Software Product Description

Product Name: TruCluster Memory Channel Software Version 1.6 **SPD 60.55.11**

DESCRIPTION

TruCluster™ Memory Channel Software Version 1.6 is part of the Tru64™ UNIX® (formerly known as DIGITAL UNIX) TruCluster product suite. The TruCluster product suite consists of Production Server Software, Available Server Software, and Memory Channel Software. The Memory Channel Software 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.

TruCluster Memory Channel Software is an enabler for highly optimized applications that require high-performance data delivery over the Memory Channel interconnect. The product's software library provides application programming interfaces (APIs) for access to Memory Channel data transfer and locking functions.

High performance within the cluster is achieved by providing user applications with direct access to the capabilities of Memory Channel interconnect. For instance, a single store instruction on the sending host is sufficient for the data to become available for reading in the memory of another host.

TruCluster Memory Channel Software allows a programmer to create and control access to regions of the cluster wide address space by specifying UNIX[R] style protections. Access to shared data can be synchronized using Memory Channel spinlocks for clusterwide locking. Clusterwide signaling is provided allowing applications to send UNIX signals to processes operating on other nodes.

TruCluster Memory Channel Software is an enabler for highly optimized implementations of Parallel Virtual Machine (PVM), Message Passing Interface (MPI), and High Performance Fortran (HPF), providing seamless scalability from SMP systems to clusters of SMP machines. This provides the programmer with comprehensive access to the current and emerging de facto standard software development tools for parallel applications while supporting easy portability of existing applications without source code changes.

TruCluster Memory Channel Software supports a variety of configurations from a 2-node configuration to an 8-node configuration, allowing you to select a configuration appropriate to application performance needs. In a configuration that includes multiple Memory Channel interconnects, an application can employ the aggregate bandwidth for even greater performance. A configuration can be easily upgraded by adding a new member, adding more CPUs to individual nodes, or replacing individual nodes with more powerful servers.

FEATURES

Support for Memory Channel Interconnect

Memory Channel is a high-performance, PCI-based interconnect that cluster members use for passing low-overhead, guaranteed delivery messages among themselves. Memory Channel Software enables a write to a memory region on one member system to appear in the memory of another system. Memory Channel has built-in error checking, which eliminates the need for software checksums. It supports high-performance mutual exclusion locking (by means of spinlocks) for synchronized resource control.

TruCluster Memory Channel Software makes the following features available to the application programmer:

- Clusterwide global address space definable and accessible by applications
- Low latency, high bandwidth direct application-to-application communication
- Clusterwide locking mechanisms
- Full UNIX style protection of Memory Channel regions and locks
- Cross-cluster UNIX signals
- IP over Memory Channel enabling operation of network services such as NFS® within the cluster.

SOFTWARE REQUIREMENTS

TruCluster Memory Channel 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, please see SPD 41.61 for more information.

Additional Required Subsets

TruCluster Memory Channel Software requires that additional software subsets be installed. Please see the TruCluster Production Server Memory Channel *Application Programming Interface* manual for further details.

OPTIONAL SOFTWARE

For more information on the availability of Compaq PVM, MPI, and DIGITAL Performance Visualizer, please see the High Performance Computing (HPC) InfoCenter at http://www.DIGITAL.com/info/hpc, or send mail to high-

performance@DIGITAL.com or call your local Compaq sales representative or reseller.

The Compaq Parallel Software Environment (PSE) provides the necessary components for the development and execution of parallel High Performance Fortran (HPF) programs on Compaq's AlphaServer systems. PSE provides the optimized message passing that enables the execution of parallel HPF programs. For more information on the Compaq Parallel Software Environment, please see SPD 51.09

Compaq PVM for UNIX provides an implementation of the de facto standard application programming interface as defined by ORNL. Compaq's version uses the TruCluster Memory Channel Software as the communications layer and is correspondingly optimized for low-latency, high-bandwidth message passing.

MPI for Tru64 UNIX is an optimized implementation of what is the emerging standard application programming interface for message passing in parallel applications. The Compaq Performance Visualizer for AlphaServer clusters displays the performance metrics for a cluster in an intuitive, visual format. It displays resource usage and load distribution for the cluster. The operation of parallel programs on all members of the cluster can also be displayed.

SOFTWARE CONFIGURATION REQUIREMENTS

- At least 96 MB of memory is required on each member system.
- Free disk space required for use (permanent): 3 MB

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.

A uniform user name space across the cluster is mandatory for correct operation of clusterwide permissions.

ORDERING INFORMATION

TruCluster Memory Channel Software is for those environments that require high performance for applications.

Software License and Documentation: QB-4ZCA*-AA
Software License: QL-4CZA*-AA
Software Upgrade License: QL-4ZCA*-RA
Software License (30-day loan): QL-4ZCA9-LB
Software License (60-day loan): QL-4ZCA9-LD
Software License (90-day loan): QL-4ZCA9-LA
Software License (180-day loan): QL-4ZCA9-LG
Software Documentation: QA-4ZCAA-GZ

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

SOFTWARE LICENSING

TruCluster Memory Channel 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.

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, please see the Tru64 UNIX Operating System Software Product Description (SPD 41.61) or to 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 Memory Channel Software, a separately licensed product, is distributed as part of the Tru64 UNIX Operating System Associated Products CD-ROM, Volume 2 (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 Memory Channel Software supports the following systems in mixed system configurations of up to 8 nodes. The TruCluster Software Products *Hardware Configuration* manual and *Release Notes* provide information regarding configuration and firmware requirements, respectively.

Supported Systems

System
AlphaServer 800 5/333, 5/400, 5/500
AlphaServer 1000 4/200, 4/233, 4/266, 5/300
AlphaServer 1000A 4/233, 4/266, 5/300, 5/333, 5/400, 5/500
AlphaServer 1200 5/400, 5/533
AlphaServer 2000 4/200, 4/233, 4/275, 5/250, 5/300, 5/350
AlphaServer 2100
AlphaServer 2100A 4/200, 4/233, 4/275, 5/250, 5/300, 5/350
AlphaServer 4000 and 4000A, 4100 5/300, 5/400, 5/466, 5/466, 5/600
AlphaServer 8200 5/300, 5/350, 5/440, 5/625
AlphaServer 8400 5/300, 5/350, 5/440, 5/625
AlphaServer DS20
AlphaServer ES40
AlphaServer GS60
AlphaServer GS140

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

Required Memory Channel Hardware

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

MC I	MC2	Description
CCMAA-AA or CCMAA-BA	CCMAB-AA	PCI Adapter
CCMHA-AA	CCMHB-AA	Hub
CCMLA-AA	CCMLB-AA	Line Card
BC12N-10	N/A	Link Cable
N/A	BN29B-04 or BN39B-10	Link Cable
N/A	BN39B-01	Link Cable
N/A	CCMFB-AA	Fiber Optics Converter
N/A	BN34R-10 or BN34R-31	Fiber Optics Cable

At least one CCMAA adapter (Memory Channel adapter) must be installed in a PCI slot in each member system. A link cable(s) 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.

HARDWARE RESTRICTIONS

The TruCluster Software Products *Hardware Configuration* manual provides additional information regarding hardware restrictions.

HARDWARE CONFIGURATION EXAMPLES

All configurations of the cluster using Memory Channel support up to 8 nodes attached to a single hub. The TruCluster Software Products *Hardware Configuration* manual has more information regarding configurations for Memory Channel. Use of the TruCluster Memory Channel Software imposes no constraints on normal configuration rules for clusters using Memory Channel.

Trademark Information

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