COMPAQ

Software Product Description

PRODUCT NAME: Compaq TeMIP OSI Management Toolkit V4.0 for Tru64 UNIX SPD 51.28.09

DESCRIPTION

TeMIP for Compaq Tru64 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, Event Logging and Trouble Ticketing for telecommunications network management.

TeMIP supports the International Standards Organisation (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 TeMIP OSI Management Toolkit V4.0 is part of this program and is the next release of the TeMIP OSI Management Toolkit V3.3N which runs on Tru64 UNIX V4.0D.

The TeMIP OSI Management Toolkit V4.0 is designed to enhance the scope of the toolkit by the following features:

- Support up to 320 active agent_records in the OSI Access Module and 1024 associations in the DECcmi stack,
- Special ASN.1 Choice translation support, mainly for attributes such as the “DMI”:ProbableCause,
- Support of ASN.1 GeneralString and ASN.1 TeletexString data types,
- Do not restrict anymore LDN offset usage to TeMIP global entities. The LDN offset can now be set to TeMIP child entities ,
- The QualityOfService alarms generated by the OSI AM can be targeted to any TeMIP object. This is achieved through Agent_Record customization,
- Enhance the error messages logged in the OSI AM and OSI PM error log files to ease the troubleshooting.

The TeMIP OSI Management Toolkit provides the TeMIP platform with access to the Open Systems Interconnection environment in accordance with TMN recommendations. As such, the TeMIP OSI Management Toolkit extends TeMIP functions to all network elements and operating systems that support the OSI model as a means of information transfer. It allows a TeMIP management system to act in the role of either Manager or Agent in a TMN, by means of the International Standards Common Management Information Protocol (IS CMIP).

It also benefits from the Event Filtering and Correlation capabilities of TeMIP. Refer to the TeMIP Fault and Trouble Management Software Product description (SPD 45.24.xx) and the TeMIP Framework SPD (54.17.xx) for more information about Distribution and Event Filtering and Correlation related features.

The TeMIP OSI Management Toolkit - GDMO Model Maker allows a user to create and generate, from an object model specified using the ISO/IEC and ITU-T standards, the TeMIP internal repository used during runtime operations. In this way, the translation of the

information exchanged between the TeMIP environment and the OSI world is fully data driven.

The TeMIP OSI Management Toolkit makes use of the Common Management Information Protocol (CMIP) as recommended in TMN, through the X/Open Management Protocol (XMP) interface. The TeMIP OSI Management Toolkit provides an easy way to integrate, within the TeMIP platform, OSI-CMIP based managed elements.

GDMO Model Maker

The ISO/IEC and ITU-T standard bodies have defined the Guidelines for the Definition of Managed Objects (GDMO) standard to help users in the definition of their management information model. The TeMIP OSI Management Toolkit-GDMO Model Maker (GDMO Browser and GDMO Translator) provides users with an easy way to create, validate and generate their management information models.

GDMO Browser

The GDMO Browser greatly simplifies the task of creating the primary data files for a management model that represents a potentially lengthy and complex editing phase. The GDMO Browser allows the user to access the many possible sources of reference and library data through a graphical interface, and to quickly include the appropriate data in the management model. The GDMO Browser is used both as a database management tool, and as a front-end to the GDMO Translator; for example, the GDMO Browser can be used to:

- Create and maintain sets of managed object definitions in ASCII files, based on GDMO templates and ASN.1 modules
- Create, define and test the complete Management Information Tree
- Perform database management on a library of managed object definitions
- View GDMO objects and ASN.1 datatype definitions in the library
- Shift between documents (library files) and definitions by means of a hypertext navigation facility
- Edit GDMO object and ASN.1 type definitions using the standard windows editing functions
- Verify new or edited object definitions by directly calling the GDMO Translator to perform a syntax check
- Directly customize the Management Information Model to build the OSI Access Module and the OSI Presentation Module.

The *TeMIP OSI Management Toolkit GDMO Browser User's Guide* describes the overall possibilities of the product.

GDMO Translator

Within the TeMIP Framework, GDMO and ASN.1 notation is mapped into Management Specification Language (MSL) notation to perform entity management. This mapping is done using the GDMO Translator tool. The GDMO Translator carries out two distinct functions:

- Assistance in the modeling by validating the syntax and semantics of GDMO and ASN.1 specifications
- Translation of the validated specifications into the equivalent TeMIP Framework MSL specifications and OSI Dictionary File, used by the OSI Access Module and OSI Agent Presentation Module for translation purposes.

The GDMO Translator input information is in the form of ASCII formatted files that contain one or any combination of the following items:

- GDMO templates, written according to the notation defined in ISO/IEC 10165-4 or ITU X.722
- ASN.1 modules, containing the ASN.1 type and value definitions referenced in the GDMO templates, and written according to the notation defined in ISO/IEC 8824 or ITU X208
- Extensions to the GDMO templates and ASN.1 definitions used for:
  - Generating MSL constructs in those cases where no equivalent GDMO or ASN.1 constructs exist
  - Tailoring the GDMO Translator to provide specific MSL output (for example, to force specific MSL entity codes)
  - Defining a Management Information Tree.
- In addition to the GDMO/ASN.1 library delivered with the kit, the electronic versions of standard documents are now available on the Network Management Forum FTP server, under /objects/Approved and /objects/Draft directories.

The GDMO Translator outputs are as follows:

- MSL Files used by the TeMIP Framework MSL Translator tool as part of the TeMIP Framework Dictionary building process
- MSL Translator Makefile to simplify the use of the MSL Translator tool
- OSI Dictionary File used by the OSI Access Module and OSI Agent Presentation Module to build their own internal dictionary
- Vector File used in the process of building a run-time OSI Access Module.

For a more detailed view of the GDMO Translator capabilities, refer to the *TeMIP OSI Management Toolkit GDMO Translator User's Guide*.

OSI Access Module

The TeMIP OSI Access Module component provides the TeMIP platform with access to the OSI environment. It allows a TeMIP-based management system to act in the role of **Manager** in a TMN, by means of the IS CMIP. The OSI AM translates TeMIP directive requests into CMIP operation requests and CMIP operation results and errors into TeMIP directive responses and exceptions.

The OSI AM is also responsible for translating any CMIP Event Reports received, which can then be used by any TeMIP Fault and Trouble Management function.

This adaptation is fully data driven and based on the object model defined using the GDMO Model Maker. This means that the user does not have to write any code if the object model is changed.

The TeMIP OSI Access Module functions are the following:

- Protocol Translations
- Address Resolution
- Multi-model management

The TeMIP OSI Access Module performs the translation between the GDMO/CMIP and MSL/TeMIP Framework representations based on the OSI Dictionary file produced by the GDMO Model Maker. In terms of the management model, the following translations are done:

GDMO/ASN.1	MSL
Object Class	Entity Class
Attribute	Attribute
Action	Directive
Notification	Event
ASN.1 data type	MSL data type

Concerning the protocol, the following mapping is performed:

TeMIP Framework	CMIP
Create	Create
Delete	Delete
Set, Add, Remove	Set
Show	Get
All other directives	Action
Response	Result
Exception	Error
Event Report	Event Report
ILV encoding	BER encoding

Address resolution refers to the way in which the TeMIP OSI Access Module determines the address of an entity in the network and establishes communication with it. An association with the remote Agent is established when a directive has to be sent to the entity concerned or an event is received from it. The TeMIP OSI Access Module supports up to 320 Agents.

Because the TeMIP platform allows you to integrate several network elements into the same view, the TeMIP OSI Access Module offers a multiple model management capability. An object model, named by its OSI Dictionary file, can be attached to one or more Agents. This feature permits you to carry out version management of network elements.

Complex GDMO models based on derivation and inheritance mechanisms may lead to ambiguities when translating incoming OSI Distinguished Names (DN) into TeMIP Entity Specifications (ES). To solve the run-time ambiguities, the OSI AM provides a way to turn on the access to the TeMIP Synonym Oracle database that contains relationships between OSI DN and TeMIP ES. The database can be populated in two ways:

- The database can be pre-configured with {OSI DN, TeMIP ES} pairs created using the TeMIP Name Service FM services. For details, please consult the TeMIP Framework SPD.
- The OSI AM is able to silently populate the database. As soon as an ambiguous OSI Distinguished Name is received, the OSI AM interrogates the remote OSI Agent to get information on the intermediate managed objects. The information retrieved is stored in the database and used to solve the current OSI Distinguished Name ambiguity. This automated database population mode requires that the OSI Agent supports the CMIP Scope and CMIP Filter parameters in the CMIP Get Request.

The TeMIP OSI Access Module offers a set of tools for its own management and activities. With such tools, the system administrator is able to:

- Trace information about activities within the TeMIP OSI Access Module and write that information to a Trace Log File
- Log errors, generated from different levels in an Error Log File
- Self-manage the TeMIP OSI Access Module by issuing directives that operate on it, and by collecting Event Reports generated by the TeMIP OSI Access Module itself. An example of directive is the creation of Agent_Record entities including the related Agent information.

The *TeMIP OSI Management Toolkit, OSI Access Module, User's Guide* provides additional information.

OSI Agent Presentation Module

The TeMIP OSI Agent Presentation Module (PM) component provides the OSI environment with access to the TeMIP platform. It allows a TeMIP management

system to act in the role of **Agent** in a TMN. The OSI PM translates CMIP operation requests into TeMIP directive requests and TeMIP directive responses and exceptions into CMIP operation results and errors. The Agent is also responsible for collecting and filtering TeMIP Event Reports, translating them into CMIP Event Reports, and forwarding them to the correct destination management system.

The OSI PM allows the TeMIP platform to be used to build TeMIP-based Mediation Devices and Q-Adaptors, which act as gateways between CMIP and proprietary Network Element management protocols. In this release, access by a remote TMN manager to the managed objects of TeMIP Fault and Trouble Management functions via the OSI PM is not supported.

The OSI PM adaptation is fully data driven and based on the object model defined using the GDMO Model Maker. This means that the user does not have to write any code if the object model is changed.

The TeMIP OSI Agent Presentation Module functions are the following:

- Protocol Translations
- Event Collection and Forwarding

The TeMIP OSI Agent Presentation Module performs the translation between MSL/TeMIP and GDMO/CMIP, based on the OSI Dictionary file produced by the GDMO Model Maker.

In terms of the management model, the following translations are done:

MSL	GDMO/ASN.1
Entity Class	Object Class
Attribute	Attribute
Directive	Action
Event	Notification
MSL data type	ASN.1 data type

Concerning the protocol, the following mapping is performed:

CMIP	TeMIP Framework
Create	Create
Delete	Delete
Set	Set, Add, Remove
Get	Show
Action	All other directives
Result	Response
Error	Exception
Event Report	Event Report
BER encoding	ILV encoding

The OSI PM supports the following event collection and forwarding functions:

- Management operations on its Event Forwarding Discriminator entities
- Collection of TeMIP Framework Event Reports
- Filtering of TeMIP Framework Event Reports using a Discriminator Construct (a CMIS filter)
- Translation of TeMIP Framework Event Reports to CMIP Event Reports
- Forwarding of CMIP Event Reports to the correct management system destination in Confirmed or Non Confirmed mode
- A retry mechanism to forward Event Reports unsuccessfully sent

Event collection is done using the TeMIP Framework Notification FM.

When translating incoming OSI Distinguished Names into TeMIP Entity Specifications, the OSI PM is able to solve the potential run-time ambiguities accessing the TeMIP Synonym Oracle database. This is achieved if the ambiguity resolution mode is turned on and the database is pre-configured with {OSI DN, TeMIP ES} pairs created using the TeMIP Name Service FM services. For details, please consult the TeMIP Framework SPD.

The TeMIP OSI Agent Presentation Module offers a set of tools for its own management and activities. With such tools, the system administrator is able to:

- Trace information about activities within the TeMIP OSI Agent Presentation Module and write that information to a Trace Log File
- Log errors, generated from different levels in an Error Log File
- Self-manage the TeMIP OSI Agent Presentation Module by issuing directives that operate on it. An example is the creation of the Manager_Record entities including the related Manager information.

The *TeMIP OSI Management Toolkit, OSI Agent Presentation Module User's Guide* provides additional information.

OSI Protocol Stack

The OSI Protocol Stack, which is part of the TeMIP OSI Management Toolkit, implements Session (ISO/IEC 8327 or ITU-TS X.225), Presentation (ISO/IEC 8323 or ITU-TS X.226) and Application layers. Within the Application layer, Application Service Elements related to network management are present (ACSE: Association Control Service Element (ISO/IEC 8650 or ITU-TS X.227), ROSE: Remote Operation Service Element (ISO/IEC 9072-2 or ITU-TS X.229), CMISE: Common Management Information Service element (ISO/IEC 9596-1)).

The protocol stack enables CMIP information exchanges:

- over an OSI compliant transport layer provided by DECnet/OSI on Compaq Tru64
- over a transport layer provided by TCP/IP. The OSI protocol stack includes a RFC1006 adaptation function for this purpose

The OSI protocol stack is a dual stack that can be dynamically configured in OSI and/or RFC1006 mode. Note that the stack supports up to 1024 simultaneous associations.

The TeMIP OSI Access Module and TeMIP OSI Agent Presentation Module access the protocol stack through XMP API (the X/Open Management Protocol June 1993). The API permits to open up to 320 simultaneous XMP sessions.

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:	11,000 Kbytes
Installation	usr 19,000 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

- Compaq Tru64 UNIX V4.0F
- TeMIP Framework V4.0

OPTIONAL SOFTWARE

- DECnet-Plus V4.0b
- WAN support for Digital Unix System V3.0A

GROWTH CONSIDERATIONS

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

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.

DISTRIBUTION MEDIA

This product is available as part of the UNIX Consolidated Software distribution on CD-ROM. Please refer to the ordering information for each Software Media reference.

ORDERING INFORMATION

TeMIP OSI Management Toolkit:

Software License: QM-6HTAA-AA
(This replaces the licenses QL-2HEA9-AA and QM-2HEAA-AA associated with previous versions)

Software Media: QA-6HPAA-H8

Software Documentation: QA-6HTAA-GZ

Software Product Services:
QT-6HTA*-T* or QR-SP6HT-**

TeMIP OSI Access Module Run-Time:

Software License: QM-6HUAA-AA
(This replaces the licenses QL-2HHA9-AA and QM-2HHAA-AA associated with previous versions)

Software Product Services:
QT-6HUA*-T* or QR-SP6HU-**

TeMIP OSI Presentation Module Run-Time:

Software License: QM-6HVAA-AA
(This replaces the licenses QL-5XSA9-AA and QM-5XSAA-AA associated with previous versions)

Software Product Services:
QT-6HVA*-T* or QR-SP6HV-**

TeMIP OSI AM Protocol Stack/ROS API:

Software License: QM-4R8AA-AA
(This replaces the license QL-4R8A9-AA)

Software Product Services:
QT-4R8A*-T* or QR-SP4R8-**

The QA-*****-H8 part numbers no longer include the QA-*****-GZ documentation kits. Hard copy documentation can be ordered separately using the QA-*****- GZ number, if required.

Note: Other run-time software is available on other Compaq operating systems. Please contact Product Management for more information.

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SOFTWARE PRODUCT SERVICES

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SOFTWARE WARRANTY

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

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