> <p><input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.</p>	<p>Navisphere Manager administrator's guide and online help</p>
<p><b>9 Server</b> <b>Make LUNs visible</b></p>	<p><input type="checkbox"/> Log in as root and restart the Navisphere Host Agent with the following HP-UX commands:</p> <p><b>/sbin/init.d/agent stop</b></p> <p><b>/sbin/init.d/agent start</b></p> <p><input type="checkbox"/> <b>Checkpoint</b> - Verify that HP-UX can recognize these LUNs with the following HP-UX commands:</p> <p><b>ioscan -fnC disk</b></p> <p><b>insf -e</b></p> <p>If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.</p> <p><input type="checkbox"/> Verify that HP-UX sees device entries for all LUNs with the following HP-UX command:</p> <p><b>ioscan -fnC disk</b></p> <p>If you do not see two paths to each LUN, verify that the <b>OptionsSupported Autotrespass</b> entry in the Host Agent configuration file is uncommented or commented as described in step 5.</p>	<p>CX-Series Server Software for HP-UX Installation Guide</p> <p>HP-UX documentation</p>
<p><b>10 Storage System</b> <b>Set up Event Monitor</b></p>	<p><input type="checkbox"/> Plan your monitoring configuration.</p> <p><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</p>	<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Reference Document
<b>11 Server</b> <i>Make LUNs available to HP-UX</i>	<input type="checkbox"/> Prepare the LUNs to receive data using the Logical Volume Manager (LVM).  If HP-UX does not recognize any LUNs, verify the connection to the Storage Group.	Host connectivity guide and HP-UX documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## Linux Installation Checklist

This chapter contains checklists of the tasks required to install a CLARiiON storage system in a configuration with a Linux<sup>®</sup> server and PowerPath, VERITAS DMP, or with no EMC failover software.

Topics are

- ◆ PowerPath Configurations for Linux.....3-2
- ◆ DMP Configurations for Linux.....3-39
- ◆ Configurations for Linux Without EMC Failover Software.....3-47

## PowerPath Configurations for Linux

Read this section if you are installing a Linux PowerPath configuration with a new or existing server and a new or existing storage system. A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running Linux that is *not* connected to any storage system.

**existing server** - A server running Linux that is already connected to one or more storage systems.

**new storage system** - A CX300, CCX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

**existing storage system** - A CX200, CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series storage system that is already connected to one or more servers and is in a Navisphere domain.

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All CLARiiON storage systems connected to the server must be CX200, CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series storage systems. If any other type of CLARiiON storage system is connected to the server, the server cannot run PowerPath.

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Topics relating to the checklists for Linux PowerPath configurations are

- ◆ Required Host Software Revisions..... 3-3
- ◆ Prerequisites ..... 3-3
- ◆ Documentation..... 3-4
- ◆ PowerPath Checklist — New Linux Server and New Storage System..... 3-7
- ◆ PowerPath Checklist — New Linux Server and Existing Storage System..... 3-13
- ◆ PowerPath Checklist — Existing Linux Server and New Storage System..... 3-23
- ◆ PowerPath Checklist — Existing Linux Server and Existing Storage System ..... 3-29

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## Required Host Software Revisions

- ◆ Linux operating system revision and errata listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ Linux PowerPath
  - For CX200, CX400, CX600, and FC4700-Series storage systems Version 3.0.2 or higher
  - For CX300, CX500, and CX700, and storage systems Version 3.0.3 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for Linux* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your Linux version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system servers and that will be connected to the SPs in CX200, CX300, CX400, CX500, CX600, CX700 or FC4700-Series storage systems.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere 6.X CLI.
  - On a network that is connected to the storage-system server and that you will connect to SPs in CX200, CX300, CX400, CX500, CX600, CX700 or FC4700-Series storage systems.
- ◆ For an FC4500 storage system connected to a server on which you will install PowerPath, you must have a computer that you can connect to the storage system. This computer must run
  - RedHat 2.1 Advance Server e.9 or higher kernel and
  - Navisphere Host Agent and CLI version 6.4 or higher

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView /A if you have this software. The following documents will help you with this planning:
  - *EMC Fibre Channel Storage System CX200-Series Configuration Planning Guide (P/N 014003115)*
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide (P/N 300-001-273)*
  - *EMC CX400-Series and CX600-Series Storage Systems Configuration Planning Guide (P/N 014003113)*
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide (P/N 014003087)*
  - *EMC Fibre Channel Storage System Model FC4700 Configuration Planning Guide (P/N 014003016)*
  - *EMC Fibre Channel Storage System Model FC4500, FC5300, and FC5700 Configuration Planning Guide (P/N 014003039)*

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## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop or, for an FC4500 or FC4700, on the computer you will connect to the storage system, before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver

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This documentation is also available from the following website:

For Qlogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- Switches and switch management software
- Red Hat Linux operating system
- ◆ *PowerPath Version 4.3 Product Guide (P/N 300-001-673)*  
or  
*PowerPath Version 3.0 Product Guide (P/N 300-001-047)*

- ◆ *PowerPath for Linux Version 4.3.1 Installation Guide*  
(P/N 300-002-247)  
or  
*PowerPath for Linux Version 4.3 Installation Guide*  
(P/N 300-001-687)  
or  
*PowerPath Version 3.0 Installation and Administration Guide for Linux* (P/N 300-000-514)
- ◆ *EMC Navisphere Host Agent and CLI for Linux Version 6.X Installation Guide* (P/N 069001148)  
or  
*EMC CX-Series Server Software for Windows Installation Guide*  
(P/N300-002-038)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference*  
(P/N 069001038)
- ◆ *EMC SnapView Installation Guide* (P/N 069001193, revision A02 or higher)
- ◆ *EMC SAN Copy Installation Guide* (P/N 069001187)
- ◆ *EMC Rails and Enclosures Field Installation Guide*  
(P/N 300-001-799)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082) - for SPS installation only
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX200-Series Setup and Cabling Guide* (P/N 014003116)
- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide*  
(P/N 300-001-276, rev A02 or higher)  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-276, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX400-Series Setup and Cabling Guide* (P/N 014003105)

- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide (P/N 300-001-275, rev A02 or higher)*  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-275, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC Storage Processor Enclosure (SPE) CX600-Series Setup and Cabling Guide (P/N 014003078)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274), rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC Storage Systems CX200-Series Initialization Guide (P/N 014003117)*
- ◆ *EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *FC4500 Setup Guide (P/N 014003102, revision A03 or higher)*
- ◆ *FC4700-2 Setup Guide (P/N 0140373)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for Linux (P/N 300-000-604)*

## PowerPath Checklist — New Linux Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <input type="checkbox"/> Boot host. <input type="checkbox"/> Install the appropriate version of the HBA driver. Make sure the QLogic HBA driver is always loaded after the internal SCSI adapter driver as specified by the <code>/etc/modules.conf</code> file.	HBA documentation (see URL on page 3-4)  PowerPath for Linux installation guide
2 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and PowerPath. <input type="checkbox"/> You will set the persistent bindings after the storage system is installed and the switches are zoned. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays. <input type="checkbox"/> Reboot host.	Linux host connectivity guide and HBA documentation (see URL on page 3-4)
3 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for Linux Installation Guide
4 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	

Task	With Access Logix	Reference Document
<b>5 Switches</b> <i>Install</i>	<b>For a SAN</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Install switches, if not already installed.</li> <li><input type="checkbox"/> Connect a cable from each host HBA port to a switch port.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.</li> </ul> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Rails, cabinet, and switch documentation
<b>6 Storage System</b> <i>Install</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the storage system in the cabinet, if not already installed.</li> </ul>	Rails and cabinet documentation
<b>7 Storage System</b> <i>Initialize and install software enablers</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports.</li> <li><input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system.</li> <li><input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.</li> </ul>	Storage-system setup guide  Navisphere Manager administrator's guide and online help



Task	With Access Logix	Reference Document
<b>12 Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <b>Note:</b> You need the WWPN of each SP port for the bindings.  <input type="checkbox"/> Reboot the server.  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure the <code>/proc/scsi/scsi</code> directory has entries for LUNZs.  <b>Note:</b> LUNZs are required to register the server HBAs with the storage system because LUNs have not be configured yet.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure the file <code>/proc/scsi</code> file in the directory for HBAs, has entries for the expected targets (HBAs).	HBA documentation (see URL on page 3-4)  Linux documentation  Navisphere Manager administrator's guide and online help  Linux documentation
<b>13 Server</b> <i>Prepare Server for PowerPath</i>	<input type="checkbox"/> Make sure you have 128 <code>sd</code> and <code>sg</code> devices in the <code>/dev</code> directory.  <input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.	PowerPath for Linux installation guide
<b>14 Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.  <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.  <input type="checkbox"/> Reload the driver (if the driver is loaded as a module) or reboot the server (if the driver is static to the kernel) so that Linux recognizes the LUNs. Now the LUNs in the Storage Group look like any other disks in the server.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <code>/proc/scsi/scsi</code> file and in the directory for the HBAs in the <code>/proc/scsi</code> directory.  If all LUN entries are missing from the file, verify the zoning. If only some LUNs are missing, use Navisphere Manager to check that the LUNs are assigned to the server's Storage Group.	Navisphere Manager administrator's guide and online help  HBA documentation  Linux documentation  Navisphere Manager online help

Task	With Access Logix	Reference Document
<b>15 Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Mount the CD-ROM. <input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Unmount the CD-ROM and remove it from the drive. <input type="checkbox"/> If you have a PowerPath license key, register it. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <input type="checkbox"/> If you loaded the HBA driver as a module, verify that all extensions are loaded. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a> <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs using the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Make sure that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 10.</li> <li>• Verify that you have the appropriate revision of the HBA driver loaded.</li> </ul>	PowerPath release notes and PowerPath for Linux installation guide           PowerPath product guide
<b>16 Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
<b>17 Server</b> <i>Make LUNs available to Linux</i>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs.	Host connectivity guide and Linux documentation

Task	With Access Logix	Reference Document
<b>18 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to the LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled paths becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — New Linux Server and Existing Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <input type="checkbox"/> Reboot host. <input type="checkbox"/> Install the appropriate version of the HBA driver. Make sure the QLogic HBA driver is always loaded after the internal SCSI adapter driver as specified by the <code>/etc/modules.conf</code> file.	<input type="checkbox"/> Install HBAs. <input type="checkbox"/> Reboot host. <input type="checkbox"/> Install the appropriate version of the HBA driver. Make sure the QLogic HBA driver is always loaded after the internal SCSI adapter driver as specified by the <code>/etc/modules.conf</code> file.	HBA documentation (see URL on page 3-4)  PowerPath for Linux installation guide
2 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and PowerPath. <input type="checkbox"/> You will set the persistent bindings after the storage system is installed and the switches are zoned. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays. <input type="checkbox"/> Reboot host.	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and PowerPath. <input type="checkbox"/> You will set the persistent bindings after the storage system is installed and the switches are zoned. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays. <input type="checkbox"/> Reboot host.	Linux host connectivity guide and HBA documentation (see URL on page 3-4)
3 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for Linux Installation Guide
4 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	N/A	

Task	With Access Logix	Without Access Logix	Reference Document
5 <b>Storage System</b> <i>Update software</i>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	Navisphere Manager administrator's guide and online help
6 <b>Server</b> <i>Cable HBAs to switches or storage system</i>	<input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.  Switch documentation  Switch documentation

Task	With Access Logix	Without Access Logix	Reference Document
7 <b>Switches</b> <i>Zone</i>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	Switch management documentation
8 <b>Server</b> <i>Register HBAs</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Restart the Navisphere Host Agent or run the Navisphere Server Utility.</li> <li><input type="checkbox"/> To make LUNs visible to the HBAs, either reload the HBA driver or reboot the server.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.</li> </ul> <p>For an FC4500 storage system, go to step 10.</p>	<p>N/A</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To make LUNs visible to the HBAs, either reload the HBA driver or reboot the server.</li> </ul> <p>For an FC4500 storage system, go to step 10.</p>	<p>CX-Series Server Software for Linux Installation Guide.</p> <p>Linux documentation</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>9 <b>CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators):</p> <p><b>Initiator Type</b> to CLARiiON Open</p> <p><b>Failover mode</b> to 1</p> <p><b>Array commpath</b> to Enabled</p> <p>For an FC4500 storage system, go to step 11.</p>	<p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>For an FC4500 storage system, go to step 11.</p>	<p>Navisphere Manager administrator's guide and online help and Navisphere CLI reference</p> <p>Navisphere CLI reference</p>



Task	With Access Logix	Without Access Logix	Reference Document
<b>11 Server</b> <b><i>Make target SPs available</i></b>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <b>Note:</b> You need the WWPN of each SP port for the bindings.  <input type="checkbox"/> Reboot the server.  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure the <b>/proc/scsi/scsi</b> file has entries for LUNZs.  <b>Note:</b> LUNZs are required to register the server HBAs with the storage system because LUNs have not be configured yet.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure the file for the HBA directory in the <b>/proc/scsi</b> directory has entries for the expected targets (HBAs).	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <b>Note:</b> You need the WWPN of each SP port for the bindings.  <input type="checkbox"/> Reboot the server.          <input type="checkbox"/> <b>Checkpoint</b> - Make sure the <b>/proc/scsi/scsi</b> file has entries for LUNZs.  <b>Note:</b> LUNZs are required to register the server HBAs with the storage system because LUNs have not be configured yet.  <input type="checkbox"/> <b>Checkpoint</b> - Make sure the file for the HBA directory in the <b>/proc/scsi</b> directory has entries for the expected targets (HBAs).	HBA documentation (see URL on page 3-4)          Linux documentation  Navisphere Manager administrator's guide and online help          Linux documentation

Task	With Access Logix	Without Access Logix	Reference Document
12 <b>Storage System Configure</b>	<p><input type="checkbox"/> If the server will use an <i>existing</i> Storage Group, use Navisphere Manager to connect the server to the Storage Group.</p> <p><input type="checkbox"/> If the server will use a <i>new</i> Storage Group, use Navisphere Manager to create RAID Groups, bind LUNs, create the Storage Group, and assign LUNs to the Storage Group.</p> <p><input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.</p> <p><input type="checkbox"/> Reload the driver (if the driver is loaded as a module) or reboot the server (if the driver is static to the kernel) so that Linux recognizes the LUNs.</p> <p>Now the LUNs in the Storage Group look like any other disks in the server.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <b>/proc/scsi/scsi</b> file and in the directory for the HBAs in the <b>/proc/scsi</b> directory.</p> <p>If all LUN entries are missing from the file, verify the zoning. If only some LUNs are missing, use Navisphere Manager to check that the LUNs are assigned to the server's Storage Group.</p> <p><b>For an FC4500 storage system</b></p> <p><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</p>	<p><input type="checkbox"/> Reload the driver (if the driver is loaded as a module) or reboot the server (if the driver is static to the kernel) so that Linux recognizes the LUNs.</p> <p>Now the LUNs look like any other disks in the server.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <b>/proc/scsi/scsi</b> file and in the directory for the HBAs in the <b>/proc/scsi</b> directory.</p> <p>If all LUN entries are missing from the file, verify the zoning. If only some LUNs are missing, use Navisphere Manager to check that the LUNs are assigned to the server's Storage Group.</p> <p><b>For an FC4500 storage system</b></p> <p><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</p>	<p>Navisphere Manager administrator's guide and online help</p> <p>HBA documentation</p> <p>Linux documentation</p> <p>Storage-system setup guide</p>
13 <b>Server Prepare Server for PowerPath</b>	<p><input type="checkbox"/> Make sure you have 128 <b>sd</b> and <b>sg</b> devices in the <b>/dev</b> directory.</p> <p><input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.</p>	<p><input type="checkbox"/> Make sure you have 128 <b>sd</b> and <b>sg</b> devices in the <b>/dev</b> directory.</p> <p><input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.</p>	PowerPath for Linux installation guide



Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to the LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to the LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server</b> <b><i>Test PowerPath with a license key (cont.)</i></b>	<input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Linux Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation (see URL on page 3-4)
2 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 3-3), update it: <ul style="list-style-type: none"> <li>• HBA driver (save the persistent bindings as you will need to add them to the new driver)</li> <li>• admsnap</li> </ul>	HBA documentation (see URL on page 3-4) SnapView installation guide (revision A02 or higher)
3 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath. You will set the persistent bindings after the storage system is installed and the switches are zoned.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.  <input type="checkbox"/> If you added additional HBAs or drivers, reboot the host.	Linux host connectivity guide and HBA documentation (see URL on page 3-4)
4 <b>Storage System</b> <i>Install</i>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
5 <b>Storage System</b> <i>Initialize and install software enablers</i>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports.  <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system.  <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.	Storage-system setup guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>6 Storage System</b> <b>Cable to switch or server and LAN</b>	<input type="checkbox"/> Connect the storage system to the switch or HBA ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.	Storage-system setup guide  Switch documentation           Storage-system setup guide
<b>7 Storage System</b> <b>Set up security</b>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>8 Storage System</b> <b>Set Properties for PowerPath</b>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>navicli -h <i>hostname</i> failovermode 1</b>  <b>navicli -h <i>hostname</i> arraycommpath 1</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference

Task	With Access Logix	Reference Document
<b>9 Server</b> <b><i>Cable additional HBAs to switches or storage system</i></b>	<input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.
<b>10 Switches</b> <b><i>Zone</i></b>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs. <input type="checkbox"/> If SAN Copy, MirrorView, and/or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation
<b>11 Server</b> <b><i>Add Persistent Bindings</i></b>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <b>Note:</b> You need the WWPN of each SP port for the bindings.	HBA documentation (see URL on page 3-4)
<b>12 Server</b> <b><i>Register additional HBAs with storage system</i></b>	<input type="checkbox"/> To make LUNs visible to the HBAs, either reload the HBA driver or reboot the server. <b>Note:</b> LUNs are required to register the server HBAs with the storage system because LUNs have not been configured yet. <input type="checkbox"/> If you reloaded the HBA driver, restart the Navisphere Host Agent or run the Navisphere Server Utility. <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.	Linux documentation  CX-Series Server Software for Linux Installation Guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
13 Server <i>Make target SPs available</i>	<input type="checkbox"/> If you did not reboot the server in step 12, reboot the server now. <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system. <input type="checkbox"/> <b>Checkpoint</b> - Make sure the <b>/proc/scsi/scsi</b> directory has entries for LUNZs. <b>Note:</b> LUNZs are required to register the server HBAs with the storage system because LUNs have not be configured yet. <input type="checkbox"/> <b>Checkpoint</b> - Make sure the file for the HBAs, in the <b>/proc/scsi</b> directory, has entries for the expected targets (HBAs).	Linux documentation Navisphere Manager administrator's guide and online help Linux documentation
14 Storage System <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group <input type="checkbox"/> Reload the driver (if the driver is loaded as a module) or reboot the server (if the driver is static to the kernel) so that Linux recognizes the LUNs. Now the LUNs in the Storage Group look like any other disks in the server. <input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <b>/proc/scsi/scsi</b> directory and in the file for the HBAs in the <b>/proc/scsi</b> directory. If any LUN entries are missing from the file, verify the zoning.	Navisphere Manager administrator's guide and online help HBA documentation (see URL on page 3-4) Linux documentation
15 Server <i>Prepare Server for PowerPath</i>	<input type="checkbox"/> Make sure you have 128 <b>sd</b> and <b>sg</b> devices in the <b>/dev</b> directory. <input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.	PowerPath for Linux installation guide

Task	With Access Logix	Reference Document
<b>16 Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Mount the CD-ROM. <input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Unmount the CD-ROM and remove it from the drive. <input type="checkbox"/> If you have a PowerPath license key, register it. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <input type="checkbox"/> If you loaded the HBA driver as a module, verify that all extensions are loaded. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for Linux installation guide
<b>17 Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
<b>18 Server</b> <i>Make LUNs available to additional HBAs</i>	<input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server and its Storage Group. <input type="checkbox"/> Reboot the server to scan for new LUNs. <input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <code>/proc/scsi/scsi</code> directory and in the file for the HBAs in the <code>/proc/scsi</code> directory. If any LUN entries are missing from the file, verify the zoning. <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs using the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Make sure that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 10.</li> <li>• Verify that you have the appropriate revision of the HBA driver loaded.</li> </ul>	Navisphere Manager administrator's guide and online help  Linux documentation  PowerPath product guide

Task	With Access Logix	Reference Document
<p><b>19 Server</b></p> <p><i>Test PowerPath with a license key</i></p>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to the LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	<p>PowerPath product guide</p>

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Linux Server and Existing Storage System

This checklist assumes that the existing Linux server and existing storage system are already connected in a SAN or direct attach configuration. Complete the tasks highlighted with grey in the checklist before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation (see URL on page 3-4)
2 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 3-3), update it: <ul style="list-style-type: none"> <li>• HBA driver (save the persistent bindings as you will need to add them to the new driver)</li> <li>• admsnap</li> </ul>	<input type="checkbox"/> If the HBA driver software is currently installed and not at the required minimum revision (page 3-3), update it: (save the persistent bindings as you will need to add them to the new driver).	HBA documentation (see URL on page 3-4) SnapView installation guide (revision A02 or higher)
3 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.  <input type="checkbox"/> If you added additional HBAs or drivers, reboot the host.	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.  <input type="checkbox"/> If you added additional HBAs or drivers, reboot the host.	Linux host connectivity guide and HBA documentation (see URL on page 3-4)

Task	With Access Logix	Without Access Logix	Reference Document
4 <b>Storage System</b> <i>Update software</i>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.  For an FC4500 storage system, go to step 6.	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.  For an FC4500 storage system, go to step 6.	Navisphere Manager administrator's guide and online help
5 <b>CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</b> <i>Set properties for PowerPath</i>	<b>For new or replacement HBAs</b> <input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -h <i>hostname</i> systemtype</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	<b>For any HBAs</b> <input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -h <i>hostname</i> systemtype</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<p>5 <b>CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</b> <i>Set properties for PowerPath (cont.)</i></p>	<p><b>For new or replacement HBAs (cont.)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycomppath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> </ul> <p><b>For existing HBAs</b></p> <p>An existing HBA is one that is registered with the storage system.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators): <b>Initiator Type</b> to CLARiiON Open <b>Failover mode</b> to 1 <b>Array comppath</b> to Enabled</li> </ul>	<p><b>For any HBAs (cont.)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycomppath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> </ul>	<p>Navisphere CLI reference</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>6 FC4500 Storage System</b> <i>Set properties for PowerPath</i>	<input type="checkbox"/> Connect a computer to the serial port on the storage system.  <b>For new HBAs</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -np -d <i>device</i> systemtype</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).  If the default storage-system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -np -d <i>device</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.  <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:  <b>navicli -np -d <i>device</i> failovermode 1</b>  <b>navicli -np -d <i>device</i> arraycommpath 1</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).	<input type="checkbox"/> Connect a computer to the serial port on the storage system.  <b>For any HBAs</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -np -d <i>device</i> systemtype</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).  If the default storage-system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -np -d <i>device</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.  <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:  <b>navicli -np -d <i>device</i> failovermode 1</b>  <b>navicli -np -d <i>device</i> arraycommpath 1</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).	Storage-system setup guide  Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<b>6 FC4500 Storage System</b> <b>Set properties for PowerPath (cont.)</b>	<p><b>For existing HBAs</b></p> <p>An existing HBA is one that is registered with the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <pre><b>navicli -np -d device storagegroup -sethost -host servername -type 3</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -failovermode 1</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -arraycommpath 1</b></pre> <p>where</p> <p><i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p><i>servername</i> is the name of the server with the HBAs</p>		Navisphere CLI reference
<b>7 Server</b> <b>Re-install Host Agent or Server Utility</b>	<p><input type="checkbox"/> Reinstall (reload) the Navisphere Host Agent or Navisphere Server Utility.</p> <p><input type="checkbox"/> Start Navisphere Host Agent or run the Navisphere Server Utility.</p>	<p><input type="checkbox"/> Reinstall (reload) the Navisphere Host Agent or Navisphere Server Utility.</p> <p><input type="checkbox"/> Start Navisphere Host Agent or Navisphere Server Utility.</p>	CX-Series Server Software for Linux Installation Guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>8 Server</b> <b><i>Cable additional HBAs to switches or storage system</i></b>	<input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.
<b>9 Switches</b> <b><i>Zone for additional HBAs</i></b>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation
<b>10 Server</b> <b><i>Add Persistent Bindings</i></b>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file.  <b>Note:</b> You need the WWPN of each SP port for the bindings.	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file.  <b>Note:</b> You need the WWPN of each SP port for the bindings.	HBA documentation (see URL on page 3-4)

Task	With Access Logix	Without Access Logix	Reference Document
11 <b>Server</b> <i>Register additional HBAs with storage system</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> To make LUNs visible to the HBAs, either reload the HBA driver or reboot the server.</li> <li><input type="checkbox"/> If you reloaded the HBA driver, restart the Navisphere Host Agent or run Navisphere Server Utility.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> To make LUNs visible to the HBAs, either reload the HBA driver or reboot the server.</li> </ul> <p>N/A</p>	<p>Linux documentation</p> <p>CX-Series Server Software for Linux Installation Guide</p> <p>Navisphere Manager administrator's guide and online help</p>
12 <b>Server</b> <i>Make LUNs available to additional HBAs</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server and its Storage Group.</li> <li><input type="checkbox"/> Reboot the server to scan for new LUNs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <code>/proc/scsi/scsi</code> directory and in the file for the HBAs in the <code>/proc/scsi</code> directory.  If any LUN entries are missing from the file, verify the zoning.</li> </ul> <p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</li> </ul>	<p>N/A</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Reboot the server to scan for new LUNs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Make sure all LUNs have entries in the <code>/proc/scsi/scsi</code> directory and in the file for the HBAs in the <code>/proc/scsi</code> directory.  If any LUN entries are missing from the file, verify the zoning.</li> </ul> <p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</li> </ul>	<p>Navisphere Manager administrator's guide and online help</p> <p>Linux documentation</p> <p>Storage-system setup guide</p>
13 <b>Server</b> <i>Prepare Server for PowerPath</i>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure you have 128 <b>sd</b> and <b>sg</b> devices in the <code>/dev</code> directory.</li> <li><input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.</li> <li><input type="checkbox"/> Manually unload the Navisphere Host Agent or Navisphere Server Utility.</li> <li><input type="checkbox"/> Install any required Red Hat patches.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure you have 128 <b>sd</b> and <b>sg</b> devices in the <code>/dev</code> directory.</li> <li><input type="checkbox"/> Ensure that the PowerPath driver's major numbers (232-239) are not already in use.</li> <li><input type="checkbox"/> Manually unload the Navisphere Host Agent or Navisphere Server Utility.</li> <li><input type="checkbox"/> Install any required Red Hat patches.</li> </ul>	<p>PowerPath for Linux installation</p> <p>CX-Series Server Software for Linux Installation Guide</p> <p>PowerPath for Linux installation</p>



Task	With Access Logix	Without Access Logix	Reference Document
<b>15 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the failover path was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
15 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i>	<input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> If you caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

## DMP Configurations for Linux

Read this section if you are installing a Linux VERITAS DMP configuration with a new server and a new storage system. A new server and a new storage system are defined as follows:

**new server** - A server running Linux and *not* connected to any storage system.

**new storage system** - A CX300, CX500, or CX700 storage system that has factory default settings and has never been connected to a server.

Topics relating to the checklist for Linux DMP configurations are

- ◆ Required Host Software Revisions..... 3-39
- ◆ Prerequisites ..... 3-39
- ◆ Documentation..... 3-40
- ◆ DMP Checklist - New Linux Server and New Storage System 3-42

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### Required Host Software Revisions

- ◆ RedHat Linux operating system revision and patches listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ VxVM 3.2 update 2 or higher

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### Prerequisites

- ◆ You have set up storage-system security (see Security administrator's guide and Navisphere Manager online help).
- ◆ You have installed any switches and connected the server HBAs and storage-system SPs to switch ports (see switch documentation).
- ◆ You have installed Navisphere Manager.

- ◆ You have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server that you will connect to the SPs in the storage system.
- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView/A if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with the HBA and HBA driver.

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This documentation is also available from the following website

For QLogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- ◆ Documentation that ships with
  - Switches and switch management software
  - RedHat Linux operating system
  - VERITAS Volume Manager
- ◆ *EMC Navisphere Host Agent and CLI for Linux Version 6.X Installation Guide* (P/N 069001148)  
or  
*EMC CX-Series Server Software for Windows Installation Guide* (P/N 300-002-038)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082)

- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide (P/N 300-001-276, rev A02 or higher)*  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-276, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide (P/N 300-001-275, rev A02 or higher)*  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-275, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274), rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for Linux (P/N 300-000-604)*

## DMP Checklist - New Linux Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the Fibre Channel HBAs, and, if needed, install the optical GBIC connector on the 1-Gbit PCI HBA.  <input type="checkbox"/> Install the HBA driver.  <input type="checkbox"/> Connect cables from the host HBA port to a switch port.	HBA documentation (see URL on Page 3-40)
2 <b>Server</b> <i>Edit the HBA driver file</i>	<input type="checkbox"/> Set the HBA driver parameters to the settings required for CLARiiON, except for the persistent bindings, which you will set after you have zoned the switches.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays	HBA documentation (see URL on Page 3-40)
3 <b>Server</b> <i>Install the Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and CLI.  <input type="checkbox"/> If not already done, connect the LAN to the server and perform any needed LAN configuration.	CX-Series Server Software for Linux Installation Guide
4 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.  <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.	Navisphere Manager administrator's guide and online help  Navisphere Manager administrator's guide and online help.
5 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration.  <input type="checkbox"/> Set user options, create templates, and set up your monitoring configuration.	Event Monitor administrator's guide and online help.
6 <b>Storage System</b> <i>Set the arraycomppath mode</i>	<input type="checkbox"/> Use the following Navisphere CLI command to set the default storage-system <b>arraycomppath</b> property with the following command:  <b>navicli -h sp arraycomppath 1</b>  where <i>sp</i> is the IP address or network name of the SP in the storage system.	Navisphere CLI reference

Task	With Access Logix	Reference Document
7 <b>Switch</b> <i>Connect servers and SPs</i>	<input type="checkbox"/> Verify that the servers and SPs are connected to the switch.	Documentation that ships with the switches
8 <b>Switch</b> <i>Zone switches</i>	<p><b>For a SAN</b></p> <input type="checkbox"/> Zone switches. This provides a path from the host initiator to the SP. You will need to know the WWPN of the host initiators - available in the switch's name server table.	Documentation that ships with the switches
	<input type="checkbox"/> Reboot the server using the <b>reboot</b> command to load the drivers and perform a login of the host initiators and SPs to the fabric ports on the switch.	
	<input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify that the HBAs and storage systems are logged in to the switch as fabric ports, and to verify that each HBA sees only the targets (SPs) to which it is zoned.	
9 <b>Server</b> <i>Add persistent bindings</i>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file.	HBA documentation (see URL on Page 3-40)
10 <b>Storage System</b> <i>Verify host initiators are registered</i>	<input type="checkbox"/> Before you connect the server to a storage group, use the <b>Connectivity Status</b> dialog in Navisphere Manager to verify that the host initiators are registered.	Navisphere Manager administrator's guide and online help
11 <b>Storage System</b> <i>Connect host initiators to Storage Groups</i>	<input type="checkbox"/> Use Navisphere Manager to connect servers to Storage Groups  <input type="checkbox"/> Reboot the server using the <b>reboot</b> command so that Linux recognizes the LUNs. Now the LUNs in the Storage Group look like any other disks in the server.  <input type="checkbox"/> <b>Checkpoint</b> - Use the <b>fdisk -l</b> command to verify that the operating system sees all the LUNs and label any new LUNs.	Navisphere Manager administrator's guide and online help
12 <b>Server</b> <i>Install Volume Manager and DMP</i>	<input type="checkbox"/> Use the <b>rpm</b> command to add Volume Manager and DMP to the server. <input type="checkbox"/> Install any recommended VERITAS updates.  <b>Important</b> To install the CLARiiON DMP driver, you must install VERITAS 3.2 update 2. Be sure to label all LUNs in order to make them visible to VERITAS DMP.	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
13 <b>Server</b> <i>Install the CLARiiON DMP driver</i>	<input type="checkbox"/> Download the CLARiiON DMP driver to the server from Services on the VERITAS website. <input type="checkbox"/> Use the <b>rpm</b> command to install the CLARiiON DMP driver on the server. <b>Note</b> Until <b>rootdg</b> is created (part of <b>vxinstall</b> command) on at least one disk, DMP displays an error message looking for the <b>config</b> daemon.	VERITAS Volume Manager documentation
14 <b>Storage System</b> <i>Set the system type and failover mode</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the default storage-system type and failover mode properties: <b>navicli -h sp systemtype -config 3</b> <b>navicli -h sp storagegroup -sethost -host linux_host -failovermode 2</b> where <i>sp</i> is the IP address or network name of the SP in the storage system. <i>linux_host</i> is the name of the Linux server	navicli man page or Navisphere CLI reference
15 <b>Server</b> <i>Create DOS partition for Volume Manager</i>	<input type="checkbox"/> Use the <b>fdisk</b> command to create at least one DOS partition for Volume Manager.	Linux documentation
16 <b>Server</b> <i>Reboot</i>	<input type="checkbox"/> Reboot the server using the <b>reboot</b> command <ul style="list-style-type: none"> <li>•to make LUNs available to Linux</li> <li>•to make LUNs accessible via both SPs</li> </ul> <b>Important</b> If you do not set the failover mode to 2, you will see only half of the expected paths to the SPs.	Linux documentation
17 <b>Server</b> <i>Configure Volume Manager</i>	<input type="checkbox"/> Run <b>vxinstall</b> to configure Volume Manager and place at least one LUN under VxVM control.	VERITAS Volume Manager documentation
18 <b>Server</b> <i>Verify DMP installation</i>	<b>For VXVM 3.5 or higher</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Log into VERITAS Enterprise Administrator (VEA).</li> <li><input type="checkbox"/> Click the host name for the server.</li> <li><input type="checkbox"/> Click <b>disks</b>.</li> <li><input type="checkbox"/> Click a device that you know belongs to the CLARiiON storage system.</li> <li><input type="checkbox"/> Click the paths tab for that device.</li> <li><input type="checkbox"/> Verify that the device has primary and secondary paths to it.</li> <li><input type="checkbox"/> Verify the state of the device (enabled or disabled).</li> </ul>	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
<b>18 Server</b> <b>Verify DMP installation (cont.)</b>	<b>For a VxVM version less than 3.5</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Log into Volume Manager Storage Administrator (VMSA)</li> <li><input type="checkbox"/> Double-click a disk icon.</li> <li><input type="checkbox"/> In the list of disks, double-click a disk you know belongs to the CLARiiON storage system.</li> <li><input type="checkbox"/> Click the <b>disks</b> tab to verify there are the expected number of Primary and Secondary paths.</li> <li><input type="checkbox"/> Verify that it displays the correct number of paths with <b>vxdisk list device</b> where <i>device</i> is the name of the disk you selected.</li> </ul>	VERITAS Volume Manager documentation
<b>19 Server</b> <b>Verify DMP Operation</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Start I/O to the VERITAS Volume.</li> <li><input type="checkbox"/> Identify the CLARiiON devices under the Volume with <b>vxprint -v</b></li> <li><input type="checkbox"/> Choose one of the CLARiiON devices and determine all its paths with <b>vxdisk list device</b> or <b>vxmpadm getsubpaths dmpnodename=device</b> where <i>device</i> is the name of the CLARiiON device</li> <li><input type="checkbox"/> Determine the control through which I/O is going with <b>iostat -xn</b></li> <li><input type="checkbox"/> Determine the controller through which I/O is going with <b>iostat -xn</b></li> <li><input type="checkbox"/> Determine the HBA and SP to which that controller corresponds.</li> <li><input type="checkbox"/> Disconnect the path to that SP.</li> </ul>	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
19 <b>Server</b> <i>Verify DMP Operation (cont.)</i>	<input type="checkbox"/> Verify that the path to the chosen CLARiiON device is disabled with <b>vxdisk list <i>device</i></b> or <b>vxmpadm getsubpaths</b> <b>dmpnodename=<i>device</i></b> where <i>device</i> is the name of the CLARiiON device  <input type="checkbox"/> Verify that I/O is still running with <b>iostat -xn</b>	VERITAS Volume Manager documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.



#### **CAUTION**

**If you want to install any new software or upgrade any existing software on a storage system after DMP is installed and running, you should use the Navisphere Manager Software Installation Wizard. If this wizard is not supported for your storage system, be sure to refer to the "Special NDU Procedure" in the *EMC Linux Utility Kit Release Notes*, which are available on the EMC Powerlink website.**

## Configurations for Linux Without EMC Failover Software

Read this section if you are installing a Linux configuration with a new server that will *not* run EMC failover software and a new storage system. A new server and storage system are defined as follows:

**New server** - A server running Linux with *no* EMC failover software and *not* connected to any storage system.

**New storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

Topics relating to the checklist for a Linux configuration without EMC failover software are

- ◆ Prerequisites ..... 3-47
- ◆ Documentation..... 3-48
- ◆ Without EMC Failover Software Checklist — New Linux Server and New Storage System..... 3-49

### Prerequisites

- ◆ All switches must be installed.
- ◆ Storage systems must be set up, initialized (if required), and connected to switches, and any optional storage-system software (Access Logix, SAN Copy, SnapView, MirrorView, MirrorView/A) you have must be installed.
- ◆ If any storage systems have SnapView, the `admsnap` utility must be installed on the servers that will be the SnapView production systems.
- ◆ If you will use Navisphere Manager 6.X, you must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>).
  - On a network that is connected to the storage-system servers and that will be connected to the SPs in the storage system.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, and MirrorView if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver

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This documentation is also available from the following websites:

For Emulex HBAs and drivers:

<http://www.emulex.com/ts/docoem/framehc.htm>

For Qlogic HBAs and drivers:

[http://www.qlogic.com/support/home\\_support.asp](http://www.qlogic.com/support/home_support.asp)

and select **EMC** in the OEM selection box at the bottom of the page.

- Switches and switch management software
- Red Hat Linux operating system
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for Linux* (P/N 300-000-604)

## Without EMC Failover Software Checklist — New Linux Server and New Storage System

Complete the tasks highlighted with grey in the checklist before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port or an SP port. <input type="checkbox"/> Boot host. <input type="checkbox"/> Install the HBA driver.	HBA documentation (see URL on page 3-48)
2 <b>Server</b> <i>Set the HBA driver parameters</i>	<input type="checkbox"/> For a Qlogic HBA, set the SAN Topology value in the HBA BIOS. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the server connections to the switch by checking the LED(s) for the switch port connected to each HBA. <b>For 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Host connectivity guide and HBA documentation (see URL on page 3-48)  Host connectivity guide and HBA documentation (see URL on page 3-48)
3 <b>Switches</b> <i>Zone</i>	<input type="checkbox"/> Zone the switches to provide a path from each host initiator to an SP. <input type="checkbox"/> Reboot the server. <input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned.	Switch management documentation
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI. <input type="checkbox"/> If you installed the Host Agent, edit the <b>agent.config</b> file to add the following entry if it does not already exist: <b>device auto auto</b>	CX-Series Server Software for Linux Installation Guide

Task	With Access Logix	Reference Document
5 <b>Storage System</b> <b>Set up security</b>	<input type="checkbox"/> For Navisphere 6.X, use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
6 <b>Storage System</b> <b>Set properties</b>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the default failover mode and array compath properties:  <b>navicli -h <i>hostname</i> failovermode 0</b>  <b>navicli -h <i>hostname</i> arraycompath 0</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
7 <b>Storage System</b> <b>Configure</b>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.  <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.  <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group.  <input type="checkbox"/> Reload the driver (if the driver is loaded as a module) or reboot the server (if the driver is static to the kernel) so that Linux recognizes the LUNs.  Now the LUNs in the Storage Group look like any other disks in the server.  If Linux does not recognize any LUNs, verify the connection to the Storage Group.	Navisphere Manager administrator's guide and online help  Navisphere Manager administrator's guide and online help  HBA documentation
8 <b>Storage System</b> <b>Set up Event Monitor</b>	<input type="checkbox"/> Plan your monitoring configuration.  <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
9 <b>Server</b> <b>Make LUNs available to Linux</b>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs.  <b>If Linux does not recognize any LUNs, verify the connection to the Storage Group.</b>	Host connectivity guide and Linux documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## NetWare Installation Checklists

This chapter contains checklists of the tasks required to install a CLARiiON storage system in a configuration with a Novell® NetWare® server and PowerPath failover software.

## PowerPath Configurations for NetWare

Read this section if you are installing a NetWare PowerPath configuration with a new or existing server and a new or existing storage system. A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running NetWare and *not* connected to any storage system.

**existing server** - A server running NetWare and that is already connected to one or more storage systems.

**new storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

**existing storage system** - A CX200, CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series storage system that is already connected to one or more servers and is in a Navisphere domain.

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All CLARiiON storage systems connected to the server must be CX200, CX300, CX400, CX500, CX600, CX700, FC4500, FC4700-Series, or FC5300 storage systems. If any other type of CLARiiON storage system is connected to the server, the server cannot run PowerPath.

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Topics relating to the checklists for NetWare PowerPath configurations are

- ◆ Required Host Software Revisions..... 4-3
- ◆ Prerequisites ..... 4-3
- ◆ PowerPath Checklist — New NetWare Server and New Storage System..... 4-7
- ◆ PowerPath Checklist — New NetWare Server and Existing Storage System ..... 4-12
- ◆ PowerPath Checklist — Existing NetWare Server and New Storage System ..... 4-21
- ◆ PowerPath Checklist — Existing NetWare Server and Existing Storage System ..... 4-28

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## Required Host Software Revisions

- ◆ NetWare operating system revision and kernel listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ NetWare PowerPath
  - For CX200, CX400, CX600, or FC4700-Series storage systems Version 3.0.0 with patch 3.0.1 or higher
  - For CX300, CX500, CX700 storage systems Version 3.0.1 or higher
  - For FC4500 storage systems Version 3.0.0 with patch 3.0.2 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath Release Notes for UNIX* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your NetWare version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server and that you will connect to the SPs in a CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere CLI version 6.X
  - On a network that is connected to the storage-system server and that you will connect to SPs in CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system.
- ◆ For an FC4500 storage system connected to a server on which you will install PowerPath, you must have a computer that you can connect to the storage system. This computer must run
  - Windows 2000
  - Navisphere Host Agent and CLI version 6.1 or higher

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView / A if you have this software. The following documents will help you with this planning:
  - *EMC Fibre Channel Storage System CX200-Series Configuration Planning Guide* (P/N 014003115)
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273)
  - *EMC CX400-Series and CX600-Series Storage Systems Configuration Planning Guide* (P/N 014003113)
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide* (P/N 014003087)
  - *EMC Fibre Channel Storage System Model FC4500, FC5300, and FC5700 Configuration Planning Guide* (P/N 014003039)

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## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop or, for an FC4500 or FC4700, on the computer you will connect to the storage system, before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver

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This documentation is also available from the following QLogic website:  
[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)  
and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- Switches and switch management software
- Novell NetWare operating system
- ◆ *Removing ATF or CDE Software Before Installing Other Failover Software* (P/N 069001173)
- ◆ *PowerPath Version 3.0 Product Guide* (P/N 300-000-047)
- ◆ *PowerPath Version 3.0 Installation and Administration Guide for NetWare* (P/N 300-000-513)

- ◆ *EMC Navisphere Host Agent and CLI for NetWare Version 6.X Installation Guide* (P/N 069001149)  
or  
*EMC CX-Series Server Software for NetWare Installation Guide* (P/N 300-002-040)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038)
- ◆ *EMC Storage-System Host Utilities for NetWare Administrator's Guide* (P/N 069001139)
- ◆ *EMC SnapView Installation Guide* (P/N 069001193, revision A02 or higher)
- ◆ *EMC SAN Copy Installation Guide* (P/N 069001187)
- ◆ *EMC Rails and Enclosures Field Installation Guide* (P/N 300-001-799)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082) - for SPS installation only
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX200-Series Setup and Cabling Guide* (P/N 014003116) and *EMC Storage Systems CX200-Series Initialization Guide* (P/N 014003117)
- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide* (P/N 300-001-276, rev A02 or higher)  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-276, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX400-Series Setup and Cabling Guide* (P/N 014003105) and *EMC Storage Systems CX400-Series and CX600-Series Initialization Guide* (P/N 014003112)
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide* (P/N 300-001-275, rev A02 or higher)  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-275, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)

- ◆ *EMC Storage Processor Enclosure (SPE) CX600-Series Setup and Cabling Guide (P/N 014003078) and EMC Storage Systems CX400-Series and CX600-Series Initialization Guide (P/N 014003112)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274), rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *FC4500 Setup Guide (P/N 014003102, revision A03 or higher)*
- ◆ *FC4700-2 Setup Guide (P/N 0140373)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for Novell NetWare (P/N 300-000-615)*

## PowerPath Checklist — New NetWare Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure. <input type="checkbox"/> Verify HBA BIOS settings. <input type="checkbox"/> Install HBA driver.	HBA documentation (see URL on page 4-4)
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON and PowerPath. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA documentation (see URL on page 4-4)
3 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed. <input type="checkbox"/> Install PowerPath. <b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b> . This device is always inactive and is unavailable for I/O. <b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	NetWare documentation  PowerPath release notes and PowerPath for NetWare installation and administrator's guide PowerPath product guide  PowerPath product guide
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for NetWare Installation Guide
5 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	

Task	With Access Logix	Reference Document
<p><b>6</b>    <b>Switches</b> <i>Install</i></p>	<p><b>For a SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Install switches, if not already installed.</li> <li><input type="checkbox"/> Connect a cable from each host HBA port to a switch port.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.</li> </ul> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Rails, cabinet, and switch documentation</p>
<p><b>7</b>    <b>Storage System</b> <i>Install</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the storage system in the cabinet, if not already installed.</li> </ul>	<p>Rails and cabinet documentation</p>
<p><b>8</b>    <b>Storage System</b> <i>Initialize and install software enablers</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports.</li> <li><input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system.</li> <li><input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.</li> </ul>	<p>Storage-system setup guide</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Reference Document
<b>9 Storage System</b> <b><i>Cable to switch or server and LAN</i></b>	<input type="checkbox"/> Connect the storage system to the switch or HBA ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.	Storage-system setup guide.
<b>10 Storage System</b> <b><i>Set up security</i></b>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>11 Storage System</b> <b><i>Set Properties for PowerPath</i></b>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
<b>12 Switches</b> <b><i>Zone</i></b>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs. <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation

Task	With Access Logix	Reference Document
<b>13 Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Scan for LUNs with the following NetWare command: <b>scan all luns</b> <input type="checkbox"/> <b>Checkpoint</b> - Verify that each path has a LUNZ with the following NetWare command: <b>list devices</b> <input type="checkbox"/> Stop and restart the Navisphere Host Agent or run the Navisphere Server Utility. <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.	NetWare documentation  CX-Series Server Software for NetWare Installation Guide  Navisphere Manager administrator's guide and online help
<b>14 Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group <input type="checkbox"/> Reboot the server. NetWare should see DGC disk devices instead of LUNZ devices. <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs with the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 11.</li> </ul>	Navisphere Manager administrator's guide and online help  PowerPath product guide
<b>15 Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
<b>16 Server</b> <i>Make LUNs available to NetWare</i>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs. If NetWare does not recognize any LUNs, verify the connection to the Storage Group.	Host connectivity guide or NetWare documentation



## PowerPath Checklist — New NetWare Server and Existing Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Verify HBA BIOS settings.  <input type="checkbox"/> Install HBA driver.	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Install HBA driver.	HBA documentation (see URL on page 4-4)
2 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON and PowerPath. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON and PowerPath. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA documentation (see URL on page 4-4)
3 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed.  <input type="checkbox"/> Install PowerPath.  <b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b> . This device is always inactive and is unavailable for I/O.	<input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed.  <input type="checkbox"/> Install PowerPath.  <b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b> . This device is always inactive and is unavailable for I/O.	NetWare documentation  PowerPath release notes and PowerPath for NetWare installation and administrator's guide PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
3 <b>Server</b> <i>Install PowerPath (cont.)</i>	<p><b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption.</p> <p><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></p>	<p><b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption.</p> <p><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></p>	PowerPath product guide
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for NetWare Installation Guide
5 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	N/A	
6 <b>Storage System</b> <i>Update software</i>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 4-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 4-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p>	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>7 Server</b> <i>Cable to switches or storage system</i></p>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide.</p>
<p><b>8 Switches</b> <i>Zone</i></p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView A is installed, create any required zones.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system</p>	<p>Switch management documentation</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>9 <b>Storage System</b> <i>Register HBAs</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> On the server, restart the Navisphere Host Agent or run the Navisphere Server Utility.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.</li> </ul>	N/A	<p>CX-Series Server Software for NetWare Installation Guide</p> <p>Navisphere Manager administrator's guide and online help</p>
<p>10 <b>Storage System</b> <i>Set Properties for PowerPath</i></p>	<p><b>For a CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's HBA ports (initiators): <ul style="list-style-type: none"> <li><b>Initiator Type</b> to CLARiiON Open</li> <li><b>Failover mode</b> to 1</li> <li><b>Array commpath</b> to Enabled</li> <li><b>Unit Serial Number</b> to LUN</li> </ul> </li> </ul>	<p><b>For a CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type: <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> </li> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the default failover mode and array commpath properties to the values for PowerPath: <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> </li> </ul>	<p>Navisphere Manager administrator's guide and online help or Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>10 Storage System</b>  <b>Set Properties for PowerPath (cont.)</b></p>	<p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Connect a computer to the serial port on the storage system.</li> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's HBA ports (initiators):                     <p><b>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -type 3</b></p> <p><b>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -arraycommpath 1</b></p> <p>where  <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).  <i>servername</i> is the name of the server with the HBAs.</p> </li> </ul>	<p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Connect a computer to the serial port on the storage system</li> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:                     <p><b>navicli -np -d <i>device</i> systemtype</b></p> <p>where  <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -np -d <i>device</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> </li> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:                     <p><b>navicli -np -d <i>device</i> failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> </li> </ul>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>11 Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Scan for LUNs with the following NetWare command: <b>scan all luns</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that each path has a LUNZ with the following NetWare command: <b>list devices</b>  <input type="checkbox"/> Stop and restart the Navisphere Host Agent or run the Navisphere Server Utility.	<input type="checkbox"/> Scan for LUNs with the following NetWare command: <b>scan all luns</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify the paths to each LUN with the following NetWare command: <b>list devices</b>  <input type="checkbox"/> Stop and restart the Navisphere Host Agent or run the Navisphere Server Utility.	NetWare documentation   CX-Series Server Software for NetWare Installation Guide
<b>12 Storage System</b> <i>Configure</i>	<input type="checkbox"/> If the server will use an <i>existing</i> Storage Group, use Navisphere Manager to connect the server to the Storage Group.  <input type="checkbox"/> If the server will use a <i>new</i> Storage Group, use Navisphere Manager to create RAID Groups, bind LUNs, create the Storage Group, and assign LUNs to the Storage Group.  <input type="checkbox"/> Use Navisphere Manager to connect the server to the Storage Group.  <input type="checkbox"/> Reboot the server.	          <input type="checkbox"/> Reboot the server.	Navisphere Manager administrator's guide and online help



Task	With Access Logix	Without Access Logix	Reference Document
<b>15 Server</b> <b>Save PowerPath configuration</b>	<input type="checkbox"/> Save the server's PowerPath configuration with the following PowerPath command:  <b>powermt -save</b>  This command creates the <b>powermt.ctm</b> configuration file.	<input type="checkbox"/> Save the server's PowerPath configuration with the following PowerPath command:  <b>powermt -save</b>  This command creates the <b>powermt.ctm</b> configuration file.	PowerPath product guide
<b>16 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.	NetWare documentation
	<input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>	<input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>	PowerPath product guide
	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	
	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where <i>x</i> is a pseudo device that represents the chosen LUN.	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where <i>x</i> is a pseudo device that represents the chosen LUN.	
	<input type="checkbox"/> Start I/O to the LUN.	<input type="checkbox"/> Start I/O to the LUN.	
	<input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	<input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	

Task	With Access Logix	Without Access Logix	Reference Document
<p>16 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i></p>	<p><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that</p> <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <p><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</p> <p><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP using the following PowerPath command:</p> <p><b>powermt restore</b></p>	<p><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that</p> <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <p><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</p> <p><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP using the following PowerPath command:</p> <p><b>powermt restore</b></p>	<p>PowerPath product guide</p>

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing NetWare Server and New Storage System

Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must

- ◆ Back up your server configurations.
- ◆ Back up data on all storage systems connected to the server.
- ◆ Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.

Simply removing ATF or CDE using the uninstall procedure in the NetWare ATF administrator's guide or the Netware utilities administrator's guide may not return the server to its original state, and may result in lost data.

Task	With Access Logix	Reference Document
<p>1 <b>Server</b> <i>Install additional HBAs</i></p>	<p><input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.</p> <p><b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.</p> <p><input type="checkbox"/> Verify HBA BIOS settings.</p>	<p>HBA documentation (see URL on page 4-4)</p>
<p>2 <b>Server</b> <i>Prepare cluster</i></p>	<p><b>If the server is in a cluster</b></p> <p><input type="checkbox"/> Move cluster resources from server you want to upgrade.</p> <p><input type="checkbox"/> If the server is <i>not</i> running ULDNCS, remove the first from the cluster with the following command:</p> <p><b>cluster leave</b></p> <p><input type="checkbox"/> Unload cluster software with the following command:</p> <p><b>uldncs</b></p>	<p>NetWare documentation</p>
<p>3 <b>Server and Client</b> <i>Remove ATF or CDE</i></p>	<p><input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.</p>	<p>Removing ATF or CDE</p>
<p>4 <b>Server</b> <i>Update Software</i></p>	<p><input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (see page 4-3), update it:</p> <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	<p>HBA documentation (see URL on page 4-4), CX-Series Server Software for NetWare Installation Guide</p>
<p>5 <b>Server</b> <i>Set HBA driver parameters</i></p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p>Host connectivity guide and HBA documentation (see URL on page 4-4)</p>

Task	With Access Logix	Reference Document
<p>6 <b>Server</b> <i>Install PowerPath</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed.</li> <li><input type="checkbox"/> If the Navisphere Host Agent is running, unload the <b>Navagent.nlm</b> driver with the following NetWare command: <b>unload navagent</b></li> <li><input type="checkbox"/> Install PowerPath.</li> </ul> <p><b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b>. This device is always inactive and is unavailable for I/O.</p> <p><b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></li> </ul>	<p>NetWare documentation</p> <p>CX-Series Server Software for NetWare Installation Guide</p> <p>PowerPath release notes and PowerPath for NetWare installation and administrator's guide</p>
<p>7 <b>Storage System</b> <i>Install</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the storage system in the cabinet, if not already installed.</li> </ul>	<p>Rails and cabinet documentation</p>
<p>8 <b>Storage System</b> <i>Initialize and install software enablers</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports.</li> <li><input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system.</li> <li><input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.</li> </ul>	<p>Storage-system setup guide</p> <p>Navisphere Manager administrator's guide and online help</p>
<p>9 <b>Storage System</b> <i>Cable to switch or server and LAN</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Connect the storage system to the switch or HBA ports.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide.</p>

Task	With Access Logix	Reference Document
<p><b>9 Storage System</b> <i>Cable to switch or server and LAN (cont.)</i></p>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <p><input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.</p>	<p>Storage-system setup guide.</p>
<p><b>10 Storage System</b> <i>Set up security</i></p>	<p><input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.</p>	<p>Navisphere security administrator's guide and Navisphere Manager online help</p>
<p><b>11 Storage System</b> <i>Set Properties for PowerPath</i></p>	<p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycomppath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p>Navisphere CLI reference</p>
<p><b>12 Server</b> <i>Cable additional HBAs to switches or storage system</i></p>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide</p>

Task	With Access Logix	Reference Document
<b>13 Switches</b> <i>Zone additional HBAs</i>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs. <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation
<b>14 Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Scan for LUNs with the following NetWare command: <b>scan all luns</b> <input type="checkbox"/> <b>Checkpoint</b> - Verify that each path has a LUNZ with the following NetWare command: <b>list devices</b> <input type="checkbox"/> Restart Navisphere Agent or run Navisphere Server Utility. <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.	NetWare documentation  CX-Series Server Software for NetWare Installation Guide Navisphere Manager administrator's guide and online help
<b>15 Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group <input type="checkbox"/> Reboot the server. <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees all the paths to the LUNs using the following PowerPath command: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 11.</li> </ul>	Navisphere Manager administrator's guide and online help  PowerPath product guide

Task	With Access Logix	Reference Document
16 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
17 <b>Server</b> <i>Move server back into cluster</i>	<p><b>If the server is in a cluster</b></p> <input type="checkbox"/> Load cluster software on the server with the following NetWare command: <b>ldncls</b> <input type="checkbox"/> Move cluster resources back to the server.	NetWare documentation
18 <b>Server</b> <i>Make LUNs available to NetWare</i>	<input type="checkbox"/> Create partitions or the pertinent database file systems on the LUNs. If NetWare does not recognize any LUNs, verify the connection to the Storage Group.	Host connectivity guide or NetWare documentation
19 <b>Server</b> <i>Save PowerPath configuration</i>	<input type="checkbox"/> Save the server's PowerPath configuration with the following PowerPath command: <b>powermt -save</b> This command creates the <b>powermt.ctm</b> configuration file.	PowerPath product guide
20 <b>Server</b> <i>Test PowerPath with a license key</i>	<p><b>If you have a PowerPath license key</b></p> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <input type="checkbox"/> View the LUNs available to the server using the PowerPath command <b>powermt display dev=all class=clariion</b> <input type="checkbox"/> Choose one available LUN to receive I/O for the test. <input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is a pseudo device that represents the chosen LUN. <input type="checkbox"/> Start I/O to the LUN. <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	NetWare documentation  PowerPath product guide

Task	With Access Logix	Reference Document
<b>20 Server</b> <b>Test PowerPath</b> <b>with a license key</b> <b>(cont.)</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing NetWare Server and Existing Storage System

This checklist assumes that the existing NetWare server and existing storage system are already connected in a SAN or direct attach configuration. Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

**EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must**

- ◆ **Back up your server configurations.**
- ◆ **Back up data on all storage systems connected to the server.**
- ◆ **Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.**

**Simply removing ATF or CDE using the uninstall procedure in the NetWare ATF administrator's guide or the NetWare utilities administrator's guide may not return the server to its original state, and may result in lost data.**

If you are transitioning a NetWare Cluster Service configuration from ATF or CDE to PowerPath, perform the procedure in the checklist on each node in succession. While you perform the procedure on one node, you can leave the cluster services active on the other node, provided failure in a path to the storage system does not occur.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation (see URL on page 4-4)
2 <b>Server</b> <i>Prepare cluster</i>	<b>If the server is in a cluster</b> <input type="checkbox"/> Move cluster resources from server you want to upgrade.  <input type="checkbox"/> Remove the first from the cluster with the following command: <b>cluster leave</b>  <input type="checkbox"/> Unload cluster software with the following command: <b>uldncs</b>	<b>If the server is in a cluster</b> <input type="checkbox"/> Move cluster resources from server you want to upgrade.  <input type="checkbox"/> Remove the first from the cluster with the following command: <b>cluster leave</b>  <input type="checkbox"/> Unload cluster software with the following command: <b>uldncs</b>	NetWare documentation
3 <b>Server and Client</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	Removing ATF or CDE instruction sheet
4 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (see page 4-3), update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (see page 4-3), update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> </ul>	HBA documentation (see URL on page 4-4), CX-Series Server Software for NetWare Installation Guide

Task	With Access Logix	Without Access Logix	Reference Document
<p>5 <b>Server</b> <i>Set HBA driver parameters</i></p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p><input type="checkbox"/> Make sure the HBA driver parameters are set to the values required for CLARiiON and PowerPath.</p> <p><b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.</p>	<p>Host connectivity guide and HBA documentation (see URL on page 4-4)</p>
<p>6 <b>Storage System</b> <i>Update software</i></p>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 4-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p> <p>For an FC4500 storage system, go to step 8.</p>	<p><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision (see page 4-3), update it.</p> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p> <p>For an FC4500 storage system, go to step 8.</p>	<p>Navisphere Manager administrator's guide and online help</p>
<p>7 <b>CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</b> <i>Set properties for PowerPath</i></p>	<p><b>For new HBAs</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p>	<p><b>For any HBAs</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p>	<p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 <b>CX200, CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System</b> <i>Set properties for PowerPath (cont.)</i></p>	<p><b>For new HBAs (cont.)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> </ul> <p><b>For existing HBAs</b> An existing HBA is one that is registered with the storage system.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators): <b>Initiator Type</b> to CLARiiON Open <b>Failover mode</b> to 1 <b>Array commpath</b> to Enabled</li> </ul>	<p><b>For any HBAs (cont.)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.</li> </ul>	<p>Navisphere CLI reference</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>8 FC4500 Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><b>For new HBAs</b></p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -np -d <i>device</i> systemtype</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -np -d <i>device</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -np -d <i>device</i> failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><b>For any HBAs</b></p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -np -d <i>device</i> systemtype</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -np -d <i>device</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -np -d <i>device</i> failovermode 1</b></p> <p><b>navicli -np -d <i>device</i> arraycommpath 1</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>8 FC4500 Storage System</b>  <b><i>Set properties for PowerPath (cont.)</i></b></p>	<p><b>For existing HBAs</b></p> <p>An existing HBA is one that is registered with the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <pre><b>navicli -np -d device storagegroup -sethost -host servername -type 3</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -failovermode 1</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -arraycommpath 1</b></pre> <p>where</p> <p><i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p><i>servername</i> is the name of the server with the HBAs</p>		<p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>9 <b>Server</b> <i>Install PowerPath</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed.</li> <li><input type="checkbox"/> If the Navisphere Host Agent is running, unload the <b>Navagent.nlm</b> driver with the command <b>unload navagent</b></li> <li><input type="checkbox"/> Install PowerPath.</li> </ul> <p><b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b>. This device is always inactive and is unavailable for I/O.</p> <p><b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure the <b>SCSISAN.CDM</b> module is not installed.</li> <li><input type="checkbox"/> If the Navisphere Host Agent is running, stop it by unloading the <b>Navagent.nlm</b> driver with the command <b>unload navagent</b></li> <li><input type="checkbox"/> Install PowerPath.</li> </ul> <p><b>Note</b> After PowerPath is installed on a NetWare 6 server, a device named <i>EMC PowerPath Control Device</i> appears under <b>ConsoleOne &gt; Tools &gt; Disk Management &gt; Devices</b>. This device is always inactive and is unavailable for I/O.</p> <p><b>CAUTION</b> If you use the <b>server -ns</b> command to bring up NetWare, you must either load the PowerPath driver manually or remove all redundant paths. Failure to do so may result in LUN corruption.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a></li> </ul>	<p>NetWare documentation</p> <p>CX-Series Server Software for NetWare Installation Guide</p> <p>PowerPath release notes and PowerPath for NetWare installation and administrator's guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>10 <b>Server</b> <i>Cable additional HBAs to switches or storage system</i></p>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Storage-system setup guide.</p>
<p>11 <b>Switches</b> <i>Zone for additional HBAs</i></p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p>Switch management documentation</p>
<p>12 <b>Server</b> <i>Register additional HBAs with storage system</i></p>	<p><input type="checkbox"/> Reboot the server.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each new HBA is registered with the storage system.</p>	<p><input type="checkbox"/> Reboot the server.</p>	<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
13 <b>Server</b> <b>Make LUNs available to additional HBAs</b>	<input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server and its Storage Group.  <input type="checkbox"/> Reboot the server	N/A	Navisphere Manager administrator's guide and online help
14 <b>Server</b> <b>Verify paths to storage system</b>	<input type="checkbox"/> <b>Checkpoint</b> - Verify the paths to each LUN with the following NetWare command:  <b>list devices</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees the paths to each LUN using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 7 or 8.</li> </ul> <b>For an FC4500 storage system</b> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	<input type="checkbox"/> <b>Checkpoint</b> - Verify the paths to each LUN with the following NetWare command:  <b>list devices</b>  <input type="checkbox"/> <b>Checkpoint</b> - Verify that PowerPath sees the paths to each LUN using the following PowerPath command:  <b>powermt display dev=all class=clariion</b>  If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 7 or 8</li> </ul> <b>For an FC4500 storage system</b> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	NetWare documentation  PowerPath product guide  Storage-system setup guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>15 Server</b> <b>Remount volumes</b>	<p><b>If the server is <i>not</i> in a cluster</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Remount the volumes on the storage system.</li> </ul> <p><b>If the server is in a cluster</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Load cluster software on the server with the following command: <b>ldncc</b></li> <li><input type="checkbox"/> Move cluster resources back to the server.</li> </ul>	<p><b>If the server is <i>not</i> in a cluster</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Remount the volumes on the storage system.</li> </ul> <p><b>If the server is in a cluster</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Load cluster software on the server with the following command: <b>ldncc</b></li> <li><input type="checkbox"/> Move cluster resources back to the server.</li> </ul>	NetWare documentation
<b>16 Server</b> <b>Save PowerPath configuration</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Save the server's PowerPath configuration with the following PowerPath command: <b>powermt -save</b> This command creates the <b>powermt.ctm</b> configuration file.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Save the server's PowerPath configuration with the following PowerPath command: <b>powermt -save</b> This command creates the <b>powermt.ctm</b> configuration file.</li> </ul>	PowerPath product guide
<b>17 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b>                      If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> </ul>	<p><b>If you have a PowerPath license key</b>                      If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> </ul>	NetWare documentation  PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<p>17 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that                             <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that                             <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> <li><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></li> </ul>	<p>PowerPath product guide</p>

## Solaris Installation Checklists

This chapter contains checklists of the tasks required to install an CLARiiON system in a configuration with a Solaris™ server and PowerPath or VERITAS DMP failover software.

The sections for the different configurations are

- ◆ PowerPath Configurations for Solaris .....5-2
- ◆ DMP Configurations for Solaris .....5-45

## PowerPath Configurations for Solaris

Read this section if you are installing a Solaris PowerPath configuration with a new or existing server and a new or existing storage system. A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running Solaris and *not* connected to any storage system.

**existing server** - A server running Solaris and that is already connected to one or more storage systems.

**new storage system** - A CX300, CX500, or CX700 storage system that has the factory default settings and has *never* been connected to a server.

**existing storage system** - CX300, CX400, CX500, CX600, CX700, FC4500, or FC4700-Series that is already connected to one or more servers and is in a Navisphere domain.

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All CLARiiON storage systems connected to the server must be CX300, CX400, CX500, CX600, CX700, FC4500, FC4700-Series, or FC5300 storage systems. If any other type of CLARiiON storage system is connected to the server, the server cannot run PowerPath.

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Topics relating to the checklists for Solaris PowerPath configurations are

- ◆ Required Host Software Revisions..... 5-3
- ◆ Prerequisites ..... 5-3
- ◆ Documentation..... 5-4
- ◆ PowerPath Checklist — New Solaris Server and New Storage System..... 5-8
- ◆ PowerPath Checklist — New Solaris Server and Existing Storage System..... 5-14
- ◆ PowerPath Checklist — Existing Solaris Server and New Storage System..... 5-25
- ◆ PowerPath Checklist — Existing Solaris Server and Existing Storage System ..... 5-32

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## Required Host Software Revisions

- ◆ Solaris operating system revision and patches listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ Solaris PowerPath
  - For CX400, CX600, FC4500, and FC4700-Series storage systems Version 3.0.0 with Patch 3.0.2 or higher, except for Solaris 9, which requires PowerPath 3.0.3 or higher
  - For CX300, CX500, and CX700 storage systems Version 3.0.4 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath Release Notes for UNIX* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your Solaris version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server and that you will connect to the SPs in CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere 6.X
  - On a network that is connected to the storage-system server and that you will connect to SPs in CX300, CX400, CX500, CX600, CX700, or FC4700-Series storage system.
- ◆ For an FC4500 storage system connected to a server on which you will install PowerPath, you must have a computer that you can connect to the storage system. This computer must run
  - Windows 2000
  - Navisphere Host Agent and CLI version 6.1 or higher.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView/A if you have this software. The following documents will help you with this planning:
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273)
  - *EMC CX400-Series and CX600-Series Storage Systems Configuration Planning Guide* (P/N 014003113)
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide* (P/N 014003087)
  - *EMC Fibre Channel Storage System Model FC4500, FC5300, and FC5700 Configuration Planning Guide* (P/N 014003039)

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## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop or, for an FC4500 or FC4700, on the computer you will connect to the storage system, before starting the installation.

- ◆ Documentation that ships with the HBA and HBA driver.

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This documentation is also available from the following websites

For Emulex HBAs and drivers:

<http://www.emulex.com/ts/docoem/framemc.htm>

For QLogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- ◆ Documentation that ships with the
  - Switches and switch management software
  - Solaris operating system
- ◆ *Removing ATF or CDE Software Before Installing Other Failover Software* (P/N 069001173)

- ◆ *PowerPath Version 4.3 Product Guide* (P/N 300-001-673)  
OR  
*PowerPath Version 4.2 Product Guide* (P/N 300-001-521)  
OR  
*PowerPath Version 4.1 Product Guide* (P/N 300-001-290)  
OR  
*PowerPath Version 4.0 Product Guide* (P/N 300-000-979)  
OR  
*PowerPath Version 3.0 Product Guide* (P/N 300-001-047)
- ◆ *PowerPath for Solaris Version 4.3 Installation and Administration Guide* (P/N 300-001-681)  
OR  
*PowerPath for Solaris Version 4.2 Installation and Administration Guide* (P/N 300-001-528)  
OR  
*PowerPath Version 4.1 for Solaris Installation and Administration Guide* (P/N 300-001-293)  
OR  
*PowerPath Version 4.0 for UNIX Installation and Administration Guide* (P/N 300-000-978)  
OR  
*PowerPath Version 3.0 for UNIX Installation and Administration Guide* (P/N 300-000-511)
- ◆ *EMC Navisphere Agent and CLI for Solaris Version 5.X Installation Guide* (P/N 069001150)  
OR  
*EMC CX-Series Server Software for Solaris Installation Guide* (P/N300-002-039)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038)
- ◆ *Storage-System Host Utilities for Solaris Administrator's Guide* (P/N 069001140)
- ◆ *EMC SnapView Installation Guide* (P/N 069001193, revision A02 or higher)
- ◆ *EMC SAN Copy Installation Guide* (P/N 069001187)

- ◆ *EMC Rails and Enclosures Field Installation Guide* (P/N 300-001-799)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082) - for SPS installation only
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX200-Series Setup and Cabling Guide* (P/N 014003116) and *EMC Storage Systems CX200-Series Initialization Guide* (P/N 014003117)
- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide* (P/N 300-001-276, rev A02 or higher)  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-276, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC 2-Gigabit Disk Processor Enclosure (DPE2) CX400-Series Setup and Cabling Guide* (P/N 014003105) and *EMC Storage Systems CX400-Series and CX600-Series Initialization Guide* (P/N 014003112)
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide* (P/N 300-001-275, rev A02 or higher)  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-275, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC Storage Processor Enclosure (SPE) CX600-Series Setup and Cabling Guide* (P/N 014003078) and *EMC Storage Systems CX400-Series and CX600-Series Initialization Guide* (P/N 014003112)
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide* (P/N 300-001-274, rev A02 or higher)  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide* (P/N 300-001-274, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide* (P/N 014003104)

- ◆ *FC4500 Setup Guide* (P/N 014003102, revision A03 or higher)
- ◆ *FC4700-2 Setup Guide* (P/N 014003073)
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for Sun Solaris* (P/N 300-000-607)

## PowerPath Checklist — New Solaris Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure. <input type="checkbox"/> Install HBA driver.	HBA documentation (see URL on page 5-4)
2 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and PowerPath. You will set the persistent bindings after the storage system is installed and the switches are zoned. For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b> <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Solaris host connectivity guide HBA documentation (see URL on page 5-4)
3 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for UNIX installation and administrator's guide
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for Solaris Installation Guide
5 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	

Task	With Access Logix	Reference Document
<b>6 Switches</b> <b><i>Install</i></b>	For a SAN <ul style="list-style-type: none"> <li><input type="checkbox"/> Install switches, if not already installed.</li> <li><input type="checkbox"/> Connect a cable from each host HBA port to a switch port.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.  <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.  <b>For a 2-Gigabit switch</b> - One of the following:               <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> </li> </ul>	Rails, cabinet, switch documentation.
<b>7 Storage System</b> <b><i>Install</i></b>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
<b>8 Storage System</b> <b><i>Initialize and install software enablers</i></b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports.</li> <li><input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system.</li> <li><input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.</li> </ul>	Storage-system setup guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>9 Storage System</b> <b><i>Cable to switch or server and LAN</i></b>	<input type="checkbox"/> Connect the storage system to the switch or HBA ports. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port. <b>For a 2-Gigabit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.	Storage-system setup guide.
<b>10 Storage System</b> <b><i>Set up security</i></b>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>11 Storage System</b> <b><i>Set Properties for PowerPath</i></b>	<input type="checkbox"/> Use the following the following Navisphere CLI commands to set the following default storage-system properties to the values for PowerPath: <b>navicli -h hostname systemtype -config 3</b> <b>navicli -h hostname failovermode 1</b> <b>navicli -h hostname arraycommpath 1</b> <b>navicli -h hostname unitserialnumber lun</b> ( <i>only for server in a Sun Cluster; it must left at the default setting for all other cases</i> ) where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
<b>12 Switches</b> <b><i>Zone</i></b>	For a SAN <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	Switch management documentation

Task	With Access Logix	Reference Document
<b>13 Server</b> <b>Make target SPs available</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Add persistent bindings to the HBA driver configuration file.</li> <li><input type="checkbox"/> Edit the <code>/kernel/drv/sd.conf</code> file to add LUNs and their targets.</li> <li><input type="checkbox"/> Reboot the server using the <code>reboot - - -r</code> command so the HBA can see the targets (SPs).</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use the inquiry option of the <code>format</code> command to verify that each path to the storage system has one arraycomppath device with an ID of <i>drive type unknown</i>. The output of this command should be <i>Vendor DGC, Product LUNZ</i>.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.</li> </ul>	<p>Solaris utilities kit administrator's guide</p> <p>Solaris <code>driver.conf</code> man page</p> <p>Solaris documentation</p> <p>Navisphere Manager administrator's guide and online help</p>
<b>14 Storage System</b> <b>Configure</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.</li> <li><input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.</li> <li><input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group</li> <li><input type="checkbox"/> Reboot the server using the <code>reboot - - -r</code> command so that Solaris recognizes the LUNs. Now the LUNs in the Storage Group look like any other disks in the server.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use the <code>format</code> command to verify that Solaris recognizes the LUNs. If Solaris does not recognize any LUNs, verify the server's connection to the Storage Group.</li> </ul>	<p>Navisphere Manager administrator's guide and online help</p> <p>Solaris documentation</p>
<b>15 Storage System</b> <b>Set up Event Monitor</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Plan your monitoring configuration.</li> <li><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</li> </ul>	<p>Manager administrator's guide and online help</p>

Task	With Access Logix	Reference Document
<b>16 Server</b> <b><i>Make LUNs available to Solaris</i></b>	<input type="checkbox"/> Prepare the LUNs to receive data by <ul style="list-style-type: none"> <li>• Specifying Solaris mount point names for them</li> <li>• Labeling and partitioning them</li> <li>• Mounting file systems on them</li> <li>• Mounting them to the mount points</li> </ul>	Solaris host connectivity guide or Solaris documentation
<b>17 Server</b> <b><i>Configure PowerPath for missing devices</i></b>	<input type="checkbox"/> Use the following PowerPath commands to configure PowerPath for any missing logical devices so all paths to LUNs are visible: <b>powercf -i or powercf -q</b> <b>powermt config</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all the paths to the LUNs: <b>powermt display dev=all class=clariion</b>  If PowerPath cannot see all the paths, verify that <ul style="list-style-type: none"> <li>• You registered your PowerPath license key if you have one.</li> <li>• the storage-system properties are set as defined in step 11.</li> </ul>	PowerPath product guide
<b>18 Server</b> <b><i>Test PowerPath with a license key</i></b>	If you have a PowerPath license key <b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.  <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b>  <input type="checkbox"/> Choose one available LUN to receive I/O for the test.  <input type="checkbox"/> View the paths to the chosen LUN using the PowerPath following command: <b>powermt display dev=x every=2</b>  where x is a pseudo device that represents the chosen LUN.	PowerPath product guide

Task	With Access Logix	Reference Document
<b>18 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> Start I/O to the LUN. <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA. <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled paths becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>19 Server</b> <b>VERITAS VxVM</b>	<b>For a server with VERITAS VxVM V3.1.1 or below</b> <input type="checkbox"/> Before you reboot the server, edit the <b>/etc/rcS.d/S24powerstartup</b> file to add the following two lines to the bottom of the file after the last <b>fi</b> character: <b>/etc/powermt set volume_open_policy=firstpath</b> <b>echo "PowerPath:powermt set volume_open_policy=firstpath"</b> On the next reboot, the first path policy used by CLARiiON storage systems will take effect. <b>For a server with VERITAS VxVM V3.2 or above</b> <input type="checkbox"/> Issue the following command: <b>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</b> You need to issue this command just once and it will take effect on the next reboot.	VERITAS VxVM documentation and EMC manual on installing and configuring EMP power devices with Solaris applications

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — New Solaris Server and Existing Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
<b>1 Server</b> <b><i>Install HBAs and driver</i></b>	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Install HBA driver.	<input type="checkbox"/> Install HBAs. <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.  <input type="checkbox"/> Install HBA driver.	HBA documentation (see URL on page 5-4).
<b>2 Server</b> <b><i>Set HBA driver parameters</i></b>	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and PowerPath.  You will set the persistent bindings after the storage system is installed and the switches are zoned.  For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b>  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Set the HBA driver parameters, except for the persistent bindings, to the values required for CLARiiON and Power Path.  You will set the persistent bindings after the storage system is installed and the switches are zoned.  For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b>  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Solaris host connectivity guide  <b>For Emulex or QLogic HBAs</b> - HBA documentation (see URL on page 5-4)  <b>For JNI HBAs</b> - Solaris utilities administrator guide

Task	With Access Logix	Without Access Logix	Reference Document
3 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for UNIX installation and administrator's guide
4 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	CX-Series Server Software for Solaris Installation Guide
5 <b>Server</b> <i>Install admsnap</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.	N/A	
6 <b>Storage System</b> <i>Update software</i>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 <b>Server</b> <i>Cable to switches or storage system</i></p>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.</p> <p><b>For a 2-Gigabit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><input type="checkbox"/> Cable the HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.</p> <p><b>For a 2-Gigabit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.

Task	With Access Logix	Without Access Logix	Reference Document
<b>8 Switches Zone</b>	For a SAN <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs</li> <li><input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	For a SAN <p>Zone the switches to provide a path from each HBA port (host initiator) to the appropriate SPs</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	Switch management documentation
<b>9 Storage System Register HBAs</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> On the server, restart the Navisphere Host Agent or Navisphere Server Utility.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's <b>Connectivity Status</b> dialog box to verify that each HBA is registered with the storage system.</li> </ul> <p>For an FC4500 storage system, go to step 11.</p>	For an FC4500 storage system go to step 11.	CX-Series Server Software for Solaris Installation Guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<p>10 <b>CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System Set Properties for PowerPath</b></p>	<p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's HBA ports (initiators):</p> <p><b>Initiator Type</b> to CLARiiON Open</p> <p><b>Failover mode</b> to 1</p> <p><b>Array compath</b> to Enabled</p> <p><input type="checkbox"/> If the server is in a Sun Cluster, use the following Navisphere CLI command to set the unitserialnumber storage-system property to <b>lun</b>:</p> <p><b>navicli -h <i>hostname</i> unitserialnumber lun</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 12.</p>	<p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycompath 1</b></p> <p><b>navicli -h <i>hostname</i> unitserialnumber lun</b> (only for server in a Sun Cluster)</p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 12.</p>	<p>Navisphere Manager administrator's guide and online help or Navisphere CLI reference</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
11 FC4500 Storage System	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's HBA ports (initiators):</p> <pre>navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -type 3  navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -failovermode 1  navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -arraycomppath 1  navicli -np -d <i>device</i> storagegroup -sethost -host <i>servername</i> -unitserialnumber <i>lun</i> (only for server in a Sun Cluster; it <i>must</i> left at the default setting for all other cases)</pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>). <i>servername</i> is the name of the server with the HBAs.</p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to determine the default storage-system type:</p> <pre>navicli -np -d <i>device</i> systemtype</pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following command to set it to 3:</p> <pre>navicli -np -d <i>device</i> systemtype -config 3</pre> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
11 FC4500 Storage System (cont.)		<input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -np -d device failovermode 1</b> <b>navicli -np -d device arraycommpath 1</b> <b>navicli -np -d device unitserialnumber lun</b> ( <i>only for server in a Sun Cluster; it must left at the default setting for all other cases</i> ) where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).	Navisphere CLI reference
12 Server <i>Make target SPs available</i>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <input type="checkbox"/> Edit the <b>/kernel/drv/sd.conf</b> file to add any additional LUNs you will bind and their targets. <input type="checkbox"/> Reboot the server using the <b>reboot -- -r</b> command so the HBA can see the targets (SPs). <input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned.	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file. <input type="checkbox"/> Edit the <b>/kernel/drv/sd.conf</b> file to add any additional LUNs you will bind and their targets. <input type="checkbox"/> Reboot the server using the <b>reboot -- -r</b> command so the HBA can see the targets (SPs). <input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned.	Solaris utilities kit administrator's guide  Solaris <b>driver.conf</b> man page  Solaris documentation



Task	With Access Logix	Without Access Logix	Reference Document
<b>14 Server</b> <b><i>Make LUNs available to Solaris</i></b>	<input type="checkbox"/> Prepare LUNs to receive data by <ul style="list-style-type: none"> <li>• Specifying Solaris mount point names for them</li> <li>• Labeling and partitioning them</li> <li>• Mounting file systems on them</li> <li>• Mounting them to the mount points</li> </ul>	<input type="checkbox"/> Prepare the LUNs to receive data by <ul style="list-style-type: none"> <li>• Specifying Solaris mount point names for them</li> <li>• Labeling and partitioning them</li> <li>• Mounting file systems on them</li> <li>• Mounting them to the mount points</li> </ul>	Solaris host connectivity guide or Solaris documentation
<b>15 Server</b> <b><i>Configure PowerPath for missing devices</i></b>	<input type="checkbox"/> Use the following PowerPath commands to configure PowerPath for any missing logical devices so all paths to the LUNs are visible: <b>powercf -i or powercf -q</b> <b>powermt config</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all paths to the LUNs: <b>powermt display dev=all class=clariion</b>  If PowerPath cannot see all the paths, verify that <ul style="list-style-type: none"> <li>• You registered your PowerPath license key.</li> <li>• The storage-system properties are set as defined in step 10.</li> </ul>	<input type="checkbox"/> Use the following PowerPath commands to configure PowerPath for any missing logical devices so all paths to the LUNs are visible: <b>powercf -i or powercf -q</b> <b>powermt config</b>  <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees all paths to the LUNs: <b>powermt display dev=all class=clariion</b>  If PowerPath cannot see all the paths, verify that <ul style="list-style-type: none"> <li>• You registered your PowerPath license key.</li> <li>• The storage-system properties are set as defined in step 10.</li> </ul>	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>16 Server</b></p> <p><b>Test PowerPath with a license key</b></p>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clarion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Stop all applications accessing the storage system and disable user logins to the server.</li> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clarion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	<p>PowerPath product guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>17 Server</b> <b>VERITAS VxVM</b>	<p><b>For a server with VERITAS VxVM V3.1.1 or below</b></p> <input type="checkbox"/> Before you reboot the server, edit the <code>/etc/rcS.d/S24powerstartup</code> file to add the following two lines to the bottom of the file after the last <code>fi</code> character: <b><code>/etc/powermt set volume_open_policy=firstpath</code></b> <b><code>echo "PowerPath:powermt set volume_open_policy=firstpath"</code></b> On the next reboot, the first path policy used by CLARiiON storage systems will take effect.	<p><b>For a server with VERITAS VxVM V3.1.1 or below</b></p> <input type="checkbox"/> Before you reboot the server, edit the <code>/etc/rcS.d/S24powerstartup</code> file to add the following two lines to the bottom of the file after the last <code>fi</code> character: <b><code>/etc/powermt set volume_open_policy=firstpath</code></b> <b><code>echo "PowerPath:powermt set volume_open_policy=firstpath"</code></b> On the next reboot, the first path policy used by CLARiiON storage systems will take effect.	VERITAS VxVM documentation and EMC manual on installing and configuring EMP power devices with Solaris applications
	<p><b>For a server with VERITAS VxVM V3.2 or above</b></p> <input type="checkbox"/> Issue the following command: <b><code>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</code></b> You need to issue this command just once and it will take effect on the next reboot.	<p><b>For a server with VERITAS VxVM V3.2 or above</b></p> <input type="checkbox"/> Issue the following command: <b><code>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</code></b> You need to issue this command just once and it will take effect on the next reboot.	

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Solaris Server and New Storage System

Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must

- ◆ Back up your server configurations.
- ◆ Back up data on all storage systems connected to the server.
- ◆ Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.

Simply removing ATF or CDE using the uninstall procedure in the Solaris ATF administrator's guide or the Solaris utilities administrator's guide may not return the server to its original state, and may result in lost data.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation (see URL on page 5-4)
2 <b>Server</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	Removing ATF or CDE
3 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 5-3), update it: <ul style="list-style-type: none"> <li>• HBA driver (save the persistent bindings as you will need to add them to the new driver.)</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	HBA documentation (see URL on page 5-4) CX-Series Server Software for Solaris Installation Guide
4 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath.  You will set the persistent bindings after the storage system is installed and the switches are zoned.  For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b>  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Solaris host connectivity guide HBA documentation (see URL on page 5-4)
5 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it.  <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  <b>Note</b> The format command will display n+1 device entries for each LUN, where n is the number of paths to the LUN. One of these entries is a PowerPath device and the other n entries are native devices.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for UNIX installation and administrator's guide
6 <b>Storage System</b> <i>Install</i>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation

Task	With Access Logix	Reference Document
<b>7 Storage System</b> <i>Initialize and install software enablers</i>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.	Storage-system setup guide  Navisphere Manager administrator's guide and online help
<b>8 Storage System</b> <i>Cable to switch or server and LAN</i>	<input type="checkbox"/> Connect the storage system to the switch or HBA ports. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port. <b>For a 2-Gigabit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <input type="checkbox"/> Cable each SP to the LAN connected to the hosts from which you will manage the storage system.	Storage-system setup guide  Storage-system setup guide
<b>9 Storage System</b> <i>Set up security</i>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>10 Set Properties for PowerPath</b>	<input type="checkbox"/> Use the following the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b> <b>navicli -h <i>hostname</i> unitserialnumber lun</b> ( <i>only</i> for server in a Sun Cluster; it <i>must</i> left at the default setting for all other cases) where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference

Task	With Access Logix	Reference Document
<b>11 Server</b> <b><i>Cable additional HBAs to switches or storage system</i></b>	<input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports. <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port. <b>For a 2-Gigabit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.
<b>12 Switches</b> <b><i>Zone additional HBAs</i></b>	<b>For a SAN</b> <input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the SPs. <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation
<b>13 Server</b> <b><i>Make target SPs available</i></b>	<input type="checkbox"/> Add persistent bindings for the new SPs and any new HBAs to the HBA driver configuration file. <b>Note</b> Removing ATF does not remove or change the persistent bindings. <input type="checkbox"/> Edit the <code>/kernel/drv/sd.conf</code> file to add LUNs and their targets. <input type="checkbox"/> Reboot the server using the <code>reboot - - -r</code> command so the HBA can see the targets (SPs). <input type="checkbox"/> <b>Checkpoint</b> - Verify that each HBA sees only the targets (SPs) to which it is zoned. <input type="checkbox"/> <b>Checkpoint</b> - Use the inquiry option of the <code>format</code> command to verify that each path to the storage system has one <code>arraycommpath</code> device with an ID of <code>drive type unknown</code> . The output of this command should be <i>Vendor DGC, Product LUNZ</i> .	Solaris utilities kit administrator's guide  Solaris <b>driver.conf</b> man page  Solaris documentation





Task	With Access Logix	Reference Document
<b>20 Server</b> <b>VERITAS VxVM</b>	<p><b>For a server with VERITAS VxVM V3.1.1 or below</b></p> <p><input type="checkbox"/> Before you reboot the server, edit the <code>/etc/rcS.d/S24powerstartup</code> file to add the following two lines to the bottom of the file after the last <code>fi</code> character:</p> <pre><b>/etc/powermt set volume_open_policy=firstpath</b></pre> <pre><b>echo "PowerPath:powermt set volume_open_policy=firstpath"</b></pre> <p>On the next reboot, the first path policy used by CLARiiON storage systems will take effect.</p> <p><b>For a server with VERITAS VxVM V3.2 or above</b></p> <p><input type="checkbox"/> Issue the following command:</p> <pre><b>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</b></pre> <p>You need to issue this command just once and it will take effect on the next reboot.</p>	VERITAS VxVM documentation and EMC manual on installing and configuring EMP power devices with Solaris applications

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Solaris Server and Existing Storage System

This checklist assumes that the existing Solaris server and existing storage system are already connected in a SAN or direct attach configuration. Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### **CAUTION**

**EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must**

- ◆ **Back up your server configurations.**
- ◆ **Back up data on all storage systems connected to the server.**
- ◆ **Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.**

**Simply removing ATF or CDE using the uninstall procedure in the Solaris ATF administrator's guide or the Solaris utilities administrator's guide may not return the server to its original state, and may result in lost data.**

If you are transitioning a SunCluster or VERITAS Cluster Server (VCS) configuration from ATF or CDE to PowerPath, perform the procedure in the checklist on each node in succession. While you perform the procedure on one node, you can leave the cluster services active on the other node, provided failure in a path to the storage system does not occur.

The **Without Access Logix** column does *not* apply to CX300, CX500, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs</i>	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA documentation (see URL on page 5-4)
2 <b>Server</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.	Removing ATF or CDE
3 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 5-3), update it <ul style="list-style-type: none"> <li>• HBA driver (save the persistent bindings as you will need to add them to the new driver.)</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> </ul>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision (page 5-3), update it: <ul style="list-style-type: none"> <li>• HBA driver (save the persistent bindings as you will need to add them to the new driver.)</li> <li>• Navisphere Host Agent</li> </ul>	<b>For Emulex or QLogic driver-</b> HBA documentation (see URL on page 5-4)  <b>For JNI driver-</b> Solaris utilities administrator guide  CX-Series Server Software for Solaris Installation Guide
4 <b>Server</b> <i>Set HBA driver parameters</i>	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath.  For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b>  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Make sure the HBA driver parameters, except for the persistent bindings, are set to the values required for CLARiiON and PowerPath.  For an Emulex HBA driver, be sure to set the following parameter: <b>no-device-delay=0</b>  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Solaris host connectivity guide  <b>For Emulex or QLogic HBAs -</b> HBA documentation (see URL on page 5-4)  <b>For JNI HBAs -</b> Solaris utilities administrator guide

Task	With Access Logix	Without Access Logix	Reference Document
<b>5 Storage System Update software</b>	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.  For an FC4500 storage system, go to step 7.	<input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.  <b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.  For an FC4500 storage system, go to step 7.	Navisphere Manager administrator's guide and online help
<b>6 CX300, CX400, CX500, CX600, CX700, or FC4700-Series Storage System Set properties for PowerPath</b>	<b>For new HBAs</b> <input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -h <i>hostname</i> systemtype</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	<b>For any HBAs</b> <input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -h <i>hostname</i> systemtype</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -h <i>hostname</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	Navisphere CLI reference



Task	With Access Logix	Without Access Logix	Reference Document
<b>7 FC4500 Storage System</b> <i>Set properties for PowerPath</i>	<input type="checkbox"/> Connect a computer to the serial port on the storage system.  <b>For new HBAs</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -np -d <i>device</i> systemtype</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -np -d <i>device</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	<input type="checkbox"/> Connect a computer to the serial port on the storage system.  <b>For any HBAs</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:  <b>navicli -np -d <i>device</i> systemtype</b>  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).  If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:  <b>navicli -np -d <i>device</i> systemtype -config 3</b>  <b>CAUTION</b> The above command reboots both SPs at the same time.	Storage-system setup guide  Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<b>7 FC4500 Storage System</b> <i>Set properties for PowerPath (cont.)</i>	<b>For new HBAs (cont.)</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:  <b>navicli -np -d <i>device</i> failovermode 1</b>  <b>navicli -np -d <i>device</i> arraycomppath 1</b>  <b>navicli -np -d <i>device</i> unitserialnumber <i>lun</i></b> ( <i>only for server in a Sun Cluster; it must left at the default setting for all other cases</i> )  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).	<b>For new HBAs (cont.)</b> <input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:  <b>navicli -np -d <i>device</i> failovermode 1</b>  <b>navicli -np -d <i>device</i> arraycomppath 1</b>  <b>navicli -np -d <i>device</i> unitserialnumber <i>lun</i></b> ( <i>only for server in a Sun Cluster; it must left at the default setting for all other cases</i> )  where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b> ).	Navisphere CLI reference

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 <b>FC4500 Storage System</b>  <b>Set properties for PowerPath (cont.)</b></p>	<p><b>For existing HBAs</b>  An existing HBA is one that is registered with the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <pre><b>navicli -np -d device storagegroup -sethost -host servername -type 3</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -failovermode 1</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -arraycommpath 1</b></pre> <pre><b>navicli -np -d device unitserialnumber lun</b> (<i>only</i> for server in a Sun Cluster; it <i>must</i> left at the default setting for all other cases)</pre> <p>where</p> <p><i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p><i>servername</i> is the name of the server with the HBAs.</p>		<p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>8 Server</b> <b>Install PowerPath</b>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <p><b>Note</b> The format command will display n+1 device entries for each LUN, where n is the number of paths to the LUN. One of these entries is a PowerPath device and the other n entries are native devices.</p> <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees the paths to the LUNs: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in step 6.</li> </ul>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> If you have a PowerPath license key, register it <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. <p><b>Note</b> The format command will display n+1 device entries for each LUN, where n is the number of paths to the LUN. One of these entries is a PowerPath device and the other n entries are native devices.</p> <input type="checkbox"/> <b>Checkpoint</b> - Use the following PowerPath command to verify that PowerPath sees the paths to the LUNs: <b>powermt display dev=all class=clariion</b> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are set as defined in step 6.</li> </ul>	PowerPath release notes and PowerPath for UNIX installation and administrator's guide  PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>9 Server</b> <i>Cable additional HBAs to switches or storage system</i></p>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p><input type="checkbox"/> Cable any additional HBA ports to the switch connected to the storage system or to SP ports.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each additional HBA port.</p> <p><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</p> <p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Storage-system setup guide.
<p><b>10 Switches</b> <i>Zone for additional HBAs</i></p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</p>	<p><b>For a SAN</b></p> <p><input type="checkbox"/> Zone the switches to provide a path from each additional HBA port (host initiator) to the appropriate SPs.</p> <p><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system</p>	Switch management documentation

Task	With Access Logix	Without Access Logix	Reference Document
<b>11 Server</b> <b>Make target SPs available</b>	<input type="checkbox"/> If you updated the driver or added additional HBAs, add persistent bindings to the HBA driver configuration file. <b>Note</b> Removing ATF does not remove or change the persistent bindings. <input type="checkbox"/> Edit the <code>/kernel/drv/sd.conf</code> file to add LUNs for the new targets. <input type="checkbox"/> If you added persistent bindings, reboot the server using the <b>reboot - - -r</b> command so the HBAs can see the targets (SPs). <input type="checkbox"/> <b>Checkpoint</b> - Use the inquiry option of the <b>format</b> command to verify the paths to the storage system. Alternate paths will have a device with an ID of <i>drive type unknown</i> .	<input type="checkbox"/> If you updated the driver or added additional HBAs, add persistent bindings to the HBA driver configuration file. <b>Note</b> Removing ATF does not remove or change the persistent bindings. <input type="checkbox"/> Edit the <code>/kernel/drv/sd.conf</code> file to add LUNs with new targets. <input type="checkbox"/> If you added persistent bindings, reboot the server using the <b>reboot - - -r</b> command so the HBAs can see the targets (SPs). <input type="checkbox"/> <b>Checkpoint</b> - Use the inquiry option of the <b>format</b> command to verify the paths to the storage system. Alternate paths will have a device with an ID of <i>drive type unknown</i> .	Solaris utilities kit administrator's guide  Solaris <b>driver.conf</b> man page  Solaris documentation
<b>12 Server</b> <b>Make paths to additional HBAs available</b>	<input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server and its Storage Group. <input type="checkbox"/> Reboot the server using the <b>reboot - - -r</b> command so the HBAs can see the LUNs in the Storage Group.	N/A	Navisphere Manager administrator's guide and online help



Task	With Access Logix	Without Access Logix	Reference Document
<b>14 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.  <input type="checkbox"/> Start I/O to the LUN.  <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.  <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.  <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.  <input type="checkbox"/> Start I/O to the LUN.  <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.  <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.  <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
<b>15 Server</b> <b>Applications online</b>	<input type="checkbox"/> Bring any applications that you shut down (such as clustering or databases) back online, and configure for PowerPath if required.	<input type="checkbox"/> Bring any applications that you shut down (such as clustering or databases) back online, and configure for PowerPath if required.	PowerPath for Unix installation and administrator's guide

Task	With Access Logix	Without Access Logix	Reference Document
16 Server <i>VERITAS VxVM</i>	<p><b>For a server with VERITAS VxVM V3.1.1 or below</b></p> <p><input type="checkbox"/> Before you reboot the server, edit the <code>/etc/rcS.d/S24powerstartup</code> file to add the following two lines to the bottom of the file after the last <code>fi</code> character:</p> <pre><b>/etc/powermt set volume_open_policy=firstpath echo "PowerPath:powermt set volume_open_policy=firstpath"</b></pre> <p>On the next reboot, the first path policy used by CLARiiON storage systems will take effect.</p> <p><b>For a server with VERITAS VxVM V3.2 or above</b></p> <p><input type="checkbox"/> Issue the following command:</p> <pre><b>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</b></pre> <p>You need to issue this command just once and it will take effect on the next reboot.</p>	<p><b>For a server with VERITAS VxVM V3.1.1 or below</b></p> <p><input type="checkbox"/> Before you reboot the server, edit the <code>/etc/rcS.d/S24powerstartup</code> file to add the following two lines to the bottom of the file after the last <code>fi</code> character:</p> <pre><b>/etc/powermt set volume_open_policy=firstpath echo "PowerPath:powermt set volume_open_policy=firstpath"</b></pre> <p>On the next reboot, the first path policy used by CLARiiON storage systems will take effect.</p> <p><b>For a server with VERITAS VxVM V3.2 or above</b></p> <p><input type="checkbox"/> Issue the following command:</p> <pre><b>vxddladm addjbod vid=DGC pagecode 0x83 offset=8 length=16</b></pre> <p>You need to issue this command just once and it will take effect on the next reboot.</p>	VERITAS VxVM documentation and EMC manual on installing and configuring EMP power devices with Solaris applications

## DMP Configurations for Solaris

Read this section if you are installing a Solaris VERITAS DMP configuration with a new server and a new storage system. A new server and a new storage system are defined as follows:

**new server** - A server running Solaris and *not* connected to any storage system.

**new storage system** - A CX300, CX500, or CX700 storage system that has factory default settings and has never been connected to a server.

Topics relating to the checklist for Solaris DMP configurations are

- ◆ Required Host Software Revisions..... 5-45
- ◆ Prerequisites ..... 5-45
- ◆ Documentation..... 5-46
- ◆ DMP Checklist - New Solaris Server and New Storage System5-48

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### Required Host Software Revisions

- ◆ Solaris operating system revision and patches listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ VxVM 3.2 update 2 or higher

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### Prerequisites

- ◆ You have installed the storage systems and, for FC4700 storage systems, initialized them (see storage-system initialization guide).
- ◆ You have set up storage-system security (see Security administrator's guide and Navisphere Manager online help).
- ◆ You have installed any switches and connected the storage-system SPs to switch ports (see switch documentation)
- ◆ You have installed Navisphere Manager.

- ◆ You have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server that you will connect to the SPs in the storage system.
- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView/A if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with the HBA and HBA driver.

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This documentation is also available from the following websites:

For Emulex HBAs and drivers:

<http://www.emulex.com/ts/docoem/framemc.htm>

For QLogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- ◆ Documentation that ships with
  - Switches and switch management software
  - Sun Solaris® operating system
  - VERITAS Volume Manager
- ◆ *Storage-System Host Utilities for Solaris Administrator's Guide* (P/N 069001140)
- ◆ *EMC CX-Series Server Software for Solaris Installation Guide* (P/N 300-002-039)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082)

- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide (P/N 300-001-276, rev A02 or higher)*  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-276, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide (P/N 300-001-275, rev A02 or higher)*  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide (P/N 300-001-275, rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide (P/N 300-001-274, rev A02 or higher)*  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide (P/N 300-001-274), rev A01) and EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide (P/N 300-001-272)*
- ◆ *EMC 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide (P/N 014003104)*
- ◆ *EMC Navisphere Manager Administrator's Guide (P/N 069001125)*
- ◆ *EMC Navisphere Security Administrator's Guide (P/N 069001124)*
- ◆ *EMC Host Connectivity Guide for Sun Solaris (P/N 300-000-607)*

## DMP Checklist - New Solaris Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs, drivers, cables</i>	<input type="checkbox"/> Install the Fibre Channel HBAs, and, if needed, install the optical GBIC connector on the 1-Gbit PCI HBA.  <input type="checkbox"/> Install the HBA driver.  <input type="checkbox"/> Connect cables from the host HBA port to a switch port.	<b>For Emulex or Qlogic HBAs</b> - HBA documentation (see URL on page 5-4)  <b>For JNI HBAs</b> - Solaris utilities administrator guide
2 <b>Server</b> <i>Edit the HBA driver file</i>	<input type="checkbox"/> Set the HBA driver parameters to the settings required for CLARiiON, except for the persistent bindings, which you will set after you have zoned the switches.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<b>For Emulex or Qlogic HBAs</b> - HBA documentation (see URL on page 5-4)  <b>For JNI HBAs</b> - Solaris utilities administrator guide
3 <b>Server</b> <i>Add LUNs to the sd.conf file</i>	<input type="checkbox"/> Add LUNs to the <code>/kernel/drv/sd.conf</code> file <input type="checkbox"/> Reboot the server using the <code>reboot -- -r</code> command.	HBA documentation (see URL on page 5-46)
4 <b>Server</b> <i>Install the Host Agent or Server Software</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.  <input type="checkbox"/> If not already done, connect the LAN to the server and perform any needed LAN configuration.	CX-Series Server Software for Solaris Installation Guide
5 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties,  <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.	Navisphere Manager administrator's guide and online help
6 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Set user options, create templates, and set up your monitoring configuration.	Event Monitor administrator's guide and online help.

Task	With Access Logix	Reference Document
7 <b>Storage System</b> <b>Set</b> <b>arraycommpath</b> <b>mode</b>	<input type="checkbox"/> Use the following Navisphere CLI command to set the default storage-system <b>arraycommpath</b> property with the following command:  <b>navicli -h sp arraycommpath 1</b>  where <i>sp</i> is the IP address or network name of the SP in the storage system.	Navisphere CLI reference
8 <b>Switch</b> <b>Connect servers</b> <b>and SPs</b>	<input type="checkbox"/> Verify that the servers and SPs are connected to the switch	Documentation that ships with the switches
9 <b>Switch</b> <b>Zone switches</b>	<b>For a SAN</b> <input type="checkbox"/> Zone switches.  This provides a path from the host initiator to the SP.  You will need to know the WWPN of the host initiators - available in the switch's name server table.  <input type="checkbox"/> Reboot the server using the <b>reboot -- -r</b> command to load the drivers and perform a login of the host initiators and SPs to the fabric ports on the switch.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify that the HBAs and storage systems are logged in to the switch as fabric ports, and to verify that each HBA sees only the targets (SPs) to which it is zoned.	Documentation that ships with the switches
10 <b>Server</b> <b>Add persistent</b> <b>bindings</b>	<input type="checkbox"/> Add persistent bindings to the HBA driver configuration file.	Solaris utilities administrator guide
11 <b>Storage System</b> <b>Verify host</b> <b>initiators are</b> <b>registered</b>	<input type="checkbox"/> Before you connect the server to a Storage Group, use the <b>Connectivity Status</b> dialog in Navisphere Manager to verify that the host initiators are registered.	Navisphere Manager administrator's guide and online help
12 <b>Storage System</b> <b>Connect host</b> <b>initiators to</b> <b>Storage Groups</b>	<input type="checkbox"/> Use Navisphere Manager to connect servers to Storage Groups  <input type="checkbox"/> Reboot the server using the <b>reboot -- -r</b> command so that Solaris recognizes the LUNs.  Now the LUNs in the Storage Group look like any other disks in the server.  <input type="checkbox"/> <b>Checkpoint</b> - Use the <b>format</b> command to verify that the operating system sees all the LUNs and label any new LUNs.	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
13 <b>Server</b> <i>Install Volume Manager and DMP</i>	<input type="checkbox"/> Use the <b>pkgadd</b> command to add Volume Manager and DMP to the server. <input type="checkbox"/> Install any recommended VERITAS updates.	VERITAS Volume Manager documentation
14 <b>Server</b> <i>Install the CLARiiON DMP driver</i>	<input type="checkbox"/> Download the CLARiiON DMP driver to the server from Services on the VERITAS website. <input type="checkbox"/> Use the <b>pkgadd</b> command to install the CLARiiON DMP driver on the server. <b>Note</b> Until <b>rootdg</b> is created (part of <b>vxinstall</b> command) on at least one disk, DMP displays an error message looking for the <b>config</b> daemon.	VERITAS Volume Manager documentation
15 <b>Storage System</b> <i>Set the system type and failover mode</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the default storage-system type and failover mode properties with the following commands: <b>navicli -h sp systemtype -config 3</b> <b>navicli -h sp storagegroup -sethost -host solaris_host -failovermode 2</b> where <i>sp</i> is the IP address or network name of the SP in the storage system. <i>solaris_host</i> is the name of the Solaris server.	<b>navicli</b> man page or Navisphere CLI reference
16 <b>Server</b> <i>Reboot</i>	<input type="checkbox"/> Reboot the server using the <b>reboot -- -r</b> command <ul style="list-style-type: none"> <li>• to make LUNs available to Solaris</li> <li>• to make LUNs accessible via both SPs</li> </ul> <b>Important</b> If you do not set the failover mode to 2, you will only see half of the expected paths to the SPs.	
17 <b>Server</b> <i>Configure Volume Manager</i>	<input type="checkbox"/> Run <b>vxinstall</b> to configure Volume Manager and place at least one LUN under VxVM control	VERITAS Volume Manager documentation
18 <b>Server</b> <i>Verify DMP installation</i>	<b>For VXVM 3.5 or higher</b> <input type="checkbox"/> Log into VERITAS Enterprise Administrator (VEA). <input type="checkbox"/> Click the host name for the server. <input type="checkbox"/> Click <b>disks</b> . <input type="checkbox"/> Click a device that you know belongs to the CLARiiON storage system.	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
<b>18 Server</b> <b>Verify DMP installation (cont.)</b>	<input type="checkbox"/> Click the paths tab for that device.  <input type="checkbox"/> Verify that the device has primary and secondary paths to it. <input type="checkbox"/> Verify the state of the device (enabled or disabled).  <b>For a VxVM version less than 3.5</b> <input type="checkbox"/> Log into Volume Manager Storage Administrator (VMSA) <input type="checkbox"/> Double-click a disk icon. <input type="checkbox"/> In the list of disks, double-click a disk you know belongs to the CLARiiON storage system. <input type="checkbox"/> Click the <b>disks</b> tab to verify there are the expected number of Primary and Secondary paths. <input type="checkbox"/> Verify that it displays the correct number of paths with <b>vxdisk list device</b> where <i>device</i> is the name of the disk you selected.	VERITAS Volume Manager documentation
<b>19 Server</b> <b>Verify DMP Operation</b>	<input type="checkbox"/> Start I/O to the VERITAS Volume.  <input type="checkbox"/> Identify the CLARiiON devices under the Volume with <b>vxprint -v</b>  <input type="checkbox"/> Choose one of the CLARiiON devices and determine all its paths with <b>vxdisk list device</b> or <b>vxdumpadm getsubpaths dmpnodename=device</b> where <i>device</i> is the name of the CLARiiON device	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
<b>19 Server</b> <b>Verify DMP Operation (cont.)</b>	<input type="checkbox"/> Determine the controller through which I/O is going with <b>iodstat -xn</b>  <input type="checkbox"/> Determine the HBA and SP to which that controller corresponds.  <input type="checkbox"/> Disconnect the path to that SP.  <input type="checkbox"/> Verify that the path to the chosen CLARiiON device is disabled with <b>vxdisk list device</b>  or <b>vxdmpadm getsubpaths</b> <b>dmpnodename=device</b>  where <i>device</i> is the name of the CLARiiON device  <input type="checkbox"/> Verify that I/O is still running with <b>iodstat -xn</b>	VERITAS Volume Manager documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.



#### **CAUTION**

**If you want to install any new software or upgrade any existing software on a storage system after DMP is installed and running, you should use the Navisphere Manager Software Installation Wizard. If this wizard is not supported for your storage system, be sure to refer to the "Special NDU Procedure" in the "VERITAS Volume Manager" section for CLARiiON of the *Host Connectivity Guide for Sun Solaris*, which is available on the EMC Powerlink website.**

## Tru64 UNIX Installation Checklist

This chapter contains a checklist of the tasks required to install a new CLARiiON storage system in a configuration with a new Tru64<sup>®</sup> UNIX<sup>®</sup> server.

Topics are

- ◆ Tru64 UNIX Configurations ..... 6-2
- ◆ Checklist - New Tru64 UNIX Server and New Storage System Without Boot Disk..... 6-4
- ◆ Checklist - New Tru64 UNIX Server and New Storage System With Boot Disk..... 6-6

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## Tru64 UNIX Configurations

Read this section if you are installing a Tru64 UNIX configuration with a new server and a new storage system. A new server and storage system are defined as follows:

**New server** - A server running Tru64 UNIX and *not* connected to any storage system.

**New storage system** - A CX500 or CX700 storage system that has the factory default settings and has *never* been connected to a server.

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### Prerequisites

- ◆ All switches must be installed.
- ◆ Storage systems must be set up, initialized (if required), and connected to switches, and any optional storage-system software (Access Logix, SAN Copy, SnapView, MirrorView, MirrorView/A) must be installed.
- ◆ If you will use Navisphere Manager 6.X, you must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system servers and that will be connected to the SPs in CX500 or CX700 storage systems.

- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView / A if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

This checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with
  - HBA and HBA driver
  - Switches and switch management software
  - Tru64<sup>®</sup> UNIX<sup>®</sup> operating system
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for Compaq Tru64 UNIX* (P/N 300-000-616)

## Checklist - New Tru64 UNIX Server and New Storage System Without Boot Disk

This checklist is for a new storage system that will *not* contain a Tru64 UNIX boot disk. If you want the new storage system to contain a boot disk, use the procedure that starts on page 6-6.

Task	With Access Logix	Reference Document
<b>1 Server</b> <i>Install HBAs, drivers, and cables</i>	<input type="checkbox"/> Install the Fibre Channel HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port. <input type="checkbox"/> Create an entry in <b>/etc/DDR.dbase</b> to provide support for CLARiiON LUNs. <input type="checkbox"/> Install the HBA driver. <input type="checkbox"/> <b>Checkpoint</b> — Verify the server connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	HBA documentation  Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation  HBA documentation
<b>2 Switches</b> <i>Zone</i>	<input type="checkbox"/> Zone the switches to provide a path from each HBA (host initiator) to an SP.	Switch management documentation
<b>3 Storage System</b> <i>Set Base UDID</i>	<input type="checkbox"/> Set the Base UDID (UUID on screen) for the storage system.  If necessary, you can determine the available UDID ranges for the server or cluster with the following command:  <b>wwidmgr -show wwid</b>	Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation

Task	With Access Logix	Reference Document										
4 <b>Storage System</b> <i>Set connection properties</i>	<input type="checkbox"/> Determine the port name and node name of each HBA connected to the storage system. <input type="checkbox"/> Use Navisphere Manager to register the connection for each HBA with the following Initiator Record properties: <table border="0"> <tr> <td><u>Property</u></td> <td><u>Value</u></td> </tr> <tr> <td>Initiator Type</td> <td><b>Compaq/Tru64</b></td> </tr> <tr> <td>ArrayCommPath</td> <td>Selected</td> </tr> <tr> <td>Failover Mode</td> <td><b>0</b></td> </tr> <tr> <td>Unit Serial Number</td> <td><b>Array</b></td> </tr> </table>	<u>Property</u>	<u>Value</u>	Initiator Type	<b>Compaq/Tru64</b>	ArrayCommPath	Selected	Failover Mode	<b>0</b>	Unit Serial Number	<b>Array</b>	<p>Host connectivity guide for Tru64 UNIX</p> <p>Navisphere Manager administrator's guide and online help</p>
<u>Property</u>	<u>Value</u>											
Initiator Type	<b>Compaq/Tru64</b>											
ArrayCommPath	Selected											
Failover Mode	<b>0</b>											
Unit Serial Number	<b>Array</b>											
5 <b>Storage System</b> <i>Set up security</i>	<input type="checkbox"/> For Navisphere 6.X, use Navisphere Manager to define a global administrator (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help										
6 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> After the binding of all LUNs is completed, use Navisphere Manager to connect the server to its Storage Group.	Host connectivity guide for Tru64 UNIX and Navisphere Manager administrator's guide and online help										
7 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help										
8 <b>Server</b> <i>Make LUNs available to Tru64 UNIX</i>	<input type="checkbox"/> Scan for new LUNs with the following command: <input type="checkbox"/> <b>hwmgr -scan scsi</b> <input type="checkbox"/> <b>Checkpoint</b> — Verify that all LUNs in the Storage Group are visible to the server with the following command: <b>hwmgr -show scsi</b> <input type="checkbox"/> Create partition tables and the appropriate utilities for the file systems you will be using with the <b>disklabel</b> command.	Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation										

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## Checklist - New Tru64 UNIX Server and New Storage System With Boot Disk

This checklist is for a new storage system that will contain a Tru64 UNIX boot disk. If you do not want the new storage system to contain a boot disk, use the procedure that starts on page 6-4.

Task	With Access Logix	Reference Document
<b>1 Server</b> <b><i>Install HBAs and cables</i></b>	<input type="checkbox"/> Install the Fibre Channel HBAs. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port. <input type="checkbox"/> <b>Checkpoint</b> — Verify the server connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	HBA documentation
<b>2 Storage System</b> <b><i>Set Base UDID</i></b>	<input type="checkbox"/> Set the Base UDID (UUID on screen) for the storage system. If necessary, you can determine the available UDID ranges for the server or cluster with the following command: <b>wwidmgr -show wwid</b>	Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation

Task	With Access Logix	Reference Document										
<b>3 Switches</b> <b>Zone single path to SP</b>	<input type="checkbox"/> Zone the switches to provide a single path from one HBA (host initiator) to default SP owner of the boot disk LUN in the storage system.  Do not zone more than one path to the storage system at this point in the installation procedure. The installation may fail if both SPs are visible to Tru64 UNIX. You can zone multiple paths later in the installation procedure.  <input type="checkbox"/> <b>Checkpoint</b> — Verify that the HBA connection is visible.  If it is not visible, execute the <b>init</b> command at the server's console.	Switch management documentation      Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation										
<b>4 Storage System</b> <b>Set connection properties</b>	<input type="checkbox"/> Determine the port name and node name of each HBA connected to the storage system.  <input type="checkbox"/> Use Navisphere Manager to register the connection for each HBA with the following Initiator Record properties:  <table border="0"> <tr> <td><u>Property</u></td> <td><u>Value</u></td> </tr> <tr> <td>Initiator Type</td> <td><b>Compaq/Tru64</b></td> </tr> <tr> <td>ArrayCommPath</td> <td>Selected</td> </tr> <tr> <td>Failover Mode</td> <td><b>0</b></td> </tr> <tr> <td>Unit Serial Number</td> <td><b>Array</b></td> </tr> </table>	<u>Property</u>	<u>Value</u>	Initiator Type	<b>Compaq/Tru64</b>	ArrayCommPath	Selected	Failover Mode	<b>0</b>	Unit Serial Number	<b>Array</b>	Host connectivity guide for Tru64 UNIX   Navisphere Manager administrator's guide and online help
<u>Property</u>	<u>Value</u>											
Initiator Type	<b>Compaq/Tru64</b>											
ArrayCommPath	Selected											
Failover Mode	<b>0</b>											
Unit Serial Number	<b>Array</b>											
<b>5 Storage System</b> <b>Bind Boot LUN</b>	<b>CAUTION</b> The RAID Group for the boot LUN must consist of Fibre Channel disks ( <i>not</i> ATA disks).  <input type="checkbox"/> Use Navisphere Manager to create a RAID Group for the LUN that will be the system disk and bind that LUN.  <input type="checkbox"/> Create a Storage Group for the boot LUN.  <input type="checkbox"/> After the binding of the boot LUN is completed, use Navisphere Manager to connect the server to its Storage Group.	Navisphere Manager administrator's guide and online help										

Task	With Access Logix	Reference Document										
<p>6 <b>Server</b> <i>Prepare SRM Console for Boot LUN</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> At the SRM console, execute the <b>init</b> command.</li> <li><input type="checkbox"/> Verify that the boot LUN is visible to the console with the following command: <b>wwidmgr -show wwid</b></li> <li><input type="checkbox"/> Execute the following command: <b>wwidmgr -quickset -udid <i>udid-num</i></b> where <i>udid-num</i> is the UDID number of the boot LUN.</li> <li><input type="checkbox"/> At the SRM console, execute the <b>init</b> command.</li> <li><input type="checkbox"/> <b>Checkpoint</b> — Verify that the boot LUN is visible with the following command: <b>show device</b></li> </ul>	<p>Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation</p>										
<p>7 <b>Server</b> <i>Install Tru64 UNIX on boot LUN</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install Tru64 UNIX on the boot LUN.</li> <li><input type="checkbox"/> Apply any required patches and driver updates.</li> <li><input type="checkbox"/> Create an entry in <b>/etc/ddr.dbase</b> to provide support for CLARiiON LUNs.</li> <li><input type="checkbox"/> Shut down the server.</li> </ul>	<p>Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation</p>										
<p>8 <b>Switches</b> <i>Zone additional paths</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Create the rest of the zones between the SPs and the appropriate HBAs on the server.</li> </ul>	<p>Switch management documentation</p>										
<p>9 <b>Storage System</b> <i>Update connection information</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to disconnect the server from the Storage Group containing the boot LUN.</li> <li><input type="checkbox"/> Use Navisphere Manager to register the remaining connections for each HBA with the following Initiator Record properties: <table style="margin-left: 20px; border: none;"> <thead> <tr> <th style="text-decoration: underline;">Property</th> <th style="text-decoration: underline;">Value</th> </tr> </thead> <tbody> <tr> <td>Initiator Type</td> <td><b>Compaq/Tru64</b></td> </tr> <tr> <td>ArrayCommPath</td> <td>Selected</td> </tr> <tr> <td>Failover Mode</td> <td><b>0</b></td> </tr> <tr> <td>Unit Serial Number</td> <td><b>Array</b></td> </tr> </tbody> </table> </li> <li><input type="checkbox"/> Reconnect the server to the Storage Group containing the boot LUN.</li> </ul>	Property	Value	Initiator Type	<b>Compaq/Tru64</b>	ArrayCommPath	Selected	Failover Mode	<b>0</b>	Unit Serial Number	<b>Array</b>	<p>Navisphere Manager administrator's guide and online help</p>
Property	Value											
Initiator Type	<b>Compaq/Tru64</b>											
ArrayCommPath	Selected											
Failover Mode	<b>0</b>											
Unit Serial Number	<b>Array</b>											

Task	With Access Logix	Reference Document
<b>10 Server</b> <b>Update SRM Console for Boot LUN</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> At the SRM console, execute the <b>init</b> command.</li> <li><input type="checkbox"/> Execute the following command:  <b>wwidmgr -quickset -udid <i>udid-num</i></b>            where <i>udid-num</i> is the UDID number of the boot LUN.</li> <li><input type="checkbox"/> At the SRM console, execute the <b>init</b> command again.</li> <li><input type="checkbox"/> <b>Checkpoint</b> — Verify that the boot LUN is visible with the following command:  <b>show device</b>            Only one entry for the LUN should appear in the device list for each path between the server and the storage system.</li> <li><input type="checkbox"/> Set the boot LUN as default boot device with the following command:  <b>set bootdef_dev</b>            being sure to include all paths to the boot LUN.</li> <li><input type="checkbox"/> Boot the server with the following command:  <b>boot</b></li> </ul>	Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation
<b>11 Storage System</b> <b>Set up security</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> For Navisphere 6.X, use Navisphere Manager to define a global administrator (if not already defined) and any additional users.</li> </ul>	Navisphere security administrator's guide and Navisphere Manager online help
<b>12 Storage System</b> <b>Configure</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to set general storage-system properties.</li> <li><input type="checkbox"/> Use Navisphere Manager to create additional RAID Groups (if desired), bind LUNs, and assign the LUNs to the Storage Group.</li> </ul>	
<b>13 Storage System</b> <b>Set up Event Monitor</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Plan your monitoring configuration.</li> <li><input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.</li> </ul>	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>14 Server</b> <b><i>Make LUNs available to Tru64 UNIX</i></b>	<input type="checkbox"/> After the binding of all LUNs is completed, scan for new LUNs with the following command: <b>hwmgr -scan scsi</b>  <input type="checkbox"/> <b>Checkpoint</b> — Verify that all LUNs in the Storage Group are visible to the server with the following command: <b>hwmgr -show scsi</b>  <input type="checkbox"/> Create partition tables and the appropriate utilities for the file systems you will be using with the <b>disklabel</b> command.	Host connectivity guide for Tru64 UNIX and Tru64 UNIX documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## Windows Installation Checklists

This chapter contains checklists of the tasks required to install an CLARiiON system in a configuration with a Windows® server and PowerPath or VERITAS DMP failover software.

CX-Series refers to all the CX storage systems, except for the CX200LC.

The sections for the different configurations are

- ◆ PowerPath Configurations for Windows .....7-2
- ◆ DMP Configurations for Windows .....7-57

## PowerPath Configurations for Windows

Read this section if you are installing a Windows Server 2003 or Windows 2000 PowerPath configuration with a new or existing server and a new or existing storage system.

A new and existing server and a new and existing storage system are defined as follows:

**new server** - A server running Windows Server 2003 or Windows 2000 and *not* connected to any storage system.

**existing server** - A server running Windows Server 2003 or Windows 2000 that is already connected to one or more storage systems.

**new storage system** - A CX300, CX500, CX500i, or CX700 storage system that has the factory default settings and that has *never* been connected to a server.

**existing storage system** - A CX-Series, FC4500, or FC4700-Series storage system that is already connected to one or more servers and is in a Navisphere domain.

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All CLARiiON storage systems connected to a Windows server must be CX-Series or FC-Series storage systems that are supported for that server. If any other type of CLARiiON storage system is connected to the server, the server cannot run PowerPath.

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Topics in this section are

- ◆ Required Host Software Revisions..... 7-3
- ◆ Prerequisites ..... 7-4
- ◆ Documentation..... 7-5
- ◆ PowerPath Checklist — New Windows Server and New Storage System..... 7-7
- ◆ PowerPath Checklist — New Windows Server and Existing Storage System Without Boot Disk ..... 7-14
- ◆ PowerPath Checklist — New Windows Server and Existing Storage System With Boot Disk ..... 7-25
- ◆ PowerPath Checklist — Existing Windows Server and New Storage System ..... 7-37
- ◆ PowerPath Checklist — Existing Windows Server and Existing Storage System ..... 7-45

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## Required Host Software Revisions

- ◆ Windows Server 2003 or Windows 2000 operating system revision and any service pack listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ Windows Server 2003 PowerPath
  - For CX200, CX400, CX600, FC4500, FC4700-Series storage systems  
Version 3.0.5 or higher
  - For CX300, CX500, and CX700 storage systems  
Version 3.0.6 or higher
  - For CX500i storage systems  
Version 4.3.1 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for Windows* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your Windows Server 2003 version.

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- ◆ Windows 2000 PowerPath
  - For CX200, CX400, CX600, and FC4700-Series storage systems  
Version 3.0.0 or higher
  - For CX300, CX500, and CX700 storage systems  
Version 3.0.5 or higher
  - For CX500i storage systems  
Version 4.3.1 or higher
  - For FC4500 storage systems  
Version 3.0.0 with Patch 3.0.1 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for Windows* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your Windows 2000 version.

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## Prerequisites

- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system server and that you will connect to the SP management ports in the storage system.
- ◆ For most configurations, you must also have a host that is
  - Running Navisphere 6.X CLI
  - On a network that is connected to the storage-system server and that you will connect to SP management ports in the storage system.
- ◆ For an FC4500 storage system connected to a server on which you will install PowerPath, you must have a computer that you can connect to the storage system. This computer must run
  - Windows 2000
  - Navisphere Host Agent and CLI version 6.1 or higher
- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, MirrorView, and MirrorView/A if you have this software. The following documents will help you with this planning:
  - *EMC Fibre Channel Storage System CX200-Series Configuration Planning Guide* (P/N 014003115)
  - *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273)
  - *EMC CX400-Series and CX600-Series Storage Systems Configuration Planning Guide* (P/N 014003113)
  - *EMC Fibre Channel Storage System Model FC4700-2 Configuration Planning Guide* (P/N 014003087)
  - *EMC Fibre Channel Storage System Model FC4500, FC5300, and FC5700 Configuration Planning Guide* (P/N 014003039)

## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop.

- ◆ Documentation that ships with the HBA or NIC and HBA or NIC driver.

The HBA documentation is also available from the following websites.

For Emulex HBAs and drivers:

<http://www.emulex.com/ts/docoem/framemc.htm>

For QLogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

- ◆ Documentation that ships with the
  - Fibre Channel switches and switch management software
  - Microsoft Windows operating system
- ◆ *Removing ATF or CDE Software Before Installing Other Failover Software* (P/N 069001173)
- ◆ *PowerPath Version 4.3 Product Guide* (P/N 300-001-673)  
or  
*PowerPath Version 3.0 Product Guide* (P/N 300-000-047)
- ◆ *PowerPath for Windows Version 4.3 Installation and Administration Guide* (P/N 300-001-685)  
or  
*PowerPath Version 3.0 Installation and Administration Guide for Windows* (P/N 300-001-045)
- ◆ *EMC Navisphere Host Agent and CLI for Windows 2000 and NT Version 6.X Installation Guide* (P/N 069001151)  
or  
*EMC CX-Series Server Software for Windows Installation Guide* (P/N300-002-038)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038)
- ◆ *EMC SnapView Version 2.X Installation Guide* (P/N 069001193, revision A02 or higher)
- ◆ *EMC SAN Copy Version 2.X Installation Guide* (P/N 069001187)

- ◆ *EMC Rails and Enclosures Field Installation Guide* (P/N 300-001-799)
- ◆ *EMC Rails and Enclosures Installation Guide for 19-Inch NEMA Cabinets* (P/N 014003082) - for SPS installation only
- ◆ *EMC CX300 2-Gigabit Disk Processor Enclosure (DPE) Setup Guide* (P/N 300-001-276, rev A02 or higher)  
or  
*EMC CLARiiON CX300 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-276, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup Guide* (P/N 300-001-275, rev A02 or higher)  
or  
*EMC CLARiiON CX500 2-Gigabit Disk Processor Enclosure (DPE2) Setup and Cabling Guide* (P/N 300-001-275, rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC CLARiiON CX500i 2-Gigabit iSCSI Disk Processor Enclosure (DPE2) Setup Guide* (300-001-924)
- ◆ *EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup Guide* (P/N 300-001-274, rev A02 or higher)  
or  
*EMC CLARiiON CX700 Storage Processor Enclosure (SPE) Setup and Cabling Guide* (P/N 300-001-274), rev A01) and *EMC CLARiiON CX300, CX500, and CX700 Storage Systems Initialization Guide* (P/N 300-001-272)
- ◆ *EMC 2-Gigabit Disk-Array Enclosure (DAE2) Setup and Cabling Guide* (P/N 014003104)
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for Windows* (P/N 300-000-603)

## PowerPath Checklist — New Windows Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs or NICs and driver</i>	<input type="checkbox"/> Install HBAs or NICs. <input type="checkbox"/> Install HBA or NIC driver.	HBA or NIC documentation (for HBAs, see URL on 7-5)
2 <b>Server with CX500i storage system</b>	<p><b>For NICs</b></p> <input type="checkbox"/> Download and install Microsoft iSCSI Software Initiator. <input type="checkbox"/> Use the appropriate Microsoft network tool (for example, <b>Start &gt; Settings &gt; Network Connections</b> ) to assign the network parameters (IP address, subnet mask, and gateway) for each NIC. <p><b>For iSCSI HBAs</b></p> <input type="checkbox"/> Download and install QLogic SANsurfer. <input type="checkbox"/> Use SANsurfer to assign the network parameters (IP address, subnet mask, and gateway) for each iSCSI HBA.	<p>Microsoft documentation</p> <p>QLogic SANsurfer documentation</p>
3 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA or NIC documentation (for HBAs, see URL on 7-5)
4 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for Windows installation and administrator's guide

Task	With Access Logix	Reference Document
5 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI. <input type="checkbox"/> <b>For a CX500i storage system</b> Reboot server either after the Host Agent installation is complete or when the Server Utility dialog prompts you to reboot.  If you do not reboot before you run the Microsoft iSCSI Software Initiator to configure iSCSI NIC initiators, the initiators will not log in to the storage system.	CX-Series Server Software for Windows installation guide
6 <b>Server</b> <i>Install admsnap and/or admhost</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility. <input type="checkbox"/> If the server has LUNs that will participate in a SAN Copy session, install the admhost utility.	CX-Series Server Software for Windows installation guide
7 <b>Fibre Channel Switches</b> <i>Install</i>	<b>For a Fibre Channel SAN</b> <input type="checkbox"/> Install Fibre Channel switches, if not already installed. <input type="checkbox"/> Connect a cable from each host HBA port to a switch port. <input type="checkbox"/> <b>Checkpoint</b> - Verify the HBA connection to the switch by checking the LED(s) for the switch port connected to the HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA is logged in to the switch port.  <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	Rails, cabinet, and switch documentation
8 <b>Storage System</b> <i>Install</i>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
9 <b>Storage System</b> <i>Cable management ports</i>	<input type="checkbox"/> Cable the storage-system management port on each SP to the network from which you will manage the storage system.	Storage-system setup guide

Task	With Access Logix	Reference Document
<b>10 Storage System</b> <i>Initialize and install software enablers</i>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers.	Storage-system setup guides installation guide  Navisphere Manager administrator's guide and online help
<b>11 Storage System</b> <i>Cable data ports to Fibre Channel switch, network, or server</i>	<p><b>For a CX300, CX500, or CX700 Storage System</b></p> <input type="checkbox"/> Connect the storage-system Fibre Channel data ports to the Fibre Channel switch or HBA ports. <input type="checkbox"/> <b>Checkpoint</b> - For a Fibre Channel SAN, verify the storage-system connections to the Fibre Channel switches by checking the LED(s) for the switch port connected to each SP port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the SP is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <p><b>For a CX500i Storage System</b></p> <input type="checkbox"/> Connect the storage-system iSCSI data ports to the network or NIC or HBA ports. <input type="checkbox"/> <b>Checkpoint</b> - For a network connection with the server, verify the storage-system connections to the network router or switch by checking the LED(s) for the router or switch port connected to each SP port.	Storage-system setup guide.  Switch documentation  Storage-system setup guide  Switch documentation
<b>12 CX500i Storage System</b> <i>Configure iSCSI storage-system data ports</i>	<input type="checkbox"/> Use Navisphere Manager to configure network parameters for the storage-system iSCSI data ports.	Storage-system setup guide and Manager online help

Task	With Access Logix	Reference Document
<b>13 Server With CX500i Storage System</b> <i>Configure server iSCSI initiator ports</i>	<b>For NICs</b> <input type="checkbox"/> Use Microsoft iSCSI Software Initiator on the server to configure the iSCSI initiators for each NIC port.  <b>For iSCSI HBAs</b> <input type="checkbox"/> Use QLogic SANsurfer to configure the network parameters for each HBA port.	Storage-system setup guide
<b>14 Storage System</b> <i>Set up security</i>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help
<b>15 Storage System</b> <i>Set Properties for PowerPath</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b>  where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
<b>16 Fibre Channel Switches</b> <i>Zone additional paths</i>	<b>For a Fibre Channel SAN</b> <input type="checkbox"/> Zone the Fibre Channel switches to provide a path from each HBA port (host initiator) to the appropriate SPs. <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Fibre Channel switch management documentation
<b>17 Server</b> <i>Make target SPs available</i>	<input type="checkbox"/> Restart the Host Agent or run the Navisphere Server Utility, then use the Disk Management tool to scan for disks. If the disks are not visible, scan for them once more.  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA or NIC is registered with the storage system.	Storage-system setup guide and Windows documentation  Navisphere Manager administrator's guide and online help
<b>18 Storage System</b> <i>Install optional software</i>	<input type="checkbox"/> If you have optional SAN Copy, SnapView, MirrorView/A, and/or MirrorView /S software that you ordered, install its enabler.	Storage-system setup guide and Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>19 Storage System Configure</b>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups. <input type="checkbox"/> Use Navisphere Manager to connect the server to a Storage Group <input type="checkbox"/> Reboot the server so Windows Server 2003 or Windows_2000 recognizes the LUNs. Now the LUNs in the Storage Group look like any other disks in the server. <input type="checkbox"/> <b>Checkpoint</b> - Use one of the following ways to verify that PowerPath sees all the paths to the LUNs: <ul style="list-style-type: none"> <li>• PowerPath Administrator (<b>Start &gt; Programs &gt; EMC &gt; PowerPath Administrator</b>)</li> <li>• PowerPath command <b>powermt display dev=all class=clariion</b></li> </ul> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 15.</li> </ul>	Navisphere Manager administrator's guide and online help  Windows documentation  PowerPath product guide
<b>20 Storage System Set up Event Monitor</b>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
<b>21 CX500i Storage System Configure optional CHAP security</b>	<input type="checkbox"/> Use Navisphere Manager to configure CHAP on the storage system, but do <i>not</i> enable it yet.	Storage-system setup guide and Manager online help

Task	With Access Logix	Reference Document
<p><b>22 Server With CX500i Storage System</b> <i>Configure optional CHAP security</i></p>	<p>If you configured CHAP security for the storage system, you must configure it for the server's iSCSI initiators.</p> <p><b>For NIC Initiators</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to enable CHAP on the storage system.</li> <li><input type="checkbox"/> Use Microsoft iSCSI Software Initiator to configure initiator CHAP on the NIC initiators.</li> </ul> <p><b>For iSCSI HBA Initiators</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use QLogic SANsurfer to configure initiator CHAP on the HBA initiators.</li> <li><input type="checkbox"/> Use Navisphere Manager to enable CHAP on the storage system</li> </ul>	<p>Storage-system setup guide and Manager online help</p> <p>Storage-system setup guide and Microsoft documentation</p> <p>Storage-system setup guide and SANsurfer documentation</p> <p>Storage-system setup guide and Manager online help</p>
<p><b>23 Server</b> <i>Make LUNs available to Windows</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare the LUNs to receive data by creating partitions on them.</li> </ul>	<p>Host connectivity guide or Windows documentation</p>
<p><b>24 Windows Server 2003 Server</b> <i>Install optional CLARiiON VSS provider</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If you want applications to access SnapView functionality on the storage system using the VSS framework or other APIs, install the optional CLARiiON VSS provider on the server.</li> </ul> <p>Note that Navisphere CLI must be installed on the server.</p>	<p>CX-Series Server Software for Windows Installation Guide</p>
<p><b>25 Server</b> <i>Test PowerPath with a license key</i></p>	<p><b>If you have a PowerPath license key</b></p> <p><b>Note</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clarion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> </ul>	<p>PowerPath product guide</p> <p>PowerPath product guide</p>

Task	With Access Logix	Reference Document
<b>25 Server</b> <b>Test PowerPath with a license key (cont.)</b>	<input type="checkbox"/> Identify the HBA or NIC sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA or NIC. <input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA or NIC. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — New Windows Server and Existing Storage System Without Boot Disk

This checklist is for an existing storage system that will *not* contain a Windows Server 2003 or Windows 2000 boot disk. If you want the existing storage system to contain a boot disk, use the procedure that starts on 7-25.

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, CX500i, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs or NICs and driver</i>	<input type="checkbox"/> Install HBAs or NICs. <input type="checkbox"/> Install HBA or NIC driver.	<input type="checkbox"/> Install HBAs. <input type="checkbox"/> Install HBA driver.	HBA or NIC documentation for HBAs, see URL on 7-5)
2 <b>Server with CX500i storage system</b>	<p><b>For NICs</b></p> <input type="checkbox"/> Download and install Microsoft iSCSI Software Initiator. <input type="checkbox"/> Use the appropriate Microsoft network tool (for example, <b>Start &gt; Settings &gt; Network Connections</b> ) to assign the network parameters (IP address, subnet mask, and gateway) for each NIC. <p><b>For iSCSI HBAs</b></p> <input type="checkbox"/> Download and install QLogic SANsurfer. <input type="checkbox"/> Use SANsurfer to assign the network parameters (IP address, subnet mask, and gateway) for each iSCSI HBA.	N/A	<p>Microsoft documentation</p> <p>QLogic SANsurfer documentation</p>

Task	With Access Logix	Without Access Logix	Reference Document
3 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA documentation (for HBAs, see URL on 7-5)
4 <b>Server</b> <i>Install PowerPath</i>	<input type="checkbox"/> Install PowerPath.  <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	<input type="checkbox"/> Install PowerPath.  <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for Windows installation and administrator's guide0-
5 <b>Server</b> <i>Install Host Agent or Server Utility</i>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and Navisphere CLI.  <input type="checkbox"/> For a CX500i storage system, reboot server either after the Host Agent installation is complete or when the Server Utility dialog prompts you to reboot.  If you do not reboot before you run the Microsoft iSCSI Software Initiator to configure iSCSI NIC initiators, the initiators will not log in to the storage system.	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and Navisphere CLI.	CX-Series Server Software Installation guide for Windows or Windows Agent and CLI installation guide



Task	With Access Logix	Without Access Logix	Reference Document
<p><b>9 Server</b> <i>Cable to Fibre Channel switches, network, or storage-system data ports (cont.)</i></p>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> <p><b>For a CX500i storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cable the HBA or NICs ports to the network connected to the storage-system iSCSI data ports or directly to the storage-system iSCSI data ports.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - For a network connection with the server, verify the storage-system connections to the network router or switch by checking the LED(s) for the router or switch port connected to each SP port.</li> </ul>	<p><b>For a 2-Gbit switch</b> - One of the following:</p> <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul>	<p>Switch documentation</p> <p>Storage-system setup guide</p> <p>Switch documentation</p>
<p><b>10 Server With a CX500i Storage System</b> <i>Configure server iSCSI initiator ports</i></p>	<p><b>For NICs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Microsoft iSCSI Software Initiator on the server to configure the iSCSI initiators for each NIC port.</li> </ul> <p><b>For iSCSI HBAs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use QLogic SANsurfer to configure the iSCSI initiators for each HBA port.</li> </ul>	<p>N/A</p>	<p>Storage-system setup guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>11 <b>Fibre Channel Switches</b> <i>Zone additional paths</i></p>	<p><b>For a Fibre Channel SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the Fibre Channel switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul>	<p><b>For a Fibre Channel SAN</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone the Fibre Channel switches to provide a path from each HBA port (host initiator) to the appropriate SPs.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.</li> </ul> <p>For a CX-Series or FC4700-Series storage system, go to step 13.</p> <p>For an FC4500 storage system, go to step 14.</p>	<p>Fibre Channel switch management documentation</p>
<p>12 <b>Storage System</b> <i>Register HBAs or NICs</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> On the server, restart the Navisphere Host Agent or run the Navisphere Server Utility.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA or NIC is registered with the storage system.</li> </ul>	<p>N/A</p>	<p>Navisphere Host Agent and CLI for Windows installation guide or storage-system setup guide</p> <p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>13 <b>CX-Series or FC4700-Series Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the Tools menu on the toolbar) to set the following storage-system properties for the server's HBA or NIC ports (initiators):</p> <p><b>Initiator Type</b> to CLARiiON Open</p> <p><b>Failover mode</b> to 1</p> <p><b>Array commpath</b> to Enabled</p> <p>Go to step 15.</p>	<p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the default failover mode and array commpath properties to the values for PowerPath:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>Go to step 15.</p>	<p>Navisphere Manager administrator's guide and online help or Navisphere CLI reference</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>14 <b>FC4500 Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's HBA or NIC ports (initiators):</p> <pre>navicli -np -d <i>device</i> storagegroup -sethost -host servername -type 3  navicli -np -d <i>device</i> storagegroup -sethost -host servername -failovermode 1  navicli -np -d <i>device</i> storagegroup -sethost -host servername -arraycommpath 1</pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>). <i>servername</i> is the name of the server with the HBAs.</p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:</p> <pre>navicli -np -d <i>device</i> systemtype</pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <pre>navicli -np -d <i>device</i> systemtype -config 3</pre> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:</p> <pre>navicli -np -d <i>device</i> failovermode 1  navicli -np -d <i>device</i> arraycommpath 1</pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p>
<p>15 <b>Server</b> <i>Make target SPs available</i></p>	<p><input type="checkbox"/> Use the Disk Management tool to scan for disks.</p>	<p><input type="checkbox"/> Use the Disk Management tool to scan for disks.</p>	Windows documentation



Task	With Access Logix	Without Access Logix	Reference Document
16 <b>Storage System</b> <i>Configure (cont.)</i>	<p><b>For an FC4500 storage system</b></p> <p><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</p>	<p><b>For an FC4500 storage system</b></p> <p><input type="checkbox"/> Disconnect the computer from the serial port on the storage system.</p>	Storage-system setup guide
17 <b>CX500i Storage System</b> <i>Configure optional storage-system CHAP security</i>	<p>If CHAP security is configured for the storage-system SP port connected to a new NIC or HBA initiator, the new initiator must use CHAP. If you want a new initiator to use the credentials already set for that SP port, you do not need to configure the storage-system CHAP for the new initiator.</p> <p><input type="checkbox"/> Use Navisphere Manager to configure initiator CHAP on the storage system for each new NIC or HBA that needs it configured.</p>	N/A	Storage-system setup guide
18 <b>Server With CX500i Storage System</b> <i>Configure optional server CHAP security</i>	<p>If you configured CHAP security on the storage system, you must configure it for the server's iSCSI Initiator.</p> <p><b>For NIC Initiators</b></p> <p><input type="checkbox"/> If CHAP is not already enabled on the storage system, use Navisphere Manager to enable it.</p> <p><input type="checkbox"/> Use Microsoft iSCSI Software Initiator to configure initiator CHAP on the NIC initiators on the server.</p> <p><b>For iSCSI HBAs</b></p> <p><input type="checkbox"/> If CHAP is already enabled on the storage system, use Navisphere Manager to disable it.</p> <p><input type="checkbox"/> Use QLogic SANsurfer to configure initiator CHAP on the HBA initiators on the server.</p> <p><input type="checkbox"/> If you disabled CHAP on the storage system, use Navisphere Manager to re-enable CHAP on the storage system.</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p>Storage-system setup guide and Manager online help</p> <p>Storage-system setup guide and Microsoft documentation</p> <p>Storage-system setup guide and SANsurfer documentation</p> <p>Storage-system setup guide and Manager online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
19 <b>Server</b> <i>Make LUNs available to Windows</i>	<input type="checkbox"/> Prepare any new LUNs to receive data by creating partitions on them.	<input type="checkbox"/> Prepare any new LUNs to receive data by creating partitions on them.	Host connectivity guide or Windows documentation
20 <b>Windows Server 2003 Server</b> <b>Install optional CLARiiON VSS provider</b>	<input type="checkbox"/> If you want applications to access SnapView functionality on the storage system using the VSS framework or other APIs, install the optional CLARiiON VSS provider on the server.  Note that Navisphere CLI must be installed on the server.	N/A	CX-Series Server Software for Windows Installation Guide
21 <b>Server</b> <i>Test PowerPath with a license key</i>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clarion</b>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command:  <b>powermt display dev=all class=clarion</b>	PowerPath product guide
	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	<input type="checkbox"/> Choose one available LUN to receive I/O for the test.	
	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where <i>x</i> is a pseudo device that represents the chosen LUN.	<input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command:  <b>powermt display dev=x every=2</b>  where <i>x</i> is a pseudo device that represents the chosen LUN.	
	<input type="checkbox"/> Start I/O to the LUN.	<input type="checkbox"/> Start I/O to the LUN.	
	<input type="checkbox"/> Identify the HBA or NIC sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA or NIC.	<input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	

Task	With Access Logix	Without Access Logix	Reference Document
21 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA or NIC. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <input type="checkbox"/> Reconnect the cable that you disconnected from the HBA. <input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — New Windows Server and Existing Storage System With Boot Disk

This checklist is for an existing storage system that will contain a Windows Server 2003 or Windows 2000 boot disk. If you do not want the existing storage system to contain a boot disk, use the procedure that starts on 7-14.



### CAUTION

**The RAID Group containing the boot LUN must consist of Fibre Channel disks (*not* ATA disks).**

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

The **Without Access Logix** column does *not* apply to CX300, CX500, CX500i, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install HBA s</i>	<input type="checkbox"/> Install HBAs. <b>Note:</b> A CX500i storage system cannot have a boot disk if it is connected to NICs in the server.	<input type="checkbox"/> Install HBAs.	HBA documentation (see URL on 7-5)
2 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA or NIC documentation (for HBAs, see URL on 7-5)	Navisphere Manager administrator's guide and online help
3 <b>Server</b> <i>Connect to storage-system management LAN</i>	<input type="checkbox"/> Cable the server to the LAN connected to the storage-system management port on each SP.	<input type="checkbox"/> Cable the server to the LAN connected to the storage-system management port on each SP.	Storage-system setup guide

Task	With Access Logix	Without Access Logix	Reference Document
<p>4 <b>Server</b></p> <p><b><i>Cable to Fibre Channel switches, network, or storage-system data ports</i></b></p>	<p><b>For SAN with CX200, CX300, CX400, CX500, CX600, or CX700 storage systems</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cable the HBA ports to the Fibre Channel switch connected to the storage system.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <ul style="list-style-type: none"> <li><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</li> <li><b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> </li> </ul> </li> </ul>	<p><b>For SAN with CX200, CX400, or CX600 storage systems</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cable the HBA ports to the Fibre Channel switch connected to the storage system.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the storage-system connections to the switch by checking the LED(s) for the switch port connected to each HBA port. <ul style="list-style-type: none"> <li><b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port.</li> <li><b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> </li> </ul> </li> </ul>	<p>Storage-system setup guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>4 Server</b></p> <p><i>Cable to Fibre Channel switches, network, or storage-system data ports (cont.)</i></p>	<p><b>For direct attach with CX200, CX300, CX400, CX500, CX600, or CX700 storage systems</b></p> <p><input type="checkbox"/> Cable the server to the storage system so <b>only a maximum of one</b> path exists from the server to each SP.</p> <p>This means that for a multiple HBA port server, you cable just one HBA port to one SP. You will cable additional HBA ports to the SPs after you set up the boot disk.</p> <p><b>For a network with a CX500i storage system</b></p> <p><input type="checkbox"/> Cable the server to the network connected to the storage-system data ports o <b>only a maximum of one</b> path exists from the server to each SP.</p> <p>This means that for a multiple HBA port server, you cable just one HBA port to one SP. You will cable additional HBA ports to the SPs after you set up the boot disk.</p>	<p><b>For direct attach</b></p> <p><input type="checkbox"/> Cable the server to the storage system so <b>only a maximum of one</b> path exists from the server to each SP.</p> <p>This means that for a multiple HBA port server, you cable just one HBA port to one SP. You will cable additional HBA ports to the SPs after you set up the boot disk.</p> <p>N/A</p>	<p>Storage-system setup guide.</p>
<p><b>5 Storage System Configure</b></p>	<p><input type="checkbox"/> If the server will use an <i>existing</i> Storage Group, use Navisphere Manager to connect the server to the Storage Group.</p> <p><input type="checkbox"/> If the server will use a <i>new</i> Storage Group, use Navisphere Manager to create RAID Groups, bind LUNs, create the Storage Group, and assign LUNs to the Storage Group.</p> <p><b>CAUTION</b> The RAID Group for the boot LUN must consist of Fibre Channel disks (<i>not</i> ATA disks).</p> <p><input type="checkbox"/> Use Navisphere Manager to connect the server to the Storage Group.</p>		<p>Navisphere Manager administrator's guide and online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
5 <b>Storage System</b> <i>Configure (cont.)</i>	<input type="checkbox"/> Reboot the server so Windows Server 2003 or Windows 2000 recognizes the LUNs.  Now the LUNs in the Storage Group look like any other disks in the server.	<input type="checkbox"/> Reboot the server so Windows Server 2003 or Windows 2000 recognizes the LUNs.  Now the LUNs look like any other disks in the server.	Windows documentation
6 <b>Server</b> <i>Create HBA driver diskette</i>	<input type="checkbox"/> Create a diskette with the EMC HBA driver from the HBA vendor's web site.	<input type="checkbox"/> Create a diskette with the EMC HBA driver from the HBA vendor's web site	URL on 7-5
7 <b>Server</b> <i>Set up HBA BIOS</i>	<input type="checkbox"/> If required, either update the Emulex HBA firmware and/or BIOS or update the QLogic HBA firmware and/or NVRAM.  <input type="checkbox"/> Reboot the server.  <input type="checkbox"/> Set up HBA BIOS.	<input type="checkbox"/> If required, either update the Emulex HBA firmware and/or BIOS or update the QLogic HBA firmware and/or NVRAM.  <input type="checkbox"/> Reboot the server.  <input type="checkbox"/> Set up HBA BIOS.	HBA documentation (see URL on 7-5)
8 <b>Fibre Channel Switches</b> <i>Zone</i>	<b>For a Fibre Channel SAN</b> <input type="checkbox"/> Zone the Fibre Channel switches to provide a single from the server to each SP.  <input type="checkbox"/> <b>Checkpoint</b> - Use Fibre Channel switch management software to verify the switch connections to the storage system.	<b>For a Fibre Channel SAN</b> <input type="checkbox"/> Zone the Fibre Channel switches to provide a single from the server to each SP.  <input type="checkbox"/> <b>Checkpoint</b> - Use Fibre Channel switch management software to verify the switch connections to the storage system	Switch management documentation
9 <b>Storage System</b> <i>Register HBAs</i>	<input type="checkbox"/> Use Navisphere Manager's <b>Connectivity Status</b> dialog box to register each HBA with the storage system.	N/A	Navisphere Manager administrator's guide and online help
10 <b>Server</b> <i>Prepare for installing operating system</i>	<input type="checkbox"/> Disconnect any SCSI hard disk connected to the server.  <input type="checkbox"/> Configure the HBA boot BIOS.	<input type="checkbox"/> Disconnect any SCSI hard disk connected to the server.  <input type="checkbox"/> Configure the HBA boot BIOS.	HBA documentation (see URL on 7-5)
11 <b>Server</b> <i>Install Windows Server 2003 or Windows 2000</i>	<input type="checkbox"/> Install Windows Server 2003 or Windows 2000 and the HBA driver on the boot LUN in the storage system.  <b>Note:</b> During the installation procedure, you will partition the boot LUN.	<input type="checkbox"/> Install Windows Server 2003 or Windows 2000 and the HBA driver on the boot LUN in the storage system.  <b>Note:</b> During the installation procedure, you will partition the boot LUN	Windows documentation and HBA documentation (see URL on 7-5)



Task	With Access Logix	Without Access Logix	Reference Document
<b>13 Storage System</b> <b>Set properties for PowerPath (cont.)</b>	<p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Connect a computer to the serial port on the storage system.</li> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's HBA ports (initiators):           <pre>navicli -np -d <i>device</i> storagegroup -sethost -host servername -type 3  navicli -np -d <i>device</i> storagegroup -sethost -host servername -failovermode 1  navicli -np -d <i>device</i> storagegroup -sethost -host servername -arraycomppath 1</pre>           where  <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).  <i>servername</i> is the name of the server with the HBAs.         </li> </ul>	<p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Connect a computer to the serial port on the storage system</li> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:           <pre>navicli -np -d <i>device</i> systemtype</pre>           where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).            If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:           <pre>navicli -np -d <i>device</i> systemtype -config 3</pre> <b>CAUTION</b> The above command reboots both SPs at the same time.         </li> </ul> <p><b>For an FC4500 storage system</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:           <pre>navicli -np -d <i>device</i> failovermode 1  navicli -np -d <i>device</i> arraycomppath 1</pre>           where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).         </li> </ul>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>14 Server</b> <b><i>Install PowerPath</i></b>	<input type="checkbox"/> Install PowerPath.  <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	<input type="checkbox"/> Install PowerPath.  <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for Windows installation and administrator's guide
<b>15 Fibre Channel Switches</b> <b><i>Zone additional paths</i></b>	<input type="checkbox"/> Zone the Fibre Channel switches to provide an additional paths from the server to each SP.  <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	<input type="checkbox"/> Zone the Fibre Channel switches to provide an additional paths from the server to each SP.        <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system	Switch management documentation



Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server (direct attach only)</b> <b><i>Cable additional paths</i></b>	<input type="checkbox"/> For a direct attach configuration, cable any additional HBA ports to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - Use one of the following ways to verify that PowerPath sees all the paths to the LUNs: <ul style="list-style-type: none"> <li>• PowerPath Administrator (<b>Start &gt; Programs &gt; EMC &gt; PowerPath Administrator</b>)</li> <li>• PowerPath command <b>powermt display dev=all class=clarion</b></li> </ul> <p>If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 13.</li> </ul> <p><b>For an FC4500 storage system</b></p> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	<input type="checkbox"/> For a direct attach configuration, cable any additional HBA ports to SP ports.  <input type="checkbox"/> <b>Checkpoint</b> - Use one of the following ways to verify that PowerPath sees all the paths to the LUNs: <ul style="list-style-type: none"> <li>• PowerPath Administrator (<b>Start &gt; Programs &gt; EMC &gt; PowerPath Administrator</b>)</li> <li>• PowerPath command <b>powermt display dev=all class=clarion</b></li> </ul> <p>If PowerPath does not see the LUNs</p> <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 13.</li> </ul> <p><b>For an FC4500 storage system</b></p> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	<p>Storage-system setup guide</p> <p>PowerPath product guide</p> <p>Storage-system setup guide</p>
<b>17 Server</b> <b><i>Install Host Agent or Server Utility</i></b>	<input type="checkbox"/> Install the Navisphere Host Agent or Navisphere Server Utility and the Navisphere CLI.	<input type="checkbox"/> Install the Navisphere Host Agent or Server Utility and the Navisphere CLI.	<p>CX-Series Server Software for Windows installation guide or Navisphere Host Agent and CLI for Windows installation guide</p>
<b>18 Server With a CX500i Storage System</b> <b><i>Configure server iSCSI HBA initiator ports</i></b>	<input type="checkbox"/> Download and install QLogic SANsurfer.  <input type="checkbox"/> Use QLogic SANsurfer to configure the network parameters for each or for each HBA.	N/A	<p>Storage-system setup guide</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>19 Server</b> <i>Install admsnap and/or admhost</i>	<input type="checkbox"/> If the server will be a SnapView production or secondary host, install the admsnap utility.  <input type="checkbox"/> If the server has LUNs that will participate in a SAN Copy session, install the admhost utility.	N/A	CX-Series Server Software for Windows installation guide
<b>20 Windows Server 2003 Server</b> <i>Install optional CLARiiON VSS provider</i>	<input type="checkbox"/> If you want applications to access SnapView functionality on the storage system using the VSS framework or other APIs, install the optional CLARiiON VSS provider on the server.  Note that Navisphere CLI must be installed on the server.	N/A	CX-Series Server Software for Windows Installation Guide
<b>21 CX500i Storage System</b> <i>Configure optional storage-system CHAP security</i>	If CHAP security is configured for the storage-system SP port connected to a new NIC or HBA initiator, the new initiator must use CHAP. If you want a new initiator to use the credentials already set for that SP port, you do not need to configure the storage-system CHAP for the new initiator.  <input type="checkbox"/> Use Navisphere Manager to configure initiator CHAP on the storage system for each new NIC or HBA that needs it configured.	N/A	Storage-system setup guide and Manager online help
<b>22 Server With CX500i Storage System</b> <i>Configure optional server CHAP security</i>	If you configured CHAP security on the storage system, you must configure it for any new iSCSI HBA initiators in the storage system.  <input type="checkbox"/> If CHAP is already enabled on the storage system, use Navisphere Manager to disable it.  <input type="checkbox"/> Use QLogic SANsurfer to configure initiator CHAP on the new HBA initiators on the server.  <input type="checkbox"/> If you disabled CHAP on the storage system, use Navisphere Manager to re-enable CHAP on the storage system.	N/A  N/A  N/A	Storage-system setup guide and Manager online help  Storage-system setup guide and Microsoft documentation  Storage-system setup guide and Manager online help

Task	With Access Logix	Without Access Logix	Reference Document
<b>23 Server</b> <b>Test PowerPath with a license key</b>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes "dead."</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</li> </ul>	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
23 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i>	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b>	PowerPath product guide
24 <b>Server</b> <i>Make new LUNs available to Windows</i>	<input type="checkbox"/> Prepare any new LUN, other than the boot LUN, to receive data by creating partitions on them.	<input type="checkbox"/> Prepare any new LUN, other than the boot LUN, to receive data by creating partitions on them.	Host connectivity guide or Windows documentation

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Windows Server and New Storage System

Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### CAUTION

EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must

- ◆ Back up your server configurations.
- ◆ Back up data on all storage systems connected to the server.
- ◆ Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.

Simply removing ATF or CDE using the uninstall procedure in the Windows ATF administrator's guide or the Windows utilities administrator's guide may not return the server to its original state, and may result in lost data.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.  <b>CAUTION</b> When you are prompted to restart the system during the ATF removal procedure, answer <b>No</b> and then click <b>Finish</b> . <b>Do not reboot</b> until you install PowerPath, even if the instructions for installing software (e.g. HBA driver) tell you to do so.	Removing ATF or CDE
2 <b>Server</b> <i>Install additional HBA or NICs</i>	<input type="checkbox"/> If you need additional HBAs or NICs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA or NIC documentation (for HBAs see URL on 7-5)
3 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision ( 7-3), update it: <ul style="list-style-type: none"> <li>• HBA or NIC driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> <li>• admhost</li> </ul>	HBA or NIC documentation (or HBAs see URL on 7-5)  CX-Series Server Software Installation guide for Windows
4 <b>Server</b> <i>Set HBA or NIC driver properties</i>	<input type="checkbox"/> Make sure the HBA or NIC driver parameters are set to the values required for CLARiiON.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.  <b>For additional NICs</b> <input type="checkbox"/> Use the appropriate Microsoft network tool (for example, <b>Start &gt; Settings &gt; Network Connections</b> ) to assign the network parameters (IP address, subnet mask, and gateway) for each NIC.  <b>For additional iSCSI HBAs</b> <input type="checkbox"/> Use SANsurfer to assign the network parameters (IP address, subnet mask, and gateway) for each iSCSI HBA.	HBA or NIC documentation (for HBAs, see URL on 7-5)  Microsoft documentation  QLogic SANsurfer documentation

Task	With Access Logix	Reference Document
<b>5 Server</b> <b><i>Install PowerPath</i></b>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath. Contrary to what the PowerPath documentation states, PowerPath will not see any logical disks (LUNs) in the storage system at this point because the storage system has not been connected. <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a>	PowerPath release notes and PowerPath for Windows installation and administrator's guide
<b>6 Storage System</b> <b><i>Install</i></b>	<input type="checkbox"/> Install the storage system in the cabinet, if not already installed.	Rails and cabinet documentation
<b>7 Storage System</b> <b><i>Cable management ports</i></b>	<input type="checkbox"/> Cable the storage-system management port on each SP to the network from which you will management the storage system.	Storage-system setup guide
<b>8 Storage System</b> <b><i>Initialize and install software enablers</i></b>	<input type="checkbox"/> Install the Navisphere Initialization Utility on a host on the <i>same subnet</i> as the storage-system management ports. <input type="checkbox"/> Use the Navisphere Initialization Utility to initialize the storage system. <input type="checkbox"/> If you have SAN Copy, SnapView, MirrorView, and/or MirrorView/A software, install their enablers. For a CX300, CX500, or CX700 storage system, continue to step 10. For a CX500i storage system, go to step 11.	Storage-system setup guide  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Reference Document
<b>9 CX300, CX500, or CX700 Storage System</b> <i>Cable to data ports to Fibre Channel switch or server HBA ports</i>	<input type="checkbox"/> Cable storage-system data ports either to the Fibre Channel switch connected to the server HBA ports or directly to the server HBA ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a SAN, verify the HBA connections to the Fibre Channel switch by checking the LED(s) for the switch port connected to each HBA port. <b>For a 1-Gbit switch</b> - LED is green, which indicates that the HBA port is logged in to the switch port. <b>For a 2-Gbit switch</b> - One of the following: <ul style="list-style-type: none"> <li>• The left LED is green and the right LED is off, which indicates that a 1-Gbit SP port is logged in to the switch port.</li> <li>• For a DS-xxB2 switch, both LEDs are green, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> <li>• For a DS-xxM2 switch, the left LED is blue and the right LED is off, which indicates that a 2-Gbit HBA port is logged in to the switch port.</li> </ul> Go to step 13.	Storage-system setup guide or storage-system setup guide
<b>10 CX500i Storage System</b> <i>Cable to data ports to network, or server HBA or NIC ports</i>	<input type="checkbox"/> Cable the storage-system iSCSI data ports either or to the network connected to the server HBA or NIC ports or directly to the server HBA or NICs ports.  <input type="checkbox"/> <b>Checkpoint</b> - For a network connection with the server, verify the storage-system connections to the network router or switch by checking the LED(s) for the router or switch port connected to each SP port.	Storage-system setup guide  Switch documentation
<b>11 CX500i Storage System</b> <i>Configure iSCSI storage-system data ports</i>	<input type="checkbox"/> Use Navisphere Manager to configure network parameters for the storage-system iSCSI data ports.	Storage-system setup guide
<b>12 Server With CX500i Storage System</b> <i>Configure any additional server iSCSI initiator ports</i>	<b>For NICs</b> <input type="checkbox"/> Use Microsoft iSCSI Software Initiator on the server to configure the iSCSI initiators for each NIC port.  <b>For iSCSI HBAs</b> <input type="checkbox"/> Use QLogic SANsurfer to configure the network parameters for each or for each HBA.	Microsoft documentation  QLogic SANsurfer documentation
<b>13 Storage System</b> <i>Set up security</i>	<input type="checkbox"/> Use Navisphere Manager to define a global administrator and domain (if not already defined) and any additional users.	Navisphere security administrator's guide and Navisphere Manager online help

Task	With Access Logix	Reference Document
<b>14 Storage System</b> <b>Set Properties for PowerPath</b>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties: <b>navicli -h <i>hostname</i> systemtype -config 3</b> <b>navicli -h <i>hostname</i> failovermode 1</b> <b>navicli -h <i>hostname</i> arraycommpath 1</b> where <i>hostname</i> is the IP address or network name of an SP in the storage system.	Navisphere CLI reference
<b>15 Fibre Channel Switches</b> <b>Zone additional paths</b>	<b>For a Fibre Channel SAN</b> <input type="checkbox"/> Zone the Fibre Channel switches to provide a path from each additional HBA port (host initiator) to the SPs. <input type="checkbox"/> If SAN Copy, MirrorView, or MirrorView/A is installed, create any required zones. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	Switch management documentation
<b>16 Server</b> <b>Make target SPs available</b>	<input type="checkbox"/> Restart the Host Agent, then use the Disk Management tool to scan for disks. If the disks are not visible, scan for them once more. <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.	Windows documentation  Navisphere Manager administrator's guide and online help



Task	With Access Logix	Reference Document
<p><b>20 Server With CX500i Storage System</b></p> <p><i>Configure optional CHAP security for new iSCSI HBA or NIC initiators</i></p>	<p><b>For iSCSI HBA Initiators</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use QLogic SANsurfer to configure initiator CHAP on the HBA initiators.</li> <li><input type="checkbox"/> Use Navisphere Manager to enable CHAP on the storage system</li> </ul> <p><b>For NIC initiators</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to enable CHAP on the storage system.</li> <li><input type="checkbox"/> Use Microsoft iSCSI Software Initiator to configure initiator CHAP on any new NIC initiators.</li> </ul>	<p>Storage-system setup guide and SANsurfer documentation</p> <p>Storage-system setup guide and Microsoft documentation</p> <p>Storage-system setup guide and Manager online help</p>
<p><b>21 Server</b></p> <p><i>Make LUNs available to Windows</i></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Prepare the LUNs to receive data by creating partitions on them.</li> </ul>	<p>Host connectivity guide or Windows documentation</p>
<p><b>22 Server</b></p> <p><i>Test PowerPath with a license key</i></p>	<p><b>If you have a PowerPath license key</b></p> <p>If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b></li> <li><input type="checkbox"/> Choose one available LUN to receive I/O for the test.</li> <li><input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where x is a pseudo device that represents the chosen LUN.</li> <li><input type="checkbox"/> Start I/O to the LUN.</li> <li><input type="checkbox"/> Identify the HBA or NIC sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HB or NIC.</li> <li><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> </li> <li><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA or NIC.</li> </ul>	<p>PowerPath product guide</p>

Task	With Access Logix	Reference Document
<b>22 Server</b> <i>Test PowerPath with a license key (cont.)</i>	<input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command:  <b>powermt restore</b>	PowerPath Product guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

## PowerPath Checklist — Existing Windows Server and Existing Storage System

This checklist assumes that the existing Windows server and existing storage system are already connected in a Fibre Channel SAN, iSCSI network, or direct attach configuration. Tasks highlighted with grey in the checklist should be performed before the service provider arrives, except for the removal of ATF or CDE, which you can have done by EMC Professional Services.



### CAUTION

EMC no longer supports ATF or CDE. Before you transition your server from ATF or CDE to PowerPath, you must

- ◆ Back up your server configurations.
- ◆ Back up data on all storage systems connected to the server.
- ◆ Remove ATF or CDE, which EMC recommends that EMC Professional Services do, especially if your server configuration is complex. If you want to remove it yourself, you must use the procedure in the *Removing ATF or CDE Software Before Installing Other Failover Software* document (P/N 069001173), which is on the Powerlink website with this roadmap.

Simply removing ATF or CDE using the uninstall procedure in the Windows ATF administrator's guide or the Windows utilities administrator's guide may not return the server to its original state, and may result in lost data.

If you are transitioning a Microsoft Cluster Server (MSCS) configuration from ATF or CDE to PowerPath, perform the procedure in the checklist on each node in succession. While you perform the procedure on one node, you can leave the cluster services active on the other node, provided failure in a path to the storage system does not occur.

The **Without Access Logix** column does *not* apply to CX300, CX500, CX500i, and CX700 storage systems because they ship from the factory with the Access Logix enabler installed.

Task	With Access Logix	Without Access Logix	Reference Document
1 <b>Server</b> <i>Install additional HBAs or NICs</i>	<input type="checkbox"/> If you need additional HBAs or NICs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	<input type="checkbox"/> If you need additional HBAs to provide more paths to the storage system, install these HBAs.  <b>CAUTION</b> Do not connect cables to the HBAs until you are told to do so later in this procedure.	HBA or NIC documentation (for HBAs, see URL on 7-5)
2 <b>Server</b> <i>Remove ATF or CDE</i>	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.  <b>CAUTION</b> When you are prompted to restart the system during the ATF removal procedure, answer <b>No and then click Finish. Do not reboot</b> until you install PowerPath, even if the instructions for installing software (e.g. HBA driver) tell you to do so.	<input type="checkbox"/> If ATF or CDE is installed, then before continuing either remove it yourself (see caution before this checklist) or arrange to have EMC Professional Services remove it.  <b>CAUTION</b> When you are prompted to restart the system during the ATF removal procedure, answer <b>No and then click Finish. Do not reboot</b> until you install PowerPath, even if the instructions for installing software (e.g. HBA driver) tell you to do so.	Removing ATF or CDE instruction sheet
3 <b>Server</b> <i>Update Software</i>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision ( 7-3), update it: <ul style="list-style-type: none"> <li>• HBA or NIC driver</li> <li>• Navisphere Host Agent</li> <li>• admsnap</li> <li>• admhost</li> </ul>	<input type="checkbox"/> If the following software is currently installed and not at the required minimum revision ( 7-3), update it: <ul style="list-style-type: none"> <li>• HBA driver</li> <li>• Navisphere Host Agent</li> </ul>	HBA or NIC documentation (for HBAs, see URL on 7-5)  CX-Series Server Software for Windows Installation Guide
4 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Make sure the HBA driver properties are set to the values required for CLARiiON.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	<input type="checkbox"/> Make sure the HBA driver properties are set to the values required for CLARiiON.  <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA documentation (see URL on 7-5)

Task	With Access Logix	Without Access Logix	Reference Document
5 Server with CX500i storage system	<p><b>For additional NICs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Download and install Microsoft iSCSI Software Initiator.</li> <li><input type="checkbox"/> Use the appropriate Microsoft network tool (for example, <b>Start &gt; Settings &gt; Network Connections</b>) to assign the network parameters (IP address, subnet mask, and gateway) for each NIC.</li> </ul> <p><b>For additional iSCSI HBAs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Download and install QLogic SANsurfer.</li> <li><input type="checkbox"/> Use SANsurfer to assign the network parameters (IP address, subnet mask, and gateway) for each iSCSI HBA.</li> </ul>	N/A	<p>Microsoft documentation</p> <p>QLogic SANsurfer documentation</p>
6 Storage System Update software	<ul style="list-style-type: none"> <li><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p> <p>For an FC4500 storage system, go to step 8.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> If currently installed storage-system software is not at the required minimum revision, update it.</li> </ul> <p><b>CAUTION</b> During the software update, hosts connected to the storage system will lose access to data if they do not have failover software or if all paths to an SP are down.</p> <p>For an FC4500 storage system, go to step 8.</p>	Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>7 CX-Series or FC4700-Series Storage System</b> <i>Set properties for PowerPath</i></p>	<p><b>For new or replacement HBAs</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><b>For new or replacement HBAs (cont.)</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p><b>For any HBAs</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -h <i>hostname</i> systemtype</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p> <p>If the default storage-system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -h <i>hostname</i> systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p> <p><b>For any HBAs (cont.)</b></p> <p><input type="checkbox"/> Use the following Navisphere CLI commands to set the following default storage-system properties:</p> <p><b>navicli -h <i>hostname</i> failovermode 1</b></p> <p><b>navicli -h <i>hostname</i> arraycommpath 1</b></p> <p>where <i>hostname</i> is the IP address or network name of an SP in the storage system.</p>	<p>Navisphere CLI reference</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p>7 <b>CX-Series or FC4700-Series Storage System</b> <i>Set properties for PowerPath (cont.)</i></p>	<p><b>For existing HBAs</b></p> <p>An existing HBA is one that is registered with the storage system.</p> <p><input type="checkbox"/> Use Navisphere Manager's <b>Failover Setup Wizard</b> (selected from the <b>Tools</b> menu on the toolbar) to set the following storage-system properties for the server's existing HBA ports (initiators):</p> <p><b>Initiator Type</b> to CLARiiON Open</p> <p><b>Failover mode</b> to 1</p> <p><b>Array commpath</b> to Enabled</p>		<p>Navisphere Manager administrator's guide and online help</p>
<p>8 <b>FC4500 Storage System</b> <i>Set properties for PowerPath</i></p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><b>For new HBAs</b></p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -np -d device systemtype</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -np -d device systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p>	<p><input type="checkbox"/> Connect a computer to the serial port on the storage system.</p> <p><b>For any HBAs</b></p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI command to determine the default storage-system type:</p> <p><b>navicli -np -d device systemtype</b></p> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p>If the default storage-system system type is <i>not</i> 3 (CLARiiON Open), use the following Navisphere CLI command to set it to 3:</p> <p><b>navicli -np -d device systemtype -config 3</b></p> <p><b>CAUTION</b> The above command reboots both SPs at the same time.</p>	<p>Storage-system setup guide</p> <p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<p><b>8 FC4500 Storage System</b>  <b>Set properties for PowerPath (cont.)</b></p>	<p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:</p> <pre><b>navicli -np -d device failovermode 1</b></pre> <pre><b>navicli -np -d device arraycommpath 1</b></pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p><b>For existing HBAs</b></p> <p>An existing HBA is one that is registered with the storage system.</p> <p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following storage-system properties for the server's existing HBA existing ports (initiators):</p> <pre><b>navicli -np -d device storagegroup -sethost -host servername -type 3</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -failovermode 1</b></pre> <pre><b>navicli -np -d device storagegroup -sethost -host servername -arraycommpath 1</b></pre> <p>where</p> <p><i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p> <p><i>servername</i> is the name of the server with the HBAs</p>	<p><input type="checkbox"/> From the computer connected to the storage system's serial port, use the following Navisphere CLI commands to set the following default storage-system properties:</p> <pre><b>navicli -np -d device failovermode 1</b></pre> <pre><b>navicli -np -d device arraycommpath 1</b></pre> <p>where <i>device</i> is the name of the computer port connected to the storage-system serial port (for example, <b>com1</b>).</p>	<p>Navisphere CLI reference</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>9 Server</b> <b><i>Install PowerPath</i></b>	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a> <input type="checkbox"/> <b>Checkpoint</b> - Use one of the following ways to verify that PowerPath sees the paths to the LUNs: <ul style="list-style-type: none"> <li>• PowerPath Administrator (<b>Start &gt; Programs &gt; EMC &gt; PowerPath Administrator</b>)</li> <li>• PowerPath command <b>powermt display dev=all class=clariion</b></li> </ul> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify the server's connection to the Storage Group.</li> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 7 or 8.</li> </ul> <input type="checkbox"/> <b>Checkpoint</b> - Use Disk Management to verify each path to the storage system.	<input type="checkbox"/> Install PowerPath. <input type="checkbox"/> Reboot the server to complete the installation of PowerPath.  <input type="checkbox"/> Install any PowerPath patches from the <b>Software downloads</b> page on the EMC Powerlink website: <a href="http://powerlink.emc.com">http://powerlink.emc.com</a> <input type="checkbox"/> <b>Checkpoint</b> - Use one of the following ways to verify that PowerPath sees the paths to the LUNs: <ul style="list-style-type: none"> <li>• PowerPath Administrator (<b>Start &gt; Programs &gt; EMC &gt; PowerPath Administrator</b>)</li> <li>• PowerPath command <b>powermt display dev=all class=clariion</b></li> </ul> If PowerPath does not see the LUNs <ul style="list-style-type: none"> <li>• Verify that you registered your PowerPath license key if you have one.</li> <li>• Verify that the storage-system properties are as defined in step 7 or 8.</li> </ul> <input type="checkbox"/> <b>Checkpoint</b> - Use Disk Management to verify each path to the storage system.	PowerPath release notes and PowerPath for Windows installation and administrator's guide  PowerPath product guide  Windows documentation



Task	With Access Logix	Without Access Logix	Reference Document
<b>10 Server</b> <i>Cable additional HBAs for NICs to Fibre Channel switches, network, or storage-system data ports (cont.)</i>	<input type="checkbox"/> <b>Checkpoint</b> - For a network connection with the server, verify the storage-system connections to the network router or switch by checking the LED(s) for the router or switch port connected to each SP port.		Switch documentation
<b>11 Server With a CX500i Storage System</b> <i>Configure additional server iSCSI initiator ports</i>	<b>For NICs</b> <input type="checkbox"/> Use Microsoft iSCSI Software Initiator on the server to configure the iSCSI initiators for each NIC port.  <b>For iSCSI HBAs</b> <input type="checkbox"/> Use QLogic SANsurfer to configure the network parameters for each or for each HBA.	N/A	Storage-system setup guide
<b>12 Fibre Channel Switches</b> <i>Zone additional paths</i>	<b>For a SAN</b> <input type="checkbox"/> Zone the Fibre Channel switches to provide a path from each additional HBA port (host initiator) to the SPs.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system.	<b>For a SAN</b> Zone the Fibre Channel switches to provide a path from each additional HBA port (host initiator) to the SPs.  <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify the switch connections to the storage system	Switch management documentation
<b>13 Server</b> <i>Register additional HBAs or NICs with storage system</i>	<input type="checkbox"/> Restart the Host Agent or run the Server Utility, then use the Disk Management tool to scan for disks.  <input type="checkbox"/> <b>Checkpoint</b> - Use Navisphere Manager's Connectivity Status dialog box to verify that each HBA is registered with the storage system.	<input type="checkbox"/> Use the Disk Management tool to scan for disks.	Windows documentation  Navisphere Manager administrator's guide and online help

Task	With Access Logix	Without Access Logix	Reference Document
<b>14 CX500i Storage System</b> <b>Configure optional storage-system CHAP security</b>	<p>If CHAP security is configured for the storage-system SP port connected to a new NIC or HBA initiator, the new initiator must use CHAP. If you want a new initiator to use the credentials already set for that SP port, you do not need to configure the storage-system CHAP for the new initiator.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to configure initiator CHAP on the storage system for each new NIC or HBA that needs it configured.</li> </ul>	N/A	Storage-system setup guide and Manager online help
<b>15 Server With CX500i Storage System</b> <b>Configure optional server CHAP security</b>	<p>If you configured CHAP security on the storage system, you must configure it for any new iSCSI initiator's in the storage system.</p> <p><b>For NIC Initiators</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> If CHAP is not already enabled on the storage system, use Navisphere Manager to enable it.</li> <li><input type="checkbox"/> Use Microsoft iSCSI Software Initiator to configure initiator CHAP on the new NIC initiators on the server.</li> </ul> <p><b>For iSCSI HBAs</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> If CHAP is already enabled on the storage system, use Navisphere Manager to disable it.</li> <li><input type="checkbox"/> Use QLogic SANsurfer to configure initiator CHAP on the new iSCSI HBA initiators on the server.</li> <li><input type="checkbox"/> If you disabled CHAP on the storage system, use Navisphere Manager to re-enable CHAP on the storage system.</li> </ul>	<p>N/A</p> <p>N/A</p>	<p>Storage-system setup guide and Manager online help</p> <p>Storage-system setup guide and QLogic SANsurfer documentation</p> <p>Storage-system setup guide and Manager online help</p>

Task	With Access Logix	Without Access Logix	Reference Document
<b>16 Server</b> <b>Make LUNs available to additional HBAs</b>	<input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server and its Storage Group. <input type="checkbox"/> Restart the Host Agent, then use the Disk Management tool to scan for disks. <b>For an FC4500 storage system</b> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	N/A  <b>For an FC4500 storage system</b> <input type="checkbox"/> Disconnect the computer from the serial port on the storage system.	Navisphere Manager administrator's guide and online help  Windows documentation  Storage-system setup guide
<b>17 Server</b> <b>Test PowerPath with a license key</b>	<b>If you have a PowerPath license key</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b> <input type="checkbox"/> Choose one available LUN to receive I/O for the test. <input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN. <input type="checkbox"/> Start I/O to the LUN. <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	<b>If you have a PowerPath license key</b> If your PowerPath license key is not registered, the load balancing policy is restricted to basic failover. <input type="checkbox"/> View the LUNs available to the server using the following PowerPath command: <b>powermt display dev=all class=clariion</b> <input type="checkbox"/> Choose one available LUN to receive I/O for the test. <input type="checkbox"/> View the paths to the chosen LUN using the following PowerPath command: <b>powermt display dev=x every=2</b> where <i>x</i> is a pseudo device that represents the chosen LUN. <input type="checkbox"/> Start I/O to the LUN. <input type="checkbox"/> Identify the HBA sending I/O to LUN by viewing the output of the <b>powermt display dev=x every=2</b> command, and disconnect the cable to that HBA.	PowerPath product guide

Task	With Access Logix	Without Access Logix	Reference Document
<p>17 <b>Server</b> <i>Test PowerPath with a license key (cont.)</i></p>	<p><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that</p> <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <p><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</p> <p><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></p>	<p><input type="checkbox"/> View the output of the <b>powermt display dev=x every=2</b> command, and verify that</p> <ul style="list-style-type: none"> <li>• The state of the uncabled path(s) becomes “dead.”</li> <li>• I/O continues to the remaining path(s) to the LUN, indicating that the path failover was successful, and PowerPath is working properly.</li> </ul> <p><input type="checkbox"/> Reconnect the cable that you disconnected from the HBA.</p> <p><input type="checkbox"/> If you did not follow the above steps exactly and caused any LUNs to trespass, restore the LUNs to their original SP with the following PowerPath command: <b>powermt restore</b></p>	<p>PowerPath product guide</p>

## DMP Configurations for Windows

Read this section if you are installing a Windows 2000 VERITAS DMP configuration with a new server and a new storage system. A new server and a new storage system are defined as follows:

**new server** - A server running Windows 2000 and *not* connected to any storage system.

**new storage system** - A CX300, CX500, or CX700 storage system that has factory default settings and has never been connected to a server.

Topics relating to the checklist for Windows DMP configurations are

- ◆ Required Host Software Revisions..... 7-57
- ◆ Prerequisites ..... 7-58
- ◆ Documentation..... 7-59
- ◆ DMP Checklist — New Windows Server and New Storage System ..... 7-60

### Required Host Software Revisions

This section lists the required software revisions for Windows 2000 configurations.

- ◆ Windows 2000 operating system revision and any service pack listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ HBA driver revision listed in the *EMC Support Matrix* on the Powerlink website (<http://powerlink.emc.com>)
- ◆ VxVM 3.1 for Windows 2000 with HotFix01 or higher

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Refer to the *EMC Support Matrix* and the *EMC PowerPath for Windows administrator's guide* on the Powerlink website (<http://powerlink.emc.com>) for the specific revision required for your Windows 2000 version.

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## Prerequisites

- ◆ All switches must be installed.
- ◆ Storage systems must be set up, initialized (if required), and connected to switches, and any optional storage-system software (Access Logix, SnapView, SAN Copy, MirrorView, MirrorView/A) you have must be installed.
- ◆ You have installed Navisphere Manager.
- ◆ If any storage systems have SnapView, the admsnap utility must be installed on the servers that will be the SnapView production and secondary hosts.
- ◆ If any storage systems have SAN Copy, the admhost utility must be installed on the servers that have access to LUNs participating in a SAN Copy session.
- ◆ You must have a host that is
  - Running an operating system that can support the Navisphere Manager 6.X browser-based client. For an up-to-date list of such operating systems, refer to the Navisphere Manager 6.X release notes on <http://powerlink.emc.com>.
  - On a network that is connected to the storage-system servers and that will be connected to the SPs in the storage systems.
- ◆ You must have planned your LUNs and RAID Groups, and Storage Groups if you have Access Logix. Be sure to consider requirements for SAN Copy, SnapView, and MirrorView if you have this software. The *EMC CLARiiON CX300, CX500, CX500i, and CX700 Storage Systems Configuration Planning Guide* (P/N 300-001-273) will help you with this planning.

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## Documentation

Each checklist refers to some or all of the documents listed below. We recommend that you load these documents on your service laptop before starting the installation.

- ◆ Documentation that ships with the HBA and HBA driver.

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This documentation is also available from the following websites.

For Emulex HBAs and drivers:

<http://www.emulex.com/ts/docoem/framemc.htm>

For QLogic HBAs and drivers:

[http://www.qlogic.com/support/drivers\\_software.asp](http://www.qlogic.com/support/drivers_software.asp)

and select **EMC** in the **OEM-approved Drivers/Firmware** list at the bottom of the page.

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- ◆ Documentation that ships with the
  - Switches and switch management software
  - Microsoft Windows 2000 operating system
  - VERITAS Volume Manager
- ◆ *EMC Navisphere Host Agent and CLI for Windows Version 6.X Installation Guide* (P/N 069001151)  
or  
*EMC CX-Series Server Software for Windows Installation Guide* (P/N300-002-038)
- ◆ *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038)
- ◆ *EMC Navisphere Manager Administrator's Guide* (P/N 069001125)
- ◆ *EMC Navisphere Security Administrator's Guide* (P/N 069001124)
- ◆ *EMC Host Connectivity Guide for Windows* (P/N 300-000-603)

## DMP Checklist — New Windows Server and New Storage System

Tasks highlighted with grey in the checklist should be completed before the service provider arrives.

Task	With Access Logix	Reference Document
1 <b>Server</b> <i>Install HBAs and driver</i>	<input type="checkbox"/> Install HBAs. <input type="checkbox"/> Install HBA driver.	HBA documentation (see URL on 7-5)
2 <b>Server</b> <i>Set HBA driver properties</i>	<input type="checkbox"/> Set the HBA driver parameters to the values required for CLARiiON. <b>CAUTION</b> Using improper settings can cause erratic failover behavior, such as greatly increased I/O delays.	Host connectivity guide and HBA documentation (see URL on 7-5)
3 <b>Storage System</b> <i>Configure</i>	<input type="checkbox"/> Use Navisphere Manager to set general storage-system properties. <input type="checkbox"/> Use Navisphere Manager to create RAID Groups, bind LUNs, create Storage Groups, and assign LUNs to Storage Groups.	Navisphere Manager administrator's guide and online help
4 <b>Storage System</b> <i>Set up Event Monitor</i>	<input type="checkbox"/> Plan your monitoring configuration. <input type="checkbox"/> Use Navisphere Manager to set user options, create templates, and set up your monitoring configuration.	Navisphere Manager administrator's guide and online help
5 <b>Storage System</b> <i>Set properties</i>	<input type="checkbox"/> Use the following Navisphere CLI commands to set the default storage-system arraycomppath and failover mode properties: <b>navicli -h sp arraycomppath 1</b> <b>navicli -h sp storagegroup -sethost -host windows_host -failovermode 1</b> where <i>sp</i> is the IP address or network name of the SP in the storage system. <i>windows_host</i> is the name of the Windows server.	Navisphere CLI reference

Task	With Access Logix	Reference Document
<b>6 Switch</b> <b>Zone switches for one path from server to storage system</b>	<b>For a SAN</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Zone switches so that <i>only one path</i> exists between a server and the storage system.  This provides a path from one host initiator (HBA port) to <i>only one SP</i>. You will need to know the WWPN of a host initiator - available in the switch's name server table.</li> <li><input type="checkbox"/> Reboot Windows.</li> <li><input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify that the HBA and storage system are logged in to the switch as fabric ports, and to verify that the HBA sees only the target (SP) to which it is zoned.</li> </ul>	<p>Documentation that ships with the switches</p> <p>Windows documentation</p> <p>Documentation that ships with the switches</p>
<b>7 Storage System</b> <b>Register one host initiator</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use the <b>Connectivity Status</b> dialog in Navisphere Manager to register <i>only one</i> host initiator with the storage system.</li> </ul>	Navisphere Manager administrator's guide and online help
<b>8 Storage System</b> <b>Connect host initiator to Storage Group</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use Navisphere Manager to connect the host initiator to its Storage Group.</li> <li><input type="checkbox"/> Use the Disk Management tool to scan for disks.  If the disks are not visible, scan for them once more.</li> </ul>	<p>Navisphere Manager administrator's guide and online help</p> <p>Windows documentation</p>
<b>9 Server</b> <b>Install Volume Manager</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install VERITAS Volume Manager for Windows 2000 on the server.</li> <li><input type="checkbox"/> Install any recommended VERITAS updates.</li> </ul> <p>If the server is running VERITAS Volume Manager 3.1 with Service Pack 1, skip to step 11.</p>	VERITAS Volume Manager documentation
<b>10 Server</b> <b>Install the CLARiiON DMP driver</b>	<b>Server is running a version of Volume Manager prior to version 3.1 with Service Pack 1</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Download the CLARiiON DMP driver to the server from Services on the VERITAS website.</li> <li><input type="checkbox"/> In the directory where you downloaded the driver, double-click the <b>install.cmd</b> file to install the driver.</li> <li><input type="checkbox"/> Reboot Windows.</li> </ul>	VERITAS Volume Manager documentation
<b>11 Server</b> <b>Add storage system to DMP management</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Use VERITAS Enterprise Administrator to turn off <b>Exclude</b> in the array settings menu for a LUN's path for the storage system.</li> </ul>	VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
<b>12 Switch</b> <i>Zone switches additional paths from server to storage system</i>	<b>For a SAN</b> <input type="checkbox"/> Zone switches so that <i>all desired paths</i> exists between a server and the storage system. You will need to know the WWPN of the host initiators - available in the switch's name server table. <input type="checkbox"/> <b>Checkpoint</b> - Use switch management software to verify that the HBAs and storage system are logged in to the switch as fabric ports, and to verify that each HBA sees only the targets (SPs) to which it is zoned.	Documentation that ships with the switches
<b>13 Storage System</b> <i>Register additional host initiators</i>	<input type="checkbox"/> Use the <b>Connectivity Status</b> dialog in Navisphere Manager to register the additional host initiators with the storage system.	Navisphere Manager administrator's guide and online help
<b>14 Storage System</b> <i>Connect Storage Group to additional host</i>	<input type="checkbox"/> Use Navisphere Manager to disconnect and then reconnect the server from its Storage Group. You can do this from the <b>Host</b> tab of the <b>Storage Group Properties</b> dialog. <input type="checkbox"/> Use the Disk Management tool to scan for disks. If the disks are not visible, scan for them once more.	Navisphere Manager administrator's guide and online help  Windows documentation
<b>15 Server</b> <i>Make LUNs available to both SPs</i>	<input type="checkbox"/> Use the Disk Management tool to scan for disks.	Windows documentation
<b>16 Server</b> <i>Verify DMP installation</i>	<input type="checkbox"/> Log into VERITAS Enterprise Administrator (VEA). <input type="checkbox"/> Click the host name for the server. <input type="checkbox"/> Click <b>disks</b> . <input type="checkbox"/> Click a device that you know belongs to the CLARiiON storage system. <input type="checkbox"/> Click the paths tab for that device. <input type="checkbox"/> Verify that the device has primary and secondary paths to it. <input type="checkbox"/> Verify the state of the device (enabled or disabled).	VERITAS Volume Manager documentation  VERITAS Volume Manager documentation

Task	With Access Logix	Reference Document
<b>17 Windows Server 2003 Server</b> <b>Install optional CLARiiON VSS provider</b>	<input type="checkbox"/> If you want applications to access SnapView functionality on the storage system using the VSS framework or other APIs, install the optional CLARiiON VSS provider on the server.  Note that Navisphere CLI must be installed on the server.	CX-Series Server Software for Windows Installation Guide

You are now ready to set up any optional software, such as SnapView or MirrorView, on the storage system.

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## Using Windows DMP

When you use Windows 2000 DMP for CLARiiON, you need to take into account the following behaviors for LUNs under DMP management:

- ◆ After Windows 2000 reboots, one SP owns all the LUNs. If you want the other SP to own any LUNs, you must manually transfer ownership of (trespass) those LUNs to the other SP using the Navisphere Manager or CLI.
- ◆ Windows DMP for CLARiiON does not support auto-restore for LUNs. If a failure occurs in a path to an SP, Windows DMP transfers ownership of LUNs to the other SP, but it does not transfer ownership back to the original SP when the path is repaired. The server does not lose access to the transferred LUNs. If you want the original SP to access any LUNs for load balancing, you must manually transfer ownership of those LUNs back to the SP using the Navisphere Manager or CLI.
- ◆ If I/O is occurring between a server and a LUN, you cannot use Navisphere to transfer ownership of the LUN from one SP to the other SP.
- ◆ Adding more than 40 LUNs to a Storage Group may cause Windows 2000 to crash.
- ◆ The Navisphere Host Agent does not register host information with the storage system correctly.

This appendix reviews the EMC process for detecting and resolving software problems, and provides essential questions that you should answer before contacting the EMC Customer Support Center.

This appendix covers the following topics:

- ◆ Overview of Detecting and Resolving Problems ..... A-2
- ◆ Troubleshooting the Problem ..... A-3
- ◆ Before Calling the Customer Support Center ..... A-4
- ◆ Documenting the Problem..... A-5
- ◆ Reporting a New Problem ..... A-6
- ◆ Sending Problem Documentation..... A-7

## Overview of Detecting and Resolving Problems

EMC software products are supported directly by the EMC Customer Support Center in the United States.

EMC uses the following process to resolve customer problems with its software products (Figure A-1).

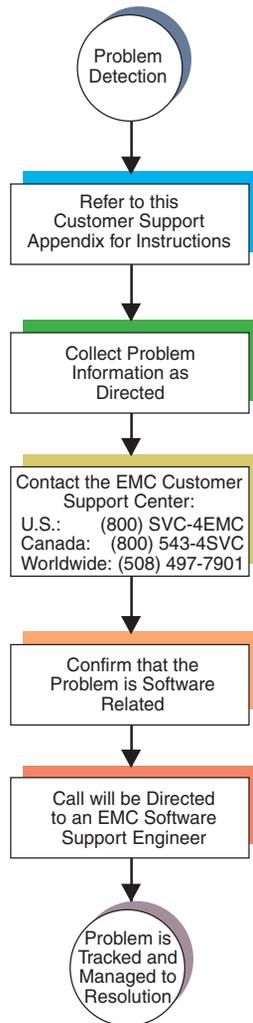


Figure A-1 Problem Detection and Resolution Process

## Troubleshooting the Problem

Please perform the relevant diagnostic steps before you contact the EMC Customer Support Center:

1. Read the documentation carefully.
2. Reconstruct the events leading up to the problem and describe them in writing.
3. Run some test cases to reproduce the problem.

If you encounter a problem that requires technical programming or analysis, call the nearest EMC office or contact the EMC Customer Support Center at one of the following numbers:

United States: **(800) 782-4362 (SVC-4EMC)**

Canada: **(800) 543-4782 (543-4SVC)**

Worldwide: **(508) 497-7901**

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Please do not request a specific support representative unless one has already been assigned to your particular system problem.

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For additional information on EMC products and services available to customers and partners, refer to the EMC Powerlink website at:

<http://powerlink.EMC.com>

## Before Calling the Customer Support Center

Have the following information available before calling the Customer Support Center or your support representative (if one has been assigned to you):

- Your company name
- Your name
- Your phone number
- For an existing problem, the problem tracking system ID, if one was previously assigned to the problem by a support representative

## Documenting the Problem

If the EMC Customer Support Center requests information regarding the problem, please document it completely, making sure to include the following information:

- Your company name and address
- Your name
- Your telephone number
- The importance of the problem, so that it can be assigned a priority level

To expedite the processing of your support request, you can photocopy this list and include it with the package.

## Reporting a New Problem

For a new problem, please provide the following information:

- Release level of the software that you are running
- Software installation parameters
- Host type on which you are running
- Operating system you are running and its release number
- Functions of the software that you are running
- Whether you can reproduce the problem
- Previous occurrences of the problem
- Whether the software has ever worked correctly
- Time period that the software did work properly
- Conditions under which the software worked properly
- Changes to your system between the time the software worked properly and the problem began
- Exact sequence of events that led to the system error
- Message numbers and complete text of any messages that the system produced
- Log file dated near the time the error occurred
- Results from tests that you have run
- Other related system output
- Other information that may help solve the problem

## Sending Problem Documentation

Use one of the following methods to send documentation of the problem to the EMC Customer Support Center:

- ◆ E-mail
- ◆ FTP
- ◆ U.S. mail to the following address:

EMC Customer Support Center  
171 South Street  
Hopkinton, MA 01748-9103

If the problem was assigned a number or a specific support representative, please include that information in the address as well.

