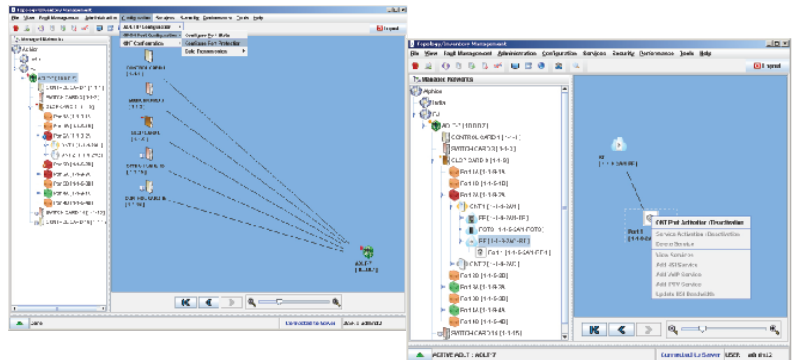


AEMS

Element Management System Software

Feature Summary

- ◆ J2EE based three-tier architecture with customized functions
- ◆ Single AEMS supports thousands of OLTs
- ◆ SSL based secured communication
- ◆ Secure certificate and RADIUS based access, with customizable user and profile based authorization
- ◆ Graphical, geographical, hierarchical and domain based network view
- ◆ Point & click wizard based provisioning
- ◆ Inventory Management
- ◆ Service profile management
- ◆ Configuration Management:
 - Creation, deletion, update, and viewing of the managed network topology data
 - Provision/Unprovision services on any NE
 - Restart NEs, cards and ports
 - Creation/Deletion of NEs into/from the NE management domain
 - NE equipment configuration, including equipment protection to cards and ports
 - Activating / Deactivating / Forcing / Locking protection switching
 - Error detection thresholds
 - Ethernet bandwidth management
- ◆ Performance monitoring
- ◆ Alarm and event monitoring
- ◆ Security management
- ◆ Software image download
- ◆ Database backup and restore
- ◆ Loopback Management
- ◆ Diagnostic Management



Left: AEMS ONT Configuration Screen ; Right: AEMS ONT Service Screen

Applications

The AEMS is a full featured Element Management System that is used to provision, configure and manage Alphion's portfolio of FTTx products.

Scalable Architecture

The AEMS is based on a J2EE three tier architecture with customized functions running on Solaris 10 or Linux.

Flexible Management

AEMS provides a graphical, geographical, hierarchical, and domain based view of the AOLT-4000 series based and AOLT-4200 series based network elements (NEs) and the interconnecting links. The visual maps display the NEs and the links in different colors depending on their status, with green indicating healthy status, amber/yellow indicating degraded condition, and red indicating a critical alarm condition. AEMS' network view facilitates simplified configuration, fault, and performance management by allowing the operator to zoom in from a domain, sub-network or ring level down to a port in one of the cards in a NE.

Comprehensive Network Monitoring

AEMS auto-discovers and notifies in real time the insertion and removal of any physical card in an NE or of an ONU/ONT to FTTx network. It also reports the usage of card resources and keeps track of network inventory, reporting changes in chronological order.

Complete GPON FTTx Network Management Solution

AEMS supports service provisioning, equipment provisioning, connection provisioning, and NE software image download, as per ITU-T G.984.x.

SPECIFICATIONS

Fault Management

AEMS supports fault management functions as described in the ITU-T G.984.x standards to isolate Faults at port level, card level and equipment level and include:

- ◆ Colour coding of alarms
- ◆ Performs persistency checks automatically on a received alarm clear notification, before reporting a failure or restoration event to the operator
- ◆ All failure and restore events are time-stamped
- ◆ AEMS supports alarm correlation (filtering and suppression) to avoid multiple alarms from a single, common source of failure
- ◆ Intuitive, real-time graphical display and processing of alarms, with the type, occurrence, severity, probable cause and clearing information
- ◆ Real-time visual display of NEs' status
- ◆ Popup window / audible support
- ◆ Alarm trouble ticketing support

Alarm and Event Surveillance

AEMS allows monitoring the health of any card in a NE in an Alphion GPON access network, with a settable periodicity of a day, week, or a month. AEMS alarm and event surveillance functions include:

- ◆ Archival of alarms (including path alarms) and status, with the type, occurrence, severity, probable cause and clearing information
- ◆ Assignment of alarm severity
- ◆ Archival of historical alarms for a minimum of 30 days
- ◆ On-line logging of historical alarms and events, with alarm/event type, alarm severity, day and time of occurrence information
- ◆ Alarm filtering/search capabilities for historical alarms and events

Performance Monitoring

AEMS supports performance management functions in accordance with ITU-T G.984.x standards for GPON and RFC 2544 for Ethernet interfaces and include:

- ◆ Scheduled performance data collection / logging at configurable launch time & rate
- ◆ Configuration of error counter thresholds
- ◆ Ethernet statistics (FCS errors, dropped frames, etc.)
- ◆ Flexible archival, reporting, and transferring of performance data
- ◆ Archive performance data for a month
- ◆ On-demand and automated, periodic reporting (including daily, weekly, and monthly) of performance data

Calendar Management

AEMS can schedule administrative operations to be performed repeatedly at a particular time of day. These operations can include NE configuration backup, software image download, performance data retrieval, operator login/logout attempts diagnostics, etc.

NE Software Management

- ◆ Loading of new NE software images (both upgrade and downgrade).
- ◆ Management of multiple versions of NE software on the same network
- ◆ Management of multiple software image versions on the same NE (e.g. active and standby images)
- ◆ Installation of software updates
- ◆ Software download status reporting Administrator authorization for the loading of NE
- ◆ Software from local or remote operator terminals

Database Management

- ◆ Support for a multi-user accessible database server, with a minimum of 25 concurrent users (including local and remote terminals)
- ◆ Database management software supports system data, software version, and database backup

Security

- ◆ SSL based secured communication
- ◆ Secure certificate and RADIUS/TACACS+ based access, with customizable user and profile based authorization
- ◆ Privileged operations requires a login password
- ◆ Reporting of all login and logout attempts in a security log file
- ◆ Domain level security

Fault Tolerance

- ◆ Dual homed connectivity to two gateway NEs (GNEs) of a sub network ensures EMS connectivity on the failure of the CTL control card of one of the NEs
- ◆ No deterioration in existing services on total loss of EMS connectivity; On restoration of AEMS connectivity, AEMS will "sync up" with the control cards, which can hold up to 6,400 performance and fault events, with a minimum of 100 alarms
- ◆ On total loss of AEMS connectivity, LCT privilege remains for monitoring and local configurations
- ◆ Supports a disaster recovery EMS server and its interconnection to an existing server, and operator ability to switch over between them
- ◆ Supports diagnostics software to trouble-shoot EMS faults

Southbound Interface

- ◆ SNMP v1/v2c/v3 interface on the Southbound interface to communicate with the AOLT-4000 series and AOLT-4200 series of Alphion OLTs.

Northbound Interface

- ◆ Northbound CORBA / XML based interface

Reports

- ◆ Customized traffic performance/Inventory/Alarm reports

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