



# Software Product Description

---

**Product Name: TruCluster Production Server Software  
Version 1.6**

**SPD 63.92.15**

## DESCRIPTION

TruCluster™ Production Server Software Version 1.6 for Tru64™ UNIX (formerly known as DIGITAL UNIX) is part of the Tru64 UNIX TruCluster product suite. The TruCluster product suite consists of Production Server Software, Available Server Software, and Memory Channel Software. The Memory Channel Software product provides high-performance data delivery for applications over the Memory Channel interconnect. The Available Server Software product provides high availability for applications. These capabilities combine in the Production Server Software product to provide a high-performance, highly available, and scalable operating environment.

By combining the advantages of symmetric multiprocessing, distributed computing, and fault resilience, a cluster running TruCluster Production Server Software offers its users high availability and achieves superior performance, providing scalability beyond the limits of a single system. By building on the high-availability features of the TruCluster Available Server, the TruCluster Production Server also significantly reduces, but does not eliminate, the impact of hardware and software failures.

TruCluster Production Server Software supports highly parallelized database applications, such as Oracle Parallel Server and Informix Dynamic Server with the Extended Parallel Option (formerly known as Informix Online-Extended Parallel Server). TruCluster Production Server Software allows the processing components of an application to concurrently access raw devices, regardless of where the devices are located in the cluster.

Using the TruCluster Production Server Software Distributed Lock Manager (DLM), an application can synchronize cluster-wide access to shared resources, which ensures data integrity. To a client, the cluster appears to be a powerful single-server system; a client is minimally, if at all, impacted by hardware and software failures in the cluster. A cluster configuration consists of systems, external disks, and tape devices connected to shared buses. TruCluster Production Server Software provides multi-host

access to shared disks and tapes, and a generic failover mechanism that makes applications and data highly available. TruCluster Production Server Software requires a PCI-based Memory Channel interconnect for fast and reliable communication between cluster members. By using multiple shared buses and redundant Memory Channel interconnects, a cluster with no single point of failure can be configured to achieve high availability.

An administrator defines services for applications that are to remain highly available in the cluster. If a hardware or software failure prevents a system from running a service, the failover mechanism automatically relocates the service to a viable system in the cluster, which maintains the availability of applications or data. Administrators can manually relocate services for load balancing or hardware maintenance. Administrators can also update a service's storage configuration, as well as other service information in the database configuration without interrupting a service's availability to its clients.

TruCluster Production Server Software supports a variety of hardware configurations that are cost effective and that meet performance needs and availability requirements. Hardware configurations can include different types of systems and storage units and can be set up to allow easy maintenance of systems and storage. In addition, it is possible to set up hardware configurations that allow the addition of a system or storage unit without shutting down the cluster.

## FEATURES

### *Support for Memory Channel Interconnect*

Memory Channel is a high-performance, PCI-based interconnect that cluster members use for passing low-overhead messages among themselves. TCP/IP is supported over Memory Channel. A software library provides a special set of application programming interfaces for high-performance data delivery over

Memory Channel. The following functions utilize Memory Channel in the cluster:

- High-performance cluster communication
- High-performance shared storage service
- High-performance Distributed Lock Manager
- High-performance, direct application to application memory serving

#### *Support for Parallelized Database Applications*

TruCluster Production Server Software enables parallelized database applications, such as Oracle Parallel Server (OPS) and Informix Dynamic Server's Extended Parallel Option to achieve performance and high availability. OPS and Informix Dynamic Server's Extended Parallel Option must be purchased separately from Oracle Corporation and Informix Software, Inc., respectively.

#### *Distributed Lock Manager*

The Distributed Lock Manager (DLM) synchronizes access to the resources that are shared among cooperating processes throughout the cluster. DLM provides a software library that applications use to implement a resource sharing policy. DLM provides services to notify a process owning a resource that it is blocking another process requesting the resource. An application can also use DLM routines to coordinate the application's activities efficiently with the state of the cluster.

#### *Connection Manager*

The Connection Manager maintains cluster membership. In addition, it establishes and maintains communication paths between each cluster member.

#### *Distributed Raw Disk*

The Distributed Raw Disk (DRD) allows a raw disk-based, user-level application to run within a cluster, regardless of where in the cluster the physical storage is located. DRD allows applications, such as distributed database systems or TP monitor systems, parallel access to storage media from multiple cluster members. DRD can provide all cluster members access to any volumes. TruCluster Production Server supports the ability to modify and retain DRD device special file permissions and owner and group settings. These settings do not have to be set manually on every system in the cluster.

#### *Highly Parallelized Servers*

TruCluster Production Server Software enables parallelized, concurrently active, and Master/Standby server configurations. Distributed components of an application can run simultaneously on different cluster members.

#### *Support for Fibre Channel solutions*

TruCluster Production Server Software Version 1.6 supports Fibre Channel as cluster storage as well as supports the use of the Fibre Channel Protocol (FCP) for SCSI-3 to use Fibre Channel as a physical interface. Fibre Channel, with its serial transmission, provides the following benefits:

- Greater performance
- Greater scalability
- More reliability, serviceability, and availability

For more details on the specific supported TruCluster configurations using Fibre Channel, refer to the TruCluster Software Products *Hardware Configuration* manual.

#### *Highly Available Backup Services*

Tape devices and media changers can be configured on the cluster-shared storage interconnect, enabling highly available backup services such as the Legato NetWorker Save and Restore product.

#### *Transparent NFS Failover*

TruCluster Production Server Software can provide highly available access to exported NFS data. In the event of a system failure, the change in the system exporting the data is virtually transparent. Clients experience only a temporary NFS server timeout. NFS locking is also supported. Both NFS UDP and NFS TCP are supported as a transport mechanism.

#### *Fast File System Recovery*

The Advanced File System (AdvFS) is a journaled, local file system that provides higher availability and greater flexibility than traditional UNIX file systems. Using transaction journaling, AdvFS recovers file domains in seconds rather than hours after an unexpected restart such as a power failure. AdvFS journaling also provides increased file system integrity. In addition, an optional separately licensed product, the Advanced File System Utilities, can perform management functions online while file systems are active. See the OPTIONAL SOFTWARE section of this SPD for more information on AdvFS Utilities.

#### *Increased Data Integrity*

Tru64 UNIX Logical Storage Manager (LSM) is an integrated, host-based solution to data storage management. Basic LSM functionality, including disk spanning and concatenation, is provided with the Tru64 UNIX operating system. Extended functions such as striping (RAID 0), mirroring (RAID 1), and online management are available with a separate license. LSM is RAID Advisory Board (RAB) certified for RAID Levels 0 and 1. See the OPTIONAL SOFTWARE section of this SPD for more information.

#### *Global Error Logger*

TruCluster Production Server Software can log messages about events that occur in the TruCluster environment to one or more systems. TruCluster administrators can also receive notification through electronic mail of critical problems when they occur.

#### *Cluster Network Failover*

A TruCluster Production Server cluster provides the ability to transparently fail over when at least two Memory Channel adapters are configured in a cluster.

#### *Network Interface Monitoring*

The TruCluster Production Server Software environment can be configured to monitor the health of up to eight (8) network interfaces per member. When any monitored network interface fails on a member, the status of all monitored network interfaces on that member is passed to a script that can be customized. The default behavior of the script is for all services to be relocated from a member that has experienced a failure of all monitored network interfaces. This allows another member that has at least one monitored network interface working to continue providing the relocated service to clients.

#### *NetRAIN*

TruCluster Production Server Software is integrated with NetRAIN to provide a highly available solution for the network interfaces, including use of NetRAIN devices as primary cluster interface as well as the client network interfaces. In addition, TruCluster Production Server Software also supports monitoring of the NetRAIN devices, which allows users to customize failure policies upon NetRAIN device failures. For more details on NetRAIN functionality, see the Tru64 UNIX Version 4.0F *Release Notes* and Tru64 UNIX *Network Administration* manual.

#### *Service Configuration Files*

The ASE Manager can be used interactively to define highly available services. In addition, for applications that require many services and large disk farms, service configuration files can be used to decrease the number of repetitive tasks that have to be done. TruCluster Production Server now supports the use of the ASE manager with a service configuration file, which eliminates the need to run the ASE manager utility (asemgr) numerous times and to re-enter the same information repeatedly to define disk, DRD, NFS, tape, or user-defined services.

#### *Cluster Monitor*

The Cluster Monitor provides a graphical view of the cluster configuration and may be used to determine the current state of availability and connectivity in the cluster. The administrator can invoke management tools, allowing the system to be managed from a single location.

#### *Cluster MIB*

TruCluster Production Server Software supports the Compaq Common Cluster MIB. This Cluster MIB is implemented by each member of a cluster, and shows member views of the cluster. Each cluster member host name, IP addressing configuration, and status are maintained in the cluster. The Compaq ServerWorks and Insight Manager applications use this Cluster MIB to discover cluster member relationships and provide a coherent view of clustered systems across supported platforms.

#### *Script Toolkit*

TruCluster Production Server Software provides supported example scripts, which can be modified as necessary to set up highly available NIS master or print server services. TruCluster Production Server Software also provides unsupported example scripts to start and stop services for the following applications and environments:

- An Oracle database
- An INFORMIX database
- The AltaVista search internet daemons
- A Netscape Web server
- A Netscape News server
- A SAMBA PC fileserver
- A Baan environment
- A Tuxedo environment

#### *Reliable Datagram Messaging*

TruCluster Production Server Software supports the Reliable Datagram (RDG) Messaging facility. RDG provides applications developed to its defined application programming interface (API) with higher bandwidth and lower latencies than are obtainable with IP-based protocols.

#### *Enhanced Security with Distributed Authentication*

TruCluster Production Server supports the ability to enable the Enhanced Security option on individual members of the cluster. This includes support for features for enhanced login checks and password management. Audit and acl support can also be enabled independently of the Enhanced Security Option on individual members of the cluster. In addition to the above features, TruCluster Production Server now supports highly available login across the cluster and support for management of distributed authentication databases.

### **SOFTWARE REQUIREMENTS**

TruCluster Production Server Software Version 1.6 requires at a minimum the Tru64 UNIX Version 4.0F operating system.

For more information on the Tru64 UNIX operating system, a separately licensed product, see SPD 41.61.

**Additional Required Subsets**

TruCluster Production Server Software requires that additional software subsets be installed. See the TruCluster Software Products *Software Installation* manual for further details.

**OPTIONAL SOFTWARE**

Oracle Parallel Server (OPS) technology is a relational database management system that capitalizes on the benefits of high availability, performance, and expandability made possible by TruCluster. Oracle Parallel Server must be ordered separately through the Oracle Corporation.

Informix Dynamic Server with the Extended Parallel Option delivers high performance while supporting commercially available cluster systems used for data warehousing and decision-support applications. Informix Dynamic Server with the Extended Parallel Option must be ordered through Informix Software, Inc.

Legato NetWorker is an integrated product offering that completely addresses the storage management needs of the heterogeneous enterprise environment. Legato NetWorker delivers manageability, availability, and performance necessary to protect multi-platform environments with one integrated solution. NetWorker Version 5.5 single server version is bundled with the Tru64 UNIX Version 4.0F operating system, enabling backup of any directly attached storage. To obtain the NetWorker V5.5 full product and service, contact Legato via email at [compaqanswers@legato.com](mailto:compaqanswers@legato.com), phone 408-530-3296, or visit the online Legato Web site at [www.legato.com/compaqanswers/](http://www.legato.com/compaqanswers/).

The Advanced File System Utilities extend the high availability and flexibility of AdvFS. The AdvFS Utilities provide a graphical user interface (GUI) to ease management tasks, and online utilities to dynamically resize file systems, defragment files, balance percentage of space used on volumes, undelete files using trashcans, stripe files, and clone files for hot backup. Advanced File System Utilities is a separately licensed software product for Tru64 UNIX. See SPD 44.52 for more information.

The Tru64 UNIX Logical Storage Manager (LSM) is an integrated, host-based solution to data storage management, providing concatenation, striping, mirroring, and a graphical user interface that allows data storage management functions to be performed online, without disrupting users or applications. The Logical Storage Manager is a separately licensed software product for Tru64 UNIX. See SPD 51.24.xx for more information.

The StorageWorks Software package includes these two key storage products: the Tru64 UNIX Logical Storage Manager and the Advanced File System Utilities. StorageWorks delivers high availability, configuration flexibility online, optimal file

system performance, and data protection. The product part number to place an order for StorageWorks is QB-5RXA\*-AA.

The Performance Manager for Tru64 UNIX is a management application that centralizes the monitoring of UNIX system performance information for a network of systems. A single instance of Performance Manager can monitor resources for many systems and alert the user when problems arise. The Performance Manager is a separately licensed product for Tru64 UNIX. See SPD 46.97 for more information.

**SOFTWARE CONFIGURATION REQUIREMENTS**

- At least 96 MB of memory is required on each member system.
- 24 MB of free disk space is required for permanent use.

These requirements refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the system environment, configuration, and software options.

**ORDERING INFORMATION**

TruCluster Production Server Software is for environments that require high availability for applications, scalability, and high-performance Memory Channel interconnect. In most cases, these environments also require running a highly parallelized database application.

Software License and Documentation: QB-3RLA\*-AA  
 Software License: QL-3RLA\*-AA  
 Software Upgrade License: QL-3RLA\*-RA  
 Software License (30-day loan): QL-3RLA9-LB  
 Software License (60-day loan): QL-3RLA9-LD  
 Software License (90-day loan): QL-3RLA9-LA  
 Software License (180-day loan): QL-3RLA9-LG  
 Software Documentation: QA-3RLAA-GZ

\* Denotes variant fields. For additional information on available services, refer to the appropriate price book.

**SOFTWARE LICENSING**

TruCluster Production Server Software is licensed as a standard Compaq software layered product and is provided only under a license. Each system in the TruCluster environment requires a separate license. For more information about Compaq's licensing terms and policies, contact your local Compaq representative or reseller.

| Systems   | Software License |
|---|------------------|
| AlphaServer™ 800, 1000A, 1200, DS20, DS20E                    | QL-3RLAC-AA      |
| AlphaServer ES40  | QL-3RLAE-AA      |
| AlphaServer 2000, 2100, 2100A, 4000, 4000A, 4100, GS60E, GS80 | QL-3RLAG-AA      |

|  |             |
|--|-------------|
| AlphaServer 8200, 8400, GS60, GS140, GS160 | QL-3RLAQ-AA |
|--|-------------|

This product supports the Tru64 UNIX License Management Facility (LMF). License units for this product are allocated on an unlimited system use basis.

For more information on the License Management Facility, see the Tru64 UNIX Operating System Software Product Description (SPD 41.61) or the Tru64 UNIX operating system documentation.

**GROWTH CONSIDERATIONS**

The minimum hardware and software requirements for any future version of this product may be different from the requirements for the current version.

**DISTRIBUTION MEDIA**

TruCluster Production Server Software, a separately licensed product, is distributed as part of the Tru64 UNIX Operating System Associated Products Volume 2 CD-ROM (QA-MT4AA-H8).

**SOFTWARE PRODUCT SERVICES**

A variety of service options are available from Compaq. For more information, contact your local Compaq service representative.

**SUPPORTED HARDWARE**

TruCluster Production Server Software supports the following systems with up to eight (8) systems in a configuration. TruCluster Production Server Software supports up to 32 shared buses with KZPSA-BB, KZPBA-CB, KGPSA-BC and KGPSA-CA adapters, subject to individual platform restrictions. TruCluster Production Server supports a maximum of 32 shared buses in total, subject to platform configurations. The TruCluster Software Products *Release Notes* provide information regarding configuration and firmware requirements.

**Supported Systems**

| System  | SCSI or Fibre Channel Adapter |
|---|-------------------------------|
| AlphaServer 800 5/333, 5/400, 5/500                       | KZPSA, KZPBA-CB, KGPSA        |
| AlphaServer 1000 4/200, 4/233, 4/266, 5/300               | KZPSA                         |
| AlphaServer 1000A   | KZPSA, KZPBA-CB, KGPSA        |
| AlphaServer 1200 5/400, 5/533                             | KZPSA, KZPBA-CB, KGPSA        |
| AlphaServer 2000 4/200, 4/233, 4/275, 5/250, 5/300, 5/350 | KZPSA, KZPBA-CB               |
| AlphaServer 2100  | KZPSA, KZPBA-CB               |
| AlphaServer 2100A   | KZPSA, KZPBA-CB               |

|   |                        |
|---|------------------------|
| 4/200, 4/233, 4/275, 5/250, 5/300, 5/350                        |                        |
| AlphaServer 4000, 4000A, 4100 5/300, 5/400, 5/466, 5/466, 5/600 | KZPSA, KZPBA-CB, KGPSA |
| AlphaServer 8200 5/300, 5/350, 5/440, 5/625                     | KZPSA, KZPBA-CB, KGPSA |
| AlphaServer 8400 5/300, 5/350, 5/440, 5/625                     | KZPSA, KZPBA-CB, KGPSA |
| DS20 & DS20E  | KZPBA-CB, KGPSA        |
| AlphaServer ES40  | KZPBA-CB, KGPSA        |
| AlphaServer GS60 & GS60E  | KZPSA, KZPBA-CB, KGPSA |
| AlphaServer GS140   | KZPSA, KZPBA-CB, KGPSA |
| AlphaServer GS80  | KZPBA-CB, KGPSA        |
| AlphaServer GS160   | KZPBA-CB, KGPSA        |

**NOTE:**

Any TruCluster configuration using AlphaServer DS20 and ES40 systems must use as minimum versions TruCluster Production Server Software Version 1.6, Tru64 UNIX Version 4.0F, and Memory Channel 2 interconnect (CCMAB-AA) and Memory Channel 2 hub (CCMHB-AA) or linecard (CCMLB-AA), if necessary.

**NOTE:**

Tru64 UNIX Version 4.0G and TruCluster Available Server Version 1.6 are the minimum versions required for configurations using AlphaServer GS80 and GS160.

**NOTE:**

There is a restriction of four (4) clustered systems per Fibre Channel fabric. There can be eight (8) members in the cluster if multiple fabrics are used.

**Supported Memory Channel Hardware**

TruCluster Production Server Software requires Memory Channel hardware. Note that there are two variants of Memory Channel (MC):

| MC 1 & 1.5           | MC 2                | Description  |
|----------------------|---------------------|--|
| CCMAA-AA or CCMAA-BA | CCMAB-AA            | PCI Adapter  |
| CCMHA-AA             | CCMHB-AA            | Hub  |
| CCMLA-AA             | CCMLB-AA            | Linecard   |
| N/A                  | BN39B-04            | 4-meter copper cable                                 |
| BC12N-10             |                     | 10' copper cable                                     |
|                      | BN39B-10            | 10m copper cable                                     |
|                      | BN39B-01 (1 meter)  | Connects CCMAB-AA adapter to CCMFB optical converter |
|                      | CCMFB-AA            | Fiber-optics converter                               |
|                      | BN34R-10 (10 meter) | Fiber-optics cable: Connect one optical converter to |

|  |                        |   |
|--|------------------------|---|
|  |                        | another   |
|  | BN34R-31<br>(31 meter) | Fiber-optics cable:<br>Connect one optical<br>converter to<br>another |

At least one Memory Channel adapter must be installed in a PCI slot in each member system. A link cable is required to connect systems. A cluster environment with more than two members requires a Memory Channel hub.

**NOTE:**

There are special rules about circumstances where Memory Channel 1 and Memory Channel 2 can be used together in the same cluster. The TruCluster Server *Hardware Configuration* manual provides information regarding supported Memory Channel configurations.

**Supported SCSI Controllers**

The systems are connected to shared SCSI buses using an adapter from the following list. The TruCluster Software Products *Hardware Configuration* manual and *Release Notes* provide more information regarding SCSI controller configuration and firmware revisions, respectively:

- KZPSA - PCI to Fast Wide Differential SCSI-2 adapter
- KZPBA-CB\* – UltraSCSI adapter

**Supported SCSI Signal Converters**

TruCluster Production Server Software supports the following SCSI signal converters. The TruCluster Software Products *Release Notes* provide information regarding supported SCSI signal converters configuration.

| Signal Converter | Description   |
|------------------|---|
| DWZZA-AA         | Standalone unit, single-ended/narrow to differential/wide |
| DWZZA-VA         | SBB, single-ended/narrow to differential/wide             |
| DWZZB-AA         | Standalone unit, single-ended/wide to differential/wide   |
| DS-DWZZH-03      | UltraSCSI hub   |
| DS-DWZZH-05      | UltraSCSI hub   |

**Supported SCSI Cables**

TruCluster Production Server Software supports the following SCSI cables:

| Device         | Description      |
|----------------|------------------|
| BN21W-0B       | SCSI-2 Cable "Y" |
| BN21R or BN23G | SCSI-2 Cable "A" |
| BN21K or BN21L | SCSI-3 Cable "P" |

|                |                     |
|----------------|---------------------|
| BC06P or BC19J | 50 pin LD Cable     |
| BN38C or BN38D | VHDCI to HD68 cable |
| BN37A          | Ultra VHDCI Cable   |

**Supported Fibre Channel Hardware**

TruCluster Production Server Software supports the following Fibre Channel hardware. For more information on the supported Fibre Channel solutions, see the TruCluster Software Products *Release Notes* and *Hardware Configuration* manual.

| Device        | Description                               |
|---------------|---|
| KGPSA-BC      | LP7000, PCI-to-Fibre Channel host adapter |
| KGPSA-CA      | LP8000, PCI-to-Fibre Channel host adapter |
| DS-DSGG-AA/AB | 8/16 port Brocade Fibre Channel switch    |
| HSG60         | Array Controller                          |
| HSG80         | Array Controller                          |

**NOTE:**

The following are the current maximum number of Fibre Channel (FC) adapters (KGPSA-BC and KGPSA-CA) that can be configured on a shared bus with the following AlphaServer systems:

| System            | # of FC Adapters |
|-------------------|------------------|
| AlphaServer 800   | 2                |
| AlphaServer 1000A | 2                |
| AlphaServer 1200  | 4                |
| AlphaServer 4x00  | 4                |
| AlphaServer 8200  | 32               |
| AlphaServer 8400  | 32               |
| AlphaServer DS20  | 4                |
| AlphaServer ES40  | 4                |
| AlphaServer GS60  | 32               |
| AlphaServer GS60E | 32               |
| AlphaServer GS140 | 32               |

**Supported Terminators and Connectors**

TruCluster Production Server Software supports the following terminators and connectors:

- H879-AA HD68 terminator
- 12-37004-04 terminator
- H885-AA HD68 trilink connector
- H8861-AA VHDCI trilink connector
- H8863-AA VHDCI terminator

**Supported Disk Devices for Shared Storage**

Every SCSI and Fibre Channel storage disk currently sold by Compaq that appears in the supported options list for a supported AlphaServer is supported for use in a cluster on a shared bus.

Some legacy disk devices are not supported for use on a shared bus. TruCluster Server supports the following disk devices on shared storage. Any SCSI or Fibre Channel storage disk manufactured by

Compaq later than the ones in the following list, and appearing in the supported options list for a supported AlphaServer, is supported.

- RZ26-VA Narrow
- RZ26L-VA Narrow
- RZ26L-VW Wide
- RZ26N-VA Narrow
- RZ26N-VW Wide
- RZ28-VA Narrow
- RZ28-VW Wide
- RZ28B-VA Narrow
- RZ28D-VA Narrow
- RZ28D-VW Wide
- RZ28L-VA Narrow
- RZ28L-VW Wide
- RZ28M-VA Narrow
- RZ28M-VW Wide
- RZ29-VA Narrow
- RZ29-VW Wide
- RZ29B-VA Narrow
- RZ29B-VW Wide
- RZ29L-VA Narrow
- RZ29L-VW Wide
- RZ40-VA Narrow
- RZ40-VW Wide
- RZ40L-VA Narrow
- RZ40L-VW Wide

**Supported Tape Devices and Media Changers**

TruCluster Production Server Software supports the following tape devices and media changers:

- TZ88
- TZ885 DLT Mini Library
- TZ887 DLT Mini Library
- TZ89
- TL890 Mini Library Expansion Unit
- TL891 Mini Library
- TL892 Mini Library
- TL893 Automated Tape Library
- TL894 Automated Tape Library
- TL895 Automated Tape Library
- TL896 Automated Tape Library
- TL881
- Compaq 20/40 GB DLT Tape Drive
- ESL9326D Enterprise Library
- 340654-001 Fibre Channel Tape Controller
- 152975-001 Fibre Channel Tape Controller II

The TL881, TL890, TL891, TL892, TL893, TL894, TL895, TL896, Compaq 20/40 GB DLT Tape Drive and ESL9326D Enterprise Library are supported with both the KZPSA and KZPBA-CB adapters. All other SCSI-attached tape device and media changer support is provided with KZPSA adapters only.

The TL891 Mini Library, TL895 Automated Tape Library, and the ESL9326D Enterprise Library are also supported on a Fibre Channel storage bus with the KGPSA-BC and KGPSA-CA adapters.

The Compaq Fibre Channel Tape Controller is a Fibre Channel-to-SCSI bridge that allows a

differential SCSI tape device to communicate with other devices on a Fibre Channel.

**Supported Storage Boxes**

TruCluster Production Server Software supports the following storage boxes:

| Storage box | Description           |
|-------------|-----------------------|
| BA350       | Single ended, narrow  |
| BA353       | Single ended, narrow  |
| BA356       | Single ended, wide    |
| DS-BA356    | Ultra SCSI, SBB shelf |

**Supported Array (RAID) Controllers**

TruCluster Production Server Software supports the following RAID controllers. The TruCluster Software Products *Release Notes* provide information regarding supported Array (RAID) controllers firmware revisions.

| RAID Controller                                |
|--|
| SWXRA-Z1 Array Controller (HSZ20)              |
| HSZ40-Ax Array Controller                      |
| HSZ40-Bx Array Controller                      |
| HSZ40-Cx Array Controller                      |
| HSZ50-Ax Array Controller                      |
| HSZ70 Array Controller                         |
| RAID Array 3000 (RA3000) with HSZ22 controller |
| HSZ80 Array Controller                         |
| HSG80 Array Controller                         |
| RAID Array 8000 (RA8000 ) with HSG80           |
| Storage Array 12000 (ESA12000 ) w/ HSG80       |

**NOTES:**

The KZPBA-CB adapter only supports the RAID Array 3000, HSZ50, HSZ70, and HSZ80 RAID Controllers.

The RAID Array 3000 is currently supported with AlphaServer 800, AS1000A, AS1200, AS4x00, and DS20.

The HSZ80 is currently supported with AlphaServer 800, 1200, 4x00, 8200, 8400, DS20, and ES40 systems.

For details on configurations with the HSG80 Array Controller, see the TruCluster Software Products *Hardware Configuration* manual.

**Network Adapters**

TruCluster Production Server Software supports monitoring for the following network adapters:

| Adapter  | Description       |
|----------|-------------------|
| DE435    | PCI/Ethernet      |
| DE450-CA | PCI/Ethernet      |
| DE500-XA | PCI/Fast Ethernet |
| DE500-AA | PCI/Fast Ethernet |
| DE500-BA | PCI/Fast Ethernet |

|             |                         |
|-------------|-------------------------|
| DE500-FA    | PCI/Fast Ethernet       |
| DE504-BA    | Quad Ethernet Channel   |
| DE600-AA    | Single Channel Ethernet |
| DE602-AA    | Multi-Channel Ethernet  |
| DEFEA       | EISA/FDDI               |
| DEFPA       | PCI/FDDI                |
| DE422       | EISA/Lance Ethernet     |
| DE425       | EISA/Ethernet           |
| DEMFA       | XMI/FDDI                |
| DEMNA       | XMI/Ethernet            |
| PMAD        | TURBOchannel/Ethernet   |
| DEFTA       | TURBOchannel/FDDI       |
| DEFZA       | TURBOchannel/FDDI       |
| DGLPB-AB    | ATMworks 350 ATM        |
| DAPCA-FA    | ATM                     |
| 3X-DAPBA-FA | ATM 155Mbit adapter     |
| DEGPA-SA    | GB Ethernet             |

**NOTE:**

The DE500-XA and DE500-AA are supported in half-duplex mode only.

**HARDWARE RESTRICTIONS**

The following are hardware restrictions for TruCluster Production Server Software. The TruCluster Software Products *Hardware Configuration* manual provides additional information regarding hardware restrictions.

- All nonshared devices such as the boot disk and CD-ROMs must be locally connected on a private SCSI bus.
- Prestoserve NVRAM failover is not supported on shared disk devices.

**HARDWARE CONFIGURATION EXAMPLES**

The TruCluster Software Products *Hardware Configuration* manual provides information regarding hardware configuration examples.

**Trademark Information**

COMPAQ and the Compaq logo Registered in the U.S. Patent and Trademark Office. AlphaServer, ServerWorks, StorageWorks, Tru64, and TruCluster are trademarks of Compaq Information Technologies Group, L.P.

® UNIX and The Open Group are trademarks of The Open Group.

® NFS is a registered trademark of Sun Microsystems, Inc.

® Prestoserve is a registered trademark and NetWorker is a trademark of Legato Systems, Inc.

® Oracle is a registered trademark and Oracle Parallel Server is a trademark of the Oracle Corporation.

® INFORMIX and INFORMIX Online-Extended Parallel Server are registered trademarks of Informix Software, Inc.

® Netscape is a registered trademark of Netscape Communications Corporation in the United States and other countries.

® Tuxedo is a registered trademark of BEA Systems.

Baan is a trademark of the Baan Company.

All other product names mentioned herein may be trademarks or registered trademarks of their respective companies.

©2000 Compaq Computer Corporation.

The previous information is valid at the time of release. Contact your local Compaq office for the latest information.