COMPAQ

Software Product Description

PRODUCT: Compaq TeMIP Access Module for Ericsson AXE10 Wireline Switch
SPD 70.51.01

DESCRIPTION

The Compaq TeMIP AXE10 Wireline Access Module (AM) provides an interface to the Ericsson AXE10 Wireline switching system (Application System 26). This AM supports fault management capabilities, receiving and processing unsolicited messages over a serial line.

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, ISO 10165-x and 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.

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.

Solution Components

The AXE10 Wireline switch is directly interfaced to TeMIP by means of a combination of Management Modules:

- The RS232 Communication Server Access Module, responsible for establishing and maintaining the physical connection to the equipment.
- The AXE10 Wireline Access Module, 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.
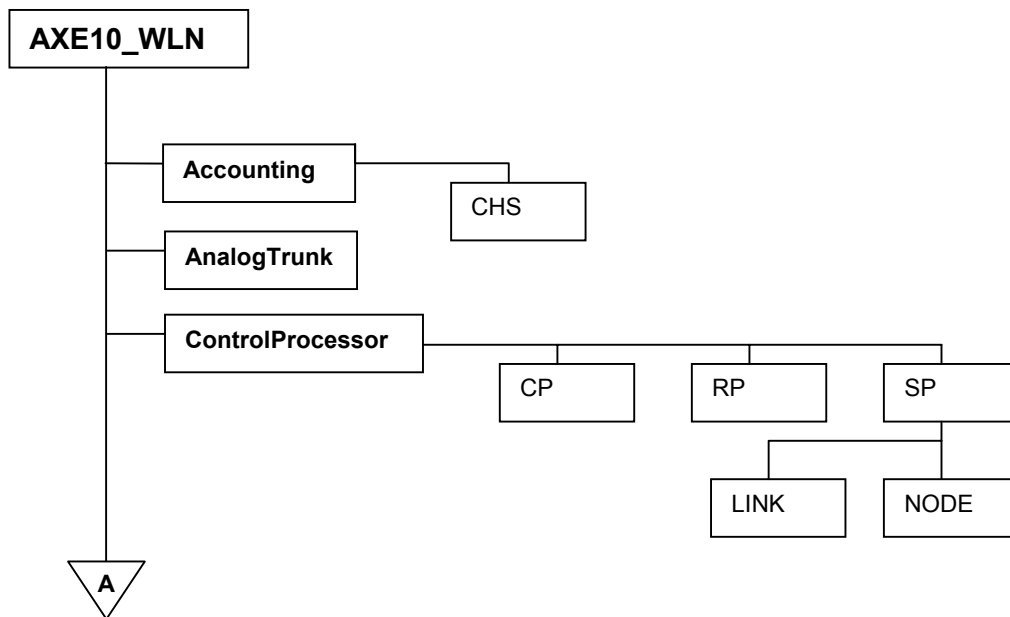
The solution components are shown in Figure 1
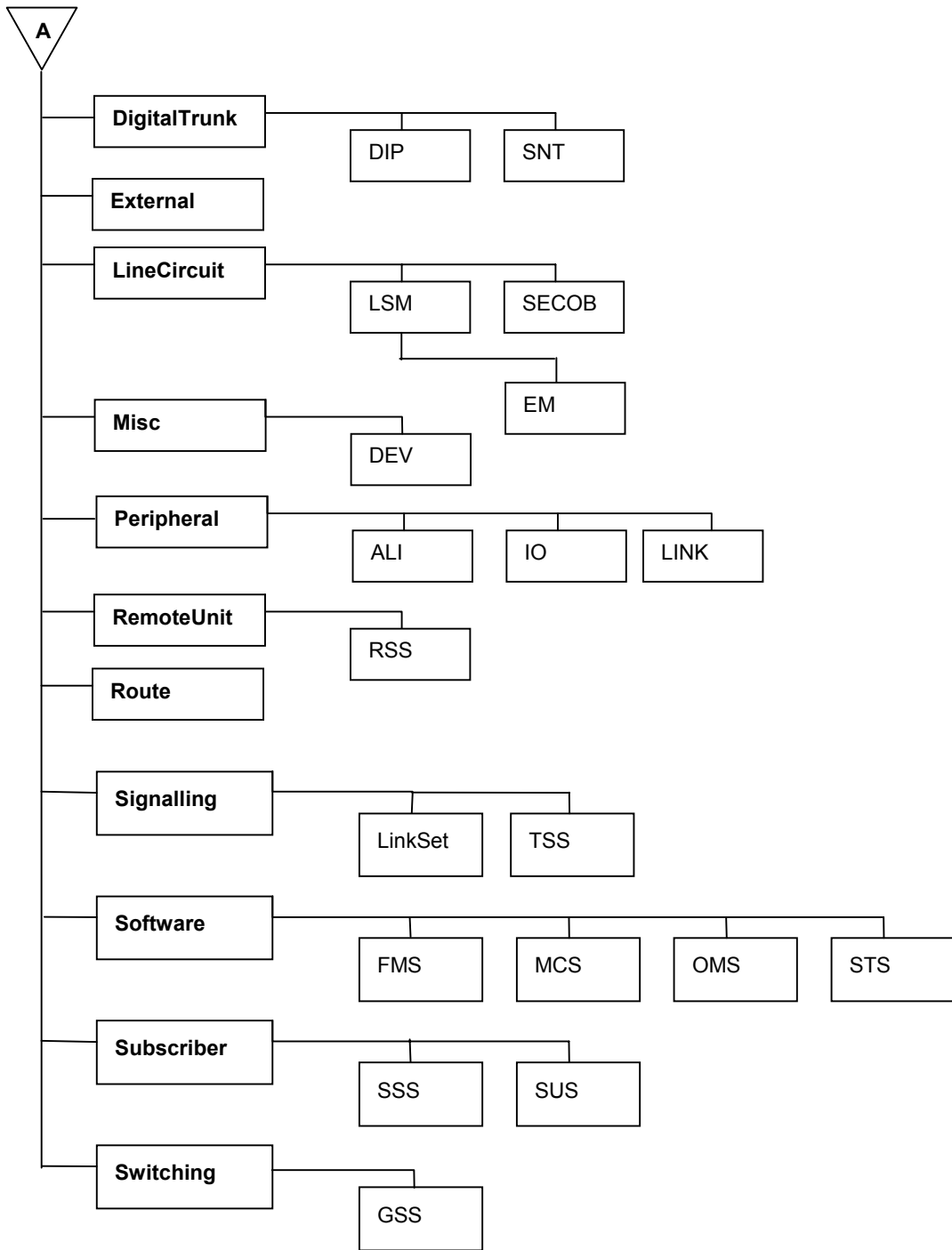
Figure 1: Solution Components
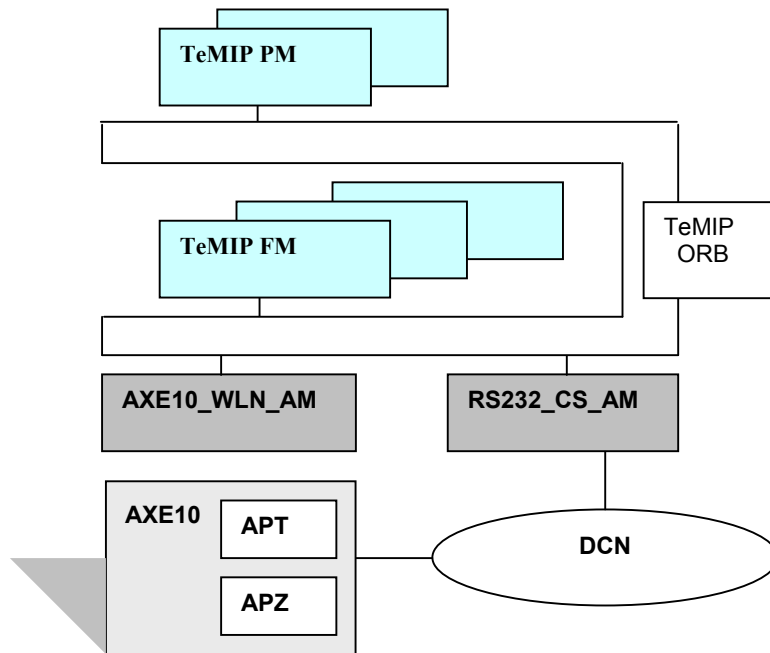
Information Model Outline

The AXE10 is represented by the Information Model shown in Figure 2.

Figure 2: Information Model

```
        ▽
        A
        │
        ├── DigitalTrunk ──────────┬──────────┐
        │                         DIP        SNT
        │
        ├── External
        │
        ├── LineCircuit ──────────┬──────────┐
        │                        LSM       SECOB
        │                         └─────────┬────┐
        │                                       EM
        │
        ├── Misc ─────────────┬────┐
        │                    DEV
        │
        ├── Peripheral ───────┬──────────┬──────────┐
        │                    ALI        IO        LINK
        │
        ├── RemoteUnit ───────┬────┐
        │                    RSS
        │
        ├── Route
        │
        ├── Signalling ───────┬──────────┐
        │                  LinkSet      TSS
        │
        ├── Software ─────────┬──────────┬──────────┬──────────┐
        │                    FMS        MCS        OMS        STS
        │
        ├── Subscriber ───────┬──────────┐
        │                    SSS        SUS
        │
        └── Switching ────────┬────┐
                             GSS
```

The switch is modeled as 14 subsystems, which present a standard view of Wireline Switches, independent of technology. The sub-systems are represented by the first level of child class and have just one instance each. This allows TMN managers to have a common view of different exchanges in a multi-vendor environment. The classes that show the specific hardware/software of the AXE10 are located below the sub-system level. The meaning of each class is described in Table 1.

Table 1: AXE10_WLN Hierarchy Class Description

Class	Child	Child	Description	Cardinality
Accounting			Exchange accounting (billing) subsystem.	1
	CHS		Charging Subsystem.	N
AnalogTrunk			Hardware parts related to analog connections to other switches.	1
ControlProcessor			Call processor and all other processors.	1
	CP		Central Processor.	N
	RP		Regional Processor.	N
	SP		Support Processor.	N
		LINK	Link Connection of Support Processor.	N
		NODE	Node Connection of Support Processor.	N
DigitalTrunk			Hardware parts related to digital connections to other switches.	1
	DIP		Digital Path.	N
	SNT		Switching Network Terminal.	N
External			Alarms related to the environment (fire, air conditioning, open door, fan).	1
LineCircuit			Hardware parts related to analog and digital subscriber connections.	1
	LSM		Line Switching Subsystem.	N
		EM	Extension Module.	N
	SECOB		Special Equipments Coin Box Subsystem.	1
Misc			Auxiliary hardware responsible for: MFC/DTMF signaling, tone generation, test equipment, announcement machine, and so on.	1
	DEV		Hardware devices.	N
Peripheral			I/O equipment (disk, printer, terminal, tape).	1
	ALI		Alarm Interface.	N

	IO		Input/Output device.	N
	LINK		Data Link Name.	N
RemoteUnit			Hardware parts located outside the switch, but functionally dependent, to connect subscribers remotely.	1
	RSS		Remote Subscriber System.	N
Route			Route logically programmed in the switch.	N
Signaling			Signaling Subsystem.	1
	LinkSet		Link Set of the Common Channel Signaling #7 Subsystem (SS7).	N
	TSS		Trunk Signaling Subsystem.	1
Software			Alarms related to software.	1
	FMS		File Management Subsystem.	1
	MCS		Man-Machine Communication Subsystem.	N
	OMS		Operation & Maintenance Subsystem.	1
	STS		Statistical Traffic Subsystem.	N
Subscriber			Alarms logically related to subscribers (all but hardware alarms).	1
	SSS		Subscriber Switching Subsystem.	N
	SUS		Subscriber Services Subsystem.	1
Switching			Hardware parts responsible for call switching.	1
	GSS		Group Switching Subsystem.	N

MANAGEMENT CAPABILITIES SUMMARY

Unsolicited Messages Support

The AXE10 Wireline Access Module can handle all unsolicited alarms sent by the switch (according to the *AXE AS26 Command & Printout Manual*), that is, all 214 alarm types sent by the switch are captured by TeMIP. Table 2 provides a list of these alarms.

The mapping of the alarm fields to the ITU-T Standards complies with the following guidelines:

- **Managed Object:** The managed object instance can be the "GEN" instance for the classes that have only one instance (refer to Table 1: AXE10_WLN Hierarchy Class Description) or can be built from the message body.
- **Severity:** The alarm severity is driven by the message header.
- **Event Type and Probable Cause:** These fields are driven by the alarm type.
- **Additional Text:** The additional text contains the original alarm message, cleared of obtrusive messages and blank lines.

Alarm Clearance

According to ITU-T standards, the clearance of an alarm can be done based on the following rule:

- The alarm has the severity Clear: the Managed Object is the same as that of a previous alarm and the Notification Identifier field is the same as the Notification Identifier of the previous alarm.

In order to clear a previous alarm, the AXE10 sends a message with the same alarm number and with a "cease flag" in the message body. The AXE10 Wireline AM generates a Notification Identifier for each alarm message, and also for the clearance alarm, so that TeMIP Alarm Handling can perform the clearance correlation whenever required.

Alarm Information

Table 2 lists the AXE10 Wireline alarm messages that are described in the *AXE AS26 Command & Printout Manual*.

Table 2: AXE10 Alarm Table

No.	Message Slogan	No.	Message Slogan
1	ACCOUNTING CASE DATA SUPERVISION	56	TG FAILURE COIN-BOX
2	CHARGING CHECK OUTPUT ERROR	59	NETWORK SYNCHRONIZATION FAULT
3	COMMON CHARGING OUTPUT BUFFER CONGESTION	60	RTU AUTOMATICALLY BLOCKED
4	COMMON CHARGING OUTPUT ERROR	61	RTU MANUALLY BLOCKED
5	COMMON CHARGING OUTPUT USER FILE MANUALLY BLOCKED	62	EXTERNAL ALARM RECEIVER BLOCKED
6	EVENT CHARGING ERROR	63	EXTERNAL ALARM RECEIVER FAULT
7	EXTERNAL PRIVATE METERING FAULT	64	HOWLER EQUIPMENT FAULT
8	IO-FAULT FOR CHARGING STATISTICS	65	HOWLER EQUIPMENT MANUALLY BLOCKED
9	CONGESTION IN ALARM SYSTEM	66	MANUAL BACKUP OF NEW RECORDING NEEDED
10	EXCHANGE INPUT LOAD SUPERVISION	67	RECORDABLE PHRASE HAS BEEN DESTROYED
11	SYSTEM ALARM STATE	68	SEMIPERMANENT CONNECTION FAULT
12	SYSTEM EVENT	69	ALPHANUMERICAL OUTPUT CONGESTION
13	OPEN COMMUNICATION ERROR	70	IS-OUTPUT ERROR
14	DIGITAL PATH FAULT SUPERVISION	71	MONITORING REGISTRATIONS OUTPUT ERROR
15	DIGITAL PATH QUALITY SUPERVISION	72	SEMIPERMANENT CONNECTION BREAK LOGGING CONGESTION
16	DIGITAL PATH UNAVAILABLE STATE FAULT	73	ALI BLOCKED
17	DISTURBANCE SUPERVISION OF INDIVIDUAL DEVICES DEACTIVATED	74	ALI FAULT
18	DISTURBANCE SUPERVISION OF TRUNK ROUTES DEACTIVATED	75	DFO IO DEVICE FAULT
19	LAYER 2 FAULT	76	IO BLOCKED
20	LAYER 3 FAULT	77	IO TAPE QUALITY WARNING
21	SEIZURE SUPERVISION	78	TEST SYSTEM p ACTIVATED FROM dev
22	BACK-UP FACILITY IS OUT OF SERVICE	79	IO DATA LINK BLOCKED
23	SWITCHING NETWORK TERMINAL FAULT	80	ALLOCATION FAULT
24	SWITCHING NETWORK TERMINAL MANUALLY BLOCKED	81	ANALYSIS DATA FAULT
25	TOO MANY PHRASES DESTROYED	82	APPLICATION DETECTED SOFTWARE ERROR
26	EXTERNAL ALARM	83	AUDIT FUNCTION DETECTED ERROR
27	DCS DISTURBANCE SUPERVISION PORT	84	AUDIT FUNCTION THRESHOLD SUPERVISION
28	DIGITAL SUBSCRIBER LINE CIRCUIT TEST EQUIPMENT FAULT	85	BACKUP ACCESS SPEED REDUCTION
29	DIGITAL SUBSCRIBER LINE CIRCUIT TEST EQUIPMENT MANUALLY BLOCKED	86	BACKUP INFORMATION FAULT
30	DISTRIBUTED SWITCH SUPERVISION	87	CHECKSUM ERROR IN DS STORED MICROPROGRAM (only APZ 211)
31	FAULT MARKING SUPERVISION FAULT	88	CP FAULT
32	FRAME HANDLER BD-CHANNEL FAULT	89	CP STATE NOT NORMAL
33	FRAME HANDLER SUPERVISION	90	CPG FAN FAULT
34	GENERATOR SUPERVISION	91	CPG FAN FAULT AT REPAIR CHECK
35	GENERIC ACCESS MANAGER SIGNALING CHANNEL CONNECTION FAULT	92	CPT FAULT
36	LINE UNIT BLOCKED	93	DEVICE PROCESSOR FAILURE
37	LSM DIGITAL LINE CIRCUIT CLOCK OR POWER FEED FAULT	94	HB (HEARTBEAT FAILURE)
38	LSM POWER UNIT FAULT	95	MANUAL EXECUTION OF COMMAND LOG AFTER SWITCH-BACK
39	PORT BLOCKED	96	MANUAL EXECUTION OF COMMAND LOG REQUIRED
40	PVC SET-UP FAILURE	97	PHC-FUNCTION INHIBITED
41	RINGING GENERATOR FAULT	98	PROGRAM CHANGE FAULT
42	SEIZURE SUPERVISION SUBSCRIBER LINES	99	PROGRAM CHANGE PASSIVATION INHIBITED
43	SUBSCRIBER LINE BLOCKING SUPERVISION FAULT	100	RELOAD OF THE SYSTEM IS PENDING
44	SUBSCRIBER LINE CIRCUIT SUPERVISION	101	RELOAD PARAMETERS INVALID
45	SUBSCRIBER LINE CIRCUIT TESTER FAULT	102	SMALL RESTART IS PENDING
46	SUBSCRIBER LINE CIRCUIT TESTER MANUALLY BLOCKED	103	SYSTEM RESTART
47	SUBSCRIBER LINE LOCKOUT SUPERVISION FAULT	104	SYSTEM STATE
48	SUBSCRIBER LINE SPECIAL PRIORITY LINE FAULT	105	CLOCK ADJUSTMENT IN EMG ACTIVATED
49	SUBSCRIBER LINE TEST BUFFER FAULT	106	EM APT ALARM WORD
50	SUBSCRIBER LINE TEST EQUIPMENT FAULT	107	EM FAULT
51	SUBSCRIBER LINE TEST EQUIPMENT MANUALLY BLOCKED	108	EM MANUALLY BLOCKED
52	TEST TONE FAULT	109	EMG CONTROL DOWN
53	TIME SUPERVISION INHIBITED	110	EMG EM MANUALLY BLOCKED
54	TONE GENERATOR FAULT	111	EMG EMRP MANUALLY BLOCKED
55	DP FAILURE	112	EMG FAULT
		113	EMG STR MANUALLY BLOCKED

No.	Message Slogan
114	EMG TRANSMISSION FAULT
115	REMOTE TERMINAL FAULT
116	CONTROL SIGNALING LINK MANUALLY BLOCKED
117	MANY REGIONAL PROCESSORS BLOCKED
118	RP FAULT
119	RP MANUALLY BLOCKED
120	RP PAIR FAULT
121	RPD RESTART DATA
122	SP FUNCTION CHANGE ACTIVE
123	SPG NOT AVAILABLE
124	SP LINK MANUALLY BLOCKED
125	SP LINK MANUALLY SEPARATED
126	SP LINK FAULT
127	SP NODE AUTOMATICALLY BLOCKED
128	SP NODE FAULT
129	SP NODE MANUALLY BLOCKED
130	SP NODE RESTARTED
131	SP TRACE SYSTEM INACTIVE
132	SP TRANSIENT FAULT SUPERVISION
133	SP UNIT FAULT
134	SP UNIT MANUALLY BLOCKED
135	SP WORKING STATE NOT NORMAL
136	ESM FAILURE
137	RINGING GENERATOR FAULT IN RSM
138	RSM SUB LINE CIRCUIT TESTER MANUALLY BLOCKED
139	RSM SUBSCRIBER LINE CIRCUIT TESTER FAULT
140	TG FAILURE
141	TG FAILURE PRIVATE METER
142	ACCOUNTING CASE CALL SUPERVISION
143	BLOCKING RESTRICTION ON ROUTES SUPERVISION
144	BLOCKING SUPERVISION
145	BLOCKING SUPERVISION OF SUBROUTES
146	CONTINUITY CHECK FAILURE
147	DISTURBANCE SUPERVISION OF INDIVIDUAL DEVICES
148	DISTURBANCE SUPERVISION OF TRUNK ROUTES
149	ROUTE RESTRICTION ACTIVATED
150	SEIZURE QUALITY SUPERVISION
151	SIGNAL FAULT SUPERV TEMPORARILY DISCONNECTED
152	SIGNALLING FAULT SUPERVISION
153	CCITT7 DESTINATION INACCESSIBLE
154	CCITT7 LINK SET SUPERVISION
155	CCITT7 MTP POLICING FIRST THRESHOLD REACHED
156	CCITT7 MTP POLICING SECOND THRESHOLD REACHED
157	CCITT7 MTP POLICING VIOLATION LIST FULL
158	CCITT7 SIGNALING LINK FAILURE
159	CCITT7 SIGNALING LINK MANUALLY DEACTIVATED
160	CCITT7 SIGNALING LINK MANUALLY INHIBITED
161	USER PART DISTURBANCE RECORDING FAULT
162	USER PART DISTURBANCE SUPERVISION
163	CCITT7 CONFUSION MESSAGE LIST FULL
164	CCITT7 CONFUSION MESSAGE LIST THRESHOLD REACHED

No.	Message Slogan
165	CCITT7 DISTURBANCE SUPERVISION LIMIT REACHED
166	CCITT7 EVENT REPORTING THRESHOLD REACHED
167	CCITT7 LONG MESSAGE VIOLATION LIST FULL
168	CCITT7 LONG MESSAGE VIOLATION LIST THRESHOLD REACHED
169	ACCOUNTING DATA OUTPUT ERROR
170	COMMAND LOG BLOCKED
171	COMMAND LOG START SUBFILE NOT ON-LINE
172	CORRUPT FILE WARNING
173	DFO BACKUP FILE SUPERVISION
174	FILE MANUALLY BLOCKED
175	INFINITE FILE END WARNING
176	INTERRUPTED AUTOMATIC COMMAND LOG EXECUTION
177	IO-FAULT FOR ALL CIRCUITS BUSY ON ROUTES
178	IO-FAULT FOR CCITT7 SIGNALING PERFORMANCE MEASUREMENT
179	IO-FAULT FOR CCITT7 TRAFFIC MEASUREMENT
180	IO-FAULT FOR DATA RECORDING PER CALL
181	IO-FAULT FOR SERVICE QUALITY STATISTICS
182	IO-FAULT FOR TIME CONGESTION MEASUREMENT ON ROUTES
183	IO-FAULT FOR TRAFFIC CHARACTER MEASUREMENT ON ROUTES
184	IO-FAULT FOR TRAFFIC DISPERSION MEASUREMENT
185	IO-FAULT FOR TRAFFIC MEASUREMENT ON ROUTES
186	IO-FAULT FOR TRAFFIC TYPE MEASUREMENT
187	SOFTWARE ERROR
188	VOLUME END WARNING
189	VOLUME LIMIT EXCEEDED
190	MCS AUTHORITY COMMAND INPUT RESTRICTED
191	MCS AUTHORITY ILLEGAL LOGON ATTEMPT
192	MCS TRANSACTION LOG FAULT
193	DEVICE IS PLACED IN TEST ROUTE
194	STATISTIC AND TRAFFIC MEASUREMENT SYSTEM STOPPED
195	STATISTIC DATA FILE OUTPUT STANDARD FORMAT ERROR
196	STATISTIC DATA MODIFIED REPORT GENERATOR OUTPUT ERROR
197	ACCESS MODULE INSTRUMENT FAULT
198	ACCESS MODULE MANUALLY BLOCKED
199	INTEGRATED PRIVATE METERING FAULT
200	ISDN MAINTENANCE DATA REGISTER FAULT
201	BLACK LIST FUNCTION BLOCKED
202	MALICIOUS CALL IDENTIFICATION DATA HAS BEEN PRINTED
203	WHITE LIST FUNCTION BLOCKED
204	BROADCAST CONNECTION FAULT
205	BROADCAST LOOP EQUIPMENT FAULT
206	COMPLETE TRAFFIC STOPPAGE IN GROUP SWITCH
207	CONNECTION PERFORMANCE TEST OF GROUP SWITCH DISTURBANCES
208	GROUP SWITCH CLM CONTROL
209	GROUP SWITCH FAULT
210	GROUP SWITCH TEST PATH ESTABLISHED
211	GROUP SWITCH TRAFFIC RESTRICTIONS
212	GROUP SWITCH UNIT MANUALLY BLOCKED
213	SWITCH BLOCKING SUPERVISION
214	SWITCH DISTURBANCE SUPERVISION

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: 19 Mbytes
Installation: /usr 65 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 inter-operates 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 Ericsson AXE10 Wireline Switch

Software License:

- QM-687AA-AA

Software Product Services:

- QT-687**-** or QR-SP687-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).

SOFTWARE LICENSING

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This product uses the FLEXlm Software License Key system.

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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.

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