Software Product Description

PRODUCT: Compaq TeMIP Fault Management V4.0A **SPD 45.24.11**

DESCRIPTION

TeMIP Fault Management for Compaq 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 Fault Management provides comprehensive off-the-shelf Fault management functions such as Alarm Handling and Event Logging for telecommunications network management.

TeMIP Fault Management supports the International Standards Organization (ISO) management standards ISO 10164-x and 10165-x. The TeMIP Fault Management features are applicable in the context of the International Telephone Union-Telecommunication Standards (ITU-T) X.73x and Telecommunication Management Network (TMN) M.3010, M3100 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 Fault Management is built on top of the TeMIP Framework, and fully benefits from the object-oriented and truly distributed software architecture as well as embedded security functions.

Full support of distributed management is available through Operation Context and Log Panel distribution. Also available are Event Filtering and Correlation features that block meaningless information (events or alarms) at source, and generate correlated events.

TeMIP Fault Management consists of a set of management modules that provide application "Function Module" (FM) and User Interface "Presentation Module" (PM) capabilities. TeMIP Fault Management provides an open development environment. TeMIP Fault Management's current features can be extended through the addition of future TeMIP Fault Management products, as well as third party or user-developed modules.

Alarm Handling Function and Presentation

TeMIP Fault Management for Tru64 UNIX includes a sophisticated and generic Alarm Handling function and presentation for the management of ISO-formatted alarm information. TeMIP Fault Management enables users to define a comprehensive alarm filtering, recording, and real-time monitoring environment. "Alarm" in ISO terminology is a specific type of event, whose purpose is to enable real-time monitoring and management.

The TeMIP Fault Management Presentation Module is integrated with the TeMIP Framework Iconic Map Presentation Module, and adds specific presentation capabilities as well as language localization to the Alarm Handling and Event Logging functions. The multiple screen support allows TeMIP Presentation Modules to be displayed on a different screen to that of the Iconic Map. For more information refer to the TeMIP Framework Software Product Description (SPD 54.17.xx). The TeMIP Alarm Handling Client for NT is described in SPD 70.64.xx.

Alarm Handling Function

TeMIP Fault Management supports ISO 10164-4 alarm reporting functions and is NMF Ensembles compliant, including alarm format (alarm type, severity, probable cause, status, and so on) and alarm management functions such as acknowledgement, clearance, and closure. Operations on alarms and alarm status changes are time stamped and identified by a User Identifier (User Id) for later analysis.

The domain definition function (generic TeMIP Framework function, Domain FM) allows the user to define the network or selected portions of it and to assign network elements to groups called domains. Domains can contain sub-domains or refer to other domains and can be hierarchical and overlapping.

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Individual network elements can be contained within multiple domains.

TeMIP Fault Management enables users to define single and multiple views of alarm activity for a domain, which can represent the entire network or selected portions of it. The scope of interest can be based on equipment type (transmission versus switching), geography (regional, national), organization (for example, personnel levels), or any other user-defined grouping. Such a view of the network is known as an Operation Context.

An Operation Context defines the behavior of the Alarm Handling function for a given view. An Operation Context allows automatic scheduling of alarm collection and alarm filtering. The automatic scheduling mechanism implements the ISO-recommended Weekly Scheduling Package and allows the specification of the scheduling to be done by hour and day of the week over a seven-day period. The TeMIP alarm filtering mechanism implements ISO recommended Discriminators and provides a fine degree of precision in the selection of alarms to be monitored (by passing or blocking filters on alarm attributes such as network element class, domains, alarm type, alarm severity and additional text). An Operation Context can be created by reference to an existing one, inheriting from it its main attributes or characteristics (for example, Discriminator Construct or Scheduling Package). The distributed Operation Context Control window allows users to manage Operation Contexts running on different directors.

Features including automatic alarm acknowledgement, automatic alarm clearance, and escalation mechanisms are provided, which are definable characteristics of the Operation Context. It is also possible to generate an ISO-formatted capacity alarm threshold when the Operation Context file is filling up. The filtered alarms are recorded as objects in the related Operation Context repository.

An Operation Context can now be customized to provide an Alarm Object Reduction capability.

TeMIP Fault Management Alarm Handling provides an archiving facility that allows Alarm Records to be exported from the Operation Context repository to an external relational database. TeMIP Fault Management supports the ORACLE® and SYBASE® databases. This feature allows offline processing of historical alarm information.

An Operation Context is controlled through two possible states: the Administrative State, which is set by the user (Locked/Unlocked), and the Operational State, depending on the availability of internal and external services for alarm collection. An Operation Context can be monitored and its attributes can be set without interrupting alarm collection and filtering.

Once alarm collection has been initiated for a particular Operation Context, the alarm collection process continues according to user-defined characteristics, even if all users are logged out. The Alarm Handling function enables users to maintain single or multiple alarm repositories on which automatic archive, automatic purge and purge on request functions are available for the SQL ORACLE and SYBASE databases.

TeMIP Fault Management's Alarm Handling function is implemented through co-operation between several Function Modules (FMs). The TeMIP Fault Management Alarm Handling FM performs the Alarm Handling function described here and uses the generic alarm/event collection and distributed notification services provided by the TeMIP Framework Alarms FM and Notification FM. For more information refer to the TeMIP Framework Software Product Description (SPD 54.17.xx).

It is useful to integrate the network management and maintenance functions of Telecommunications Operators by linking the occurrence of a network event to the creation of a trouble ticket. TeMIP Clarify Liaison provides this link. (SPD 70.86.xx)

Alarm Handling Presentation

TeMIP Fault Management's Alarm Handling presentation allows the user to define and manage the alarm environment and to manage, monitor and administer the alarm information.

Defining and managing the alarm environment concerns the definition and control of the alarm collection. This involves the creation of Operation Contexts, which are represented by icons in the Iconic Map. Users can select the Operation Context icon and initiate management directives for creating and defining an Operation Context and its associated characteristics, for the starting and stopping of alarm collection, and for modification of the way alarm collection and filtering is carried out.

TeMIP Fault Management provides the user with a sophisticated editor to define and modify the filters (Discriminators) and the scheduling of activity (Scheduling Package). Filters can be predefined and stored in a library to simplify and accelerate operations.

Managing the alarm information refers to the day-to-day Alarm Handling and general administration of Operation Contexts. TeMIP Fault Management enables the user to work with alarm information through two different windows, each of which can be started either manually or automatically from the Iconic Map presentation module or directly from the shell (UNIX prompt) as a stand-alone module. (Note that in the stand-alone mode no Iconic Map-related functions are available). Online Help is provided to the user through the presentation of predefined choices for most criteria.

The alarm information windows are:

- The TeMIP Fault Management real-time alarm handling window, which provides users with a list of alarms that are currently active. Alarm notification is also provided using the Iconic Map domain associated with an Operation Context. The Operation Context icon contained in the domain represents the network element that generated the alarm. A user-defined sound level allows operators to customize the intensity of the bell according to the alarm severity. New

alarms are automatically reported to the user in these windows. Each level of alarm severity is color-coded and that color is used both on the real-time alarm window and on the Iconic Map. Through the locate/find entity button a user can easily locate a faulty network element on the Map from an alarm presented in the alarm list. The Map is automatically modified to present the target element.

The TeMIP Fault Management real-time alarm handling window enables the user to display alarms for one or more Operation Contexts at any given time and provides statistical information on the alarms displayed. It also provides display selection criteria such as alarms originating from specified network elements or domains, alarms of severity above or equal to specified levels, and alarms from specific Operation Contexts.

The real-time alarm handling window allows the user to perform operations on one or more alarms, including acknowledgement and termination of alarms, alarm full information display and printout, and addition of a note to a specific alarm report. An operation such as print to file allows an Operator to save the result of a search to a file in the user directory. From this window, the user can also perform management actions on a network element corresponding with an alarm present in the alarm list. The user can have Alarm Object Statistics per Operation Context and per Managed Object.

- The Control window, which displays Operation Context status information in real-time, and allows the user to perform general Operation Context management and customization of the user environment (start/stop notification, default Operation Context, and so on).

  Several users can share the same Operation Context view at any given time; they are notified of new alarms, and alarms are updated in real-time if another user performs operations on them.

- The View Alarms window, which allows the user to perform sophisticated retrieval of alarm information within an Operation Context. This includes alarms previously treated and those that are still outstanding. The View Alarms window also allows the user to perform all management operations on alarms as defined in the previous outstanding alarms window section. Search operations can be extended and applied to other Operation Contexts when necessary.

  The View Alarms window provides the user with numerous combinations of search criteria including alarm type, managed entity, probable cause, severity, alarm state, problem status (whether the alarm is associated with a trouble ticket report or not), additional text attribute, notification identifier and time period. When alarms are associated with a trouble ticket report, the window allows the user to search alarms associated with one or more trouble ticket reports. Search criteria can be saved and automatically presented in a pull-down menu under a user-defined name.

Various other features, such as correlation based on Specific Problem, Alarm Clearance Timestamp, real-time display of Operator Note and Specific Problem are also available.

It is also possible to run multiple instances of the real-time alarm handling window (sub-windows), with all alarm management functions available. When these are minimized, sub-window icons show the number of alarms (total alarms or new alarms) and the highest severity level.

Other features are:

- Enhanced alarm filtering, such as the application of Boolean expressions (logical AND, OR, NOT) when defining filters, and drag-and-drop between alarm windows and the associated filter window.
- Alarm sorting (ascending or descending) in the alarm handling window by a simple click on a column header.
- Customizable additional alarm fields, enabling the display of user-defined alarm fields extracted from the Additional Text attribute.
- Searches for alarms that have an Operator Note.
- Display of alarm statistics in real-time on a per entity or per operation context basis.

Event Logging Function and Presentation

TeMIP Fault Management for Tru64 UNIX includes a generic Event Logging function and presentation for the collection, recording and analysis of ISO-formatted events. This information provides the user with the information base necessary to perform network fault analysis. "Event" in ISO terminology represents a network element condition, normal or abnormal, of interest to a network operator or network manager.

Event Logging Function

The TeMIP Fault Management Event Logging function implements the ISO 10164-5 report management functions and ISO 10164-6 log control functions for OSI-defined management systems. TeMIP Fault Management Event Logging is also OMNIPoint 1 compliant.

The TeMIP Fault Management Event Logging function enables the user to define single or multiple collection and recording of events for a domain, which represents the entire or selected portions of the network. As for Alarm Handling, the scope of interest of Event Logging is dependent upon management objectives, technology, geography, or organization, and is represented by an Event Log instance. Use is made of the OSI-defined OSI System Object to support Event Logging. The user creates an Event Log instance as a child of the OSI System Object class. Usually the OSI System Object represents the local management system. An Event Log can be created by reference to an

existing one, inheriting from it its main attributes or characteristics (for example, Discriminator Construct or Scheduling Package). Support of distribution is performed through the distributed Log Panel that allows the browsing of any selected OSI System's LOGs.

The Event Log also defines the behavior of the Event Logging function for single collection and recording of events. It includes automatic scheduling of event collection, event filtering definition, log file or log recording location, log file size, action to be taken when log is full (TeMIP Fault Management supports only HALT on log full) and generation of an ISO-formatted capacity alarm threshold when the log file is filling up.

The automatic scheduling mechanism implements the ISO recommended Weekly Scheduling Package and allows users to specify the scheduling to be done by hour and day of the week over a seven-day period. The TeMIP Fault Management event filtering mechanism implements ISO recommended Discriminators and provides a high degree of precision in the selection of events to be collected (by passing or blocking filters on event attributes such as network element class or event type).

An Event Log is controlled by two possible states: the Administrative State, which is set by the user (Locked/Unlocked) and the Operational State, depending on the availability of internal and external service for event collection.

Once the Event Logging has been initiated for a particular Event Log instance, the event collection process continues according to user-defined characteristics, even if all users are logged out.

The TeMIP Fault Management Event Logging function supports and stores the seven classes of ISO-defined log record; alarm, security alarm, object creation, object deletion, attribute value change, state change, and relationship change.

The TeMIP Fault Management Event Logging function is implemented through co-operation between several Function Modules. The TeMIP Fault Management Event Log FM performs the Event Logging function described herein and uses the generic alarm/event collection and notification services provided by the TeMIP Framework Alarms FM and Notification FM. For more information refer to the TeMIP Framework Software Product Description (SPD 54.17.xx).

Event Logging Presentation

The TeMIP Fault Management Event Logging presentation allows the user to define and manage single or multiple Event Logs and to manage and analyze the Event Log records.

Defining and managing the Event Log refers to the definition and control of the event collection for each Event Log. Event Logs are represented by icons, and users can select these icons and initiate management directives to define and modify Event Log instances and their associated characteristics. This includes starting and stopping event collection, modifying the way event collection and filtering is carried out and deleting the Event Log instance.

A Log Panel window displays the Event Log status in real-time and provides the user with the capability to perform Event Log management and customization of the Event Log environment (start/stop, notification of messages and so on).

TeMIP Fault Management provides the user with a sophisticated editor to define and modify the filters (Discriminators) and the activity scheduling using the Scheduling Package. Filters can be pre-defined and stored in a library to simplify and speed up operations.

TeMIP Fault Management enables users to perform Event Log Record information management and analysis through the View Event Records window. This window enables users to perform retrieval operations within one Event Log repository and to extend the search operations to other Event Log repositories at any given time.

The View Event Records window provides users with search criteria such as the log record class (wildcarding can be used), alarm type (for alarm record and security alarm record), additional text and notification identifier. Additional search criteria are presented to the user according to the class of record on which the search is done.

Search criteria common to all classes include managed object and time period. Online help is provided with the presentation of pre-defined choices for most criteria.

The View Event Records window allows users to perform actions on one or more Event Log records, including display and printing of Event Log record full information and record deletion. Operations such as print to file allow an operator to save the result of a search to a file in the user directory.

The View Event Records window can be started from the Iconic Map presentation module or directly from the shell as a stand-alone module.

Scheduling Package and Discriminator Construct Routines

TeMIP Fault Management's Alarm Handling and Event Logging functions use the services of the Scheduling Package and Discriminator Construct routines.

- Scheduling Package Routines

  As described in the Alarm Handling and Event Logging sections, the Scheduling Package routines allow the user to determine exactly when alarm and event collections are to be activated. This can be done on a weekly or daily basis and more than one period can be specified per day. The ISO weekly Scheduling Package is implemented in conformance with ISO 10165 Part 2.

  The Scheduling Package routines provide the user with services that include the initiation and requesting of real-time alerts, and evaluation of

time intervals based on a given Scheduling Package.

- Discriminator Construct Routines

  As described in the Alarm Handling and Event Logging sections, the Discriminator Construct routines allow the user to determine exactly what type of alarm and event reports are to be monitored. The filter (or Discriminator Construct in ISO terminology) is defined, in conformance with ISO standards 10164 parts 4 and 5, as a Common Management Information Services (CMIS) filter data type.

  The Discriminator Construct routines provide the user with filtering services, including evaluation of filter syntax and complexity, testing of alarm or event occurrences against a filter, and filter conversion.

Both sets of routines are available for developers to build freestanding management modules on top of TeMIP. The TeMIP kit also provides developers with the complete Scheduling Package and Discriminator Construct datatype definitions and the ability for developers to use and call the Discriminator Construct and Scheduling Package Editors for setting DC and SP attributes of a user-defined object.

TeMIP Event Filtering and Correlation

Through its Event Filtering and Correlation Function Module, TeMIP Fault Management allows a reduction in the rate at which events arrive at the user interface. This reduces the event rate to a level where the operator or the management system can cope with actual problems as they arise, thus improving the overall manageability and performance of your system. The Event Filtering and Correlation FM enables you to define several types of Event Filter that can be used to design a filtering system that best suits your requirements.

TeMIP Event Filtering and Correlation Function

The Event Filtering and Correlation Function Module filters events at source (low level filtering) using the Discriminator Construct. The input for an Event Filter consists of any OSI event. The events are tested against the associated Discriminator Construct for a given filter: if the event passes the DC, then it is processed further by the Event Filter(s), otherwise it is passed to the next existing filter. With this release, filtering is limited to one class of network entity per Event Filter.

The TeMIP Event Filtering and Correlation function allows the definition and use of filters that can have either filtering capacity, where nothing is forwarded to the operator, or correlation capacity, where a single event containing "value-added" information (correlated with other similar alarms) is forwarded to the operator, or both. A single filter or a combination of filters can be applied in series. The following filters, in order of precedence, can be defined:

- Corrective Filter: Modifies an event before forwarding it to other filters (if they exist) and can also generate an event as the result of a user-defined customization.
- Blocking Filter: Also called a Tap Filter, is a simple "on/off" type of event filter that either passes or rejects an event. It has only filtering capacity.
- Transient Filter: Collects events that are similar on the basis of time. If the timeframe expires, an event is then forwarded if the problem has not been resolved. It has both filtering and correlation capacity.
- Threshold Filter: Forwards an event if the threshold (event count) is crossed within a given timeframe. This filter operates on the basis of event rate. It has both filtering and correlation capacity.
- Heap Filter: Forwards an event after a given timeframe expires. This filter operates on the basis of time only by forwarding a "value-added" event when the timeout period expires. It has only correlation capacity.

The filters are created and managed from the Iconic Map or through the FCL PM. They are stored in the FM database as manageable objects that can be manipulated using management directives. Any changes made to the filter definition are communicated to the Access Modules.

The event filtering functionality is integrated into the Access Module(s) using the Event Filtering and Correlation Toolkit. The Toolkit consists of a routine library that must be called by any Access Module wanting to use the services of the Event Filtering and Correlation FM.

TeMIP Customization

Some features of TeMIP can be customized to suit the user's own environment. Numerous customization options are available, including changing the default printer queue, changing display colors, presenting alarms in ascending order of severity, and default values.

For each main window provided by TeMIP, the user is able to customize and save:

- Selected subsets of fields displayed (for example, summary of Alarm Record or Event Record information).
- The order in which these fields are displayed.
- The size and position of the window.
- Other useful customizable items.

These customizations are saved and automatically recalled when the user logs in. Users can also customize screen layout using the resource files.

For more information on customization, please contact your local Compaq office.

HARDWARE REQUIREMENTS

Disk Space Requirements

Disk space required for installation (includes TeMIP Framework):

Root file system		10 KB
Other file systems	usr	115,000 KB
	var	12 KB

Disk Space Required for Use (Permanent):

Root file system		0 KB
Other file systems	usr	0 KB
	var	500 MB

These counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration and software options.

Memory Requirements

The minimum memory supported is 128MB, however, performance is improved by using the software in conjunction with increased memory.

Note that if you are operating in multi-user mode, more memory is required.

Recommended Configuration:

For running TeMIP Fault Management on top of TeMIP Framework:

- AlphaServer 2000
- 256MB memory, or more
- RZ28 disks or equivalent disk space
- Ethernet controller

Note: Specific network environments may require larger configurations.

OPTIONAL HARDWARE

For multi-screen support, an extra graphical card (PMAGB-B) must be supplied.

SOFTWARE REQUIREMENTS

- Compaq Tru64 UNIX Operating System V4.0F or V4.0G DECwindows Motif®. (Note that DECwindows Motif is compliant with OSF/Motif.)
- TeMIP Framework V4.0

For all Alarm Archiving functions:

- ORACLE8 Server Version 8.1.6.2 with corresponding SQL*NET and TCP/IP Protocol Adapter
- SYBASE Version V11.0.2 or higher on the server and OpenClient/C Embedded SQL V10.0.4 or higher on the clients.

Note: The user-licensing scheme for ORACLE and SYBASE may differ depending on the country or system. Please refer to your local distributor for more information.

OPTIONAL SOFTWARE

- Any other software modules or packages necessary for communication with the managed network elements.
- SQL*Plus corresponding to ORACLE8 Server Version 8.1.6.2.

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 V4.0 are applicable, as this product was verified as being Year 2000 Ready.

GROWTH CONSIDERATIONS

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

DISTRIBUTION MEDIA

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

ORDERING INFORMATION

Please note that in a distributed TeMIP environment, any of the licenses listed below (that is, applications) loaded on a TeMIP server would allow the related application Presentation Module to be run on any TeMIP Client connected to that server.

TeMIP Alarm Handling and Event Logging
Software License: QM-6HMAA-AA

This partially replaces the licenses QL-3D3A*-AA and QM-3D3AA-A* (extra client licenses are necessary)

Software media: QA-6HPAA-H8
Software Documentation: QA-6HMAA-GZ
Software Product Services: QT-6HMA*-**

TeMIP Alarm Handling Client V4.0 for Tru64 UNIX

Software License: QM-6GPAA-AA (1 license per user)

Software media: QA-6HPAA-H8
Software Documentation: QA-6HMAA-GZ
Software Product Services: QT-6HMA*-**

TeMIP Alarm Handling Client V4.1 for Windows NT®

Software Product Description 70.64.xx

TeMIP Clarify Liaison V4.1

Software Product Description 70.86.xx

Please note that the QA-*****-H8 part numbers no longer include the QA-*****-GZ documentation kits. These must be ordered separately using the QA-*****- GZ number, if required.

Note: * Denotes variant fields. For additional information on available services, or hardware platform tiers, refer to the appropriate price book.

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Compaq Computer Corporation's Shrinkwrap License Terms and Conditions. For more information about Compaq licensing terms and policies, contact your local Compaq office.

License units for TeMIP Alarm Handling and Event Logging are allocated on an Unlimited System Use basis.

License units for TeMIP Alarm Handling Client are allocated on a user basis. The user is identified as the UNIX or NT user.

Compaq TRU64 UNIX LICENSE MANAGEMENT

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 license keys from the Compaq License Key Fulfillment Web Site according to instructions provided with the license agreement.

SOFTWARE PRODUCT SERVICES

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

SOFTWARE WARRANTY

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

The above information is valid at the time of release. Please contact your local Compaq office for the most up-to-date information.