Tekelec EAGLE® 5
Signaling Application System

Release 34.0

Feature Notice
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TEKELEC

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Introduction

Feature notices are distributed to customers with each new release of software.

The *Feature Notice* includes a brief feature overview, lists new hardware required if any, provides the hardware baseline for this release, and explains how to find the *Release Notice* and other customer documentation on the Customer Support Site for Release 34.0 (see "How to Locate Documentation on the Customer Support Site" on page FN-130).

New Features

The EAGLE® 5 Signaling Application System (SAS) Release 34.0 introduces the following new features:

- 192 Million LNP Numbers

- Synchronous E1 High Speed Link (SE-HSL)

- Multiple Routing Contexts

- STPLAN SSEDCM Capacity Increase

- Update Validation

- Configurable alarm thresholds

Features from Limited Availability Releases

The following features are included in Release 34.0 from Limited Availability releases that were available between Release 31.6 and Release 34.0:

- Discard TFC Traffic

- CSPC Increase in Groups

- High-Capacity Multi-Channel Interface Module (HC-MIM card)

- High Speed IMT Packet Router (HIPR card)

- 8000 Routesets

- DigitAction Expansion

- GSM MAP SRI Redirect to Serving HLR

- ISUP NP with EPAP

- Linkset Restricted Support

- MTP MAP Screening

- Private Point Code

- ITU International and National Spare Point Code

- IETF SUA Support

Important Operational Changes

- UAM Format Change - "UAM Format Changes" on page FN-68

- UIM Format Change - "UIM Format Changes" on page FN-72

Feature Overview

192 Million LNP Numbers

The 192 Million LNP Numbers Support feature expands the maximum number of ported/pooled Local Number Portability (LNP) numbers supported on one EAGLE 5 SAS platform to 192 million LNP numbers. The feature supports feature access keys for 132, 144, 156, 168, 180, or 192 million ported/pooled numbers.

Configurable alarm thresholds indicate:

- When the transactions-per-second (TPS) for the EAGLE 5 SAS (as a whole) reaches the threshold value.

- When the number of LNP ported TNs and LRNs in the database is approaching the configured percent of the enabled maximum number allowed in the database.

- When the thermal limits of an HC-MIM card have been reached.

See "192 Million LNP Numbers" on page FN-8 for more details.

Synchronous E1 High Speed Link

The SE-HSL feature provides "unchannelized" E1 high-speed link interfaces where time-slot 0 is used for framing and error control, and the remainder of the bandwidth equivalent to 32 channels of 64 Kbps data is used as a single data link yielding a total capacity of 1.984 Mbps. SE-HSL links can be used to connect two signaling points that require bandwidth greater than that provided by 8 low-speed links. The HC-MIM card is used for SE-HSL function, with an appropriately configured E1 interface on any 2 of the 8 HC-MIM card ports.

See "Synchronous E1 High Speed Link (SE-HSL)" on page FN-11 for more details.

Multiple Routing Contexts (SUA)

In the M3UA and SUA protocols, the "Routing Context" parameter can be used by the application to distinguish between traffic associated with different Application Servers.

This feature enhances the current EAGLE 5 SAS Routing Context implementation to allow more than one Routing Context to be assigned to a single M3UA/SUA SCTP association while supporting independent control of the traffic state using the Routing Contexts. The traffic state (ASP-Active / ASP-Inactive) can be modified for one Routing Context independently of any other Routing Context.

The following changes to EAGLE 5 SAS IP functions have been made in conjunction with the Multiple Routing Contexts implementation:

- This feature removes the ASP entity from M3UA and SUA configuration. Although the configuration of ASPs is being removed from the EAGLE 5 SAS for this feature, the ASP entity still exists in the M3UA and SUA architecture. The ASP states (ASP-Down, ASP-Inactive, and ASP-Active) are still used in the EAGLE 5 SAS when reporting the management and traffic handling states of each Association/AS combination within the EAGLE 5 SAS.

- The **ent-asp, chg-asp, dlt-asp, rtrv-asp**, and **rept-stat-asp** commands are obsolete. The **rept-stat-as** command can be used to retrieve association ASP states and ASP-IDs per AS or per association. The **asplog** pass-through command is renamed to **ualog,** and the log entries are enhanced to include a routing context indication for all applicable log entries. The ASPNAME parameter in the **ent-as**, **dlt-as**, **rtrv-as** and **ualog** commands has been changed to the ANAME parameter.

- With the removal of the ASP entity in configuration, the feature allows an M3UA/SUA association to be assigned to more than one Application Server (AS). On a given IPGWx card, the total number of all association-to-AS assignments and TALI connections cannot exceed 50.

- Many of the IP database tables reference other IP database tables using name strings. In many cases, the name strings were not resolved to existing IP database entries at the time of provisioning. This feature modifies the IP database provisioning rules to require a strict order of entry and deletion in order to prevent unresolved references. The provisioning of the IPHOST table must now be done before the provisioning of the IPLNK table (this reverses the previous sequence).

- The AS recovery timer has been relocated from the UAPS Timer 1 in the UAPS table to the AS table. Because with this feature a single association can now exist in more than one AS, the **chg-as** command is now used to modify the AS recovery timer (instead of the **chg-uaps** command). The timer units are in milliseconds, and the valid range is 10-2000 ms.

- This feature modifies the existing reporting of primary service state (PST) and secondary service state (SST) for all SCTP associations. This change in PST function for SCTP associations results in a change in the meaning of the "IP Connection" alarms for SCTP (M3UA/SUA/M2PA) associations only. TALI socket IP Connection alarms remain unchanged.

- This feature removes support for M3UA connections on IPLIMx cards. All M3UA deployments must use IPGWx cards only. An EAGLE 5 SAS containing M3UA IPLIMx links cannot be upgraded to this release. The EAGLE 5 SAS Health Check procedure has been updated to detect this condition.

The following changes have also been made for IPGWx functions:

- M3UA connections must be assigned to an Application Server (AS) and the AS must have at least one routing key assigned to transition to ASP-Active state.

- Validation that the ASP-ID received in an ASP-UP message is unique across connections within the AS will be removed (this removes Strict/Relaxed ASP-ID validation); as a result, the UAPS Parm 3 becomes undefined.

- The **chg-appl-rtkey** command no longer has the capability to override the current AS in a routing key to another AS; or the current set of sockets in a routing key to a single socket. This prevents an M3UA or SUA association from being brought into service (ASP-ACTIVE) without having an assigned AS and routing key; the override routing key function is no longer needed. The NSNAME and NASNAME parameters are no longer valid for the **chg-appl-rtkey** command. The equivalent function can be accomplished using the **dlt-appl-rtkey** and **ent-appl-rtkey** commands.

See "Multiple Routing Contexts" on page FN-15 for more details.

STPLAN SSEDCM Capacity Increase

The STPLAN SSEDCM Capacity Increase feature provides provisioning to specify the transmission speed of the link. The user can select either 10 Mbps or 100 Mbps for the Ethernet transmission speed.

See "STPLAN SSEDCM Capacity Increase" on page FN-20 for more details.

Update Validation

The Update Validation feature provides additional data validation checks prior to applying an update or change from the RTDB at the EPAP or ELAP to the RTDB on the DSM cards. These additional checks are designed to prevent overwriting of existing data records with new data records when operators are provisioning new subscribers. No EAGLE 5 SAS commands are affected by this feature.

See "Update Validation" on page FN-21 for more details.

Discard TFC Traffic

The **chg-ss7opts** command includes the **discardtfci** and **discardtfcn** parameters to enable and disable the discarding of TFC traffic. The **rtrv-ss7opts** command displays the current setting of the parameters.

CSPC Increase in Groups

The maximum number of point codes that can be provisioned in a Concerned Signaling Point Code (CSPC) group is increased from 32 to 96.

High Capacity Multi-Channel Interface Module

The High Capacity Multi-Channel Interface Module (HC-MIM) provides access to 8 E1 or T1 ports residing on backplane connectors A and B. Each port or data stream consists of 24 T1 DS0 channels or 31 E1 channels assigned in a time-division multiplex (TDM) manner. Each channel occupies a unique timeslot in the data stream. Up to 64 signaling links can be assigned to an HC-MIM card.

The HC-MIM card increases the signaling link density in the EAGLE 5 SAS. Because the EAGLE 5 SAS supports a finite number of link interface cards, increasing system capacity or reducing system footprint requires increasing the link density per card. Using fewer cards for a given system capacity yields lower per-link cost.

Configurable temperature alarm thresholds indicate when HC-MIM cards are approaching a temperature that could damage the cards.

For links that are assigned HC-MIM cards and E1/T1 MIM cards that are used as T1 cards, the transmission rate can be either 56 Kbps or 64 Kbps.

See "High-Capacity Multi-Channel Interface Module (HC-MIM card)" on page FN-22 for more details.

High Speed IMT Packet Router

HIPR acts as a gateway between the intra-shelf IMT bus, running at 125 Mbps, and the inter-shelf ring operating at 1.0625 Gbps. The inter-shelf ring is used to connect the shelves together in the EAGLE 5 SAS. A HIPR card installs into the slot that was used by the HMUX card. HIPR cards must replace HMUX cards in shelves that contain HC-MIM cards.

See "High Speed IMT Packet Router (HIPR card)" on page FN-27 for more details.

8000 Routesets

The 8000 Routesets Support feature expands the SS7 routing connectivity between the EAGLE 5 SAS and other nodes by increasing the number of routesets supported by EAGLE 5 SAS from 6000 to 8000.

See "8000 Routesets" on page FN-29 for more details.

Linkset Restricted Support

The Linkset Restricted Support feature provides an optional alternate routing determination algorithm that is more tolerant during linkset transitions.

See "Linkset Restricted Support" on page FN-35 for more details.

Private Point Code Support

The Private Point Code Support feature provides support for the use of point codes that are internal to the EAGLE 5 SAS. Point codes within the EAGLE 5 SAS are useful for routing messages within the EAGLE 5 SAS. The use of private point codes allows a point code value to be indicated as private and still have the same point code value (non-private) available for network configuration.

See "Private Point Code" on page FN-42 for more details.

Spare Point Code Support

The Spare Point Code Support feature enables the EAGLE 5 SAS to fully support ITU National Spare Point Codes and ITU International Spare Point Codes. This feature allows a single linkset to support multiple outgoing network indicators. Messages are routed according to the point code on the outgoing node that corresponds to the associated network indicator.

See "ITU International and National Spare Point Code" on page FN-43 for more details.

DigitAction Expansion

The DigitAction Expansion feature provides G-Port and G-Flex support options that can be selected to overwrite the SCCP CdPA GTA field. These options are defined by the DigitAction field of the PDBI Enter Network Entity and Update Network Entity commands. No EAGLE 5 SAS commands are affected by this feature.

See "DigitAction Expansion" on page FN-31 for more details.

GSM MAP SRI Redirect to Serving HLR

The GSM MAP SRI Redirect to Serving HLR feature provides the capability to resolve the incompatibility introduced by the proprietary implementation of the GSM MAP SRI message. This feature is an extension to the G-Port Mobile Number Portability (G-Port MNP) Protocol and is compatible with other MNP enhancement features including the G-Port MNP Circular Route Prevention, Portability Check for Mobile Originated SMS, and Pre-paid SMS Intercept features.

See "GSM MAP SRI Redirect to Serving HLR" on page FN-32 for more details.

ISUP NP with EPAP

The ISUP NP with EPAP feature adds a prefix (a SubNet prefix or RN) to the CdPN of an IAM message if the CdPN is a ported in (including never been ported) or a ported out DN before relaying the message to its destination. The prefix provides to the recipient switch a means to differentiate a call so that different billing rates or routing can be applied to the call.

See "ISUP NP with EPAP" on page FN-33 for more details.

SUA RFC (SS7 SCCP User Adaptation Layer Request for Comment)

The SUA RFC feature replaces Draft Version 3 support on the IPGWx GPL with the following feature highlights:

- Support for SCCP Connectionless messages via SUA CLDT and CLDR. Connection-oriented messages are not supported.

- Support for SUA Signaling Network Management Messages.

See "IETF SUA Support" on page FN-51 for more details.

MTP MAP Screening

The MTP MAP Screening feature is an enhancement to the existing GMS/EGMS features. The MTP MAP Screening feature adds the ability to route MTP traffic with the service indicator (SI) field set to SCCP or MAP through the MAP Screening subsystem without sending it through GTT/GWS. It also adds a per-server MAP Screening forced pass measurements peg count (MSCRNPAFP).

See "MTP MAP Screening" on page FN-41 for more details.

192 Million LNP Numbers

The 192 Million LNP Numbers Support feature expands the maximum number of ported/pooled Local Number Portability (LNP) numbers supported on one EAGLE 5 SAS platform to 192 Million LNP Numbers. The feature supports feature access keys for 132, 144, 156, 168, 180, or 192 million ported/pooled numbers.

Configurable alarm thresholds

Enables the user to change and monitor the alarm threshold values used by the system SCCP.

- When the transactions-per-second (TPS) for the EAGLE 5 SAS (as a whole) reaches the threshold value.

- When the number of LNP ported TNs and LRNs in the database is approaching the configured percent of the enabled maximum number allowed in the database.

- The temperature of an HC-MIM card reaches predetermined thermal limits.

ELAP 5.0

The 192 Million LNP Numbers Support feature requires the ELAP 5.0 database application. The ELAP 5.0 database application is installed and runs on the T1100 application server.

Hardware Requirements

The existing 4GB DSM card must be used for the 192 Million LNP Numbers feature.

The ELAP 5.0 database application that supports 192 million LNP numbers runs on the T1100 platform.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands have been enhanced to support the 192 Million LNP Numbers Feature Access Keys (FAKs).

- The **enable-ctrl feat** command supports the feature access keys to enable 132-192 Million LNP Numbers, and verifies that 4G DSMs are present in the system.

- The **rtrv-ctrl-feat** command output shows the maximum quantity of LNP ported TNs that was enabled with the feature access key.

- When no value is specified for the **loc** parameter, and any of the parameters **npanxx**, **lrn**, or **tn** are specified, the **rtrv-data-rtdb** command retrieves the matching entry for the respective parameter values from the DSM card in the STP card list that meets the following conditions:

  – With the lowest numeric value card location that is in the In-Service Normal state

  – For which the SCCP Subsystem is in the active state.

  The existence of the matching entry is checked and reported for all other In-Service Normal DSM cards.

- The **rept-stat-sccp** command has been modified to display the following system information:

  System Daily Peak SCCP Load—highest TPS load over the past 24 hours.

  System Overall Peak SCCP Load—last 10 highest TPS load

  System SCCP Capacity—

  System SCCP Capacity Calc. Method (N or N+1)—The method used to calculate SCCP Capacity.

  System TPS Alarm Threshold—

- The **chg-th-sccp** command has been renamed to the **chg-th-alm** command, and now provides an option to calculate the TPS alarm threshold based on the System N+1 SCCP Capacity, or the default System Maximum SCCP Capacity.

- The **rtrv-th-sccp** command has been changed to the **rtrv-th-alm** command, and now indicates what percent of the enabled maximum number of LNP ported TNs exists in the LNP database when the command is entered.

- The **rept-stat-alm** command displays the TPS alarm threshold setting.

See the *Commands Manual* of your Release 34.0 documentation set for a detailed description of all commands and their parameters.

Limitations

- The 192 Million LNP Numbers feature is available only for North American LNP customers.

- This feature requires the LSMS 192 Million LNP Numbers feature.

- Prior to the upgrade, Tekelec will perform a pre-upgrade health check to access the compatibility of your current hardware and software configuration. If the Message Relay Group (MRG) table exceeds 2 million entries, the Software Release Upgrade cannot occur. This is an incompatible situation, and a loss of data may occur if the upgrade is executed for either the EAGLE 5 SAS or ELAP.

- 192 Million LNP Numbers feature activation on the EAGLE 5 SAS is based on the following conditions:

    – The ELAP LNP Configuration feature access key must be on.

    – 4-Gigabyte DSMs are required; at least one 4-Gigabyte DSM must be provisioned in the system.

    – The ELAP software version must be ELAP 4.0 if an EAGLE 5 SAS feature access key for 96-120 Million LNP Numbers is enabled.

    – The ELAP software version must be ELAP 5.0 if an EAGLE 5 SAS feature access key for more than 120 Million LNP Numbers is enabled.

Alarms

New or Changed UAMs

New or changed UAMs necessary to support 192 Million LNP Numbers are defined in Table FN-3.

New or Changed UIMs

New or changed UIMs necessary to support the 192 Million LNP Numbers feature are defined in Table FN-7 on page FN-62.

New or Changed Hardware Verification Codes

New or changed Hardware Verification Codes necessary to support the 192 Million LNP Numbers feature are as defined in Table FN-10 on page FN-64.

UAM Format Changes

No new UAM formats have been added to support 192 Million LNP Numbers.

UIM Format Changes

No new UIM formats have been added to support 192 Million LNP Numbers.

Error Messages

New or changed Error Messages necessary to support the 192 Million LNP Numbers feature are defined in Table FN-14 on page FN-109.

Synchronous E1 High Speed Link (SE-HSL)

Description

The SE-HSL feature provides "unchannelized" E1 high-speed link interfaces (as defined in ITU-T Q.703 Annex-A) where time-slot 0 is used for framing and error control, and the remainder of the bandwidth equivalent to 31 channels of 64 Kbps data is used as a single data link yielding a total capacity of 1.984 Mbps. SE-HSL links can be used to connect two signaling points that require bandwidth greater than that provided by 8 low-speed links. The HC-MIM card is used as an SE-HSL card; any 2 of the 8 HC-MIM card ports can be used for SE-HSL E1 interfaces.

The SE-HSL feature supports the following functions:

- Timing modes (external master and line), HDB3 and AMI encoding, and CRC4 encoding.

- Local and line loopback testing at the port level.

- Provisionable FISU/LSSU rate to ensure a minimum density of signaling units on outbound links. The default rate is 1 signaling unit per millisecond.

- The new **apcntype** linkset parameter to support changeover messages for ITU National links in China and outside of China.

- A Feature Access Key must be enabled to provide a maximum of 4, 8, 16, 32, 40, 48, 56, or 64 SE-HSL signaling links in the system. A mixture of channelized links and SE-HSL links is not supported on an HC-MIM card.

- Linkset commands—The **rtrv-ls** output shows LSN headings for adjacent point code types ITU-N and ITU-N 24-bit that are used for changeover processing (the **ent-ls** and **chg-ls** commands indicate the type with the new **apctype** parameter).

- E1 commands—The **rtrv-e1** command output shows headings LINKCLASS and MINSURATE (these are new E1 command parameters for SE-HSL). The LINKCLASS parameter indicates whether the HC-MIM card is used for "channelized" E1 links or for "unchannelized" SE-HSL E1 links. In EAGLE 5 SAS Release 34.0, the LINKCLASS parameter default value CHAN ("channelized") always appears in the **rtrv-e1** output; dashes always appear in the MINSURATE column.

- MTP Level Timer commands—The number of level 2 timer sets has increased from 20 to 30. The **rtrv-l2t** command output shows the default values for the Level 2 timers in each of the 30 timer sets.

Hardware Requirements

The HC-MIM card is used as the SE-HSL card to run software that provides "unchannelized" E1 functions.

Each shelf that contains at least one HC-MIM card must contain HIPR cards in slots *xy*09 and *xy*10 (*x* is the frame, *y* is the shelf).

Each shelf that contains at least one HC-MIM card must contain a fan tray assembly. The fan feature bit must be turned on in the EAGLE 5 SAS.

See "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands or command families are enhanced to support SE-HSL cards. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- Linkset commands—The **rtrv-ls** command output shows LSN headings for adjacent point code types ITU-N and ITU-N 24-bit that are used for changeover processing (the **ent-ls** and **chg-ls** commands indicate the type with the new **apctype** parameter).

- E1 commands—The **ent-e1** command and the **chg-e1** command support the definition of E1 interfaces for any 2 of the 8 ports on SE-HSL cards. In the **ent-e1** command and the **chg-e1** command, the new **linkclass** parameter indicates whether the HC-MIM card is used for "channelized" E1 links or for "unchannelized" SE-HSL E1 links.The new **minsurate** (minimum signal unit rate) parameter indicates the minimum number of SUs present on a link uniformly distributed. The **rtrv-e1** command output shows headings LINKCLASS and MINSURATE. If the card is not an SE-HSL card, the LINKCLASS parameter default value CHAN ("channelized") appears in the **rtrv-e1** output; the value UNCHAN ("unchannelized") appears for SE-HSL cards. If the card is not an SE-HSL card, dashes appear in the MINSURATE column. The default or specified **minsurate** parameter value appears for SE-HSL cards.

- MTP Level 2 Timer commands—In the **l2tset** parameter of the **chg-l2t** command, the number of available level 2 timer sets has increased from 20 to 30. The 8 timer value parameters include ranges and system default values for ANSI, ITU, high-speed China, and high-speed Q.703 Annex A links. The **rtrv-l2t** command output shows the default or specified values for the MTP Level 2 timers in each of the 30 timer sets.

- Controlled feature commands—The **enable-ctrl-feat** command supports the entry of the SE-HSL SLK Capacity feature access keys. The **rtrv-ctrl-feat** command output displays the quantity that is enabled in the SE-HSL SLK Capacity entry.

- Signaling link commands—The **ent-slk** command supports the new MTP Level 2 timer sets, and supports assignment of SE-HSL links. The **rtrv-slk** command displays information for SE-HSL links.

- Report Card Status command—The **rept-stat-card** command supports the display of new Hardware Verification Code 133, "Card cannot support unchannelized mode.".

Limitations

The SE-HSL feature inherits all the limitations of HC-MIM as listed in "Limitations" on page FN-26.

The SE-HSL feature does not support the following functions:

- PCR for satelite links

- Link Fault Selection (LFS) testing

During the Changeover/Changeback/Controlled rerouting, the source card on EAGLE 5 SAS buffers the signaling data destined for the concerned link until the Changeover/Changeback/Controlled rerouting procedure is completed. This could take as long as two seconds. Therefore a queue large enough to buffer two seconds worth of data is required on the source card. When the link is operating at 1 Erlang, two seconds worth of data amounts to 21564 MSUs. An SE-HSL enabled card can support two HSLs, therefore two queues of size 21564 are reserved on the source card.

Another aspect is rerouting the on-hold data off the source card. Rerouting this much data has ramifications associated with it. SE-HSL supports buffering and rerouting at 0.4 Erlang to avoid the possibility of congestion or discard. Above 0.4 Erlang, buffering and rerouting may result into congestion or loss of data.

SE-HSL supports timers T1-T6 values up to 550 milliseconds. However, setting the T1-T6 times to 550 msec opens a possibility for mis-sequencing. EAGLE 5 SAS supports only one Layer 3 timer set. Once provisioned for high-speed links, all the links in the system use the T1-T6 limit of 550 milliseconds.

Alarms

- The standard alarms have been extended for the additional E1/T1 ports.

- Alarms for the additional E1/T1 ports can be inhibited.

New or Changed UAMs

New or changed UAMs necessary to support SE-HSL are defined in "New or Changed UAMs - EAGLE 5 SAS Release 34.0" on page FN-53.

New or Changed UIMs

No new or changed UIMs are necessary to support the SE-HSL feature.

New or Changed Hardware Verification Codes

New or changed Hardware Verification Codes necessary to support the SE-HSL feature are as defined in Table FN-10 on page FN-64.

UAM Format Changes

No new UAM formats have been added to support SE-HSL.

UIM Format Changes

No new UIM formats have been added to support SE-HSL.

Error Messages

New or changed Error Messages necessary to support the SE-HSL feature are as defined in Table FN-13 on page FN-108.

Multiple Routing Contexts

Description

EAGLE 5 SAS Release 34.0 supports Multiple Routing Contexts for M3UA and SUA protocols.

In the M3UA and SUA protocols, there is a Routing Context parameter that can be used by the application to distinguish between traffic associated with different Application Servers (ASs).

In the original EAGLE 5 SAS implementation, an Application Server Process (ASP) could be assigned to only a single AS. A single AS could be associated with any number of routing keys if the routing keys do not contain a Routing Context. A single AS could be associated with up to 4 Routing Keys if the routing keys contain a Routing Context. However, the traffic state (ASP-Active/ASP-Inactive) for the ASPs within an AS could not be independently controlled using the individual Routing Contexts. This effectively restricts the traffic on each SCTP association to 4 Routing Contexts that must all transition their traffic state in unison. If traffic to the same far end has different Routing Context values, the original EAGLE 5 SAS design requires multiple SCTP associations to the far end in order to support independent control of the traffic state using the Routing Context.

This feature enhances the original EAGLE 5 SAS Routing Context implementation to allow more than one Routing Context to be assigned to a single M3UA/SUA SCTP association, while supporting independent control of the traffic state using the Routing Contexts. The traffic state (ASP-Active / ASP-Inactive) can be modified for one Routing Context independently of any other Routing Context.

The following changes to EAGLE 5 SAS IP functions have been made in conjunction with the Multiple Routing Contexts implementation:

- This feature removes the ASP entity from M3UA and SUA configuration. Although the configuration of ASPs is being removed from the EAGLE 5 SAS for this feature, the ASP entity still exists in the M3UA and SUA architecture. The ASP states (ASP-Down, ASP-Inactive, and ASP-Active) are still used in the EAGLE 5 SAS when reporting the management and traffic handling states of each Association/AS combination within the EAGLE 5 SAS.

The **rept-stat-as** command can be used to retrieve association ASP states and ASP-IDs per AS or per association. The **asplog** pass-through command is renamed to **ualog,** and the log entries are enhanced to include a routing context indication for all applicable log entries. The ASPNAME parameter in the **ent-as**, **dlt-as**, **rtrv-as** and **ualog** commands has been changed to the ANAME parameter.

- With the removal of the ASP entity in configuration, the feature allows an M3UA/SUA association to be assigned to more than one Application Server (AS).

Each time an association is assigned to an AS, it requires that the IPGWx card which hosts the Association maintain a unique adapter state for the association-AS combination. Each time a TALI socket is entered, it requires that the IPGWx card which hosts the socket maintain an adapter state for the TALI socket. This feature requires that the total number of adapter states maintained by a single IPGWx card is less than or equal to 50. On a given IPGWx card, the total number of all association-to-AS assignments and TALI connections cannot exceed 50. This total number could be reached by assigning a single association to up to 50 Application Servers.

- To ensure that it is not possible for an M3UA or SUA connection to be in the ASP-Active state without a routing key, the last routing key containing a given AS may not be deleted unless all associations in the AS are set to OPEN=NO.

- Prior to this feature, many of the IP database tables reference other IP database tables using name strings. In many cases, the name strings are not resolved to existing IP database entries at the time of provisioning. For example, a routing key can be successfully entered with an Application Server Name that does not exist in the AS table. As another example, it is possible to have a connection with an LHOST that cannot be resolved to a card because the matching IPHOST entry does not have a corresponding IPLNK entry. In this case the card location for the association cannot be determined. This lack of IP database cross-checking at provisioning time provides flexibility in command order and eases re-mapping of IP database entries, but it creates complexity and allows provisioning errors to go unnoticed.

  This feature modifies the IP database provisioning rules to require a strict order of entry and deletion in order to prevent unresolved references. The IP database tables must be provisioned in the following order:

  Note: In previous releases, the IPHOST table was required to be provisioned before the IPLNK table for a given IP address. This feature reverses the required order.

1. Provision the card (**ent-card** command)

2. Provision the IPLNK entry with the card's IP address(es) (**chg-ip-lnk** command).

3. Provision the IPHOST entry with the card's IP address and host name (**ent-ip-host** command).* IPHOST entries for local hosts (IP cards in this EAGLE 5 SAS) will be designated as "local" in the ent-ip-host command and must exist in the IPLNK table. If the entry is not specifically designated as local or remote, it defaults to "local". Attempts to enter IPHOST entries as "remote" are rejected if the corresponding IP address exists in the IPLNK table.

4. Provision the Association/Socket connections (**ent-assoc** command and **ent-appl-sock** command). The LHOST parameter is now mandatory for these

commands. The LHOST and ALHOST of the connection must exist and must be provisioned as "local" in the IPHOST table. The RHOST of the connection is not required to be provisioned in the IPHOST table. If the RHOST of the connection is provisioned in the IPHOST table, it is not required to be provisioned as "remote".

5. Provision the Application Server (**ent-as** command). Each association that is added to the AS must exist.

6. Provision the routing key (**ent-appl-rtkey** command). For M3UA/SUA, the AS being entered into the routing key must exist. For TALI, each socket entered into the routing key must exist.

    Deleting of configuration entities that are referenced by other configuration entities is required before the referencing configuration entities can be modified or deleted (don't break the chain).

- Before the IP address or hostname assigned to an IP card's Ethernet interface can be changed, all connections referencing the hostname must be closed, removed from any Application Servers and/or routing keys that they are assigned to, and deleted or temporarily modified to reference another valid LHOST/ALHOST. This requires entry of more commands than in previous releases, but it does not present any new out-of-service conditions because the card has always been required to be inhibited prior to modifying its IP address(es).

- The AS recovery timer has been relocated from the UAPS Timer 1 in the UAPS table to the AS table. Because with this feature a single association can now exist in more than one AS, the **chg-as** command is now used to modify the AS recovery timer (instead of the **chg-uaps** command). The timer units are in milliseconds, and the valid range is 10-2000 ms.

- This feature modifies the existing reporting of primary service state (PST) and secondary service state (SST) for all SCTP associations. This change in PST function for SCTP associations results in a change in the meaning of the "IP Connection" alarms for SCTP (M3UA/SUA/M2PA) associations only. TALI socket IP Connection alarms remain unchanged.

- This feature removes support for M3UA/SUA connections on IPLIMx cards. All M3UA deployments must use IPGWx cards only. An EAGLE 5 SAS containing M3UA IPLIMx links cannot be upgraded to this release. The EAGLE 5 SAS Health Check procedure has been updated to detect this condition.

The following changes have also been made for IPGWx functions:

- M3UA/SUA connections must be assigned to an Application Server (AS) and the AS must have at least one routing key assigned to transition to ASP-Active state.

- Validation that the ASP-ID received in an ASP-UP message is unique across connections within the AS will be removed (this removes Strict/Relaxed ASP-ID validation); as a result, the UAPS Parm 3 becomes undefined.

- The **chg-appl-rtkey** command no longer has the capability to override the current AS in a routing key to another AS; or the current set of sockets in a routing key to a single socket. This prevents an M3UA or SUA association from being brought into service (ASP-ACTIVE) without having an assigned AS and routing key. The NSNAME and NASNAME parameters are no longer valid for the **chg-appl-rtkey** command. The equivalent function can be accomplished using the **dlt-appl-rtkey** and **ent-appl-rtkey** commands.

Hardware Requirements

No new hardware is required for this feature. Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

New and Enhanced Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The **asplog** pass-through command name is changed to **ualog** (User Adapter Log).

- The **rept-stat-as** command can be used to display the current ASP state of connections within each AS

- The **chg-/dlt-/ent-appl-rtkey** commands are changed as follows:

  – The **nsname** and **nasname** parameters and associated "override routing key" function are obsolete.

  – The **rcontext** parameter can be used to either assign a routing context to a routing key that is already present in the table, or change the routing context of the routing key that already has a routing context.. Routing context is mandatory for keys associated with SUA Application Servers, optional for keys associated with M3UA Application Servers, and invalid for keys associated with TALI connections. An AS can be associated with multiple routing keys that do not contain routing context. An AS can be associated with only 1 routing key with routing context. In order for an M3UA or SUA association to be assigned to multiple routing keys with routing context, the M3UA/SUA association must be assigned to multiple ASs, and each AS must be assigned to a routing key with routing context. An AS cannot be simultaneously assigned to a routing key with routing context and routing keys without routing context.

- In the **ent-appl-sock** command, the **lhost** parameter is now mandatory. The hostname specified by the **lhost** parameter must be provisioned as "local" to this EAGLE 5 SAS.

- The **chg**-/**dlt**-/**ent**-/**rtrv**-**assoc** commands are changed as follows:

  – In the **ent**-/**chg**-**assoc** commands, the **lhost** parameter is now mandatory. The hostnames specified by the **lhost** and **alhost** parameters must be provisioned in the IPHOST table as "local" to this EAGLE.

  – Each SS7IPGW or IPGWI card has a maximum limit of 50 adapter states.

  – If the application is IPLIMx, the adapter must equal M2PA and the **iplim2** parameter from the **ent**-**slk** command must match the adapter.

  – The **uaps** parameter is moved to the **chg**-**assoc** command from the obsolete **chg**-**asp** command. The **uaps** parameter specifies the User Adapter Parameter Set used by the M3UA or SUA association for various SNM message and notification response options.

  – The **ver** parameter is obsolete. The RFC version only is supported for M3UA and SUA. Draft version 6 only is supported for M2PA.

  – M3UA adapters are no longer supported for IPLIM or IPLIMI cards.

- The **chg**-/**dlt**-/**ent**-/**rtrv**-**as** commands are changed as follows:

  – The ASP name parameter (**aspname**) is obsolete and replaced with the association name (**aname)** parameter.

  – A single M3UA/SUA association may have multiple adapter states, one for each AS it resides in.

  – Each SS7IPGW or IPGWI card has a maximum limit of 50 adapter states.

  – The AS recovery timer (**tr** parameter) has been moved from the **chg**-**uaps** command to the **chg**-**as** command. The AS recovery timer value for an AS can be changed at any time. The new timer value will be used the next time the AS enters the AS-pending state.

- The **rept**-**stat**-**as** command reports the primary state, secondary state, ASP state, and the ASP-ID for each association in the AS when the optional **asname** parameter is specfied. The new optional association name (**aname**) parameter can be specified in order to display the ASP state for each AS that the Association is assigned to. Only the AS states are displayed when no optional parameters are specified.

- The **rept**-**stat**-**assoc** command no longer reports ASP states; but reports the SCTP connection state.

- The **rtrv**-**uaps** command—Support for Strict/Relaxed ASP ID checking has been removed. The EAGLE 5 SAS will no longer perform validation of the ASP IDs requested by M3UA or SUA connections. The AS Recovery timer has been moved to the AS table (see the -**as** commands).

- The **chg**-**ip**-**lnk** command—An IPLNK entry must be provisioned before an IPHOST entry can be provisioned with a corresponding IP address. Similarily, an IPHOST entry must be deleted before the IPLINK entry with a corresponding IP address can be set to 0.0.0.0.

Obsolete Commands and Parameters

The following commands are obsolete and can no longer be used:

- **ent-asp**

- **chg-asp**

- **dlt-asp**

- **rtrv-asp**

- **rept-stat-asp**

The following parameters are obsolete and can no longer be used:

- **aspname** - the ASP name parameter is replaced by the association name (**aname**) parameter

- **nsname**

- **nasname**

Limitations

Currently there is no maintenance action at the EAGLE 5 SAS to prohibit or allow an association's traffic state for a specific AS. For this reason, an association that is to be added to or removed from an AS must be set to OPEN=NO, preventing it from carrying traffic in any other AS during these provisioning activities. The OPEN=NO state ensures that there are other associations in the ASs being modified that can carry the traffic during the provisioning activities.

Error Messages

Incorrect use of the enhanced commands for the Multiple Routing Context feature may generate the error messages listed in Table 14 on page FN-109.

STPLAN SSEDCM Capacity Increase

Description

This feature allows the user to select either 10 Mbps or 100 Mbps for the data link speed of the Ethernet connection on the Single Slot Enhanced Database Communication Module (SSEDCM) STPLAN card.

Hardware Requirements

The VXWSLAN card is required for 100 Mbps data links. Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The **ent-dlk** command has the **speed** parameter that allows provisioning to specify the transmission speed of the data link. The user can select either 10 Mbps or 100 Mbps for the Ethernet transmission speed.

- The **rtrv-dlk** command is used to display the data link speed.

Update Validation

Description

The Update Validation feature provides additional data validation checks prior to applying an update or change from the RTDB at the EPAP or ELAP to the RTDB on the DSM cards. These additional checks are designed to prevent overwriting of existing data records with new data records when operators are provisioning new subscribers.

Hardware

No new hardware is required for this feature. Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

No EAGLE 5 SAS commands are affected by this feature.

High-Capacity Multi-Channel Interface Module (HC-MIM card)

Description

The High Capacity Multi-Channel Interface Module (HC-MIM) provides access to eight E1/T1 ports residing on backplane connectors A and B. Each port or data stream consists of 24 T1 DS0 channels or 32 E1 channels assigned in a time-division multiplex (TDM) manner. Each channel occupies a unique timeslot in the data stream and can be selected as a signaling link on the interface card.

The HC-MIM card increases the signaling link density in the EAGLE 5 SAS. Because the EAGLE 5 SAS supports a finite number of link interface cards, increasing system capacity or reducing system footprint requires increasing the link density per card. Using fewer cards for a given system capacity yields lower per-link cost.

Configurable temperature alarm thresholds indicate when HC-MIM cards are approaching a temperature that could damage the cards.

64 Link HC-MIM Support

The HC-MIM card operates 8 E1 or 8 T1 port interfaces, with a maximum of 64 signaling links provisioned among the 8 E1 or 8 T1 ports. The HC-MIM card is compatible with existing 2-port E1 cards and E1/T1 MIM cards in the EAGLE 5 SAS shelf for ease in upgrading a live system.

EAGLE 5 SAS software has been modified as follows to support the HC-MIM card:

- All Card, Diagnostic, and Link/Route commands support 8 E1 or 8 T1 ports and up to 64 signaling links per HC-MIM card.

- New commands **rept-stat-e1** and **rept-stat-t1** report the status of all E1/T1 links.

- The E1 and T1 commands support the new channel bridging function. On a HC-MIM card, E1 or T1 ports 1, 3, 5, and 7 (master ports) can be independently channel bridged with their adjacent even-numbered (slave) E1 or T1 ports 2, 4, 6, and 8 to allow non-signaling data pass-through.

- The standard alarms have been extended for the additional E1/T1 ports.

- Alarms for the additional E1/T1 ports can be inhibited.

- For links that are assigned HC-MIM cards and E1/T1 MIM cards that are used as T1 cards, the transmission rate can be either 56 Kbps or 64 Kbps.

Multiple LFS

Multiple LFS tests are supported for HC-MIM cards that are used as T1 cards.

LFS (Link Fault Sectionalization) tests are initiated by the EAGLE 5 SAS or other remote network elements. LFS manual, latching or non-latching tests are used to test the functionality of the link from the EAGLE 5 SAS through multiple channel banks to a remote Network Element. LFS can be run on either SS7ANSI and CCS7ITU Application Class (**appl**=) cards. LFS is not supported on E1 cards.

"Manual LFS test" refers to the process of creating a loopback on a signaling link activated by manually enabling the far end for reception and transmission of LFS loopback data. Once the loopback is established, it must be removed by manually disabling LFS on the far end of the signaling link.

"Latching LFS test" and "non-latching LFS test" refers to the process of creating a loopback on a signaling link activated by the transmission of a sequence of pre-defined control codes. Once the loopback is established, it can be removed only by another set of pre-defined control codes.

Latching loopback is activated by the following method:

1. The transmission of a predefined set of Loopback commands. The signaling link test proceeds to step 2 after receiving the command from software to begin sending loopback data.

2. Test data transmitted continuously until a pre-defined loopback code is received to halt transmission.

    The latching loopback on the far end will stop only if the correct command is received from the initiator.

Non-latching loopback is activated by the following method:

1. The transmission of a minimum of 40 bytes of loopback code in multiples of 40 bytes, transmitted continuously. The signaling link test proceeds to step 2 after receiving the command from software to begin sending loopback data.

2. Alternating loopback code and test data is transmitted continuously until a message is received to halt transmission.

    The non-latching loopback test is dropped if every other byte transmitted is not a loopback code.

The EAGLE 5 SAS supports 1024 simultaneously-running system tests.

EAGLE 5 SAS supports a maximum of 32 remote link elements per SS7 link.

An HC-MIM card that is used as a T1 card supports as many simulataneous tests as there are provisioned links on that card.

Hardware Requirements

- HC-MIM card

- HIPR cards in each shelf that contains one or more HC-MIM cards

- Fan Assembly for each shelf that contains HC-MIM cards

- Air Management card in each empty slot in a shelf that contains HC-MIM cards

- Fuse and Alarm panel (requires 60 Amp feed)

The HC-MIM card is a dual-slot card that is inserted into an odd-even pair of slots. An HC-MIM card will not go onto the IMT bus if it is inserted into an even-odd pair of slots.

Any shelf that contains one or more HC-MIM cards must include HIPR on both the A and B IMT buses. The shelf must have a fan assembly, and the fan feature bit must be turned on (see the **chg-feat:fan=on** command). If these conditions are not met, any HC-MIM cards installed in the shelf will not go onto the IMT bus.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

New and Enhanced Commands

The following commands or command families are new or enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- A new command, **flash-card,** now performs the functionality of both the **init-flash** and the **act-flash** commands. This command loads all flash images supported by the specified card to the card's inactive FLASH memory, boots the card and then requests the card to activate the FLASH GPLs that are currently running. However, if the card is already running the specified GPL, the **flash-card** command will not reload the GPL.

- Two new commands, **rept-stat-e1** and **rept-stat-t1,** are used to display the port status and signaling link status for cards that have provisioned E1 or T1 port interfaces. Ports 3 through 8 are only on HC-MIM cards.

- Two new commands, **tst-e1** and **tst-t1,** support loopback testing on HC-MIM card ports. The **loopback** parameter provides the ability to select local transceiver (**lxvr**) and line loopback tests.

- The **act-flash** and **init-flash** commands support flashing of the seven HC-MIM GPLs (**blbios, blcpld, bldiag, blvxw, imtpci, plde1t1, pldpmc1**).

  A conflict exists between the HC-MIM card **blbios** and **blcpld** GPLs. One of these GPLs must be flashed to an HC-MIM and running as active before the other GPL can be flashed to the HC-MIM card.

  The **init-flash** command supports the new boot parameter, which indicates whether the HC-MIM should boot or not boot after the command successfully completes.

- The **ent-**/**dlt-**/**rtrv-slk** commands support HC-MIM signaling links **a4-a31** and **b4-b31** in the **port/link** parameter. The **ent-slk** command allows provisioning of a 64 Kbps link transmission rate for HC-MIM card and E1/T1 MIM T1 links.

- Added **link** parameter support to the **rept-stat-applsock, rept-stat-assoc**, **rtrv-appl-sock**, and **rtrv-assoc** commands.

- The **act-**/**chg-**/**rept-stat-**/**rtrv-gpl** commands allow the HC-MIM GPLs (**blbios, blcpld, bldiag, blvxw, imtpci, plde1t1, pldpmc1**) to be specified in the **gpl** parameter.

- The **ent-card** command supports the HC-MIM card as card type **lime1** or **limt1**, running the **ss7ansi** or **ccs7itu** application.

- The **inh-**/**alw-card** commands support HC-MIM cards.

- The **rept-stat-card** command includes HC-MIM cards in the output.

- The **inh-alm** command supports **dev** parameter values **e1port** and **t1port** to inhibit the E1 or T1 card port alarms, and the new **e1port** and **t1port** parameters to indicate the port for which alarms will be inhibited.

  The **unhb-alm** command supports **dev** parameter values **e1port** and **t1port** to restore the E1 or T1 card port alarms, and the new **e1port** and **t1port** parameters to indicate the port for which alarms will be restored.

- The **enable-ctrl-feature** command is used to enable the HC-MIM SLK Capacity for the maximum number of signaling links that can be assigned per HC-MIM card.

  The **rtrv-ctrl-feat** command provides an output display of the enabled quantity for the HC-MIM SLK Capacity quantity feature access key.

- The **ent-**/**chg-**/**dlt-**/**rtrv-e1**, **ent-**/**chg-**/**dlt-**/**rtrv-t1** commands support HC-MIM card ports 3 through 8 for E1 and T1 interfaces.

- The **ent-**/**chg-e1**, **ent-**/**chg-t1** commands support the new **chanbrdg** parameter. On a HC-MIM card, E1 or T1 ports 1, 3, 5, and 7 (master ports) can be independently channel bridged with their adjacent even-numbered (slave) E1 or T1 ports 2, 4, 6, and 8 to allow non-signaling data pass-through.

  The **chanbrdg** parameter is specified for the odd-numbered port only. The **e1tsel** and **t1tsel** parameters support the **recovered** timing source value, which indicates that the timing source for the even-numbered port is to be recovered from the odd-numbered port in the channel bridged pair.

  The **cas=on** parameter is not supported for HC-MIM cards.

- The **chg-th-alm** command supports configuration of low and high temperature alarm thresholds to indicate when HC-MIM cards are approaching temperatures that could damage the cards. The **rtrv-th-alm** command displays the configured thresholds.

Limitations

The limitations of the HC-MIM card in the system are as follows:

- The HC-MIM will not support channel cards because it uses all connections on the backplane.

- The HC-MIM does not support CAS on an E1 interface.

- The HC-MIM card is a dual-slot card that is inserted into an odd-even pair of slots. An HC-MIM card will not go onto the IMT bus if it is inserted into an even-odd pair of slots.

- The HC-MIM card can be provisioned as either an LIME1 card type or an LIMT1 card type. An HC-MIM card cannot go onto the IMT bus if HIPR cards are not equipped in the shelf where the HC-MIM card resides.

- The HC-MIM card used as a T1 card supports manually initiated Link Fault Sectionalization (LFS) tests, requiring a craftsperson.

- The final LFS test results are displayed only once, upon test completion.

- There is no notification to the remote network element of Link Fault Sectionalization test initiation or test results.

- LFS test duration is specified in terms of hours, minutes and seconds (hh:mm:ss), and at most 24 hours can be specified.

- The Fuse and Alarm panel requires a 60 Amp feed.

High Speed IMT Packet Router (HIPR card)

Description

HIPR, the next evolutionary step of the IMT for the EAGLE 5 SAS, provides increases in system throughput and traffic capacity. HIPR moves EAGLE 5 SAS from an intra-shelf ring topology to an intra-shelf switch topology. HIPR acts as a gateway between the intra-shelf switched slot connectors and the inter-shelf ring operating at 1.0625 Gbps. The inter-shelf ring is used to connect the shelves together in the EAGLE 5 SAS. A HIPR card is inserted into the slot that was used by the HMUX card. A mixture of HMUX and HIPR cards within one system is possible, when HIPR is installed on both the IMT A and IMT B buses in a given shelf. HIPR cards or HMUX cards, but not both, can be installed on a shelf.

Hourly Report

A HIPR card reports statistics on each of its 16 ports (one port per card slot in the shelf), the high-speed inter-shelf ring, and the UART. For the hourly report, the HIPR card reports the low speed statistics as an aggregate number. The HIPR statistics and the HMUX statistics are different. The **rept-imt-info** command displays HIPR and HMUX statistics.

Hardware Requirements

HIPR cards can replace HMUX cards in EAGLE 5 SAS shelves. HIPR cards are required in each shelf that contains one or more HC-MIM cards.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

New and Enhanced Commands

The following commands or command families are new or enhanced to support HIPR cards. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- A new command, **rept-stat-mux**, is used to list the location and status of all HMUX and HIPR card in the system.

- The **act-flash** and **init-flash** commands support flashing of the **hipr** GPL.

- The **canc-cmd** and **dact-cmd** commands support canceling of the **rept-imt-info** command execution and canceling of the **rtrv-obit** command execution for the active OAM.

- The **act-gpl**, **chg-gpl**, **init-imt-gpl**, **rept-stat-gpl**, and **rtrv-gpl** commands allow the **hipr** GPL to be specified in the **gpl** parameter.

- The **rept-imt-info** command reports HMUX statistics and HIPR statistics.

- The **clr-imt-stats** command clears the HIPR statistics buckets.

- The **init-mux** command initializes HIPR cards and HMUX cards.

- The **rept-stat-card** and **rept-stat-sys** commands include HIPR cards in the report information.

- The **chg-bip-fld**, **chg-bip-rec, disp-bip**, **rtrv-bip**, and **tst-bip** commands do not support HIPR cards; HIPR cards do not contain Board PROM information.

- The **disp-/dlt-/ent-bp** commands support break points for HIPR cards.

- The **tst-imt** command reports on HIPR cards.

Limitations

The accuracy of statistics collected, maintained, and reported by HIPR in the HEM task are limited by the sample rate of the statistics. There are no count values associated with the sampling of the number of times a particular (recoverable) error has occurred since the last (500mS) sampling period, but simply that one or more of a particular error condition has been detected. Subsequently, a count value is incremented by one. This affects the granularity of the error counts, but not their usefulness in diagnosing IMT problems. An initial sample rate of 500mS has been chosen to minimize the number of accesses by the StrongARM processor to the FPGA via the SlowPort Bus. This is because each access via the SlowPort bus to the FPGA blocks the microengines' access to SRAM, because the SRAM and SlowPort are shared buses.

8000 Routesets

Description

The 8000 Routesets feature expands the SS7 routing connectivity between the EAGLE 5 SAS and other nodes by increasing the number of routesets supported by EAGLE 5 SAS from 6000 to 8000. This feature can be viewed as an extension to the 6000 Routesets feature, which expanded the EAGLE 5 SAS routesets from 5000 to 6000.

A Feature Access Key (FAK) allows the customer to set the routeset limit to either 7000 or 8000. With the exception of a routeset provisioning limit imposed by the 7000 FAK, the 7000 Routeset and 8000 Routeset implementations are identical.

The number of aliases for destinations that can be provisioned depends on the Routeset features that are turned on. If no Routeset features are on or if features for up to 6000 Routesets are on, a maximum of 8000 aliases can be provisioned.

Hardware Requirements

The 8000 Routesets feature does not require any new hardware.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands support the 8000 Routesets feature. See the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set for a detailed description of all commands and their parameters.

- The **chg-/dlt-/ent-dstn** commands are used to change, add, or delete the destination point codes in the Destination table for a specific signal transfer point (STP).

- The **rtrv-dstn** command is used to display the (x of y) z% full entry for the Destination table and the Alias table where:

  x = the number currently provisioned in each table

  y = the maximum number of routesets or aliases allowed in each table

  z = the table percent full value

  This information is displayed in the first two lines of the output Summary Report:
  ```
  Destination table is (10 of 8000) 1% full
  Alias table is (8 of 12000) 1% full
  ```

  The output Detail Report displays additonal Destination and Alias information:
  ```
  rlghncxa03w 05508-18 08:29:15 EST  EAGLE 34.0.0
  DESTINATION ENTRIES ALLOCATED:   8000
  ```

```
      FULL DPC(s):                  9
      NETWORK DPC(s):               0
      CLUSTER DPC(s):               1
      TOTAL DPC(s):                10
      CAPACITY (% FULL):           1%
 ALIASES ALLOCATED:             12000
      ALIASES USED:                 8
      CAPACITY (% FULL):           1%
 X-LIST ENTRIES ALLOCATED:       500
 CHG-DSTN: MASP A - COMPLTD
;
```

- **chg-stpopts** - The **mtpdpcq** parameter of the **chg-stpopts** command must be set to the value of the quantity feature (6000, 7000, or 8000 routesets) to allow the maximum number of destinations to be provisioned.

- The **enable-**/**rtrv-ctrl-feat** commands are used to enable the 8000 Routesets feature and display the enabled feature quantity.

- The **rept-stat-dstn (rte)** command is used to generate a report of the MTP point code status for provisioned point codes. Any provisioned destination can be specified, including a cluster destination (*ni-nc-**) or a network destination (*ni-*-**). This command can display 8000 routes/destinations when the key is enabled.

- The **rtrv-tbl-capacity** command is used to retrieve a summary of the table use capacity. For each table listed, the number of table entry elements in use and the total allowed number of table elements is presented - along with a percent (%) full value.

DigitAction Expansion

Description

G-Port and G-Flex allow the SCCP CdPA GTA field to be overwritten if G-Port determines the call should be relayed to its destination after a PDB lookup is performed.

G-Port and G-Flex support options that can be selected to overwrite or not to overwrite the SCCP CdPA GTA field. These options are defined by the DigitAction field of the PDBI Enter Network Entity command and Update Network Entity command. The user can also set these options to format the SCCP field before the EAGLE 5 SAS relays the message to the destination.

The rules for formatting the SCCP CdPA GTA field are based on the value specified in the DigitAction field. If **digitaction** = **none**, the EAGLE 5 SAS does not overwrite the SCCP CdPA GTA field. For all other values, the EAGLE 5 SAS formats the SCCP CdPA GTA field according to the value assigned to DigitAction field.

This feature expands the DigitAction field in PDBI and the EPAP GUI to support additional values **delcc**, **delccprefix**, **spare1**, and **spare2**. If the DigitAction value is **delccprefix**, the SCCP CdPA GTA field of an outgoing message is formatted by prepending the RN/SP ID to the incoming SCCP CdPA GTA field and deleting the default country code if present. If the DigitAction value is **delcc**, the SCCP CdPA GTA field of an outgoing message is the incoming SCCP CdPA GTA field without the default country code if present. The result of specifying the DigitAction field values **spare1** and **spare2** is the same as specifying the value **none**.

Hardware Requirements

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

No EAGLE 5 SAS commands are affected by this feature.

GSM MAP SRI Redirect to Serving HLR

Description

This feature provides the capability to resolve the incompatibility introduced by the proprietary implementation of the GSM MAP SRI message. This feature is an extension to the G-Port Mobile Number Portability (G-Port MNP) Protocol. Therefore, the feature is compatible with other MNP enhancement features provided to date, including the "G-Port MNP Circular Route Prevention," "Portability Check for Mobile Originated SMS" and "Pre-paid SMS Intercept" features.

Hardware Requirements

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhancements to Existing Commands

The following commands or command families have been enhanced to support the GSM MAP SRI Redirect feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The **enable**-/**chg**-/**rtrv**-**ctrl**-**feat** commands are used to enable and turn on or off the GSM MAP SRI Redirect feature, and display of the status of the enabled feature (on or off).

- The **chg**-/**dlt**-/**rtrv**-**prefix** commands are used to:

  - Enter the name of a feature, the value of a prefix used by the feature, and a prefix number that is used to refer to the prefix from another table.

  - Delete a prefix based on the name of the feature, its prefix, and its prefix number.

  - Retrieve provisioned prefix information for all supported features or for a specified feature.

- The **ent**-/**dlt**-/**rtrv**-**vendid** commands are used to enter, delete, and display elements in the Vendor ID list, for the GSM MAP SRI Redirect feature. Each entry is identified by the Vendor ID and the Vendor number.

  - The Vendor ID length (**vendidlen** parameter) must be entered first, before the command is entered the second time to enter the Vendor ID and Vendor Number.

ISUP NP with EPAP

Description

The purpose of the Integrated Services Digital Network User Part Numbering Plan with EAGLE 5 SAS Provisioning Application Processor (ISUP NP with EPAP) feature is to prepend a prefix (a SubNet prefix or RN) to the CdPN of an IAM message if the CdPN is a ported in (including never been ported) or a ported out DN before relaying the message to its destination. The prefix provides the recipient switch a means to differentiate a call so that different billing rates or routing can be applied to the call.

The title is selected to distinguish a similar feature developed for support of ELAP database lookup based on the ANSI ISUP Initial Address Message (IAM). This feature presents no impact on the EPAP.

The EAGLE 5 SAS provides the "ISUP NP with EPAP" treatments to the ISUP IAMs that meet certain gateway screening criteria using the existing Gateway Screening feature. The Gateway Screening feature will allow SS7 messages to be selected for the "ISUP NP with EPAP" treatments, minimally, based on:

- OPC

- DPC

- SIO

- ISUP message type (IAM and SAM)

For the selected ISUP messages, the EAGLE 5 SAS performs NPDB lookup based on ISUP IAM CdPN (the B-number). If the CdPN is a ported out number, the EAGLE 5 SAS relays the IAM with CdPN=RN + Initial CdPN. If the CdPN is a ported-in or never been ported subscriber, the EAGLE 5 SAS prepends a SubNet prefix, that identifies the SubNet to which the CdPN belongs within the operator network, to the CdPN of the IAM message before relaying the message to its destination. For any other types of CdPN, the EAGLE 5 SAS relays the IAM without modifications. If SAM are used in the network, then SAM should be entered in the Gateway Screening rules.

Hardware Requirements

The ISUP NP with EPAP feature does not require any new hardware.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands or command families have been enhanced to support the ISUP NP with EPAP feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The **chg-ctrl-feat** command is used to turn on or turn off On/Off features and turn on Permanently On features (they cannot be turned off after they have been turned on)

- The **rtrv-ctrl-feat** command is used to retrieve the status of the ISUP NP with EPAP feature.

- The **chg-gws-actset** command is used to configure the gateway screening stop action sets in the EAGLE 5 SAS database. Stop action sets are used to define the actions performed on the Message Sending Units (MSUs) that pass the gateway screening process. The Gateway Screening Stop Action table contains a maximum of 16 stop action sets, with each stop action set containing a maximum of 10 stop actions. The first three gateway screening stop action sets (actid=1, actid=2, and actid=3) are already defined with the existing gateway screening stop actions shown in Chapter 5 of the *Commands Manual*. Triggerless LNP (**tlnp**) Gateway Screening Stop Action can be used when the TLNP feature is turned on, or the "ISUP NP with EPAP" feature is enabled.

- The **chg-prefix** command is used to enter the name of a feature, the value of a prefix used by the feature, and a prefix number that is used to refer to the prefix from another table.

- The **dlt-prefix** command is used to delete a prefix based on the name of the feature, its prefix, and its prefix number.

- The **rtrv-prefix** command is used to retrieve provisioned prefix information for all supported features or for a specified feature.

- The **dlt-subnetid** command is used to delete a Subnet ID entry from the Subnet ID list, for the "ISUP NP with EPAP" feature.

- The **ent-subnetid** command is used to enter elements into the Subnet ID list, for the "ISUP NP with EPAP" feature. Each entry is identified by the Subnet ID and the Subnet number.

  - The Subnet ID length (**subnetidlen** parameter) must be entered first, before the command is entered the second time to enter the Subnet ID and Subnet Number.

- The **rtrv-subnetid** command is used to retrieve a list of Subnet ID entries from the SUBNETID table, for the "ISUP NP with EPAP" feature.

Linkset Restricted Support

Description

The Linkset Restricted Support feature provides an alternate routing algorithm that is more tolerant during linkset transitions, and reduces the likelihood of experiencing congestion on those linksets that do not have a sufficient quantity of links available to carry normal traffic loads.

This feature is designed to prevent congestion on newly available linksets for GT-routed traffic in addition to MTP-routed traffic.

The route (linkset) that a message takes is determined using on two factors:

1. Route Status. Restricted and Allowed are both considered available from a routing path perspective.

2. Routing cost (ent-rte:rc=)

Current routing procedures determine and use the least cost available route, regardless of whether the route is Allowed or Restricted. However, congestion can occur if too few Allowed links are available to handle an unexpected spike in the traffic load. While at the same time, a higher cost available route may exist that is Allowed and with more links available to handle the congestion, receives no traffic.

The current routing determination algorithm does not use Restricted status when determining the preferred route. Use of the current algorithm is normally not an issue for messages not destined to the EAGLE 5 SAS (e.g., ISUP) but can have detrimental effects on messages destined to the EAGLE 5 SAS's point code (e.g., GTT traffic). The EAGLE 5 SAS can issue TFRs for MTP-routed traffic and expect the upstream nodes to find alternate routes. However, when GTT traffic arrives destined for the EAGLE 5 SAS's point code during a linkset failure, the originating node does not receive a TFR concerning the EAGLE 5 SAS's point code. Therefore, GTT traffic will not be diverted; and when the first link in the failed linkset becomes allowed, the EAGLE 5 SAS will try to route all traffic over the newly available link. Congestion can occur due to the potentially large amounts of GTT traffic. This behavior is shown in Figure FN-1 on page FN-36.

Figure FN-1.   Example of SCCP Traffic During Linkset Failures
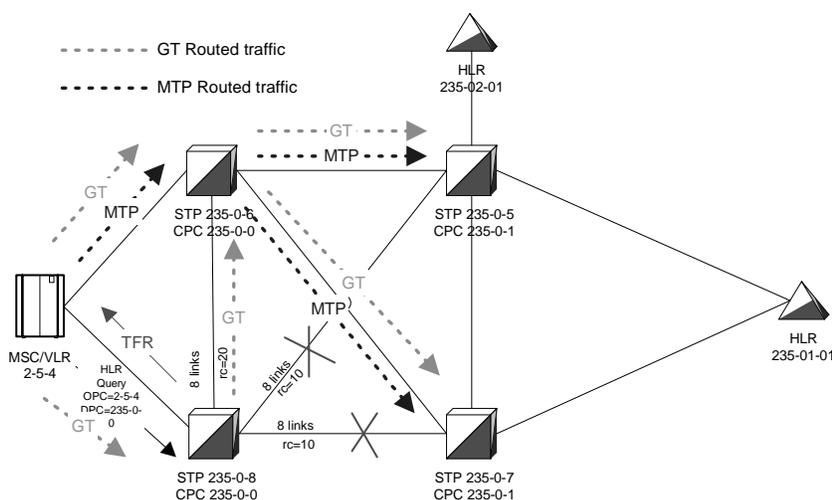
The B-linkset from STP 235-0-8 to STP 235-0-7 and the D-Linkset from STP 235-0-8 to STP 235-0-5 fail. Normally, a TFR would be sent to the MSC/VLR concerning destinations such as HLR 235-1-1. MTP traffic would be diverted from STP 235-0-8 to STP 235-0-6 and STP 235-0-8 would not receive any traffic. As links become available again on the B- or D-linksets, when the threshold is specified by the **tfatcabmlq** parameter, a TFA/TCA is broadcast to the MSC/VLR to allow MTP-routed traffic to flow again through STP 235-0-8.

However, GT-routed traffic to the true point code or CPC of STP 235-0-8 continues to arrive at STP 235-0-8 and be sent over the C-linkset when the B- and D-linksets failed. STP 235-0-8 knows that HLR 235-1-1 is restricted, but has no method of notifying MSC 2-5-4 to attemp to find an alternate path. Since the destination of the GT-routed traffic is STP 235-0-8, a TFR to MSC 254 concerning HLR 235-1-1 is ignored.

As links become available on the B-linkset again, GT-routed traffic immediately starts to undergo changeback procedures. This can congest the newly available links, if there are not enough, within the B-linkset to carry the normal traffic load. Again, MTP-routed traffic is still being diverted to the mate STP 235-0-6 by the MSC/VLR until the setting in the **tfatcabmlq** parameter (broadcast minimum link quanity) is met and a TFA/TCA is issued.

The Linkset Restricted Support feature compares a linkset's available links against its provisioned links to determine if it is capable of carrying its normal load. If all or most links are available, the linkset is considered Allowed. If fewer than a specified number of links are available, the linkset may experience congestion and is considered Restricted.

Based on available link count, the Linkset Restricted Support feature alters the routing path decision process and chooses the higher-cost Allowed route instead of the lower-cost Restricted route.

For Linkset Restriced Support, while the B-Linkset is Restricted, it gets bypassed and GT-routed traffic is sent on the C-Linkset. When enough links become available for the B-Linkset to be Allowed, then B-Linkset will again be used for routing. This helps prevent congestion by ensuring that traffic gets routed on the linkset with the most available capacity.

> **NOTE: NonAdjacent Restricted status is not used to determine when to use higher-cost routes. A route that has a linkset status of Allowed and a NonAdjacent status of Restricted is considered to be the lowest-cost available route and is used. Non-Adjacent Restricted status is used to choose which linksets of a combined linkset to use. NonAdjacent Prohibited status is still used to determine routing path decisions.**

This feature supports ITU linksets and ANSI linksets.

Transfer Restricted (TFR) procedures support ITU-N linksets only if the ITU TFR option is turned on for the linkset. ITU-I linksets do not support TFR procedures. However, when the **lsrestrict** option is on, the Restricted status for a route internal to the EAGLE 5 SAS still applies to ITU linksets. The user can set the number of links required for the linkset to be allowed to a higher number just like ANSI linksets.

Hardware Requirements

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhancements to Existing Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your current documentation set.

chg-/rtrv-ss7opts

The **chg-ss7opts** command is used to change the values of one or more of the SS7 option indicators maintained in the SS7 Options table. SS7 options can modify normal handling of SS7 traffic.

The **rtrv-ss7opts** command is used to retrieve the current values of the SS7 option indicators maintained in the STP Options table. SS7 options can modify normal handling of SS7 traffic.

Parameter

:lsrestrict= (optional)
Use the restricted-linkset routing-determination algorithm. This parameter enables and disables the restricted linkset routing determination algorithm on a system-wide basis.

Range: on, off

> **on**—Restrictive linkset routing enabled; route traffic on the least restrictive available route with the lowest cost.
>
> **off**—Restrictive linkset routing disabled; route traffic on the lowest cost route.

Default: Current value in the database.

> System Default: **off**

Output Example

chg-ss7opts:lsrestrict=yes

```
rlghncxa03w 05-08-29 16:40:40 EST  EAGLE 34.0.0
CHG-SS7OPTS: MASP A - COMPLTD
```

rtrv-ss7opts

```
tekelecstp 05-08-28 14:42:38 EST  EAGLE 34.0.0
SS7 OPTIONS
-----------------------
LSRESTRICT         off
```

chg-ls

The **chg-ls** command is used to change the attributes for a specified linkset in the EAGLE 5 SAS database. The new values overwrite the existing values.

Parameter

:tfatcabmlq=. (optional)

TFA/TCA broadcast minimum link quantity. This parameter specifies the minimum number of links in the given linkset, or in the combined linkset in which the linkset resides, that must be available to user-part messages traffic. This parameter value gives the user the ability to configure when linksets are considered to be Allowed or Restricted.

When the **tfatcabmlq** parameter database value is **0**, the TFA/TCA broadcast minimum link quantity is calculated by the Eagle to be either a minimum of **1** for linksets containing 3 or fewer links, or half of the number of links configured in the linkset for linksets containing more than 3 links.

When the **tfatcabmlq** parameter value is set to a specific value greater than **0**, the Eagle does not calculate a TFA/TCA broadcast minimum link quantity. The specified value is used.

If the **lsrestrict** option is **off** (see the **chg-ss7opts** command), the **tfatcabmlq** database value for C linksets cannot be changed from the system default of **0**. If the **lsrestrict** option is **on** (see the **chg-ss7opts** command), the **tfatcabmlq** value for C linksets (**lst=c**) can be set to a value from **1** to **16**. If you change the **tfatcabmlq** value for one or more C linksets in the system, you cannot set the **lsrestrict** option from **on** to **off** until you set all of the changed C linkset **tfatcabmlq** values back to **0**.

> **NOTE:**   **The rtrv-ls command output always shows the calculated value or the provisioned value for the tfatcabmlq parameter. See the rtrv-ls command description in the *Commands Manual* of your current documentation set.**

Range: 0, 1–16

Default: No change to current value.

　　　　　System default: **0**

rept-stat-dstn/rte

The **rept-stat-dstn** command is used to generate a report of the MTP point code status for provisioned point codes. Any provisioned destination can be specified, including a cluster destination (*ni-nc-**) or a network destination (*ni-*-**). For a destination that is not prohibited, a '*' will be displayed next to the route(s) that are currently carrying traffic.

The **rept-stat-rte** command is used to display the signaling route status for a particular destination. Route(s) currently carrying traffic for the destination will each have a '*' next to it.

Output Example

The asterisks in the space after the route numbers in the following examples indicate which route (or combined route) is carrying traffic.

rept-stat-dstn:dpc=1-1-1

```
    tekelecstp 05-09-24 09:19:04 EST  EAGLE 34.0.0
      DPCA                  PST           SST       AST
      001-001-001           IS-NR         Allowed   ACCESS
    ALARM STATUS         = No Alarms.
    RTE COST  LSN             APCA         LS STAT   NON-ADJ    ROUTE STAT
     1*  05   lse1e1          001-001-001  Allowed   Allowed    Allowed
     2*  05   lse1e2          001-002-001  Allowed   Allowed    Allowed
     3   10   lse1e3          001-003-001  Allowed   Allowed    Allowed
     4   --   ---------- ---***-***-***   --------  --------   --------
     5   --   ---------- ---***-***-***   --------  --------   --------
     6   --   ---------- ---***-***-***   --------  --------   --------
    Command Completed.
;
```

rept-stat-dstn:dpc=1-1-1

No asterisk appears after the route number in the following example; no routes were carrying traffic at the time.

```
tekelecstp 05-09-24 09:19:04 EST  EAGLE 34.0.0
DPCA                    PST           SST       AST
001-001-001             OOS-MT        Prohibit  INACCESS
  ALARM STATUS      = *C  0313 DPC is prohibited
  RTE COST  LSN          APCA          LS STAT   NON-ADJ   ROUTE STAT
   1   05   lse1e1       001-001-001   Prohibit  Allowed   Prohibit
   2   05   lse1e2       001-002-001   Prohibit  Allowed   Prohibit
   3   10   lse1e3       001-003-001   Prohibit  Allowed   Prohibit
   4   --   ---------- ***-***-***     --------  --------  --------
   5   --   ---------- ***-***-***     --------  --------  --------
   6   --   ---------- ***-***-***     --------  --------  --------
Command Completed.
;
```

In the following example, the primary route is not carrying traffic.

rept-stat-dstn:dpc=1-1-1

```
tekelecstp 05-09-24 09:19:04 EST  EAGLE 34.0.0
DPCA                    PST           SST       AST
001-001-001             IS-ANR        Restrict  ACCESS
  ALARM STATUS      = *C 0334 DPC Subsystem is Abnormal
  RTE COST  LSN          APCA          LS STAT   NON-ADJ   ROUTE STAT
   1   05   lse1e1       001-001-001   Prohibit  Allowed   Prohibit
   2   05   lse1e2       001-002-001   Prohibit  Allowed   Prohibit
   3*  10   lse1e3       001-003-001   Allowed   Allowed   Allowed
   4   --   ---------- ***-***-***     --------  --------  --------
   5   --   ---------- ***-***-***     --------  --------  --------
   6   --   ---------- ***-***-***     --------  --------  --------
Command Completed.
;
```

Legend

DPC/DPCA—The ANSI destination point code of the route

PST—The primary state of the subsystem. The possible values are described in in Appendix A of the Commands Manual.

SST—The secondary state of the subsystem. The possible values are described in in Appendix A of the Commands Manual.

AST—The associated state of the subsystem. The possible values are described in in Appendix A of the Commands Manual.

MTP MAP Screening

Description

MTP MAP Screening is an enhancement to the existing GMS/EGMS features that adds the ability to route MTP traffic whose service indicator (SI) field is SCCP through the MAP Screening subsystem. It also adds a per-server MAP Screening forced pass peg count (MSCRNPAFP).

Hardware Requirements

This feature requires an MCPM EDSM-2G (870-2372-03) card and DSM cards.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands or command families have been enhanced with new parameters to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The **chg-ctrl-feat** command is used to turn the MTP MAP Screening feature on or off.

- The **enable-ctrl-feat** command is used to enable the MTP MAP Screening feature.

- The **rtrv-ctrl-feat** command is used to retrieve the status of the MTP MAP Screening feature access key.

Private Point Code

Description

Private point codes (PPCs) are used for internal routing within the EAGLE 5 SAS. PPCs may be used for "internal point codes" which are used for the End Office feature, and adjacent point codes for IPGWx linksets. The principle difference between private point codes and non-private is whether the point code is known outside the EAGLE 5 SAS. Point codes within the EAGLE 5 SAS are useful for routing messages within the EAGLE 5 SAS, but when these point codes are non-private, they consume a point code value in the network. By making these point codes private, it is possible to have a point code value indicated as private and still have the same point code value (as not private) available for network configuration.

PPCs must be supported in every supported domain. ANSI, ITU-I, ITU-N, ITUI-Spare, ITUN-Spare, ITUN24 must all support a private version of a point code.

PPCs will be allowed for IPGWx APCs (adjacent point codes). Currently there are special rules for provisioning IPGWx APCs. A special parameter IPGWAPC=YES on the ent-dstn and ent-ls commands allows point codes with otherwise invalid ranges (e.g., ANSI point code 0-0-1) to be used. This parameter also identifies the linkset as one that may only contain IPGWx links. With the implementation of this feature, PPCs will also be allowed for this purpose. The IPGWAPC parameter will remain, however, since not all PPCs are IPGWx APCs.

PPCs will also be allowed for SAPCs on IPGWx linksets. Like IPGWx APCs, SAPCs on IPGWx linksets are not "real" point code, and the network beyond the EAGLE 5 SAS does not need to be aware of them.

PPCs will also be allowed used for the provisioning the End Office feature. In order to support this, PPCs must be allowed for the Remote Application (RMT-APPL) table, and GTT table, in addition to the Destination and Route tables.

Existing Internal Point Codes and IPGW linkset adjacent point codes will not be modified during upgrade. After upgrade, both private and non-private point codes can be used for these purposes.

Note that static routing keys are never needed for RMT-APPL point codes or IPGWx adjacent point codes. For the End Office feature, a true or secondary point code routing key is needed, while for IPGWs adjacent point codes, no routing key is needed.

ITU International and National Spare Point Code

Description

The EAGLE ITU International/National Spare Point Code feature allows a network operator to use the same Point Codes across two networks (either ITU-I or ITU-N). The feature also enables both ITU spare and non-spare traffic to be routed over the same linkset. The EAGLE uses the MSU Network Indicator (NI) to differentiate the same point code of one network from the other. In accordance with the SS7 standard, unique Network Indicator values are defined for ITU-I, ITU-N, ITU-I Spare, and ITU-N Spare Point Code types.

The EAGLE currently provides full support for four types of point codes:

- ANSI, ITU-National (NI=10binary)

- ITU-National 24-bit

- ITU-International (NI=00 binary)

- ITU National Spare PCs (NI=11 binary) can be primarily supported via a combination of the following two items:

1. Support for ITU-National Spare can be set on a per linkset basis using the linkset NIS parameter. If set, the EAGLE will allow receipt of messages with NI=11binary on the designated linkset and will force all outgoing messages on that linkset to have NI=11binary.

2. The Duplicate Point Code routing feature, combined with the Multiple Point Code Support feature, can be used to create a separate routing group for a National Spare Point Code network.

While these two functions can be combined to support ITU National Spare Point Code routing, there are limitations described as follows:

- The EAGLE cannot distinguish between messages with different network indicators received over the same linkset. For example, the EAGLE will route a message with DPC = 1-1-1 (NI=10binary) the same way as a message with DPC = 1-1-1 (NI=11binary).

- Forcing the user to use the Duplicate PC Routing feature requires that all linksets in the system be placed in one of the defined groups.

The Spare Point Code Support feature addresses the above limitations and provides a new PC sub type named Spare that supports both the ITU-N Spare and ITU-I Spare Point Code feature.

Additionally, this feature requires a single linkset to support multiple outgoing network indicators (e.g. 11 binary, 00 binary). In turn, messages are routed according to the Point Code on the outgoing node that corresponds to the associated network indicator.

Hardware Requirements

There is no new hardware for this release.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhancements to Existing Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

Table FN-1 lists the commands that support the spare, private, and private and spare point codes.

Table FN-1.   Commands with Subtype Prefixes and New Parameters

s-		p-	ps-	pcst	pcst, npcst
ent-/chg-/dlt-/rtrv-dstn (aliases are s- only)				ent-/dlt-/rtrv-scr-dpc	chg-scr-dpc
rept-stat-dstn-/rte				ent-/dlt-/rtrv-scr-blkdpc	chg-scr-blkdpc
ent-/chg-/dlt-/rtrv-rte				ent-/dlt-/rtrv-scr-opc	chg-scr-scr-opc
inh-/unhb-alm				ent-/dlt-/rtrv-scr-blkopc	chg-scr-blkopc
ent-/dlt-rmt-appl				ent-/dlt-/rtrv-scr-destfld	chg-scr-destfld
ent-/chg-ls				ent-/dlt-/rtrv-scr-aftpc	chg-scr-aftpc
ent-/chg-/rtrv-gta				ent-/dlt-/rtrv-scr-cgpa	chg-scr-cgpa
ent-/chg-/rtrv-gtt				ent-/dlt-/rtrv-scr-cdpa	chg-scr-cdpa
ent-/chg-/dlt-/rtrv-map		rst-dstn		rtrv-dstn	
ent-/chg-/rtrv-sid		rept-stat-cluster		rtrv-rte	
ent-/dlt-/rtrv-spc					
ent-/chg-/dlt-/rtrv-appl-rtkey					
chg-gsmopts					
ent-/chg-gsmmap-scrn					
ent-/chg-gsms-opcode					
ent-/chg-/dlt-/rtrv-mrn					
ent-/dlt-cspc					
ent-trace					

s- Spare point code subtype prefix.
p- Private point code subtype prefix.
ps- Private and spare point code subtype prefix.
:pcst: Point code subtype parameter that indicates whether the specified ITU international or ITU national point code has no subtype prefix or has the specified point code prefix.
:npcst: New point code subtype parameter that indicates whether the specified new ITU international or ITU national point code has no subtype prefix or has the specified point code prefix.

Gateway Screening Commands

The **chg-scr-** commands support the Point Code Subtype (**pcst**) parameter and the New Point Code Subtype (**npcst**) parameter. The **ent-scr-**, **dlt-scr-,** and **rtrv-scr-** commands support only the **pcst** parameter. The (**npcst**) parameter indicates whether the specified new ITU international or ITU national point code has no subtype prefix or has the spare point prefix (**s-**).

Commands that Support Entry of Point Code Subtype Prefixes

The point code parameters that support both spare point codes and private point codes are shown in the following examples:

:dpci= (mandatory)
ITU international destination point code with subfields *zone-area-id*. The *prefix* subfield indicates a spare point code, private point code, or private and spare point code (*prefix-zone-area-id*).

Range: **s-, p-, ps-, 0-255**
Specify a valid value for each subfield of the point code, and separate the subfields with a dash (-).

The point code **0-000-0** is not a valid point code.

prefix—**s-, p-, ps-**
zone—**0–7**
area—**000–255**
id—**0–7**

:dpcn= (mandatory)
ITU national destination point code in the format of a 5-digit number (*nnnnn*); or 2, 3, or 4 numbers (members) separated by dashes (*m1-m2-m3-m4*) as defined by the **chg-stpopts:npcfmti** flexible point code option. A group code must be specified when the ITUDUPPC feature is turned on (*nnnnn-gc, m1-m2-m3-m4-gc*). The *prefix* subfield indicates a spare point code, private point code, or private and spare point code (*prefix-nnnnn, prefix-nnnnn-gc, prefix-m1-m2-m3-m4, prefix-m1-m2-m3-m4-gc*).

Range: **s-, p-, ps-, 0-16383, aa-zz**
Specify a valid value for each subfield of the point code, and separate the subfields with a dash (-).

prefix—**s-, p-, ps-**
nnnnn—**0–16383**
gc—**aa** - **zz**
m1-m2-m3-m4—**0-14** for each member; values must sum to 14

The point code parameters for commands that support only spare point codes are shown in the following examples:

:dpci= (optional)
ITU international destination point code with subfields *zone-area-id*. The *prefix* subfield indicates a spare point code (*prefix-zone-area-id*)

Range: s-, 0-255
>   Specify a valid value for each subfield of the point code, and separate the
>   subfields with a dash (-).
>
>   *prefix*—**s-**
>   *zone*—**0–7**
>   *area*—**000–255**
>   *id*—**0–7**
>   The point code **0-000-0** is not a valid point code.

:dpcn=   (optional)

ITU national destination point code in the format of a 5-digit number (*nnnnn*); or
2, 3, or 4 numbers (members) separated by dashes (*m1-m2-m3-m4*) as defined by
the **chg-stpopts:npcfmti** flexible point code option. A group code must be
specified when the ITUDUPPC feature is turned on (*nnnnn-gc*, *m1-m2-m3-m4-gc*).
The *prefix* subfield indicates a spare point code (*prefix-nnnnn, prefix-nnnnn-gc,
prefix-m1-m2-m3-m4, prefix-m1-m2-m3-m4-gc*).

Range: s-, 0-16383, aa-zz
>   Specify a valid value for each subfield of the point code, and separate the
>   subfields with a dash (-).
>
>   *prefix*—**s-**
>   *nnnnn*—**0–16383**
>   *gc*—**aa** - **zz**
>   *m1-m2-m3-m4*—**0-14** for each member; values must sum to 14

The point code parameters for commands that support only private point codes
are shown in the following examples:

:dpc= or **:dpca=**   (mandatory)

ANSI destination point code with subfields *network indicator-network
cluster-network cluster membe*r (*ni-nc-ncm*). The *prefix* subfield indicates a private
point code (*prefix-ni-nc-ncm).*

Range: p-, 000-255, *
>   Specify a valid value for each subfield of the point code, and separate the
>   subfields with a dash (-).
>
>   *prefix*—**p-**
>   The asterisk (*) value is not valid for the *ni* subfield.
>   When **chg-sid:pctype=ansi** is specified, *ni* = **000** is not valid.
>   When **chg-sid:pctype=ansi** is specified, *nc* = **000** is not valid if *ni* =
>   **001–005**.
>   When **chg-sid:pctype=ansi** is specified, *nc* = **000** is valid if *ni* = **006–255**.
>   When **chg-sid:pctype=ansi** is specified, *ni*-*-* is valid if *ni* = **006–255**.
>   The point code **000-000-000** is not a valid point code.

:dpcn24= (mandatory)

24-bit ITU national destination point code with subfields *main signaling area-sub signaling area-signaling point* (*msa-ssa-sp*). The *prefix* subfield indicates a private point code (*prefix-msa-ssa-sp*).

Range: p-, 000-255

> Specify a valid value for each subfield of the point code, and separate the subfields with a dash (-).
>
> *prefix*—**p-**
> *msa*—**000–255**
> *ssa*—**000–255**
> *sp*—**000–255**

Retrieve Command

The commands in Table FN-2 have only output example changes:

Table FN-2.   Commands with Only Output Changes

rept-stat-alm	rtrv-cscp	rtrv-ls
rept-stat-ls	rtrv-gsmmap-scrn	rtrv-na
rept-stat-trbl	rtrv-gsmopts	rtrv-rtdb-data
	rtrv-gsms-opcode	rtrv-log

> **NOTE: The rtrv-na output displays the network point code types that each network appearance represents.**

When spare, private, and both private and spare point codes appear in output, the appropriate point code subtype prefix precedes the point code. For example:

rtrv-dstn:pctype=itui

```
    tekelecstp 05-04-05 08:09:42 EST  EAGLE 34.0.0
       DPCI          CLLI        BEI ELEI   ALIASA         ALIASN/N24    DOMAIN

        s-2-002-1    ----------- no  --- -------------- -------------- SS7
        s-2-002-2    ----------- no  ---   001-001-003  -------------- SS7
        s-1-002-3    ----------- no  --- -------------- -------------- SS7
       ps-2-100-1    ----------- no  --- -------------- -------------- SS7
        s-2-100-1    ----------- no  --- -------------- -------------- SS7
          2-100-1    ----------- no  --- -------------- -------------- SS7
        p-2-120-1    ----------- no  --- -------------- -------------- SS7
        p-7-100-1    ----------- no  --- -------------- -------------- SS7
        s-7-100-1    ----------- no  --- -------------- -------------- SS7
       ps-7-129-2    ----------- no  --- -------------- -------------- SS7
       ps-4-012-1    ----------- no  --- -------------- -------------- SS7
        p-2-012-1    ----------- no  --- -------------- -------------- SS7
        s-2-012-1    ----------- no  --- -------------- -------------- SS7
        s-3-134-1    ----------- no  --- -------------- -------------- SS7
        p-3-134-1    ----------- no  --- -------------- -------------- SS7
       ps-3-134-1    ----------- no  --- -------------- -------------- SS7
       ps-5-120-1    ----------- no  --- -------------- -------------- SS7
        s-5-120-1    ----------- no  --- -------------- -------------- SS7
```

```
      p-5-120-1        ---------- no  --- --------------  --------------   SS7

      Destination table is (65 of 2000) 3% full
      Alias table is (6 of 12000) 1% full
      RTRV-DSTN: MASP A - COMPLTD
;
```

Legend

DPCI—Destination point code.

CLLI—Command Language Location Indicator.

BEI—Broadcast Exception Indicator.

ELEI—Cluster Exception-List Exclusion Indicator.

NCAI—Nested Cluster Allowed Indicator.

ALIASN24—Alias point code.

SPC—Secondary point code.

DOMAIN—Destination Entity Domain.

Pass-through Commands

drklog

The **drklog** command is used to report the dynamic route key provisioning history. However, TALI Dynamic Routing Key requests do not support the spare point code type. Therefore, the drklog history report will not contain spare point codes.

msucount

The **msucount** command is used to report the count of SS7 MSUs and bytes that pass through links, routing keys, and IP connections. These counts can be reported and reset at the same time to get accurate counts for longer periods of time. In addition to MSUs transmitted and received, the **msucount** command also reports statistics on packets related to MTP Primitives and on discarded transmit and receive data.

Options

-c point code type
This option modifier can be specified preceding the -**k** option to identify the point code type (ANSI, ITU international, ITU-national, 24-bit ITU national, ITu international spare, and ITU national spare) in the routing key that follows the -**k** option in the command.
Range: ansi, itui, itun, itun24, ituis, ituns
Default: ansi

msuroute

The **msuroute** command is used to provide a list of all routing keys currently configured on an SS7IPGW/IPGWI card that could be used to route a particular MSU. With 3 types of routing keys (fully specified, partial and default) and 2 types of routing key tables (static and dynamic) the complexity associated with figuring out how a particular MSU would be routed at any point in time is not trivial. This command provides output to help determine how MSUs will be routed based on current conditions.

Options

-**c** <u>point code type</u>
This option modifier can be specified preceding the -**k** option to identify the point code type (ANSI, ITU international, ITU national, ITU international spare, ITu national spare) in the routing key that follows the -**k** option in the command.

Range: ansi, itui, itun, itun24. ituis, ituns
Default: ansi

msutrace

The **msutrace** command provides filter and trace capability for MSUs passing through the IP[7] GPLs. This command provides a view of MSU data as it exists in the PSTN network and its corresponding format as it exists in the IP network.

Options

-**c** <u>point code type</u>
This option specifies which type of point code (ANSI, ITU international, ITU national, 24-bit ITU national, ITU-I spare, or ITU-N spare) is contained in the filter key, when the key contains a DPC or OPC.

Range: ansi, itui, itun, itun24, ituis, ituns
Default: ansi

Other Enhanced Commands

ent-/**dlt**-**na**—The **ituis** (ITU-I spare point code) and **ituns** (ITU-N spare point code) network appearance point code types are now supported in the Network Appearance table.

New Command

ent-**sid**

The new **ent**-**sid** command is used to define additional true point codes for an STP. This command allows newly defined true point codes to be distributed to the cards without requiring network initialization.

Limitations

1. This feature does not allow the EAGLE to MTP convert between National and National Spare Point Codes. Likewise, this feature does not allow the EAGLE to MTP convert between International and International Spare Point Codes.

2. In the destination table, an ITU-I alias and an ITU-I Spare alias cannot be defined for the same Point Code, likewise an ITU-N alias and an ITU-N Spare alias cannot be defined for the same point code

3. The feature is not supported on the SEAS interface. Spare point codes are only supported for ITU point codes, and SEAS only supports ANSI point codes. Any Private ANSI point code provisioned using the standard EAGLE 5 SAS command line interface is not displayed by the SEAS VFY- command.

4. ITU National and ITU National Spare Point Code are implemented as separate network domains that can co-exist within the same STP.

5. Spare point codes are not supported for IPGWI sockets using TALI protocols. The spare point code feature may not be enabled if any application sockets have been provisioned on IPGWI cards.

6. The existing implementation of Gateway Screening does not support Group Code (Duplicate Point Codes). Gateway Screening will also not support PPCs.

7. The Spare Point Code and PPC prefix value, s- and p- do not apply to domain type point codes for ANSI and ITU-N24.

8. ITU-N and ITU-N24 Point Codes cannot co-exist as SID Destination True Point Codes and therefore ITU-N Spare and ITU-N24 Point Codes cannot coexist as SID Destination True Point Codes.

9. A single STPOPTS value (cnvcgdi) will be used to control message handling for ITU-I and ITU-I Spare messages when the CgPA PC does not have a required alias.

10. A single STPOPTS value (cnvcgdn) will be used to control message handling for ITU-N and ITU-N Spare messages when the CgPA PC does not have a required alias.

11. The existing implementation of the SRVSEL command interface to the SRVSEL table does not provide a way to separate MSU traffic for different ITU National Group Code networks. Therefore no provision is made for the SRVSEL command to control the separation of ITU spare and non-spare traffic. The SRVSEL table applies to the EPAP based features G-FLEX, INP, G-PORT, SMS Prepaid, and IS-41 to GSM Migration. Likewise, no provision is made for the GTTSEL command interface to the GTTSEL table to allow separation of ITU spare and non-spare traffic for EGTT, VGTT and MGTT.

IETF SUA Support

Description

The IETF SCCP-User Adaptation (SUA) Layer Request for Comment (RFC) feature enhances IPGWx GPL software to support RFC with the following feature highlights:

- Replaces Draft Version 3 support on the IPGWx GPL with SUA RFC.

- Provides support for SCCP Connectionless messages via SUA CLDT and CLDR. Connection oriented messages are not supported.

- Provides support for SUA Signaling Network Management Messages.

Hardware Requirements

An EDCM (single-slot) P/N 870-2372-01 Rev E is required for SUA RFC.

Refer to "Appendix B. Hardware Baseline" for the hardware baseline of this release.

Enhanced Commands

The following commands or command families have been enhanced to support this feature. For a complete description of these commands, refer to the *Commands Manual* of your EAGLE 5 SAS Release 34.0 documentation set.

- The SUA feature has added a parameter to each of these commands:
  ent-/chg-/rtrv-appl-rtkey :rcontext

  The routing context parameter can be used to assign a new routing context to the routing key or to change the existing routing context of the routing key. The routing context uniquely identifies the routing key.

  – Routing context is mandatory for routing keys associated with SUA Application Servers.

  – Routing context is optional for routing keys associated with M3UA Application Servers.

  – Routing context is invalid for routing keys associated with TALI connections.

- The SUA feature has added an option to this command: **msucount: -x**

- The SUA feature has updated output for the **msucount** and **ualog** commands.

- **ent**-/**chg**-/**rtrv**-**appl**-**rtkey**—A routing key entry associates a routing key with up to 16 socket names with a limit of 1000 routing keys per system (if there are any dual-slot DCMs) or 2500 routing keys per system (if there are only SSEDCMs).

Limitations

- The version of SUA implemented in this release is NOT backward compatible with the SUA version currently available on EAGLE 5 SAS releases.

- Only the Connections Message transfer part of the SUA protocol is supported for class 0 and class 1 SCCP messages.

- To remove a routing context from a routing key, the routing key must be deleted and re-entered.

Signaling Link Terminology and PORT Parameters

The **link** parameter has been added as a synonym in all commands that use the **port** parameter to specify a signaling link. Either the **link** parameter or the **port** parameter can be used in these commands for the next few EAGLE releases. Then the **port** parameter will be removed.

The term "signaling link port" has been changed to "signaling link" or "link" to eliminate the confusion between physical ports on LIM and MIM cards and the signaling links that are assigned to the LIM and MIM cards (as links **a**, **a1**, **a2**, **b**, **b1**, **b2**, and so on). The **port** parameter and the **link** parameter refer to the signaling link assignments, and not to the physical ports on the cards.

APPL and GPL Parameters

When EAGLE applications and general program loads (GPLs) were first developed, the application and the GPL names were the same. This was usually because the card ran only one GPL and one application.

When cards became available that could run more than one application for the same GPL, the GPL and application names could no longer be the same. For example, the MPL card runs GPL **ss7ml**, and can run either the **ss7ansi** application or the **ccs7itu** application.

Many EAGLE commands originally used the **appl** parameter to specify a GPL name. The following commands have been changed to use the **gpl** parameter instead of the **appl** parameter, to specify a GPL and not an application: **act-flash**, **init-flash**, **rept-stat-card**, **chg-gpl**, **act-gpl**, **rtrv-gpl**, **rept-stat-gpl**

Alarms

New or Changed UAMs

New Unsolicited Alarm Messages (UAMs) neccessary to support EAGLE 5 SAS Release 34.0 are defined in Table FN-3.

Table FN-3.   New or Changed UAMs - EAGLE 5 SAS Release 34.0

Format	LNPSS		
Action	Modified for PR - 54602: LNP 192 Million.		
New Optional Parameter	The new parameters will be for when the TN value exceeds the percentage threshold of the configured TN quantity.		LNPSS
Format	SCCP SS		
Action	Added optional parameter for 60470.		
New Optional Parameter	The new parameter that will be for when the service threshold for SCCP services exceed the Level 1 and Level 2 Threshold levels for that affected service.		SCCP SS
Format	DSM		
Action	Modified for IP Connection Unavailable alarm needs more clarification.		
New Optional Parameter	The new parameters will be for when the IP Connection Unavailable is issued to identify which channels have failed.		DSM
UAM	281		
Action	Deleted for LNP 192 Million		
Old data	LNP Ported TNs exceeds Feat. Capacity	Major	CARD
New data	Available for Reuse	None	N/A
UAM	282		
Action	Deleted for LNP 192 Million		
Old data	LNP Ported TNs Capacity Normal	Major	CARD
New data	Available for Reuse	None	N/A
UAM	283		
Action	Modified for LNP 192 Million		
Old data	LNP Ported LRNs exceeds Feat. Capacity		CARD

Table FN-3.   New or Changed UAMs - EAGLE 5 SAS Release 34.0

New data	LNP Ported LRNs exceeds Feat. Capacity	Major	LNP SS
UAM	284		
Action	Modified for LNP 192 Million		
Old data	LNP Ported LRNs Capacity Normal		CARD
New data	LNP Ported LRNs Capacity Normal	None	LNP SS
UAM	285		
Action	Modified for LNP 192 Million		
Old data	LNP Ported NPAs exceeds Feat. Capacity		CARD
New data	LNP Ported NPAs exceeds Feat. Capacity	Major	LNP SS
UAM	286		
Action	Modified for LNP 192 Million		
Old data	LNP Ported NPAs Capacity Normal		CARD
New data	LNP Ported NPAs Capacity Normal	None	LNP SS
UAM	287		
Action	Added for LNP 192 Million		
Old data	Available for reuse		
New data	RTDB Table Level 2 FAK Cap exceeded	Critical	LNP SS
UAM	288		
Action	Added for LNP 192 Million		
Old data	Available for reuse		
New data	RTDB Table Level 1 FAK Cap exceeded	Major	LNP SS
UAM	289		
Action	Added for LNP 192 Million		
Old data	Available for reuse		
New data	RTDB Table FAK Capacity Normal	Normal	LNP SS
UAM	442		
Action	Modifed for LNP 192 Million		
Old data	RTDB database capacity is 100% full	Minor	
New data	RTDB database capacity is 95% full	Critical	CARD
UAM	443		

Table FN-3.   New or Changed UAMs - EAGLE 5 SAS Release 34.0

Action	Modified for RTDB Database Corrupted Alarm Severity needs to be Major		
Old data	RTDB database is corrupted	Minor	
New data	RTDB database is corrupted	Major	CARD
UAM	446		
Action	Modified for LNP 192 Million		
Old data	RTDB database capacity is 80% full	Minor	
New data	RTDB database capacity is 80% full	Critical	CARD
UAM	452		
Action	Added for PR 60470		
Old data	Available for reuse		
New data	Exceeded Service Error Threshold Lvl 1	Major	SCCP SS
UAM	453		
Action	Added for PR 60470		
Old data	Available for reuse		
New data	Exceeded Service Error Threshold Lvl 2	Critical	SCCP SS
UAM	454		
Action	Added for PR 60470		
Old data	Available for reuse		
New data	Service Error Threshold Alarm Cleared	Normal	SCCP SS
UAM	501		
Action	Added for UAM Generator		
Old data	Available for reuse		
New data	OAM ITT sample Minor Alarm	Minor	ALL
UAM	502		
Action	Added for UAM Generator		
Old data	Available for reuse		
New data	OAM ITT sample Major Alarm	Major	ALL
UAM	90		
Action	Added for SIFB		
Old data	Available for reuse		
New data	SIFB-ShMC Communications Fault	Major	CARD

Table FN-3.   New or Changed UAMs - EAGLE 5 SAS Release 34.0

UAM	91		
Action	Added for SIFB		
Old data	Available for reuse		
New data	SIFB-ShMC Communications Re-established	Normal	CARD
UAM	94		
Action	Added for SIFB		
Old data	Available for reuse		
New data	Intra-shelf Routing Error	Major	CARD
UAM	95		
Action	Added for SIFB		
Old data	Available for reuse		
New data	Intra-shelf Routing Error Cleared	Normal	CARD

New Unsolicited Alarm Messages (UAMs) neccessary to support HC-MIM are defined in Table FN-4.

Table FN-4.   New or Changed UAMs - HC-MIM

Format	E1	Format	Output Group
Action	Added for HC-MIM		
New data	New Generic format for E1 ports alarms	4.9	E1
Format	T1		
Action	Added for HC-MIM		
New data	New Generic format for T1 ports alarms	4.40	T1
UAM	376		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-T1F:FAC-T1 LOS failure		T1
UAM	377		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-T1F:FAC-T1 LOF failure		T1
UAM	378		

Table FN-4. New or Changed UAMs - HC-MIM (Cont'd)

Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-T1F:FAC-T1 Remote Alarm		T1
UAM	379		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-T1F:FAC-T1 Alarm		T1
UAM	380		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	RCVRY-T1F:FAC-T1 available		T1
UAM	381		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 LOS failure		E1
UAM	382		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 LOF failure		E1
UAM	383		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 IS detected		E1
UAM	384		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 Far End failure		E1
UAM	385		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 10E-3 BER failed		E1
UAM	386		

Table FN-4. New or Changed UAMs - HC-MIM (Cont'd)

Action	Added for HC-MIM		
Old data	Available for reuse		
New data	RCVRY-E1F:FAC-E1 available		E1
UAM	78		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Card temperature above nominal level		CARD
UAM	79		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Card temperature within nominal levels		CARD
UAM	43		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Incorrect feature configuration		CARD
UAM	44		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Real time clock battery low		CARD
UAM	45		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Real time clock battery restored		CARD
UAM	369		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-T1F:FAC-T1 unavailable		T1
UAM	387		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-E1F:FAC-E1 unavailable		E1
FORMAT	CARD		

Table FN-4.   New or Changed UAMs - HC-MIM (Cont'd)

Action	Modified for HC-MIM Large Card Performance Enhancements		
New data	New optional parameter for TVG Vital information		CARD
UAM	204		
Action	Change text of message for SE-HSL		
Old data	REPT-LKF: XER-SUERM threshold exceeded		
New data	REPT-LKF: XER-ERM threshold exceeded		LINK_Maint
UAM	230		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	REPT-LKF: local blocked - thermal	Major	LINK
UAM	104		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Card temperature exceeds high threshold	Critical	CARD
UAM	105		
Action	Added for HC-MIM		
Old data	Available for reuse		
New data	Card temperature exceeds high threshold	None	CARD

New Unsolicited Alarm Messages (UAMs) neccessary to support Private Point Code and Spare Point Code are defined in Table FN-5.

Table FN-5.   New or Changed UAMs - Private Point Code and Spare Point Code

Format	DPC	Format	Output Group
Action	Modified for Spare Point Code Feature. Expanded the point code to allow for the Spare and Private Prefix characters.		
Old Data	DPC format used PC of ###-###-###		
New data	DPC format used PC of &&-###-###-###	DPC Format	LINK_Maint

New or Changed UIMs

New Unsolicited Information Messages (UIMs) neccessary to support EAGLE 5 SAS Release 34.0 are listed in Table FN-6.

Table FN-6. UIM format changes - EAGLE 5 SAS Release 34.0

UIM	1308		
Action	Updated for 192 Million LNP		
Old data	Unused		
New data	Updates inhibited: Target Cell CRC Fail	I-59	SYSMAINT
UIM	1309		
Action	Updated for 192 Million LNP		
Old data	Unused		
New data	Updates inhibited: Target Cell CRC Fail	I-60	SYSMAINT
Format	I-59		
Action	Updated for 192 Million LNP		
Old data	Unused		
New data	New Format for RTDB data target CRC failure.	I-59	SYSMAINT
Format	I-60		
Action	Updated for 192 Million LNP		
Old data	Unused		
New data	New Format for RTDB data source CRC failure.	I-60	SYSMAINT
UIM	1321		
Action	Updated for PR 89937		
Old data	Unused		
New data	Eagle RTDB Birthdate Mismatch	I-1	SYSMAINT
UIM	1322		
Action	Updated for PR 89937		
Old data	Unused		
New data	Eagle RTDB Levels Invalid	I-1	SYSMAINT
UIM	1323		
Action	Updated for PR 89937		
Old data	Unused		

Table FN-6.   UIM format changes - EAGLE 5 SAS Release 34.0

New data	Eagle/Elap TN Quantity Mismatch	I-1	SYSMAINT
UIM	1324		
Action	Updated for PR 89937		
Old data	Unused		
New data	Eagle/Elap NPANXX Quantity Mismatch	I-1	SYSMAINT
UIM	1325		
Action	Updated for PR 89937		
Old data	Unused		
New data	Eagle/Elap LRN Quantity Mismatch	I-1	SYSMAINT
UIM	1326		
Action	Updated for PR 90113		
Old data	Unused		
New data	Eagle RTDB Depth Alert	I-1	SYSMAINT

New Unsolicited Information Messages (UIMs) neccessary to support HIPR are defined in Table FN-7.

Table FN-7.   New or Changed UIMs - HIPR

UIM	1101	Format	Output Group
Action	Added for HIPR Feature		
Old data	Available after 29.0.		
New data	SDRAM Single Bit Error Report	I54	SYS_MAINT
Format	I54		
Action	Added for HIPR Feature		
Old data	Available any time, this format has never been used.		
New data	Added a new format for HIPR: RPT_IXP_ERR_HISTORY	All UIMs that share this format are affected	
UIM	I57		
Action	Changed format for "RPT_TABLE_CHKSUM_MISMATCH"		
Old data	Unused		
New data	New Format for Table Checksum Mismatch.	I57	SYSMAINT
UIM	I58		
Action	Changed format for "RPT_SUBSET_CHKSUM_MISMATCH "		
Old data	Unused		
New data	New Format for Subset Checksum Mismatch.	I58	SYSMAINT
UIM	1187		
Action	Updated		
Old data	Unused		
New data	GPL Table Checksum Mismatch	I57	SYSMAINT
UIM	1188		
Action	Updated		
Old data	Unused		
New data	Meas data load failure: old vesion	I58	SYSMAINT

Table FN-7.   New or Changed UIMs - HIPR (Cont'd)

UIM	1189		
Action	Updated		
Old data	Unused		
New data	SCCP did not route: DPC not in RTE table	I-44	GTT
UIM			
Action	Updated		
Old data	No DPC displayed		
New data	New Format includes the DPC field.	All UIMs that share this format are affected	

New Unsolicited Information Messages (UIMs) neccessary to support 8000 Routesets are listed in Table FN-8.

Table FN-8.   UIM format changes - 8000 Routesets

UIM	1186		
Action	Updated for enhancement to Upgrade		
Old data	Unused		
New data	DB Subset Checksum Mismatch	I1	MEAS

New Unsolicited Information Messages (UIMs) neccessary to support Private Point Code and Spare Point Code are defined in Table FN-9.

Table FN-9.   New or Changed UIMs - Private Point Code and Spare Point Code

Formats	I-2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 22, 24, 25, 26, 28, 29, 37, 38, 39, 40, 43, 44, 47, 48, and 52		
Action	Modified the Point Code elements to be prefixed with three additional characters depending on their Point Code subtypes, with either: "" - Neither Spare nor Private Point Code. "s-" - Spare Point Code "p-" - Private Point Code "ps-" - Both Private and Spare point code	All UIMs that share any of these formats are affected	

New or Changed Hardware Verification Codes

New or changed Hardware Verification Codes necessary to support the SE-HSL feature are as defined in Table FN-10.

Table FN-10.   New or Changed Hardware Verification Codes - SE-HSL

H/W Code	133	Format	UAM
Action	Modified for Synchronous E1 - High Speed Link (SE-HSL)		
Old data	Available		
New data	Card cannot support unchannelized mode.	LIME1, LIMDS0, MIM, MPL	

New or changed Hardware Verification Codes necessary to support the HC-MIM feature are as defined in Table FN-11.

Table FN-11.   New or Changed Hardware Verification Codes - HC-MIM

H/W Code	119	Format	UAM
Action	Modified for HC-MIM Base Card Support		
Old data	2 port E1 card provisioned w/ ports > 2 (slk prov on port A1-B3)		
New data	2 Port E1/T1 card with SLK provisioned on link greater than B.	LIME1	297
H/W Code	122		
Action	Modified for HC-MIM Base Card Support		
Old data	Card is not a MIM - provisioned as T1 or T1 chan associated with T1		
New data	Card is not a MIM and is provisioned as T1 channel card.	MIM	99
H/W Code	124		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Card is not a MIM or HC-MIM and is provisioned as a T1 card.	MIM/HC-MIM	99
H/W Code	125		
Action	Added for HC-MIM Base Card Support		
Old data	Available		

Table FN-11.   New or Changed Hardware Verification Codes (Cont'd)- HC-MIM

New data	MIM/MPL card with SLK provisioned on link greater than B3.	MIM	297
H/W Code	126		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	2 Port E1 card with an SLK provisioned on E1 port 2-7	LIME1	297
H/W Code	127		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	MIM card with an SLK provisioned on E1/T1 port 2-7	MIM	297
H/W Code	128		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Fan feature bit must be ON for HC-MIM	HC-MIM	43
H/W Code	129		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	HC-MIM does not support CAS framing	HC-MIM	297
H/W Code	130		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Card is not a LIME1 or MIM and is provisioned as and E1 channel card.	LIME1/MIM	99
H/W Code	131		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Card has channel bridging mode active but is not running HC-MIM GPL	LIME1/MIM	297

Table FN-11. New or Changed Hardware Verification Codes (Cont'd)- HC-MIM

New data	MIM/MPL card with SLK provisioned on link greater than B3.	MIM	297
H/W Code	126		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	2 Port E1 card with an SLK provisioned on E1 port 2-7	LIME1	297
H/W Code	127		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	MIM card with an SLK provisioned on E1/T1 port 2-7	MIM	297
H/W Code	128		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Fan feature bit must be ON for HC-MIM	HC-MIM	43
H/W Code	129		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	HC-MIM does not support CAS framing	HC-MIM	297
H/W Code	130		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Card is not a LIME1 or MIM and is provisioned as and E1 channel card.	LIME1/MIM	99
H/W Code	131		
Action	Added for HC-MIM Base Card Support		
Old data	Available		
New data	Card has channel bridging mode active but is not running HC-MIM GPL	LIME1/MIM	297

Table FN-11. New or Changed Hardware Verification Codes (Cont'd)- HC-MIM

H/W Code	132		
Action	Modified for HC-MIM Base Card Support		
Old data	Available		
New data	Card is not a LIME1 or MIM and is provisioned as and E1 card.	MPL	99
H/W Code	133		
Action	Modified for Synchronous E1 High Speed Link (SE-HSL)		
Old data	Available		
New data	Card cannot support unchannelized mode	LIME1, LIMDS0, MIM, MPL	

UAM Format Changes

The following UAM changes support EAGLE 5 SAS Release 34.0.

CARD

1.1 CARD

| Format | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.yyyy zz CARD cccc [device]      text
                 ASSY SN:  nnnnnnnnnnnnnn(optional field)
                 HW VERIFICATION CODE: ###(optional field)
                 INFO:  ########  ######(optional field)
                 ALARM INHIBIT LEVEL:   XXXX(optional field)
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0012.0008 ** CARD 1113 OAM          Active MASP has become isolated


         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0012.0013 ** CARD 1101 SCCP         Card is isolated from the system
                  ASSY SN:  102199815a1234


         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0012.0514 **  CARD 1115 OAM         Standby MASP is inhibited


         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0012.0515    CARD 1115 OAM           Standby MASP is allowed

         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0044.0422 ** CARD 1107              Insufficient extended memory
                  HW VERIFICATION CODE: 051

         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   5009.0300 ** CARD 1202 SS7ANSI      TVG Grant Failure
                  INFO:    SLAN    -D-H—


         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0012.0390 ** CARD 1109 HMUX         Illegal Address Error

         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0062.0296    CARD 1117 MDAL          REPT-ALMINH: alarm output TEMP Inhibit
                  ALARM INHIBIT LEVEL:   CRIT
``` |
| Notes | Added an optional line for the alarm inhibit level.

Added an additional optional field for auto-inhibit HW verification code. |

DPC

Format	**Variation #1:**
	``
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
      xxxx.yyyy zz DPC &&-###-###-###   text
                   ALARM INHIBIT LEVEL: XXXX(optional field)
```
**Variation #2:  (used when DPC SS status has changed)**
```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
      xxxx.yyyy zz DPC &&-###-###-###   text
                   LSN=[lnkset]
                   Prohibited SS ###, ###, … (optional)
                   Blocked   SS ###, ###, … (optional)
                   Allowed   SS ###, ###, … (optional)
                   UnBlocked SS ###, ###, … (optional)
```
**Variation #3: (used to report circular routing)**
```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
      xxxx.yyyy zz DPC &&-###-###-###   text
                   XMIT LSN=[lnkset]   RC=##
                   RCV LSN=[lnkset]
                   MEMBER=###-###-###
``` |
| Output Examples | ```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
      0045.0296   DPC   001-001-001   REPT-ALMINH: alarm output TEMP Inhibit
                   ALARM INHIBIT LEVEL: MINR
```
```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
      0044.0311   DPC s-001-001-001   DPC is allowed
                   LSN=lsn012345
```
```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
   *C 0044.0313 *C DPC   001-001-001   DPC is prohibited
                   LSN=lsn012345
                   Prohibited SS 5, 20
```
```
            1   2   3   4   5   6   7   8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
   *C 0044.0320 *C DPC   011-020-*   REPT-MTPLP-DET: Circ rte det(cong)
                   XMIT LSN=ls01   RC=10
                   RCV LSN=lsnabcde1
                   MEMBER=011-210-007
``` |

DSM

| Format | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.yyyy zz DSM cccc,p   text
                 Failed Channels: XXXX XXXX XXXX XXXX   (Optional)
``` |
|---|---|
| Output Examples | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   0259.0084 ** DSM 1101,B   IP Connection Unavailable
                 Failed Channels: Prov Dnld TCP UDP
``` |
| Notes | Added an optional parameter to show which IP Channels are unavailable in the case of an IP Connection Unavailable alarm. Added for PR 54962. |

E1PORT

| Format | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.yyyy zz E1PORT cccc,ppp   text
``` |
|---|---|
| Output Examples | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   5648.0382 ** E1PORT 1201,2   REPT-E1F:FAC-E1   LOF failure
``` |
| Notes | |

LNP SYSTEM

| Format | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.yyyy zz LNP SYSTEM   text
                 TABLE: TN   Threshold Value: zzz%   (Optional)
                                      Exceeds xxxxxxxxx of yyyyyyyyy (Optional)
``` |
|---|---|
| Output Examples | ``` 1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
*C   0056.0424 *C LNP SYSTEM   LNP Subsystem is not available

*C   0056.0287 *C LNP SYSTEM   RTDB Table Level 2 FAK Cap exceeded
                 TABLE: TN   Threshold Value: 80%
                                      Exceeds 76800000 of 96000000
``` |
| Notes | Added the two new optional parameters for LNP 192 Million for Table TN Threshold. |

LNP SYSTEM

| Format | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.yyyy zz LNP SYSTEM   text
                TABLE: TN   Threshold Value: zzz%   (Optional)
                                   Exceeds xxxxxxxxx of yyyyyyyyy (Optional)</pre> |
|---|---|
| Output Examples | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
*C   0056.0424 *C LNP SYSTEM   LNP Subsystem is not available

*C   0056.0287 *C LNP SYSTEM   RTDB Table Level 2 FAK Cap exceeded
                TABLE: TN   Threshold Value: 80%
                                   Exceeds 76800000 of 96000000</pre> |
| Notes | Added the two new optional parameters for LNP 192 Million for Table TN Threshold. |

SCCP SYSTEM

| Format | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  xxxx.yyyy zz SCCP SYSTEM   text
              Service: sssss sssss sssss ssss ssss ssss ssss ssss (optional)</pre> |
|---|---|
| Output Examples | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
*C 0056.0331 *C SCCP SYSTEM   SCCP is not available</pre> |
| Notes | Added a new threshold parameter to display the affected SCCP Services. |

T1PORT

| Format | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.yyyy zz T1PORT cccc,ppp   text</pre> |
|---|---|
| Output Examples | <pre>   1   2   3   4   5   6   7   8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
**   5248.0376 ** T1PORT 1201,2   REPT-T1F:FAC-T1   LOS failure</pre> |
| Notes | New in Rel 33.0 |

UIM Format Changes

The following UIM format has been added to support EAGLE 5 SAS Release 34.0.

I2 (SNM SNT)

Literal	`RPT_GWS_SNM_SNT`
Format	``` 1 2 3 4 5 6 7 8` `1234567890123456789012345678901234567890123456789012345678901234567890` ` xxxx.xxxx CARD cccc,ppp INFO 'text'` ` SIO=xx OPC=&&-###-###-### DPC=&&-###-###-###` ` H0H1=xx AFTPC`[1]`=&&-###-###-###` ` TEST MODE`[2] ` SR=[sr] LSN=[lnkset]`
Output Examples	``` 1 2 3 4 5 6 7 8` `1234567890123456789012345678901234567890123456789012345678901234567890` ` 0001.1005 CARD 1105,B INFO GWS rcvd OPC that is not allowed` ` SIO=01 OPC=s-001-001-001 DPC=s-002-002-002` ` H0H1=00 AFTPC=003-003-003` ` TEST MODE` ` SR=scrb LSN=ABCD123` ` Report Date:02-07-21 Time:16:20:19`
Data Structures	```#define MAX_NUM_CHARS_IN_GWS_NAME 4`  `struct s_ath_rpt_gws_snm_snt` ` {` ` t_u8 sio;` ` t_ss7_pc opc;` ` t_ss7_pc dpc;` ` t_u8 h0h1;` ` t_ss7_pc aftpc;` ` t_s8 scr_ref[MAX_NUM_CHARS_IN_GWS_NAME];` ` };`  `typedef struct s_ath_rpt_gws_snm_snt t_ath_rpt_gws_snm_snt;`
Notes	`All GWS UIMs for MSUs with an SIO = 0, 1, 2 will use UIM format I2.` [1]`AFTPC is optional field and will be displayed as dashes if not present.` [2]`Only displayed if produced in test mode.` Modified the Point Codes to allow for the Spare and Private indicators. .

I3 (SCCP MANAGEMENT

Literal	RPT_GWS_SCCP_MGMT
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 xxxx.xxxx CARD cccc,ppp INFO 'text' SIO=xx OPC=&&-###-###-### DPC=&&-###-###-### SCMG: TYPE=### AFTPC=&&-###-###-### MULT=### AFTSS=### TEST MODE1 SR=[sr] LSN=[lnkset] ```
[1]Note	[1]Only displayed if produced in test mode.
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0020.1015 CARD 1106,A INFO GWS rcvd SCMG with not allowed AFTPC SIO=03 OPC=001-001-001 DPC=s-002-002-002 SCMG: TYPE=000 AFTPC=003-003-003 MULT=000 AFTSS=005 SR=scrb LSN=ABCD123 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` #define MAX_NUM_CHARS_IN_GWS_NAME 4 struct s_ath_rpt_gws_sccp_mgmt { t_u8 sio; t_ss7_pc opc; t_ss7_pc dpc; t_u8 msg_type; t_ss7_pc aftpc; t_u8 multiplicity; t_u8 aftss; t_s8 scr_ref[MAX_NUM_CHARS_IN_GWS_NAME]; }; typedef struct s_ath_rpt_gws_sccp_mgmt t_ath_rpt_gws_sccp_mgmt; ```
Notes	All GWS UIMs for MSUs with an SIO = 3 and SSN = 1 will use UIM format I3. [1]Only displayed if produced in test mode. Modified the Point Codes to allow for the Spare and Private indicators.

I5 (SCCP REPORT)

Literal	RPT_GWS_SCCP
| Format | ```
                1         2         3         4         5         6         7         8
       12345678901234567890123456789012345678901234567890123456789012345678901234567890
         xxxx.xxxx    CARD cccc,ppp INFO     'text'
                      SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                      SCCP MT=###
                      CDPA: AI=xx PC=&&-###-###-###   SSN=### TT=###
                           ADDR=####################
                      CGPA: AI=xx PC=&&-###-###-###   SSN=### TT=###
                           ADDR=####################
                      TEST MODE¹
                      SR=[sr]  LSN=[lnkset]
``` |
| Output Examples | ```
                1         2         3         4         5         6         7         8
       12345678901234567890123456789012345678901234567890123456789012345678901234567890
         0185.1005    CARD 1101,A2  INFO     GWS rcvd OPC that is not allowed
                      SIO=03   OPC=007-021-067      DPC=005-022-019
                      SCCP MT=018
                      CDPA: AI=05 PC=005-006-007     SSN=006 TT=007
                           ADDR=0
                      CGPA: AI=14 PC=015-016-017     SSN=022 TT=023
                           ADDR=9194603655
                      SR=scr1  LSN=ABCD123
                      Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define MAX_NUM_CHARS_IN_GWS_NAME    4
#define SCCP_MAX_GT_ADDRESS_DIGITS   21
#define SCCP_MAX_GT_ADDRESS_BYTES    (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct  sccp_gt_address
        {
        t_u8  length;
        t_u8  digits[SCCP_MAX_GT_ADDRESS_BYTES];
        };

typedef struct sccp_gt_address  t_sccp_gt_address;

struct s_ath_rpt_cpa
        {
        t_u8             ai;
        t_ss7_pc         pc;
        t_u8             ssn;
        t_u8             tt;
        t_sccp_gt_address  addr;
        };

typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_gws_sccp
        {
        t_u8           sio;
        t_ss7_pc       opc;
        t_ss7_pc       dpc;
        t_u8           sccpmt;
        t_ath_rpt_cpa  cdpa;
        t_ath_rpt_cpa  cgpa;
        t_s8           scr_ref[MAX_NUM_CHARS_IN_GWS_NAME];
        };

typedef struct s_ath_rpt_gws_sccp  t_ath_rpt_gws_sccp;
``` |
| Notes | All GWS UIMs for MSUs with an SIO = 3 and SSN <> 1 will use UIM format I5. As of Release 29.0, this format will print up to 21 digits of the CDPA and CGPA. ¹Only displayed if produced in test mode.

Modified the Point Codes to allow for the Spare and Private indicators. |

I6 (MTP DATA DUMP)

Literal	RPT_GWS_USER_PART
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 xxxx.xxxx CARD cccc,ppp INFO 'text' SIO=xx OPC=&&-###-###-### DPC=&&-###-###-### DATA=xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx TEST MODE¹ SR=[sr] LSN=[lnkset] ```
Note	¹Only displayed if produced in test mode.
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0017.1005 CARD 1103,A INFO GWS rcvd OPC that is not allowed SIO=08 OPC=001-001-001 DPC=s-002-002-002 DATA=12 34 56 78 90 12 34 56 78 90 12 34 56 78 90 12 34 56 78 90 12 34 56 78 12 34 SR=scrb LSN=ABCD123 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` #define MAX_NUM_CHARS_IN_GWS_NAME 4 #define ATH_MAX_DATA_DUMP 40 #define ATH_RPT_MAX_GWS_USER_PART_DATA (ATH_MAX_DATA_DUMP – sizeof(t_u8) – sizeof(t_ss7_pc) – sizeof(t_ss7_pc) – sizeof(t_u8) – (sizeof(t_u8) * MAX_NUM_CHARS_IN_GWS_NAME)) struct s_ath_rpt_gws_user_part { t_u8 sio; t_ss7_pc opc; t_ss7_pc dpc; t_s8 scr_ref[MAX_NUM_CHARS_IN_GWS_NAME]; t_u8 data_len; t_u8 data[ATH_RPT_MAX_GWS_USER_PART_DATA]; }; typedef struct s_ath_rpt_gws_user_part t_ath_rpt_gws_user_part; ```
Notes	All GWS UIMs for MSUs with an SIO > 3 will use UIM format I6. Modified the Point Codes to allow for the Spare and Private indicators.

I8 (OPC – DPC)

Literal	RPT_MTP_UNKNOWN_DPC
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 xxxx.xxxx CARD cccc,ppp INFO 'text' SIO=xx OPC=&&-###-###-### DPC=&&-###-###-### LSN=[lnkset] ```
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0010.1004 CARD 1205,B INFO MTP rcvd unknown DPC SIO=07 OPC=001-001-001 DPC=002-002-002 LSN=ABCD123 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` struct s_ath_rpt_mtp_unknown_dpc { t_u8 sio; t_ss7_pc opc; t_ss7_pc dpc; }; typedef struct s_ath_rpt_mtp_unknown_dpc t_ath_rpt_mtp_unknown_dpc; ```
Notes	Modified the Point Codes to allow for the Spare and Private indicators.

I9 (H0H1)

Literal	RPT_MTP_INV_H0H1
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppp INFO     `text'
               SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
               H0H1=xx
               LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0011.1003    CARD 1205,B   INFO     MTP rcvd invalid H0/H1 code
               SIO=08   OPC=001-001-001     DPC=002-002-002
               H0H1=00
               LSN=ABCD123
               Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_ath_rpt_mtp_inv_h0h1
    {
    t_u8     sio;
    t_ss7_pc opc;
    t_ss7_pc dpc;
    t_u8     h0h1;
    };

typedef struct s_ath_rpt_mtp_inv_h0h1  t_ath_rpt_mtp_inv_h0h1;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I10 (MTP USER PART)

Literal	RPT_MTP_INV_USER_PART
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0012.1000 CARD cccc,ppp INFO 'text' SIO=xx OPC=&&-###-###-### DPC=&&-###-###-### AFTPC=&&-###-###-### UPU=xxx UNAVAIL CAUSE=xxx LSN=[lnkset] ```
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0012.1000 CARD 1305,B INFO MTP rcvd UPU – user part is not SCCP SIO=09 OPC=001-001-001 DPC=002-002-002 AFTPC=003-003-003 UPU=000 UNAVAIL CAUSE=016 LSN=ABCD123 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` struct s_ath_rpt_mtp_inv_upu { t_u8 sio; t_ss7_pc opc; t_ss7_pc dpc; t_ss7_pc aftpc; t_u8 mtp_user_part; t_u8 unavailability_cause; }; typedef struct s_ath_rpt_mtp_inv_upu t_ath_rpt_mtp_inv_upu; ```
Notes	Modified the Point Codes to allow for the Spare and Private indicators.

I11 (MTP CONGESTION)

Literal	RPT_MTP_CONGESTION
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 xxxx.xxxx CARD cccc,ppp INFO 'text' SIO=xx OPC=&&-###-###-### DPC=&&-###-###-### AFTPC=&&-###-###-### CONG STATUS=### LSN=[lnkset] ```
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 0013.1002 CARD 1205,B INFO MTP rcvd invalid TFC – status 0 SIO=0a OPC=001-001-001 DPC=002-002-002 AFTPC=003-003-003 CONG STATUS=000 LSN=ABCD123 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` struct s_ath_rpt_mtp_tfc { t_u8 sio; t_ss7_pc opc; t_ss7_pc dpc; t_ss7_pc aftpc; t_u8 congestion_status; }; typedef struct s_ath_rpt_mtp_tfc t_ath_rpt_mtp_tfc; ```
Notes	Modified the Point Codes to allow for the Spare and Private indicators..

I12 (SCCP UDT)

Literal	RPT_SCCP_INV_UDT
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc,ppp INFO     'text'
                 SIO=xx    OPC=&&-###-###-###    DPC=&&-###-###-###
                 CDPA: SSN=###  TT=###
                 CGPA: SSN=###  TT=###
                 RETURN CAUSE=###
                 DATA=xx xx xx xx xx xx xx xx xx xx xx xx
                      xx xx xx xx xx xx xx xx xx xx xx xx
                        xx
                 LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0014.1019    CARD 1103,A  INFO      SCCP rcvd invalid UDTS msg
                 SIO=03   OPC=001-001-001       DPC=002-002-002
                 CDPA: SSN=005  TT=250
                 CGPA: SSN=000  TT=000
                 RETURN CAUSE=001
                 DATA=26 80 03 09 0e 06 09 00 fe 08 50 55
                      43 00
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define ATH_MAX_DATA_DUMP  40

struct s_ath_rpt_sccp_inv_udt
    {
    t_u8      sio;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      cdpa_ss;
    t_u8      cdpa_tt;
    t_u8      cgpa_ss;
    t_u8      cgpa_tt;
    t_u8      return_cause;
    t_u8      data_len;
    t_u8      data[ATH_MAX_DATA_DUMP -
                  sizeof(t_u8) -
                  sizeof(t_ss7_pc) -
                  sizeof(t_ss7_pc) -
                  sizeof(t_u8) -
                  sizeof(t_u8) -
                  sizeof(t_u8) -
                  sizeof(t_u8) -
                  sizeof(t_u8) -
                  sizeof(t_u8)];
    };

typedef struct s_ath_rpt_sccp_inv_udt  t_ath_rpt_sccp_inv_udt;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I13 (SCCP INV TCAP)

Relese 31.12	
Literal	RPT_SCCP_INV_TCAP
| Format | ```
            1         2         3         4         5         6         7         8
  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc,ppp INFO      'text'
                 SIO=xx   OPC=&&-###-###-###      DPC=&&-###-###-###
                 CDPA:  AI=xx  SSN=###  TT=###
                        ADDR=###################
                 CGPA:  AI=xx  PC=&&-###-###-###      SSN=###
                 DATA=xx xx xx xx xx xx xx xx xx xx xx xx
                      xx xx xx xx xx xx xx xx xx xx xx xx
                      xx
                 LSN=[lnkset]
``` |
| Output Examples | ```
            1         2         3         4         5         6         7         8
  123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
    0226.1169    CARD 1101,A1  INFO      SCCP rcvd inv TCAP portion
                 SIO=05   OPC=1-200-2            DPC=3-054-4
                 CDPA: AI=05  SSN=006  TT=007
                  ADDR=ABCDEF0123456789ABCDE
                 CGPA: AI=14  PC=2-054-2             SSN=022

                 DATA=3a e2 38 c7 04 e7 04 35 ae e8 30 e9

                    2e cf 01 00 d0 02 83 01 f2 25 aa 0b
                    84 09 01 00 11 0a 19 49
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define SCCP_MAX_GT_ADDRESS_DIGITS   21
#define SCCP_MAX_GT_ADDRESS_BYTES    (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct  sccp_gt_address
    {
    t_u8  length;
    t_u8  digits[SCCP_MAX_GT_ADDRESS_BYTES];
    };

typedef struct sccp_gt_address  t_sccp_gt_address;

struct s_ath_rpt_cpa
    {
    t_u8             ai;
    t_ss7_pc         pc;
    t_u8             ssn;
    t_u8             tt;
    t_sccp_gt_address  addr;
    };
typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_sccp_inv_tcap
    {
    t_u8             sio;
    t_ss7_pc         opc;
    t_ss7_pc         dpc;
    t_ath_rpt_cpa  cdpa;
    t_ath_rpt_cpa  cgpa;
    };
typedef struct s_ath_rpt_sccp_inv_tcap  t_ath_rpt_sccp_inv_tcap;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators.
. |

I14 (SCCP CLASS)

Literal	`RPT_SCCP_INV_CLASS`
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx     CARD cccc,ppp INFO      'text'
                 SIO=xx   OPC=&&-###-###-###     DPC=&&-###-###-###
                 CDPA: SSN=###   TT=###
                 CGPA: SSN=###   TT=###
                 CLASS=###      MSG TYPE=##
                 DATA=xx xx xx xx xx xx xx xx xx xx xx xx
                      xx xx xx xx xx xx xx xx xx xx xx xx
                 LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0016.1025     CARD 1103,A  INFO      SCCP rcvd inv msg class
                 SIO=03   OPC=001-001-001     DPC=s-002-002-002
                 CDPA: SSN=005  TT=250
                 CGPA: SSN=000  TT=000
                 CLASS=000      MSG TYPE=04
                 DATA=26 80 03 09 0e 06 09 00 fe 08 50 55
                      43 00
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define ATH_MAX_DATA_DUMP  40

struct s_ath_rpt_sccp_inv_class
    {
    t_u8      sio;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      msu_clss;       /* "c l a s s" is c++ reserved word */
    t_u8      sccp_msg_type;
    t_u8      cdpa_ss;
    t_u8      cdpa_tt;
    t_u8      cgpa_ss;
    t_u8      cgpa_tt;
    t_u8      data_len;
    t_u8      data[ATH_MAX_DATA_DUMP -
                sizeof(t_u8) -
                sizeof(t_ss7_pc) -
                sizeof(t_ss7_pc) -
                sizeof(t_u8) -
                sizeof(t_u8) -
                sizeof(t_u8) -
                sizeof(t_u8) -
                sizeof(t_u8) -
                sizeof(t_u8) -
                sizeof(t_u8)];
    };

typedef struct s_ath_rpt_sccp_inv_class  t_ath_rpt_sccp_inv_class;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I15 (SCCP MESSAGE)

Literal	RPT_SCCP_INV_MSG
| Format | ```
            1         2         3         4         5         6         7         8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc,ppp INFO     'text'
                 SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                 DATA=xx xx xx xx xx xx xx xx xx xx xx xx
                      xx xx xx xx xx xx xx xx xx xx xx xx
                      xx xx xx xx xx xx
                 LSN=[lnkset]
``` |
| Output Examples | ```
            1         2         3         4         5         6         7         8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0017.1042    CARD 1103,A   INFO       SCCP rcvd inv GT - bad Translation Type
                 SIO=03   OPC=001-001-001       DPC=002-002-002
                 DATA=26 80 03 09 0e 06 09 00 fe 08 50 55 05
                      43 00 00 00 00 00
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define ATH_MAX_DATA_DUMP  40

struct s_ath_rpt_sccp_inv_msg
    {
    t_u8      sio;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      data_len;
    t_u8      data[ATH_MAX_DATA_DUMP -
               sizeof(t_u8) -
               sizeof(t_ss7_pc) -
               sizeof(t_ss7_pc) -
               sizeof(t_u8)];
    };

typedef struct s_ath_rpt_sccp_inv_msg  t_ath_rpt_sccp_inv_msg;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I16 (SCCP CDPA)

Literal	RPT_SCCP_INV_CDPA
| Format | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppp INFO      'text'
               SIO=xx   OPC=&&-###-###-###     DPC=&&-###-###-###
               CDPA LENGTH=###   MSG TYPE=##
               CDPA: AI=xx PC=&&-###-###-###    SSN=### TT=###
                     ADDR=###################
               LSN=[lnkset]
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0241.1033    CARD 1101,A1  INFO      SCCP rcvd inv Cld Party - bad network
               SIO=03   OPC=1-200-2           DPC=3-054-4
               CDPA LENGTH=019   MSG TYPE=04
               CDPA: AI=05 PC=1-050-1          SSN=006 TT=007
                     ADDR=ABCDEF0123456789ABCDE
               LSN=ABCD123
               Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define SCCP_MAX_GT_ADDRESS_DIGITS  21
#define SCCP_MAX_GT_ADDRESS_BYTES   (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct  sccp_gt_address
    {
    t_u8  length;
    t_u8  digits[SCCP_MAX_GT_ADDRESS_BYTES];
    };

typedef struct sccp_gt_address  t_sccp_gt_address;

struct s_ath_rpt_cpa
    {
    t_u8             ai;
    t_ss7_pc         pc;
    t_u8             ssn;
    t_u8             tt;
    t_sccp_gt_address  addr;
    };

typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_sccp_inv_cdpa
    {
    t_u8             sio;
    t_ss7_pc         opc;
    t_ss7_pc         dpc;
    t_u8             cdpa_length;
    t_u8             sccp_msg_type;
    t_ath_rpt_cpa  cdpa;
    t_u8             cgpa_addr_type;
    t_u8             cgpa_ssn;
    t_ss7_pc         cgpa_pc;
    };

typedef struct s_ath_rpt_sccp_inv_cdpa  t_ath_rpt_sccp_inv_cdpa;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I17 (SCCP ROUTING)

Literal	RPT_SCCP_ROUTING
| Format | ```
            1         2         3         4         5         6         7         8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
     xxxx.xxxx    CARD cccc,ppp INFO      'text'
                  OPC=&&-###-###-###
                  TRANSLATED PC=&&-###-###-###    TRANSLATED SS=###
                  CDPA LENGTH=###              MSG TYPE=##
                  CDPA: AI=xx PC=&&-###-###-###   SSN=### TT=###
                     ADDR=###################
                  LSN=[lnkset]
``` |
| Output Examples | ```
            1         2         3         4         5         6         7         8
   12345678901234567890123456789012345678901234567890123456789012345678901234567890
     0246.1043    CARD 1101,A1  INFO      SCCP did not route - bad translation
                  OPC=1-200-2
                  TRANSLATED PC=5-038-6            TRANSLATED SS=202
                  CDPA LENGTH=019          MSG TYPE=04
                  CDPA: AI=05 PC=1-050-1           SSN=006 TT=007
                     ADDR=ABCDEF0123456789ABCDE
                  LSN=ABCD123
                  Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define SCCP_MAX_GT_ADDRESS_DIGITS   21
#define SCCP_MAX_GT_ADDRESS_BYTES    (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct   sccp_gt_address
    {
    t_u8   length;
    t_u8   digits[SCCP_MAX_GT_ADDRESS_BYTES];
    };

typedef struct sccp_gt_address   t_sccp_gt_address;

struct s_ath_rpt_cpa
    {
    t_u8              ai;
    t_ss7_pc          pc;
    t_u8              ssn;
    t_u8              tt;
    t_sccp_gt_address  addr;
    };

typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_sccp_routing
    {
    t_ss7_pc       opc;
    t_ss7_pc       trans_pc;
    t_u8           trans_ss;
    t_u8           sccp_msg_type;
    t_u8           cdpa_length;
    t_ath_rpt_cpa  cdpa;
    };

typedef struct s_ath_rpt_sccp_routing  t_ath_rpt_sccp_routing;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I18 (SCMG)

Literal	RPT_SCMG_INV_DATA
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.yyyy    CARD cccc,ppp INFO      'text'
               SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
               SCMG:   MSG TYPE=###       MSG LEN=###
                      AFTPC=&&-###-###-###   AFTSS=###   MULT=###
               LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0020.1055    CARD 1106,A   INFO      SCCP rcvd inv SCMG - bad AFTPC
               SIO=11   OPC=001-001-001       DPC=002-002-002
               SCMG:   MSG TYPE=083       MSG LEN=012
                      AFTPC=003-003-003      AFTSS=005   MULT=001
               LSN=ABCD123
               Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_ath_rpt_scmg_inv_data
    {
    t_u8      sio;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      scmg_msg_type;
    t_u8      scmg_msg_length;
    t_ss7_pc  scmg_affected_pc;
    t_u8      scmg_affected_ss;
    t_u8      scmg_multiplicity;
    };

typedef struct s_ath_rpt_scmg_inv_data  t_ath_rpt_scmg_inv_data;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I22 (SLTC)

Literal	RPT_SLTC_FAILURE
Format	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 xxxx.xxxx CARD cccc,ppp INFO 'text' ADJ PC=&&-###-###-### SLC=### LEN=### DATA=xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx ```
Output Examples	``` 1 2 3 4 5 6 7 8 12345678901234567890123456789012345678901234567890123456789012345678901234567890 1230.1071 CARD 1201,A INFO SLTC failure: invalid SLC ADJ PC=001-001-001 SLC=02 LEN=0f DATA=01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 Report Date:02-07-21 Time:16:20:19 ```
Data Structures	``` #define SLT_MAX_TEST_DATA_BYTES 15 struct s_ath_rpt_sltc_failure { t_ss7_pc adjpc; t_u8 slc_and_data_len; t_u8 data[SLT_MAX_TEST_DATA_BYTES]; }; typedef struct s_ath_rpt_sltc_failure t_ath_rpt_sltc_failure; ```
Notes	Modified the Point Codes to allow for the Spare and Private indicators.

I24 (GTW CPC)

Literal	RPT_GTW_UNKNOWN_CPC
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc,ppp INFO      'text'
                 SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                 CPC=&&-###-###-###
                 LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0018.1090    CARD 1103,A   INFO      ITU GWY:CPC conversion failure
                 SIO=0f   OPC=001-001-001      DPC=002-002-002
                 CPC=003-003-003
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_ath_rpt_mtp_unknown_cpc
    {
    t_u8      sio;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_ss7_pc  cpc;
    };
typedef struct s_ath_rpt_mtp_unknown_cpc  t_ath_rpt_mtp_unknown_cpc;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I25 (ISUP)

Literal	RPT_ISUP_INV_TYPE
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc,ppp INFO      'text'
                 SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                 MSG TYPE=xx
                 LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0018.1093    CARD 1103,A   INFO      ITU GWY:rcvd msg type cannot convert
                 SIO=04   OPC=001-001-001      DPC=002-002-002
                 MSG TYPE=0a
                 LSN=ABCD123
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_mrn_rpt_isupcnv_inv_msg
    {
    t_u8      io;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      isup_msg_type;
    };

typedef struct s_mrn_rpt_isupcnv_inv_msg  t_mrn_rpt_isupcnv_inv_msg
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I26 (X25)

Release 31.12	
Literal	RPT_X25_TYPE
Format	``` `           1         2         3         4         5         6         7         8` `12345678901234567890123456789012345678901234567890123456789012345678901234567890` `   xxxx.xxxx    CARD cccc,ppp INFO     'text string'` `                CHANNEL=####   X_ADDR=###############` `                CODE=xx xx     PC=&&-###-###-###` ```
Output Examples	``` `           1         2         3         4         5         6         7         8` `12345678901234567890123456789012345678901234567890123456789012345678901234567890` `   0010.1143    CARD 1205,A   INFO     GX25 cannot make connection` `                CHANNEL=0003   X_ADDR=123456789012345` `                CODE=09 03     PC=116-006-001` `                Report Date:02-07-21  Time:16:20:19` ```
Data Structures	``` #define X25_ADDR_ARRAY_SIZE 8 #define X25_CODE_ARRAY_SIZE 2 struct s_ath_rpt_x25_data { t_u16 channel; t_u8 x_addr[X25_ADDR_ARRAY_SIZE]; /* holds bcd data type */ t_u8 code[X25_CODE_ARRAY_SIZE]; /* holds hex data type */ t_ss7_pc pc; }; typedef struct s_ath_rpt_x25_data t_ath_rpt_x25_data; ```
Notes	As of Rel 28.0, X25 links only on A port - output is limited to Port A as shown in this example. Modified the Point Codes to allow for the Spare and Private indicators.

I28 (XLIST ENTRY EXPIRED)

Literal	RPT_XLIST_ENTRY_EXPIRED
| Format | ``` 
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc    INFO     'text'
                DPC=&&-###-###-###
``` |
| Output Examples | ``` 
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   1234.1146    CARD 1101    INFO     REPT-XLST-TIMO: X-LIST entry expired
                DPC=001-001-001
                Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ``` 
struct s_ath_rpt_xlist_entry_expired
    {
    t_ss7_pc  dpc;  /* DPC of XLIST entry that expired */
    };

typedef struct s_ath_rpt_xlist_entry_expired  t_ath_rpt_xlist_entry_expired;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I29 (TFX MSG)

Literal	RPT_INV_TFX_MSG
| Format | ``` 
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppp INFO     'text'
                OPC=&&-###-###-###    CPC=&&-###-###-###
                LSN=[lnkset]
``` |
| Output Examples | ``` 
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   1234.1147    CARD 1205,A  INFO     MTP Invalid TFA received
                OPC=001-001-001    CPC=002-002-002
                LSN=ABCD123
                Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ``` 
struct s_ath_rpt_inv_tfx_msg_rcvd
    {
    t_ss7_pc  opc;  /* OPC of invalid TFx msg */
    t_ss7_pc  cpc;  /* CPC of invalid TFx msg */
    };

typedef struct s_ath_rpt_inv_tfx_msg_rcvd  t_ath_rpt_inv_tfx_msg_rcvd;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I37 (MTP INV-LENGTH)

Literal	RPT_MTP_INV_LENGTH
| Format | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppp INFO      'text'
                LEN=xxx
                SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                LSN=[lnkset]
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0010.1004    CARD 1205,B  INFO      REPT-OVSZMSG: MTP MSU too large to rte.
                LEN=279
                SIO=07   OPC=001-001-001      DPC=s-002-002-002
                LSN=ABCD123
                Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_ath_rpt_mtp_inv_length
    {
    t_u8      sio;
    t_ss7_pc  dpc;
    t_ss7_pc  opc;
    t_u16     len;
    };

typedef struct s_ath_rpt_mtp_inv_length  t_ath_rpt_mtp_inv_length;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I38 (SCCP INV LENGTH)

Literal	RPT_SCCP_INV_LENGTH
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.yyyy    CARD cccc,ppp INFO      'text'
               LEN=###
               SIO=XX   OPC=&&-###-###-###    DPC=&&-###-###-###
               SCCP MT=###
               CDPA: AI=XX PC=&&-###-###-###    SSN=### TT=###
                     ADDR=####################
               CGPA: AI=XX PC=&&-###-###-###    SSN=### TT=###
                     ADDR=####################
               LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0304.1172    CARD 1101,A2  INFO      REPT-OVSZMSG: SCCP MSU too large to rte
               LEN=10
               SIO=05   OPC=007-021-067       DPC=005-022-019
               SCCP MT=004
               CDPA: AI=05 PC=005-006-007       SSN=006 TT=007
                     ADDR=ABCDEF0123456789ABCDE
               CGPA: AI=14 PC=015-016-017       SSN=022 TT=023
                     ADDR=9194603655ABCDEF01234
               LSN=ABCD123
               Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define SCCP_MAX_GT_ADDRESS_DIGITS   21
#define SCCP_MAX_GT_ADDRESS_BYTES    (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct  sccp_gt_address
    {
    t_u8  length;
    t_u8  digits[SCCP_MAX_GT_ADDRESS_BYTES];
    };

typedef struct sccp_gt_address  t_sccp_gt_address;

struct s_ath_rpt_cpa
    {
    t_u8             ai;
    t_ss7_pc         pc;
    t_u8             ssn;
    t_u8             tt;
    t_sccp_gt_address  addr;
    };
typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_sccp_inv_length
    {
    t_u8          sio;   /* Service Information Octet */
    t_ss7_pc      dpc;
    t_ss7_pc      opc;
    t_u8          sccp_msg_type;
    t_ath_rpt_cpa  cdpa;
    t_ath_rpt_cpa  cgpa;
    t_u16         len;   /* Message Length Indicator */
    };
typedef struct s_ath_rpt_sccp_inv_length  t_ath_rpt_sccp_inv_length;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators.

Please refer to **Error! Reference source not found.** for a description of the Point Code display formats. |

I39 (SCCP INV TCAP W/ DATA)

Literal	RPT_SCCP_INV_TCAP_DATA
Format	``` 1 2 3 4 5 6 7 8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
xxxx.yyyy   CARD cccc,ppp INFO   'text'
SIO=XX   OPC=&&-###-###-###   DPC=&&-###-###-###
LEN=###   SCCP MT=###
CGPA: AI=XX PC=&&-###-###-###   SSN=### TT=###
ADDR=####################
PKG=XX CMPNT=XX OFFSET=### EXPECTED=XX ACTUAL=XX
LSN=[lnkset]
``
Output Examples	``` 1 2 3 4 5 6 7 8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
0314.1182   CARD 1101,B3 INFO   Cnvrsn Discard: Invalid TCAP element
SIO=03   OPC=15-15-15-3-ab   DPC=02-07-00-2-cd
LEN=101   SCCP MT=006
CGPA: AI=32 PC=01-15-04-0-cd   SSN=052 TT=053
ADDR=ABCDEF0123456789ABCDE
PKG=15 CMPNT=16 OFFSET=023 EXPECTED=18 ACTUAL=19
LSN=ABCD123
Report Date:02-07-21 Time:16:20:19
``
| Data Structures | ```
#define SCCP_MAX_GT_ADDRESS_DIGITS  21
#define SCCP_MAX_GT_ADDRESS_BYTES   (SCCP_MAX_GT_ADDRESS_DIGITS + 1)/2

struct  sccp_gt_address
    {
    t_u8  length;
    t_u8  digits[SCCP_MAX_GT_ADDRESS_BYTES];
    };
typedef struct sccp_gt_address  t_sccp_gt_address;

struct s_ath_rpt_cpa
    {
    t_u8             ai;
    t_ss7_pc         pc;
    t_u8             ssn;
    t_u8             tt;
    t_sccp_gt_address  addr;
    };
typedef struct s_ath_rpt_cpa  t_ath_rpt_cpa;

struct s_ath_rpt_tcap_data
    {
    t_u16  package;
    t_u16  component;
    t_u16  offset;
    t_u16  expected_value;
    t_u16  actual_value;
    };
typedef struct s_ath_rpt_tcap_data  t_ath_rpt_tcap_data;

struct s_ath_rpt_sccp_inv_tcap_data
    {
    t_u8             sio;
    t_ss7_pc         opc;
    t_ss7_pc         dpc;
    t_u8             sccp_msg_type;
    t_ath_rpt_cpa    cgpa;
    t_u16            len;
    t_ath_rpt_tcap_data  tcap;
    };
typedef struct s_ath_rpt_sccp_inv_tcap_data  t_ath_rpt_sccp_inv_tcap_data;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I40 (LNPSUB DPC ZERO ROUTES)

Literal	RPT_LNP_SUB_DPC_NO_ROUTE
| Format | ```
            1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  xxxx.xxxx    SYSTEM       INFO      'text'
               TN=npanxxdddd  LRN=dddddddddd
               DPC(s)=&&-xxx-xxx-xxx    &&-xxx-xxx-xxx    &&-xxx-xxx-xxx
                      &&-xxx-xxx-xxx    &&-xxx-xxx-xxx    &&-xxx-xxx-xxx
``` |
| Output Examples | ```
            1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  1234.1176    SYSTEM       INFO      LNP subscription ref's DPC w/ 0 rtes
               TN=9194605500  LRN=1234567890
               DPC(s)=005-022-019        007-021-067        004-016-200
                      004-016-200        007-021-067        005-022-019
               Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define    MRN_MAX_ZERO_ROUTE_DPCS_PER_UIM  6

enum mrn_zero_rte_dpc_lrn_avail_flag
     {
     MRN_ZERO_RTE_DPC_LRN_AVAIL,
     MRN_ZERO_RTE_DPC_LRN_NOT_AVAIL
     };

typedef t_u8  e_mrn_zero_rte_dpc_lrn_avail_flag;

struct s_mrn_rpt_lnp_sub_dpc_no_route
     {
     t_u8                              npanxx[MAX_NPANXX_ADDRESS_BYTES];
     t_u8                              nnnn[MAX_4DIGIT_ADDRESS_BYTES];
     e_mrn_zero_rte_dpc_lrn_avail_flag lrn_avail_flag;
     t_u8                              lrn[MAX_LRN_ADDRESS_BYTES];
     t_ss7_pc                          dpc[MRN_MAX_ZERO_ROUTE_DPCS_PER_UIM];
     };

typedef struct s_mrn_rpt_lnp_sub_dpc_no_route  t_mrn_rpt_lnp_sub_dpc_no_route;
``` |
| Notes | As of Release 29.0 the maximum number of DPCs displayed on a single line is 3. These UIMs are generated for OAP-based LNP provisioning and architecture. They are NOT generated for ELAP-based LNP provisioning architectures.
Shifted text output from column 41 to 42. |

I43 (SCCP CDPA FOR EGTT)

Literal	RPT_SCCP_INV_CDPA_2
| Format | ```
         1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppppINFO    'text'
                SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                SCCP MSG TYPE=##
                CDPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                       TT=###  NP=##  NAI=###  ADDR=####################
                       PC=&&-###-###-###     SSN=###
                CGPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                       TT=###  NP=##  NAI=###  ADDR=####################
                       PC=&&-###-###-###     SSN=###
                LSN=[lnkset]
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890
   0018.1120    CARD 1103,A    INFO    SCCP-CNV: Unable to convert ANSI CDPA GT
                SIO=03   OPC=001-001-001     DPC=002-002-002
                SCCP MSG TYPE=04
                CDPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                       TT=250  NP=04  NAI=010  ADDR=12345678901234567890
                       PC=003-003-003      SSN=005
                CGPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                       TT=100  NP=07  NAI=012  ADDR=01234567890123456789
                       PC=001-001-001      SSN=004
                LSN=ABCD123
                Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
#define ATH_RPT_MAX_SCCP_BCD_ADDR_BYTES SCCP_MAX_GT_ADDRESS_BYTES

#define SIH_UIM_MAX_DATA                (ATH_MAX_DATA_DUMP * 2)

union u_gt_struct
    {
    struct
    {
        t_sccp_gt_tt_np_es_nai   selectors;
        t_sccp_gt_address        addr;
    }    gt;
    t_ss7_pc  pc;
    };

typedefu_gt_struct  t_gt_struct;

structs_ath_rpt_egtt_cpa
    {
    t_sccp_addr_ind   ai;
    t_sccp_subsystem  ssn;
    t_gt_struct       gt_or_pc;
    };

typedefstructs_ath_rpt_egtt_cpa  t_ath_rpt_egtt_cpa;

structs_ath_rpt_sccp_inv_cdpa_2
    {
    t_u8               sio;
    t_ss7_pc           opc;
    t_ss7_pc           dpc;
    e_scmg_msg_type    sccp_msg_type;
    t_ath_rpt_egtt_cpa cdpa;
    t_ath_rpt_egtt_cpa cgpa;
    };

typedefstructs_ath_rpt_sccp_inv_cdpa_2  t_ath_rpt_sccp_inv_cdpa_2;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I44 (SCCP ROUTING FOR EGTT)

Release 31.12	
Literal	RPT_SCCP_ROUTING_2

Format	<pre> 1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	   xxxx.xxxx CARD cccc,ppp INFO 'text'
	                TRANSLATED PC=&&-###-###-### TRANSLATED SS=###
	                CDPA: NI=# RI=@ GTI=## SSNI=@ PCI=@
	                       TT=### NP=## NAI=### ADDR=####################
	                       PC=&&-###-###-### SSN=###
	                CGPA: NI=# RI=@ GTI=## SSNI=@ PCI=@
	                       TT=### NP=## NAI=### ADDR=####################
	                       PC=&&-###-###-### SSN=###
	                LSN=[lnkset]</pre>

Output Examples	<pre> 1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	   0019.1226 CARD 1104,A INFO SCCP did not route - DPC congested
	                TRANSLATED PC=003-003-003 TRANSLATED SS=005
	                CDPA: NI=1 RI=0 GTI=04 SSNI=0 PCI=1
	                       TT=250 NP=04 NAI=010 ADDR=12345678901234567890 1
	                       PC=003-003-003 SSN=005
	                CGPA: NI=1 RI=0 GTI=04 SSNI=0 PCI=1
	                       TT=100 NP=07 NAI=012 ADDR=012345678901234567890
	                       PC=001-001-001 SSN=004
	                LSN=ABCD123
	                Report Date:02-07-21 Time:16:20:19</pre>

Data Structures	<pre>#define ATH_RPT_MAX_SCCP_BCD_ADDR_BYTES 5
	
	union u_gt_struct
	    {
	    struct
	        {
	        t_sccp_gt_tt_np_es_nai selectors;
	        t_sccp_gt_address addr;
	        } gt;
	    t_ss7_pc pc;
	    };
	
	typedef u_gt_struct t_gt_struct;
	
	struct s_ath_rpt_egtt_cpa
	    {
	    t_sccp_addr_ind ai;
	    t_sccp_subsystem ssn;
	    t_gt_struct gt_or_pc;
	    };
	
	typedef struct s_ath_rpt_egtt_cpa t_ath_rpt_egtt_cpa;
	
	struct s_ath_rpt_sccp_routing_2
	    {
	    t_ss7_pc trans_pc;
	    t_sccp_subsystem trans_ss;
	    e msu_type msu_type;
	    t_ath_rpt_egtt_cpa cdpa;
	    t_ath_rpt_egtt_cpa cgpa;
	    };
	
	typedef struct s_ath_rpt_sccp_routing_2 t_ath_rpt_sccp_routing_2;</pre>

Notes	Issued on SCCP and VSCCP cards, so ports allowed are A and B only. Modified the Point Codes to allow for the Spare and Private indicators.

I47 (LNPSSP DTH MEASUREMENTS DISCARDED FOR DPC)

Literal	`RPT_MEAS_LNPSSP_DTH_INFO`
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    SYSTEM      INFO      'text'
                 DPC=&&-###-###-###
                 Non-Zero Measurements Discarded: xxx
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    1234.1199    SYSTEM      INFO      LNP DTH Measurements Discarded for DPC
                 DPC=001-001-001
                 Non-Zero Measurements Discarded: Yes
                 Report Date:02-07-21  Time:16:20:19
``` |
| Data Structures | ```
struct s_rpt_mrn_meas_lnpssp_dth_full
    {
    t_ss7_pc  key;
    t_bool    non_zero_data;
    };

typedef struct s_rpt_mrn_meas_lnpssp_dth_full  t_rpt_mrn_meas_lnpssp_dth_full;
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I48 (GSM MAP SCREENING)(1 of 4)

Literal	RPT_INV_GSM_MS_FORMAT_KEY
| Format | ```
           1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890
  xxxx.xxxx   CARD cccc    INFO     'text'
              OPC=&&-###-###-###      DPC=&&-###-###-###
              CDPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                     TT=###  NP=##  NAI=###  ADDR=####################
                     PC=&&-###-###-###     SSN=###
              CGPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                     TT=###  NP=##  NAI=###  ADDR=####################
                     PC=&&-###-###-###     SSN=###
              Op-Code=### Forbidden Param=N/A  Action=Discard
``` |
| Output Examples | ```
           1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890
  0018.1248   CARD 1103    INFO       GSM Map Screening rcvd unknown orig
              OPC=001-001-001         DPC= 2-012-002
              CDPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                     TT=250  NP=04  NAI=010  ADDR=123456789012345678901
                     PC=003-003-003        SSN=005
              CGPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                     TT=100  NP=07  NAI=012  ADDR=012345678901234567890
                     PC=001-001-001        SSN=004
              Op-Code=### Forbidden Param=N/A  Action=Discard
              Report Date:02-07-21  Time:16:20:19
``` |

I48 (GSM MAP SCREENING) (2 of 4)

| Data Structures | ```
union u_gsm_gt_struct
    {
    struct
        {
        t_sccp_gt_tt_np_es_nai  selectors;
        t_sccp_gsm_gt_address   addr;
        }   gt;
    t_ss7_pc  pc;
    };

typedef union u_gsm_gt_struct  t_gsm_gt_struct;

struct s_ath_rpt_gsm_cpa
    {
    t_sccp_addr_ind   ai;
    t_sccp_subsystem  ssn;
    t_gsm_gt_struct   gt_or_pc;
    };

typedef struct s_ath_rpt_gsm_cpa  t_ath_rpt_gsm_cpa;

typedef t_u8 t_gsm_map_opcode;

enum gsm_forbid_param
    {
    GSM_FORBID_NONE     = 0,
    GSM_FORBID_STATE    = 1,
    GSM_FORBID_LOCATION = 2,
    GSM_FORBID_ALL      = 3,
    GSM_FORBID_UNDEF    = 255
    };

typedef t_u8 e_gsm_forbid_param;

enum gsm_screening_action
    {
    GSM_ACT_PASS    = 0,
    GSM_ACT_DISCARD = 1,
    GSM_ACT_ATIERR  = 2,
    GSM_ACT_UNDEF   = 255
    };

typedef t_u8 e_gsm_screening_action;

struct s_ath_rpt_inv_gsm_ms
    {
    t_ss7_pc                opc;
    t_ss7_pc                dpc;
    t_ath_rpt_gsm_cpa       cdpa;
    t_ath_rpt_gsm_cpa       cgpa;
    t_gsm_map_opcode        opcode;
    e_gsm_forbid_param      forbid;
    e_gsm_screening_action  act;
    };
typedef struct s_ath_rpt_inv_gsm_ms  t_ath_rpt_inv_gsm_ms;

typedef struct s_ath_rpt_inv_gsm_ms  t_ath_rpt_inv_gsm_ms;
``` |
| Notes | Modified to insert the DPC. |

I48 (GSM MAP SCREENING)(3 of 4)

Literal	RPT_INV_GSM_MS_FORMAT_KEY
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc     INFO       'text'
                 OPC=&&-###-###-###
                 CDPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                        TT=###  NP=##  NAI=###  ADDR=####################
                        PC=&&-###-###-###    SSN=###
                 CGPA:  NI=#  RI=@  GTI=##  SSNI=@  PCI=@
                        TT=###  NP=##  NAI=###  ADDR=####################
                        PC=&&-###-###-###    SSN=###
                 Op-Code=### Forbidden Param=N/A  Action=Discard
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0018.1248    CARD 1103     INFO       GSM Map Screening rcvd unknown orig
                 OPC=001-001-001
                 CDPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                        TT=250  NP=04  NAI=010  ADDR=12345678901234567890 1
                        PC=003-003-003         SSN=005
                 CGPA:  NI=1  RI=0  GTI=04  SSNI=0  PCI=1
                        TT=100  NP=07  NAI=012  ADDR=012345678901234567890
                        PC=001-001-001         SSN=004
                 Op-Code=### Forbidden Param=N/A  Action=Discard
                 Report Date:02-07-21  Time:16:20:19
``` |

I48 (GSM MAP SCREENING) (4 of 4)

| `Data Structures` | ```
union u_gsm_gt_struct
    {
    struct
        {
        t_sccp_gt_tt_np_es_nai  selectors;
        t_sccp_gsm_gt_address   addr;
        }     gt;
    t_ss7_pc  pc;
    };

typedef union u_gsm_gt_struct  t_gsm_gt_struct;

struct s_ath_rpt_gsm_cpa
    {
    t_sccp_addr_ind   ai;
    t_sccp_subsystem  ssn;
    t_gsm_gt_struct   gt_or_pc;
    };

typedef struct s_ath_rpt_gsm_cpa  t_ath_rpt_gsm_cpa;

typedef t_u8 t_gsm_map_opcode;

enum gsm_forbid_param
    {
    GSM_FORBID_NONE     = 0,
    GSM_FORBID_STATE    = 1,
    GSM_FORBID_LOCATION = 2,
    GSM_FORBID_ALL      = 3,
    GSM_FORBID_UNDEF    = 255
    };

typedef t_u8 e_gsm_forbid_param;

enum gsm_screening_action
    {
    GSM_ACT_PASS    = 0,
    GSM_ACT_DISCARD = 1,
    GSM_ACT_ATIERR  = 2,
    GSM_ACT_UNDEF   = 255
    };

typedef t_u8 e_gsm_screening_action;

struct s_ath_rpt_inv_gsm_ms
    {
    t_ss7_pc                opc;
    t_ath_rpt_gsm_cpa       cdpa;
    t_ath_rpt_gsm_cpa       cgpa;
    t_gsm_map_opcode        opcode;
    e_gsm_forbid_param      forbid;
    e_gsm_screening_action  act;
    };

typedef struct s_ath_rpt_inv_gsm_ms  t_ath_rpt_inv_gsm_ms;
``` |
| `Notes` | Modified the Point Codes to allow for the Spare and Private indicators. |

I52 (GWS ISUP)

Literal	RPT_GWS_ISUP_MSG_TYPE
| Format | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   xxxx.xxxx    CARD cccc,ppp INFO      'text'
                SIO=xx   OPC=&&-###-###-###    DPC=&&-###-###-###
                MSG TYPE=xx
                SR=isup  LSN=[lnkset]
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
   0054.1160    CARD 1205,A   INFO    GWS rcvd ISUP that is not allowed
                SIO=85   OPC=001-001-001       DPC=002-001-000
                MSG TYPE=01
                SR=isup  LSN=e1m1s1
                Report Date:14-01-10  Time:14:43:12
``` |
| Data Structures | ```
struct s_mrn_rpt_isupcnv_inv_msg
    {
    t_u8      io;
    t_ss7_pc  opc;
    t_ss7_pc  dpc;
    t_u8      isup_msg_type;
    };

typedef struct s_mrn_rpt_isupcnv_inv_msg  t_mrn_rpt_isupcnv_inv_msg
``` |
| Notes | Modified the Point Codes to allow for the Spare and Private indicators. |

I54 IXP ERROR HISTORY

<table>
<tr><td colspan="2">**Release 33.0**</td></tr>
<tr>
<td>Literal</td>
<td>RPT_IXP_ERR_HISTORY</td>
</tr>
<tr>
<td>Format</td>
<td>
<pre>
          1   2   3   4   5   6   7   8
1234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx   CARD cccc   INFO   'text'
                 Any Errors   : YES   current hour------v
                 24 Hour History : NNNYNN NNNNNN NNNNYN NYNNNY
                 Microengine Count : xxxxxxxx
                 PCI   Count : xxxxxxxx
                 StrongARM   Count : xxxxxxxx
</pre>
</td>
</tr>
<tr>
<td>Output Examples</td>
<td>
<pre>
          1   2   3   4   5   6   7   8
1234567890123456789012345678901234567890123456789012345678901234567890
    0024.1101   CARD 1109   INFO   SDRAM single bit error report
                 Any Errors   : YES   current hour------v
                 24 Hour History : NNNYNN NNNNNN NNNNYN NYNNNY
                 Microengine Count : 12345678
                 PCI   Count : 12345678
                 StrongARM   Count : 12345678
                 Report Date:02-07-21 Time:16:20:19
</pre>
</td>
</tr>
<tr>
<td>Data Structures</td>
<td>
<pre>
struct s_ath_ixp_rpt_err_history
    {
    t_bool   any_error;   /* TRUE if any error since power on */
    t_u32   history;   /* aggregate Record of last 24 hours */
    t_u32   ueng_sbe_count;   /* microengine single-bit error peg count */
    t_u32   pci_sbe_count;   /* pci   single-bit error peg count */
    t_u32   sa_sbe_count;   /* StrongARM single-bit error peg count */
    };

typedef struct s_ath_ixp_rpt_err_history   t_ath_ixp_rpt_err_history;
</pre>
</td>
</tr>
<tr>
<td>Notes</td>
<td>**Initial version for Release 33.0**</td>
</tr>
</table>

I57 (TABLE INFO)

0	
Literal	RPT_TABLE_CHKSUM_MISMATCH
| Format | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc    INFO      'TEXT'
                 TBL ID = ###  CALC CHKSUM=XXXX   REF CHKSUM=XXXX
                 LBA READ: INITIAL=######## CURR=########
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0014.1187    CARD 1113    INFO      DMS table checksum mismatch
                 TBL ID =  51  CALC CHKSUM=B7C0   REF CHKSUM=4A5F
                 LBA READ: INITIAL= 8447979 CURR= 8441835
``` |
| Data Structures | struct s_ath_rpt_tbl_chksum_info
　{
t_u16　dms_tbl_id;
t_u16　calc_chksum;
t_u16　ref_chksum;
t_u16　initial_lba;
t_u16　curr_lba;
　};

typedef struct s_ath_rpt_tbl_chksum_info t_ath_rpt_tbl_chksum_info |
| Notes | None. |

I58 (SUBSET CHECKSUM INFO)

Literal	RPT_SUBSET_CHKSUM_MISMATCH
| Format | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    xxxx.xxxx    CARD cccc    INFO       "TEXT"
                 SUBSET = #  CALC CHKSUM=XXXX   REF CHKSUM=XXXX
``` |
| Output Examples | ```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
    0008.1188    CARD 1113    INFO      DB Subset Checksum Mismatch
                 SUBSET = 3  CALC CHKSUM = H'abcd  REF CHKSUM = H'cdef
``` |
| Data Structures | struct s_ath_rpt_ss_chksum_info
　{
t_u16　subset;
t_u16　calc_chksum;
t_u16　ref_chksum;
　};

typedef struct s_ath_rpt_ss_chksum_info t_ath_rpt_ss_chksum_info; |
| Notes | None. (List any changes that separate this version of the format from previous version of it, if any exist) |

I59 (RTDB DATA TARGET CRC FAILED)

Literal	RPT_RTDB_DATA_TRGT_CRC_FAIL
| Format | ```
          1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789 0
   xxxx.xxxx    CARD cccc    INFO       "TEXT"
            CARD = #  TABLE=XXXX OFFSET=XXXX TRGT CRC=XXXX
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789 0

   0008.1308    CARD 1113    INFO     Updates inhibited: Target-Cell CRC Fail
            CARD=1107    TABLE=50     OFFSET=0    TRGT CRC=1423697
``` |
| Data Structures | ```
typedef struct s_ath_rpt_rtdb_data_crc_fail
      {
   t_u16 card_loc;
   t_u16 table_id;
   t_u32 cell_offset;
   t_u32 target_crc;
   } t_ath_rpt_rtdb_data_crc_fail;
``` |
| Notes | None. |

I60 (RTDB DATA SOURCE CRC FAILED)

Literal	RPT_RTDB_DATA_SRC_CRC_FAIL
| Format | ```
          1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789 0
   xxxx.xxxx    CARD cccc    INFO       "TEXT"
            CARD = #  TABLE=XXXX OFFSET=XXXX
``` |
| Output Examples | ```
          1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789 0

   0008.1309    CARD 1113    INFO     Updates inhibited: Source-Cell CRC Fail
            CARD=1107    TABLE=50     OFFSET=0
``` |
| Data Structures | ```
typedef struct s_ath_rpt_rtdb_data_crc_fail
      {
   t_u16 card_loc;
   t_u16 table_id;
   t_u32 cell_offset;
   t_u32 target_crc;
   } t_ath_rpt_rtdb_data_crc_fail;
``` |
| Notes | None. |

STC IP LINKS ALARMS

Format	1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	  xxxx.yyyy zz DLK cccc,ppp [device] text
	              Failed Channels: XXXX XXXX XXXX XXXX (Optional)
	              ERROR STATUS: axxxxxxxxx. axxxxxxxxxxx. (Optional)
	              ALARM INHIBIT LEVEL: XXXX (Optional)

Output
Examples
	1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	* 5043.0155 * DLK 1111,A STPLAN STPLAN connection unavailable
	
	  1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	** 5152.0084 ** DLK 1105,B EROUTE IP Connection Unavailable
	              ERROR STATUS: DHCP Lease. Physical Link.
	
	  1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	** 0259.0084 ** DLK 1101,B VSCCP IP Connection Unavailable
	              Failed Channels: Prov Dnld TCP UDP
	
	  1 2 3 4 5 6 7 8
	12345678901234567890123456789012345678901234567890123456789012345678901234567890
	   0045.0296 DLK 1104,A MCP REPT-ALMINH: alarm output TEMP Inhibit
	              ALARM INHIBIT LEVEL: MINR

Notes	Added an optional parameter to show which IP Channels are unavailable in the case of an IP Connection Unavailable alarm. Added for PR 54962. Combined the DLK, DSM, and MCPM formats into this one format.

Error Codes

Incorrect use of the enhanced commands for the 192 Million LNP Numbers feature may generate the error messages listed in Table FN-12.

Table FN-12.   Error Messages - 192 Million LNP Numbers

Response ID Code	Error Message	New?	Used by Command:
E3457	Perm feature key cannnot be turned off for the feature	N	enable-ctrl-feat
E3464	LNP ported TNs 48 to 192 M Qty Feat Req at least DSM4GB	N	enable-ctrl-feat
E4325	ELAP architecture does not support LNP quantity requested	Y	enable-ctrl-feat
E4326	ELAP must be available to verify LNP quantity support	Y	enable-ctrl-feat
E4370	Level 1 Alarm Threshold level must be less than Level 2	Y	chg-th-alm

Incorrect use of the enhanced commands for the SE-HSL feature may generate the error messages listed in Table FN-13.

Table FN-13.   Error Messages - SE-HSL

Response ID Code	Error Message	New?	Used by Command:
E4274	Cannot mix Unchannnelized and Channelized modes on E1 card.	N	chg-/ent-/rtrv-el
E4275	TS not allowed when SEHSL feature has set Linkclass = Unchan	N	ent-slk
E4276	If specified BPS must be 1984000 when Linkclass = Unchan	N	ent-slk
E4277	LINKCLASS=UCHAN is not valid for even numbered card loc.	N	ent-el
E4278	APCNTYPE parameter is only valid for ITUN/ITUN24 link sets	Y	chg-/ent-ls
E4281	Link Parameter may only be a or b for SE-HSL.	N	ent-slk
E4282	A SEHSL feature key must be enabled to provision SEHSL.	N	ent-el

Incorrect use of the enhanced commands for the Multiple Routing Context feature may generate the error messages listed in Table FN-14.

Table FN-14.   Error Messages - Multiple Routing Context

Response ID Code	Error Message	New?	Used by Command:
E2745	Deleted, obsolete ALHOST is invalid without LHOST	N	ent-assoc
E3447	IPLIMx connections cannot be resident in AS	N	ent-as
E3471	Deleted, obsolete	N	
E3733	Socket name not found	Y	ent-appl-sock
E3839	Split, RC, NCICS, NCICE, or attributes required	N	chg-appl-rtkey
E3840	Attributes required	N	chg-appl-rtkey
E3957	When type=partial or default, specify attributes	N	chg-appl-rtkey
E4022	Deleted, obsolete	N	
E4070	Deleted, obsolete	N	
E4071	Deleted, obsolete	N	
E4072	Deleted, obsolete	N	
E4073	AS/socket cannot be deleted while assigned to a routing key	N	dlt-assoc
E4079	Specified AS name not found	Y	dlt-as
E4081	Maximum number of connections already provisioned for AS	N	ent-as
E4082	Deleted, obsolete	N	
E4083	Connection adapter type does not match AS adapter type	N	ent-as
E4084	Deleted, obsolete	N	
E4089	Unable to change adapter when assigned to an AS	N	chg-assoc
E4098	OPEN must be NO to change an association or its AS	N	dlt-/rtrv-assoc, dlt-appl-rtkey, chg-/ent-as
E4099	Specified association name not found	Y	chg-/dlt-/ent-/rtrv-as
E4109	Association is still assigned to AS	N	dlt-assoc
E4111	Deleted, obsolete	N	
E4112	Deleted, obsolete	N	

Table FN-14. Error Messages - Multiple Routing Context

Response ID Code	Error Message	New?	Used by Command:
E4300	Conns cannot exist with and without rcontext	N	dlt-/ent-appl-rtkey
E4374	Association in maximum allowed application servers	N	ent-as
E4384	Local IP address not found in IPLNK table	N	ent-ip-host
E4385	Remote IP address found in IPLNK table	N	ent-ip-host
E4386	IP address found in IP Host table	N	chg-ip-lnk
E4448	Maximum adapter states per card exceeded	Y	chg-assoc, ent-appl-sock
E4491	Invalid IP database configuration	N	act-upgrade

Incorrect use of the enhanced commands for the STPLAN SSEDCM Capacity Increase feature may generate the error messages listed in Table FN-15.

Table FN-15. Error Messages - STPLAN SSEDCM Capacity Increase

Response ID Code	Error Message	New?	Used by Command:
E4490	Card type must be VXWSLAN for a 100 Mbit link	Y	ent-dlk

Incorrect use of the enhanced commands for the HC-MIM feature feature may generate the error messages listed in Table FN-16.

Table FN-16. Error Messages - Base HC-MIM Support

Response ID Code	Error Message	New?	Used by Command:
E2155	Invalid parameter combination specified	N	act-/init-flash rept-stat-slk
E2428	Card GPL state conflict	Y	act-/init-flash
E3710	APPL not valid for command	N	ent-card

Incorrect use of the enhanced commands for the 64 Link Support feature may generate the error messages listed in Table FN-17.

Table FN-17.   Error Messages - 64 Link Support

Response ID Code	Error Message	New?	Used by Command:
E2288	Either LSN or LOC and LINK must be specified	N	rept-meas
E2289	LOC and LINK must be specified when PERIOD=ALL	N	rept-meas
E2295	LSN and LINK parms cannot be specified together	N	rept-meas
E2296	Both LOC and LINK must be specified	N	rept-meas rtrv-/vfy-slk
E2299	LINK parameter valid only when ENTTYPE=LINK	N	rept-meas
E2586	Invalid LINK for APPL	N	rept-meas ent-/asgn-slk dlt-/disc-slk rtrv-/vfy-slk
E2740	The specified LOC only supports SLTC loopbacks	N	tst-slk
E2976	Card does not support more than 2 links	N	ent-/dlt-/rtrv-slk asgn/disc-/vfy-slk act-/canc-/blk-/ublk /unhb-/tst-slk rept-stat-slk
E3405	LINK must be A if card type is LIMATM or LIME1ATM	N	ent-/asgn-slk rtrv-/vfy-slk
E3482	link capacity exceeds limit allow by feature key	Y	ent-/asgn-slk
E3483	CAS=ON is invalid for HC-MIM	Y	ent-/chg-e1
E3484	HC-MIM does not support interface to a channel card	Y	ent-/asgn-slk
E3485	CHANBRDG is only valid for HC-MIM	Y	ent-/chg-e1 ent-/chg-t1
E3486	CHANBRDG parameter is invalid for even numbered port	Y	ent-/chg-e1 ent-/chg-t1

Table FN-17.   Error Messages - 64 Link Support (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E3487	Timing Source must be specified if CHANBRDG=ON is specified	Y	ent-/chg-e1 ent-/chg-t1
E3488	RECOVERED is allowed only in channel bridging mode	Y	ent-/chg-e1 ent-/chg-t1
E3489	Adjacent even numbered port has signaling link assigned	Y	ent-/chg-e1 ent-/chg-t1
E3490	HIPR must be equipped on the shelf where HC-MIM card reside	Y	ent-/asgn-slk chg-e1 chg-t1
E3491	Port is channel bridged with its master port	Y	ent-/asgn-slk chg-/dlt-e1 chg-/dlt-t1
E3492	ADD/DROP mode provisioned FORCE=YES required	Y	inh-card
E3494	Link is invalid for card location	Y	ent-/asgn-slk
E3495	CHANBRDG is invalid for even numbered card location	Y	ent-/chg-e1 ent-/chg-t1
E3496	E1/T1 Port greater than 2 unavailable	Y	ent-e1 ent-t1
E3534	E1 Port test command in progress	Y	tst-e1
E3535	E1 Port test command not in progress	Y	tst-e1
E3615	T1 Port test command in progress	Y	tst-t1
E3768	LINK B not supported for device	N	ent-/asgn-slk rept-stat-slk
E3866	Fan feature must be enabled	N	ent-/chg-el ent-/chg-t1
E4013	T1 Port test command not in progress	Y	tst-t1
E4214	LOC and E1PORT parameter combination must be specified	Y	inh/unhb-alm
E4215	LOC and T1PORT parameter combination must be specified	Y	inh/unhb-alm
E4266	Channel bridged slave port is invalid for link provisioning	Y	ent-/asgn-slk

Table FN-17.   Error Messages - 64 Link Support (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E4267	Invalid timing source for channel bridging	Y	ent-/chg-e1 ent-/chg-t1
E4366	DEV type is not supported by specified location	Y	unhb-alm

Incorrect use of the enhanced commands for the High-Speed IMT Packet Router (HIPR) feature may generate the error messages listed in Table FN-18.

Table FN-18.   Error Messages - High-Speed IMT Packet Router (HIPR)

Response ID Code	Error Message	New?	Used by Command:
E2155	Invalid parameter combination specified	N	init-imt-gpl rept-imt-info act-/init-flash
E2212	Invalid card type for this command	N	init-imt-gpl disp-bip chg-bip-fld chg-bip-rec
E3481	S/ESLOT cannot be set to 9 or 10	Y	rept-imt-info
E4146	CTX parameter is invalid for this card	Y	ent-bp
E4147	Invalid combination of TYPE, UENG, and CTX parameters	Y	ent-bp
E4148	DATA parameter is invalid for this card	Y	ent-bp
E4149	ARM register must be specified	Y	ent-bp
E4150	UENG register must be specified	Y	ent-bp
E4151	After: UENG parameter is invalid for this card Before: NA	Y	ent-bp
E4152	Invalid combination of TYPE and DATA parameters	Y	ent-bp
E4153	CA or CB register value is invalid for this card	Y	ent-bp
E4154	DRARM parameter is invalid for this processor	Y	ent-bp
E4155	DR parameter is invalid for this card	Y	ent-bp
E4156	DRARM parameter is invalid for this card	Y	ent-bp

Table FN-18.   Error Messages - High-Speed IMT Packet Router (HIPR)

Response ID Code	Error Message	New?	Used by Command:
E4157	DA parameter is invalid for this card	Y	ent-bp
E4158	ADDR parameter is invalid for this card	Y	ent-bp
E4159	TYPE parameter value is invalid for this card	Y	ent-bp
E4160	ACCESS parameter value is invalid for this card	Y	ent-bp

Incorrect use of the enhanced commands for 8000 Routesets feature may result in the error messages listed in Table FN-19.

Table FN-19.   Error Messages - 8000 Routesets

Response ID Code	Error Message	New?	Used by Command:
E3421	DSTN5000 feature must be ON	N	chg-stpopts
E3454	Routesets Feature Quantity must be increased	N	chg-stpopts
E4280	The 7000 or 8000 Routesets Quantity Keys can not be enabled if the number of provisioned alias PCs is greater than 8000	Y	enable-ctrl-feat
E4298	Alias PC table is full	Y	ent-dstn chg-dstn

Incorrect use of the enhanced commands for GSM MAP SRI Redirect to Serving HLR feature may result in the error messages listed in Table FN-20.

Table FN-20.   Error Messages - GSM MAP SRI Redirect to Serving HLR

Response ID Code	Error Message	New?	Used by Command:
E3502	The NONE value is not allowed in this case	N	ent-trace chg-prefix ent-vendid rtrv-vendid ent-subnetid rtrv-subnetid
E3991	GPORT feature must be on	N	chg-prefix chg-gsmopts enable-ctrl-feat

Table FN-20.   Error Messages - GSM MAP SRI Redirect to Serving HLR (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E4316	VENDID table is full	Y	dlt-vendid
E4317	Failed reading VENDID table	Y	rtrv-vendid
E4318	VENDID already exists in VENDID table	Y	dlt-vendid
E4319	VENDID does not exist in VENDID table	Y	rtrv-vendid
E4320	SRI Redirect Feature must be enabled	Y	chg-prefix dlt-vendid rtrv-vendid
E4321	All VENDID table entries must be of length VENDIDLEN	Y	dlt-vendid
E4322	VENDIDLEN may only be changed if VENDID table is empty	Y	dlt-vendid
E4327	For VENDNUM specified the prefix is not provisioned	Y	dlt-vendid
E4343	Feature Prefix too long	Y	chg-prefix
E4360	VENDIDLEN must be set before Vendor ID may be entered.	Y	dlt-vendid
E4361	Enter VENDIDLEN, or VENDID, VENDNUM and VENDTYPE	Y	dlt-vendid

Incorrect use of the enhanced commands for the ISUP NP with EPAP feature may generate the error messages listed in Table FN-21.

Table FN-21.   Error Messages - ISUP NP with EPAP

Response ID Code	Error Message	New?	Used by Command:
E2585	GWS feature must be ON	N	ent-card enable-ctrl-feat
E3502	The NONE value is not allowed in this case	N	ent-trace chg-prefix ent-vendid rtrv-vendid ent-subnetid rtrv-subnetid

Table FN-21. Error Messages - ISUP NP with EPAP (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E3991	GPORT feature must be on	N	chg-prefix chg-gsmopts enable-ctrl-feat
E4316	VENDID table is full	Y	dlt-vendid
E4317	Failed reading VENDID table	Y	rtrv-vendid
E4318	VENDID already exists in VENDID table	Y	dlt-vendid
E4319	VENDID does not exist in VENDID table	Y	rtrv-vendid
E4320	SRI Redirect Feature must be enabled	Y	chg-prefix dlt-vendid rtrv-vendid
E4321	All VENDID table entries must be of length VENDIDLEN	Y	dlt-vendid
E4322	VENDIDLEN may only be changed if VENDID table is empty	Y	dlt-vendid
E4327	For VENDNUM specified the prefix is not provisioned	Y	dlt-vendid
E4336	MNP ISUP NP Query and LNP features are mutually exclusive.	N	No longer used in chg-feat
E4337	GWS must be enabled for MNP ISUP NP Query feature	N	No longer used in chg-feat
E4342	Feature Prefix too short	Y	chg-prefix
E4343	Feature Prefix too long	Y	chg-prefix
E4344	Maximum allowed Prefix values already entered for feature	Y	chg-prefix
E4345	Feature Prefix already exists	Y	chg-prefix
E4346	FEATPFX table full	Y	chg-prefix
E4347	Feature Name is not valid	Y	chg-prefix
E4348	Feature Prefix Number invalid	Y	chg-prefix
E4349	Feature Prefix still in use	Y	dlt-prefix
E4350	Feature Prefix not found	Y	dlt-prefix
E4352	SUBNETID table is full	Y	ent-subnetid
E4353	Failed reading SUBNETID table	Y	dlt-subnetid rtrv-subnetid

Table FN-21. Error Messages - ISUP NP with EPAP (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E4354	SUBNETID already exists in SUBNETID table	Y	dlt-subnetid
E4355	SUBNETID does not exist in SUBNETID table	Y	rtrv-subnetid
E4356	ISUP NP with EPAP feature must be enabled	Y	chg-prefix ent-subnetid rtrv-subnetid
E4357	All SUBNETID table entries must be of length SUBNETIDLEN	Y	dlt-subnetid
E4358	SUBNETIDLEN may only be changed if SUB-NETID table is empty	Y	dlt-subnetid
E4359	For SUBNETNUM specified the prefix is not provisioned	Y	dlt-subnetid
E4360	VENDIDLEN must be set before Vendor ID may be entered	Y	dlt-vendid
E4361	Enter params VENIDLEN, or enter params VENDID and VENDNUM	Y	dlt-vendid
E4362	SUBNETDLEN must be set before Subnet ID may be entered	Y	dlt-subnetid
E4363	Enter params SUBNETIDLEN or paramrs SUB-NETID and SUBNETNUM	Y	dlt-subnetid
E4364	Failed reading FEATPFX	Y	chg-prefix
E4365	Either TLNP or ISUP NP with EPAP must be en-abled	Y	chg-gws-actset

Incorrect use of the enhanced commands for the Linkset Restricted Support feature may generate the error messages listed in Table FN-22.

Table FN-22. New Error Message - Linkset Restricted Support

Response ID Code	Error Message	New?	Used by Command:
E4334	Requires C-linksets parameter **tfatcabmlq** to be set to 0	Y	chg-ss7opts

Incorrect use of the enhanced commands for the MTP MAP Screening feature may generate the error messages listed in Table FN-23.

Table FN-23. Error Messages - MTP MAP Screening

Response ID Code	Error Message	New?	Used by Command:
E3088	MEAS Platform must be enabled	N	enable-ctrl-feat
E4166	Enhanced GSM MAP Screening must be ON	Y	enable-ctrl-feat

Incorrect use of the enhanced commands for the Private Point Code feature may generate the error messages listed in Table FN-24.

Table FN-24. Error messages - Private Point Code

Response ID Code	Error Message	New?	Used by Command:
E4273	Private PC not allowed for non-IPGW linkset	Y	ent-/chg-ls
E4279	Only IPGW routes are allowed for private PCs	Y	ent-/chg-rte

Incorrect use of the enhanced commands for the Spare Point Code feature may generate the error messages listed in Table FN-25.

Table FN-25. Error Messages - Spare Point Code

Response ID Code	Error Message	New?	Used by Command:
E2787	PC network type does not match existing PC network type	N	ent-/chg-mrn
E2884	PCx, NPCx, CPCx or NCPCx must not be equal	N	chg-sid
E3921	ITU National Point Code must be full point code	N	ent-/chg-sid ent-trace
E4132	Group code not allowed with specified network type	N	ent-/dlt-na
E4165	Point Code Subtype Prefix not supported	N	rtrv-dstn rtrv-rte

Table FN-25.   Error Messages - Spare Point Code (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E4193	Spare Point Code Feature must be enabled	N	ent-/chg-/rtrv-sid ent-/dlt-/rtrv-spc ent-/chg-dstn ent-/chg-/dlt-/rtrv-scr-blkopc ent-/chg-map ent-/chg-/dlt-/rtrv-scr-dpc entchg-/dlt-/rtrv-scr-blkdpc ent-/chg-/dlt-/rtrv-scr-opc ent-/chg-/dlt-/rtrv-scr-destfld entchg-/dlt-/rtrv-scr-aftpc ent-/chg-/dlt-/rtrv-scr-cgpa ent-/dlt-/chg-/rtrv-scr-cdpa rtrv-scr-cgpa/cdpa ent-/dlt-cspc ent-rte ent-/dlt-/rtrv-na
E4195	Spare Point Codes not supported with adapter type	Y	ent-/chg-appl-rtkey
E4196	Spare Point Code Feature not compatible with TALI socket	N	ent-/chg-appl-sock enable-ctrl-feat
E4263	Parameter PCST / NPCST is not allowed with C for blocked SR	Y	ent-/chg-blkdpc ent-/chg-blkopc

Table FN-25.   Error Messages - Spare Point Code (Cont'd)

Response ID Code	Error Message	New?	Used by Command:
E4264	Parameter PCST / NPCST is not allowed with C for blocked SR	Y	rtrv-spc rtrv-scr-blkdpc ent-/chg-/dlt-/rtrv-scr-opc ent-/chg-/dlt-/rtrv-scr-blkopc ent-/chg-/dlt-/rtrv-scr-dpc ent-/chg-/dlt-/rtrf-scr-blkdpc ent-/chg-/dlt-/rtrv-scr-destfld ent-/chg-/dlt-/rtrv-scr-aftpc entchg-/dlt-/rtrv-scr-cgpa ent-/chg-/dlt-/rtrv-scr-cdpa
E4265	Network Appearance table full	Y	ent-na
E4269	No match on PCST parameter during retrieve	Y	rtrv-scr-dpc rtrv-scr-blkdpc rtrv-scr-opc rtrv-scr-blkopc rtrv-scr-destfld rtrv-scr-aftpc rtrv-scr-cgpa rtrv-scr-cgps/cdpa
E4270	Failed reading Application Socket table	Y	enable-ctrl-feat
E4271	At least 1 Site Point Code must exist	N	No longer valid for
E4301	PCx specified does not exist as a True Point Code	Y	chg-sid
E4302	NPCx cannot be specified without PCx	Y	chg-sid

Incorrect use of the enhanced commands for the SUA RFC feature may generate the error messages listed in Table FN-26.

Table FN-26.   Error Messages - SUA RFC

Response ID Code	Error Message	New?	Used by Command:
E3006	Deleted, obsolete	N	No longer used in `chg-asp`
E4031	Deleted, obsolete	N	No longer used in `chg-asp`
E4067	Only SNAME and ASNAME allowed for default routing key	N	`ent-appl-rtkey`
E4139	RC Already Equipped	Y	`ent-appl-rtkey` `chg-appl-rtkey`
E4140	Deleted, obsolete		

E4161	Routing Context parameter is required for SUA.	Y	`ent-as`
			`ent-appl-rtkey`
			`chg-appl-rtkey`

E4162	Deleted, obsolete		
E4163	Deleted, obsolete		
E4164	Deleted, obsolete		

E4262	A specified SI value must be 3 for SUA	Y	`ent-as`
			`ent-appl-rtkey`
			`chg-appl-rtkey`

E4272	Maximum RContexts per AS exceeded	Y	`ent-as`
			`ent-appl-rtkey`
			`chg-appl-rtkey`

E4300	An AS cannot exist in both rcontext and non-rcontext rtkeys	Y	`ent-appl-rtkey` `chg-appl-rtkey`

Customer Documentation

The documentation set for EAGLE 5 SAS Release 34.0 comprises the following manuals and documents. The list is sorted by manual name and is followed by a brief description of each manual.

> **NOTE: The most current update of each manual can be found on Tekelec's Customer Support website.**

- *Commands Error Recovery Manual*

- *Commands Manual*

- *Commands Pocket Guide*

- *Commands Quick Reference Guide*

- *Database Administration Manual – Features*

- *Database Administration Manual – Gateway Screening*

- *Database Administration Manual – Global Title Translation*

- *Database Administration Manual – IP7 Secure Gateway*

- *Database Administration Manual – SEAS*

- *Database Administration Manual – SS7*

- *Database Administration Manual – System Management*

- *Dimensioning Guide for EPAP Advanced DB Features*

- *ELAP Administration Manual*

- *EPAP Administration Manual*

- *EPAP DSM Dimensioning Tool*

- *ELAP Administration Manual*

- *Feature Manual – EIR*

- *Feature Manual – G-Flex C7 Relay*

- *Feature Manual – G-Port*

- *Feature Manual – INP*

- *Hardware Manual – EAGLE 5 SAS*

- *Hardware Manual – Tekelec 1000 Application Server*

- *Hardware Manual – Tekelec 1100 Application Server*

- *Installation Manual – EAGLE 5 SAS*

- *Installation Manual - Integrated Applications*

- *LNP Database Synchronization (LSMS with EAGLE 5 SAS)*

- *LNP Feature Activation Guide*

- *Maintenance Manual*

- *Maintenance Pocket Guide*

- *Maintenance Emergency Recovery Pocket Guide*

- *MPS Platform Software and Maintenance Manual (EAGLE 5 SAS with Tekelec T1000 Application Server)*

- *MPS Platform Software and Maintenance Manual (EAGLE 5 SAS with Tekelec T1100 Application Server)*

- *Previously Released Features Manual*

- *Provisioning Database Interface Manual*

- *Release Documentation*

  - *Feature Notice*

  - *Master Glossary*

  - *Master Index*

  - *Release Notice (online only)*

  - *System Overview*

- *System Manual – EOAP*

Commands Error Recovery Manual

The *Commands Error Recovery Manual* contains the procedures to resolve error message conditions generated by the commands in the *Commands Manual*. These error messages are presented in numerical order.

Commands Manual

The *Commands Manual* contains procedures for logging into an EAGLE 5 SAS system, logging out of the system, a general description of the terminals, printers, the disk drive used on the system, and a description of all the commands used in the system.

Commands Pocket Guide

The *Commands Pocket Guide* is an abridged version of the *Commands Manual*. It contains all commands and parameters, and it shows the command-parameter syntax.

Commands Quick Reference Guide

The *Commands Quick Reference Guide* contains an alphabetical listing of the commands and parameters. The guide is sized to fit a shirt-pocket.

Database Administration Manual – Features

The *Database Administration Manual – Features* contains procedural information required to configure an EAGLE 5 SAS or an IP^7 Secure Gateway system to implement these features: X.25 Gateway, STP LAN, Database Transport Access, GSM MAP Screening, and EAGLE 5 SAS Support for Integrated Sentinel.

Database Administration Manual – Gateway Screening

The *Database Administration Manual - Gateway Screening* contains a description of the Gateway Screening (GWS) feature and the procedures necessary to configure the EAGLE 5 SAS or IP^7 Secure Gateway system to support this feature.

Database Administration Manual – Global Title Translation

The *Database Administration Manual – Global Title Translation* contains procedural information required to configure an EAGLE 5 SAS or an IP^7 Secure Gateway system to implement these features: Global Title Translation, Enhanced Global Title Translation, Variable Length Global Title Translation, Interim Global Title Modification, and Intermediate GTT Load Sharing.

Database Administration Manual – IP^7 Secure Gateway

This manual contains procedural information required to configure the system to implement the SS7-IP Gateway.

Database Administration Manual – SEAS

The *Database Administration Manual – SEAS* contains the EAGLE 5 SAS configuration procedures that can be performed from the Signaling Engineering and Administration Center (SEAC) or a Signaling Network Control Center (SNCC). Each procedure includes a brief description of the procedure, a flowchart showing the steps required, a list of any EAGLE 5 SAS commands that may be required for the procedure but that are not supported by SEAS, and a reference to optional procedure-related information, which can be found in one of these manuals:

— Database Administration Manual – Gateway Screening

— Database Administration Manual – Global Title Translation

— Database Administration Manual – SS7

Database Administration Manual – SS7

The *Database Administration Manual – SS7* contains procedural information required to configure an EAGLE 5 SAS or an IP[7] Secure Gateway system to implement the SS7 protocol.

Database Administration Manual – System Management

The *Database Administration Manual – System Management* contains procedural information required to manage the EAGLE 5 SAS's database and GPLs, and to configure basic system requirements such as user names and passwords, system-wide security requirements, and terminal configurations.

Dimensioning Guide for EPAP Advanced DB Features

The *Dimensioning Guide for EPAP Advanced DB Features* is used to provide EPAP planning and dimensioning information. This manual is used by Tekelec personnel and EAGLE 5 SAS customers to aid in the sale, planning, implementation, deployment, and upgrade of EAGLE 5 SAS systems equipped with one of the EAGLE 5 SAS EPAP Advanced Database (EADB) Features.

ELAP Administration Manual

The *ELAP Administration Manual* defines the user interface to the EAGLE 5 SAS LNP Application Processor on the MPS/ELAP platform. The manual defines the methods for accessing the user interface, menus, screens available to the user and describes their impact. It provides the syntax and semantics of user input, and defines the output the user receives, including information and error messages, alarms, and status.

EPAP Administration Manual

The *EPAP Administration Manual* describes how to administer the EAGLE 5 SAS Provisioning Application Processor on the MPS/EPAP platform. The manual defines the methods for accessing the user interface, menus, and screens available to the user and describes their impact. It provides the syntax and semantics of user input and defines the output the user receives, including messages, alarms, and status.

Feature Manual – EIR

The *Feature Manual - EIR* provides instructions and information on how to install, use, and maintain the EIR feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS. The feature provides network operators with the capability to prevent stolen or disallowed GSM mobile handsets from accessing the network.

Feature Manual – G-Flex C7 Relay

The *Feature Manual - G-Flex C7 Relay* provides an overview of a feature supporting the efficient management of Home Location Registers in various networks. This manual gives the instructions and information on how to install, use, and maintain the G-Flex feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.

Feature Manual – G-Port

The *Feature Manual - G-Port* provides an overview of a feature providing the capability for mobile subscribers to change the GSM subscription network within a portability cluster while retaining their original MSISDNs. This manual provides instructions and information on how to install, use, and maintain the G-Port feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.

Feature Manual – INP

The *Feature Manual - INP* provides the user with information and instructions on how to implement, utilize, and maintain the INAP-based Number Portability (INP) feature on the Multi-Purpose Server (MPS) platform of the EAGLE 5 SAS.

FTP-Based Table Retrieve Application (FTRA) User Guide

The *FTP-Based Table Retrieve Application (FTRA) User Guide* describes how to set up and use a PC to serve as the offline application for the EAGLE 5 SAS FTP Retrieve and Replace feature.

Hardware Manual – EAGLE 5 SAS

The *Hardware Manual – EAGLE 5 SAS* contains hardware descriptions and specifications of Tekelec's signaling products. These include the EAGLE 5 SAS system, OEM-based products which include the AS*i* 4000 Service Control Point (SCP), the Netra-based Multi-Purpose Server (MPS), and the Integrated Sentinel with Extended Services Platform (ESP) subassembly.

The Hardware Manual provides an overview of each system and its subsystems, details of standard and optional hardware components in each system, and basic site engineering. Refer to this manual to obtain a basic understanding of each type of system and its related hardware, to locate detailed information about hardware components used in a particular release, and to help configure a site for use with the system hardware.

Hardware Manual – Tekelec 1000 Application Server

The *Hardware Manual - Tekelec 1000 Application Server* provides general specifications and a description of the Tekelec 1000 Applications Server (T1000 AS). This manual also includes site preparation, environmental and other requirements, procedures used to physically install the Tekelec 1000 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

Hardware Manual – Tekelec 1100 Application Server

The *Hardware Manual - Tekelec 1100 Application Server* provides general specifications and a description of the Tekelec 1100 Applications Server (T1100 AS). This manual also includes site preparation, environmental and other requirements, procedures used to physically install the Tekelec 1100 AS, and troubleshooting and repair of Field Replaceable Units (FRUs).

Installation Manual – EAGLE 5 SAS

The *Installation Manual - EAGLE 5 SAS* contains cabling requirements, schematics, and procedures used for installing the EAGLE 5 SAS along with LEDs, Connectors, Cables, and Power Cords to Peripherals. Refer to this manual to install components or the complete systems.

Installation Manual - Integrated Applications

The *Installation Manual - Integrated Applications* provides the installation information for integrated applications such as EPAP 4.0 or earlier (Netra-based Multi-Purpose Server (MPS) platform) and Sentinel. The manual includes information about frame floors and shelves, LEDs, connectors, cables, and power cords to peripherals. Refer to this manual to install components or the complete systems.

LNP Database Synchronization (LSMS with EAGLE 5 SAS)

The *LNP Database Synchronization Manual - LSMS/EAGLE 5 SAS* describes how to keep the LNP databases at the LSMS and at the network element (the EAGLE 5 SAS is a network element) synchronized through the use of resynchronization, audits and reconciles, and bulk loads. This manual is contained in both the LSMS documentation set and in the EAGLE 5 SAS documentation set.

LNP Feature Activation Guide

The *LNP Feature Activation Guide* contains procedural information required to configure the EAGLE 5 SAS for the LNP feature and to implement these parts of the LNP feature on the EAGLE 5 SAS:

– LNP services

– LNP options

–   LNP subsystem application

–   Automatic call gapping

–   Triggerless LNP feature

–   Increasing the LRN and NPANXX Quantities on the EAGLE 5 SAS

–   Activating and Deactivating the LNP Short Message Service (SMS)
     feature.

Maintenance Manual

The *Maintenance Manual* contains procedural information required for
maintaining the EAGLE 5 SAS system and the IP[7] Secure Gateway system. The
Maintenance Manual provides preventive and corrective maintenance procedures
used to maintain the different systems.

Maintenance Pocket Guide

The *Maintenance Pocket Guide* is an abridged version of the *Maintenance Manual*
and contains all the corrective maintenance procedures used to maintain the
EAGLE 5 SAS.

Maintenance Emergency Recovery Pocket Guide

The *Maintenance Emergency Recovery Pocket Guide* is an abridged version of the
Maintenance Manual and contains the corrective maintenance procedures used
for critical and major alarms generated on the EAGLE 5 SAS.

**MPS Platform Software and Maintenance Manual (EAGLE 5 SAS with Tekelec T1000
Application Server)**

The *EAGLE 5 SAS with Tekelec T1000 Application Server* describes the platform
software for the Multi-Purpose Server (MPS) based on the Tekelec 1000
Application Server (T1000 AS) and describes how to perform preventive and
corrective maintenance for the T1000 AS-based MPS. This manual should be used
with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).

**MPS Platform Software and Maintenance Manual (EAGLE 5 SAS with Tekelec T1100
Application Server)**

The *EAGLE 5 SAS STP with Tekelec T1100 Application Server* describes the platform
software for the Multi-Purpose Server (MPS) based on the Tekelec 1100
Application Server (T1100 AS). This manual describes how to perform preventive
and corrective maintenance for the T1100 AS-based MPS. This manual should be
used with the EPAP-based applications (EIR, G-Port, G-Flex, and INP).

Previously Released Features Manual

> The *Previously Released Features Manual* summarizes the features of previous EAGLE, EAGLE 5 SAS, and IP[7] Secure Gateway releases, and it identifies the release number of their introduction.

Provisioning Database Interface Manual

> The *Provisioning Database Interface Manual* defines the programming interface that populates the Provisioning Database (PDB) for the EAGLE 5 SAS features supported on the MPS/EPAP platform. The manual defines the provisioning messages, usage rules, and informational and error messages of the interface. The customer uses the PDBI interface information to write his own client application to communicate with the MPS/EPAP platform.

Release Documentation

> The *Release Documentation* is a release-specific compilation of the following documents:
>
> - *Feature Notice* - Describes the features contained in the specified release; also provides the hardware baseline, describes the customer documentation set, provides information about customer training, and explains how to access the Customer Support website.
>
> - *Master Glossary* - Contains an alphabetical listing of terms, acronyms, and abbreviations relevant to the system.
>
> - *Master Index* - Lists all index entries used throughout the documentation set.
>
> - *Release Notice* - Describes the changes made to the system during the lifecycle of a release. The final Release Notice provides a list of Generic Program Loads (GPLs), PRs resolved in a build, and all known PRs.
>
>   **NOTE: The *Release Notice* is maintained solely on Tekelec's Customer Support Website to provide you with instant access to the most up-to-date release information.**
>
> - *System Overview* - Provides high-level information on SS7, the IP[7] Secure Gateway, system architecture, LNP, and EOAP.

System Manual – EOAP

> The *System Manual – EOAP* describes the Embedded Operations Support System Application Processor (EOAP) and provides the user with procedures on how to implement the EOAP, replace EOAP-related hardware, device testing and basic troubleshooting information.

How to Locate Documentation on the Customer Support Site

Access to Tekelec's Customer Support area is restricted to current Tekelec customers. This section describes how to log into Tekelec's Customer Support site and how to locate customer documentation. Viewing these files requires Adobe Acrobat Reader.

1   Go to Tekelec's Customer Support login page at **https://support.tekelec.com/index.asp**

2   Enter your assigned username and chosen password, then click **Go.**

Or, if you do not have access to the Customer Support site, click **Need an Account?**

Follow the instructions on the screen.

NOTE: After 20 minutes of inactivity, you will be logged off, and you must repeat this step to regain access.

3   After successful login, select a product from the Product Support drop-down menu.

4   Select a release number from the Product Support Release drop-down menu.

5   Locate the appropriate documentation section (i.e., a Feature Notice would be under **Notices,** and user documentation would be under **Manuals**).

6   To open the documentation in the same window, double click the document name. To open the documentation in a new window, right-click the document name and select **Open in New Window**.

7   To download the document, right-click the document name and select **Save Target As**.

Customer Training

Tekelec offers a variety of technical training courses designed to provide the knowledge and experience required to properly provision, administer, operate and maintain the EAGLE 5 SAS. To enroll in any of the courses or for schedule information, contact the Tekelec Training Center at (919) 460-3064 or E-mail `eagletrain@tekelec.com`.

A complete list and schedule of open enrollment can be found at `www.tekelec.com`.

Tekelec Technical Services

The Tekelec Customer Care Center offers a point of contact through which customers can receive support for problems that may be encountered during the use of Tekelec's products. The Tekelec Customer Care Center is staffed with highly trained engineers to provide solutions to your technical questions and issues seven days a week, twenty-four hours a day. A variety of service programs are available through the Tekelec Customer Care Center to maximize the performance of Tekelec products that meet and exceed customer needs.

Technical Assistance

To receive technical assistance, call the Tekelec Customer Care Center at one of the following locations:

- Tekelec, Europe and UK

    Phone: +44 1784 467 804

    Fax: +44 1784 477 120

    Email: ecsc@tekelec.com

- Tekelec, USA

    Phone (within the continental US) 1 888-FOR-TKLC
            (outside the continental US) +1 919-460-2150

    Fax: +1 919 460 0877

    Email: support@tekelec.com

When your call is received, Technical Services issues a Customer Service Report (CSR). Each CSR includes an individual tracking number. When a CSR is issued, Technical Services determines the classification of the trouble. The CSR contains the serial number of the system, problem symptoms, and messages. Technical Services assigns the CSR to a primary engineer, who will work to solve the problem. Technical Services closes the CSR when the problem is resolved.

If a critical problem exists, Technical Services initiates emergency procedures (see the following topic, "Emergency Response").

Emergency Response

If a critical service situation occurs, Tekelec Technical Services offers emergency response twenty-four hours a day, seven days a week. The emergency response provides immediate coverage, automatic escalation, and other features to ensure a rapid resolution to the problem.

A critical situation is defined as an EAGLE 5 SAS problem that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical problems affect service or system operation, resulting in:

- Failure in the system that prevents transaction processing

- Reduction in system capacity or in system traffic-handling capability

- Inability to restart the system

- Corruption of the database

- Inability to perform maintenance or recovery operations

- Inability to provide any required critical or major trouble notification

- Any other problem severely affecting service, capacity, traffic, and billing. Maintenance capabilities may be defined as critical by prior discussion and agreement with Tekelec Technical Services.

Appendix A. Acronyms and Terminology

Basic Input Output System—BIOS

BIOS—Basic Input Output System

Eagle Router GPL—EROUTE

EDCM—Enhanced Data Communication Module.

EGMS—Enhanced GMS

Enhanced Data Communication Module—EDCM

Enhanced GMS—EGMS

Enhanced OAM—EOAM

EOAM—Enhanced OAM

EROUTE—Eagle Router GPL

FAK—Feature Access Key

Feature Access Key—FAK

General Purpose Service Module—GPSM

Generic Program Load—GPL

Global Title Address—GTT

Global Title Translation—GTA

GMS—GSM Map Screening

GPL—Generic Program Load

GPSM—General Purpose Service Module

GSM Map Screening—GMS

GTA—Global Title Address

GTT—Global Title Translation

HC-MIM—High Capacity Multi-channel Interface Module

High Capacity Multi-channel Interface Module (HC-MIM)—Provides access to eight E1/T1 ports residing on backplane connectors A and B

High Speed IMT Packet Router (HIPR)—The next evolutionary step of the IMT for Eagle systems; provides increases in system throughput and traffic capacity

High Speed Link—HSL

High Speed Multiplexer—HMUX

HIPR—High Speed IMT Packet Router

HMUX—High-speed Multiplexer

HSL—High Speed Link

IMEI—International Mobile Equipment Identity

IMT—Inter-processor Message Transport

Inter-processor Message Transport—IMT

International Mobile Equipment Identity—IMEA

Internet Protocol Link Interface Module—IPLIM

Internet Protocol Services—IPS

IP Services Module—IPSM

IPGWI—An ITU version of SS7IPGW

IPGWx—Generic reference to both ANSI (SS7IPGW) and ITU (IPGWI) IP7 Application.

IPLIM—Internet Protocol Link Interface Module. Point to Point IP7 Application.

IPLIMI—An ITU version of IPLIM

IPS—Internet Protocol Services

IPSM—IP Services Module

ITU version of IPLIM—IPLIMI

ITU version of SS7IPGW—IPGWI

LIM—Link Interface Module

LFS—Link Fault Sectionalization

Link Fault Sectionalization—LFS

Link Interface Module—LIM

M3UA—SS7 MTP3 Adaptation Layer

MCPM—Measurement Collection and Polling Module

Measurement Collection and Polling Module—MCPM

MIM—Multi-Channel Interface Module

MPL—Multi Port LIM

Multi Port LIM—MPL

Multi-Channel Interface Module—MIM

OAM—Operations, Administration, & Maintenance Application

Operations, Administration, & Maintenance Application—OAM

RAM—Random Access Memory

Random Access Memory—RAM

SCCP—Signaling Connection Control Part

SCCP User Adaptation Layer—SUA

SDRAM—Synchronous Dynamic Random Access Memory

SDS—System Debug Services

SE-HSL—Synchronous E1 High Speed Link

Sentinel Transport Card—STC

Service Selector—SRVSEL

SIFB—Switched IMT Fabric Board

Signaling Connection Control Part—SCCP

Signaling System 7/Internet Protocol Gateway—SS7IPGW

SRAM—Static Random Access Memory

SRVSEL—Service Selector

SS7 MTP3 Adaptation Layer—M3UA

SS7IPGW—Signaling System 7/Internet Protocol Gateway. Point to Multipoint IP7 Application.

STC—Sentinel Transport Card

Static Random Access Memory—SRAM

SUA—SCCP User Adaptation Layer

Switched IMT Fabric Board—SIFB

Synchronous Dynamic Random Access Memory—SDRAM

System Debug Services—SDS

TDM—Terminals, Disk, & Maintenance card, or time division multiplex

Terminals, Disk, & Maintenance card, or Time Division Multiplex—TDM

TFC—Transfer Congested (trafic)

TFR—Transfer Restricted

TLNP—Triggerless LNP

Transfer Congested (trafic)—TFC

Transfer Restricted—TFR

Triggerless LNP—TLNP

UAM—unsolicited alarm message

UIM—unsolicited information message

unsolicited alarm message—UAM

unsolicited information message—UIM

VSCCP—VxWorks Signaling Connection Control Part

VxWorks Signaling Connection Control Part—VSCCP

Appendix B. Hardware Baseline

The following hardware baseline supports this release. This list shows top-level part numbers (in bold) and assembly part numbers (if applicable).

- Control Shelf   **870-2321-02 Rev A**[1] or
  Control Shelf   **870-2321-04 Rev A**[2] or
  Control Shelf   **870-2377-01 Rev A**[3]

- Control Shelf Backplane   **870-0775-03 Rev E**

- Extension Shelf   **870-2378-01 Rev A**[4]
  Extension Shelf   **870-0776-02 Rev C**[5]
  Extension Shelf   **870-0776-03 Rev D**
  Extension Shelf   **870-0776-06 Rev A**
  Extension Shelf   **870-0776-07 Rev A**

- Extension Shelf Backplane   **870-0776-08 Rev A** or
  Extension Shelf Backplane   **870-0776-11 Rev A**

- ACM   **870-1008-02 Rev D** or
  ACM   **870-1008-03 Rev A** or
  ACM   **870-1008-04 Rev A** or
  ACM   **870-1008-05 Rev A**

- Air Management Card   **870-1842-01 Rev A**[6]

- DCM   **870-1945-03 Rev A**

- DCM   **870-1945-01 Rev A**
  DCM   **870-1945-02 Rev A**

- EDCM   **870-2371-01 Rev E**

- EDCM (single-slot)   **870-2372-01 Rev E**

- DCMX   **870-1984-01 Rev A**

- DSM, 1GB MEM   **870-1984-02 Rev A** or
  DSM, 2GB MEM   **870-1984-03 Rev A** or
  DSM, 3GB MEM   **870-1984-04 Rev A** or
  DSM, 4GB MEM   **870-1984-05 Rev A**[7]

- DSM-1G   **870-2371-02 Rev A**

- EDSM-2G (MCPM)   **870-2372-03 Rev A**

- E1/T1 MIM   **870-2198-01 Rev G** or
  E1/T1 MIM   **870-2198-02 Rev A**

- E1-ATM   **870-2455-01 Rev B**
  E1-ATM   **870-2455-02 Rev B**

- EILA   **870-2049-01 Rev A** or
  EILA w/ DIMM   **870-2049-02 Rev A**

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[1] Required for HMUX.
[2] Required for HMUX, Standard Frame
[3] Required for HMUX, Heavy Duty Frame
[4] Required for Heavy Duty Frame
[5] Required for Standard Frame
[6] Required for Shelves with HC-MIM Cards
[7] Required for 192 Million LNP Numbers

- FAP   **870-1606-02 Rev C**[1][2] or
  FAP   **870-2320-01 Rev J**[3][4]

- FAP-CF/EF   **870-0243-08 Rev C**
  FAP-MISC   **870-0243-09 Rev C**

- GPSM-II   **870-2360-01 Rev E**

- HC-MIM   **870-2671-01 Rev P**

- HC-MIM   **870-2671-02 Rev A**

- HIPR   **870-2574-01 Rev D**

- HMUX   **870-1965-01 Rev A**

- LIM-AINF   **870-1014-01 Rev D** or
  LIM-AINF   **870-1014-02 Rev A** or
  LIM-AINF   **870-1014-03 Rev B** or
  LIM-AINF   **870-1014-04 Rev A** or
  LIM-AINF   **870-1014-05 Rev A** or
  LIM-AINF   **870-1014-06 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-01 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-02 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-03 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-04 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-05 Rev A** or
  LIM-AINF w/ DIMM   **870-1488-06 Rev A**

- LIM-ATM   **870-1293-02 Rev A** or
  LIM-ATM   **870-1293-03 Rev A**
  LIM ATM   **870-1293-06 Rev A**
  LIM ATM   **870-1293-07 Rev A**
  LIM-ATM   **870-1293-08 Rev A**

- LIM-DS0   **870-1009-02 Rev D** or
  LIM-DS0   **870-1009-03 Rev A** or
  LIM-DS0   **870-1009-04 Rev A** or
  LIM-DS0 w/ DIMM   **870-1485-01 Rev A** or
  LIM-DS0 w/ DIMM   **870-1485-02 Rev A** or
  LIM-DS0 w/ DIMM   **870-1485-03 Rev A**

- LIM-E1   **870-1379-01 Rev A**

- LIM-ILA   **870-1484-01 Rev E** or
  LIM-ILA w/ DIMM   **870-1484-02 Rev C**

- LIM-OCU   **870-1010-03 Rev D** or
  LIM-OCU   **870-1010-04 Rev A** or
  LIM-OCU   **870-1010-05 Rev A** or
  LIM-OCU w/ DIMM   **870-1486-02 Rev A** or
  LIM-OCU w/ DIMM   **870-1486-03 Rev A** or
  LIM-OCU w/ DIMM   **870-1486-04 Rev A**

- IM-V.35   **870-1012-02 Rev D**
  LIM-V.35   **870-1012-03 Rev A**
  LIM-V.35   **870-1012-04 Rev A**
  LIM-V.35 w/ DIMM   **870-1487-01 Rev A** or
  LIM-V.35 w/ DIMM   **870-1487-02 Rev A** or
  LIM-V.35 w/ DIMM   **870-1487-03 Rev A**

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[1] Required for Standard Frame
[2] Required for Frames with HC-MIMs
[3] Required for Heavy Duty Frame
[4] Required for Frames with HC-MIMs

- MDAL   **870-0773-04 Rev B** or
  MDAL   **870-0773-05 Rev A** or
  MDAL   **870-0773-06 Rev A** or
  MDAL   **870-0773-08 Rev A**

- MPL   **870-2061-01 Rev A**
  MPL-T   **870-2061-02 Rev C**

- MPS EPAP   **890-1801-01 Rev D**

- MPS Sun Netra ELAP   **890-1374-06 Rev A**

- TDM   **870-0774-10 Rev A** or
  TDM   **870-0774-11 Rev A**

- TDM GTI   **870-0774-15 Rev B**

- TSM-256   **870-1289-02 Rev A** or
  TSM-256   **870-1289-03 Rev A**

- TSM-512   **870-1290-02 Rev A** or
  TSM-512   **870-1290-03 Rev A**

- TSM-768   **870-1291-02 Rev A** or
  TSM-768   **870-1291-03 Rev A**

- TSM-1024   **870-1292-02 Rev A** or
  TSM-1024   **870-1292-03 Rev A**

- Dual GR-376 EOAP   **890-1050-02 Rev G**

- Single EOAP   **890-1050-03 Rev H**

- Dual EOAP   **890-1050-01 Rev K**

- Kit, E1   **890-1037-01 Rev A**

- Kit, Holdover Clock Assy   **890-1013-01 Rev A**

- Fan Assy (Standard Frame)   **890-1038-01 Rev D**

- Fan Assy (Heavy Duty Frame)   **890-1038-02 Rev A**

- Fan Assy (Shelves with HC-MIM cards) **890-0001-01 Rev A**

- MPS Sun Netra ELAP   **890-1277-04 Rev G**

- Sun Netra ELAP   **890-1374-04 Rev E**

- T1000 Application Server   **870-2640-01 Rev F**

  - Dual Port G-Bit E-Net Card   **870-2707-01 Rev B**

  - Quad Serial Exp. Card   **870-2708-01 Rev B**

  - 120 GB Hard Drive Assy   **870-2721-02 Rev B**

- T1100 (Application Server - DC)   **870-2754-01 Rev A**

  - PCI Card - Dual Port Ethernet **870-2706-02 Rev A**

  - Hard Disc Drive - 250 GB SATA **870-2787-01 Rev B**

- T1100 (Application Server - AC)   **870-2754-02 Rev A**

  - PCI Card - Dual Port Ethernet **870-2706-02 Rev A**

  - Hard Disc Drive - 250 GB SATA **870-2787-01 Rev B**

- Upgrade kit, MPS Netra-to-
  T1000 Application Server   **870-2735-01 Rev A**