



# Software Product Description

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**PRODUCT NAME:** HP Reliable Transaction Router Version 5.0 for OpenVMS

**51.04.15**

## 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 Systems and OpenVMS Industry Standard 64 (I64) Integrity servers.

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

Reliable Transaction Router provides application programming interfaces (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. 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 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, and RTR Explorer, components of the browser-based RTR Administrator.

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.

On OpenVMS, Reliable Transaction Router also 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 IPv4 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.
- Provides the necessary environment to run Reliable Transaction Router client applications under OpenVMS as part of a Reliable Transaction Router application network (facility).
- Provides client functionality in a production environment.
- Uses HP TCP/IP IPv4 as the underlying network transport. HP DECnet and HP DECnet-Plus are also supported.
- Supports transactional and broadcast (nontransactional) messages.
- Supports router load balancing in a facility.
- Supports automatic router failover 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 OpenVMS Operating System Software Product Description (SPD 82.35.xx) for further information.

- Disk space requirement: 53000 blocks to install, 36000 blocks after installation<sup>1</sup>
- Memory requirements: 5.8 MB<sup>2</sup>

<sup>1</sup> This count refers to the minimum disk space required on the system disk. The size is approximate; actual size may vary depending on the user's system environment, configuration, and software.

<sup>2</sup> Basic memory requirements for an unconfigured RTR Application Control Process (RTRACP). Additional memory may be required depending on the RTRACP operating system environment.

**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 7.3-2 or 8.2
- OpenVMS I64 Version 8.2 or 8.2-1

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

- HP TCP/IP Services for OpenVMS (SPD 46.46.xx)
- HP DECnet for OpenVMS (Phase IV, SPD 48.48.xx)
- HP DECnet-Plus (Phase V, SPD 50.45.xx for Alpha, SPD 54.45.xx for I64).

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

OpenVMS	TCP/IP	DECnet IV	DECnet V
Alpha 7.3-2	5.4	7.3-2	7.3-2
Alpha 8.2	5.5	8.2	8.2
I64 8.2	5.5	8.2	8.2
I64 8.2-1	5.5	8.2-1	8.2-1

**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.

## OPTIONAL SOFTWARE

- Remote execution software to support system management from remote nodes.
- Microsoft-supported Windows-based browser for system management running on a Windows® PC: Internet Explorer Version 5.01, 5.5, 6.0.

Reliable Transaction Router applications can be written using the RTR C or C++ APIs and compiled using HP C and C++ compilers.

- For more information, see the C Software Product Description, SPD 25.38.xx.
- For more information, see the C++ Software Product Description, SPD 70.57.xx.

## 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 Product Library for OpenVMS.

## ORDERING INFORMATION

### *Ordering RTR for OpenVMS Alpha*

See the Software Licensing section.

### *Ordering RTR for OpenVMS I64*

Reliable Transaction Router for OpenVMS I64 software product licenses are sold on a per-processor license (PPL) basis (see the Software Licensing section).

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.

### *Ordering Hardcopy Documentation*

A hardcopy documentation set can be ordered separately as QA-4BTAA-GZ or BA416MN.

## SOFTWARE LICENSING

### *Ordering RTR for OpenVMS Alpha*

HP Reliable Transaction Router for OpenVMS Alpha is licensed as part of the OpenVMS operating system (refer to the OpenVMS Software Product Description 82.35.xx). Reliable Transaction Router Software Product Services are sold separately.

### *Ordering RTR for OpenVMS I64*

HP Reliable Transaction Router for OpenVMS I64 is licensed per processor (PPL) with one license required for each active physical processor in the system or hard partition. If additional processors are later added to the system or hard partition, each requires an additional per-processor license (PPL).

### *License Types*

Reliable Transaction Router for OpenVMS I64 has two license types. The Backend license provides full client/router/server functionality. It is required for nodes configured as routers or servers, and can also be used for nodes configured as clients.

The Frontend license provides client application functionality only, in a production environment, plus a single-node development and testing environment for RTR applications.

Software Licenses for RTR on OpenVMS I64:  
Frontend Per-Processor License: BA384AC  
Backend Per-Processor License: BA408AC  
Frontend Media: BA384AA  
Backend Media: BA416AA

The RTR for OpenVMS I64 Backend license can also be ordered as part of the Mission Critical Operating Environment (MCOE) package. For information on the Mission Critical Operating Environments (MCOE), refer to the Software Product Description on HP Operating Environments for OpenVMS Industry Standard 64 for Integrity Servers, SPD 82.34.00.

### **SOFTWARE PRODUCT SERVICES**

A variety of service options are available from HP. For more information, contact your local HP account representative or distributor. Information is also available on [www.hp.com/hps/software](http://www.hp.com/hps/software).

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