COMPAQ

Software Product Description

PRODUCT: Compaq TeMIP Access Module for Fujitsu SDH Transmission SPD 80.53.00

DESCRIPTION

The Compaq TeMIP Fujitsu SDH Transmission (FJTX) Access Module (AM) provides an interface to the Fujitsu SDH Transmission equipment. This Access Module is a bi-directional module addressing fault management. It receives and processes unsolicited messages, as well as sends management commands and receives associated responses (Fault Management).

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, Event Logging and Trouble Ticketing 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 Telecommunication Union-Telecom Standard Sector (ITU-T) X.73x and Telecommunications Management Network (TMN) M.3010 and M.3100 Recommendations. TeMIP 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.

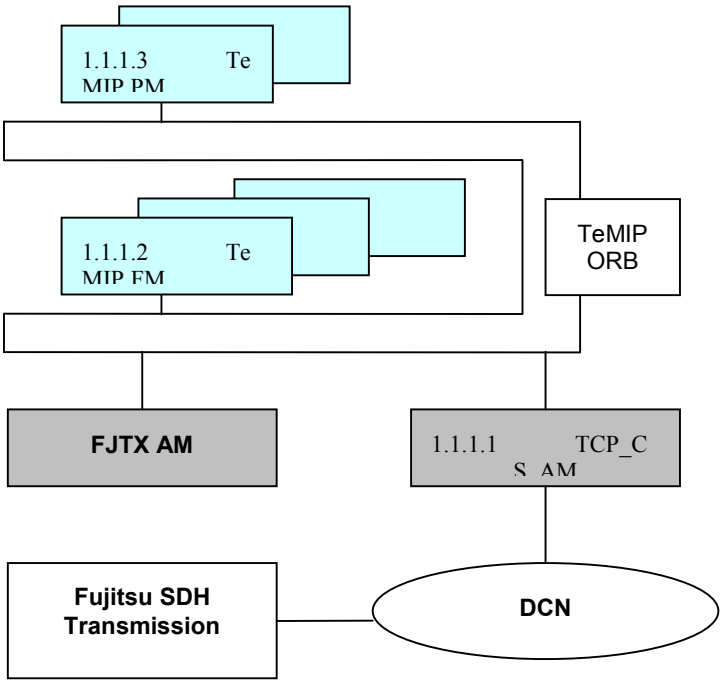
SOLUTION COMPONENTS

The Fujitsu SDH Transmission equipment is directly interfaced to TeMIP by means of a combination of Management Modules:

- The TCP Communications Server Access Module, responsible for establishing and maintaining the physical connection to the equipment. (As an alternative to the TCP Communications Server, either the X.25 (SVC), RS232 or Telnet Communications Servers could also be envisioned),
- The FJTX AM, responsible for the Information Model representing the management capabilities of the equipment as well as all associated semantic translations between its ASCII-based messaging interface and TeMIP data models.

The solution components are shown in Figure 1.

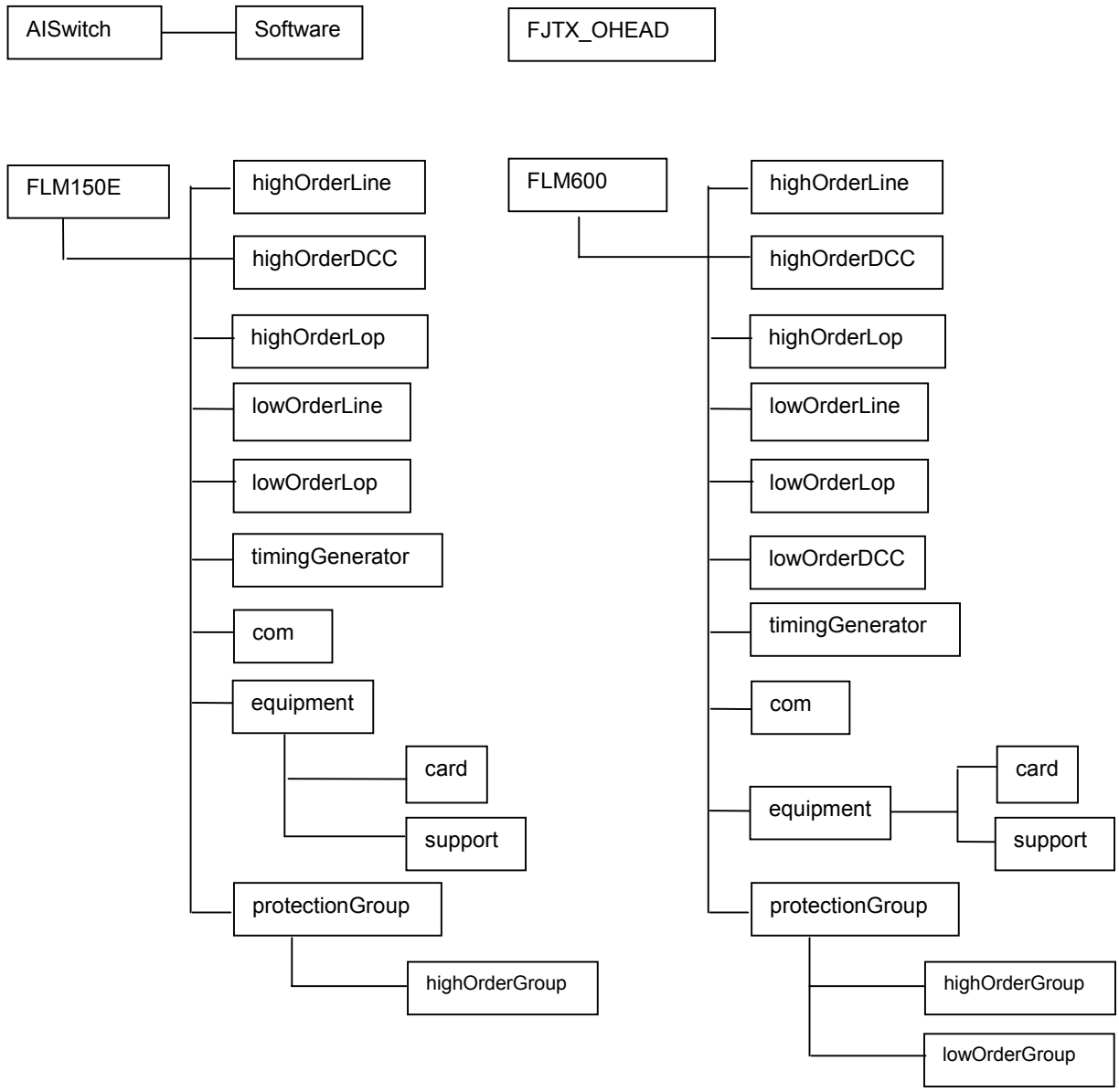
Figure 1: Solution Components

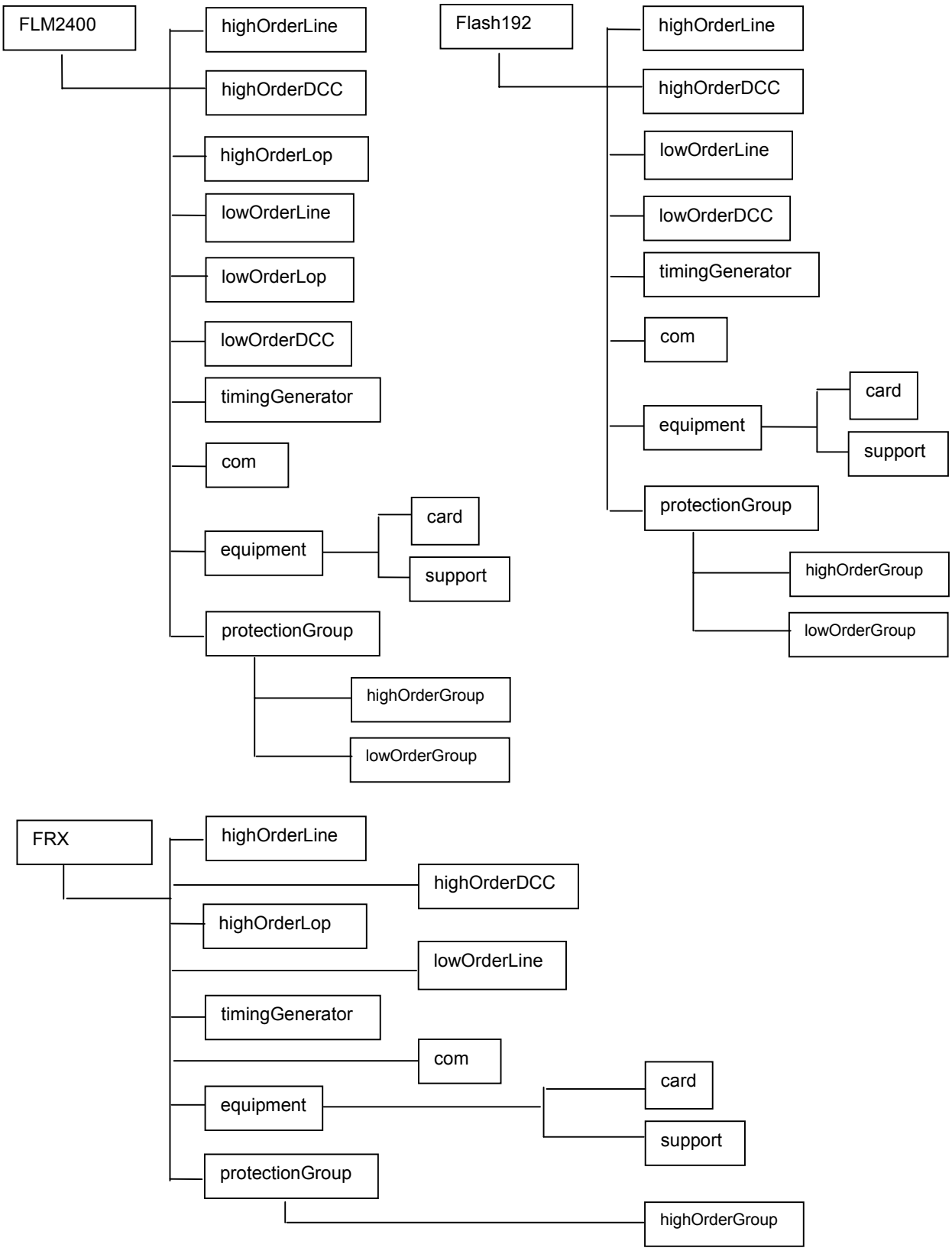


INFORMATION MODEL OUTLINE

The Fujitsu SDH Transmission is represented by the information Model shown in Figure 2.

Figure 2: Information Model




FLM2400
highOrderLine
highOrderDCC
highOrderLop
lowOrderLine
lowOrderLop
lowOrderDCC
timingGenerator
com
equipment
card
support
protectionGroup
highOrderGroup
lowOrderGroup
Flash192
highOrderLine
highOrderDCC
lowOrderLine
lowOrderDCC
timingGenerator
com
equipment
card
support
protectionGroup
highOrderGroup
lowOrderGroup
FRX
highOrderLine
highOrderDCC
highOrderLop
lowOrderLine
timingGenerator
com
equipment
card
support
protectionGroup
highOrderGroup

The meaning of each class is described in Table 1.

Table 1: Fujitsu SDH Transmission Hierarchy Description

Global Class	Child Class	Child class	Description	Cardinality
AISwitch			Represents the mediation equipment between the OSS and the Fujitsu FLMs. It is responsible for secure user access to FLMs and provides transparent passthrough of user commands/responses and NE notifications. The Applied Innovation Switch is used as a mediation device to the Fujitsu SDH equipment. The AI switch is a PC based mediation system that consists of the ASPS software, controlling the Fujitsu equipment and the NEAMS operating system. The AI switch can currently manage, in order of precedence, up to 35 SDH rings or 100 NEs.	N
	Software		Contains information on the current version of software for the AI Switch.	N
FLM150E			Represents a SDH transmission equipment being managed. It can be an ADM, MUX or Regenerator. The Fujitsu FLM150E is an STM-1 (155 Mbps) SDH Add/Drop Multiplexer, which multiplexes/de-multiplexes a combination of 140 Mbs, 34 Mbs and 2 Mbs G.702 tributaries to/from an STM-1 aggregate or bearer transmission path. The equipment is housed on a sub-rack and includes the following cards: • PWR: Power supply • SAC: Supervisory unit • AW: Order Wire Unit • TCU: Master Clock Unit • HSC: High Speed Switch Card (Protection for High Speed Cards) • EC: DCC Controller • MPU: Main Processing Unit • TSA: Timeslot Allocation • LSSW: Low Speed Switch Unit • MLDM: Multiplexer Unit • Low Speed Card (2M tributary cards) • Middle Speed Card (140M, 34M tributary cards) • High Speed Card (STM-1 Optical interface)	N
	highOrderLine		Represents the point where, on the high order or bearer side of the NE: • An incoming optical interface signal is converted, • The timing information is recovered, • The RS and MS overheads are managed, and • The outgoing STM-n/OC-n signal is converted into an optical/electrical/radio interface signal.	N
	highOrderLop		Provides the adaptation function for the AU4/AU3 channels on the high order side.	N
	highOrderDCC		Originates/terminates the DCC channels on the high order side of the equipment.	N

Global Class	Child Class	Child class	Description	Cardinality
	lowOrderLine		Represents the point where, on the low order or tributary side of the NE: • An incoming optical/electrical/radio interface signal is converted, • The timing information is recovered, • The RS and MS overheads are managed, and • The outgoing STM-n/OC-n or PDH signal is converted into an optical/electrical/radio interface signal.	N
	lowOrderLop		Provides the adaptation function for the AU4/AU3 channels on the low order.	N
	timingGenerator		Originates/terminates timing bits in the STM/STS/OC frame.	N
	com		Covers the following facilities in the following equipment classes: • FLM150E: COM: Manually caused abnormal condition. • FLM600: null: Manually caused abnormal condition and Clock source management • FLM2400: null: Manually caused abnormal condition and Clock source management • FRX: null: Manually caused abnormal condition and Clock source management	N
	equipment		Represents physical characteristics of the equipment to be managed. An instance is automatically created/deleted when an instance of the flm150E/flm600/flm2400/flash192/frx is created/deleted.	N
		card	Represents a controller of a physical interface equipment in the managed sdhNE. The following card types are supported: • opticalSTM1 • opticalSTM4 • opticalSTM16 • opticalOC3 • opticalOC12 • opticalOC48 • opticalOC192 • electricalSTS1/DS3 • electricalSTS3 • electricalSTS12 • pdh140Mb • pdh34Mb • pdh2Mb • tenBt	N
		support	Represents any equipment card, not directly controlling the transmission path, but able to emit Equipment Alarms. The support class covers the following card types: PWR, AW, TCU, SV6A, NMI, MPU, TSA, LSSW, MLDM	N

Global Class	Child Class	Child class	Description	Cardinality
	protectionGroup		Contains information on the protection type used for the facilities of the FLM.	N
		highOrderGroup	Represents the path protection facilities for a given STM/OC higher order path.	N
FLM600			Represents a SDH transmission equipment being managed. It can be an ADM, MUX or Regenerator. The Fujitsu FLM 600 is an STM-4 (622 Mbps) SDH Add/Drop Multiplexer, which multiplexes/de-multiplexes a combination of 45 Mbs (DS3) and STM-1 tributaries to/from an STM-4 aggregate or bearer transmission path. The equipment is housed on a sub-rack and includes the following cards: • PWR: Power supply • SAC: Supervisory unit • AW: Order Wire Unit • TCU: Master Clock Unit • HSC: High Switch Controller Card (Protection for High Speed Cards) • MSC: Middle Switch Controller Card (Protection for Middle Speed Cards) • EC: DCC Controller • MPU: Main Processing Unit • TAS: Timeslot Allocation • Middle Speed Card (DS-3 (45Mbs) and STM-1 tributary cards) • High Speed Card (STM-4 Optical interface)	N
	highOrderLine		See definition given for the previous global class.	N
	highOrderLop		See definition given for the previous global class.	N
	highOrderDCC		See definition given for the previous global class.	N
	lowOrderLine		See definition given for the previous global class.	N
	lowOrderLop		See definition given for the previous global class.	N
	lowOrderDCC		Originates/terminates the DCC channels on the low order side of the equipment.	N
	timingGenerator		See definition given for the previous global class.	N
	com		See definition given for the previous global class.	N
	equipment		See definition given for the previous global class.	N
		card	See definition given for the previous global class.	N
		support	Represents any equipment card, not directly controlling the transmission path, but able to emit Equipment Alarms. The support class covers the following card types: PW6A, AW6A, TCA, EC6A, MP6A, HC6A, MS6A, SV6A	N
	protectionGroup		See definition given for the previous global class.	N
		highOrderGroup	See definition given for the previous global class.	N
		lowOrderGroup	Represents the path protection facilities for a given STM/OC lower order path.	N

Global Class	Child Class	Child class	Description	Cardinality
FLM2400			Represents a SDH transmission equipment being managed. It can be an ADM, MUX or Regenerator. The Fujitsu FLM 2400 is an STM-16/Sonet OC48 (2.5 Gbps) SDH Add/Drop Multiplexer, which multiplexes/de-multiplexes a combination of STM-4, STM-1, OC-12, OC-3, STS12, STS3, STS1 and 45 Mbs tributaries to/from an OC aggregate or bearer transmission path. The equipment is housed on several shelves and includes the following cards: • PWR: Power supply • SAC: Supervisory unit • AW: Alarm/Order Wire Unit • TCU: Master Clock Unit • HSC: High Switch Controller Card (Protection for High Speed Cards) • EC: DCC Controller • MPU: Main Processing Unit • HCA: Hardware Controller, (which provides an electrical interface between the High Speed STM-16 Controller and 4 X STM-4 controllers). • TSA: Timeslot Allocation • High Speed Card (STM-16/OC48 Optical interface) • Middle Speed Card (STM-4/OC12, STM-1/OC3 Optical interface, STS12/STS3/DS3 (45Mbs) electrical interface)	N
	highOrderLine		See definition given for the previous global class.	N
	highOrderLop		See definition given for the previous global class.	N
	highOrderDCC		See definition given for the previous global class.	N
	lowOrderLine		See definition given for the previous global class.	N
	lowOrderLop		See definition given for the previous global class.	N
	lowOrderDCC		See definition given for the previous global class.	
	timingGenerator		See definition given for the previous global class.	N
	com		See definition given for the previous global class.	N
	equipment		See definition given for the previous global class.	N
		card	See definition given for the previous global class.	N
		support	Represents any equipment card, not directly controlling the transmission path, but able to emit Equipment Alarms. The support class covers the following card types: PW2H, PW6A, AW6A, AW2H, TCA, HS2H, HS6A, HM2H, EC6A, MP6A, SV6A, MS6A, HC6A	N
	protectionGroup		See definition given for the previous global class.	N

Global Class	Child Class	Child class	Description	Cardinality
		highOrderGroup	See definition given for the previous global class.	N
		lowOrderGroup	See definition given for the previous global class.	N
Flash192			Represents a SDH transmission equipment being managed. It can be an ADM, MUX or Regenerator. The Fujitsu Flash 192 is a Sonet based OC192 (10 Gbps) SDH Multiplexer, which "passes-through" a combination of STM-16 bearers onto a 10Gbs "bit stream". The equipment is housed in several shelves and includes the following cards: • PWR: Power supply • SAC: Supervisory unit • AW: Order Wire Unit • FAN: Fan • TCU: Master Clock Unit • HSC: High Switch Controller Card (Protection for High Speed Cards) • EC: DCC Controller • MPU: Main Processing Unit • HUB Memory Controller (internal controllers) • DEM Demultiplexer • MUX: Multiplexer • TSA: Timeslot Allocation • opticalOC48Card: Low Speed Card (OC48 Optical interface) • opticalOC192Card: High Speed (Transmit/Receive) Card (OC192 Optical interface)	N
	highOrderLine		See definition given for the previous global class.	N
	highOrderDCC		See definition given for the previous global class.	N
	lowOrderLine		See definition given for the previous global class.	N
	lowOrderDCC		See definition given for the previous global class.	
	timingGenerator		See definition given for the previous global class.	N
	com		See definition given for the previous global class.	N
	equipment		See definition given for the previous global class.	N
		card	See definition given for the previous global class.	N
		support	Represents any equipment card, not directly controlling the transmission path, but able to emit Equipment Alarms. The support class covers the following card types: PWR, AW, TCU, HSC, EC, MPU, TSA, MEM, FAN, HUB, DEM, MUX	N
	protectionGroup		See definition given for the previous global class.	N
		highOrderGroup	See definition given for the previous global class.	N
		lowOrderGroup	See definition given for the previous global class.	N

Global Class	Child Class	Child class	Description	Cardinality
FRX			Represents a SDH transmission equipment being managed. It can be an ADM, MUX or Regenerator. The Fujitsu FRX is an STM-1 (155 Mbps) SDH Repeater, which provides a bearer interface between optical and radio transmission paths. The equipment is housed on a sub-rack and includes the following cards: • PWR: Power supply • SAC: Supervisory unit • MOD: Modulator • DOM: Demodulator • RPS: (Radio Protection Switch) Card • INT: (High Speed (STM-1 Optical) interface to RPSW interface	N
	highOrderLine		See definition given for the previous global class.	N
	highOrderLop		See definition given for the previous global class.	N
	highOrderDCC		See definition given for the previous global class.	N
	lowOrderLine		See definition given for the previous global class.	N
	timingGenerator		See definition given for the previous global class.	N
	com		See definition given for the previous global class.	N
	equipment		See definition given for the previous global class.	N
		card	See definition given for the previous global class.	N
		support	Represents any equipment card, not directly controlling the transmission path, but able to emit Equipment Alarms. The support class covers the following card types: PS, NMI, RPSW, MOD, DEM, MPU, XPIC	N
	protectionGroup		See definition given for the previous global class.	N
		highOrderGroup	See definition given for the previous global class.	N
FJTX_OHEAD			Logical entity that acts as a sink or collection point for all overhead messages that are generated by this AM. Refer to document for a detailed description of overhead messages and classes. FJTX_OHEAD is a TeMIP global class. These global entities are responsible for signaling received messages that are not assigned to an entity representing a NE, MD.	N

MANAGEMENT CAPABILITIES SUMMARY

Unsolicited Messages Support

The Fujitsu SDH Transmission AM shall handle the following unsolicited messages (also called Autonomous messages) pertaining to the Surveillance Interface:

- REPT ALM
- REPT ALM ENV
- REPT EVT
- REPT PM
- REPT NSMALM
- REPT POLLALM
- REPT LED
- REPT STAT

Commands support

The following commands pertaining to the Surveillance Interface shall be supported:

- RTRV-HDR: Retrieve Header (KEEPALIVE),
- RTRV-ALM-ALL: Retrieve All Alarms,
- RTRV-ALM-ENV: Retrieve Environment Alarm,
- RTRV-COND-ALL: Retrieve All Condition,
- ALW-MSG-ALL: Enable Autonomous Message Reporting,
- INH-MSG-ALL: Inhibit Autonomous Message Reporting,
- ALW-PMREPT-ALL: Enable Performance Monitoring Reporting,
- INH-PMREPT-ALL: Inhibit Performance Monitoring Reporting,
- ACT-USER: Session Logon,
- CANC-USER: Session Logoff,

Alarm Clearance

Some alarm messages have a corresponding alarm clear message.

Two schemes of processing of CLEAR alarms are explained hereafter.

The SDH Transmission switch does not provide with a specific alarm identifier to allow the correlation of the alarm with its clear message. So, alarm clearing is performed based on some fields in the message, according to ITU-T standards:

- The alarm has severity clear; and the Managed Object, Event Type, Probable Cause and Specific Problem fields are the same as a previous alarm.

But, when the specific entity is not provisioned, the alarm and its clearance alarm are sent against a default entity. Then, to correlate the alarms on a default entity, the FJTX AM automatically generates a unique Notification Identifier for the alarm and its clearance alarm.

In this case, according to ITU-T standards, the clearance of an alarm can be done based on the following rule:

- The alarm has severity clear; the Managed Object is the same of a previous alarm; and the Notification Identifier field is the same as the Notification Identifier of the previous alarm.

MISCELLANEOUS MANAGEMENT CAPABILITIES

The Fujitsu SDH Transmission AM shall implement the features listed below:

- Keep-Alive message generation at regular/controllable intervals,
- Automatic Detection and reporting of communication failure when the connection is initiated from TeMIP,

HARDWARE REQUIREMENTS

Supported Alpha AXP Processors:

DIGITAL Personal Workstation au series
DIGITAL Ultimate Workstation
AlphaStation 600
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: 35 Mbytes
Installation: /usr 120 Mbytes

Disk Space Required for Use (Permanent):
No specific requirement

Memory Requirements:

The minimum memory supported, due to a TeMIP Framework prerequisite, is 128 Mbytes.

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

SOFTWARE REQUIREMENTS

Compaq Tru64 UNIX® Operating System V4.0F

TeMIP Framework V4.0

OPTIONAL SOFTWARE

TeMIP Graphical ASCII Toolkit V4.0

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

DISTRIBUTION MEDIA

This software is available by electronic means, distributed directly by Compaq TeMIP Engineering Team in Sophia Antipolis, France. The team can be contacted through your local Compaq office, which sends an internal e-mail to vbetemipsupp@compaq.com (containing customer identification and proof of license purchase).

ORDERING INFORMATION

Compaq TeMIP Access Module for Fujitsu SDH Transmission *(Fault Management)*

Software License:

- QM-6KNAA-AA

Software Product Services:

- QT-6KN**-** or QR-SP6KN-A9

Notes:

1. * denotes variable fields. For additional information on available services, or hardware platform tiers, refer to the appropriate price book.
2. The QM number corresponding to the TeMIP Graphical ASCII Toolkit V4.0 (Run-Time) must also be purchased (QM-5SMAA-AA) for each system where the AM software is installed.

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Compaq Computer Corporation's Shrink-wrap Terms and Conditions. **The license is a Corporate wide license, i.e. can be copied as many times as necessary on systems using the same TeMIP Namespace.**

However, one Graphical ASCII Toolkit runtime license per copy of the Access Module is required.

For more information about Compaq's licensing terms and policies, contact your local Compaq office.

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 number is provided for each license, which allows the user to obtain license keys from an Internet Web Server according to instructions provided with the License Certificate.

SOFTWARE PRODUCT SERVICES

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

SOFTWARE WARRANTY

This software product 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.

TRADEMARK INFORMATION