COMPAQ

Software Product Description

PRODUCT NAME: Compaq TeMIP CORBA Toolkit V4.0 for Tru64 UNIX SPD 80.32.00

TOOLKIT DESCRIPTION

COMPAQ TeMIP for Tru64 UNIX is a family of software products for the management of telecommunications and corporate networks, including fixed wire and mobile/cellular, voice and data, multi-vendor, multi-technology networks. TeMIP V4.0 provides comprehensive off-the-shelf fault and trouble management functions such as Alarm Handling and Event Logging for telecommunications network management.

TeMIP supports the International Standards Organization (ISO) management standards ISO 10164-x and ISO 10165-x, the OMNIpoint 1 standards as defined by NMF and T1M1. TeMIP and its features are applicable in the context of the International Telephone Union-Telecommunication Standards (ITU-T) X.73x and Telecommunication Management Network (TMN) M.3010 and M.3100 Recommendations. It gives network operators a global view of their networks, and enables them to activate management functions and operations from single or multiple workstations.

TeMIP is built on top of the TeMIP Framework and fully benefits from the object-oriented and truly distributed software architecture.

The COMPAQ TeMIP CORBA Toolkit V4.0 is part of this program. It provides the TeMIP platform with the mediation function for access to *Common Object Request Broker Architecture* (CORBA) based management systems.

CORBA is an emerging protocol that is becoming in great demand for use in the distribution of applications and with classical manager-agent relationships, especially at the service management level. Also, CORBA is being used as the interface to a growing number of Management Systems (MSs), for example Network Elements, Element MSs, Network MSs, and Service MSs. The Compaq TeMIP CORBA Toolkit meets this emerging requirement.

The Toolkit provides the TeMIP platform with access to the CORBA middleware in accordance with CORBA 2.1 standard. In order to guarantee the interoperability with any CORBA Server, the Internet Inter-ORB Protocol (IIOP) inter-ORB communication is used.

The toolkit relies on the ***ORBIX 3.0.1*** Object Request Broker (ORB) from IONA, which is compliant to CORBA 2.1 standard. The ORBIX Development component is shipped with the TeMIP CORBA Toolkit V4.0 product and packaged as a kit subset. Note that the ORBIX Run-time is embedded in the TeMIP Framework and is installed transparently.

The Compaq TeMIP CORBA Toolkit, is a toolkit as opposed to a self-contained executable program. It provides the basic blocks to build and customize TeMIP Access Modules (AMs). The AMs then interact with CORBA objects via the ORB.

The generated CORBA AMs benefit from the Event Filtering and Correlation capabilities of TeMIP. Refer to the TeMIP Fault and Trouble Management Software Product description (SPD 45.24.10 and the TeMIP Framework SPD (54.17.08) for more information about Distribution and Event Filtering and Correlation related features.

TOOLKIT COMPONENTS

The Toolkit comprises the following components:

- The TeMIP CORBA AM Builder, which is used to generate MSL specifications and CORBA AM C++ skeletons from IDL specifications.
- The Support Library, which provides a set of C++ functions for data types and names mapping.

- The Event Collector, which provides basic support for the collection of events from the CORBA world as well as for events translation.

TeMIP CORBA AM Builder

It consists of:

- The *TeMIP IDL => MSL Translator* :

- Verifies the syntax of Interface Definition Language (IDL) specifications and is used to define the CORBA object interface (constants, operations to be performed on the objects, operations parameters, exceptions, attributes,etc). An IDL specification is shared between the CORBA Client (role assumed by the TeMIP CORBA AM) and the CORBA Server .

- Generates the TeMIP MSL management model specifications.

- Supports delta-IDL templates that aim to specify the Management Information tree and to bypass the default rules used by the Translator to generate the MSL.

- *The TeMIP CORBA AM Code Generator:*

It generates C++ code based on Visual TeMIP as well as relevant makefiles required to build the final TeMIP CORBA AM executable program. The generated C++ code ensures the following run-time translations:

- TeMIP directives into CORBA operation invocations,

- CORBA operation terminations into TeMIP directive responses,

- CORBA exceptions into TeMIP specialized exceptions,

- TeMIP data type from/to CORBA data types (for directives/exceptions arguments and attributes).

The Support Library

The Support Library provides:

- A part of the self-management interface that is used to manage name resolution tables,

- A set of C++ classes and functions to:

  - Convert IDL data types from/to MSL data types,

  - Convert CORBA Standard Exceptions to TeMIP Exceptions,

  - Support the translation of CORBA Names from/to TeMIP Names.

The Event Collector

The Event Collector is a set of support facilities that is used to collect events from the CORBA world. These facilities are used at CORBA AM build time. They are extended, customized, and integrated in the build process of a CORBA AM. The support facilities must be adapted according to the nature of event collection interfaces and semantics present in the CORBA world.

This basic support defines base interfaces for the administration of event consumers. These interfaces have to be included in the build process of a CORBA AM and customized as for any other object interface. The event collector includes an example of the utilization and customization of the basic event collection support.

FEATURES

TeMIP CORBA AM Builder

The TEMIP CORBA AM Builder allows easy generation and development of TeMIP CORBA AMs:

- A command line allows generation of the MSL and the CORBA AM executable from multiple IDL and Delta-IDL files. Moreover, specific AM information can be given at generation time such as the AM name, AM code, AM Version.

- The User can make use of the Delta-IDL templates to drive the MSL and C++ generation. Mainly the Delta-IDL aims at:

  - Defining a Management Information Tree (MIT). The MIT Delta-IDL template is required to generate a CORBA AM. It allows the definition of a containment tree from the IDL interfaces.

  - Tailoring the IDL-MSL Translator to provide specific MSL output (for example, to force specific MSL entity codes, names).

  - Augmenting the generated MSL model with private attribute and event partitions.

  - Preventing attributes and directives specified in the IDL from being generating in the MSL.

  - Adding extra attributes and directives in the generated MSL.

  - Overriding the default generated MSL data types with user-defined ones.

  - Driving the mapping of the "ANY" IDL datatype into a user-defined one. By default, the translator builds a MSL ANY datatype that includes all the IDL types present in the IDL specifications.

- The Code Generator generates C++ code based on Visual TeMIP V4.0 that is ready to compile and run. This code allows the run-time translation of attributes, operations, exceptions and data types. Some customizable entry points are available to the User for specific processing. By default, these routines do nothing, but the User can override them for the following purposes:

- Specific pre-processing and post-processing in CORBA attributes retrieval routines,
- Specific pre-processing and post-processing in CORBA attribute set routines,
- Specific pre-processing and post-processing in CORBA action mapping routines,
- Specific processing at module startup and termination phases.

Moreover, model-dependent customizable entry points are generated according to the Delta-IDL specified:

- For user-defined data type mappings,
- For extra MSL attributes and MSL directives.

For a more detailed view of the TeMIP CORBA AM Builder capabilities, refer to the *COMPAQ TeMIP CORBA Toolkit Developer's Guide*.

Name resolution

Name Resolution is the part of the CORBA AM processing that maps TeMIP Entity Specifications to CORBA object/interface references.

User customization is typically required for Name Resolution. Default Name Resolution is provided, based on the CORBA CosNaming Service. A specific convention has been defined for the mapping of a TeMIP Entity Specification to a CosNaming::Name. This convention may be acceptable as it is, depending on the CORBA AM being built. If the default CosNaming resolution is not acceptable, User customization is typically required.

Through appropriate customization, the user can override the default behavior and plug the desired name resolution function for each TeMIP Entity class.

The CORBA AM self-management offers a user interface to access the name resolution support structures. The first one is dedicated to the Entity Specification to Object Reference (ES, OR) pair management. The second one is dedicated to the management of object referencing name resolution services.

Event Collector

The Event Collector is a set of support facilities used at CORBA AM build time to collect events from the CORBA world. They are made of:

- An Event Collector Library that provides base classes to be extended, customized and integrated in the build process of a CORBA AM. They must be adapted according to the nature of event collection interfaces and semantics present in the CORBA world.
- A customization example to be used as a starting point to build other event collectors. This is not a ready to run executable.

Event Collection typically involves processing of upward and downward flows. The downward flow is usual directive/attribute processing for the management of the event collection itself. This typically includes the interface to manage event consumers, e.g. create an event consumer, connect to supplier, disconnect from the supplier, etc. That is the reason why this interface is plugged under the self-management of the CORBA AM.

Naturally, the core part of an event collector is the upward flow, i.e. the event communication and event format translation. The upward flow consists of implementing customized C++ code based on C++ event collection base classes. Since event communication in CORBA follows either a push or pull model, a general architecture for queuing and multi-threading has been designed and implemented in the event collector base classes. The consumer objects defined in the event collection classes are managed in a CORBA server embedded in the CORBA AM. This CORBA server must be integrated in the CORBA AM using customization.

DOCUMENTATION

For additional information, refer to the appropriate documentation:

- *Compaq TeMIP CORBA Toolkit Development Guide*
- *Compaq TeMIP CORBA Toolkit Reference Guide*
- Compaq TeMIP CORBA AM User's Guide

HARDWARE REQUIREMENTS

DIGITAL Personal Workstation au series
DIGITAL Ultimate Workstation
AlphaStation 600
Compaq Professional Workstation XP1000

AlphaServer 800, 1000A, 1200
Compaq AlphaServer DS10, DS20

AlphaServer 2000, 2100, 4000, 4100
Compaq AlphaServer ES40
AlphaServer 8200, 8400

Compaq AlphaServer GS60, GS140

Disk Space Requirements:

Disk space required for installation:

Subset copy:	17,000 Kbytes
Installation	/usr 40,000 Kbytes

Disk Space Required for Use (Permanent):

No specific requirement

Memory Requirements:

For development systems:
The minimum memory supported, due to a TeMIP Framework prerequisite, is 256 MB.

For run-time systems:
The minimum memory supported, due to a TeMIP Framework prerequisite, is 128 MB.

However, the use of this software in conjunction with increased memory improves performance.

SOFTWARE REQUIREMENTS

For run-time systems:

- Compaq Tru64 UNIX V4.0F
- TeMIP Framework V4.0 (that embeds ORBIX 3.0.1 Run-Time)

For development systems, the following software must be installed on top of the above:

- Visual TeMIP Developer's Toolkit V4.0
- DEC C++ V6.1 compiler
- ORBIX 3.0.1 Development Kit (that is a subset of the COMPAQ TeMIP CORBA Toolkit)

OPTIONAL SOFTWARE

None

GROWTH CONSIDERATIONS

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

YEAR 2000 READY

This product is Year 2000 Ready.

"Year 2000 Ready" products are defined by Compaq as products capable of accurately processing, providing, and/or receiving date data from, into and between the twentieth and the twenty-first centuries, and the years 1999 and 2000, including leap year calculations, when used in accordance with the associated Compaq product documentation and provided that all hardware, firmware and software used in combination with such Compaq products properly exchange accurate date data with the Compaq products.

For additional information visit Compaq's Year 2000 Product Readiness web site located at http://www.compaq.com/year2000.

To ensure that this product is Year 2000 Ready, code assessment and system tests to verify the transition between December 31st 1999 and January 1st 2000 were utilized.

To ensure that this product interoperates properly with other hardware and software, the system tests involving Compaq's TeMIP V3.2 are applicable, as this product was verified as being Year 2000 Ready.

ORDERING INFORMATION

COMPAQ TeMIP CORBA Toolkit:

Software License: QM-6GRAA-AA

Software Media: QA-6HPAA-H8

Software Documentation: QA-6GRAA-GZ

Software Product Services:
QT-6GRA*-T* or QR-SP6GR-**

COMPAQ TeMIP CORBA AM Run-Time:

Software License: QM-6GSAA-AA

Software Media: QA-6HPAA-H8

Software Documentation: QA-6GRAA-GZ

Software Product Services:
QT-6GSA*-T* or QR-SP6GS-**

SOFTWARE LICENSING

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TeMIP CORBA toolkit development licence includes an IONA Orbix development license. This license is restricted to the use of Orbix **in conjunction with TeMIP**.

License units for TeMIP CORBA Toolkit *Run-Time* are allocated on a Concurrent Use basis. "Concurrent Use" is defined as the number of instances of Access Modules running at the same time on a single machine.

This product uses the FLEXlm Software License Key system.

A FLEXlm key must be obtained using information provided with the license deliverable. An Authorization ID is provided for each license, which allows the user to generate a license key from the Compaq License Key Fulfillment Website according to instructions provided with the license agreement.

The License Agreement for the current version extends the right to utilize prior versions.

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