Software Product Description

PRODUCT NAME: hp Reliable Transaction Router Version 4.2 for OpenVMS **51.04.11**

DESCRIPTION

HP Reliable Transaction Router (RTR) is fault tolerant transactional messaging middleware used to implement large, distributed applications using client/server technology. This version of Reliable Transaction Router enables enterprises to deploy distributed applications on OpenVMS Alpha and VAX systems.

Reliable Transaction Router enables distributed applications to run in heterogeneous environments, allowing client and server applications to interoperate on the supported Windows®, Tru64 UNIX®, Sun Solaris, and OpenVMS platforms.

Reliable Transaction Router provides APIs for development of distributed applications using languages such as C and C++, with optional all-or-nothing transaction semantics as well as a message broadcasting capability. C API calls are also available from a command line interface. The C++ API provides an object-oriented interface for developing user and system management applications. [1] Applications can also use the X/Open XA interface.

Reliable Transaction Router provides a reliable, transparent, dynamic message-routing system that includes both a transactional and non-transactional message control system. RTR transaction management supports two-phase commit of distributed transactions.

Reliable Transaction Router implements automatic software fault tolerance and failure recovery in multinode environments by adapting to many kinds of hardware (CPU), communications, application software, and site failures. Automatic failover and recovery of service operate by exploiting redundant or alternate hardware and network links. If alternate hardware or network links are not available, RTR automatically continues service when the CPU or network link becomes available.

Reliable Transaction Router applications are developed and deployed using a three-tier client/router/server software model. Client applications call the RTR client software tier, which passes messages to the router tier of the software. Transaction messages are routed reliably and transparently, based on message content, to the appropriate processes in the server tier. Server applications typically execute transactions against a database and return results back to clients.

A single physical node may run one, two, or three tiers of the RTR client/router/server software model. Each of the three software tiers may consist of one or more nodes. The software model and its content-based routing present a virtual rather than physical network to the application developer. This model enables application software to be independent of physical hardware (CPU) location, network naming conventions, and communications protocol. This facilitates single-node development, and transparent scalability of applications in complex network configurations.

Reliable Transaction Router software fault tolerant features such as router failover and shadow-server processing provide continuous computing services with completion of in-progress transactions despite single or multiple points of failure in the distributed client/server environment. Callout servers implement user authentication control, and concurrent servers provide dynamic message load balancing for high performance. High performance transactional messaging is implemented as a full-duplex conversation with remote server procedures using real-time flow control techniques. Use of

[1] The C++ API is not available for the OpenVMS VAX operating system.

these features generally requires no special user application programming logic.

The RTR system management interface is available as a command line interface and a web-based interface. The web-based interface provides a point and click style of managing RTR from a browser.

The browser interface provides monitoring and management of the RTR configuration with the RTR Manager. Both interfaces allow the creation, deletion, and modification of application networks (facilities) within a network, and permit control of distributed RTR processes from a single system in the distributed environment. The RTR system management interfaces are used to bind the physical hardware (CPU and communications) to a virtual network namespace and are transparent to the applications software. A monitoring utility can be invoked to report application performance information on a local or remote node.

Reliable Transaction Router is independent of forms and window management systems and databases. Multiple databases and other resource managers (for example, flat-file systems) can be updated within the same distributed transaction.

Reliable Transaction Router is intended for distributed applications that require continuous computing services and transaction integrity (for example, trading systems, banking systems, electronic commerce, payment systems, transportation systems, and telecommunications systems). Reliable Transaction Router can also be used for applications that require reliable messaging and fault tolerant application control over LANs or WANs. Reliable Transaction Router provides the enabling technology for applications requiring fully distributed client/server models.

Reliable Transaction Router on OpenVMS provides an interface for controlling transaction commitment directly with a DECdtm compliant resource manager.

Backend Features

- Provides transparent, content-based transaction routing for client/server applications.
- Provides publish/subscribe broadcast (nontransactional) messaging for delivery to multiple subscription domains within a virtual network.
- Allows user-defined partitioned data models (content-based routing) for improved performance of user applications.
- Acts as a layer between client and server applications, thus decoupling the end-to-end relationship normally required by user application control. This provides the application developer with a single system view of the programming environment.
- Ensures atomicity of transactions (all or nothing) by using a two-phase commit protocol for transactional message delivery among one or more server applications.
- Offers at-most-once semantics for valid transactions. This includes specially flagged transaction replay to a surviving server application, or a later instantiation of that server on the same or a different machine on the virtual network.
- DECdtm support is provided for use with resource managers that support DECdtm.
- Supports multiple (concurrent) servers.
- Supports user authentication control (callout servers) with consistent reply in shadow environments.
- Provides disaster protection against site failure by mirroring transactions in shadow-server environments. Automatic resynchronization of shadow pairs after recovery is provided transparently to the application.
- Maintains performance scaling over a wide range of configurations allowing easy horizontal expansion of both hardware systems and application software.
- Enables automatic failover/failback of server applications on multiple backend systems while remaining transparent to client applications executing on remote systems. RTR can maintain application operation in many instances of single or multiple failures in a widely distributed software/hardware configuration.
- Includes system management interfaces for online control of virtual networks from any workstation or terminal with the appropriate privileges. Monitoring of statistics, software and hardware states, and clients and servers is provided from local and remote nodes.
- Uses HP TCP/IP as the underlying network transport. HP DECnet and HP DECnet-Plus are also supported.
- Enables the operator to manage partitions, providing the ability to:
  - — Create or delete a partition with a user-specified name.
  - — Define a key range definition.
  - — Select a preferred primary node.
  - — Select the failover precedence option to choose between local and cross-site shadow failover.
  - — Suspend and resume operations to synchronize database backups with transaction flows.
  - — Override RTR's automatic recovery decisions to allow manual special recovery procedures.
  - — Specify retry limits for problem transactions.

- Enables the operator to selectively inspect, modify the state of, or remove transactions from the journal or the running RTR system.
- Supports anonymous clients, that is, allows clients to be configured with wildcarded node names.
- Supports compression and decompression of broadcast event and transaction reply data to improve network throughput.
- Supports failover between multiple IP addresses for any host machine with multiple network adapters.

Frontend Features

- Provides the ability for the client to start transaction branches, where the global transaction may be controlled by RTR or another external transaction manager.
- Provides the necessary environment to run Reliable Transaction Router client applications under OpenVMS as part of a Reliable Transaction Router application network.
- Provides client functionality in a production environment, as well as a single-node application development and testing environment for RTR applications.
- Uses TCP/IP as the underlying network transport. DECnet and HP DECnet-Plus are also supported.
- Supports transactional and broadcast (nontransactional) messages.
- Supports router load balancing in a facility.
- Supports automatic failover to another router in the event of a communication link failure.
- Supports Reliable Transaction Router system management operations.

HARDWARE REQUIREMENTS

Any hardware that supports the OpenVMS operating system. Refer to the configuration charts listed in the OpenVMS Operating System Software Product Description (SPD 25.01.xx) Hardware Support Tables for further information.

SOFTWARE REQUIREMENTS

To qualify for a software support contract, you must have one of the following versions of the OpenVMS operating system:

- OpenVMS Alpha Version 7.2-2, 7.3 or 7.3-1
- OpenVMS VAX Version 7.2, 7.3

You must also have one of the following networking products appropriate for the version of OpenVMS:

- TCP/IP Services for OpenVMS (SPD 46.46.xx)
- DECnet for OpenVMS (Phase IV, SPD 48.48.xx)
- HP DECnet-Plus (Phase V, SPD 50.45.xx for Alpha, SPD 25.03.xx for VAX).

The following table lists versions of the networking products supported for each version of OpenVMS:

OpenVMS	TCP/IP	DECnet IV	DECnet V
Alpha 7.2-2	5.3	7.2	7.2
Alpha 7.3	5.3	7.3	7.3
Alpha 7.3-1	5.3	7.3	7.3-1
VAX 7.2	5.3	7.2	7.2
VAX 7.3	5.3	7.3	7.3

CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed VMScluster* configuration without restrictions. The HARDWARE REQUIREMENTS section of this product's Software Product Description details any special hardware required by this product.

VMScluster configurations are fully described in the VMScluster Software Product Description (SPD 29.78.xx) and include CI, Ethernet, and Mixed Interconnect configurations.

* Denotes variant field.

OPTIONAL SOFTWARE

- Remote execution software to support system management from remote nodes.
- Windows-based browser for system management: Internet Explorer Version 5.01, 5.5, 6.0.

Reliable Transaction Router applications can be written using Compaq C and C++ compilers.

OpenVMS ALPHA

– Compaq C Version 6.2-006 for OpenVMS. For more information, see the C Software Product Description, SPD 25.38.29.

– Compaq C++ Version 6.2-035 for OpenVMS. For more information, see the C++ Software Product Description, SPD 70.57.03.

OpenVMS VAX

– Compaq C Version 6.2-003 for OpenVMS. For more information, see the C Software Product Description, SPD 25.38.29.

GROWTH CONSIDERATIONS

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

DISTRIBUTION MEDIA

The software and documentation for Reliable Transaction Router are available on the HP CD-ROM Software Library for OpenVMS.

The software and documentation for Alpha systems are also available on a separate CD-ROM supplied as part of the media and documentation kit QA-2AQAA-H8. A hardcopy documentation set can be ordered separately as QA-2AQAA-GZ.

The software and documentation for VAX systems are also available on a separate CD-ROM as part of the media and documentation kit QA-XNKAA-H8. A hardcopy documentation set can be ordered separately as QA-XNKAA-GZ.

ORDERING INFORMATION

OpenVMS Alpha Software Product Services
Back End Software Product Services: QT-2AQA*-**
Front End Software Product Services: QT-2ARA*-**

For more information on software licensing, see the Software Licensing section. For additional information on available licenses, services, and media, refer to the appropriate price book.

SOFTWARE LICENSING

Reliable Transaction Router is licensed as part of the OpenVMS operating system (refer to the OpenVMS Software Product Description, SPD 25.01.xx). Reliable Transaction Router Software Product Services are sold separately.

SOFTWARE PRODUCT SERVICES

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

SOFTWARE WARRANTY

This software is provided by HP with a 90 day conformance warranty in accordance with the HP warranty terms applicable to the license purchase.

© 2003 Hewlett-Packard Development Company, L.P.

Microsoft, MS-DOS, Windows, and Windows NT are US registered trademarks of Microsoft Corporation. Intel is a US registered trademark of Intel Corporation. UNIX is a registered trademark of The Open Group.

Confidential computer software. Valid license from HP and/or its subsidiaries required for possession, use, or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's commercial license.

Neither HP nor any of its subsidiaries shall be liable for technical or editorial errors or omissions contained herein. The information in this document is provided "as is" without warranty of any kind and is subject to change without notice. The warranties for HP products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty.

* Denotes variant field.