

Release Notes

Version 6.6



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Notice

This document describes the new features and known issues in Version 6.6 of the AudioCodes' Element Management System (EMS).

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Note: The Element Management System supports the following products:

1. Mediant 8000 Media Gateway and E-SBC
2. Mediant 5000 Media Gateway and E-SBC
3. Mediant 4000 E-SBC
4. Mediant 3000
5. Mediant 2600 E-SBC
6. Mediant 2000
7. Mediant 1000
8. Mediant 1000 Gateway and E-SBC
9. Mediant 1000 MSBG
10. Mediant 850 MSBG
11. Mediant 800 MSBG
12. Mediant 800 Gateway and E-SBC
13. Mediant 600 Media Gateway
14. MediaPack Media Gateways MP-112 (FXS), MP-114 (FXS and FXO), MP-118 (FXS and FXO), MP-124 (FXS).

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Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used.

Document Revision Record

LTRT	Description
90529	Initial document release for Version 6.6.
90534	Correction for SEM monitored devices; the Mediant 3000 can only be monitored for SIP gateways.

Documentation Feedback

AudioCodes continually strives to produce high quality documentation. If you have any comments (suggestions or errors) regarding this document, please fill out the Documentation Feedback form on our Web site at <http://www.audiocodes.com/downloads>.

Related Documentation

Manual Name
Mediant 600 and 1000 SIP User's Manual
Mediant 800 Gateway and E-SBC SIP User's Manual
Mediant 800 MSBR SIP User's Manual
Mediant 850 MSBR SIP User's Manual
Mediant 1000 Gateway and E-SBC User's Manual
Mediant 1000B MSBR User's Manual
Mediant 2000 SIP User's Manual
Mediant 2600 E-SBC User's Manual
Mediant 3000 SIP User's Manual
MGCP-MEGACO Product Reference Manual
Mediant 4000 E-SBC User's Manual
MediaPack User's Manual
Element Management System (EMS) Server Installation, Operation and Maintenance Manual
Element Management System (EMS) Product Description
Element Management System (EMS) OAMP Integration Guide
Element Management System (EMS) User's Manual
Element Management System (EMS) Online Help
Mediant 5000 / 8000 Media Gateway Installation, Operation and Maintenance Manual
Mediant 5000 / 8000 Media Gateway Release Notes
Mediant 5000 / 8000 Media Gateway Programmer's User Manual
Mediant 3000 TP-8410 OAM Guide
Mediant 3000 TP-6310 OAM Guide
Mediant 2000 OAM Guide
Mediant 1000 E-SBC OAM Guide
Mediant 1000 MSBG OAM Guide
Mediant 800 E-SBC OAM Guide
Mediant 800 MSBG OAM Guide
Mediant 600 OAM Guide

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1 Managed VoIP Equipment

1.1 Managed Devices for all EMS Server Versions

The following products (**bold** font indicates new products / versions) are managed by the EMS:

- Mediant 8000 Media Gateway (MEGACO & SIP): versions **6.6**, 6.2
- Mediant 5000 Media Gateway (MEGACO & SIP): versions **6.6**, 6.2
- Mediant 4000 E-SBC (SIP): version **6.6**
- Mediant 3000 Media Gateways (MEGACO & SIP): versions **6.6**, 6.4, 6.2
- Mediant 2600 E-SBC (SIP): version **6.6**
- Mediant 2000 Media Gateways (SIP): versions **6.6**, 6.4, 6.2
- Mediant 1000 (SIP), Mediant 1000 Gateway and E-SBC (SIP) and Mediant 1000 MSBG (SIP): versions **6.6**, 6.4, 6.2
- Mediant 850 (SIP): version **6.6**
- Mediant 800 Gateway and E-SBC (SIP) and Mediant 800 MSBG (SIP): versions **6.6**, 6.4, 6.2
- Mediant 600 (SIP): versions 6.4, 6.2
- MediaPack 11x Media Gateways (SIP): versions **6.6**, 6.2

1.2 SEM Monitored Devices

The following lists the devices monitored by the SEM:

- Mediant 4000 E-SBC
- Mediant 3000 Media Gateways (SIP gateways only)
- Mediant 2600 E-SBC
- Mediant 2000 Media Gateways
- Mediant 1000, Mediant 1000 Gateway and E-SBC and Mediant 1000 MSBG
- Mediant 850 MSBG
- Mediant 800 Gateway and E-SBC and Mediant 800 MSBG
- MediaPack 11x Media Gateways

Note that all the devices monitored by the SEM should be version 6.6.

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2 New Features in EMS Version 6.6

2.1 General

2.1.1 Virtualized EMS Server

In this version, the EMS server, in addition to the regular installation, is delivered as virtual appliance (VMware vSphere Hypervisor™ (ESXi) on the VMware Virtual Servers. The following configurations are supported:

- Entry level
- Standard
- Large configuration

The difference between the above configurations relates to storage capacity.

The virtual environment allows the IT manager, carriers and all EMS customers to minimize dedicated hardware per application usage, and consequently lead to IT maintenance cost savings.

2.1.2 Syslog Server Running on the EMS Server

Syslog from all managed machines can now be logged directly to the EMS server without the need for a 3rd party Syslog server in the same local network.

The EMS Server Manager is used to enable this feature. In addition, the user should configure the device that they wish to monitor to send syslog messages toward the standard syslog port (UDP 514) on the EMS server machine.

The syslog log file 'syslog' is located in the following EMS server directory:

```
'/opt/ACEMS/NBIF/mgDebug/syslog'
```

The syslog file is automatically rotated once a week, where up to four files are stored. The oldest file is purged once a week.

2.1.3 Debug Recording Collection on the EMS Server

Debug recordings packets from all managed machines can now be logged directly to the EMS server without the need for a 3rd party network sniffer in the same local network.

The EMS server runs the Wireshark network sniffer, which listens on a particular configured port. The sniffer records the packets to a network capture file in the Debug Recording (DR) directory.

The EMS Server Manager is used to enable this feature. The user should configure the device to send its debug record messages to a specific port (UDP 925) on the EMS server IP.

The DR capture file is located in the following EMS server directory:

`/opt/ACEMS/NBIF/mgDebug/DebugRecording'`

The file 'TPDebugRec<DATE>.cap' is saved for each session. The user is responsible for closing (stopping) each debug recording session. In any case, each session (file) is limited to 10MB or one hour of recording (the first rule which is met causes the file to close i.e. if the file reaches 10MB in less than an hour of recording, it is closed). A cleanup process is run daily, deleting capture files that are 5 days old.

The user is able to retrieve this file from the EMS server and open it locally on their own PC using Wireshark with the debug recording plug-in installed (Wireshark version 1.6.2 supports the Debug Recording plug-in).

2.2 Configuration, Management and Maintenance

2.2.1 PSTN – D Channel Switch Activity

The EMS now indicates D-Channel (DS0) status, which directly affects the overall Trunk (DS1) status. As a consequence, this version includes the following:

- The 'D-Channel Status' field has been added to the existing trunks table.
- The 'NFAS Group Status' status table has been added to the PSTN navigation folder. This table displays a summary for each NFAS group of the primary and secondary D channels trunks and each channels respective activity status. A new action 'Switch D-channel activity' is implemented per NFAS group.
- Trunk status color coding has been extended with a new color 'orange', which represents the NFAS Alarm.

2.2.2 PSTN - Reset B-Channel

A new user action enables you to reset the selected B-channel for each one of the trunks (DS1).

2.2.3 Mediant 1000 – New Module Support

A new module 'SWX' is now supported on Mediant 1000 devices. This module includes four Ethernet ports.

2.2.4 Extensions in Voice Quality Rules Provisioning

Extension in Voice Quality Rules enables monitoring of the remote side (Caller and Callee legs) metrics.

2.2.5 SIP Enhancements

This release includes various SIP enhancements (for more information, see the relevant *SIP Release Notes* document and the relevant *OAM Guides*).

2.3 Security Management

2.3.1 EMS Users Permissions per Region

This feature enables you to set different user permissions for different regions. This feature has been implemented for Enterprise and Service provider environments who need to allow specific users to view only a subset of the sites, as well as to provide them with different security level per sites (regions).

In addition to the existing security levels– ‘Super Admin’, ‘Admin’, ‘Operator’ and ‘Monitor’, a new level – ‘Not Visible’ has been added. This level allows you to filter views for EMS users with ‘Operator’ and ‘Monitor’ privileges according to sites.

For example, an ITSP may have an EMS server installation that can manage multiple clients; where each client is assigned a separate region or alternatively a specific ITSP customer with global operations may wish to secure EMS information confidentially for each corporate region i.e. North West, North East and South.

You can configure regions when performing ‘Add Region’ or ‘Add User’ operations, or at any time using one of the following screens: ‘Users List’, ‘Region Details’ or ‘User Details’.

2.4 SEM (Session Experience Manager) Features

2.4.1 Monitoring Links

A link is defined as the communication path between two devices. The purpose of the link is to measure and display the key metrics for all calls made on a specific link path. Links between these two devices can be defined according to one of the following criteria:

- IP Group
- Trunk Group
- Phone Number
- SIP IP address

The 'source' device (based upon which key metrics are monitored) must be an AudioCodes device. The second device can be either an AudioCodes or non-AudioCodes device that is defined by the user (see below). The user can define one or more links between each device.

Only links explicitly defined by the users are displayed in the Network Map view. Each device and link status is displayed as 'Red' or 'Green'.

The device/link is 'Red' if one or more of the following criteria is met:

- Failed Calls threshold is reached (default = 10%)
- Poor Calls Quality threshold is reached (default = 5%)

The user can define third-party non-AudioCodes devices on the Network Map view. These devices are not directly monitored by the SEM application; however, they assist the user to view all the relevant devices in the VoIP network and to monitor links with AudioCodes devices. The most commonly used non-AudioCodes devices are the Microsoft Lync Server 2010, an IP PBX, an ITSP or routers. For example, the SEM module can calculate the call quality for the link defined between the AudioCodes devices and Microsoft Lync Server 2010 devices to identify poor call quality patterns. Non-AudioCodes devices are defined by name and IP address.

2.4.2 Reports

The Report view has been added in version 6.6. It's divided into three rubrics which allow the user to focus on different aspects of the call analysis:

- **Network Status** – displays a summary analysis of key call metrics during a specified time period with a separate row entry for each device/link. The main purpose of these reports is to perform a high level comparison between various objects. For example, the 'Calls Statistics by Device' report summarizes for selected devices/links, the total percentage of successful and failed calls and metrics such as 'Number Of Calls' and 'Calls Quality'. Alternatively, the 'Call Quality per Device' report summarizes the key metrics affecting Voice Quality, such as 'Jitter', 'Delay' and 'Packet Loss'.
- **Trends** – displays the 'over time' behavior (monitored for a specific device/link over specified time intervals) where the same call metrics (described above) are displayed. For example, the 'Calls Trend by Device' report displays the 'Number of Calls', 'ASR' and 'Total Duration' in hourly intervals.
- **Top Users** – includes a list of users sorted according to one of the following metrics: 'Number Of Calls'; 'Calls Duration' and 'Users Who Experienced Most Poor Quality Calls' (based on specific metrics).

Below is a list of generic report features available for each one of the above reports:

- **Filters:** user can define the exact subset of objects relevant for the specific report (devices / links), the exact report time period and for trend reports, the time interval.
- **Data graphical representation:** by default, SEM displays on the graph, one of the report metrics (predefined in the SEM application). The user can show graphical representation for additional table columns as well as view graphs either vertically (one under another) or horizontally.
- **Table view:** add/remove columns. Each report shows the default number of columns (predefined by the SEM application). In most of the reports, there are lists of additional columns which are also available for display. The user can add or remove columns to each report.
- **Table:** footer line is represented in the bottom of the table and includes the summary of each one of the columns. For countable objects it includes the summary of all the rows, for average values it includes the average of all the rows, and corresponding minimum, maximum and percentage.
- **Search:** user can use 'Search' option to search for any string. When the requested string is found, it is marked in the report.
- **Save as PDF:** enable the user to create a PDF file including all the user current selections: filters, columns, graphs, etc.

2.4.3 Threshold Based Alerts

Threshold based alerts are an ideal network operator tool for automatic quality analysis. SEM alerts help to avoid false alarms when defining the appropriate minimal number of calls and criteria thresholds.

Threshold based alerts are generated as a result of the SEM application data analysis. Alerts are raised and cleared based upon user-defined policies and rules. The alerts are displayed in the 'Alarms' view as regular alarms.

Rules are provisioned according to the following:

- **Rule scope** – the object scope of the alert criteria. The user can select all the devices / links, or a specific device / link, or choose a set of the devices/links in each rule (default – all the objects: devices or links).
- **Rule frequency (min)** – how often the tool runs (default - 15 min).
- **Rule time window (min)** – the backlog time period that data is analyzed (default – 60 min).
- **Minimal Calls number for analysis (#)** – the minimum number of calls required for analysis; if the number of calls during the selected time period was lower than the provisioned number of calls, SEM does not perform the data analysis (default – 50 calls).
- **Alert criteria and its thresholds** – the key metrics that are measured during the analysis. The table below summarizes the supported criteria's and default threshold values.

#	Criteria	Critical Threshold	Major Threshold
1	Failed Calls %	5	3
2	Poor Quality Calls (Red Color) %	10	8
3	Average Call Duration (sec)	5	10

For example, given the following:

- Scope = Device (default)
- Frequency = 15 min (default)
- Time window = 60 minutes
- Minimal Calls # = 50
- Criteria Definitions and thresholds table: default settings.

Every 15 minutes, the 'SEM Quality Analysis' performs the following checks:

- Check the number of calls for each device in the past hour (60 min).
- For signaling links upon which the number of calls was greater than 50, the following statistics are collected and compared to the policy criteria and thresholds:
 - Percentage of failed / successful calls
 - Percentage of poor quality calls ('Red' calls)
 - Average call duration (sec)

2.4.4 New Call Types Support: Gateway

The following lists the supported call types in the current version:

- SBC and IP2IP calls: the call is composed of two legs (both of IP type)
- Gateway calls:
 - ISDN, CAS, Transparent calls; one of the legs is IP, and the second side is PSTN
 - FXO, FXS, EANDM calls; one of the legs is IP, and the second side is Analog
 - TEST calls; one of the legs is IP, and the second side is Test

2.4.5 Voice Quality Parameters Extensions

2.4.5.1 Call Color and Cause Parameter

The SEM module assigns one of the following color grades to represent each call leg and an overall quality of the call:

- 'Red' indicates 'poor' call quality
- 'Yellow' indicates 'fair' call quality
- 'Green' indicates 'good' call quality

The call quality rating is based on the calculations for the following metrics:

- MOS
- Jitter
- Packet Loss
- Delay
- Echo

These metrics are monitored at the following call legs:

- Caller side device
- Caller side end-user
- Callee side device
- Callee side end-user

At the end of each call, the call quality assessment is reached based on the worst voice quality that is measured at one of the call legs.

After the problematic call leg is identified, the specific monitored parameter which caused the call quality degradation is traced and identified as a Cause.

Details of the call quality assessment are displayed in the Calls view (see Section "Calls and Call Details View Updates" below).

2.4.5.2 Calls and Call Details View Updates

The Calls table indicates the color rating of the call in the 'Call Quality' column, the 'Cause' column specifies the name of the monitored parameter that caused the degradation in call quality, and the 'Caller' and 'Callee' columns indicate the relevant associated user.

In the Call Details screen, the specific monitored parameter which caused the call quality degradation is displayed in 'Red' or 'Yellow' (see explanation above).

The Call Details screen 'Trend' tab includes trend graphs displaying all four monitored call legs (described above) as well as all monitored metrics. All monitored call legs and metrics are updated on-the-fly during the call.

2.4.6 Context Linking Network and Statistics Views to Calls View

The Network and Statistics views graphs now include context links to the Calls view.

For example, in the Network view, when the user clicks on the 'red' segment of the 'Quality Statistics' pie-chart, the list of the poor quality calls is displayed in the Calls view. Alternatively, in the Statistics view, when the user clicks on the failed calls segment (for a specific time frame) in the 'Success/Failed Calls' bar chart, the list of failed calls for the corresponding time frame is displayed in the Calls view.

2.4.7 Calls List Filters

The Calls view includes the following new filters for rapid and focused search:

- Call Status filter: Success / Failed calls
- Quality Filters: Poor / Fair / Good / Unknown
- Cause: MOS / Jitter / Packet loss / Delay / Echo
- Monitoring Endpoint Type: SBC, IP2IP, FXS, FXO, etc.
- Exact Termination Reasons type

The user can enable one or more filters simultaneously.

2.4.8 Network Views

The following network tree views are now supported:

- **Table View** (the default) – displays a list of all the monitored devices (or links) with a summary of the most important metrics.
- **Map view** – displays a map of devices and links with color coded status summary.
- **Regions View** – displays a list of devices according to the regions.

3 New Features in EMS Version 6.4

3.1 Managed 6.4 Devices and Control Protocols

Product / Control Protocol	MEGACO	SIP
Mediant 3000, TP-8410 & TP-6310	✓	✓
Mediant 2000	×	✓
Mediant 1000, Mediant 1000 ESBC & Mediant 1000 MSBG	×	✓
Mediant 800 ESBC and Mediant 800 MSBG	×	✓
Mediant 600	×	✓

3.2 Session Experience Manager (SEM)

The SEM is a valuable new tool that delivers important technical and business statistics, based on AudioCodes methodologies, developed over years of VoIP experience.

The tool enables VoIP network managers to do the following:

1. Rapidly identify the metric or metrics responsible for degradation in the quality of any VoIP call made over the network.
2. Accurately diagnose and troubleshoot quality problems in response to VoIP user criticism.
3. Proactively prevent VoIP quality degradation and optimize quality of experience for VoIP users.

The SEM provides a real-time, as well as an historical monitoring and VoIP network health model.

Examples of critical call quality metrics that are calculated by the SEM include the following:

- **Mean Opinion Score (MOS)** (specified by ITU-T recommendation P.800) scored by SEM-tested calls on a quality scale of 'Good' to 'Failed'.
- **Jitter**, resulting from uneven delays between received voice packets. To space voice packets evenly, the jitter buffer adds delay. The SEM calculates the degradation impact of the jitter buffer's delay on audio quality. To achieve smoother playback in congested networks, VoIP network managers can prioritize traffic.
- **Delay** (or latency) is the SEM-calculated time it takes for information to travel from source to destination. Sources of delay include voice encoding / decoding, link bandwidth and jitter buffer depth.
- **Packet Loss**, resulting in choppy voice transmissions. Lost packets are RTP packets that are not received by the voice endpoint for processing. This occurs when networks are congested with heavy traffic.

Each metric's default is defined at the device level. Users can customize default values per device media realm entity using EMS provisioning functionality.

The SEM module is accessed from the EMS client toolbar. In this version, the SEM module supports SBC and IP2IP call monitoring for the following products: Mediant 3000, Mediant 1000, and Mediant 800. All SEM information is stored in the EMS database.

3.2.1 SEM Module Views

The SEM features the following main views:

- Network. See Section 3.2.1.1 on page 20.
- Statistics. See Section 3.2.1.2 on page 21.
- Call List. See Section 3.2.1.3 on page 21.
- Alarms. See Section 3.2.1.4 on page 22.

In each view, users can filter the information displayed using Date and Device filters. After filtering, the filter remains unchanged for all SEM views until the next time the information is re-filtered.

All SEM tables can be sorted by any column.

The Network, Call List and Alarms views includes a search field, which enables users to search for specific information relevant to the active view. For example, in the Network view, you can search for a specific device.

3.2.1.1 Network

Network view features:

- **Map** view option displays a graphic representation of devices in the network. Selected devices are blue color-coded; filtered-out devices are grayed. Each device's call quality metrics are shown in a color-coded bar on the device icon's left side. In addition, a popup showing Average MOS, Jitter, Delay, Packet Loss and # of Calls pops up, when the mouse is pointed over a device icon.
- **Table** view option lists devices and voice metrics in a table. The table summarizes Number of Calls, Average MOS, Jitter, Delay and Packet Loss, per device.
- **Call Performance** pane shows the distribution of successful / failed calls over a timeline. Two chart options are available: **Line** chart and **Bar** chart.
- **Quality Statistics** pane shows a color-coded pie chart of the percentage of calls whose quality was Good, Fair and Failed. This pane also indicates the number of calls in each quality category and each category's percentage of calls of the total percentage of calls made.
- **Alarms** pane lists the names of the most recently active alarms, each alarm's Severity level (color-coded), the Time it was received, and the name of the device triggering it.
- **Filtering**, using an advanced 'Search' field enables users to search for a device according to its Name.

3.2.1.2 Statistics

Statistics view features:

- **Call Performance** chart shows average success rate (ASR) of calls over time, and an adjacent pane showing **Top Fail Reasons**.
- **Call Quality** bar chart shows the rate of each quality category (Good, Fair and Failed) over time. This chart also displays the distribution of the quality metrics MOS, Jitter, Delay and Packet Loss over time. An adjacent **Quality Statistics** pane presents a color-coded pie chart, showing the percentage of calls whose quality was Good, Fair and Failed, and the total number of calls in each quality category.
- **Utilization Distribution** bar chart shows the counts and distribution of the Received / Transmitted Octets and Packets over time, and an adjacent pane showing a table summarizing average network utilization.

3.2.1.3 Call List

The **Call List** view features the following components:

- A Call List summary and detailed information on each call, for both Caller and Callee sides, including:
 1. **Call Quality:** The following metrics are displayed: MOS LQ, MOS CQ, Jitter (msec), Packet Loss (%), Round Trip Delay (msec), Signal Level (dBm), Noise Level (dBm), Signal To Noise Ratio (SNR) (db), RERL (db), burst Duration (msec), GAP Density (msec) and Discard Rate, for both Local (VoIP device side) and Remote (user side).
 2. **Control Info:** The following metrics are displayed: Source and Destination SIP IP, SIP Port and URIs, as well as the Control Protocol logical entities involved in the call, such as SRD, IP Group, SIP Interface, Proxy Set ID and IP Profile ID. This component also shows Call Transport Type and Signaling DiffServ.
 3. **Media Info:** The following metrics are displayed: Media Source and Destination SIP IP and Ports. Media-related logical entities involved in the call: Media REALM and Network Interface. Media information: RTP and RTCP Directions, Coder, Packetization Time (PTime), Silence Compression, capacity of media data transferred during the call: RX / TX Octets and Packets per second.
 4. **Trend:** Six pre-defined linear graphs showing call behavior over time based on events sent by the VoIP device. Each graph shows two lines: Caller and Callee. Each supports the following metrics: Call Quality, MOS_CQ, MOS_LQ, Packet Loss, Delay and Jitter.
 5. **Alarms:** List of alarms received from the relevant equipment during the specific call. Alarms can be sorted by column, helping users to quickly isolate a specific alarm. A 'Search' field enables the listing of specific alarms; postmortem analysis of any faulty or problematic call can be speedily performed.

3.2.1.3.1 Filtering

The Call List view features the following filtering options:

- **Advanced Filtering:** Using an advanced 'Search' field, users can display calls for example, for a specific Endpoint Type (SBC, IP2IP, etc.) or for a specific Media Type (Voice or Data) by entering the criterion in the field.
- **Multiple filtering:** Enables users to filter calls according to best/worst quality, based on metrics, such as Call Duration, MOS LQ (Caller/Callee), MOS CQ (Caller/Callee), Jitter (Caller/Callee), Packet Loss (Caller/Callee) and Delay (Caller/Callee).

3.2.1.4 Alarms

Two table view options are available in Alarms view: Active and History Alarms.

Both of these views feature the following:

- Filtering according to alarm Severity, enabling users to quickly isolate the most severe alarms.
- Filtering using an advanced 'Search' field criterion according to a user-defined text string. Clicking on the alarm opens a row displaying the alarm properties, including Alarm Category; Probable Cause; GW IP and GW Port and SNMP OID.

3.3 General

3.3.1 Globe and Region Levels - Performance Monitoring Graphical Enhancements

The graphical auto-refreshable summary screen consists of the following panes:

- The upper pane summarizes the following:
 - **Globe Level** - Alarm severity and connection status of all devices managed by the EMS server, categorized according to regions (each region is represented by a bar chart that is divided according to alarm severity and connection statuses).
 - **Region Level** - Alarm severity and connection status of all devices loaded to a specific region categorized according to the device product (each device product is represented by a bar chart that is divided according to alarm severity and connection statuses).

In addition to the devices alarm severity, the device status is represented with the following states: Locked, Not Connected and Mismatch State.

When devices cannot be categorized into one of the above states, they are collectively represented as a separate bar graph with the label 'Unknown'.

- The lower pane consists of the following tabs:
 - **Redundancy status of the TP boards (TP Boards tab)**: Distribution between the Active and Redundant boards for all the devices in the corresponding level (globe or region). This view consists of three pie charts: TP-1610, TP-6310 and TP-8410 boards respectively (in the Mediant 2000, 3000, Mediant 5000 or Mediant 8000 chassis). The TP boards are categorized according to one of the following protection types: Not Protected, Hot, Warm, and Redundant.
 - **Interface types of the CPE devices (CPEs tab)**: Distribution of modules for the Mediant 600, Mediant 800, Mediant 800 MSBG, Mediant 1000 and Mediant 1000 MSBG devices (Digital, Analog, BRI, IPmedia) and channels status distribution – on hook / off hook. This view consists of two pie charts; one for the module distribution and another for the channels status distribution.

3.3.2 Region View – GWs Table - New Column

New column 'TPs #' has been added to the 'Nodes Table' at the Region level. This column includes the total number of TP boards (active and redundant) defined for the Mediant 5000 and Mediant 8000 devices. It allows the user to view the entire region capacity in a single screen.

3.3.3 Search MG Extensions

New search criteria have been added to the 'Search MG' tool. The user can now search according to Board or Module type. For example, search for all the TP-6310 boards in the Mediant 3000, Mediant 5000, Mediant 8000 devices, or for the 'FXO' module in the Mediant 800 or Mediant 800 MSBG, Mediant1000 or Mediant 1000 MSBG devices.

3.3.4 Managed Gateways Tree – Save Sorting Order

When sorting Regions / Devices in the MG Tree, the sorted MG tree is saved by the EMS application, enabling the user to return to the same view.

3.3.5 EMS Server Features

3.3.5.1 SSH Configuration

An SSH Configuration Manager option has been added to the EMS Server Manager. This option enables the convenient configuration of EMS Server SSH connectivity. It includes options to configure SSH banner, SSH log level and SSH Allowed hosts.

For the full list of the options, see the *EMS Server IOM Guide*.

3.3.5.2 Change Server Hostname

A new option 'Change Server Hostname' has been added to the EMS Server Manager. The command is located under the 'Change Server's IP Address' menu.

3.3.5.3 Improvements of Linux OS security

The Linux Operating System security can be improved by performing minor modifications to the TCP/IP implementation. For example, the following new security options have been added to the 'EMS Server Manager > Security > Network Settings' menu:

- 'Log Martians':
Log and drop 'Martian' packets. A 'Martian' packet is a packet where the host does not have a route back to the source IP address. These days most hosts have a default route, implying that such Martian packets do not exist; however for additional assurance, it's recommended to enable this parameter.
- 'Ignore ICMP' and 'Ignore Broadcasts'
'Ignore ICMP' and 'Ignore Broadcast' options disable ICMP broadcast echo activity. It prevents the EMS server undergoing a 'Smurf attack'.

By default, all the above options are disabled.

For the full list of the new options, see the *EMS Server IOM Guide*.

3.3.5.4 Operating System Users Security Extensions

Operating system passwords have been extended with an option to provision the following additional security options:

- The parameter 'Maximum allowed number of simultaneous open sessions' defines the maximum number of simultaneous sessions that can be opened by the user. Default value – not limited.
- The parameter 'Days of inactivity before a user is locked (days)' defines the number of days that a user can be inactive before his account is blocked. Default value – not limited.

3.3.5.5 Scheduled Backup Extensions

The existing EMS server scheduled backup has been extended with the following new options:

- Enable weekly or daily backups with the exact specification according to day, hour and minutes (until now, only weekly backup was supported).
- Extend the number of backup files to be saved. Default – 1 backup. It is possible to provision up to three separate backup files (in the previous version, only one backup file could be stored).
- Extend backup file name with <Date> suffix to enable easier file management.

3.3.5.6 EMS Server Disk Mirroring (RAID 1) on Netra T5220

The Netra T5220 server's on-board SAS controller can configure up to two RAID volumes. The *EMS server IOM* manual details the procedure for the configuration of RAID 1 (mirroring).

Disk mirroring (RAID 1) is a technique that uses data redundancy; two complete copies of all data stored on two separate disks, to protect against loss of data due to disk failure. One logical volume is duplicated on two separate physical disks. Whenever the operating system needs to write to a mirrored volume, both disks are updated. The disks are maintained in real-time with identical information. When the operating system needs to read from the mirrored volume, the OS reads from whichever disk is more readily accessible at the time. This functionality can result in enhanced performance for read operations.

3.4 Configuration, Management and Maintenance

3.4.1 Mediant 800 MSBG - Power over Ethernet Support

This feature provides support for configuring Power over Ethernet (PoE). PoE provides power on the Ethernet lines through all the device's LAN ports.

This EMS feature allows the user to view the status of Ethernet ports, including PoE provisioning. In addition, the user can perform the following PoE configuration:

- Enable or disable PoE on per port basis (PoE is enabled on all ports upon device startup – by default).
- Define the maximum port power consumption (up to 15.4W) – should be used when plugged-in client is detected to be of class 0.

3.4.2 Mediant 800 – 'E and M' Module Support

New 'E and M' (earth and magneto, or ear and mouth) signaling interface endpoints can be configured for the new Mediant 800 module.

Status and endpoints have now been added to the Mediant 800 status screen for this new module. The corresponding provisioning parameters have also been added to the relevant provisioning screens.

3.4.3 Provisioning Navigation Changes

The root navigation level for all the SIP related parameters for the Mediant 800, Mediant 800 MSBG, Mediant 1000, Mediant 1000 MSBG and Mediant 3000 devices is now based on the SIP application types. The *EMS User's Manual* describes the new navigation paths to all the provisioning screens for all the supported products.

3.4.4 New Options for INI file Download

To support INI file download to a device prior to software version download, an additional option has been provided to eliminate the process of validating the INI file with the device's existing configuration (prior to software upgrade). The INI file download process has been enhanced with the following options:

1. Full Configuration INI file download– with validation and apply (recommended).
2. Full Configuration INI file download– without validation and apply (for software upgrade).
3. Incremental INI file download (previous configuration remains).

3.4.5 Configuration Data file Download and Upload Support

A new configuration file 'Configuration Data' is used to store the Data related (router) configuration for the Mediant 800 MSBG and Mediant1000 MSBG devices. In EMS V.6.4 this file can be downloaded to these specified devices or uploaded from them by the EMS application.

3.5 Performance Management

3.5.1 Real-Time Performance Monitoring – Pre-defined Graphs

The Performance Monitoring Desktop automatically displays a pre-defined real-time graph showing the progress of key parameters. The user can close the pre-defined graph, and / or open and configure additional real-time performance monitoring windows.

For each one of the managed devices and for each navigation level, there is a different set of pre-defined parameters selected and displayed to the user.

3.6 Security Management

3.6.1 Integration with CAC Card

The EMS Application can now use the Common Access Card (CAC) as an alternative method for logging into the EMS client.

The Common Access Card (CAC) is a United States Department of Defense (DoD) smart card issued as standard identification for active-duty military personnel, reserve personnel, civilian employees, other non-DoD government employees, state employees of the National Guard and eligible contractor personnel.

The CAC is used as a general identification card as well as for authentication to enable access to DoD computers, networks, and specific DoD facilities. It also serves as an identification card under the Geneva Conventions. The CAC enables the encryption and cryptographic signing or authentication and authorization, thereby facilitating the use of PKI authentication tools, and establishing an authoritative process for the use of identity credentials.

DoD PCs have a smartcard reader device installed, which is accompanied by the corresponding software kit that provides PKCS#11 compliant access to the smartcard reader.

The EMS application uses data from the CAC card, inserted into the smart card reader on a client PC where the EMS client is run, to perform the following main functions:

1. Authentication (i.e. determines EMS username)
2. Authorization (i.e. determines EMS user privilege level)
3. Encryption (i.e. use the X.509 certificate from the CAC card to establish a TLS connection between the EMS client and the EMS server).

In the EMS login screen, a new checkbox 'CAC PIN Number' is added, when selected, displays a field to enter the CAC PIN number to login to the EMS client, instead of entering the EMS username and password.

3.6.2 Operator Password Expiration Extension

A new option to extend the number of logins after the user password has expired, has been added to the EMS Users definitions. When enabled, the user can login to the EMS application during a 'pre-defined number of days' and 'days and login attempts', after his password has expired (without changing his password).

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4 New Features in EMS Version 6.2

4.1 Managed Gateways and Control Protocol (Version 6.2)

Product / Control Protocol	MGCP	MEGACO	SIP
Mediant 8000	✓	✓	✓
Mediant 5000	✓	✓	✓
Mediant 3000, TP-8410	✓	✓	✓
Mediant 3000, TP-6310	✓	✓	✓
Mediant 2000	×	×	✓
Mediant 1000, Mediant 1000 MSBG	×	×	✓
Mediant 600	×	×	✓
Mediant-800 MSBG	×	×	✓
MediaPack 11x, 124	×	×	✓

4.2 General

4.2.1 EMS Server Installation

4.2.1.1 EMS Server Installation Improvements

A new faster and automated EMS server installation process (clean install and upgrade) has been implemented.

The new process supports both the Solaris and Linux platforms and is divided into four separate components, each component supplied as a separate DVD:

- OS installation: OS installation DVD; separate DVDs for both Linux and Solaris.
- Oracle Installation: Oracle installation DVD for both Linux and Solaris platforms.
- EMS Application: EMS server installation DVD for both the Linux and Solaris platforms.
- EMS Server Patches: Upgrade patches DVD containing OS (Linux and Solaris) patches, Oracle patches, java patches or any other EMS required patches. This DVD enables the upgrading of the EMS required patches without the EMS application upgrade.

While a clean installation requires all 4 DVDs, an EMS application upgrade requires only the 'EMS Application' DVD and the patches upgrade (in most cases) requires only the 'EMS Server Patches' DVD and doesn't require the application upgrade.

4.2.1.2 EMS Server Security Enhancements

EMS server OS user permissions are now differentiated according to the specific application task. This feature is designed to prevent security breaches and to ensure that a specific OS user is authorized to perform a subset of tasks on a subset of machine directories. The EMS server includes the following OS user permissions:

- *root* user: user permissions for installation, upgrade ,maintenance using EMS server manager and EMS application execution.
- *acems* user: The **only available user** for Login/ Telnet/FTP tasks.
- *emsadmin* user: user with permissions for mainly the EMS server manager and EMS application for data manipulation and DB access.
- *oracle* user: user permissions for the Oracle DB access for maintenance such as installation, patches upgrade, backups and other Oracle DB tasks.
- *oralsnr* user: user in charge of oracle listener startup.

4.2.2 SNMPv3 – Change EMS Server Machine Engine ID

The EMS Server Manager has a new option “Configure Server SNMPv3 Engine ID “under the Networking sub-menu.

The EMS server Engine ID is used by the SNMPv3 protocol when alarms are forwarded from the EMS to an NMS. By default, the EMS server SNMPv3 Engine ID is automatically created as a function of the EMS server IP address. This new option enables the user to customize the EMS server Engine ID according to their NMS configuration.

4.2.3 EMS Client Login on all EMS server Network Interfaces

The EMS server can be configured with up to four network interfaces (connected to different subnets). You can now connect to any one of these four interfaces directly from the EMS client login dialog.

Where the “Server IP” field in EMS client login dialog is set to the desired EMS server network interface IP address.

4.2.4 EMS Client GUI Enhancements

The EMS Client GUI design has been enhanced with the following improvements:

- Navigation improvements allow fast transitions between the same status views on different instance indexes. For example, moving from Board #1 to Board #3, or from Board #2/Trunk#3 to Board#4/Trunk#7, now does not require you to navigate between the boards on the Status screen and instead can be performed using an index in the Navigation pane.
- Table Screens –pressing CTRL-A enables you to select all the rows in a configuration table at once.
- The putty application can now be opened from the main EMS menu.

4.3 Fault Management

4.3.1 Active and History Alarm Printing

The EMS client can now print the EMS Alarms details and the Alarms History table.

4.4 Security Management

4.4.1 EMS Client Security Enhancements

4.4.1.1 Last Successful Login Message

The user can determine whether to enable the last successful login message; lists the last successful and unsuccessful logon time and date.

4.4.1.2 Welcome Message Journal Display

A journal record is logged when the user performs any type of change to the ‘welcome message’ display.

4.4.1.3 Super User

A new 'Administrator Super User' security level has been defined in the EMS. This user is the highest level user with permissions for adding, removing and manipulating other low level users, including Administrators.

The EMS application now supports the following user types:

- Administrator Super User
- Administrator
- Operator
- Monitoring

4.5 Configuration, Management and Maintenance

4.5.1 Parameters Search

A new powerful parameter search feature enables you to search for configuration parameters in the gateways provisioning frames. The basic search option enables you to perform a random search for a 'contains' string. Advanced search options enable you to match an exact/any word and to search for a MIB parameter.

The Search Result dialog displays a list of retrieved entries. When you double-click on a specific retrieved entry, the navigation path to the parameter's provisioning frame is displayed in the lower pane of the Search result dialog. The user then has the option to open the provisioning frame that is related to the search result entry. For example, for specific trunk parameters, in the Navigation path frame, a drop-down list enables you to select a specific board number and trunk number. You can then open the specific provisioning frame for the selected board and trunk number.

The context sensitive search options are always visible in the right-hand corner of the EMS Toolbar. In addition, the Advanced Search Configuration dialog can be displayed from the EMS Tools menu.

4.5.2 Provisioning Frame – Parameter range display

A Provisioning frame tooltip with parameter range upon mouse over has been added.

4.5.3 Configuration Desktop Option – Close all Open Frames

A new Configuration desktop right-click option 'Close all' enables you to close all frames with a specific action and to close all frames associated with a Media Gateway after it has been removed from the EMS tree.

4.5.4 Mediant 5000/8000 Related Features

4.5.4.1 New Provisioning Parameters, Performance Measurements Support and Alarms

New features and parameters, including new configuration and performance monitoring parameters have been added. For a detailed list of these parameters and alarms, refer to the relevant Media Gateway OAM Guides

4.5.4.2 Supported VoP Boards

The following VoP board types (and application types) are supported in this version:

- TP-6310 OC-3/STM-1/T3
- TP-8410

4.5.4.3 Performance Measurements Threshold

This feature provides the customer with a powerful and flexible tool for monitoring the healthiness of the system.

User can define High and Low threshold for any history PMs; an alarm is generated when the predefined High Threshold value is exceeded. The alarm is cleared when the PMs value passes below the predefined Low Threshold value.

The severity of the generated alarm can also be configured by the user.

The feature is applicable for History PMs only, for both Counters and Gauge PM types. Up to 100 entries can be configured in the PM thresholds table.

4.5.4.4 Move TP Board

A new right-click TP Board Maintenance action "Move TP Board" has been added to the MG Status Screen. This option allows you to move an existing TP board, along with its entire configuration to a free slot on the Media Gateway. This feature may be used for system troubleshooting or due to changes in PSTN cabling.

4.5.4.5 Virtual Gateways

The Media Gateway offers Virtual gateway functionality for MEGACO Media Gateway boards (according to the H.248.1 spec, section 11.1 "Multiple Virtual MGs"). Each VoIP board can be represented to the IP cloud as up to 3 different gateways, where each Virtual gateway autonomously registers and operates against its controlling MGC. This way, the user can see a single VoIP board as a number of Gateways or Media Servers.

Each Virtual Gateway has individual MGC lists (one Active and several Redundant) and maintains its own connectivity state. Each Virtual Gateway may be connected on different control networks/VLAN and run over different transport layers (UDP/TCP/SCTP).

4.5.4.6 WAN and LAN Enhancements

Two new interface separation modes are supported:

- OAM and LAN and WAN
- OLAN and WAN

LAN and WAN physical interfaces may contain both Control and Media subnets.

This feature is primarily intended for SBC applications.

4.5.4.7 Improved Static Routes Configuration

The Static routes configuration has been modified to support an instant re-configuration.

The new configuration is performed via the following new managed objects:

- TP Static Routes (applies to TP-6310 and TP-8410 boards)
- SC Static Routes (applies to SC boards)

Both of the above tables support instant re-configuration (i.e. the new routing configuration may be applied to the working TP/SC board instantly, without the need for board restart).

The number of supported static routes has been increased as follows:

- TP Static Routes – up to 30 entries
- SC Static Routes – up to 25 entries

4.5.5 Mediant 600/1000/2000/3000 and MediaPack Related Features

4.5.5.1 New Provisioning Parameters, Performance Measurements Support and Alarms

New features and parameters, including new configuration and performance monitoring parameters have been added. For a detailed list of the parameters and alarms, please refer to the relevant GW OAM Guides.

4.5.5.2 Navigation Restructure

- The Navigation desktop has been improved with a more intuitive hierarchy. In addition, the Provisioning Frame and Tabs has been divided into enhanced hierarchical views.
- Virtual directories have been added to contain all the similar objects, frames and tabs. For example, the VoIP virtual directory contains network, media and other VoIP related folders.

4.5.5.3 Backdoor Configuration

The Provisioning frame menu includes a new action Tools→Configuration Backdoor , which applies any single or table INI file parameter to the Media Gateway.

4.5.5.4 Virtual Gateways Provisioning

Media Virtual Gateways configuration has been added to the EMS (See Section 4.5.4.5).

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5 Known Limitations and Workarounds

Issue	Problem/Limitation	Comments and Workaround
First-time login	<p>Important note for first-time users (this is not a problem; however first-time users may encounter the following):</p> <p>When logging in for the first time:</p> <ol style="list-style-type: none"> 1. Login as user 'acladmin' with password 'pass_1234' or with 'pass_12345' 2. From the main screen, open the 'Users List' (menu 'Security' > option 'Users List') and add new users according to your requirements. 	-
Number of MGs in one region	For optimal system performance, do not define more than 500 Media Gateways in any one region.	-
Working with MediaPack, Mediant 1000/2000/3000 via satellite	IP network round trip delay must not exceed 0.5 second.	-
Software Version number update after Software Upgrade	Occasionally after a Software Upgrade, or an Online Software Upgrade, the EMS status screen is not updated with the new version number.	Select Region status on the EMS Tree panel and then select the MG again. The new version number will be updated.
Online Help	The Online Help is not available in this version.	It will be available in one of the future fixes.
EMS Application License Key	This feature is not supported in this version.	It will be supported in one of the future fixes.
EMS Server – Virtual Platform	The Multiple Ethernet redundancy and EMS server HA features are not supported in this version for Virtualized server.	It will be supported in one of the future fixes.
EMS Server on Solaris Platform	EMS server is not supported on the Solaris Platform in this version.	The Linux platform is supported.

Release Notes

Version 6.6



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