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Gateway Platform System Release Notes

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1. Scope

This document provides information regarding the system software version 5.1.0.0.292.SP.3 for the System Processor (SP) and Input/Output Modules (IOMs). Topics covered are:

- File contents and notes
- Element Management System (EMS) and Billing server requirements
- Resolved and unresolved error defects
- Known hardware and software limitations

Detailed information regarding all of the hardware supported by this release is listed by CLEI code and part number in your copy of the *Planning and Engineering Guide*.

2. Upgrade Files

The following files are required to upgrade to version 5.1.0.0.292.SP.3:

- swCPU = 5.1.0.0.292.SP.3
- swCM = 5.1.0.0.15
- swDS1_2 = 5.1.0.0.16
- swTRIDS3 = 5.1.0.0.17
- swOCTDS3 = 5.1.0.0.17
- swVPS = 5.1.0.0.23
- swENA = 5.1.0.0.17

3. Upgrade Notes

3.1 In-Service Upgrade

An in-service system processor upgrade from version 5.1.0.0.254.SP.1 to version 5.1.0.0.292.SP.3 is supported. For instructions on performing the in-service system processor upgrade, contact Lucent Worldwide Services (LWS) at 1-866-582-3688 (Option 5). An LWS representative will refer you to DLP-685, which contains specific steps for completing the in-service system processor upgrade. DLP-685 can be obtained from your LWS representative.

Important: The IOMs must be at the following versions prior to performing the in-service system processor upgrade:

Supported IOM Type	Part Number	Commcode	Version
10/100/1000 Ethernet Network Access Module	89-0390-A	300730124	5.1.0.0.13
10/100/1000 Ethernet Network Access Module w/RAM	89-0390-B	300746906	5.1.0.0.13
Voice Server Module 2688 Channel	89-0395-B	300730157	5.1.0.0.18
Triple DS3 STS-1 I/O with Tone Detect	89-0410-A	300730215	5.1.0.0.13
Octal DS3 STS-1 I/O with Tone Detect	89-0411-A	300730223	5.1.0.0.13
DS1/E1/J1 I/O Termination Module	89-0414-A	300746922	5.1.0.0.12
Compute Module Front	89-0419-B	300763885	5.1.0.0.10
Triple DS3 I/O Module With Tone Detect	89-0424-A	300730264	5.1.0.0.13
Octal DS3 I/O Module With Tone Detect	89-0425-A	300730272	5.1.0.0.13

For instructions on performing an in-service IOM upgrade, contact LWS. An LWS representative will refer you to DLP-686, which contains specific steps for completing an IOM upgrade. DLP-686 can be obtained from your LWS representative.

Important: After upgrading the system processor, you should check the versions of the IOMs and upgrade, if necessary. For instructions on performing an in-service IOM upgrade, contact LWS. An LWS representative will refer you to DLP-686, which contains specific steps for completing the upgrade. DLP-686 can be obtained from your LWS representative.

Supported IOM Type	Part Number	Commcode	Version
10/100/1000 Ethernet Network Access Module	89-0390-A	300730124	5.1.0.0.17
10/100/1000 Ethernet Network Access Module w/RAM	89-0390-B	300746906	5.1.0.0.17
Voice Server Module 2688 Channel	89-0395-B	300730157	5.1.0.0.23
Triple DS3 STS-1 I/O with Tone Detect	89-0410-A	300730215	5.1.0.0.17
Octal DS3 STS-1 I/O with Tone Detect	89-0411-A	300730223	5.1.0.0.17

Supported IOM Type	Part Number	Commcode	Version
DS1/E1/J1 I/O Termination Module	89-0414-A	300746922	5.1.0.0.16
Compute Module Front	89-0419-B	300763885	5.1.0.0.15
Triple DS3 I/O Module With Tone Detect	89-0424-A	300730264	5.1.0.0.17
Octal DS3 I/O Module With Tone Detect	89-0425-A	300730272	5.1.0.0.17

3.2 In-Service Downgrade

An in-service downgrade from version 5.1.0.0.292.SP.3 to version 5.1.0.0.254.SP.1 is not supported in this version.

3.3 Out-of-Service Downgrade

Upon completion of an in-service upgrade to version 5.1.0.0.292.SP.3, a service-affecting downgrade to version 5.1.0.0.254.SP.1 must be performed in order to revert back to the previous version of switch software and databases. For instructions on performing the out-of-service downgrade, contact LWS. An LWS representative will refer you to DLP-692, which contains specific steps for completing the out-of-service downgrade. DLP-692 can be obtained from your LWS representative.

4. EMS/Billing/Traffic Server Requirements

- Element Management System (EMS) version 9.7.0.0 or higher is required for 5.1.0.0.292.SP.3.
- Billing and Traffic System (BTS) version 5.1.1.0.3 or higher is required for 5.1.0.0.292.SP.3.
- Traffic Collection Application (TCA) version 2.0.0.91 or higher is required for 5.1.0.0.292.SP.3.

5. New Features and Product Improvements

For software version 5.1.0.2, version 5.1.0.1 Class 4/Transit Switch routing functionality has been combined with the enhancements listed below.

This version of system software provides the following features and improvements.

5.1 GMSC Feature Package

Unlike traditional wireless networks, where calls can traverse two or more legacy MSCs, the Gateway MSC routes calls directly to the end destination, resulting in improved routing efficiency for roaming calls (which accounts for over 50% of calls), forwarded calls, and voicemail services which frees up tens of thousands of legacy MSC ports, reducing inter-MSC and PSTN interconnection facilities, resulting in significantly lower OPEX and CAPEX increases

The following sections detail the Gateway MSC wireless feature set.

5.1.1 SS7/C7 Signaling

5.1.1.1 Default ANSI/ITU SS7 Routing

Enables the routing of TCAP messages and responses to other SSP(s) in the absence of having explicitly configured SS7 routes for them. This capability benefits applications like Automatic Call Back and GMSC Optimal Routing. **Note:** Default Routing is supported for SCCP messages only. Default Routing for ISUP messages is not supported.

This feature is enabled using either the `ROUTE-SS7 TL1` command or the `EMS Add SS7 Route Screen` by setting the point code value to “DEF_ANSI” or “DEF_ITU”. Refer to the *TL1 Reference Guide* or the Provisioning the SS7 Node Chapter in the *EMS User Guide* for detailed information.

5.1.1.2 ANSI-41D

This feature provides the operation as a Gateway MSC, using the messages defined in the ANSI-41D standard, as it applies to Gateway MSC operation. The following messages are supported:

- Sending of Location Request Invoke
- Receipt of Location Request Return Result
- Mandatory parameters
 - Electronic Serial Number
 - Mobile Identification Number
 - MSCID
- Optional parameters
 - AccessDeniedReason
 - Digits (Carrier)
 - Digits (Destination)

- DMH_AccountCodeDigits
- DMH_AlternateBillingDigits
- DMH_BillingDigits
- DMH_RedirectionIndicator
- DMH_ServiceID
- RoutingDigits TerminationList
- MobileDirectoryNumber
- RedirectingNumberDigits
- Note: One of the following optional parameters must be received: Digits (Destination) or AccessDeniedReason
- Sending of Transfer to Number Request Invoke
- Receipt of Transfer to Number Request Return Result
- Mandatory parameters
 - Digits (Destination)
- Optional parameters
 - AccessDeniedReason
 - Digits (Carrier)
 - DMH_AccountCodeDigits
 - DMH_AlternateBillingDigits
 - DMH_BillingDigits
 - DMH_RedirectionIndicator
 - DMH_ServiceID
 - MobileDirectoryNumber
 - TerminationList
 - RedirectingNumberDigits
- Receipt of Redirection Request Invoke
- Sending of Redirection Request Return Result

To enable this feature you need to provision the Service Logic Host Route (SLHR) to the HLR using the `SLHR-SCP TL1` command or the EMS `SLHR SCP` Screen. Key SLHR GMSC parameters include:

- ROUTETYPE message (GTT, PC-SSN)
- SVCREQSSN (up to five switch-based requesting SSNs)
- SVCPROVSSN (single SSN on the HLR)
- TCAPUSER (IS41)
- TCAPVARIANT (ANSI1992)
- SCCPVARIANT (ITU1992)

5.1.1.3 GSM MAP

This feature set provides the operation as a Gateway MSC, using the messages defined in the GSM MAP Phase 2 standard, as it applies to Gateway MSC operation. The following messages are supported:

- Sending of Send Routing Information (Basic and Forwarding interrogation types) message.
- Receipt of Send Routing Information Ack message.
- Receipt of Resume Call Handling message.
- Receipt of Resume Call Handling Ack message.

To enable this feature you need to provision a Service Logic Host Route to the HLR using the `SLHR-SCP` TL1 command or the EMS `SLHR SCP` Screen. Key SLHR GMSC parameters include:

- `ROUTETYPE(GTT, direct)`
- `SVCREQSSN`(up to five switch-based requesting SSNs)
- `SVCPROVSSN`(single SSN on the HLR)
- `TCAPUSER(MAP)`
- `TCAPVARIANT(ETSI1992, ITU1992)`
- `SCCPVARIANT(ITU1992)`

5.1.1.4 Enable/Disable EXM

Allows the enabling/disabling of the Exit Message (EXM) when the GMSC's OwnClass is Access Tandem and the FarEndClass is End Office. This feature would typically be optionally used against the trunk groups that connect the GMSC to the wireless carrier's MSCs, which typically don't support the EXM message. This feature is enabled by setting the setting the class of service to "WTDM" using either the TL1 `ENT/ED-TRKGRP` command or the EMS Provisioning the Routing Parameters Tab in the Add Trunk Group Routing Parameters Screen.

5.1.1.5 Optimal Call Redirection / Routing

Efficiently re-routes calls in scenarios where the mobile terminated call, originally routed to the Serving MSC by the GMSC, needs to be redirected back to the GMSC for re-routing to a forwarded-to number (in cases of CFNA, Call Collision, etc.). Call redirection is automatically enabled upon receipt of an ANSI Redirection Request from the Serving MSC. In GSM, the optimal routing flag must be enabled, using the TL1 `GMSC-GSMSYS` command or the EMS Modify Gateway MSC GSM System Screen, in addition to receiving a Resume Call Handling Request from the Serving MSC.

5.1.2 Call Processing

5.1.2.1 Mobile Digit Screening

This feature allows the service provider to create and delete up to 1024 based mobile digit screening table entries for all the subtending MSC(s) to which the GMSC can route calls. The screening is performed using the longest prefix match comparison method. Table entries of size 3, 6, 7, 8, 9 and 10 are supported. Supported mobile digit screening types (triggers):

- **MOBILE TERMINATION:** incoming calls matching the entry will be subject to ANSI-41 interrogation. If the ANSI HLR returns an unknown subscriber, then the GSM HLR will be queried (default).
- **MOBILE TERMINATION ANSI:** incoming calls matching the entry will be subject to ANSI-41 interrogation only.
- **MOBILE TERMINATION GSM:** incoming calls matching the entry will be subject to GSM interrogation only.

This feature is enabled using either the TL1 `AINTRIGGER` command or EMS `Add AIN Trigger Screen`.

5.1.2.2 Mobile Digit Screening Escape Lists

Service providers can also create and delete digit screening escape lists that contain up to 50 entries of the form (NAP-NXX-XXXX) or (NPA-NXX-XXXX to NPA-NXX-XXXX range). Any call whose Called Party Number (CdPN) exactly matches an entry in this escape list is not subject to mobile digit screening. This feature is enabled using either the TL1 `LIST-TRIGESC` command or the EMS `Add Trigger Escape List Screen`.

5.1.2.3 Router Support for Over-Decadic Digits

This feature allows the GMSC to analyze over-decadic digits (A, B, C, D, E) in the Called Party Number and related ANSI 41/GSM HLR fields. Over-decadic digits are useful as prefixes that denote special routing instructions (an AB-XX prefix denotes a specific voicemail system).

5.1.2.4 Customizable Announcements

Service provider-specific announcement playback, along with system default playback, is supported for the following cases:

- An HLR returns a TCAP error of “User Busy”.
- An HLR returns a TCAP error of “No Response”.

- An HLR sends a response of “Unknown Subscriber” (ANSI-41 or GSM screening).
- Both HLRs send a response of “Unknown Subscriber” (DUAL screening).
- A RedirectionRequest or ResumeCallHandling fails due to a session mismatch (the GMSC cannot locate the session that the Serving MSC indicates needs redirecting)

Service provider-specific announcements are configured using the TL1 PRFL-FAILCND, TREATMENT commands or the EMS Add Failure Condition Screen and the EMS Common Routing Elements>Treatments section. The TL1 AUDIO-ANNC and AUDIO-MSG commands are used to specify new service provider-specific audio announcement and pre-recorded audio messages that are stored on-board the switch, if required.

5.1.2.5 Wireless Intelligent Network Bypass Mode

When enabled, the GMSC indicates to the HLR, using ANSI-41 Locreq Invoke Request/Response messages and WIN triggers, that Wireless Number Portability is supported. If the HLR responds with triggers for the call, the GMSC tandems the call to the subtending MSC using the original Called Party Number (CdPN) or Location Routing Number (LRN), as appropriate.

5.1.2.6 Wireless Number Portability

Call Termination - If the HLR responds with triggers for the call, a number portability query (see note below) will be sent to the NPDB. If an LRN is returned, the GMSC checks the returned LRN against the provisioned LRN table. If there is a match in the table, indicating that the call is destined toward an adjacent MSC, the LRN is used to locate the correct HLR and the CdPN found in the Ported Gap is sent in the HLR query.

Mobile Origination - If the NP query is to be performed, the GMSC sends an NPREQ query to the NPDB. If the NPDB returns a valid LRN, the GMSC analyzes the LRN against the LRN table. If a match is found in the table, call processing continues with HLR call processing, using the LRN to locate the correct HLR. If a match is not found in the LRN table, the call is routed using the LRN as the CdPN, with the original CdPN in the GAP field.

In the course of number portability processing for a mobile terminated call, if the subscriber is "ported in", and the subscriber is also a CALEA

target, no mobile service processing occurs (no HLR query is sent to the HLR that is associated with the LRN) and the call is treated as a tandem call, using the LRN as the CdPN and the subscriber DN in the GAP field.

This feature is enabled using the TL1 `GMSC-ANSISYS` and `GMSC-GSMSYS` commands or the `EMS Modify Gateway MSC GSM System` and `EMS Modify Gateway MSC ANSI System Screens`. Key parameters are `WIN/CAMEL` phase and the optional bypass string that is applied as a prefix to the CdPN if the GMSC logic is bypassed and the call is transited through the GMSC without performing an HLR query.

Note: Wireless ANSI-41 WNP and AIN LNP have been implemented as mutually exclusive services based on the assumption that a common NPDB is used for Wireline and Wireless numbers and the ANSI-41 WNP and AIN LNP queries are accessing the same NPDB. Therefore, once one Number Portability service is activated, the other cannot be activated. For example, if Number Portability is configured to perform ANSI-41 NPREQ queries to the NPDB, then the GMSC platform cannot be configured to perform AIN queries to the NPDB.

5.1.3 Lawful Intercept/CALEA Bypass

Ensures that calls that are subject to LEA surveillance are routed based on Called Number, resulting in the call being forwarded to the Home MSC where existing Serving MSC-based lawful intercept mechanisms can be activated. The GMSC Lawful Intercept table allows the operator to provision a 10-digit number in the table, which results in all calls bypassing the GMSC logic.

Provisioning commands ensure that access is restricted to CALEA user privilege and that the Directory Numbers that are under surveillance are suppressed from the system log files. The Lawful Intercept table can either be provisioned using the `Service Provider Administration (SPA)` component in the Lucent Technologies Delivery Unit (LTDU) or via the `GMSC-LAESDN TL-1` command.

Note: Due to security considerations, the Lawful Intercept table is not provisionable using the PlexView EMS.

5.1.4 Voice Mail Handling

This feature enables routing by either the HLR-returned voice mail deposit number or forward-to-number prefix digits (digits or overdecadic A-E) as well as selective digit stripping of the forward-to-number prefix. This

voice mail prefix is enabled using the TL1 GMSC-ANSISYS and GMSC-GSMSYS commands or the EMS Modify Gateway MSC GSM System and EMS Modify Gateway MSC ANSI System Screens.

5.2 Session Initiation Protocol

The following SIP-related features are enabled using the TL1 SIP-SYS and TRKGRP commands or the EMS SDP Profile (for SIP, SIP-T) in the Provisioning Trunk Groups section and Provisioning the SIP Node Chapter (Trunk Groups, System, IP Address).

5.2.1 SIP for Telephones (SIP-T)

The support for SIP-T, as defined in RFC3372, enables standards-based SIP bridging for the transport of call signaling information across a packet network with Lucent Compact Switches (LCS), running version 3.10.1 or later, and Lucent Network Controllers (MGCs), running version 5.1 or later.

Feature Highlights

- Parameter Translation
 - The ISUP parameters are translated into the SIP header per RFC3398
 - The SIP header to ISUP mapping is performed per RFC3392.
 - The information from the SIP header (calling party number, called party number) overrides the equivalent parameters within the ISUP message, since these values may be changed by intermediate SIP proxies.
 - Non-ISUP ingress call legs are mapped to ISUP prior to parameter translation and message encapsulation.
- Message Mapping
 - The ISUP IAM message is carried as a MIME enclosure by the SIP INVITE request;
 - The ISUP ACM is carried as a MIME enclosure by the SIP 18x status message; and
 - The ISUP ANM message is carried as a MIME enclosure by the SIP 200 status message.
 - The ISUP REL message is carried as a MIME enclosure by the SIP BYE or CANCEL message.
Note: ISUP-to-SIP-T-to-ISUP mid-call signaling is not supported in this version.
- Message Encapsulation

- The encapsulation of the ISUP message within MIME enclosures is in accordance with RFC3204.
- Sending of messages
 - Supported SIP Content Negotiation Types - The sending of the following Content-types is supported for MIME-encapsulated ISUP: application/isup (Content-type: application/isup); required (Content-disposition: signal; handling=required); and optional (Content-disposition: signal; handling=optional - allows the other side to silently discard the MIME-encapsulated ISUP if it does not support it)
- Receipt of messages
 - A MIME-encapsulated ISUP message with a "415 Unsupported Media Type" is rejected if the incoming trunk group is not configured for SIP-T and the content-disposition handling is set to "required".
 - If the incoming trunk group is not configured for SIP-T and the content-disposition handling is set to "optional", the MIME-encapsulated ISUP message is silently discarded and the rest of the SIP message is processed.
 - The receipt of a SIP message from a SIP-T trunk group without a MIME encapsulated ISUP body is treated as if it were received from a SIP trunk group.
- Trunk Group Support
 - A SIP-T trunk group supports all the parameters that were previously supported by SIP trunk groups.

5.2.2 SIP P-Called-Party-ID

Support for the mapping of the ISUP OCN (Original Called Number) to the SIP 3GPP P-Called-Party-ID. This mapping is used in an application with feature server (e.g., Broadsoft) to provide features to a mobile wireless subscriber.

5.2.3 SIP Domain Name with Maddr

This feature provides a trunk group configuration option to associate a source and destination Domain Name and an Outbound-Proxy IP address with a trunk group. On the send side, the destination domain name is used to populate the host part of the Request-URI and TO header but the Outbound-Proxy IP address is still used for routing the call (sending the INVITE). The FROM header will be populated with source domain name. On the receive side, the domain names in the Request-URI, TO and FROM headers are ignored and only the phone number part of the URL is used.

5.2.4 SIP Session Timer

SIP now uses the Session Timer feature to audit active calls to make sure they have not unilaterally gone away. This allows for the cleanup of lost sessions and frees up resources. The SIP Session Timer feature is provisioned using the TL1 ED-SIP-SYS command.

5.3 Intelligent Network Digit Modification

This feature provides the ability to support digit modification (prefixing or stripping of digits) from the Called Party Number (CdPN) field after the Intelligent Network (IN) trigger point has been reached, but before the actual IN message is sent. Note: "IN" is used generically and includes IN, AIN, ANSI-41, GSM, INAP, WIN, CAMEL (all services available via ENT-LIST-AINTRIGGER). Up to a 20 digit prefix can be inserted before the CdPN and up to 31 digits can be stripped from the CdPN (digit stripping takes place from left to right). When both digit stripping and prefixing are enabled, digit stripping takes precedence over prefixing. A commit parameter is supported that, when enabled, makes the CdPN modifications permanent and when disabled, restores the CdPN to its original value if the IN query fails.

This feature is enabled using the TL1 LIST-AINTRIGGER command or the EMS Add AIN Trigger Screen. Key provisioning information includes: CdPN prefix, Number of digits to strip from the CdPN, the Nature of Address Indicator of the CdPN and whether the modifications are permanent or only for the query.

5.4 Maximum Number of Media Gateways per Compute Module

A maximum of eight media gateways can now be controlled by a single Compute Module (subject to Compute Module call processing capacity).

5.5 System Management Enhancements

5.5.1 Wireless Billing

Two different types of billing mechanisms are supported (AIN, WIRELESS) for recording calls that require HLR dips. The AIN method will model this service as an AIN service and utilize generic AIN AMA billing.

The WIRELESS method will utilize AMA extensions for cellular calls which mirror the AMA records that are generated by Lucent's

Flexent^R/AUTOPLEX^R Wireless Networks Executive Cellular Processor (ECP). These records support the following structure codes:

- SC x2118 - Tandem Call With Carrier Interconnect (CI) Information
- SC x2119 - Tandem Call Without Carrier Interconnect (CI) Information
- SC x2329 - Cellular Originated Call Without Carrier Interconnect (CI) Information
- SC x2330 - Cellular Originated Call With Carrier Interconnect (CI) Information

5.5.2 ESN Billing Enhancement

This feature enhancement records the ESN a (if applicable) for each IS41 redirection in a new billing module and records the IMSI (if applicable) for each GSM MAP redirection in a new billing module.

5.5.3 Autoplex Compatibility Billing Feature

This feature enhancement makes the AMA records mirror Lucent's AutoPlex AMA records.

5.5.4 Billing and Traffic Server Secure FTP

This feature provides support for SSH as the security feature on the Billing and Traffic Server (BTS) using SSHv2, which provides a secure file transfer, replacing FTP, between the BTS and upstream billing mediation system.

5.5.5 Performance Monitoring

In addition to standard system performance monitoring, these additional GMSC call statistics are maintained.

- Number of mobile terminating (MT) calls handled
- Number of MT calls successfully handled
- Number of MT calls failed as subscriber is unknown at HLR
- Number of calls subjected to dual dips
- Number of calls subjected to TLDN routing
- Number of calls subjected to MSRN routing
- Number of calls forwarded by ANSI HLR
- Number of calls forwarded by GSM HLR
- Number of calls subjected to successful GSM cache lookup
- Number of ANSI calls redirected by S-MSC

- Number of GSM calls redirected by VMSC
- Number of ANSI calls transferred as a result of Termination Trigger hit (post Locreq routing)

The GMSC performance monitoring can be initialized via the TL1 INIT-REG-GMSC command or the EMS Init Register GMSC screen. Current performance monitoring values can be retrieved using the TL1 RTRV-PM-GMSC command or the EMS Initializing and Retrieving Performance Monitoring for GMSC Screen.

5.5.6 Traffic Statistic Enhancements

The PlexView Traffic Collection Application (TCA) has been enhanced to provide a new "PACKET" report that is available on a per Media Gateway basis and can also be rolled up to provide switch level totals.

The PlexView Billing and Traffic System (BTS) has been enhanced to provide Trunk Percent Occupancy values in the TRSUM Report.

5.5.7 Bulk download for Route Digits

This feature provides the same features of the EXEC-BULK download that are in the 3.x versions, which supports the following commands: LNP-SCREEN-DIGITS, ROUTE-DIGITS, and SUBSCRIBER-CL4.

5.5.8 Bulk download for LNP Screen Digits

This feature enhances the EXEC-BULK download command by supporting bulk provisioning of LNP data (ENT/DEL-LNP-SCREEN-DIGITS TL1 command).

5.5.9 Call Trace and Call Capture

This feature provides the means of capturing and tracing answered as well as unanswered calls that was previously supported in 3.X. Additionally, the call trace and call capture have been enhanced to identify the incoming and outgoing MGs and associated ports.

6. TL1 Commands

6.1 New TL1 Commands

The following TL1 commands were added in version 5.1.

- OPR/RLS-PROTNSW-OC3 – Enables you to initiate or release an external SONET line protection request. Your request initiated by OPR-PROTNSW-OC3 T remains active until it is released via the RLS-PROTNSW-OC3 command or is overridden by a higher priority, externally initiated or automatic, protection switch request. This command appears under the heading “Equipment, Module Commands” in the *TL1 Commands Reference Guide*.
- INIT-REG/RTRV-PM-CC – Enables you to clear or retrieve the current call control performance data either for the entire LNC or for a user-specified Media Gateway. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.10.1. Added missing enums from 3.11 (FROUTE, FDPCPAUSED, FRES, LNPQUERIES), (LNPFAILURES, LNPVALIDRESP, LNPISRTRDCALLS), (LNP_CALLS_REL_BY_DONSWTCH), (LNP_CALLS_REL_BY_THISSWTCH), (LASTINITRCV, LASTINITTRMT). This command appears under the heading “Test and Diagnosis Commands” in the *TL1 Commands Reference Guide*.
- INIT/RTRV-REG-RC- Enables you to reset or retrieve the counters for transmitted or received release cause types. This command appears under the heading “Test and Diagnosis Commands” in the *TL1 Commands Reference Guide*.
- RTRV-PM-RSRC – Enables you to retrieve resource utilization information at the SP, CM or IOM level. Monitored values include ALL, average/peak CPU, used/free memory, used/free disk, active/free/running/stopped/waiting/suspended/zombied processes, active/free/running/stopped/waiting/suspended/zombied threads, free/open files, open/free sockets, open/free pipes, open/free character devices, open/free block devices, used/free IP memory buffers, used/free IP memory clusters and the number of IP memory buffer/cluster requests that failed. This command appears under the heading “Test and Diagnosis Commands” in the *TL1 Commands Reference Guide*.
- DLT/ED/ENT/RTRV-LIST-TRIGESC – Enables you to remove, modify, establish or retrieve a range of directory numbers associated with a specified trigger escape list. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.10.1. This command appears under the heading “Intelligent Network Functions Commands” in the *TL1 Commands Reference Guide*. Refer to the *Maintenance and Troubleshooting Guide*, DLP-619, for procedures.

- DLT/ED/ENT/RTRV-LIST-AINTRIGGER – Enables you to remove, change, establish or retrieve a trigger or trigger attributes from a list of AIN triggers. This is the first time that these commands are supported in a 5.X version (although they were previously supported in 3.10.1). Added TCAPUSER restriction. Added *nai* (default: NATNUM). Added *prefixDgts* (default: NULL). Added *stripDgts* (default: 0). Added *newNai* (default: NULL). Added *modType* (default: QUERY). Updated rules for MOBILE_TERMINATION. Removed CUSTOM_DIALPLAN. This command appears under the heading “Intelligent Network Functions Commands” in the *TL1 Commands Reference Guide*. Refer to the *Maintenance and Troubleshooting Guide*, DLP-619, for procedures.
- DLT/ED/ENT/RTRV-LIST-TOLLFREE – Enables you to remove, change, establish or retrieve the toll free numbers that are to be translated locally. This command appears under the heading “Routing Commands” in the *TL1 Commands Reference Guide*.
- DLT/ENT/RTRV-GMSC-LAESDN – Enables you to remove, designate or retrieve wireless subscribers that are under CALEA surveillance. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.10.1. Added support for “ALL” keyword. This command appears under the heading “CALEA Commands” in the *TL1 Commands Reference Guide*.
- DLT/ED/ENT/RTRV-LNPSCREEN-DIGITS – Enables you to remove, change, establish or retrieve a telephone number from a list of called numbers for which LNP queries can be issued. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.X. The ED-LNPSCREEN-DIGITS command was added in this version. Added *trigEsclist* (default: NULL). This command appears under the heading “Global Commands” in the *TL1 Commands Reference Guide*.
- DLT/ED/ENT/RTRV-LRN – Enables you to remove, change, establish or retrieve a location routing number to support the service-provider type of LNP. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.X. Changed *lrnType* to optional name defined (default: SEC). Changed *lrnType* enums to PRI, SEC. Added *replaceCDPN* (default: Y). This command appears under the heading “Numbering Configuration Commands” in the *TL1 Commands Reference Guide*.

- DLT/ENT/RTRV-RATE-CENTER – Enables you to remove, establish or retrieve a rate center in a specific NXX in an NPA. ENT-RATE-CENTER will not work unless ENT-NATIONAL-NPA or ENT-AREACODE has already been issued. This is the first time that these commands are supported in a 5.X version although they were previously supported in 3.X. This command appears under the heading “Numbering Configuration Commands” in the *TL1 Commands Reference Guide*.
- RTRV-STATUS-CM – Enables you to retrieve the location and state for the configured processes (centralized processes or instances on a media gateway) running on Compute Modules in a Lucent Network Controller. This command appears under the heading “VoIP System Commands” in the *TL1 Commands Reference Guide*.
- RTRV-STATUS-MGCPROC lets the user retrieve state information for the configured media gateway control processes running on Compute Modules in a Lucent Network Controller. This command appears under the heading “VoIP System Commands” in the *TL1 Commands Reference Guide*.
- RTRV-STATE-MGCM3UA – Enables you to retrieve the routing context identifier, source port, and state for the M3UA link between the Lucent Network Controller and the signaling gateway for the specified media gateway.
- INIT/RTRV-REG-MGCM3UA – Enables you to initialize or retrieve one or more storage registers or event counters for a Connection Control and Signaling (CCS) process. The AID mgName uniquely identifies each CCS. This command appears under the heading “Global Configuration Commands” in the *TL1 Commands Reference Guide*.
- DLT/ENT/ED-PRFL-FAILCND - Enables you to remove, establish or modify a failure condition profile that determines the action taken (release the call with an error message or provide some sort of treatment) on encountering a specific failure condition. The Switch supports up to 10 failure condition profiles. The RTRV-PRFL-FAILCND was already supported in a 5.X version.

6.2 Modified TL1 Commands

The following commands were modified in version 5.1.

6.2.1 Facility Commands

- DLT/ED/ENT/RTRV-OC3 - Added *swMode* (default: NRVT), *wtrTmr* (default: 5), *sdThr* (default: 7), *fThr* (default: 3) and new secondary states.
- DLT/ED/ENT/RTRV-STS1 - Added *timd* (default: DISABLED).

- DLT/ED/ENT/RTRV-T3 – Changed AISC parameter to NONE only.

6.2.2 Equipment Commands, Module

- INIT/RTRV-T0 - Restricted RTRV-T0 to port and T0.

6.2.3 ISDN PRI Commands

- DLT/ED/ENT/RTRV-ISDN-BCHAN - Changed AID to support *infNum* up to 2147483647.
- DLT/ED/ENT/RTRV-ISDN-LNK - Changed AID to support *ifNum* up to 2,147,483,645. Refer to the *Installation and Operations Manual*, DLP-529, for procedures.
- DLT/ED/ENT/RTRV-ISDN-IF - Changed *ifNum* to support up to 2147483647. Removed *prefixDigits* parameter. Refer to the *Installation and Operations Manual*, DLP-546, for procedures.
- SW-TOPROTN_ISDN - Changed *infNum* to support up to 2147483647.

6.2.4 ISDN User Adaptation

- INIT-REG/RTRV-PM-MGCMGIUA – Added support for *mgName*.

6.2.5 Media Resources

- ED/RTRV-AUDIO-SYS – Added parameter *anncPlan* (default: US).

6.2.6 SS7 Transport (MTP 2/3) Commands

- DLT/ENT/RTRV-ROUTE-SS7 - Added support for DEF_ANSI and DEF_ITU routing.
- DLT/ED/ENT/RTRV-SLK - Removed *sgId*.

6.2.7 Test and Diagnosis Commands

- INIT-REG/RTRV-PM-RC - Added *mgName* support. Removed *montypes* except for ALL.
- DLT/ENT/RTRV-CALL-CAPTVERBOSE – Removed *calldur*.
- INIT-REG/RTRV-PM-DPC - Changed command name to PM-SGPC.
- INIT-REG/RTRV-PM-SS7ROUTE - Changed command name to PM-ROUTESS7.
- RTRV-PM-TRKGRP - Changed the AID to be optional.
- RTRV-PM-MGCMEGACOMSG – Changed the AID to be optional.

6.2.8 Inter-Machine Trunks Commands

- OPR-CCR - Added *localCallStatus*, *localMntStatus*, *remoteCallStatus*, and *remoteMntStatus* output fields. Updated AID range to support 31 CICs.

- OPR-CQM - Added *statusInfo* and *testStatusEnum* as output fields. Updated AID range to support 31 CICs.
- DLT/ED/ENT/RTRV-PRFL-ISUPITU - Changed *hopCounter* to 0-31 and *t5* start range to 60.
- DLT/ED/ENT/RTRV-PRFL-ISUPITUQ767 - Changed *t5* start range to 60.
- DLT/ED/ENT/RTRV-PRFL-ISUPMEXICO - Changed *t5* start range to 60.
- DLT/ED/ENT/RTRV-PRFL-BILLING - Added *vMail* (default: N)
- DLT/ED/ENT-SS7-TRK - Restricted ITU TRKGRP CICs to 0-4095. Modified to allow for ED/DLT of non-contiguous ranges.
- DLT/ED/ENT/RTRV-TRKGRP – Added ISUPTELSTRA, ISUPG500 and SIPT to *sigType*. Added *txPad* (default: 0DB) and *rxPad* (default: 0DB). Added FCIMBIT to action String (DGTMODKEY only). Added WTDM to *classOfSvc* (same restriction as FGD). Added *pCpdId* (Default: N). Added *sipSrcFqdn* (default: NULL). Added *sipDstFqdn* (default: NULL). Added *sipDstFqdnPort* (default: 0). Added *sipProxyIp* (default: NULL). Added *sipProxyPort* (default: 0). Added *sipCgpMap* (default: N). Removed *ipAddr* parameter. Removed *unique ipAddr* for SIP TRKGRPs. Restricted *echoCtrl* to 0, 8, 16, 32, 64 and 128. Restricted *echoCtrl* to 0 for SIP.

6.2.9 Channel-Associated Signaling Commands

- DLT/ED-CAS-TRK – Allowed for ED/DLT of non-contiguous ranges. Lowered *memberId* range to 1-16383.
- DLT/ED/ENT/RTRV-MG-PRFLCAS – Changed *dialPulse* DTMFONLY to TONEONLY. Changed *dialPulse* default to TONEONLY. Changed *outPulseDelay* default to 500.
- DLT/ED/ENT/RTRV-MGC-PRFLCAS – Added *tDgtFirst* (default: 9000), *tDgtShort* (default: 2000) and *tDgtLong* (default: 2000). Added *callModel* EO_OPS_V2. Changed *dialPulse* DTMFONLY to TONEONLY. Changed default to TONEONLY.

6.2.10 Session Initiation Protocol Commands

- DLT/ED/ENT/RTRV-SIP-IPADDR – Added restrictions for reserved IP addresses. Changed SECIPADDR default to NULL.
- ED/RTRV-SIP-SYS – Added *sendPrack* (default: N), *sesTmr* (default: 0) and *inviteRetry* (default: 6) from 3.10.1. Changed *inviteTmout* and *t2* to decinum. Changed default *inviteTmout* to 45, *t1* range to 0.2 – 60, and *t2* range to 1 – 180.

6.2.11 Routing Commands

- DLT/ED/ENT/RTRV-DIGIT-SCREEN – Added 4 new *callType* enums (LOCAL_RATE, PREMIUM_RATE, TOLL_DIR_ASSIST, NOTSPEC). Added support for GP in AID and *dgtScrnKey* and FCIMBIT to action String (DGTMODKEY only).
- DLT/ED/ENT/RTRV-DIGITMOD-DN – Added support for GP in *nextDgtModKey*. Added support for FCIMBIT in *altParam* and *nextDgtModKey*
- DLT/ED/ENT/RTRV-DIGITMOD-GEN – Added support for GP in AID. Added support for GP in *nextDgtModKey*. Added support for FCIMBIT in *altParam* and *nextDgtModKey*
- DLT/ED/ENT/RTRV-DIGITMOD-PARAM – Added 4 new *callType* enums (LOCAL_RATE, PREMIUM_RATE, TOLL_DIR_ASSIST, NOTSPEC). Added support for GP in *nextDgtModKey*. Added support for FCIMBIT in AID, *altParam* and *nextDgtModKey*.
- DLT/ED/ENT/RTRV-DIGITMOD-TNS – Added support for GP in *nextDgtModKey* - Added support for FCIMBIT in *altParam*. Added support for FCIMBIT in *nextDgtModKey*
- DLT/ED/ENT/RTRV-TREATMENT – Added support for GP and FCIMBIT to *dgtModKey*.
- DLT/ED/ENT/RTRV-TRANS-PLAN – Added support for GP to *rtKeyList* and *dgtModKey* action. Added FCIMBIT to *action String* (DGTMODKEY only).
- TEST-TRANS – Modified ABGN definition to include *remoteReferType*.
- DLT/ED/ENT/RTRV-PRFL-SCHED – Changed resolution to 15 minutes.
- DLT/ED/ENT/RTRV-ROUTE - Increased ISDNIF range to 2147483647. Added support for GP and FCIMBIT to *dgtModKey*.
- DLT/ED/ENT/RTRV-ROUTE-DIGITS - Added 4 new *callType* enums (LOCAL_RATE, PREMIUM_RATE, TOLL_DIR_ASSIST, NOTSPEC). Added support for GP in AID. Added FCIMBIT to *action String* (DGTMODKEY only).
- DLT/ED/ENT/RTRV-SUBSCRIBER-CL4 - Added support for GP to *dgtScrnKey*.

6.2.12 Global Configuration Commands

- INIT-REG/RTRV-PM-GMSC - Added support for *mgName* to AID.
- ED/RTRV-GMSC-ANSISYS – Added *winPhase* (default: 0), *bypassPrefix* (default: NULL), *npTmout* (default: 10), *multiGtt* (default: N) and *billingType* (default: CELLULAR). Added TCAPUSER=IS41 restriction to SLHRID. Changed *oprTmout* range to 12-32 (default: 16). Changed *npTmout* range to 4-12 (default: 6).

- ED/RTRV-GMSC-GSMSYS – Added *npTmout* (default: 10), *multiGtt* (default: N) and *billingType* (default: WIRELESS). Added TCAPUSER=MAP restriction to SLHRID.
- DLT-GMSC-LAESDN – Added support for "ALL" keyword.
- DLT/ED/ENT/RTRV-MGC-MGASSOC - Changed *name* to accept IP addresses only (no fully-qualified domain names).
- DLT/ED/ENT/RTRV-MGC-PC - Added variants ISUPTTELSTRA and ISUPG500. Added *isupCongCtrl* (default: N) *t29* (default: 0.5), *t30* (default: 10), *congLvl1* (default: 25), *congLvl2* (default: 50) and *congLvl3* (default: 100).
- DLT/ED/ENT/RTRV-MGC-PCOWN - Added INSERVICES restrictions.
- DLT/ED/ENT/RTRV-MGC-PRFLMEGACO - Changed *transProt* to *transpProt*.
- ED/RTRV-MGC-SYS - Added *tSuspCas* (default: 14), *tSuspIsup* (default: 12), *tSuspOrig* (default: 10), *tAwaitAns* (default: 120) and *sgType* (default: GEN).
- ED/RTRV-SWITCH-CFG - Added enums to *nmbPlan* (AUS, MEX).
- DLT/ED/ENT/RTRV-NP-POOLED - Added *trigEscList* (default: NULL). Changed ENDINGXXXX to optional.
- DLT/ED/ENT/RTRV-PRFL-PC - Changed command name to PRFL-SGPC.
- DLT/ENT/RTRV-SG-ISUPPROXY - Added variants ISUPTTELSTRA and ISUPG500.
- DLT/ED/ENT/RTRV-SG-PC - Added support for DEF_ANSI and DEF_ITU routing.
- DLT/ED/ENT/RTRV-MGC-SGASSOC – Added *netTypeDflt* (default: ITU).

6.2.13 Numbering Configuration Commands

- DLT/ED/ENT/RTRV- AREACODE - Added support for *numPlan* AUS. Refer to the *Installation and Operations Manual*, DLP-XXX for procedures.

6.2.14 Equal Access to Carriers Commands

- ED/RTRV-SERVICE-ACCESSCODE - Added GSM_IS41 and GSM_MAP services. Added TCAPUSER restriction to SLHRID.

6.2.15 Intelligent Network Functions Commands

- DLE/ENT/RTRV-SCCP-ROUTE - Added restriction for MGC-PCOWN INSERVICES. Added support for DEF_ANSI and DEF_ITU routing.

- DLT/ED/ENT/RTRV-SLHR-SCP - Added support for multiple *svcReqSSN* entries. Added *tcapUser* restrictions. Removed ETSI1996 from *tcapVariant*. Changed *inapVariant* to *tcapUser* (default: AIN1992).

6.3 Removed TL1 Commands

None.

7. Resolved Error Defects

Tracking Number	Symptom	Resolution
39944	No Voice Path for Call Forwarding Don't Answer call.	Fixed in 5.1.0.0.292.SP.3
39902	Unable to modify route digits on release 5.1.0.0.292.SP.1	Fixed in 5.1.0.0.292.SP.2
39933	TEST-TRANS causes the CM to immediately failover	Fixed in 5.1.0.0.292.SP.1
34077	SIP-IPADDR has no restrictions on SECIPADDR.	Fixed in 5.1.0.0.292
37654	Taking the CM active card out of service via the EMS causes the standby to reboot.	Fixed 5.1.0.0.292
37851	Need support of ISUP-OLI parameter in SIP Invites.	Fixed 5.1.0.0.292
38463	MGC CAS-TRK did not show OOS-MA after ED-CAS-TRK:::::OOS;	Fixed 5.1.0.0.292
38700	MGC "ent-call-caPTVERBOSE" is not working.	Fixed 5.1.0.0.292
38779	No call trace tool available on EMS and TL1.	Fixed 5.1.0.0.292
38780	SNMP v2 Trap Destination Port Cannot Be Configured	Fixed 5.1.0.0.292
38811	ED-ROUTE-DIGITS has problems with the ACTN string.	Fixed 5.1.0.0.292
38968	The switch stopped processing calls and many alarms were observed in the EMS related to the signaling gateway, network gateway, and network controller.	Fixed 5.1.0.0.292
38974	SIP-A memory increases every day.	Fixed 5.1.0.0.292
39074	IOM-4-CPU-C:MJ,INTERR,SA,2005-06-21,13-18-08,,,,:\\"Module in slot 4 faulted – MODULE_ERR_APP_CORE(79)\",,,,:74"	Fixed 5.1.0.0.292
39084	Call setup delay mobile-to-mobile > 250ms*. *Call setup delay was reduced to less than 300ms.	Fixed 5.1.0.0.292

Tracking Number	Symptom	Resolution
39111	Cannot edit the REROUTE field in ED-ROUTE-DIGITIS on GMSC.	Fixed 5.1.0.0.292
39156	OLI from SIP to ISUP mapping with a value 256 mapped to 0.	Fixed 5.1.0.0.292
39166	RTRV-PM-SIPMSG shows SCALLS=200, 168, etc.	Fixed 5.1.0.0.292
39197	TSN should take precedence in mapping to CIC.	Fixed 5.1.0.0.292
39258	Security Scan causes failure on the slave processor.	Fixed 5.1.0.0.292
39258	The EMS shows Manhattan network controller, Westbury network controller/network gateway/signaling gateway disconnected. Physical chassis shows Active and Standby.	Fixed 5.1.0.0.292
39269	Cannot log in to management and TL1 after enabling the SSH.	Fixed 5.1.0.0.292
39273	OA&M: addition of a sigdbg.log log file.	Fixed 5.1.0.0.292
39314	+CC-NDC-SN number has no effect.	Fixed 5.1.0.0.292
38904	QD_INAP: CCS cores when making a normal INAP call with SurePay.	Fixed in EMS
39652	EMS shows 7 active calls. TL1, etc. shows 0.	Fixed 5.1.0.0.292

8. Unresolved Error Defects

Tracking Number	Symptom	Target Fix Release
38951	Lucent Gateway Platform is not setting RSeq in 18X response for a Supported : 100rel INVITE.	
39805	WLNP query on TLDN needs to be enabled to support number pooling of TLDN ranges.	
39990/39991	Removing the Signaling Ethernet cable on either the Active Signaling Gateway System Processor Module or the Active Network Gateway Controller will cause calls standing to be disconnected and new call processing will be interrupted for great than 20 seconds than normally expected. Bug numbers 39990 and 39991 are tracking this issue. Lucent Engineering is working on a resolution for this issue.	

9. Hardware Installation and Provisioning Considerations

- A front SP-3 module, 89-406, requires a rear SP-3 module, 89-0417, front switch fabric card (89-0363-D), and Midplane III (chassis 85-3007 or 85-3008).
Note: The OS port is above the SIGA port on the rear SP-3 module, whereas the OS port is below the SIG port on the rear SP module.
- Front and rear CM modules, 89-419 and 89-420 respectively, require SP-3 modules, and Midplane III (chassis 85-3008 ONLY). Slot I/O-9 cannot be used for a CM. Up to 8 protected CM pairs are allowed in a single chassis. A MGC chassis that is fully loaded with CMs has a power dissipation of 1800 Watts.
- The high performance Triple and Octal DS-3 Front IOMs, 89-0424 and 89-0425, require a Rear Octal DS-3 module, 89-0383, and a rear Octal Protection module, 89-0386. They are only supported in a chassis with Midplane II (85-3004) and Midplane III (85-3007 and 85-3008).
- The high performance Triple and Octal DS-3 Front IOMs, 89-0424 and 89-0425 can be protected by corresponding 89-0424/0425 IOMs as well as by 89-0410/0411 IOMs.
Note: ISDN, MTP2, CAS and GR-303 peak signaling rates must be taken into account when using a 89-0410/0411 to protect a 89-

0424/0425, since they support higher signaling rates than the 89-0410/0411 IOMs (25%, or greater, depending on the signaling).

Note: They cannot be used to protect corresponding Triple and Octal DS-3/STS-1 IOMs, part numbers 89-0397/ 0398/ 0410/0411, since they do not support STS-1.

Note: They cannot be used to replace previously provisioned Triple and Octal DS-3/STS-1 IOMs, part numbers 89-0397/ 0398/ 0410/ 0411, since they do not support STS-1.

- A VSM can be provisioned in any I/O slot, but it will only fail over to I/O slot 9. Version 5.0.0.0.47 is the minimum version that is required to support VSM protection in I/O slot 9. **Note:** In versions 3.X and earlier versions of 5.0, the VSM would only failover to slot I/O 17.
- ENA IOMs can only be provisioned in slot 8 and will only fail over to slot 10.
- A OC-3 module, 89-0400-A, requires a Midplane III (chassis 85-3007 or 85-3008). It also requires a OC-3 rear module (89-0492-A). The rear module can terminate four OC-3 lines. Only the first eight STS-1 can be provisioned. STS-1 through STS-6 can be bulk provisioned. STS-7 and STS-8 cannot be bulk provisioned. They must be provisioned individually. A maximum of four protected pairs of Channelized OC-3 modules are supported. A Channelized OC-3 module cannot be provisioned if there is a card in its mated pair I/O slot that is other than a Channelized OC-3 module. The protected pairs can be installed in:
 - I/O-1 and I/O-2
 - I/O-3 and I/O-4
 - I/O-5 and I/O-6
 - I/O-7 and I/O-8
- A Midplane III (85-3007 and 85-3008) chassis requires an Octal rear-protection IOM on DS3 IOMs regardless of whether the front IOMs are Octal or Triple DS3 IOMs (rear-working IOMs can be Triples, but the protection IOM must always be Octal).
- An Octal rev. A can be backed up with either an Octal rev. A or an Octal rev. B; however, an Octal rev. B can only be backed up with an Octal rev. B. IOM failover won't work if Octal rev. B tries to fail over to an Octal rev. A.
- A Switch Fabric (SF) module must be inserted before its associated SP module.
- SP and SF Rev. B or later are required for operation with Octal DS3 IOMs.
- Chassis Part Number 85-3000, CLEI Code BAM9LJ0GRA, does not support Octal IOMs.
- CAS is supported on Octal, part number 89-0398 and higher and triple DS3, part number 89-0397 and higher.

- When using the ENT-EQPT command, redundancy can be set equal to SEC (redundancy=sec) only if the IOM AID specified is in a protection slot. Attempting to provision an unsupported slot as a SEC redundancy returns a DENY message.
- You cannot provision slot 11 (IOM slot 9) if the ENA port 4 is provisioned, nor can you provision the ENA port 4 if slot 11 (IOM slot 9) contains a provisioned card. This is because there is a bandwidth limitation on the SF card.
- If an SP module is manually removed and then reinserted, it will not automatically be restored to service. You must enter the TL1 command, RST-EQPT : : SP - { A | B }, to initialize and synchronize the previously removed SP.

10. Software Installation and Provisioning Considerations

10.1 Equipment Management Issues

- A Compute Module can support up to eight media gateways (subject to Compute Module CPU capacity).
- Additional logic has been implemented regarding the execution of the remove command on an active module. The system will now deny RMV commands for working 1:1 modules (CM, ANA, ENA) when the protection card is provisioned to be IS.
 - If the protection card is provisioned to be OOS, then the RMV card will be accepted - this is to allow the operator to take a working/standalone card OOS for emergency operations.
 - If an attempt is made to remove an active IOM before first removing the stand-by card the system will respond with a DENY card not in a valid state. The operator should then follow the proper procedure of first removing the stand-by module.
 - If an attempt is made to remove an active IOM using the EMS, it will respond with "our your sure" and if the user selects "yes" the system will respond with "The card is not in a valid state."
 - If an attempt is made to remove an active IOM before first removing the stand-by card the system will respond with a DENY card not in a valid state. The operator should then follow the proper procedure of first removing the stand-by module.
- The absence of carrier on the signaling or management ports on the protection SP will not prevent the manually executed SW-TOPROTN-EQPT::SP-x TL1 command from being executed. It will result in an SP failover, even if the signaling or management ports do not have carrier (an Ethernet cable has been pulled). **Note:** It is recommended that you check for alarms before issuing any equipment commands that force failovers.

- The associated Connection Control and Signaling (CCS) process must be rebooted when a TL1 DLT-MGC-MGASSOC command is issued.
- When an IOM or CM is manually put into an OOS state using the TL1 SW-TOPROTN-EQPT command or by selecting Switch to Protection within the EMS, it must be manually put back IS using the TL1 RST-EQPT command or by setting the card's state to IS with the EMS Modify Card screen prior to issuing a TL1 SW-TOWORK-EQPT command or EMS Switch to Working screen .
- If a CM needs to be moved from one slot to another, the corresponding MGs must be deleted prior to removing the CM. The corresponding MGs must then be re-entered after the CM has been installed in the new slot.
- Support for the following software features is not available in this software version but is on the roadmap for a future 5.X release: H248.2 (Text Conversation and FAX) – MG and MGC.
- The IP addresses must be correct and unique on both SPs before bringing the switches into service.
- IP addresses for OS, signaling and craft Ethernet ports should not be on the same subnet. If it is desired that they be on the same subnet, contact Lucent Worldwide Services at 1-866-582-3688 for provisioning assistance.
- If the signaling interfaces are not configured with IP addresses, an alarm from each SP, stating “lost link on signaling Ethernet,” will be generated.
- When switching from SS7 to ISDN signaling or vice-versa, the signaling link and interface must be deleted and the Octal DS3/DS1/DS3 IOMs must be rebooted before provisioning can occur.
- If you pull an SP, thus taking it out of service, you must wait 10 seconds before reinserting the SP.
- Using the ED-DATE TL1 command to change the time is not required or recommended when the NTP is provisioned. If the new date differs by more than 1000 seconds, then the NTP daemon may shut down. If this happens, you should reset the NTP server to 0.0.0.0 then back to the correct server IP address.
- A single IOM cannot support signaling links of both 56K and 64K. The link speed must be the same for all links on a single IOM. This restriction does not apply to Triple DS3 IOMs, part numbers 89-0397 and higher, and Octal DS3 IOMs, part numbers 89-0398 and higher, as a mix in the link speed creates no problems.
- Midplane II (85-3004 chassis) and Midplane III (85-3007 and 85-3008 chassis) use slot pairs for provisioning line timing. Therefore, you cannot have just one IOM in a paired slot. Slots 1 and 2 are paired, as are slots 8 and 10. To use line timing, any Triple DS3 IOMs must be in place in a given slot pair or any Octal DS3 IOMs.

10.1.1 DS3 IOMs

- The ED/ENT-T3 command does not support LINECDE=CCHAN; it only supports B3ZS.

10.1.2 STS-1 IOMs

- GR-253 (R6-372) states that there must be a method provided to detect and report the actual contents of the Received STS Path Trace message. The RTRV-STIS1 command presently only supports the expected Rx Trace message and the Tx Trace message.
- The system reports an STS Trace ID Mismatch when the J1 byte is inaccessible. GR-253 (R6-382) states that STS Path Trace monitoring should be suspended if the J1 byte in the Path Overhead cannot be accessed (e.g., LOS, LOF, LOP-P and AIS-P). This means that the system should not report an STS Trace ID Mismatch just before it declares any of the above mentioned alarm conditions, or after they clear.
- STS reports Trace ID Mismatch events.

10.1.3 Voice Server Modules

- When the precedence of RTP packets is changed with ED-VOIP-SYS, the voice server module needs to be rebooted for the settings to take effect. This can be done with an IOM failover to the protection voice server module followed by an IOM revert of the voice server module.

10.1.4 Primary Rate ISDN Line

- As indicated by the ED/ENT-ISDN-IF command responses, the 4ESS ISDN PRI variant is currently not supported in this version.
- Two-way Primary Rate ISDN lines on the Plexus should be provisioned as National ISDN-2 or DMS-100.
- The Plexus supports National ISDN-2, 4ESS, 5ESS, and DMS-100 variants for one-way calls leaving the Plexus.

10.2 SS7 and ISDN Signaling

- The capturing of SS7 MTP3 signaling messages via SigTrace is supported in this version. The capture of ISDN Q.931 or CAS signaling messages is not supported in this version.
- When editing a T1 out-of-service the mode (OMODE) must be set to AIS in order to bring MTP2 and LAPD down.
- Currently, the signaling point code restart procedure is not supported.
- Alarms for ISUP timer expiry are disabled.
- Alarms are not generated if the initial condition for a remote Point Code is down.
- A maximum of 1250 destination point codes can be configured.

- A signaling link set must contain at least one signaling link with a link priority set to 0. Any additional links, in the link set, must have contiguous priorities.
- Plexus currently does not support T-321 timers.
- Trunk Group IDs must be unique in the system.
- There can be no more than 100,000 interfaces formed by TRKGRPS+ISDNIF+CASIF in the router. The breakdown of each consists of the following: a maximum of 3808 configurable ISDN interfaces and TRKGRPS each; and a maximum of 91392 CAS-IF interfaces (currently, however, it is recommended that you not configure more than 64,000 CAS-IFs).

10.3 CAS Signaling

- The CAS profileID for an existing CAS trunk group cannot be edited. In order to change the CAS profileID, all of the trunks in the trunk group must be deleted, the trunk group must be then be deleted and subsequently re-added with the new CAS profile.
- The maximum CAS ports (T1s) that can be provisioned for one Octal (89-0398, 89-0411, 89-0425) is 150 T1 ports (3600 T0s).
- Parameters in the CAS-IF command cannot be edited after changing the ALLOC parameter equal to CIRCULAR for one CAS-IF entry.

10.4 ISUP and SIP-T Interworking

- All unrecognized parameters received in SIP-T messages are not passed to ISUP. Correspondingly, all unrecognized parameters received in ISUP messages will be discarded in SIP-T.

10.5 Call Processing

- The SS7 signaling links are not protected during an IOM hardware failover.
- When an IOM is in protection mode, attempting to add, modify or delete ISDN or signaling links from the protected IOM will return DENY messages.
- The trade of between call setup latency and CPU utilization was adjusted in this software release.

10.6 Billing/Statistics

- The ISDN PRI Traffic CCS report does not currently update the available circuit (AVLCIRC) field to reflect ISDN channels that are OOS.

- Because Feature Group D functionality is fully supported from an Access Tandem and Inter-Exchange Carrier standpoint for CAS and ISUP in release 3.8 and above, originating carrier information (such as connect date, connect time, and elapsed time) is only valid for Feature Group D trunks. Note: End Office Feature Group D functionality is not fully supported. For terminating carrier access calls, the carrier timing information is populated even if the incoming trunk group is not Feature Group D.

10.7 Session Initiation Protocol

- In release 3.10, the default NPI for CPN for SIP initiated calls was UNKNOWN. Starting with this release, the default NPI value is ISDN. Customers that were previously assuming that the default value was UNKNOWN or were using digitmods to change the NPI value, need to make appropriate configuration changes (add/remove the digitmods).
- Changing media streams in SIP 18x responses and subsequent 200 OK responses is not supported since it is contrary to RFC 3261.
- A SIP CANCEL message is not sent out after Invite Timer (T1) expiry which is consistent with RFC 3261 but inconsistent with RFC 3398.

10.8 Integrated VoIP

- The system does not currently verify the IP link connectivity state on IOM-8 prior to reverting.
Note: You should verify the status of the IP links on IOM-8 prior to reverting.
- If you change the VSM aa15enc encoding parameter (VCMUX, LLC SNAP), a VSM reboot is required for the change to take effect.
- If you change the ENA format parameter (802.3, DIX II), an ENA reboot is required for the change to take effect.
- Tone Relay support is limited to DTMF Events per RFC2833, Section 3.10, Table 1. Other types of tones are not supported.
- Fax/modem support between the Plexus and some third-party equipment (such as gateways, IADs) is only available on G711 calls. For calls using compressed codecs (using G.729 protocol), fax/modem calls won't work with these vendors if they use proprietary signaling protocols.
- The Plexus supports G.711, G.726, G.729, G.723.1, CLEARMODE, X-CCD, CISCO-CLEAR-CHANNEL codecs, each with 10, 20, 30 and 40ms sampling, except for G.723.1, which supports 30 and 60ms sampling

- If you want to modify the endptvoip IP address on a GigE port, you must edit the ENET port Out of Service (OOS) and then use the RMV-EQPT command on the VSM. There is no way to dynamically update the IP addresses without dropping all calls associated with a VSM. For example, information would be entered as such:
ED-ENET::IOM-8-ENET-1:::OOS; (GigE port)
RMV-EQPT::IOM-11; (VSM)
DLT-ENET-ENDPTVOIP::IOM-8-ENET-1;(Delete Endpoint)
ENT-ENET-ENDPTVOIP::IOM-8-ENET-:::IPADDR=10.18.140.211,
MATEIPADDR=10.18.140.212,SUBNETMASK=255.255.255.0,
DEFAULTGATEWAY=10.18.140.1:IS;
(Enter new IP address to the endpoint)
ED-ENET::IOM-8-ENET-1:::IS;
RST-EQPT::IOM-11;
- When the SDP profile contains multiple deep compression CODECs (G.729, G.723.1 or G.726), only the first available deep compression CODEC in the preference list will be included in the originating offer from the Plexus, e.g., G.729, G.711, G.726. This results in G.711 and G.729 being the offered CODECs in the originating offer (provided G.729 is available; otherwise, G.726 or G.711 would be offered). This limitation applies to CODEC negotiation across SIP.
- MF Tone detection is not supported on the VSM in this release. In order to support MF Tone detection, 89-0410/0411/0424/0425 IOMs, which have on-board DSPs to perform MF tone detection, must be used.
- The Plexus only supports Payload Type 13 comfort noise for G.711 and G.726.
- RTCP reports sent for T.38 calls are invalid and should be ignored.

10.9 System Software

- UNIX system security does not support password aging or security logging for FTP and remote login access.
- The date/time should be set before configuring the system and adding the IOM. It is advised that GMT time be used. Please contact Lucent Worldwide Services at 1-866-582-3688 for instructions on how to provision the switch clock for GMT time.
- If an IOM protection switch occurs, the monitoring function stops. Once an IOM revert occurs, the cross-connect to the test port has to be put out of service (OOS) and restored.
- Currently, there is no way to retrieve the status of a nailed up DS0 connection unless you know the exact DS0 of one of the connections. RTRV-CRS-T0 without an AID should return the status of test port settings.
- The ED-SERVICE-ACCESSCODE must put the VMS in-service to support voice mail. The command would appear as: ED-SERVICE-ACCESSCODE::VMS:::IS;

10.10 SS7 MTP-2 Performance

Listed below are the number of SS7 MTP-2 messages per second that can be supported by various IOMs at different IOM CPU utilization rates, assuming that the IOM is ONLY handling SS7 signaling and IMTs. The table does not indicate the calls per second for SS7 links since these performance numbers are a function of TCAP transactions as well as ISUP (or BICC) usage. Please contact your Lucent Sales Engineer, for assistance in determining the numbers of calls per second that can be supported for your particular application(s).

Note: The total number of messages per second per chassis is 8,500 messages/sec (at 85% utilization).

Description	Part Number	MTP-2 Msgs/sec (80%)	MTP-2 Msgs/sec (40%)
3 DS-3/STS-1	89-0397	544	272
8 DS-3/STS-1	89-0398	544	272
3 DS-3/STS-1 w digit collect	89-0410	544	272
8 DS-3/STS-1 w digit collect	89-0411	544	272
28 T1/E1/J1	89-0414	768	384
3 DS-3 w digit collect	89-0424	768	384
8 DS-3 w digit collect	89-0425	768	384

11. TL1 Restrictions

- The EXEC-BULK-DOWNLOAD command is not supported in this version.
- The TEST-TRANS command has the following limitations:
 - It does not trigger/emulate any SCP interactions.
 - Treatments related to announcements capture the announcement ID. If the announcement takes multiple arguments, those may not be captured.
- The following parameters in the ED-MGC-SYS command cannot be edited in this version and should be left:
 - cdr
 - iua
 - m3ua
 - megaco
 - mgcp
 - sipStaPortRange

- The *sipCgpMap* parameter for SIP and SIP-T trunk groups in the ENT/ED/RTRV-TRKGRP command is not implemented; leave it blank.
- ED/ENT-TRKGRP incorrectly allows you to set the BEARERCAP parameter to RESDIGITAL or UN UNRESDIGITAL in the ITU-T stack. These are ASN1 only values.
- The minDgt2Seize parameter in the DLT/ED/ENT/RTRV-PC is not supported in this version, even though TL1 incorrectly lets you provision this un-supported parameter.
- RTRV-PM-T3::IOM-1-T3-1-PORT-1; :: [<montype>], [<monlev>] should not be executed with *montype* parameter equal to *all* since the large amount of data returned will lead to a failure in writing the data on the TL1 -port and subsequently result in the TL1 session being closed.
- Occasionally a “reply timeout” message will be seen while trying to execute an ENT, ED or DLT TL1 command. The command may have still worked and should be validated with a RTRV.
- The number of TL1 retrieve (RTRV) commands is limited to five results per second.
- Signaling TL1 commands respond “All Resources Busy” while standby SP is synchronizing.
- Logging into the TL1 agent cannot be done during part of SP sync on the standby side.
- When using the INIT-SYS, ED-BILLSYS, and EXEC-RESTORE-PLEXUS commands, the target identifier (TID) must always be used. Therefore, the form of the command must be, as an example, INIT-SYS:TID:::10; or ED-BILLSYS:TID:::10; or EXEC-RESTORE-PLEXUS:TID:::10;
- Before restoring a backed up database using the EXEC-RESTORE-PLEXUS command, contact Lucent Worldwide Services at 1-866-582-3688 for assistance to ensure a successful database restoration.
- The *T3 Idle* and *T3 Map* parameters in the ENT/ED/RTRV-T3 command are not supported.
- For the commands INIT-REG-T1/T3/E1/OC3/STS1, NULL is the only accepted value in the *mondatt* and *montm* parameters. *ALL* is the only *montype* that will clear the registers.
- The “state” information on the SIP-IPADDR command is not persistent. If the primary IP address has failed over to the secondary IP address, and then you fail over the SP, your first SIP call after the SP failover will initially attempt the call on the wrong IP address. The call will complete on the secondary IP address once the SP determines the primary is down. The secondary IP address will then be made “active” and all subsequent calls will be made using the “active” IP Address.

- For the DLT/ED/ENT/RTRV-SS7-TRK command, ITU TRKGRP CICs are restricted to 0-4095. This command has been modified to allow for ED/DLT of non-contiguous ranges. RTRV returns a status of no more than 4,000 CICs at a time; re-invoke the command to return information for successive groups of 4,000.
- The RTRV-CAS-TRK command returns a status of no more than 4,000 CICs at a time; re-invoke the command to return information for successive groups of 4,000.

12. IP Security Considerations

IP Filtering, an IP packet filtering application that runs on the SPs is available in this build. It is important to note that IP packet filtering is only a subset of full firewall/Session Border Controller functionality (e.g., packet filtering, bandwidth management, user authentication, network access rules, network address translation, and back-to-back user-agent). Because IP filtering and processing filtering rules is a CPU-intensive task that can degrade overall switch performance, the use of an external network firewall is highly desirable and recommended.

However, in the absence of a firewall, IP filtering can protect the switch from unsophisticated attacks or accidental misuse.

IP Filtering **is not enabled** upon initial boot up. Should IP filtering be required, contact Lucent Worldwide Services at 1-866-582-3688 (Option 5) for assistance. An LWS representative will refer you to DLP-XXX, which contains specific steps for activating/de-activating and editing security settings. DLP-XXX can be obtained from your LWS representative. It is recommended that security be enabled during the switch maintenance window in order to minimize any impact to call completion during initial activation.

Secure Shell (SSH) is unavailable in this release. If OS-level switch access is required, and IP filtering is required on the switch, then add an IP filtering rule to enable TELNET clients to connect to the switch (on port 23) prior to enabling filtering.

Notes: