Lucent Technologies
Bell Labs Innovations

4ESS™ Switch Product Release Document

4E25 Release 3 Generic

234-090-253AC
Issue 1, May 2000

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About this information product

Purpose

The purpose of the Product Release Document (PRD) is to provide customers with information pertaining to the new features that are introduced in the *4ESS* switch. A PRD is written to cover the features introduced in full generic releases and quarterly generic releases.

This PRD provides information pertaining to the new features included in the 4E25 Release 3 Generic, plus features that are released as Software Change Packages (SCPs), and features that are Non Release Specific (NRS).

Safety Labels

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Scope

The Product Release Document provides customers with information not covered in other *4ESS* switch documentation. It is not a replacement for other documentation such as Standard Lucent Technologies Practices, Task Oriented Practices (TOP), Maintenance Reference Handbooks, etc. that support the *4ESS* switch. The information in this document is intended only for the introduction of the new 4E25 Release 3 and SCP features, not the long-term maintenance. Since other documentation is used for the operation and maintenance of features after their introduction into the *4ESS* switch, this PRD will not be reissued, unless there are added SCP features.

Intended Audience

The document is intended for people involved in testing, provisioning, maintenance, administration, and technical support of the *4ESS* switch. Feature managers, Integrated Test Network (ITN) personnel, field support, Network Control Center (NCC), Product Engineering Control Center (PECC), and National Electronic Switching Assistance Center (NESAC) personnel are examples of some of the people who will use the PRD.

How to Use This Document

The PRD for 4E25 Release 3 Generic and 4E25 SCPs contains 8 new features. Each chapter in this document provides information about these features. The chapters are in numerical order according to feature number. The chapter titles are also the feature names.

The following is a list of the chapters contained in this document with a brief description of each feature:

Chapter 1: Utility System (US)/Remote Utility Access System (RUAS) Productization Feature (566)

This feature formalizes the management, delivery, and support processes for the Utility System (US) Remote Utility Access System (RUAS), and makes US/RUAS an officially supported Lucent product.

The existing functions of US and RUAS tools are not changed as a result of this feature.

Chapter 2: 4ESS Switch Signaling Capacity Improvements Feature (6915i)

Features 6915i and 6915 are focused on the throughput between the 1B Processor and 3B/Common Network Interface (CNI). The Direct Link Node – Attached Processor (DLN-AP) is upgraded from a 68030 (AP30) processor to a 68060 (AP60). The features track and manage the hardware/software associated with the DLN-AP Upgrade. Feature 6915 manages the hardware, and Feature 6915i manages the software.

Chapter 3: Enhanced Scheduling and Executive Control Feature (6989)

This feature enhances the task scheduling algorithms in order to take advantage of the faster 1B Processor. The task scheduling algorithms improve the call processing capability of the *4ESS* switch and thus provide more capacity.

Chapter 4: Non Emergency (NE) Initial Address Message (IAM) Priority Level at the Egress of the Network Feature (7106)

This feature allows the Terminating *4ESS* switch to set the Initial Address Message (IAM) Priority level to the American National Standards Institute (ANSI) standard for non-emergency calls on egress.

Chapter 5: AT&T Network Connection (ANC) Enhancements to Special Routing Features (7497)

This feature provides special routing functionalities in addition to Features 7323 and 6266, specifically feature activation and Carrier Identification Code (CIC) association.

Chapter 6: Network Routing and Numbering Database for International Routing Feature (7592)

This feature, *Network Routing and Numbering Database for International Routing*, changes the current *4ESS* switch routing architecture. The new database, Network Routing and Numbering Database (NRN DB) is queried by AT&T outbound and transit calls from an originating *4ESS* switch to obtain the following information:

- Terminating foreign carrier
- International Switching Center (ISC)/Gateway switch connected to the foreign carrier.

The architecture allows simpler changes to the international routing data that results in quick routing re-arrangement and route selection optimization.

Chapter 7: Location Routing Number (LRN) Recipient Switch Coding of Forward Call Indicator (FCI) for Interswitch Routing of DN Feature (7880)

This feature is delivered as a Software Change Package (SCP).

This feature ensures that the Forward Call Indicator (FCI) remains set to 1 when it egresses the switch. Previous to this feature, the *4ESS* switch would reset the FCI to 0 (not translated) based on Features 6330 and 7181. These two features ensured that an FCI = 1 was not sent to an ISDN Applications Part (ISUP) PBX. It was also assumed in those features that calls arriving on LSP_LOCAL trunks would not route interswitch. However, Features 6330 and 7181 are not compliant with industry standards, and now calls can be routed between AT&T switches. For these reasons this feature ensures that the FCI remains set to 1 when it egresses the switch.

This feature also provides for the *4ESS* switch to include Local Automatic Number Identification (LANI) in the Transaction Capabilities Application Part (TCAP) Begin Message to the Segmentation Directory (SD) and 2DSA/2NCP for AT&T Digital Link (ADL) dial-around calls to the Government Emergency Telecommunications System (GETS).

Chapter 8: Billing Number for Switched Data Video Gateway (SDVG) Feature (7883)

This feature is delivered as a Software Change Package (SCP).

This feature acts as a gateway between a customer's Asynchronous Transfer Mode/Internet Protocol (ATM/IP) network and AT&T's Switched Data Services/Software Defined Data Network (SDS/SDDN). Originating calls from within this network arrive at the *4ESS* switch over a nodal Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) link. The only identification of the customer will be via the delivered Calling Party Number (CPN). Therefore this feature forces the *4ESS* switch to use the delivered CPN as the Automatic Number Identification (ANI) for all call processing (TCAP, ISUP, AMA recording). A new indicator in the Parameterized NSF IE in the SETUP will identify calls.

This feature is valid only for 4E25 and 4E26. It is **not** valid for 4E27 and later.

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1 US/RUAS Productization Feature (566)

Overview

Description This feature formalizes the management, delivery, and support processes for the Utility System (US) Remote Utility Access System (RUAS), and makes US/RUAS an officially supported Lucent product.

The existing functions of US and RUAS tools are not changed as a result of this feature.

Purpose The purpose of this chapter is to describe the productization of US and RUAS. This feature is developed only for AT&T, and this chapter is oriented toward the processes of AT&T.

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Feature Description

Background

The US/RUAS is a tool set that was developed for the 4E19 Generic Release, to assist in the rapid isolation and identification of *4ESS*™ switch software and hardware problems and the debugging of 1B Processor software (Feature 3670). Feature 3670 is documented in the *4ESS Switch Product Release Document, 4E18/19 Release 1 Generic* (234-090-181AC). The US/RUAS also facilitated problem resolution during installation of the 1B Processor.

As of the 4E24 Release 2 Generic (Feature 545), the US operates locally on a Sun Workstation running under *Solaris*[1] 2.6. Feature 545 is documented in the *4ESS* Switch Product Release Document, 4E24 Release 2 Generic (234-090-242AC). The US internal hardware is controlled by the Master Control Complex (MCC). The Utility Workstation is connected to the MCC Utility Processor (MUP) via an Ethernet link, and then to the 1B Processor. The US, with this direct-connect configuration, exists on an Installation Test Equipment (ITE) workstation in the *4ESS* switch system labs, in the factory system test labs, and in two Integrated Test Network (ITN) locations (*4ESS* switch system lab ITE configuration includes software not found at the factory or ITN).

The RUAS allows multiple switches to be monitored from a central location. RUAS assists Lucent Field Support, as well as remote AT&T work centers such as the Network Control Center (NCC), the ITN, and the National Electronic Switching Assistance Center (NESAC) with remote debugging of *4ESS* switch 1B Processor software and hardware problems. It is used in situations where a software or hardware fault exists but the *4ESS* is still processing calls, or in dead-start situations where the *4ESS* has ceased to handle calls.

With 4E24 Release 2 Generic, RUAS also operates on a *Sun* Workstation running under *Solaris* 2.6. RUAS is supported by routers using the NSDNet Network and the Dedicated Wide Area Network (DWAN) to connect the remote work centers, Network Fault Management [NFM (formerly known as TNM)] and the *4ESS* offices. RUAS now exists in four ITNs (via a connection to a workstation in

[1] Registered trademark of Sun Microsystems, Inc.

Warrenville), the NCC, and NESAC.

Compliance with Year 2000 (Y2K) readiness and general support for RUAS/US is addressed by Feature 545.

Reference

The US/RUAS description, installation, operation, and maintenance is given in the *4ESS Switch Utility System User's Guide (Solaris 2.6 Version)* (234-310-001AC).

Benefits

This feature makes US/RUAS an officially and fully supported Lucent product. Lucent is committed to ensuring that US/RUAS is available to support the remote maintenance and management of the AT&T *4ESS* network.

Configurations for US and RUAS

The following configurations exist, one for US and two for RUAS:

- US residing on an ITE workstation, directly connected to the MUP and then to the 1B Processor, located in the *4ESS* switch system labs and the ITN. This configuration is not aware of the IP addresses of other *4ESS* switches and therefore cannot talk to other *4ESS* switches in the AT&T network.
- RUAS with third party software packages residing on a standalone workstation used to perform RUAS functions remotely to the 1B processor - located in the ITN and the NESAC. This configuration as used by NESAC is capable of connecting with every switch in AT&T's network.
- NFM Workstation with the RUAS application and third party software packages remotely mounted from servers residing in the NCC. This configuration is also capable of connecting with every switch in the AT&T network.

RUAS in the NCC

Figure 1-1 shows RUAS in its configuration as an NFM application in the NCC.

The NCC contains an NFM *Ultra*[2] 5 workstation, and a Cisco router linked to East and West Mini-computer Maintenance Operations Centers (MMOCs). The NCC also has a Sun *Enterprise*[3] 5500 server where the RUAS software and data for the NFM workstation resides. The NFM workstation accesses the RUAS software by remotely mounting file systems from the RUAS server. NFM provides access security for all RUAS transactions.

The East and West MMOCs, located respectively in Conyers (Atlanta) and Denver, each contain a Cisco router, and one or more Tandem *PUMA*[4] (S4000) processors for the NFM Integrator Module (TIM) and the NFM Surveillance Module (TSM); and a *Bay Networks* Backbone Concentrator Node (BCN) router. The concentrator nodes are used to link the MMOC Local Area Network (LAN) and the *4ESS* switch site LANs with 9.6 Kbps synchronous links.

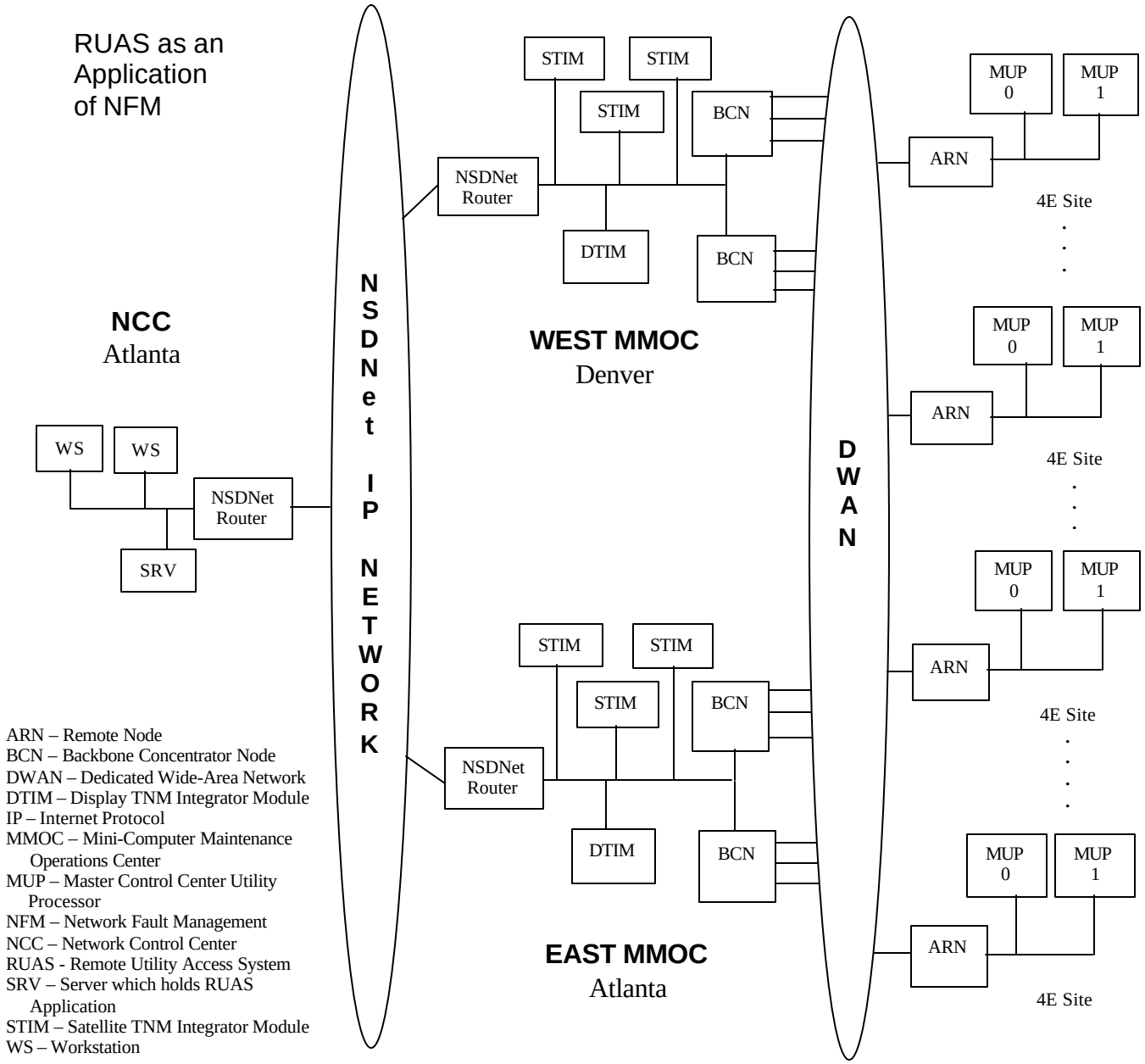
Each of the *4ESS* switch sites contain a Bay Networks Advanced Remote Node (ARN) router and two MUPs on an Ethernet LAN. The *4ESS* switch sites are connected to the MMOCs by 9.6 Kbps synchronous links.

[2] Registered trademark of Sun Microsystems, Inc.

[3] Registered trademark of Sun Microsystems, Inc.

[4] Registered trademark of Tandem Computers, Inc., a wholly owned subsidiary of Compaq Computer Corporation.

Figure 1-1 - RUAS in the NCC



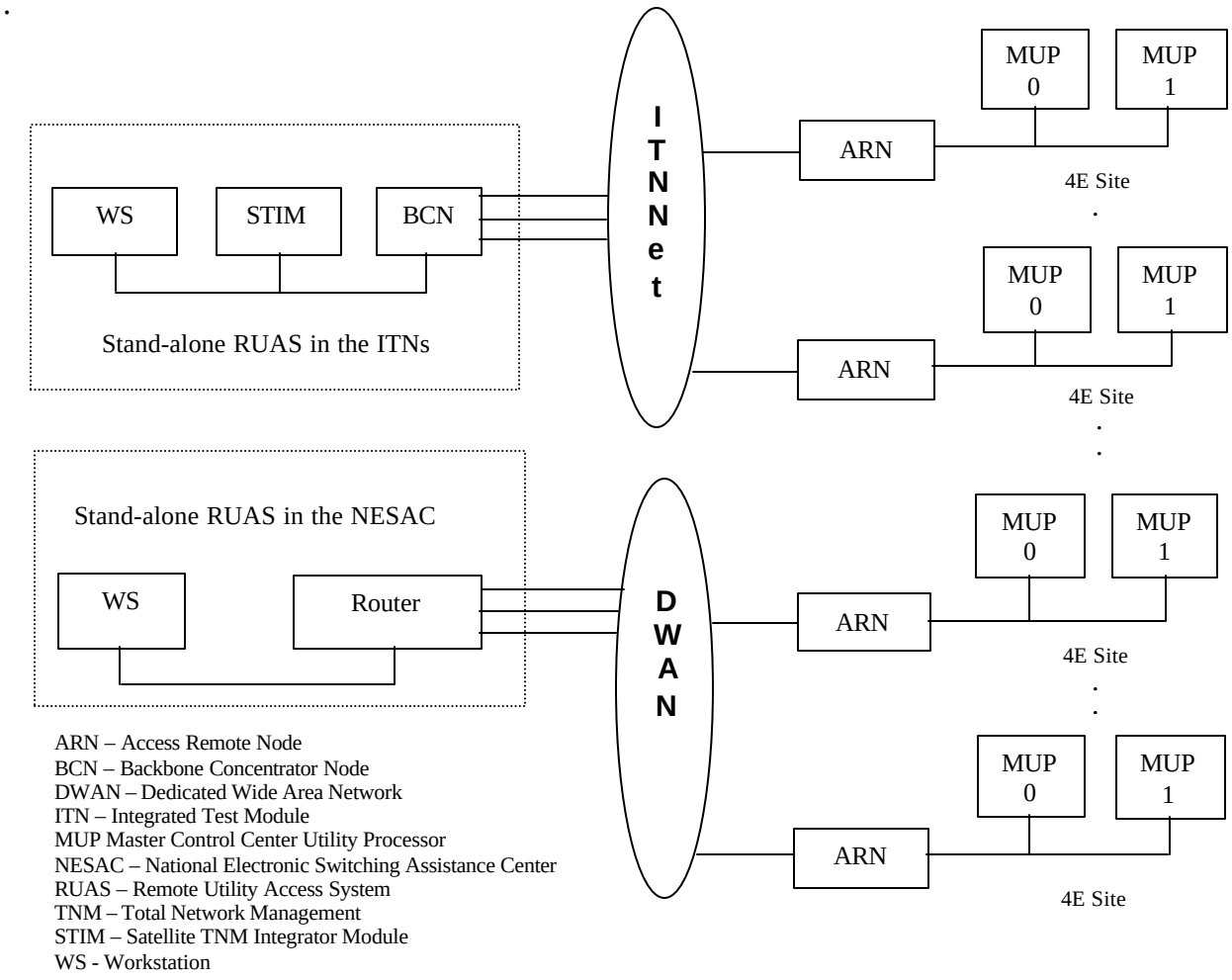
RUAS in the ITNs and NESAC

Figure 1-2 shows RUAS in its standalone configuration in the ITNs and the NESAC.

The RUAS at the ITN contains a workstation, a TIM, and a BCN, connected via ITNNet to the two *4ESS* ITN switches. Each switch contains an ARN router and two MUPs.

The RUAS at NESAC contains a workstation and a router connected via a DWAN to each of the *4ESS* switches.

Figure 1-2 - RUAS in the ITNs and the NESAC



US/RUAS Equipment and Software

The US/RUAS network consists not only of the software for comprising the tool, but also the workstations, servers, and routers necessary for operation of the US/RUAS tool. This equipment and software was deployed with Feature 545 – US/RUAS Y2K Compliance feature.

Table 1-A. Y2K US/RUAS Equipment and Software

Component	Equipment/Software
US direct-connect ITE workstation	Sun *Ultra 5* running *Solaris* 2.6
RUAS standalone workstation	Sun *Ultra 5* running *Solaris* 2.6
Server on which the RUAS application is installed.	Sun *Enterprise* 5500 server running *Solaris* 2.6
NFM workstation with RUAS application running on a Server	Sun *Ultra 5* running *Solaris* 2.6
NFM (STIM/DTIM) server	Tandem *PUMA* (S4000) processor running NFM release 6.3 or greater.
Routers	Bay Networks ARN (Model CV1001004) BCN (Model 73000)

Third Party Software

Third party teleconferencing software packages are used to allow the NCC and NESAC to share screen displays. The existing third party software that needs to be supported includes the following:

Table 1-B. Third Party Software Used with Standalone RUAS & NFM Application (Note)

Tool	Version	Vendor
Solaris	Version 2.6	*Sun* Microsystems
XTvision[5]	Version 2.0	*VisualTek* Solutions

Note: *CDE* has replaced *Motif* as the supported Sun Microsystems window manager.

[5] Registered trademark of VisualTek Solutions, Inc.

Software Update

The US and RUAS tools are managed and delivered outside of the processes that govern the regular *4ESS* quarterly releases. US and RUAS are supported in the following manner:

- Routine maintenance that includes updating address maps for RUAS is performed at each base release and for each quarterly release at Q4. Additionally, changes to the tools can also be necessitated due to new releases of NFM, the system by which RUAS interfaces with the field *4ESS* switches, or changes to the operating environment of AT&T.
- The US/RUAS tapes are tested at a system lab of Lucent Technologies before going to the ITN.
- US/RUAS software will be hand-delivered to the AT&T Generic Technical Manager at the ITN along with a current copy of the *4ESS Switch Utility System User's Guide (Solaris 2.6 Version)* (234-310-001AC).

□

Call Flow (Not Affected)

Provisioning (Not Affected)

Recording (Not Affected)

Network Management (Not Affected)

Maintenance and Troubleshooting (Not Affected)

Transition Considerations

Feature Deployment It is not necessary for all *4ESS* switches to be running the 4E25 Release 1 Generic for this feature to be fully operational.

Feature Activation This feature is turned on by hardware/software deployment.

Input/Output Manual Pages (Not Affected)

2 *4ESS*™ Switch Signaling Capacity Improvements Feature (6915i)

Overview

Description Features 6915i and 6915 are focused on the throughput between the 1B Processor and 3B/Common Network Interface (CNI). The Direct Link Node – Attached Processor (DLN-AP) is upgraded from a 68030 (AP30) processor to a 68060 (AP60). The features track and manage the hardware/software associated with the DLN-AP Upgrade. Feature 6915 manages the hardware, and Feature 6915i manages the software.

Purpose This chapter provides information to users on Feature 6915i (software) and Feature 6915 (hardware) including description, recording, and transition considerations.

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Feature Description

Background

The network signaling capacity exhaust is anticipated to occur in the timeframe of the years 2000 to 2001. Features 6915i and 6915 provide a short-term solution to bridge the gap until the long-term solution is available.

These features provide a near-term solution for part of the signaling relief. They focus on the strategy that provides just enough capacity relief in the DLN such that it would no longer be the bottleneck. It would be no or little benefit to pursue solutions that provide significantly more signaling capacity since the switch would be exhausted at other shared resources, e.g. 1B and 3B, before the excess signaling capacity can be used. Traffic growth beyond the 2003 time frame would be migrated off the 4E and moved onto the new switch network. By enhancing the AP for DLN, the increased capacity is expected to exceed the 1B real-time processing capacity.

Description

These features are focused on the throughput between the 1B Processor and 3B/Common Network Interface (CNI). The Direct Link Node – Attached Processor (DLN-AP) is upgraded from a 68030 (AP30) processor to a 68060 (AP60). The features track and manage the hardware/software associated with the DLN-AP Upgrade. Feature 6915 manages the hardware, and Feature 6915i manages the software.

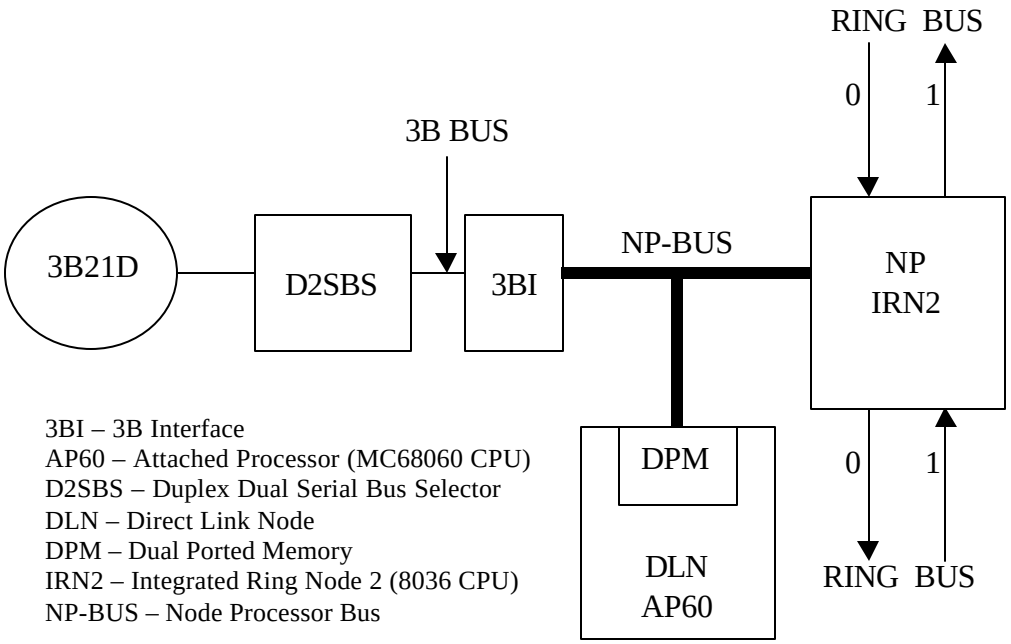
Benefits

The *4ESS* switch signaling capacity is increased to meet increasing demand: more call attempts, more signaling intensive features, and the projected trunk growth for new business opportunities.

Hardware

DLNs are converted from 68030 (AP30) to 68060 (AP60). The new DLN physical architecture is shown in Figure 2-1.

Figure 2-1 - Direct Link Node Physical Architecture



□

Call Flow (Not Affected)

Provisioning (Not Affected)

Recording (Not Affected)

Network Management (Not Affected)

Maintenance/Troubleshooting

DEMS/DARICS The operating system Dynamic Engineering Mechanized System/Data Acquisition Reports and Integrated Communication System (DEMS/DARICS) is updated to provide 15 minute DLN Attached Processor (AP) and Node Processor (NP) utilization reports.

□

Transition Considerations

Feature Deployment

Each *4ESS* switch must be upgraded to the AP60 DLN (Feature 6915) for Feature 6915i to be fully operational. The hardware and associated conversion scripts will be available in the 4E25R4 timeframe. Therefore, the DLNs may be converted to AP60 after the 4E25R4 software generic is applied.

CNI growth is documented in 234-153-055AC, *Common Network Interface Growth/Degrowth.*

It is not necessary for this feature to be deployed in all *4ESS* switches for Feature 6915i to be fully operational.

Feature 6915i is dependent on the following features. These features must be installed and fully operational for Feature 6915i to work properly.

- 4694 - *DLN Capacity Upgrade – Phase 2* (4E22R1 Generic, documented in Product Release Document 234-090-221AC)
- 5222 - *3B21D APS Upgrade – Hardware* (documented in Product Release Document 234-090-231AC)

Feature Activation

Features 6915i and 6915 are activated by software and hardware deployment.

Input/Output Manual Pages (Not Affected)

3 Enhanced Scheduling and Executive Control Feature (6989)

Overview

Description This feature enhances the task scheduling algorithms in order to take advantage of the faster 1B Processor. The task scheduling algorithms improve the call processing capability of the *4ESS*™ switch and thus provide more capacity.

Purpose This chapter describes the changes to the task scheduling and call admission algorithms so that the 1B Processor is used more efficiently.

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Feature Description

Introduction

This feature, *Enhanced Scheduling and Executive Control*, was identified by the *4ESS* switch Capacity Mining team in response to the need for additional call capacity in the *4ESS* switch. By restructuring the software to allocate more resources (for example, call registers and other facilities) during peak Base Level Cycles (BLCs) and distributing the load more evenly, additional real time per BLC is available for call processing. This improves the call processing capability of the switch and provides more capacity.

When the 1B Processor replaced the 1A Processor of the *4ESS* switch Central Control, the average length of the BLC was reduced more than 50 percent. As a result, the danger of a *4ESS* switch reaching real-time overload was significantly reduced. At that time, no other efforts were undertaken to determine if other improvements could be achieved by taking advantage of the faster 1B Processor. Since the deployment of the 1B Processor, there has been a significant increase in the call complexities in the switch, resulting in lower Busy Hour Call Attempt (BHCA) capacity of the 1B Processor. On the other hand, *4ESS* switches continue to grow with more terminations and higher call volumes, making improvements necessary in the 1B Processor capacity, especially under bursty traffic. This feature makes changes to the task scheduling and call admission algorithms so that more work (in the form of calls) is given to the 1B Processor, thereby using the 1B Processor real time more efficiently.

This feature does not attempt to save any 1B Processor real time. Instead, it attempts to distribute work and resources more efficiently to make better use of the real time available to a system in overload. The introduction of this feature is expected to result in a 6 to 10 percent greater call capacity in the 1B Processor.

Background

The parameters used to establish task scheduling for the 1A Processor Central Control were based on call setup time requirements, call capacity (calls per hour) requirements, and office size requirements (number of terminations per *4ESS* switch office). This dictated the

frequency of program execution needed to satisfy these requirements. As a result, the Executive Control Program (responsible for scheduling Base Level and Interject Programs in the switch) was designed to execute all its scheduled tasks well within 100 milliseconds. The Overload Control Program (monitors and controls real-time usage) was designed to manage the call admission algorithm and the use of system resources efficiently. The Overload Control Program was also responsible for taking action when the system reached an overloaded state. These two programs were designed to work hand-in-hand to administer the workload given to the 1A Processor and to maintain a stable system.

Over the past 20 years, new tasks have been added to the Executive Control Program as new hardware was introduced (for example, the Service Circuit System) and advanced services (for example, Advanced 800 Services) requiring more sophisticated call processing capabilities were added. These tasks use more real time and the length of the average BLC is increased accordingly. Eventually, it became necessary to replace the 1A Processor with the faster 1B Processor. Because the software running on the 1A Processor was mature and reliable, most of the software was ported unchanged to the 1B Processor.

At the time of the transition, the primary concern was real-time exhaust. Although the introduction of the 1B Processor as the *4ESS* switch Central Control resulted in dramatic improvements in real-time performance and reliability, the real-time improvement was limited to reducing the average length of the BLC while doing the same amount of work as the 1A Processor. This was not unexpected because the workload offered to both processors was essentially the same.

□

Call Flow (Not Affected)

Provisioning

Structure Affected

OD4OFCCOPY2

Item **OD4F29** is assigned as the office parameter to indicate if this feature is activated. **On** means the parameter is active and the feature is activated. **Off** means the feature is disabled (inactive). Table 3-A describes the state of F29.

Table 3-A - OD4F29 State Assignments

Item/State	Word	Disp.	Size	Description
OD4F29 4ODFB_OFF (=0) 4ODFB_ON (=1)	0	4	1	Enhanced Scheduling and Executive Control Feature Off—the feature is disabled (default) On—feature is enabled

The F29 indicator flag is populated using Recent Change (RC) Form 809 and verified using Verify Forms 16az and 8j. Table 3-B lists the population rules.

Table 3-B - OD4F29 Population Rules

RC Form 809 Entry				
FEATURE ITEM	**ON OR OFF**	**Populates Item**	**With**	**Checks**
F29	ON	OD4F29	4ODFB_ON	None
	OFF		4ODFB_OFF	None

Recent Change Form 809

This form is used to enable and disable the feature bits. The layout of this form is not changing. Population rules are listed in Table 3-B.

□

Recording (Not Affected)

Network Management

Switch Measurement Report

The following hourly measurements are being added to the *4ESS* Switch Measurement Report and are independent of the value of the feature bit:

- The number of times the switch stops servicing its receive signaling buffer because a limit on the number of messages is reached
- The number of times additional resources are allocated
- The number of BLCs whose length exceeds the activation threshold.

The Switch Measurement Report is scheduled in a given *4ESS* switch and printed on the 1B Processor Output Channel. This requirement will be deployed in the 4E25 Release 3 Generic and retired in the 4E26 Release 1 Generic.

Machine Load and Service Summary

The following hourly measurements must be added to the *4ESS* switch Machine Load and Service Summary (MLSS) Report:

- The number of times the switch stops servicing its receive signaling buffer because a limit on the number of messages is reached
- The number of times additional resources are allocated
- The number of BLCs whose length exceeds the activation threshold.

The MLSS Report is scheduled in a given *4ESS* switch and printed on the 1B Processor Output Channel. Because the MLSS Report can only be added on a generic boundary, this requirement will be deployed in the 4E26 Release 1 Generic.

Capacity and Performance

This feature predicts a minimum 6 percent increase in useable Busy Hour Call Attempt (BHCA) capacity in the1B Processor. It changes the strategy of the scheduler and executive control to defer nonessential work and allocate more time for call processing during peak traffic periods. This reduces the probability of an overload condition before it occurs.

□

Maintenance/Troubleshooting (Not Affected)

Transition Considerations

Feature Deployment

It is not necessary for the 4E25 release 3 Generic to be deployed in all *4ESS* switches in the network for this feature to be fully operational.

Feature Activation

This feature is activated by an Office Data Assembler (ODA) RC using RC Form 809. The FEATURE ITEM field is set to **F29** and the ON OR OFF field is set to **ON**.

□

Input/Output Manual Pages (Not Affected)

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4 Non-Emergency (NE) Initial Address Message (IAM) Message Transfer Part (MTP) Priority Level at the Egress of the Network Feature (7106)

Overview

Description This feature allows the Terminating *4ESS* switch to set the Initial Address Message (IAM) Priority level to the American National Standards Institute (ANSI) standard for non-emergency calls on egress.

Purpose This chapter provides the user with information on the feature description, provisioning, transition considerations, and input/output manual pages..

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Description

Background

Previous to this feature, the ASN network supported different values for the IAM MTP (Message Transfer Part) priority level than the ANSI standard. This feature changes the value of this priority level at the egress switch. Within the AT&T network, however, the levels are still different than the ANSI standard.

Feature Description

In order for the 4ESS Terminating AT&T Switch (TAS) to have the ability to make changes to the IAM MTP priority level associated with Non-Emergency (NE) calls, this switch must first be able to distinguish between NE calls and other types of calls. This is accomplished by having the TAS identify NE calls as those for which the Calling Party's Category (CPC) parameter in the IAM has a codepoint value not equal to 11100000, 11100001, or 11100010. Emergency service calls have a codepoint value of 11100000, high priority emergency service calls have a codepoint value of 11100001, and National Security and Emergency Preparedness (NS/EP) calls have a codepoint value of 11100010. The CPC parameter value for a call is set by the *4ESS* Originating AT&T Switch (OAS).

The new recent changeable parameter, named the *ANSI Standard NE IAM MTP parameter*, contains the value of the recommended ANSI standard for the NE IAM MTP priority level. The default value for this parameter is 0, which corresponds with the current recommended standard.

The second new recent changeable *4ESS* office parameter, named the *NE Egress MTP indicator*, indicates whether the NE IAM MTP priority level should be set to the ANSI standard or to the ASN-assigned value for NE calls. The ASN-assigned value is the priority level that the TAS receives from the OAS. This value is currently equal to 1. If the value for this parameter is OFF, the TAS maintains the NE IAM MTP priority level at the ASN-assigned value for NE calls. If the parameter value is ON, the TAS changes the value of the NE IAM MTP priority level to the ANSI standard for NE calls. The NE Egress MTP indicator could be either ON or OFF, and could be modified on an individual switch or nationwide basis. At this time, it is more appropriate to maintain the NE IAM MTP priority level at the ASN-assigned value for NE calls until all the LECs have complied with the ANSI standard. Therefore, the default value for the NE

Egress MTP indicator is OFF.

Benefits This feature allows calls transversing the AT&T network to conform to the ANSI standards for IAM MTP priority levels at the interfaces.

Call Flow (Not Affected)

Provisioning

Recent Change Form 809 RC Form 809 is modified to allow feature bit **PF71** to turn this feature ON and OFF.

Recent Change Form 810 RC Form 810 is modified to allow the parameter **NEIPAV** to be used to provision the AT&T Egress Non Emergency IAM MTP (ANSI standard) Priority level Value. Valid entries for priority level are 0 to 3.

Verify Input Message 16ds

Figure 4-1 shows Verify Input Message 16ds – Request Verification of the Egress Non-Emergency IAM MTP (ANSI) Priority Level Data. This is a new message, added with Generic 4E25, Release 3.

This message requests the verification of the AT&T Egress Non-Emergency IAM MTP ANSI Priority Level value and the ON/OFF status of Feature 7106.

Message Entries

VER:MISC NEIPAV!(EOT)
The above format represents the entries that comprise this input message. The format is fixed; there is no variable data. The EOT following the message denotes operation of the End of Transmission control on the keyboard.

Figure 4-1 - Verify Input Message 16ds – Request Verification of the Egress Non-Emergency IAM MTP (ANSI) Priority Level Data

SAMPLE MESSAGES

```
INPUT:                          VERIFY 16ds

                Ex. 1    VER:MISC NEIPAV!(EOT)

OUTPUT:                         VERIFY 6ds

                         VER:MISC,OPT(NEIPAV):
```

RECENT CHANGE INPUT SOURCE – FORM #810 – CHANGE MISCELLANEOUS FEATURE INFORMATION,
AND – FORM #809 – CHANGE FEATURE BITS

Verify Output Form 6ds

Figure 4-2 shows Verify Output Form 6ds – Egress Non-Emergency IAM MTP (ANSI) Priority Level Data. This is a new message, added with Generic 4E25, Release 3.

This message provides the ability to verify the AT&T Egress Non-Emergency IAM MTP ANSI Priority Level value and the ON/OFF status of Feature 7106.

Message Entries

ANSI IAM MTP VALUE
The recommended Non-Emergency ANSI IAM MTP Priority Level value.
Entries: 0 to 3.

FEATURE MODE:
The Feature operation mode which can be either OFF or ON.
Entries: **OFF** or **ON**.

Figure 4-2 - Verify Output Form 6ds – Egress Non-Emergency IAM MTP (ANSI) Priority Level Data

VERIFY EGRESS NON_EMERGENCY IAM MTP (ANSI) PRIORITY LEVEL DATA

```
INPUT:                      VERIFY 16ds

VER:MISC NEIPAV!(EOT)


OUTPUT:                     VERIFY 6ds

VER:MISC,OPT(NEIPAV):

ANSI IAM MTP VALUE: _,    FEATURE MODE: ---
```

RECENT CHANGE INPUT SOURCE – FORM #810 – CHANGE MISCELLANEOUS FEATURE INFORMATION,
AND – FORM #809 – CHANGE FEATURE BITS

Recording (Not Affected)

Network Management (Not Affected)

Maintenance and Troubleshooting (Not Affected)

Transition Considerations

Feature Deployment

It is not necessary for all the *4ESS* switches in the network to be running the 4E25 Generic, Release 3 for this feature to be fully operational.

Feature Activation

This feature is activated using a 1B Processor Recent Change. The feature bit **PF71** is set using RC Form 809. To activate this feature, set the feature bit to **ON**. To deactivate this feature, set the feature bit to **OFF**.

Input/Output Manual Pages

Input Manual Page - New

The following input manual page is new with this feature:

VER:MISC-NEIPAV

Output Manual Page - New

The following output manual page is new with this feature:

VER:MISC-NEIPAV

5 AT&T Network Connection (ANC) Enhancements to Special Routing Features (7497)

Overview

Description This feature provides special routing functionalities in addition to Features 7323 and 6266, specifically feature activation and Carrier Identification Code (CIC) association.

Purpose This chapter provides the user with information on the feature description, call flow, provisioning, transition considerations, and input/output manual pages.

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Feature Description

Functionality

This feature provides updated functionality associated with two AT&T Network Connection (ANC) features, Enhanced CIC Routing for International Services (ECR International, Feature 6266) and North American Numbering Plan (NANP) CIC Routing (Feature 7323). These features provide alternative routing options for International and Domestic switched access Resell and Nodal access Carrier Solutions Nodal (CSN) calls, respectively, than what is provided by default. Instead of delivering such calls directly to a foreign Postal Telephone and Telegraph (PTT) or Local Exchange Carrier (LEC) for call completion, as is typically done for AT&T Retail calls and Resell / CSN calls, they would be delivered to an external customer platform. Thus, alternative routing data is provided in the *4ESS* switch to support these features, which is based on the Country Code or Numbering Plan Area (NPA) as well as the CIC.

Routing Feature Activation

This feature defines a per-CIC feature on/off parameter for each routing feature. This capability is provided so that all Resell/Carrier Solutions Nodal (CSN)-identified calls are not examined for routing eligibility to the extent that they have been. More specifically, only Resell and CSN calls with a CIC value that has this feature on/off bit turned on is checked against the Operator Services Position System (OSPS) Access ID table to determine if either of these routing features is eligible. This capability is referred to as "Feature Activation."

CIC Association

A second capability provides an association between CICs for each routing feature. In the *4ESS*, a given CIC (referred to as Base CIC) can be associated with a Parent CIC for Enhanced CIC Routing (ECR) International purposes and with a separate Parent CIC for NANP CIC Routing purposes. Via *4ESS* call processing logic, a Resell /CSN call associated with a Base CIC uses the Parent CIC, if provisioned, to determine whether a special route to an external customer platform is provisioned. This capability is referred to as "CIC Association".

Benefits

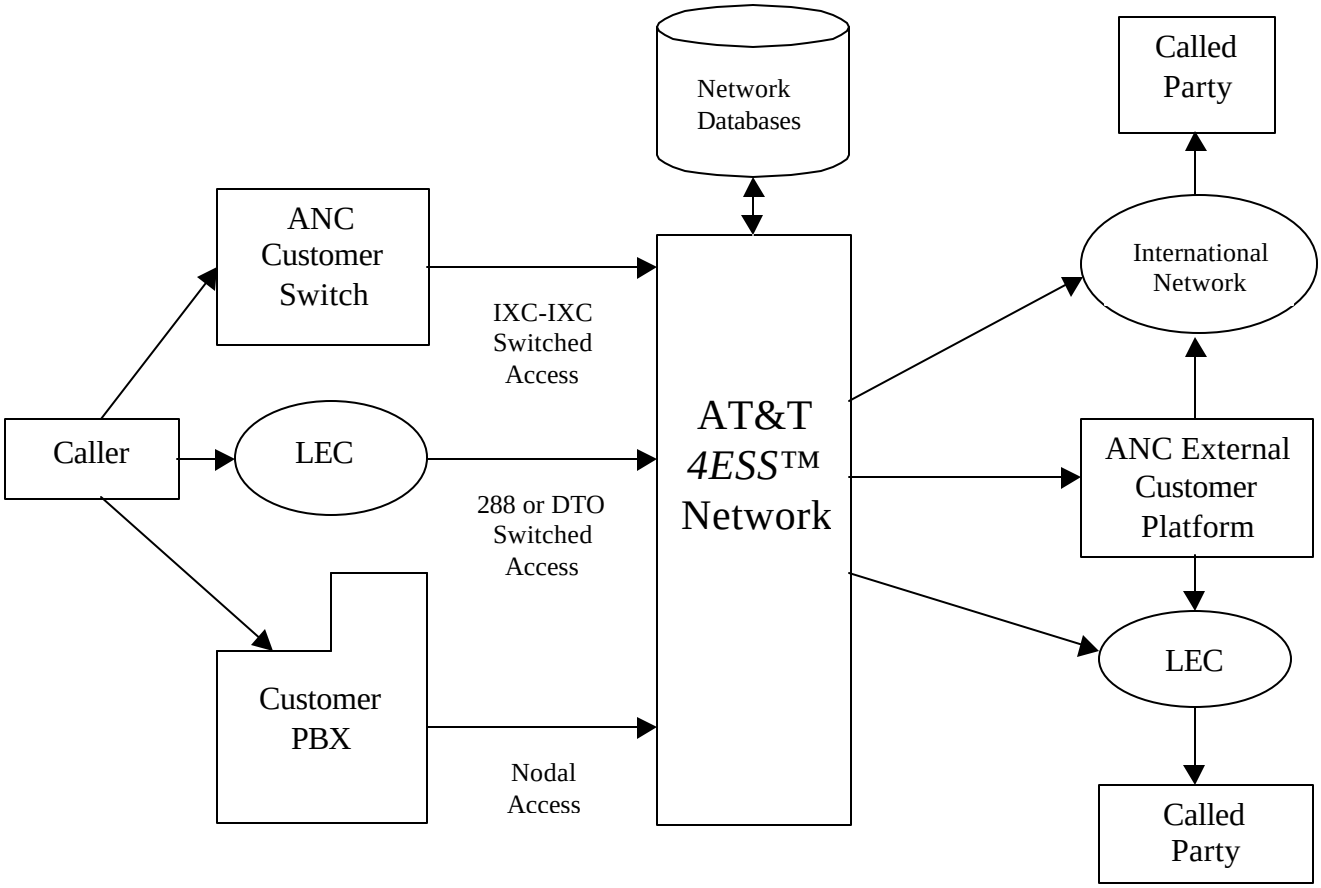
This feature allows control of features 7323 and 6266, rather than all ANC calls checking the OSPS ID table. Also, this feature allows multiple CICs to use the "pseudo-CIC" in construction of the OSPS ID table for routing.

□

Call Flow

Call Flow Diagram Figure 5-1 shows the call flow architecture that supports Feature 7497.

Figure 5-1 - ANC Call Flow Architecture for Enhancements to Special Routing Features



ANC – AT&T Network Connection
DTO – Dedicated Trunk Subgroup Option
IXC – Interexchange Carrier
LEC – Local Exchange Carrier

□

Call Flow Narrative

The following call flow (illustrated in Figure 5-1) provides a representation of how the new capabilities of Feature 7497 apply to Resell and CSN calls in the *4ESS* switch. This flow represents a logical view of call processing / feature invocation and does not necessarily represent the actual order that functionality is implemented in the *4ESS* switch. For this flow, it is assumed that the office on/off parameters for Features 6266, 7323, and 7497 are set to ON.

1. The calling party dials an NANP or International number, as follows:
   A. For switched access, the calling party is either pre-subscribed to an ANC carrier or dials the ANC carrier as part of a dialing prefix. If presubscribed, the caller dials 1 + 7-digit NANP/10-digit NANP for Domestic, or 011+ CC + NN for International. Otherwise, the caller prefixes the above with the code "101+CIC", where the CIC is a 4-digit code identifying the caller's carrier of choice, which includes a prefixed 0 if the carrier's code is 3 digits.

   B. For Nodal access, the calling party dials 1+ 7-digit NANP/10-digit NANP for Domestic, or 011+ CC + NN for International.

2. For switched access, the local carrier uses the received CIC, if supplied, otherwise uses the CIC to which the caller is presubscribed, to route the call onto a trunk group for which the carrier's 1+ NANP calls for Domestic or 011+ calls for International are designated. For an ANC customer, this is either onto a switched access Dedicated Trunk Sub-Group Option (DTO) trunk group or a switched access 288 trunk group to the AT&T *4ESS* network. If the ANC customer's switch has received the call, it can be sent to AT&T via Interexchange Carrier (IXC)-IXC switched access trunks (identical to DTO trunks from an AT&T *4ESS* perspective).

   For Nodal access, the calls arrive directly from the Nodal access trunk group.

3. The call arrives at an AT&T *4ESS* switch on either a switched access trunk group or Nodal access trunk group, per *Step 2*. The *4ESS* must derive the CIC associated with the call. For switched access calls, the *4ESS* must also determine whether the derived CIC is a Resell CIC or not.

   A. For switched access trunk groups, the *4ESS* uses existing functionality to determine the CIC of the call, which can be

either via signaling or via Trunk Group characteristics. For switched access, the *4ESS* uses the derived CIC to determine whether or not the call is a Resell call via existing functionality.

B. For Nodal access trunk groups, the *4ESS* identifies the call as a Carrier Solutions Nodal (CSN) call if the CSN parameter of the trunk group has been set to a value of Resell or AT&T International Wholesale Service (AIWS). Additionally, a CIC must be provisioned on these Nodal trunk groups, via the Carrier ID (CID) trunk group parameter, in order for calls originating on such trunk groups to be eligible for ECR International or NANP CIC Routing functionality.

If the call has been determined not to be a Resell or CSN call, per the above, then call processing continues, and Feature 7497 does not apply. If the call is a Resell or CSN call, continue with *Step 4*.

4. Support NAI queries, for switched access Resell call types that support it.

5. Appropriate service database queries are supported, as follows:

A. Resell platform feature-associated database queries for switched access calls are supported. These queries support determination of featured versus non-featured CICs as well as featured and non-featured Automatic Number Identification (ANI)s as a basis for querying the No. 2 Direct Services – ANI Based (2DSA) Network Control Point (NCP) for potential feature invocation. Segmentation Directory (SD) Phase 3 alters the querying architecture associated with determining CIC/ANI feature applicability. *4ESS* actions in this area are dependent on its interactions with the SD database and the 2DSA database (acting as a service processor), as well as the *4ESS*'s SD transition mode setting for Resell calls (i.e., Present Mode of Operation [PMO] versus SD Mode of Operation [SMO]). Note that this SD interaction also impacts the Resell determination of *Step 3*. That is, if an SPResponse is received by the *4ESS* with a Service Processor Service Identification (SPSI) value of "Carrier Solutions", then the call is recognized as a Resell call. Thus, Feature 7497 applies to these calls. For other SPSI values returned that result in other services being identified, Feature 7497 does not apply. If no SPResponse applies (e.g., an SDResponse is returned to the *4ESS* with instructions to proceed), then Carrier Solutions determination is as defined in *Step 3A*.

B. Nodal access database queries are supported. These queries are determined via the underlying base service of *MEGACOM*[*] or Software Defined Network (SDN) (whichever applies to the Nodal access TG), as opposed to the Resell-based database architecture of *Step 1A*. The SD architecture also has impact on these services in a similar fashion to what is described for switched access calls via *Step 5A*.

Existing Service Identity Index derivation is provided.

6. The *4ESS* determines the appropriate routing number to use as a basis for determining ECR International or NANP CIC Routing eligibility, to determine when either routing feature applies:

   A. For ECR International, Feature 6266 defines which routing number to use, either using the routing number from a database response or using the Called Party Number received. The routing number must be of the format CC-NN to be considered for ECR International processing, and a non-zero FAI value returned in a database response disqualifies the call from receiving ECR International routing. Feature 5641 (SD Phase 3) provides an additional query response from the database for which the routing number needs to be derived. Feature 6266 excludes Operator Assistance Required Resell / CSN calls and Universal International Freephone Number (UIFN) calls from ECR International eligibility.

   B. For NANP CIC Routing, Feature 7323 defines the routing number to use as a basis for NANP CIC Routing eligibility (which include SD Phase 3 considerations), and defines the eligibility criteria for NANP CIC Routing, which specifies that the routing number must be in NANP format, the call must not be an Operator Assistance Required or Directory Assistance Required call, the call must not be eligible for 700 PIC Verification treatment, and the call must not have a dialed NPA of 500, 710, 8YY, or 900.

7. If ECR International or NANP CIC Routing is eligible via *Step 2B*, the *4ESS* applies an additional criterion for each routing feature as follows:

   A. For ECR International, the new ESRF table is consulted, as

[*] *MEGACOM* Services is a registered trademark of AT&T

follows:

i. If the derived CIC from *Step 3* is found as a Base CIC field value, and the value of the associated International Feature Activation field is set to ECRI ON, then ECR International is still eligible, and the call flow continues with *Step 8*.

ii. Otherwise, if the value of the associated International Feature Activation field is set to any value other than ECRI ON or if the derived CIC is not found as a Base CIC field value, then ECR International is no longer eligible, and default routing of the CC-NN routing number ensues. **End of call flow.**

B. For NANP CIC Routing, the new ESRF table is consulted, as follows:

i. If the derived CIC from *Step 3* is found as a Base CIC field value, and the value of the associated Domestic Feature Activation field is set to ANCR ON, then NANP CIC Routing is still eligible, and the call flow continues with *Step 8*.

ii. Otherwise, if the value of the associated Domestic Feature Activation field is set to any value other than ANCR ON or if the derived CIC is not found as a Base CIC field value, then NANP CIC Routing is no longer eligible, and default routing of the NANP routing number ensues. The one exception to the default routing treatment is for calls with a 700 NPA, which must be Final Handled. **End of call flow.**

8. The *4ESS* constructs a 10-digit number for searching the OSPS Access ID table, using new logic for each routing feature as follows:

A. For ECR International, the *4ESS* searches for the derived CIC within the Base CIC field of the new ESRF Table.

i. If a match is found in the Base CIC field, and its associated International Parent CIC field has a value populated (i.e., not blank), then the *4ESS* constructs the 10-digit number for the OSPS Access ID (OAID) search except that the *4ESS* uses the International Parent CIC value for digits GHIJ instead of the derived CIC. This number would take the form of 100-CC-CIC. The International Parent CIC is

used for no other purpose.

ii. If the associated International Parent CIC field has a blank value or if no match is found in the Base CIC field corresponding to the derived CIC, then the *4ESS* constructs the 10-digit number for the OAID search without change.

B. For NANP CIC Routing, the *4ESS* searches for the derived CIC within the Base CIC field of the new ESRF Table.

i. If a match is found in the Base CIC field, and its associated Domestic Parent CIC field has a value populated (i.e., not blank), then the *4ESS* constructs the 10-digit number for the OAID search. However, the *4ESS* uses the Domestic Parent CIC value for digits GHIJ instead of the derived CIC. This number would take the form of 400-CC-CIC. The Domestic Parent CIC is used for no other purpose.

ii. If the associated Domestic Parent CIC field has a blank value or if no match is found in the Base CIC field corresponding to the derived CIC, then the *4ESS* constructs the 10-digit number for the OAID search without change.

For all subsequent steps, both the ECR International and NANP CIC Routing features is in force with no augmentation.

9. The *4ESS* looks for a match of the constructed 10-digit number from *Step 8* (depending on whether ECR International or NANP CIC Routing applies) in the 10-digit field of the OSPS Access ID table.

A. If a match is found in the 10-digit field, then the corresponding OSPS ID and routing data is used as the basis for routing the call.

B. If no 10-digit match is found in the OSPS Access ID Table for the constructed 10-digit number, and subsequent 6-digit and 3-digit lookups in the OAID Table also result in no match, then the *4ESS* ends further ECR International or NANP CIC Routing call processing and routes the call, with the exception of 700 NPA calls. 700 NPA calls receive final handling at this point for NANP CIC Routing.

C. If a match is found in the 10-digit field, but invalid or no routing has been provisioned into the switch for the corresponding OSPS ID, then the *4ESS* switch final handles the

call and applies vacant code treatment.

10. Assuming that valid routing is determined (valid OSPS ID Call Type treatments are SSP, MRT, and DSN), the *4ESS* applies the routing to determine the terminating *4ESS* switch. If the result is that the terminating switch is not the same as the originating switch, then the originating switch must send an Initial Address Message (IAM) to the terminating *4ESS*, which includes the following information:

    A. The Called Party Number, which is the number that was used in *Step 8* to construct the 10-digit number for OSPS Access ID table lookup.
    B. The Calling Party Number, which is the number originally received in the incoming IAM by the Originating ASN Switch (OAS), if an IAM was received and contained this parameter.
    C. The Charge Number parameter, which is the Charge Number or ANI received in the incoming signaling by the OAS for switched access calls (if present) or the True Billing Number (TBN) of the incoming Trunk Group for Nodal access calls.
    D. The Jurisdiction Information Parameter (JIP), if received in the incoming IAM.
    E. The Originating Line Information parameter, as received in the same field of the incoming IAM (SS7 signaling) or as received in the incoming II digits (EAMF signaling). If the OLI / II was not received in incoming signaling, then the OLI parameter is not included in this IAM.
    F. The Carrier Selection Indicator, as received in the incoming IAM, if applicable.
    G. The Carrier Identification Parameter, which includes the CIC that was derived for the call via *Step 3*.
    H. The Operator Systems Indicator (OSI) parameter, if available
    I. OSPS Identifier Generic Operations Parameter (GOP), populated with the OSPS ID determined via *Step 9*.

11. At the terminating switch (via IAM routing of *Step 10* or if the originating and terminating switches are the same), the OSPS ID is used for routing determination (as opposed to the Called Party Number). The routing treatment must be NDB and identifies a terminating trunk group.

12. The characteristics of the terminating trunk group determine the signaling information to be delivered to the external customer platform; the Trunk Group is built as an OCC TOT.

    A. If the trunk group is provisioned as an SS7 trunk group, the

IAM message from the terminating switch to the external customer platform includes the following parameters:

i. The Called Party Number, which is either a) the number that was used in *Step 8* to construct the 10-digit number for OSPS Access ID table lookup, if OAS = TAS, or b) the Called Party Number received from the OAS in the IAM, if OAS < > TAS.
ii. The Calling Party Number, which is either a) the number originally received in the incoming IAM by the OAS, if an IAM was received and contained this parameter, if OAS = TAS, or b) the Calling Party Number received from the OAS in the IAM, if OAS < > TAS and this parameter was received.
iii. The Charge Number parameter, which is the Charge Number or ANI received in the incoming signaling by the OAS for switched access calls (if present) or the True Billing Number (TBN) of the incoming Trunk Group for Nodal access calls.
iv. The Originating Line Information parameter, as received in the same field of the incoming IAM (SS7 signaling) or as received in the II digits (EAMF signaling). If not received, then the value 00 is used.
v. The Jurisdiction Information Parameter (JIP), if received in the incoming IAM.
vi. The Carrier Selection Indicator, as received in the incoming IAM, if applicable.
vii. The Carrier Identification Parameter for NANP CIC calls or the Transit Network Selection (TNS) parameter for ECR International calls, which includes the CIC that was derived for the call via *Step 3*.
viii. The Operator Systems Indicator (OSI) parameter, if available.

B. If the trunk group is provisioned as an EAMF trunk group, the following call setup parameters are sent by the *4ESS* to the external customer platform:

i. The Called Party Number, which is either a) the number that was used in *Step 8* to construct the 10-digit number for OSPS Access ID table lookup, if originating switch = terminating switch, or b) the Called Party Number received from the originating switch in the IAM, if originating switch < > terminating switch.
ii. The ANI, which is the Charge Number or ANI received in

the incoming signaling by the originating switch for switched access calls (if present) or the True Billing Number (TBN) of the incoming Trunk Group for Nodal access calls.

iii. The II digits, which is either the OLI parameter value of the incoming IAM (SS7 signaling) or the II digits (EAMF signaling). If not received, then the value 00 is used.

iv. The CIC that was derived for the call via *Step 3*, if this is an ECR International call.

13. If the terminating *4ESS* is not the originating *4ESS*, the terminating *4ESS* generates an EXIT message toward the originating *4ESS* upon initiating outgoing signaling, if the outgoing trunk type is Other Common Carrier (OCC) and the Trunk Subgroup (TSG) parameter, CARSON, is set to Y, as follows:

    A. If the egress trunk signaling is ISDN User Part (ISUP), then upon sending an IAM to the external platform, an ISUP EXIT message is sent in the backward direction toward the originating *4ESS*.

    B. If the egress trunk signaling is EAMF, then upon seizure of a trunk and receipt of a Wink from the external platform, an ISUP EXIT message is sent in the backward direction toward the originating *4ESS*.

14. At the originating *4ESS*, elapsed time recording begins, as follows:

    A. If the terminating *4ESS* is the originating *4ESS*, the egress trunk type is OCC, the TSG parameter CARSON is set to Y, and the egress signaling is ISUP, then upon sending an IAM to the external platform, the recording of elapsed time begins.

    B. If the terminating *4ESS* is the originating *4ESS*, the egress trunk type is OCC, the TSG parameter CARSON is set to Y, and the egress signaling is EAMF, then after seizing a trunk and upon receipt of a Wink, the recording of elapsed time begins.

    C. If the terminating *4ESS* is not the originating *4ESS*, then upon receiving an ISUP EXIT message from the terminating *4ESS* for this call, the originating *4ESS* begins recording of elapsed time.

15. Upon completion of the call, the circuit is disconnected and released in accordance with existing procedures.

16. The OAS then stops the elapsed time. The AMA record cut for this call is as defined for switched access Resell calls and for Nodal

access CSN calls. In addition, the *4ESS* appends Module 941 to the AMA record for Nodal access calls that are ECR International or NANP CIC routed to an external platform. Module 941 continues to be used to identify switched access Resell calls. Module 908 continues to be used for dedicated switched and Nodal access calls. Module 132 is used in support of Answer at Exit functionality, consistent with the ECR and NANP CIC Routing features. Existing structure codes are used to record the elapsed time.
End of call flow.

□

Provisioning

Feature Implementation

The following items have been created and administered through provisioning to ensure successful implementation of this feature:

- The *4ESS* switch supports a new office On/Off parameter, AESRF.
- At any time, if any of the Features 5198 (PF30), 5791 (PF49), 5840(PF50), 5918 (PF52), 6266 (PF56), or 7323 (PF74) is set to OFF, then the *4ESS* switch sets the AESRF office parameter to OFF automatically. NOTE: Features 6266 and 7323 are, in turn, dependent on features 5198, 5791, 5840, and 5918.

Forms Affected

Recent Change (RC) form 668 is new for this feature, and a new feature bit has been added to RC form 809. Verify forms 16bv and 6bv are new for this feature.

RC Form 668

Figure 5-2 shows Recent Change Form 668 – Enhancements for Special Carrier ID Code Routing. This is a new form, added with generic 4E25, Release 3.

RC Form 668 is used to provision the Enhancements for Special CIC Routing (ESCR) translator. This translator provides domestic and international routing information for a Basic Carrier ID Code (BCIC). The routing information is: a Domestic Status parameter (DSTAT), a Domestic Carrier ID Code (DCIC), an International Status parameter

(ISTAT), and an International Carrier ID Code (ICIC). NOTE: The BCIC entry must be unique (duplicate BCICs may not exist in the translator). The default entry for the status parameters, DSTAT or ISTAT is ON (a blank means ON). The DCIC and ICIC entries are optional – if they are specified, they do **not** have to be unique (multiple BCICs can specify the same DCIC and ICIC). Also, the DCIC and ICIC entries are **not** dependent on any state of the DSTAT and ISTAT entries.

An action of A is used to add an entry, a BCIC and its corresponding CIC routing information. An ACTION of C is used to change or replace the existing BCIC data with new data. An action of D is used to delete an existing BCIC entry and all corresponding data.

If ACTION = A, the 4-digit BCIC value must be unique and **not** found. Then the BCIC and its corresponding CIC routing information is added (maximum of 1024 entries allowed).

If ACTION = C, the 4-digit BCIC must have already been provisioned. Then the old data in the translator is changed or replaced with the new data specified on the form.

If ACTION = D, the 4-digit BCIC must have already been provisioned. Then the BCIC and its corresponding CIC routing information are deleted. NOTE: the DCIC, DSTAT, ICIC, and ISTAT fields are ignored for this action (they should be blank).

Form Entries for RC Form 668

- RC:ESCR;CHG;___:
  Entries: blank, BUF, TST, ACT, FTA, FTB, or FTT.

- **BCIC** – Basic Carrier ID Code
  Entries: 0000 to 9999.

- **ORNU** – Order Number
  Entries: 1 to 999999.

- **ACTION** – Action
  Entries: A, C, or D.

- **DSTAT** – Domestic Status Parameter
  Entries: blank, ON, or OFF.

- **DCIC** – Domestic Carrier ID Code
  Entries: blank, or 0000 to 9999.

- **ISTAT** – International Status Parameter
  Entries: blank, ON, or OFF.

- **ICIC –** International Carrier ID Code
  Entries: blank, or 0000 to 9999.

Figure 5-2 - RC Form 668 – Enhancements for Special Carrier ID Code Routing

FORM 668 ENHANCEMENTS FOR SPECIAL CARRIER ID CODE ROUTING

```
RC:ESCR;CHG;____:                        BCIC ____,

ORNU _________,   ACTION _,

DSTAT ____,  DCIC ____,  ISTAT ____,  ICIC ____,

REMARKS _____________________________________________________________!
```

ASSOCIATED VERIFY MESSAGES – 16bv (Input) and 6bv (Output)

RC Form 809 Item PF77 is assigned as the office parameter for RC Form 809 to indicate whether or not ANC Enhancements to Special Routing Features is on or off for the switch. ON indicates the feature is enabled or activated; the default is OFF.

PF77 cannot be set to ON unless all of the office On/Off parameters for features 5198 (PF30), 5791 (PF49), 5840 (PF50), 5918 (PF52), 6266 (PF56), and 7323 (PF74) are also set to ON. NOTE: Features 6266 and 7323 are, in turn, dependent on features 5198, 5791, 5840, and 5918.

Verify Input Form 16bv

Figure 5-3 shows Verify Input Message 16bv – Request Verification of the Enhancements for Special Carrier ID Code Routing Translator. This a new form, added with generic 4E25, Release 3.

This message requests the verification of the Enhancements for Special CIC Routing (ESCR) translator. This translator provides Domestic and International routing information for a Basic Carrier ID Code (BCIC). The routing information is: a Domestic Status parameter (DSTAT), a Domestic Carrier ID Code (DCIC), an International Status parameter (ISTAT), and an International Carrier ID Code (ICIC). If the optional input BCIC entry is specified, only that specific 4-Digit BCIC is verified and displayed. Otherwise, all the provisioned entries within the ESCR translator are verified and displayed.

Message Entries for Verify Input Form 16bv

VER:MISC ESCR[:BCIC a]!(EOT)
The above format represents the entries that comprise this input message. Lower case letters represent variable items in a given field. A bracket [ ] designates an optional item. Items without the bracket are required as a minimum input for this message. The EOT following the message denotes operation of the End of Transmission control on the keyboard. The following describes the entry for the variable item.

BCIC – Basic Carrier ID Code (optional)
Entries: 0000 to 9999.
If this optional BCIC entry is **not** specified, all the provisioned entries within the ESCR translator are verified (maximum of 1024 entries allowed).

Figure 5-3 - Verify Input Form 16bv – Request Verification of the Enhancements for Special Carrier ID Code Routing Translator

SAMPLE MESSAGES:

```
INPUT:                Verify 16bv

     Ex. 1     Verify a specific Basic Carrier ID Code.

               VER:MISC ESCR:BCIC 0345!(EOT)

     Ex. 2     Verify all Basic Carrier ID Codes provisioned.

               VER:MISC ESCR!(EOT)

OUTPUT:              Verify 6bv

                  VER:MISC,OPT(ESCR)
```

RECENT CHANGE INPUT SOURCE - #668 RC:ESCR;CHG;___:

Verify Output Form 6bv

Figure 5-4 shows Verify Output Message 6bv – The Enhancements for Special Carrier ID Code Routing. This a new form, added with generic 4E25, Release 3.

This output form provides the ability to verify entries provisioned in the Enhancements for Special CIC Routing (ESCR) translator. This translator provides Domestic and International routing information for a Basic Carrier ID Code (BCIC). The routing information is: a Domestic Status parameter (DSTAT), a Domestic Carrier ID Code (DCIC), an International Status parameter (ISTAT), and an International Carrier ID Code (ICIC). If the optional input BCIC input parameter is used, only that specific 4-Digit BCIC is verified and displayed. Otherwise, all the provisioned entries within the ESCR translator are verified and displayed.

Form Entries for Verify Output Form 6bv

VER:MISC,OPT(ESCR)
BCIC optional input message request.
If this option entry is **not** specified, all the provisioned entries within the ESCR translator are verified and displayed (maximum of 1024 entries allowed).

- **BCIC** – Basic Carrier ID Code
  Entries: 0000 to 9999.
- **DSTAT** – Domestic Status Parameter
  Entries: ON or OFF.
- **DCIC** – Domestic Carrier ID Code
  Entries: blank, or 0000 to 9999.
- **ISTAT** – International Status Parameter
  Entries: ON or OFF.
- **ICIC –** International Carrier ID Code
  Entries: blank, or 0000 to 9999.

Figure 5-4 - Verify Output Form 6bv – The Enhancements for Special Carrier ID Code Routing

```
INPUT:                          VERIFY #16bv

VER:MISC ESCR[:BCIC a]!(EOT)

OUTPUT:                         VERIFY 6bv

       VER:MISC,OPT(ESCR)
       BCIC    DSTAT   DCIC    ISTAT   ICIC
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
       _____,    ___,  _____,    ___,  _____,
```

RECENT CHANGE INPUT SOURCE - #668 RC:ESCR;GHG;___:

SNOW-R The Service Now – Routing (SNOW-R) operating system supports the following new capabilities for this feature:

1. Supports a new *4ESS* Recent Change and Verify data structure. This is referred to as the Enhancements to Special Routing Features (ESRF) Table. The table includes a Base CIC parameter, a Domestic Parent CIC parameter, an International Parent CIC parameter, a Domestic Feature Activation parameter and an International Feature Activation parameter. The Base CIC and Parent CIC parameters support CIC entry, with the Base CIC parameter being unique across entries, and the Parent CIC parameters allowing for duplicate values across entries. The two feature activation parameters each support as many as 8 values. These values are ANCR OFF and ANCR ON for the Domestic Feature Activation parameter, and ECRI OFF and ECRI ON for the International Feature Activation parameter.
2. Provides additional edits on the Parent CIC parameters to prevent a Parent CIC value from being provisioned if this value is not also provisioned as a Base CIC.
3. Supports the Recent Change and Verify functions of a new office on/off parameter for this feature, with dependencies on the office on/off parameters of the ECR International and NANP CIC Routing features.

□

Recording (Not Affected)

Network Management (Not Affected)

Maintenance/Troubleshooting (Not Affected)

Transition Considerations

Feature Deployment

It is not necessary for All *4ESS* switches in the network to be running the 4E25 Generic, Release 3 for this feature to be fully operational.

Feature Activation

To activate this feature, set the ODA bit, OD4PF77 to **ON**, and populate **RC Form 668**. To deactivate this feature, set OD4PF77 to **OFF**.

Feature Dependencies

Feature 7497 is dependent on Features 6266 and 7323, which are, in turn, dependent on features 5198, 5791, 5840, and 5918 (see Table 5-1). All of these features must be activated for Feature 7497 to function properly.

Table 5-1 - Feature 7497 Dependencies

Feature Number	Feature Title	Document
5198	CIC Based Resale	234-090-221AC
5791	Long-Term CIC-Based NAI	234-090-223AC
5840	1+CIC Wholesale Features – Phase 1	234-090-224AC
5918	Inband Q.931 Signaling for Carrier Solutions Nodal Customers	234-090-232AC
6266	Enhanced CIC Routing for International Calls	234-090-233AC
7323	ANC NANP CIC Routing	234-090-251AC

□

Input/Output Manual Pages

Input Manual Page - New

The following input manual page is new with this feature:

VER:MISC-ESCR

Output Manual Page - New

The following output manual page is new with this feature:

VER:MISC-ESCR

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6 Network Routing and Numbering Database for International Routing Feature (7592)

Overview

Description

This feature, *Network Routing and Numbering Database for International Routing*, changes the current *4ESS*™ switch routing architecture. The new database, Network Routing and Numbering Database (NRN DB) is queried by AT&T outbound and transit calls from an originating *4ESS* switch to obtain the following information:

- Terminating foreign carrier
- International Switching Center (ISC)/Gateway switch connected to the foreign carrier.

The architecture allows simpler changes to the international routing data that results in quick routing re-arrangement and route selection optimization.

Purpose This chapter describes the Routing Database architecture for the AT&T Switched Network (ASN) in support of outgoing International World Zone 1 (IWZ1), Non-World Zone 1 (NWZ1), and transit voice and data traffic.

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Feature Description

Introduction

In an effort to drive international telephone rates down, regulators are allowing administrations to terminate calls within countries using alternative means to avoid paying higher terminating charges levied by the traditional Telecommunications Administrators (TAs). Traffic handled in this manner is considered non-traditional traffic and includes both IWZ1 and NWZ1 traffic. These arrangements include the following:

- Re-filing traffic through an incumbent TA
- Using Alternate Transport Providers (ATPs) for outgoing traffic
- Re-originating incoming (transit) traffic.

AT&T also uses ATPs to carry its traffic to and from the United States to foreign countries.

The provisioning process for the existing AT&T *4ESS* switch codegroup translations and routing structures for international routing does not allow rapid provisioning changes to meet the Non-Traditional Market (NTM) needs. An AT&T 60-day task force study was carried out to answer the following needs:

- Reduce provisioning cycle time to redistribute traffic among ATPS and bilateral carriers
- Establish new ATP routes
- Support Time of DAY (TOD)/Day of Week (DOW) routing.

The recommended architecture was the Routing Database architecture because it could meet most NTM needs in the acceptable time frame and it could evolve to the new Edge Switch architecture of AT&T in the future.

With the activation of this feature, specialized international routing capabilities (for example, routing by service identity, routing by transport capability, carrier selection, and multiple egress routing) that are currently provided at the originating *4ESS* switch are provided through the new NRN database. Under this feature, AT&T outgoing IWZ1, NWZ1, and transit calls from an originating *4ESS* switch query the new database to obtain information on the terminating foreign

carrier/alternate service provider and the Network Switch Number (the address) of the ISC/Gateway switch that connects to the foreign carrier. Determination of the foreign carrier at the database is based on the TOD/DOW, Service Identity (SI), and allocated percentages for traffic distribution.

Architecture

The AT&T toll network consists of *4ESS* switches, Network Edge Switch Vehicle (NESV) toll switches, and *5ESS*® Operator Service Position System (OSPS) switches (for operator service calls) along with various service processors that provide specific service processing for different AT&T services. Among the *4ESS* switches that are included are nine ISCs connecting to NWZ1 countries and six Gateway switches connecting to Canada and the Caribbean Islands (IWZ1 countries). In the evolving AT&T architecture, there are other non-*4ESS* switches (NESVs) initially used for AT&T Digital Link (ADL) traffic. The architecture for this feature assumes that all the international and transit calls either originate on a *4ESS* switch, or if originated on an NESV or OSPS switch, are upchained to an originating *4ESS* switch to obtain the appropriate international routing capability.

The architecture under this feature introduces the new NRN DB network element. This database is deployed on the No. 2 Network Control Point (2NCP) XA/R platform, while the feature application builds upon the No. 2 Direct Services Dialing (2DSD) application.

Under this architecture, all domestic originating international and transit voice/data calls query the NRN DB from an originating *4ESS* switch using an AT&T Transaction Capability (TCAP) message. The NRN DB contains the following records:

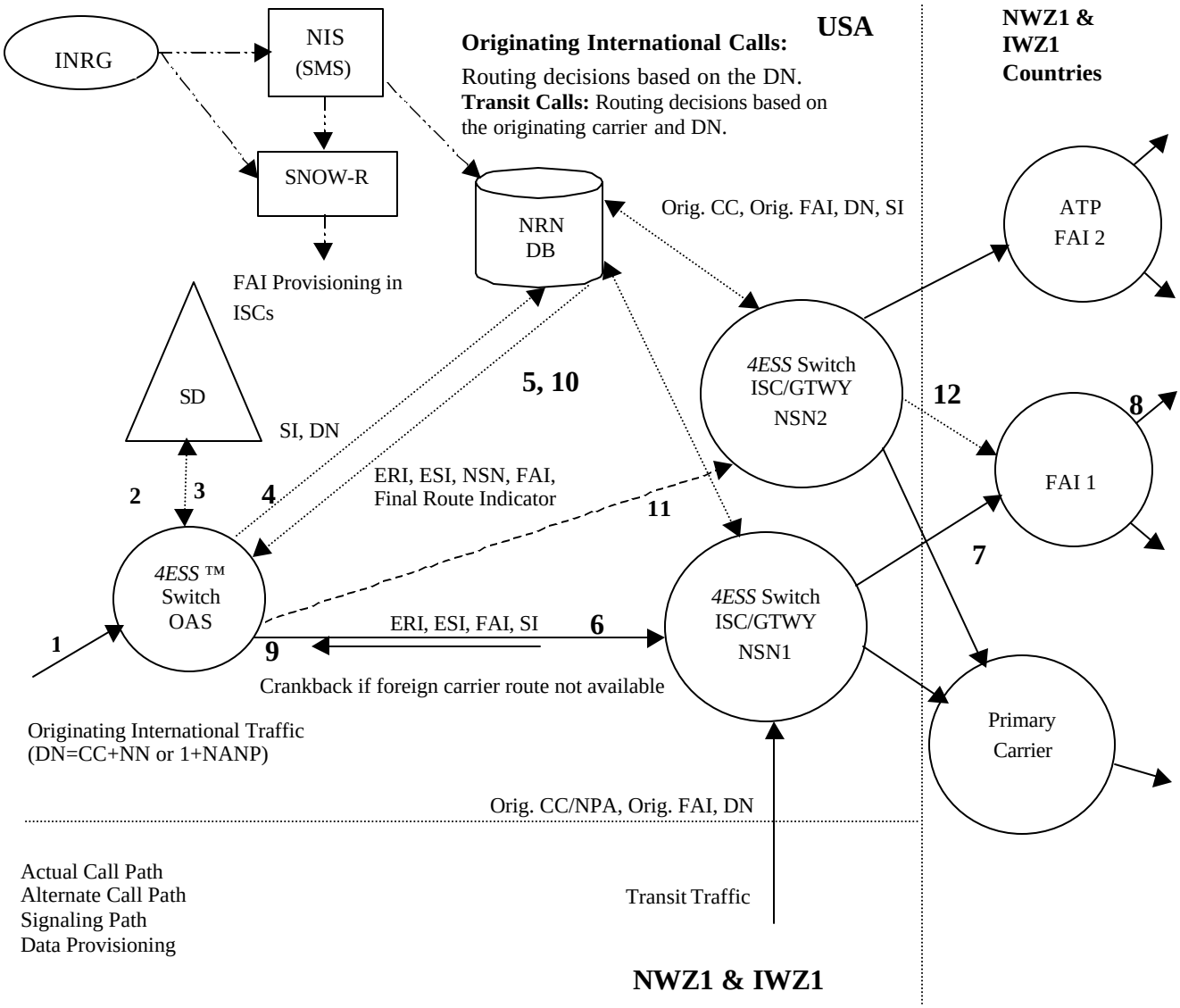
- Destination Number (DN), Service Identity Index (SII), and data rate calls originating from the United States
- Originating Country Code [or Originating Numbering Plan Area (NPA) for IWZ1 originating traffic], Originating Foreign Administration Identity (FAI), Destination Number (DN), and SII for transit calls.

Each call processing record includes a percentage distribution of traffic to specific foreign carriers (indicated by FAI) with the address of the AT&T ISCs [Network Switch Number (NSN)] that provide connectivity to those carriers. The list of FAIs may include major carriers and ATPs available for a given country and city.

The NRN DB (see Figure 6-1) provides at most two routes to a requesting Originating AT&T Switch (OAS). Based in the routing instructions received from the NRN DB, the OAS routes the call to the first ISC/Gateway switch. If the foreign carrier route from the first ISC/Gateway switch is unsuccessful, the ISC/Gateway switch sends a Crankback message to the OAS. If the OAS has the next route available, the OAS routes the call on that route. Otherwise, the OAS may query the NRN DB to obtain additional routes. This continues until a successful route to the foreign destination is found or all the routes to the foreign destination are exhausted.

In terms of the provisioning flow under this architecture, carrier specific information [that is, ATP, percentage traffic distribution, TOD/DOW information, Originating Country Code (OCC), and FAI mapping to terminating carrier] is received by the International Routing Group (INRG) from International Network Engineering (INE). The INRG provides this information to the Network Information Systems (NIS) provisioning system which is responsible for updating and maintaining the NRN DB and providing FAI information to the Service NOW-Routing (SNOW-R) system to provision the ISC/Gateway switches. For network management purposes, a Network Management Operations System (NEMOS) interface is provided to the NRN DB.

Figure 6-1 - NRN DB Architecture for International Routes



Legend:

ATP – Alternate Transport Provider	NIS – Network Implementation System
CC – Country Code	NN – National Number
DN – Destination Number	NPA – Numbering Plan Area
ERI – Egress Route Indicator	NRN DB – Network Routing & Numbering Database
ESI – Egress Switch Indicator	NSN – Network Switch Number
FAI – Foreign Administration Identity	OAS – Originating AT&T Switch
GTWY – Gateway	SD – Segmentation Directory
INRG – International Routing Group	SI – Service Identity
ISC – International Switching Center	SMS – Service Management System
NANP – North American Numbering Plan	SNOW-R – Service NOW-Routing

In summary, the capabilities supported by the NRN DB feature are defined in Table 6-A.

Table 6-A- NRN DB Capabilities

Type of Call/Capability	Description
Outgoing Originating International and Transit Voice/Data calls to both IWZ1 and NWZ1 countries	• International Long Distance Service (ILDS) • Global Software Defined Network (GSDN) • International 800 (I800)
Destination Numbers (also known as Routing Numbers)	a. CC + National Number (for NWZ1) b. CC+CC-suffix+CID (Customer Identification)+TNRN (Transit Network Routing Number) to NWZ1-GSDN c. NANP (for IWZ1) d. APN (for IWZ1) e. Operator-to-Operator dialed digits: • CC + operator dialed string • Other special operator dialed strings (for example, 180, 190 to Mexico operator)
Type of Routing	a. Carrier Selection: —Proportional Routing —Preferred —Mandatory —Based on Originating City, and Originating Carrier for Transit calls b. Time of Day/Day of Week c. Service Dependent Routing (SI screening) d. Transport Capability (Data Rate based)
Maximum Foreign Carriers per country (FAI)	31 [The expansion of the number of FAIs beyond 31 impacts the *4ESS*™ switch, TCAP, Integrated Digital Services (ISDN) User Part (UP), and many Operation Systems (OSs) and databases.]
Maximum overflow FAIs allowed per FAI	6 (The number of Overflow FAIs can be increased without *4ESS* switch development.)
Maximum ISC/Gateway Routes per foreign carrier	8 (The number of ISC/Gateway Routes per foreign carrier can be increased without *4ESS* switch development.)
Destination Number—Screening up to	7 Digits

□

Call Flow

General

The call flows for the following categories of outgoing international/transit calls are described in this section:

1. Originating calls to IWZ1 and NWZ1 countries requiring FAI and NSN routes from the NRN DB (that is, ILDS calls)

2. Transit calls to IWZ1 and NWZ1 countries requiring FAI and NSN routes from the NRN DB

3. Originating calls to IWZ1 and NWZ1 countries that may already have an FAI of *Preferred* or *Mandatory* nature from a service processor and require NSN routes from the NRN DB (that is, GSDN and I800)

4. Special case of all of the preceding categories when a call is terminating to Canada (one of the IWZ1 countries) based on which OAS queries the NRN DB

5. Default route treatment for all of the preceding categories

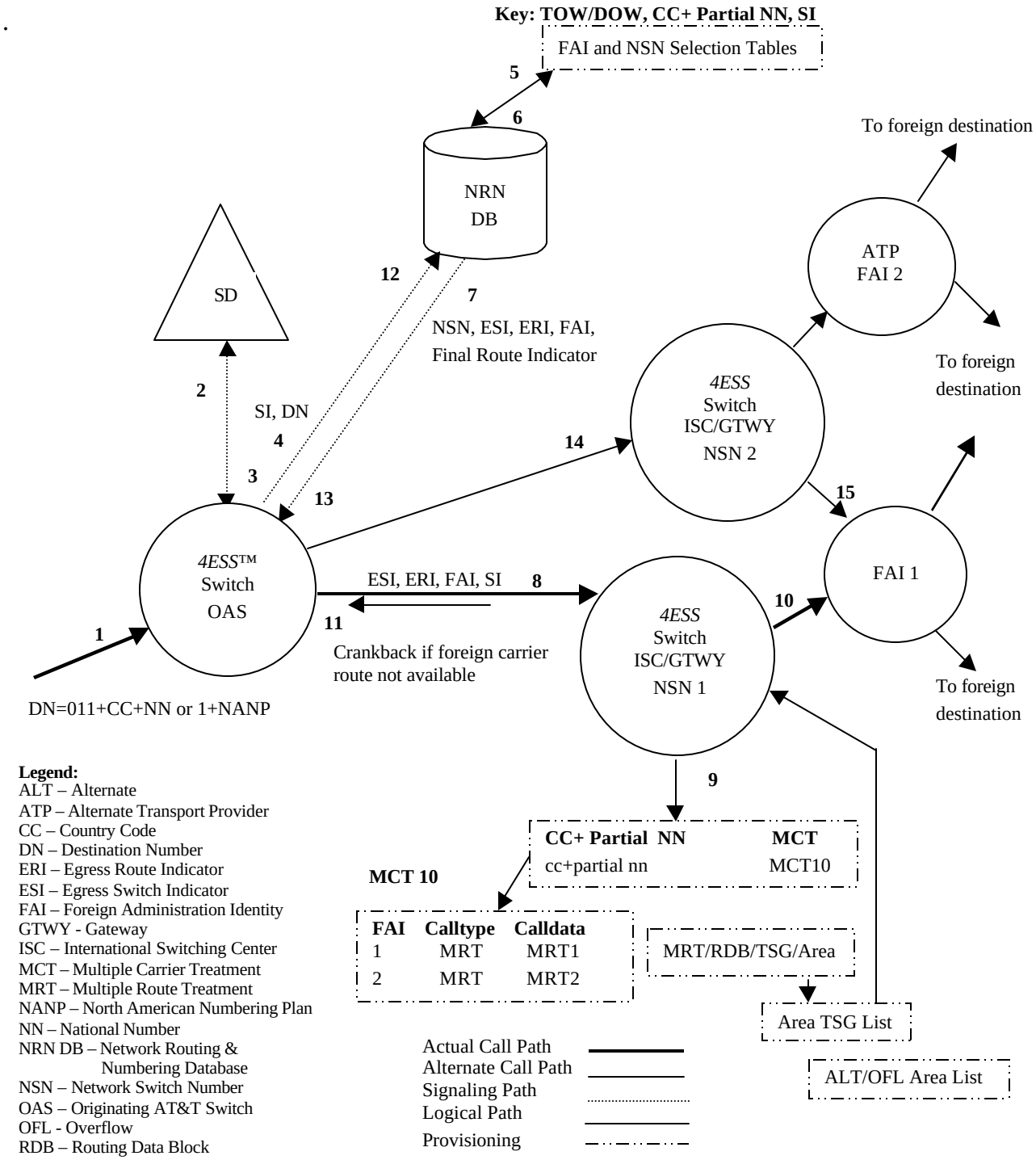
6. Special case of the preceding categories when the OAS is the terminating ISC/Gateway switch.

   Important! The call flow steps do not match the steps illustrated in Figure 6-2.

Originating Outgoing International Call Without an FAI

This category covers the call types where the calls originating at a *4ESS* switch have either IWZ1 or NWZ1 destinations. To obtain the foreign carrier route, the calls need NRN DB processing. This category includes CC+NN and NANP type of destination numbers (NANP routes to Canada are not included) as well as operator-to-operator calls where a special operator string follows a CC or an NPA of the destination number.

Figure 6-2 - ILDS Call Originating in the United States



Legend:
ALT – Alternate
ATP – Alternate Transport Provider
CC – Country Code
DN – Destination Number
ERI – Egress Route Indicator
ESI – Egress Switch Indicator
FAI – Foreign Administration Identity
GTWY - Gateway
ISC – International Switching Center
MCT – Multiple Carrier Treatment
MRT – Multiple Route Treatment
NANP – North American Numbering Plan
NN – National Number
NRN DB – Network Routing & Numbering Database
NSN – Network Switch Number
OAS – Originating AT&T Switch
OFL - Overflow
RDB – Routing Data Block
SD – Segmentation Directory
SI – Service Identity
TOD - Time of Day
TOW – Time of Week
TSG – Trunk Subgroup

ILDS Call Originating in the United States

1. A caller dials 011+CC+NN (to a NWZ1 location) or 1+NANP (to an IWZ1 location; does not apply to Canada).

2. A Local Exchange Carrier (LEC) End Office (EO) identifies that AT&T is the presubscribed carrier for the call and routes it to an OAS.

3. The OAS launches a query to the Segmentation Directory (SD).

4. The SD determines that this is a featureless call and instructs the *4ESS* OAS to continue with call processing.

5. The OAS launches a query to the Network Access Interrupt (NAI) database and continues processing the call. (During call processing, if the NAI response is received back, the NAI response supercedes any other processing at the switch. Either the call is terminated or redirected to an appropriate location.)

6. Based on the Destination Number (DN), the OAS determines a determinant call type [for example, Multiple Carrier Treatment (MCT), Multiple Route Treatment (MRT), Proportional Routing Treatment (PRT), Routing Data Block (RDB), GO/NO-GO, or Destination Switch Number (DSN)].

7. The OAS derives the Service Identity Index (SII), =13, for the call.

8. The AT&T Service/Call ID Type (ASCIT) Table is checked to see if the SII uses an NRN DB query at the OAS. If it does, proceed to Step 9. Otherwise, the call does not require NRN DB processing. **End of Call Flow**.

9. If the NRN DB Transition Complete Bit is set to **Yes**, proceed to Step 11.

10. The call flow continues as follows:

If the call is to...	Then the OAS checks the...
An NWZ1 location (TDEST=ISC)	CC of the DN in the Country Code Translator Table to see if this specific country record is transitioned to the NRN DB. If the NRN CC Transition Bit is set to **Yes**, the OAS prepares to launch a query to determine a route for the call. Proceed to Step 11. Otherwise, the OAS continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**.
An IWZ1 location (TDEST is other than ISC or NODAL)	NPA of the DN in the NRN DB IWZ1 Transition DIGTYP to see if this specific NPA has transitioned to the NRN DB. If the NRN DB IWZ1 Transition DIGTYP is set to **Yes**, the OAS prepares to launch a query to the NRN DB to determine a route for the call. Proceed to Step 11. Otherwise, the OAS continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**. **Important!** APNs are used only with calls that query a Service Processor.

11. The OAS attempts to send the DN along with the SII to the NRN DB in the TCAP Begin message.

    a. In case of a DB failure, signaling link failure, or Automatic Call Gap (ACG) on the DN, the call flow follows the **Default Route Treatment** discussed later in this section. **End of Call Flow**.

    b. Otherwise, proceed to Step 12.

The NRN DB receives the Begin message and attempts to retrieve an appropriate record based on the received SII and DN. The autonomous logic at the NRN DB uses the SII and DN as the key to search the International Dialed Number Translation Table (DNTT), a 2NCP Network Table for retrieving an appropriate Call Processing Record (CPR) for a particular country. The DN also includes the Nature of Number (NoN) which in this case is *National* for IWZ1 or *International* for NWZ1 terminations.

a. If the NRN DB does not find any match on the SII and DN in the International DNTT or finds that there is no CPR for this pair of SII and DN, it sends a TCAP End message with an invalid code indicator to the OAS. Proceed to Step 14.

b. Otherwise, the NRN DB retrieves an appropriate CPR. Based on the TOD and Time of Week (TOW), the CPR finds an FAI Allocator Table. This table lists all the provisioned FAIs with the percentage of traffic distribution assigned to each FAI. The CPR determines an initial FAI for the call based on the percentages in the table.

   In the percentages for this example, FAI=1 is determined as the initial FAI for the call. Based on this FAI, the CPR searches the FAI Table to obtain the NSN route.

      i. The CPR retrieves the appropriate NSN Allocator Table to obtain the NSN route(s) for the call. For the initial FAI 1 in this example, it is NSN-T1.

      The CPR checks the NSN of the OAS and matches it against this table to check if the OAS is also a Terminating ISC/Gateway switch. If the OAS is also a Terminating ISC/Gateway switch, the NRN DB provides the NSN routes in the order applicable to this special case. Proceed to *ii*.

Otherwise, the CPR determines an initial NSN route based on the percent allocation. In this example, assume it is NSN 2. Once an initial NSN route is determined, the subsequent routes for a given FAI are already set in the order they are provisioned (from top to bottom, skipping the initial NSN route) in the NSN Allocator Table. Therefore, the subsequent NSN routes are NSN1, NSN3, NSN4, up to NSN8. Note that each NSN route is provisioned with an Egress Route Index (ERI).

Important! The case where the OAS is a candidate Terminating AT&T Switch (TAS) for the call is a special case not covered in this call flow.

ii. Based on the number of NSN routes that the CPR determines for a given FAI, it assigns an appropriate Egress Switch Indicator (ESI) to each NSN route. For example, if there is only one NSN route, the ESI associated with this route is 0 (first and last route). If there are two NSN routes, the initial route is assigned ESI=1 (first route) and the second route is assigned ESI=3 (last route). If there are more than two NSN routes determined for a given FAI, the initial NSN is assigned ESI=1, all the intermediate NSN routes are assigned ESI=2, and the last NSN route is assigned ESI=3.

13. Based on the CPR logic, the NRN DB returns the routing instruction back to the OAS in a TCAP Continue message. This message contains the primary NSN (initial NSN route) and its associated FAI, ERI, and ESI. If the second NSN route is available, then the secondary NSN with its associated FAI, ERI, and ESI are also sent.

If there are more routes available either for the current FAI or for a subsequent Overflow FAI, the NRN DB sends a *Not the Final Route* indicator in the TCAP Continue message. If no additional routes are available for the call, then a *Final Route* indicator is sent in the TCAP Continue message with the last available route.

14. If the OAS does not receive any response from the NRN DB, receives a TCAP End message with an invalid code indicator from the NRN DB, or receives specific routing instructions from the NRN DB, then the following applies:

a. The OAS follows the **Default Routing Treatment** discussed later in this section when no response is received from the NRN DB. **End of Call Flow**.

b. The OAS applies the appropriate Vacant Code treatment and terminates the call when a TCAP End message is received indicating vacant code. **End of Call Flow**.

c. When the OAS receives routing instructions from the NRN DB, the OAS first uses the primary NSN to identify the appropriate ISC/Gateway switch to route the call. If this is its own NSN, then the **OAS = Terminating ISC/Gateway** call flow as described later in this section applies. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the primary NSN.

15. The OAS formulates an ISUP Initial Address Message (IAM) by populating the DN in the Called Party Number (CdPN) parameter, the FAI associated with the route in the Transit Network Selection (TNS) parameter, and the ERI and ESI associated with the route in the Dynamic Non-Hierarchical Routing (DNHR) indicators parameter.

16. The OAS sends the ISUP IAM message to the ISC/Gateway switch [or Via AT&T Switch (VAS)] to which it routed the call.

17. Upon receiving the IAM message from the OAS, the ISC/Gateway switch determines an outgoing trunk to the foreign carrier based on the FAI, DN, and other parameters as follows:

    a. If the ISC/Gateway switch can successfully route the call to the foreign carrier per the End-to-end Class of Service (ECOS) Area List using ERI in the incoming message, the ISC/Gateway switch pegs appropriate counts based on the ESI received in the incoming message per existing procedures. The ISC/Gateway switch propagates the Address Complete Message (ACM) received from the foreign carrier to the OAS and processes an International Call Detail Recording (ICDR) record. Proceed to Step 18.

    b. If the ISC/Gateway switch cannot find a route to the foreign carrier, it cranks back [Split Access Flexible Egress Routing-Egress Busy Crank-back (SAFER-EBC)] the call to the OAS per existing procedures. Proceed to Step 20.

    c. If the ISC/Gateway switch is successful in routing to the foreign carrier, but the foreign carrier is unsuccessful in routing to the subsequent switch, the foreign carrier may release the call back to the ISC/Gateway switch. At this point, the ISC/Gateway switch finds that Automatic Routing (AR) is active on the call and may crank back to the OAS according to Route Advance (RA)-EBC (Feature 4967). Proceed to Step 20.

18. Upon receiving the ACM from the ISC/Gateway switch, the OAS sends an End message to the NRN DB indicating that the call was successfully routed and the route that was used.

19. The NRN DB receives the End message, performs the necessary Network Management measurements, and closes the TCAP transaction. **End of Call Flow.**

20. The OAS receives the proprietary Crank Back message due to SAFER-EBC or RA-EBC and performs the following tasks:

    a. If a secondary NSN is available from the NRN DB, the OAS uses this NSN to identify the appropriate ISC/Gateway switch to route the call. If this is its own NSN, the **OAS = ISC/Gateway Switch** call flow described later in this section applies. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the secondary NSN. Go to Step 15.

    b. If a *Final Route* indicator is associated with the last route received from the NRN DB, the OAS final handles the call using the Final Handling Treatment (FHT) specified by the NRN DB with the last route. The OAS also sends an End message to the NRN DB indicating there was *No Egress Available* for the call and the last route that was attempted. Go to Step 19.

    c. If both NSN routes are attempted and there is no *Final Route* indicator from the NRN DB, the OAS sends a subsequent query to the NRN DB by sending a TCAP Continue message for additional routing information.

21. The NRN DB receives the TCAP Continue message, and the CPR for this call continues the routing algorithm to select two more NSN routes for the given FAI. If all NSN routes for the FAI are exhausted, the next Overflow FAI from the FAI Table for the initial (original) FAI is selected. (For example, using the FAI table, if the original FAI is 1, then the first Overflow FAI is FAI 3.) For this Overflow FAI, the NSN is determined based on the NSN Allocator Table for this FAI (that is, NSN-T3) and subsequent routes are determined as explained previously. The call flow continues from Step 13 until the call is successfully routed or all NSN routes for all the FAIs for the call are exhausted from the NRN DB. **End of Call Flow**.

Transit Call

This category includes transit calls received at an AT&T ISC/Gateway switch from an NWZ1 or IWZ1 location that may have its destination in some other NWZ1 or IWZ1 location. Routing of these transit calls depends on which foreign carrier and from which country or city the call originated. The originating ISC/Gateway switch provides originating information along with the DN and call service type to the NRN DB to obtain the appropriate foreign carrier route. This category includes CC+NN and NANP-type DNs (excluding NANP routes to Canada) as well as operator-to-operator calls where a special operator string follows a CC or an NPA of the DN.

1. An originating ISC/Gateway switch receives a transit call from a foreign network.

2. The originating ISC/Gateway switch extracts the originating FAI information from the incoming Trunk Subgroup (TSG) on which the transit call is received.

3. Based on the DN, the originating ISC/Gateway switch determines a determinant call type (MCT, MRT, PRT, RDB, GO/NO-GO, or DSN).

4. The originating ISC/Gateway derives the SII (=15) for the call.

5. The ASCIT Table is checked to see if the SII uses an NRN DB query at the OAS. If it does, proceed to Step 6. Otherwise, the call does not require NRN DB processing and the call is processed per existing procedures. **End of Call Flow**.

6. If the NRN DB Transition Complete Bit is set to **Yes**, proceed to Step 8.

7. If the call is to an NWZ1 location (TDEST=ISC), the originating ISC/Gateway switch checks the CC of the DN in the Country Code Translator Table to see if the records of this specific country are transitioned to the NRN DB. If the NRN DB Transition Bit for this call is set to **Yes**, the originating ISC/Gateway switch prepares to launch a query to the NRN DB to determine a route for the call. Proceed to Step 8. Otherwise, the originating ISC/Gateway switch continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**.

   If the Call is to an IWZ1 location (TDEST is other than ISC or NODAL), the originating ISC/Gateway switch checks the NPA of the DN in the NRN DB IWZ1 Transition DIGTYP to see if this specific NPA is transitioned to the NRN DB. If the NRN DB IWZ1 Transition DIGTYP is set to **Yes**, the originating ISC/Gateway switch prepares to launch a query to the NRN DB to determine a route for the call. Proceed to Step 8. Otherwise, the OAS continues with its current mode of operation to determine an international route and call processing. **End of Call Flow**.

8. The originating ISC/Gateway switch attempts to send the OCC (or originating NPA if in World Zone 1), originating FAI, DN, and the derived SII to the NRN DB in the TCAP Begin message.

   a. In case of a DB failure, signaling link failure, or ACG on the DN, the call follows the **Default Route Treatment** described later in this section. **End of Call Flow**.

   b. Otherwise, proceed to Step 9.

9. The NRN DB receives the Begin message and attempts to retrieve an appropriate record based on the OCC, originating FAI, SII, and DN. The autonomous logic at the NRN DB uses these four parameters as the key to search the International DNTT Table (a 2NCP Network Table for retrieving an appropriate CPR for a particular country).

a. Traditional Transit Route Treatment: If the NRN DB does not find a match on these four parameters, the OCC=0 and originating FAI=0 with the appropriate SI and DN are matched in the International DNTT Table.

   If the NRN DB does not find a match on the SII and DN (with OCC=0 and originating FAI=0) in the International DNTT Table, or finds there is no CPR for this pair of SII and DN, it sends a TCAP End message with a vacant code indicator to the OAS. Proceed to Step 11.

   Otherwise, the appropriate Traditional Transit Route Treatment CPR is retrieved. The CPR uses the FAI Allocator Table and the NSN Allocator Table as described previously to obtain the route(s) for the call. The initial NSN route and subsequent routes are determined in the same fashion as described previously. Proceed to Step 11.

b. Not Allowed Transit Call: If the NRN DB finds a match on these four parameters but the indicated CPR requires that the call not be allowed, the NRN DB updates the appropriate Network Management measurements and sends a TCAP End message with a Connection Control-Disconnect operation to the OAS to apply a vacant code treatment to the call. Proceed to Step 11.

c. Normal Call Processing: Otherwise, the NRN DB retrieves an appropriate CPR. The CPR logic for this case is the same as described previously.

10. Based on the CPR logic, the NRN DB returns the routing instruction to the originating ISC/Gateway switch in a TCAP Continue message. This message contains the primary NSN and its associated FAI, ERI, and ESI. If the secondary NSN route is available, then the secondary NSN with its associated FAI, ERI, and ESI are also sent.

    If more routes are available, the NRN DB sends a *Not the Final Route* indicator in the TCAP Continue message with the last available route.

11. If the originating ISC/Gateway switch either does not receive a response from the NRN DB, receives a TCAP End message with an invalid code indicator or a Connection Control-Disconnect operation for the call from the NRN DB, or receives specific routing instructions from the NRN DB, call processing continues as follows:

    a. When no response is received from the NRN DB, the OAS follows the **Default Route Treatment** described later in this section. **End of Call Flow**.

    b. If the error message from the NRN DB indicates a Connection Control-Disconnect operation, the switch applies the appropriate Vacant Code treatment and terminates the call. **End of Call Flow**.

    c. When the originating ISC/Gateway switch receives routing instructions from the NRN DB, the switch checks to see if the primary NSN received in the TCAP response is its own NSN. If this is its own NSN, then the **OAS=Terminating ISC/Gateway** call flow as described later in this section applies. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the primary NSN.

12. The originating ISC/Gateway switch formulates an ISUP IAM by populating the DN in the CdPN parameter, the FAI associated with the route in the TNS parameter, and the ERI and ESI associated with the route in the DNHR indicators parameter.

13. The originating ISC/Gateway switch sends the ISUP IAM to the terminating ISC/Gateway switch to which it routed the call.

14. Upon receiving the IAM from the originating ISC/Gateway switch, the terminating ISC/Gateway switch determines an outgoing trunk to the foreign carrier based on the FAI, DN, and other parameters as follows:

    a. If the terminating ISC/Gateway switch can successfully route the call to the foreign carrier per the ECOS Area List using ERI in the incoming message, the ISC/Gateway switch pegs appropriate counts based on the ESI received in the incoming message per existing procedures. The terminating ISC/Gateway switch propagates the ACM received from the foreign carrier to the originating ISC/Gateway switch and processes an ICDR record. Proceed to Step 15.

    b. If the terminating ISC/Gateway switch cannot find a route to the foreign carrier, it cranks back the call to the originating ISC/Gateway switch per existing procedures. Proceed to Step 17.

    c. If the terminating ISC/Gateway switch is successful in routing to the foreign carrier but the foreign carrier is unsuccessful in routing to the subsequent switch, the foreign carrier may release the call back to the terminating ISC/Gateway switch. At this point, the terminating ISC/Gateway switch finds that AR is active on the call and may crank back to the OAS according to RA-EBC (Feature 4967). Proceed to Step 17.

15. Upon receiving the ACM from the terminating ISC/Gateway switch, the originating ISC/Gateway switch sends an End message to the NRN DB indicting that the call was successfully routed on the selected route.

16. The NRN DB receives the End message, processes the necessary Network Management measurements, and closes the TCAP transaction. **End of Call Flow**.

17. The originating ISC/Gateway switch receives the proprietary Crank-back message due to SAFER-EBC or RA-EBC and performs the following tasks:

    a. If a secondary NSN is available from the NRN DB, the originating ISC/Gateway switch uses the NSN to identify the appropriate terminating ISC/Gateway switch to route the call. If this is its own NSN, the **OAS = ISC/Gateway Switch** call flow described later in this section applies. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the secondary NSN. (The AMA record may be modified.) Go to Step 12.

    b. If a *Final Route* indicator is associated with the last route received from the NRN DB, the OAS final handles the call using the FHT specified by the NRN DB with the last route. The OAS also sends an End message to the NRN DB indicating there was *No Egress Available* for the call and the last route attempted. Go to Step 16.

    c. If both NSN routes are attempted and there is no *Final Route* indicator from the NRN DB, the OAS sends a subsequent query to the NRN DB by sending a TCAP Continue message for additional routing information.

18. The NRN DB receives the TCAP Continue message, and the CPR for this call continues the routing algorithm to select two more NSN routes for the given FAI. If all NSN routes for the FAI are exhausted, the next Overflow FAI from the FAI Table for the initial (original) FAI is selected. (For example, using the FAI table, if the original FAI is 1, then the first Overflow FAI is FAI 3.) For this Overflow FAI, the NSN is determined based on the NSN Allocator Table for this FAI (that is, NSN-T3) and subsequent routes are determined as explained previously. The NRN DB provides two additional routes to the originating ISC/Gateway switch as explained in Step 9. The call flow continues from Step 10 until the call is successfully routed or all NSN routes for all the FAIs for the call are exhausted from the NRN DB. **End of Call Flow**.

Originating Outgoing International Call With or Without an FAI

This category covers the call types where calls originating at a *4ESS* switch have either an IWZ1 or NWZ1 destination and a Service Processor (SP) for the call has either provided a terminating foreign cattier ID or has not provided one. In either case, the calls need NRN DB processing. This category includes CC+NN, CC+CC-suffix+CID+TNRN (GSDN service routing number), APN (private routing number to Canadian/Caribbean destination), and NANP type of destination numbers. (NANP routes to Canada are excluded. See **Call Terminating to Canada Using NANP Routing Numbers**.) The following GSDN call flow describes calls using an SP.

GSDN Outbound Calls

1. The OAS receives calls from the SDN dedicated/switched access trunks in Domain SDNA.

2. The OAS sends an SD query.

3. The SD finds an ANI match and queries the SDN/2DSA/2NCP.

4. The SDN CPR performs service logic. If the call is allowed, the 2DSA/2NCP returns the following information:

   a. Charging-Bill Call with Call Code = 129.
   b. Connection Control-Connect:
      - The Routing Number may be in the following forms:
        -CC+CC-suffix+CID+TNRN to NWZ1 countries, including Mexico.
        -NANP to IWZ1 countries, including Canada and the Caribbean.
      - GRI.
      - Terminating FAI and CSR Preference indicator, if provisioned. For On-net calls, the CSR Preference indicator is set to *Mandatory*. For Off-net calls, the CSR Preference indicator is set to *Preferred* if GCSR is set. Otherwise, no FAI and CSR Preference indicator are sent.
      - SRI = 12 for GSDN On-net.

5. The OAS prepares information for an AMA record with FAI Module 932.

6. Based on the DN, the OAS determines a determinant call type (that is, MCT, PRT, RDB, GO/NO-GO, or DSN).

7. The OAS derives the SII (=9 for GSDN outbound) for the call.

8. The ASCIT Table is checked to see if the SII uses an NRN DB query at the OAS. If it does, proceed to Step 9. Otherwise, the call does not require NRN DB processing and the call proceeds per existing procedures. **End of Call Flow**.

9. If the NRN DB Transition Complete Bit is set to **Yes**, proceed to Step 11.

10. The call flow continues as follows:

If the call is to...	Then the OAS checks the...
An NWZ1 location (TDEST=ISC)	CC of the DN in the Country Code Translator Table to see if this specific country record is transitioned to the NRN DB. If the NRN CC Transition Bit is set to **Yes**, the OAS prepares to launch a query to determine a route for the call. Proceed to Step 11. Otherwise, the OAS continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**.
An APN DN (TDEST=NODAL)	Checks the first three digits of the DN in the NRN DB APN Transition DIGTYP to see if this specific APN is transitioned to the NRN DB. If the NRN DB APN Transition DIGTYP for this call is set to **Yes**, the OAS prepares to launch a query to the NRN DB to determine a route for the call. Proceed to Step 11. Otherwise, the OAS continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**.
An IWZ1 location (TDEST is other than ISC or NODAL)	NPA of the DN in the NRN DB IWZ1 Transition DIGTYP to see if this specific NPA has transitioned to the NRN DB. If the NRN DB IWZ1 Transition 3-digit type is set to **Yes**, the OAS prepares to launch a query to the NRN DB to determine a route for the call. Proceed to Step 11. Otherwise, the OAS continues with its current mode of operation to determine the international route and call processing. **End of Call Flow**.

11. The OAS attempts to send the DN along with the SII to the NRN DB in the TCAP Begin message.

    a. In case of a DB failure, signaling link failure, or Automatic Call Gap (ACG) on the DN, the call flow follows the **Default Route Treatment** discussed later in this section. **End of Call Flow**.

    b. Otherwise, proceed to Step 12.

12. The OAS sends a Begin message to the NRN DB that includes the routing numbers as the DN, terminating FAI, and CSR Preference Indicator along with the derived SII in the TCAP message.

13. The NRN DB receives the Begin message. The autonomous logic uses the SII and the DN as keys to search the International DNTT Table (a 2NCP Network Table for the CPR for a particular country).

    The NN may also be a part of the DN key. The DN attribute must be able to accept the differentiation of NWZ1, IWZ1, or APN.

    If the NRN DB does not find a match on the SII and DN in the International DNTT Table or finds that there is no CPR for this pair (SII and DN), it sends a TCAP end message with an invalid code indicator to the OAS. Proceed to Step 15. Otherwise, proceed to Step 14.

14. The autonomous logic executes the CPR as follows:

    a. If no terminating FAI and CSR Preference indicator are received, the CPR uses the FAI Allocator Table to get an initial FAI. For that FAI, the corresponding NSN routes are determined (See **ILDS Call Originating in the United States**.) Proceed to Step 15.

    b. If the terminating FAI and a CSR Preference Indicator of *Mandatory* are received, the Carrier Specific Routing algorithm is used to find the NSN of an ISC/Gateway switch as follows:

    - The CPR uses the received terminating FAI as the key to search a provisioned FAI Table for the NSN Table for that FAI. ***No overflow FAI is allowed***.
    - From the NSN Table, the CPR retrieves the initial NSN, the subsequent NSN, and their ERIs. Their ESIs are also derived.
    - The CPR returns the routing instruction to the OAS in a TCAP Continue message. This message contains the primary routing number (initial NSN route) and its associated FAI, ERI, and ESI. If a second NSN route is available, then the secondary routing number with its associated FAI, ERI, and ESI are also sent. If more routes are available, the NRN DB sends a *Not the Final Route* indicator in the TCAP Continue message. If no additional NSN routes are available, then a *Final Route* indicator is sent in the TCAP Continue message with the last route. Proceed to Step 15.

    c. If the terminating FAI and CSR Preference Indicator of *Preferred* are received, Carrier Specific Routing is used as specified in (b). The main difference is that ***overflow FAIs are allowed*** because of the *Preferred* CSR Preference Indicator.

15. If the OAS does not receive a response from the NRN DB, receives a TCAP End message with an invalid code indicator, or receives specific routing instructions form the NRN DB, call processing continues as follows:

    a. If no response is received, the OAS follows the **Default Route Treatment** described later in this section. **End of Call Flow**.

    b. If an invalid code indicator message is received, the OAS applies the appropriate Vacant Code treatment and terminates the call. **End of Call Flow**.

    c. If the OAS receives routing instructions from the NRN DB, the OAS first uses the primary NSN to identify the appropriate ISC/Gateway switch to route the call. If this is its own NSN, the call follows the **OAS=Terminating ISC/Gateway Switch** call flow described later in this section. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the primary NSN.

16. The OAS formulates an ISUP IAM by populating the DN in the CdPN parameter, the FAI associated with the route in the TNS parameter, and the ERI and ESI associated with the route in the DNHR Indicators parameter.

17. The OAS sends the ISUP IAM to the ISC/Gateway switch (or VAS) to which it routed the call.

18. Upon receiving the IAM from the OAS, the ISC/Gateway switch determines an outgoing trunk to the ATP based on the FAI, DN, and other parameters as follows:

    a. If the ISC/Gateway switch can successfully route the call to the foreign carrier per the ECOS Area List using ERI in the incoming message, the ISC/Gateway switch pegs appropriate counts based on the ESI received in the incoming message per existing procedures. The ISC/Gateway switch propagates the ACM received from the foreign carrier to the originating ISC/Gateway switch and processes an ICDR record. Proceed to Step 19.

b. If the ISC/Gateway switch cannot find a route to the foreign carrier, it cranks back the call to the OAS per existing procedures. Proceed to Step 21.

c. If the ISC/Gateway switch is successful in routing to the foreign carrier but the foreign carrier is unsuccessful in routing to the subsequent switch, the foreign carrier may release the call back to the ISC/Gateway switch. At this point, the ISC/Gateway switch finds that AR is active on the call and may crank back to the OAS according to RA-EBC (Feature 4967). Proceed to Step 21.

19. Upon receiving the ACM from the ISC/Gateway switch, the OAS sends an End message to the NRN DB indicting that the call was successfully routed on the provided FAI, NSN route.

20. The NRN DB receives the END message, processes the necessary Network Management measurements, and closes the TCAP transaction. **End of Call Flow.**

21. The originating ISC/Gateway switch receives the proprietary Crank-back message due to SAFER-EBC or RA-EBC and performs the following tasks:

a. If a secondary NSN is available from the NRN DB, the OAS uses the NSN to identify the appropriate ISC/Gateway switch to route the call. If this is its own NSN, the **OAS = ISC/Gateway Switch** call flow described later in this section applies. Otherwise, the OAS routes the call to the appropriate ISC/Gateway switch based on the secondary NSN. (The AMA record may be modified.) Go to Step 16.

b. If a *Final Route* indicator is associated with the last route received from the NRN DB, the OAS final handles the call using the FHT specified by the NRN DB with the last route. The OAS also sends an End message to the NRN DB indicating there was *No Egress Available* for the call and the last route attempted. Go to Step 20.

c. If both NSN routes are attempted and there is no *Final Route* indicator from the NRN DB, the OAS sends a subsequent query to the NRN DB by sending a TCAP Continue message for additional routing information.

22. The NRN DB receives the TCAP Continue message, and the CPR for this call continues the routing algorithm to select two more NSN routes for the given FAI. If all NSN routes for the FAI are exhausted and the CSR Preference Indicator is **not** *Mandatory*, the next Overflow FAI from the FAI Table for the initial (original) FAI is selected. (For example, using the FAI table, if the original FAI is 1, then the first Overflow FAI is FAI 3.) For this Overflow FAI, the first NSN is determined based on the NSN Allocator Table for this FAI (that is, NSN-T3) and subsequent routes are determined as explained previously. The NRN DB provides two additional routes to the OAS. The call flow continues from Step 15 until the call is successfully routed or all NSN routes for all the FAIs for the call are exhausted from the NRN DB. **End of Call Flow**.

Call Terminating to Canada Using NANP Routing Numbers (Special Case)

AT&T applies a special routing treatment for calls that have termination in Canada and that are being routed on an NANP number. The routing for these calls is based not only on the DN, but also on which switch originated the call. Depending on the originating switch, the nearest terminating Gateway switch is identified to route the call via that specific Gateway switch to its destination in Canada.

The call flow steps are the same as those described in the **ILDS Call Originating in the United States** call flow with one exception. The CPR for calls to Canada use the originating switch NSN (NSN of the OAS querying the NRN DB) to locate a specific NSN Allocator Table for a given FAI and provide routes per the table.

Default Route Treatment

The following call flow describes the default route treatment on a call to an IWZ1 or NWZ1 location when the NRN DB cannot be queried or when no response is received from the NRN DB. The default routing treatment for this feature is only applied ***after*** a country is transitioned to the NRN DB.

The default routing treatment makes use of non-NRN DB routing capabilities. The only difference between non-NRN DB routing and default routing is that measurements are scored to track the number of default routed calls per country.

Example of Default Routing Call Flow

1. The OAS determines that it cannot obtain routing information from the NRN DB because of one of the following reasons:

   - The NRN DB is inoperable
   - The signaling links to the NRN DB are inoperable
   - There is an ACG control on the DN
   - A query was launched to the NRN DB, but no response was received in the expected time.

   The OAS scores one of the following counts:

   - The Default Routing Treatment count

   - The ACG default Route Directed count if there is an ACG control on the DN.

2. If the OAS determines that it is also an ISC/Gateway switch for this call, it follows the **OAS=ISC/Gateway Switch** call processing. Otherwise, proceed to Step 3.

3. The OAS determines the terminating ISC/Gateway switch for the call based on the determinant call type derived for the call and uses current procedures to route the call to this ISC/Gateway switch. For example, if a DSN entry is provisioned as the determinant call type, it is used to route to the ISC/Gateway switch specified by the DSN.

4. The OAS formulates an ISUP IAM and sends all the appropriate parameters. If an FAI is available from the SP, it sends the FAI in the IAM message. Otherwise, no FAI is sent if there is no MCT Table at the OAS.

5. The ISC/Gateway switch receives the IAM. If an FAI is available in the message, the call flow continues with Step 6. Otherwise, the switch uses the provisioned MCT Table to obtain the foreign carrier to which the call must be routed. (The provisioning system may provision 100 percent or any other percentage of the traffic to the dominant carrier in the MCT Table. The plan for default routing is that the percentages in the MCT Table will ***not*** be updated on a regular basis.)

6. The ISC/Gateway switch determines an outgoing trunk to the foreign carrier based on the FAI, DN, and other parameters as follows:

    a. If the ISC/Gateway switch can successfully route the call to the foreign carrier per the ECOS Area List using ERI in the incoming message, the ISC pegs the appropriate counts based on the ESI in the incoming message. The ISC/Gateway switch propagates the ACM received from the foreign carrier to the OAS and records an ICDR. **End of Call Flow.**

    b. If the ISC/Gateway switch cannot find a route to the foreign carrier, it cranks back (SAFER-EBC) the call to the OAS per existing procedures. Proceed to Step 7.

    c. If the ISC/Gateway switch is successful in routing to the subsequent switch, it may release the call back to the ISC/Gateway switch. The ISC/Gateway switch finds that AR is active on the call and may crank back to the OAS according to RA-EBC. Proceed to Step 7.

7. The OAS receives the proprietary crank back message due to SAFER-EBC or RA-EBC. The OAS picks the next route in the MRT entry to try an alternate ISC/Gateway switch route. Call flow

Steps 3 through 7 are repeated until all the NSN routes from the MRT Table are exhausted or the call finds a successful route. **End of Call Flow**.

OAS=Terminating ISC/Gateway Switch (Special Case)

This call flow describes a case when the NSN (primary/secondary) returned from the NRN DB is the same NSN of the OAS that made the query. In this case, the OAS also performs the terminating switch functionality (that is, it acts as the terminating ISC/Gateway switch to egress the call out of the AT&T network).

1. After receiving the NSN route(s) from the NRN DB, the OAS first determines if the NSN to which it needs to route is its own NSN.

    a. If it is not its own NSN, the switch follows routing treatment as previously described.

    b. Otherwise, the OAS is also the terminating ISC/Gateway switch. Proceed to the next step.

2. The OAS/terminating ISC/Gateway switch proceeds to determine an outgoing trunk to the foreign carrier (FAI) received from the NRN DB using the determinant call type derived prior to the NRN DB query.

    a. If the OAS/terminating ISC/Gateway switch can successfully route the call to the foreign carrier per the ECOS Area List using the ERI from the TCAP response, the switch performs the following tasks:
        - Pegs the appropriate counts based on the ESI received from the TCAP response
        - Upon receipt of the ACM received from the foreign carrier, sends an End message to the NRN DB indicating that the call was successfully routed and the route that was used
        - Records an ICDR. Proceed to Step 3.

b. If the OAS/terminating ISC/Gateway switch cannot find a route to the foreign carrier, call processing continues with Step 4.

c. If the ISC/Gateway switch is successful in routing to the foreign carrier but the foreign carrier is unsuccessful in routing to the subsequent switch, it may release the call back to the OAS/ terminating ISC/Gateway switch. The OAS/terminating ISC/Gateway switch finds that AR is active on the call. Proceed to Step 4.

3. The NRN DB receives the End message, performs the necessary Network Management measurements, and closes the TCAP transaction. **End of Call Flow**.

4. Because the foreign route is not available, the switch (as an OAS) proceeds as follows:

   a. If a secondary NSN route is available from the NRN DB, the OAS uses this route to identify the appropriate terminating ISC/Gateway switch to route the call. Call processing continues from Step 1.

   b. If there is a *Final Route* indicator associated with the last route received from the NRN DB, the OAS final handles the call using the FHT specified by the NRN DB with the last route. The OAS also sends an End message to the NRN DB indicating the Final Handling Code (FHC) for the call. Go to Step 3.

   c. If both NSN routes are attempted and there is no *Final Route* indicator from the NRN DB, the originating ISC/Gateway switch sends a subsequent query to the NRN DB by sending a TCAP Continue message for additional routing information.

5. The NRN DB receives the TCAP Continue message, and the CPR for this call continues the routing algorithm to select two more NSN routes for the given FAI. If all NSN routes for the FAI are exhausted, the next Overflow FAI from the FAI Table for the original FAI is selected. (For example, using the FAI table, if the

original FAI is 1, then the first Overflow FAI is FAI 3.) For this Overflow FAI, the first NSN is determined based on the NSN Allocator Table for this FAI (that is, NSN-T3) and subsequent routes are determined as explained previously. The NRN DB provides two additional routes to the OAS. The call flow continues as explained for an **ILDS Call Originating in the United States** until the call is successfully routed or all NSN routes for all the FAIs for the call are exhausted from the NRN DB. **End of Call Flow**.

□

Provisioning

Structures Affected ***OD4OFCCOPY2***

Item **OD4PF78** is assigned as an office parameter to indicate whether or not the NRN DB Transition is complete for this feature. Table 6-B describes the state of PF78 and Table 6-C lists the population rules. The feature On/Off flag is populated or updated using Recent Change (RC) Form 809 and verified using Verify Forms 16az and 8j.

Table 6-B- NRN DB On/Off Indicator

Item/State	Word	Disp.	Size	Description
OD4PF78 4ODFB_OFF(=0) 4ODFB_ON(=1)	7	5	1	Network Routing & Number Database Transition Indicator Transition is ***not*** complete (default) Transition is complete

Table 6-C – OD4PF78 Population Rules

RC Form 809 Entry				
Feature Item	**ON or OFF**	**Populates Item**	**With**	**Checks**
PF78	ON	OD4PF78	4ODFB_ON	None
	OFF		4ODFB_OFF	None

HT43DIGTYP

For the 4E25R3 and later generics, two spare 3-Digit Type indicators, **DT14** and **DT15**, are assigned to this feature as outlined in Table 6-D.

Table 6-D – Spare 3-Digit Type Indicator Assignments

Item/State	Word	Disp.	Size	Description
XL43DT14	1	13	1	Identifies if an NANP number is eligible for NRN DB query
4XL3DFALSE (=0)				NANP number is ***not*** eligible for NRN DB query (default)
4XL3DTRUE (=1)				NANP number is eligible for NRN DB query
XL43DT15	1	14	1	Identifies if an APN number is eligible for NRN DB query
4XL3DFALSE (=0)				APN number is ***not*** eligible for NRN DB query (default)
4XL3DTRUE (=1)				APN number is eligible for NRN DB query

These indicators are populated using RC Forms 319 and 320 by specifying **DT14** or **DT15** as the DIGTYP entry value. The associated Verify Forms are 13d and 3h. No changes are being made to the forms or population rules for these assignments.

HT4ASCITA

For 4E25R3 and later generics, ASCIT Question Number 24 (**XL4ASCIT24**) is assigned to this feature. The description for this question is changing from unused to the following:

Is the SII for this call eligible for an NRN DB Query?

The SII ASCIT Questions (Q1 through Q48) are provisioned using RC Form 653 and verified by Input Message 16au and Output Message 6bb. No form or population rule changes apply to this type of SII ASCIT Question assignment.

OD4NRNAPN_TT, OD4NRNE164_TT, OD4MAP_HEX_B, and OD4MAP_HEX_C

Four new Office Data Assembler (ODA) 1-word structures are being defined for this feature as follows:

- Two words for Intelligent Network TCAP Translation Types: **OD4NRNAPN_TT** and **OD4NRNE164_TT**

- Two words for mapping HEX codes into BCD digits: **OD4MAP_HEX_B**, and **OD4MAP_HEX_C.**

Each of these structures are defined in the NO4MEM library as a single word block of memory within Protected, Simplex, Disk-backed, API accessible and ODA populated (PBAO) memory as outlined in Table 6-E.

Table 6-E – New ODA 1-Word Structures Assignments

Structure Name	Block Size	4E25 Core Address Octal	4E25 Disk Address Octal	Initial Value Octal	Description
OD4NRNE164_TT	1	7143165	747525	00000350	Translation Type for E.164 - 232
OD4NRNAPN_TT	1	7143166	747526	00000351	Translation Type for NRN APN - 233
OD4MAP_HEX_B	1	7143167	747527	00000010	Map HEX “B” code 11 into BCD digit 8 for GTT@STP
OD4MAP_HEX_C	1	7143170	747530	00000011	Map HEX “C” code 12 into BCD digit 9 for GTT@STP

Important! These words will be initialized via special overwrites.

These four structures are not recent changeable or verifiable by the traditional RC/Verification method. The only method by which they can be updated or provisioned is by using an absolute address via RC Form 800 [or the equivalent Input/Output (I/O) command IN:OWBUF] and verified using the I/O command DUMP:CSS. The structures will be initialized to the values listed in Table 6-E.

HT4CCONV

The existing item XL4CC_FAXPR (FAX Preferred Routing) item within the Country Code Conversion (HT4CCCONV) translator is used as an NRN DB Country Code Translation Complete indicator.

The HT4CCCONV translator structure is provisioned using RC Forms 317 and 318, and verified using Input Message 13d and Output Form 3h. The compool item (XL4CC_FAXPR), associated RC/V Forms, and field names are not changing. Only the corresponding comments associated with this item are being updated.

Recent Change Form Affected

The RC Form 317 is used to add a new Country Code Conversion translator entry to the HT4CCCONV structure. This form will be slightly modified to become an ADD/CHANGE (or full replacement) form instead of a pure defensive ADD only form. To incorporate this change, the defensive checks are being removed that check and reject the form when the CC entered (XL4CC_CC1 through XL4CC_CC3) already exists in the translator. The translation data is not changed when corresponding fields (CBONLY, CCRF, FAXPR, LD RESELL, and SCLB) are blank.

□

Recording (Not Affected)

Network Management

The *4ESS* switch provides the Network Management Operations Support (NEMOS) counts described in Table 6-F.

Table 6-F - Network Management Counts

Message	Description
204	This new message allows NEMOS to obtain the NRN DB ACG Final Handling and NRN DB ACG Default Routing 5-minute counts.
8	This modified message allows NEMOS to obtain the NRN DB non-ACG Default Routing 5-minute counts.
1	This modified message allows NEMOS to obtain the following two new 30-second discretes: • Data Base Overload ACG Control Rejected • OSS-Initiated ACG Control Rejected.
49	This modified message allows NEMOS to determine if a certain type of call is eligible for an NRN DB query.

□

Maintenance/Troubleshooting

Final Handling Codes

Eighteen new Final Handling Codes (FHCs) are associated with this feature. They are described in Table 6-G.

Table 6-G- Final Handling Code Descriptions

Code	Description
2195	**Last Normal Condition:** A response was received from the NRN DB. **Irregular Condition:** Invalid DSN routing was encountered while attempting a non-final route from the NRN DB. **Handling:** Additional routes from the NRN DB will be attempted.
2196	**Last Normal Condition:** A response was received from the NRN DB. **Irregular Condition**: A non-final route returned by the NRN DB contains a Foreign Administration ID that does not match an entry in the MCT Table. **Handling:** Additional routes from the NRN DB will be attempted.
2197	**Last Normal Condition:** A response was received from the NRN DB. **Irregular Condition:** Invalid DSN routing was encountered while attempting a final route from the NRN DB. **Handling:** The call will be final handled using the treatment returned by the NRN DB.
2198	**Last Normal Condition:** A response was received from the NRN DB. **Irregular Condition**: The final route returned by the NRN DB contains a Foreign Administration ID that does not match an entry in the MCT Table. **Handling:** The call will be final handled using the treatment returned by the NRN DB.
2199	**Last Normal Condition:** A response was received from the NRN DB. **Irregular Condition:** Exhausted routing options for all routes were returned from the NRN DB. **Handling:** The call will be final handled using the treatment returned by the NRN DB.
2208	**Last Normal Condition:** Communication for a call was established with the NRN DB. **Irregular Condition:** The NRN DB instructed the switch to terminate the call with a No Circuit Condition. **Handling:** The call is terminated.
2209	**Last Normal Condition:** Communication for a call was established with the NRN DB. **Irregular Condition:** The NRN DB instructed the switch to disconnect the call with a Vacant Code Treatment. **Handling:** The call is terminated.
2210	**Last Normal Condition:** Communication for an International call was established with the NRN DB. **Irregular Condition:** The NRN DB instructed the switch to disconnect the call with a Vacant Code Treatment. **Handling:** The call is terminated.
2211	**Last Normal Condition:** An attempt was made to query the NRN DB. **Irregular Condition:** While attempting to send the query, an ACG Control was encountered on the routing digits that instructed the switch to terminate the call with a No Circuit Announcement. **Handling:** The call is terminated.

Table 6-G- Final Handling Code Descriptions (Cont'd)

Code	Description
2212	**Last Normal Condition:** An attempt was made to query the NRN DB. **Irregular Condition:** While attempting to send the query, an ACG Control was encountered on the routing digits that instructed the switch to terminate the call with the International No Circuit Announcement. **Handling:** The call is terminated.
2213	**Last Normal Condition:** Communication for an International call was established with the NRN DB. **Irregular Condition:** The NRN DB instructed the switch to terminate the call because of an error code of missing routing records. **Handling:** The call is terminated.
2214	**Last Normal Condition:** An attempt is made to query the NRN DB. **Irregular Condition:** While attempting to send a query to the NRN DB, an ACG control was encountered on the routing digits that require the switch to default route the call. **Handling:** The call is routed based on the current routing digits and routing information.
2215	**Last Normal Condition:** An attempt is made to query the NRN DB (International call). **Irregular Condition:** While attempting to send a query to the NRN DB, an ACG control was encountered on the routing digits that require the switch to default route the call. **Handling:** The call is routed to a NWZ1 location based on the current routing digits and routing information.
2216	**Last Normal Condition:** A TCAP message is built and an attempt is made to send the message to the NRN DB. **Irregular Condition:** The message failed to reach the NRN DB. **Handling:** The call is default routed based on the current routing digits and routing information.
2217	**Last Normal Condition:** Communication for a call was established with the NRN DB. **Irregular Condition:** The NRN DB instructed the switch to default route the call because the routing records were provisioned erroneously. **Handling:** The call is default routed with the current routing digits and routing information.
2218	**Last Normal Condition:** Communication for a call was established with the NRN DB. **Irregular Condition:** The switch received a message from the NRN DB that contained an error. An exception code will be included in the Call Irregularity Report that identifies the specific error. **Handling:** The call is default routed with the current routing digits and routing information.

Table 6-G- Final Handling Code Descriptions (Cont'd)

Code	Description
2219	**Last Normal Condition:** An attempt is made to send a query (TCAP Begin message) to the NRN DB. **Irregular Condition:** The switch waited for 2 seconds for a response from the NRN DB but did not receive the response. **Handling:** The call is default routed based on the current routing digits and routing information.
2220	**Last Normal Condition:** An attempt is made to requery (TCAP Continue message) to the NRN DB for additional information. **Irregular Condition:** The switch waited for 2 seconds for a response from the NRN DB but did not receive the response. **Handling:** The call is default routed based on the current routing digits and routing information.

Exception Codes New NRNDB Exception Codes are listed in Table 6-H.

Table 6-H - NRNDB Exception Codes

Code	Description
260	NRNDB protocol error
261	Received UDS MSG--query returned
262	NRN invalid caller interaction operation
263	NRN invalid network management operation
264	RCVD reject from NRN DB
265	RCVD PABORT from NRN DB
266	RCVD UABORT from NRN DB
267	RCVD return error from NRN DB
268	RCVD DUPL CC MSG from NRN DB
269	RCVD DUPL NM-ACG from NRN DB
270	RCVD invalid invoke component operation from NRN DB
271	RCVD invalid connection control connect operation
273	Missing mandatory parameter in the route constructor parameter
274	RCVD invalid digit type from NRN DB
275	RCVD invalid error code from NRN DB
276	Failed to send MSG due to stream down
277	Failed to send MSG due to buffer overflow condition
279	Missing routing record-no circuits available
280	Call handling-not allowed
281	Call handling-network management controls applied
290	Detected an unrecognized component in the NRN DB message
291	Detected an invalid continue message
292	Detected an invalid end message

Table 6-H - NRNDB Exception Codes (Cont'd)

Code	Description
293	Detected a message that was neither a continue nor an end
294	Detected an invalid connection control connect parameter
295	Detected an invalid connection control connect DISC parameter
296	Detected an invalid caller interaction play announcement parameter
297	Detected an invalid network management ACG parameter
298	Detected an invalid network management digits parameter
299	Missing a mandatory FRI parameter
300	Detected an invalid return error request cause it was not a DISC or CONN request
301	Missing mandatory standard announcement parameter and or disconnect operation
302	Received a request to disconnect the call and the call handling parameter did not indicate no route
303	Received a request to disconnect the call and the call handling info did not indicate NM controlled or not allowed
304	Received a request to disconnect the call, no call handling parameter received

Transition Considerations

Growth and Retrofit

The Office Data Management System (ODMS) must copy and preserve the four new 1-word structures into the next generic.

Special ODA Overwrite

With the introduction of the new structures on a non-Release 1 Generic boundary, a special ODA overwrite must be supplied to initialize these structures to the appropriate values.

Related Features

This feature is related to Feature 4967—*Automatic Routing* (4E24 Release 1 Generic.

Feature Deployment

It is not necessary for the 4E25 Release 3 Generic to be deployed in all *4ESS* switches in the network for this feature to be fully operational.

Prerequisites for Feature Activation

The new NCPs (that is, the NRN DB) should be deployed and the 2STPs should be provisioned with the new translation types (232 and 233) before activating this feature.

Feature Activation

1. In order for the switch to begin a query to the NRN DB, the SII associated with the calls that need to query the NRN DB must have their associated ASCIT Table Question Q24 set to **Y** using RC Form 653.

2. If feature bit PF78 (set using RC Form 809) is set to **ON**, the switch can query the NRN DB. This bit is referred to as the Transition Complete Bit. If feature bit PF78 is set to **OFF**, the call may still be eligible for an NRN DB query based on the following conditions (referred to as Transition Indicators):
   - If the call is to an NWZ1 location and the CC indicator FAXPR is set to **Y**, the call is eligible for an NRN DB query. RC Form 317 is used to set FAXPR.
   - If the call is to an APN number and DT15 is associated with the first 3 digits of the number, the call is eligible for an NRN DB query. RC Form 319 is used to set DT15.
   - If the call is to an NANP number and DT14 is associated with the first 3 digits of the number (that is, the NPA), the call is eligible for an NRN DB query. Use RC Form 319 to set DT14.

3. If ASCIT Table Question Q24 is not set for the SII regardless of the setting of the feature Bit (PF78), the DIGTYPE fields (DT 14 and DT15), or the country Conversion indicator (FAXPR), the NRN DB is **not** queried.

□

Input/Output Manual Pages

Input Manual Pages - New

The following input manual page is new with this feature:

TEST:NRNDB

Input Manual Pages – Modified

The following input manual page has been modified by this feature:

VER:ASCIT

Output Manual Pages - New

The following output manual page is new with this feature:

TEST:NRNDB

Output Manual Pages - Modified

The following output manual page has been modified by this feature:

REPT:IAOFC
VER:ASCIT-ANSR
VER:CODEGRP-CCD

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7 LRN Recipient Switch Coding of FCI for Interswitch Routing of Dialed Number Feature (7880)

Overview

Description

This feature ensures that the Forward Call Indicator (FCI) remains set to 1 when it egresses the switch. Previous to this feature, the *4ESS* switch would reset the FCI to 0 (not translated) based on Features 6330 and 7181. These two features ensured that an FCI = 1 was not sent to an ISDN Applications Part (ISUP) PBX. It was also assumed in those features that calls arriving on LSP_LOCAL trunks would not route interswitch. However, Features 6330 and 7181 are not compliant with industry standards, and now calls can be routed between AT&T switches. For these reasons this feature ensures that the FCI remains set to 1 when it egresses the switch.

This feature also provides for the *4ESS* switch to include Local Automatic Number Identification (LANI) in the Transaction Capabilities Application Part (TCAP) Begin Message to the Segmentation Directory (SD) and 2DSA/2NCP for AT&T Digital Link (ADL) dial-around calls to the Government Emergency Telecommunications System (GETS).

Purpose This chapter provides the user with feature description, call flows, and transition considerations.

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Feature Description

Introduction

This feature redefines how a *4ESS* switch formulates an IAM (Initial Address Message) when routing an interswitch call as a result of digit analysis of a destination number. This feature applies to the following two cases:

- *4ESS* receives its own LRN (Location Routing Number) in response to a Local Number Portability (LNP) query, or
- *4ESS* receives its LRN in the CdPN (Called Party Number) field in an IAM (Initial Address Message) with an FCI (Forward Call

Background – Setting the FCI Bit

DL dial around call attempts to 710-NCS-GETS.

Currently, when the *4ESS* recognizes its own LRN in response to an LNP query, the *4ESS* will perform digit analysis on the dialed number and route the call to the terminating PBX customer. When routing this call, if the call routes interswitch using ISUP or routes intraswitch to an ISUP PBX customer, the *4ESS* formulates an IAM where:

- the dialed number is contained in the CdPN field,
- the Ported Number GAP field is not included, and
- the FCI indicates “not translated” (i.e. M bit = 0).

Likewise, if the *4ESS* is the recipient switch of a call where its LRN is in the CdPN field, the dialed number is in the Ported Number GAP, and the FCI is set to “Number Translated.” Upon recognizing it LRN, the *4ESS* performs digit analysis on the dialed number contained within the GAP, and if the call is to be routed interswitch or intraswitch to an ISUP PBX customer, the *4ESS* formulates an IAM where:

- the dialed number is in the CdPN,
- the Ported Number GAP is not included, and
- the FCI is reset to reflect "Not Translated."

According to industry standards, once a switch recognizes its LRN, if as a result of digit analysis the call is to be routed interswitch, the FCI should not be reset, but rather remain encoded as "Translated Number". The *4ESS* deviates from industry standards due to requirements introduced in Feature 6330 "*4ESS* AT&T Digital Link LRN capabilities" and Feature 7181"Removal of NSN for ADL LNP processing." The requirements in these two features were written to ensure that an FCI = 1 was not sent to an ISUP PBX for fear of negatively impacting the customer.

With the introduction of the NESV (Network Edge Switch Vehicle) network and the need to route calls between the *4ESS* network and the NESV network, coding of the FCI parameter must comply with industry standards. In particular, in mid 2000, there will be a need to route interswitch from *4ESS* to NESV in order to reach an announcement played on the AT&T Local Announcement Platform. In order for the NESV to not redo LNP on the dialed number contained in the CdPN, the FCI in the IAM must remain set as "number translated = 1".

Background – Dial-Around to GETS

Feature 6990 – *4ESS* AT&T Digital Link Phase 3 – Dial-Around Capability, introduced the capability for an ADL customer to place dial-around calls on their PBX trunk groups connected to a *4ESS* switch. It was assumed by this feature that an ADL customer would be allowed to dial around to other carriers for service on a per-call basis. Sprint and MCI provide GETS service to AT&T.

Feature 6990 provided for the *4ESS* to recognize a dial-around call attempt from an ADL customer and defined TCAP parameters the *4ESS* should send in a TCAP begin message to the SD and/or 2DSA/2NCP. The 2DSA/2NCP provides the customer logic required to either honor dial-around call attempts or to deny call-around attempts. In order to access the dial-around logic in the 2DSA/2NCP, the 2DSA/2NCP must receive several TCAP parameters. The TCAP digits (LANI) parameter is one of the key parameters that must be

received.

Feature 5371 – *4ESS* Local for Nodal Customers – Phase II provides that all originating calls on a direct connect PBX trunk group where the new parameter CBN_DIGS (LANI) is populated and the LOCAL_NODAL Feature bit is ON, the *4ESS* will retrieve the value from the trunk group to be used as the LANI. However, GETS calls are exempt from this requirement. Consequently, the *4ESS* does not retrieve the LANI on call attempts to 710-NCS-GETS and therefore does not include the TCAP digits (LANI) parameter in the TCAP begin message on a dial-around call attempt to 710-NCS-GETS.

Table 7-1 shows the Product Release Document (PRD) in which the referenced Features are documented.

Table 7-1 - Feature References

Feature	Title	PRD
5371	4E Local for Nodal Customers – Phase II	234-090-223AC
6330	*4ESS* Switch AT&T Digital Link Location Routing Number Capabilities	234-090-232AC
6990	AT&T Digital Link Phase 3 – Equal Access Dial-Around Capability	234-090-243AC
7181	Removal of Network Switch Numbers for AT&T Digital Link Number portability	234-090-241AC

Benefits This feature allows the *4ESS* switch to support the AT&T Local Announcement Platform, and to support AT&T Digital Link (ADL) dial around call attempts to 710-NCS-GETS (Government Emergency Telecommunications Service).

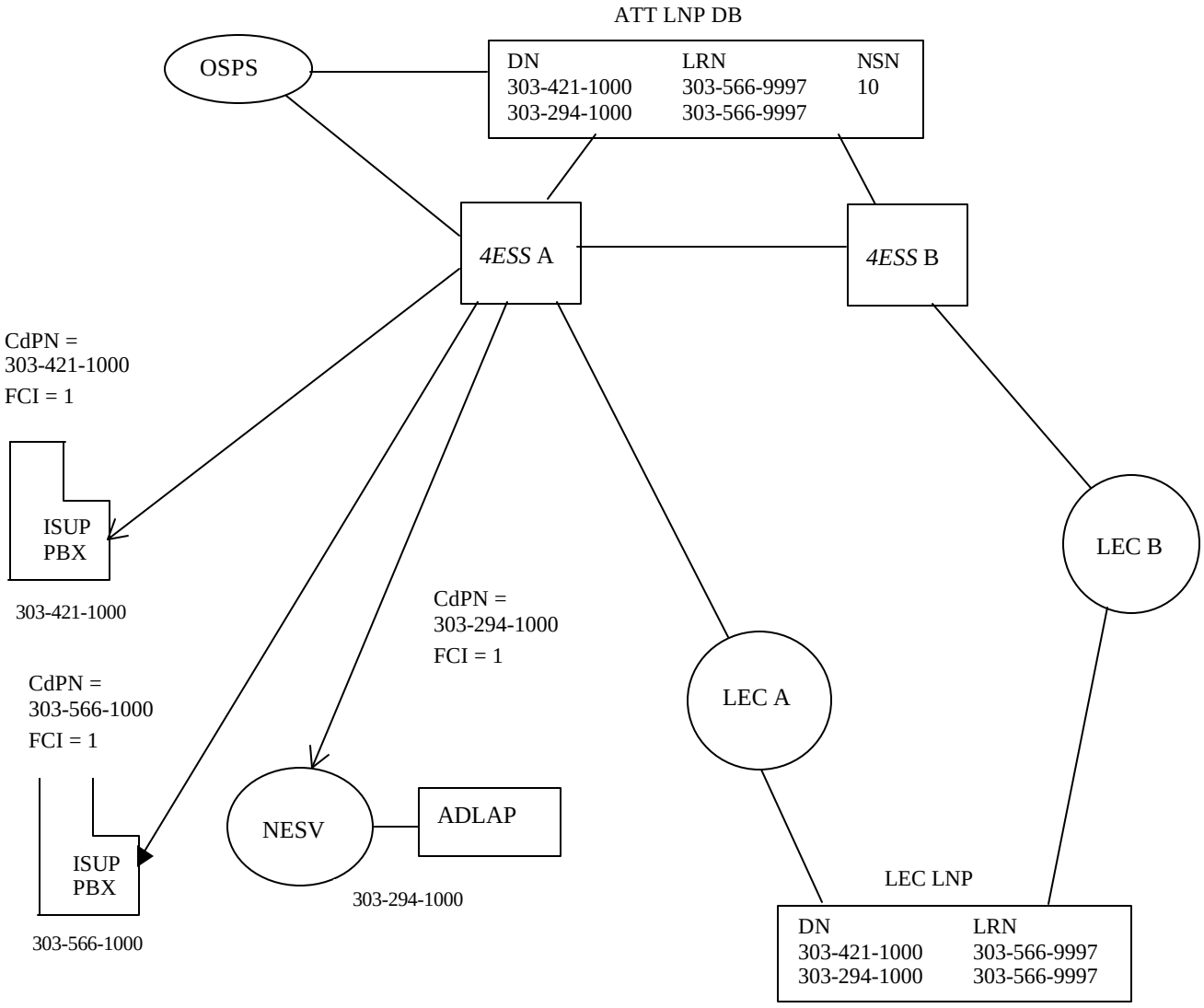
□

Call Flow

Call Flow Diagram

Figure 17-1 shows the call flow architecture that supports Feature 7880.

Figure 7-1 - Call Flow Architecture for LRN Recipient Switch Coding of FCI for Interswitch Routing of Dialed Number



Call Flow Narrative

The following call flows are examples of LRN recipient switch coding of FCI for interswitch routing of dialed number. These call flows are examples only, not all combinations.

Originating *4ESS* LRN Call

This call flow assumes that the ADL customer is provisioned in the network using Feature 6330 architecture.

1. A customer behind LEC A dials 303-421-1000.
2. LEC A determines that this call is a toll call and routes to *4ESS* A with an IAM of CdPN = 303-421-1000, no ported number GAP and FCI = 0.
3. *4ESS* A determines that 303-421 is opened to portability and queries the ATT LNP DB.
4. The ATT LNP DB returns an LRN of 303-566-9997 and an NSN of 10.
5. *4ESS* A determines whether the LRN of 303-566 belongs to itself or another 4E. In this case, 303-566 belongs to itself. Hence, *4ESS* A will not route the call based on NSN nor will it route the call based on LRN. *4ESS* A will route based on the digits received in the CdPN (303-421-1000)
6. *4ESS* A performs digit translations on 303-421-1000. Translations point to an ISUP PBX TOT. The *4ESS* formulates an IAM where the CdPN = 303-421-1000, no ported number GAP, and FCI = 1.

End of call flow.

Originating OSPS LRN Call

This call flow assumes that the ADL customer is provisioned in the network using Feature 7181 architecture.

1. The OSPS sends *4ESS* A an ISUP IAM with the LRN in the CdPN (303-566-9997), the dialed number in a ported number GAP (303-294-1000), and the FCI = 1.
2. *4ESS* A recognizes its LRN in the CdPN and retrieves the dialed number in the ported number GAP.

3. *4ESS* A performs digit translations on 303-294-1000. Translations point to an ISUP trunk to a NESV. The *4ESS* formulates an ISUP IAM where the CdPN = 303-294-1000, no ported number GAP, and an FCI =1.

4. The NESV identifies that 303-294 is opened to portability, but since the FCI = 1, it doesn't perform an LNP query. The NESV simply performs digit translations on 303-294-1000 and completes the call, which in this case is probably to an announcement on the AT&T Digital Link Local Announcement Platform.

End of call flow.

Terminating LRN Call Over LSP_LOCAL TOT

This call flow assumes that the ADL customer is provisioned in the network using Feature 7181 architecture.

1. A customer behind LEC A dials 303-294-1000.

2. The LEC A end office recognizes that 303-294 is open to portability and the call is a local call.

3. LEC A end office queries its LNP DB and finds that the dialed number has an associated LRN of 303-566-9997.

4. Based on translations, LEC A routes this call to *4ESS* A over LSP_LOCAL TOT with the LRN in the CdPN (303-566-9997), the dialed number in the ported number GAP (303-294-1000), and the FCI set to 1.

5. *4ESS* A recognizes its LRN in the CdPN and retrieves the dialed number in the ported number GAP.

6. *4ESS* A performs digit translations on 303-294-1000. Translations point to an ISUP PBX TOT. The *4ESS* formulates an IAM where the CdPN = 303-294-1000, no ported number GAP, and FCI = 1.

End of call flow.

Terminating Inter-*4ESS* LRN Call

This call flow assumes that the ADL customer is provisioned in the network using Feature 6330 architecture.

1. A customer behind LEC B dials 303-421-1000.
2. LEC B determines that this call is a toll call and routes to *4ESS* B with an IAM of CdPN = 303-421-1000, no ported number GAP and FCI = 0.
3. *4ESS* B determines that 303-421 is opened to portability and queries the ATT LNP DB.
4. The ATT LNP DB returns an LRN of 303-566-1000 and an NSN of 10.
5. *4ESS* B determines whether the LRN of 303-566 belongs to itself or another 4E. In this case, 303-566 belongs to another 4E. Hence, *4ESS* B will not route the call based on NSN. *4ESS* B will route the call to *4ESS* A based on translations on the LRN of 303-566. *4ESS* B sends an ISUP IAM with the LRN in the CdPN (303-566-9997), the dialed number in the ported number GAP (303-421-1000) and FCI = 1.
6. *4ESS* A determines that the digits in the CdPN is its own LRN. It retrieves the dialed number in the ported number GAP.
7. *4ESS* A performs digit translations on 303-421-1000. Translations point to an ISUP PBX TOT. The *4ESS* formulates an IAM where the CdPN = 303-421-1000, no ported number GAP, and FCI = 1.

End of call flow.

Terminating Inter-*4ESS* Call to a Local Exchange Routing Guide (LERG) Assigned ADL Customer

1. A customer behind LEC B dials 303-566-1000.
2. LEC B determines that this call is a toll call and routes to *4ESS* B with an IAM of CdPN = 303-566-1000, no ported number GAP, and FCI = 0.
3. *4ESS* B determines that 303-566 is opened to portability and queries the ATT LNP DB.
4. The ATT LNP DB returns the dialed number, 303-566-1000

without an LRN.

5. *4ESS* B will route the call to *4ESS* A based on translations on the dialed number, 303-566-1000. *4ESS* B sends an ISUP IAM with the dialed number in the CdPN (303-566-1000), no ported number GAP, and FCI = 1.

6. *4ESS* A performs digit translations on 303-566-1000. Translations point to an ISUP PBX TOT. The *4ESS* formulates an IAM where the CdPN = 303-566-1000, no ported number GAP, and FCI = 1.

End of call flow.

□

Provisioning (Not Affected)

Recording (Not Affected)

Network Management (Not Affected)

Maintenance/Troubleshooting (Not Affected)

Transition Considerations

Feature Deployment

Full deployment of this feature in the network is not necessary for this feature to be fully operational.

This feature is deployed as a Software Change Package (SCP) to Generic 4E25.

Feature Activation

This feature is activated by software deployment.

□

Input/Output Manual Pages (Not Affected)

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8 Billing Number for Switched Data Video Gateway (SDVG) Feature (7883)

Overview

Description

This feature acts as a gateway between a customer's Asynchronous Transfer Mode/Internet Protocol (ATM/IP) network and AT&T's Switched Data Services/Software Defined Data Network (SDS/SDDN). Originating calls from within this network arrive at the *4ESS* switch over a nodal Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) link. The only identification of the customer will be via the delivered Calling Party Number (CPN). Therefore this feature forces the *4ESS* switch to use the delivered CPN as the Automatic Number Identification (ANI) for all call processing (TCAP, ISUP, AMA recording). A new indicator in the Parameterized Network-Specific Facilities Information Element (NSF IE) in the SETUP will identify calls.

This feature is valid only for Generics 4E25 and 4E26. This feature will not be valid for Generics 4E27 and later.

Purpose This chapter provides the user with a feature description, information on a final handling code, and transition considerations.

Contents This chapter contains the following topics:

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Feature Description

Description SDVG service allows interoperability of SDS and SDDN based video (for example narrowband ISDN) with similar services provided over broadband (for example, ATM, IP). The SDVG acts as a gateway between the customer's ATM/IP network and AT&T's SDS/SDDN network. For originating calls that require transport outside of the customer's ATM/IP network, the SDVG performs ATM/IP-ISDN protocol conversion and sends the calls to the *4ESS* over a commercial ISDN nodal PRI.

Since the customer is behind the SDVG and is only identified by the incoming Q.931 CPN, this feature requires that the *4ESS* use the Called Party Number (CPN) rather than the *4ESS* Trunk Subgroup (TSG) Billing Number, as the ANI for call processing (including TCAP queries, ISUP signaling, and AMA recording).

For terminating calls that require transport to the customer's ATM/IP network, the *4ESS* is currently designed to send calls to the SDVG over the same ISDN PRI. The SDVG performs ISDN-ATM/IP protocol conversion and completes the call to the customer.

> **Important!** This feature is valid only for Generics 4E25 and 4E26. This feature will not be valid for Generics 4E27 and later.

Benefits This feature allows AT&T to properly bill and route customer calls which arrive at the *4ESS* switch from behind a subscribers video gateway.

□

Call Flow (Not Affected)

Provisioning

RC Forms Affected

The following Recent Change form modifications apply to Generics 4E25 and 4E26 only. The population rules for the following RC forms have been modified to allow the use of the spare parameter **S10** to determine if the TSG is assigned as the SDVG TSG. The spare parameter, when used as an SDVG indicator, is only provisionable for AT&T, incoming Q931 TSGs.

- RC FORM 100 – ADD a new two way Trunk Subgroup
- RC FORM 101 – ADD a new one way incoming Trunk Subgroup
- RC FORM 107 – CHANGE a two way Trunk Subgroup
- RC FORM 108 – CHANGE a one way incoming Trunk Subgroup

The S10 field can have the following input values:

- **Blank** or **N** – DEFAULT, the TSG is NOT an assigned Switched Data Video Gateway.
- **Y** – The TSG is an assigned Switched Data Video Gateway.

These forms are documented in the TG-4, Division 7, Section 1.

Recording (Not Affected)

Network Management (Not Affected)

Maintenance/Troubleshooting

Final Handling Code

The following final handling code was created for this feature:

FHC - 699

Last Normal Condition: Received an NSF IE with the SDVG value in the parameterized field.
Irregular Condition: Did not receive a 10 digit calling party number IE or the subscription bit not set to Y.
Final Handling: The switch sends a release complete message indicating invalid information element.

Transition Considerations

Feature Deployment

Full deployment of this feature in the network is not necessary for this feature to be fully operational.

This feature is deployed as a Software Change Package (SCP) to Generic 4E25.

This feature is valid only for Generics 4E25 and 4E26. This feature will not be valid for Generics 4E27 and later.

Feature Activation

This feature is activated by software deployment.

□

Input/Output Manual Pages (Not Affected)

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A Release Summary - 4E25 Release 3 Generic

Overview

Purpose This appendix summarizes the growth and retrofit documents, input and output messages, the OS interfaces, new or changed alarms, measurements, and the feature activation summary for the 4E25 Release 3 Generic Product Release Document (PRD). This includes Software Change Packages (SCPs) documented in this PRD.

□

Contents This Appendix contains the following topics:

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Growth and Retrofit Documents

Growth and Retrofit Documents

The following growth and retrofit documents are impacted by the 4E25 Release 3 Generic:

- 234-153-055AC – *4ESS* Switch – Common Network Interface Growth/Degrowth

NOTE: The DLN upgrade in the CNI is expected to take place during the 4E25R4 timeframe, but the CNI document is listed here to be consistent with the release of the Product Release Document.

□

Input/Output Messages

Input and Output Messages

The following lists include the input and output messages for the 4E25 Release 3 Generic that are feature-related. A notation is included indicating whether each message is new, revised, or deleted. The feature numbers are included in parentheses ( ).

At the end of this document are copies of input and output messages that were not included in the 4E25R1 I/O Manuals.

4ESS Output Messages

The following is a 4ESS output message for 4E25R3. It is included in output manual OM-4B-000-01.

VER:CODEGRP-CCD Revised (7592)

4ESS Proprietary Input Messages

The following are 4ESS proprietary input messages for 4E25R3. These messages will be included in proprietary input/output manual 4B-000-01AC.

TEST:NRNDB	New (7592)
VER:ASCIT	Revised (7592)
VER:MISC-ESCR	New (7497)
VER:MISC-NEIPAV	New (7106)

4ESS Proprietary Output Messages

The following are 4ESS proprietary output messages for Generic 4E25R3. These messages are included in proprietary input/output manual 4B-000-01AC.

REPT:IAOFC	Revised (7592)
TEST:NRNDB	New (7592)
VER:ASCIT-ANSR	New (7592)
VER:MISC-ESCR	New (7497)
VER:MISC-NEIPAV	New (7106)

□

OS Interfaces

OS Interfaces

Several features in this release interact with various Operation Support Systems (OSSs). The following features interact with various Operation Support Systems, including AMA, CDRP, IRAS, NEMOS, and TOPAS.

Feature	OSS
6915i	DEMS/DARICS
7497	SNOW-R
7592	NEMOS

□

New or Changed Alarms

New or Changed Alarms

There are no new alarms related to the features documented in the Product Release Document for the 4E25 Release 3 Generic.

□

Measurements/OSOR

Feature 6915i Measurements

The operating system Dynamic Engineering Mechanized System/Data Acquisition Reports and Integrated Communication System (DEMS/DARICS) is updated to provide 15 minute DLN Attached Processor (AP) and Node Processor (NP) utilization reports.

Feature 6989 Measurements

SWITCH MEASUREMENT REPORT

The following hourly measurements are being added to the *4ESS* Switch Measurement Report and are independent of the value of the feature bit:

- The number of times the switch stops servicing its receive signaling buffer because a limit on the number of messages is reached
- The number of times additional resources are allocated
- The number of BLCs whose length exceeds the activation threshold.

The Switch Measurement Report is scheduled in a given *4ESS* switch and printed on the 1B Processor Output Channel. This requirement will be deployed in the 4E25 Release 3 Generic and retired in the 4E26 Release 1 Generic.

MACHINE LOAD AND SERVICE SUMMARY

The following hourly measurements must be added to the *4ESS* switch

Machine Load and Service Summary (MLSS) Report:

- The number of times the switch stops servicing its receive signaling buffer because a limit on the number of messages is reached
- The number of times additional resources are allocated
- The number of BLCs whose length exceeds the activation threshold.

The MLSS Report is scheduled in a given *4ESS* switch and printed on the 1B Processor Output Channel. Because the MLSS Report can only be added on a generic boundary, this requirement will be deployed in the 4E26 Release 1 Generic.

CAPACITY AND PERFORMANCE

This feature predicts a minimum 6 percent increase in useable Busy Hour Call Attempt (BHCA) capacity in the1B Processor. It changes the strategy of the scheduler and executive control to defer nonessential work and allocate more time for call processing during peak traffic periods. This reduces the probability of an overload condition before it occurs.

Feature 7592 Measurements

The *4ESS* switch provides the Network Management Operations Support (NEMOS) counts described below.

Network Management Counts

Message	Description
204	This new message allows NEMOS to obtain the NRN DB ACG Final Handling and NRN DB ACG Default Routing 5-minute counts.
8	This modified message allows NEMOS to obtain the NRN DB non-ACG Default Routing 5-minute counts.
1	This modified message allows NEMOS to obtain the following two new 30-second discretes: • Data Base Overload ACG Control Rejected • OSS-Initiated ACG Control Rejected.
49	This modified message allows NEMOS to determine if a certain type of call is eligible for an NRN DB query.

□

Feature Activation Summary

Feature 566 **US/RUAS Productization**

This feature is activated by hardware and software deployment.

Feature 6915i **4ESS Signaling Capacity Improvements**

Features 6915i and 6915 are activated by software and hardware deployment. The hardware is expected to be available in the 4E25R4 timeframe.

Feature 6989 **Enhanced Scheduling and Executive Control**

This feature is activated by an Office Data Assembler (ODA) RC using RC Form 809. The FEATURE ITEM field is set to **F29** and the ON OR OFF field is set to **ON**.

Feature 7106 **NE IAM MTP Priority Level at Egress of Network**

This feature is activated using a 1B Processor Recent Change. The feature bit **PF71** is set using RC Form 809. To activate this feature, set the feature bit to **ON**. To deactivate this feature, set the feature bit to **OFF**.

Feature 7497 **ANC Enhancements to Special Routing Features**

To activate this feature, set the ODA bit, OD4PF77 to **ON**, and populate **RC Form 668**. To deactivate this feature, set OD4PF77 to **OFF**.

Feature 7592 **NRN DB**

The new NCPs (that is, the NRN DB) should be deployed and the 2STPs should be provisioned with the new translation types (232 and 233) before activating this feature.

1. In order for the switch to begin a query to the NRN DB, the SII associated with the calls that need to query the NRN DB must have their associated ASCIT Table Question Q24 set to **Y** using RC Form 653.

2. If feature bit PF78 (set using RC Form 809) is set to **ON**, the switch can query the NRN DB. This bit is referred to as the Transition Complete Bit. If feature bit PF78 is set to **OFF**, the call may still be eligible for an NRN DB query based on the following conditions (referred to as Transition Indicators):

- If the call is to an NWZ1 location and the CC indicator FAXPR is set to **Y**, the call is eligible for an NRN DB query. RC Form 317 is used to set FAXPR.
- If the call is to an APN number and DT15 is associated with the first 3 digits of the number, the call is eligible for an NRN DB query. RC Form 319 is used to set DT15.
- If the call is to an NANP number and DT14 is associated with the first 3 digits of the number (that is, the NPA), the call is eligible for an NRN DB query. Use RC Form 319 to set DT14.

3. If ASCIT Table Question Q24 is not set for the SII regardless of the setting of the feature Bit (PF78), the DIGTYPE fields (DT 14 and DT15), or the country Conversion indicator (FAXPR), the NRN DB is **not** queried.

Feature 7880 **LRN Recipient Switch Coding of FCI for Interswitch Routing of DN**

This feature is activated by software deployment.

Feature 7883 **Billing Number for SDVG**

This feature is activated by software deployment.

□

B Acronyms and Abbreviations

Overview

Purpose This appendix lists acronyms and abbreviations used throughout this document.

Acronym/Abbreviation	Definition
2DSA	No. 2 Direct Services – ANI Based
2NCP	No. 2 Network Control Point
2NCPAS	2 Network Control Point Administration System
AAP	Announcement Administrative Process
AATOS	Alternate Access to Operator Services Signaling
ACD	Automatic Call Distributor
ACG	Automatic Call Gapping
ACG	Automatic Code Gap
ACK	Acknowledge
ACM	Address Complete Message
ACP	Action Control Point
ACV	Access Charge Verification
AD3	Additional Data 3
ADA	ANC Dial-Around
ADL	AT&T Digital Link
ADL2	AT&T Digital Link 2
ADL4	AT&T Digital Link 4

ADL5	AT&T Digital Link 5
ADL-V	AT&T Digital Link-Phase V
ADR	Alternate Destination Routing
AILS	Automatic Inward Line Screening
AINS	Advanced Intelligent Network
AIWS	AT&T International Wholesale Service
ALA	Adjunct Logical Address
ALAMO	AT&T Local Access Management Option
ALI	Automatic Line Identification
ALN	AT&T Local Network
AMA	Automatic Message Accounting
ANC	AT&T Network Connections
ANI	Automatic Number Identification
ANICAR	Automatic Number Identification Call Attempt Record
ANI-TT	ANI Trigger Table
ANSI	American National Standards Institute
ANT	Alternate Number Transition
AP	Attached Processor
APN	Action Point Number
APS	Attached Processor System
AR	Automatic Routing
ARN	Advanced Remote Node
ARS	Automatic Route Selection
ASCIT	AT&T Service/Call ID Type
ASN	AT&T Switched Network
AT	Access Tandem
ATM	Asynchronous Transfer Mode
ATP	AT&T Trigger Platform
ATP	Alternate Transport Provider
ATV	AT&T Trigger Validation
BCD	Binary Coded Decimal
BCIC	Basic Carrier ID Code
BCN	Backbone Concentrator Node
BCSN	Billing Call Sequence Number
BHCA	Busy Hour Call Attempt
BILLDATS	Billing Data Acquisition and Transfer System
BLC	Base Level Cycle
BLDS	Business Long Distance Service
BMD	Business Markets Division
BN	Billing Number
BWM	Broadcast Warning Message
CAC	Carrier Access Code

CAC	Customized Announcement Capabilities
CADCR	Centralized Alternate Direct Call Routing
CADCS	Call Attempt Data Collection Service
CAL	Customer Application Logic
CAL	Customer Application Language
CAMA	Centralized Automatic Message Accounting
CAS	Competitive Access Provider
CAUCS	Centralized Announcement Update Control System
CBIS	Cincinnati Billing Information System
CC	Country Code
CCIS	Common Channel Interoffice Signaling
CCS	Hundred-Call Seconds
CCT	Continuity Check Transceiver
CCT	Continuity Check Test
CDDS II	Call Detail Data System II
CDN	Calling Directory Number
CdPN	Called Party Number
CDRP	Call Detail Recording Platform
CIC	Carrier Identification Code
CID	Carrier Identification
CIM	Call Irregularity Message
CIP	Calls in Progress
CIP	Carrier Identification Parameter
CLD	Consumer Long Distance
CLEC	Certified Local Exchange Carrier
CLF	Clear Forward
CLLI	Common Language Location Identifier
CMC	Cellular Mobile Carrier
CMD	Consumer Market Division
CN	Calling Number
CN	Charge Number
CNI	Common Network Interface
CNRDB	Common Network Routing Database
COS	Class of Service
COT	Continuity Test Successful
CPA	Common Platform Adjunct
CPC	Calling Party Category
CPE	Customer Premises Equipment
CPED	Call Processing Execution District
CPN	Calling Party Number
CPPA	Calling Party Pays Airtime
CPPS	Call Processing Process Support

CPR	Call Processing Number
C-PRI	Commercial PRI
CPUP	Call Processing Upchained
CR	Call Register
CRB	Crankback
CRI	Carrier Routing Index
CS	Carrier Solutions
CSC	Circuit Selection Capability
CSCI	Circuit Selection Capability Indicator
CSCR	Circuit Selection Capabilities Routing
CSI	Carrier Selection Information
CSMC	Consumer Services Management Center
CSMS	CMD Service Management Center
CSN	Carrier Solutions Nodal
CSRO	Customer Specific Routing Option
DARICS	Data Acquisition Recording, Integrated Communications System
DAS	Digit Analysis Selector
DB	Data Base
DCI	Dual-serial Channel Interface
DCIC	Domestic Carrier ID Code
DCN	D-Channel Nodes
DDD	Direct Distance Dialing
DECOS	Domestic End-to-End Class of Service
DEMS	Dynamic Engineering Mechanized System
DFS	Directory Function Server
DHNR	Dynamic Non-Hierarchical Routing
DID	Direct Inward Dialing
DIF	Digital Interface Frame
DL	Digital Link
DLN	Direct Link Node
DMS	Database Management System
DN	Destination Number
DN	Dialed Number
DNHR	Dynamic Non-Hierarchical Routing
DNIS	Dialed Number Identification Service
DNST	Dialed Number Services Type
DNTT	Dialed Number Trigger Table
DOD	Direct Outward Dialing
DOW	Day of Week
DP	Dial Pulse
DPM	Dual Ported Memory
DS1	Digital Signal 1

DSA	Direct Services ANI
DSA	Direct Services Application
DSAS	Direct Signaling Assignment System
DSCH	Dual Serial Channel
DSD	Direct Services Dialing
DSN	Destination Switch Number
DSTAT	Domestic Status
DTIM	Display TNM Integrator Module
DTMF	Dual Tone Multi-Frequency
DTO	Dedicated Trunk Sub-group Option
DWAN	Dedicated Wide Area Network
EA	Equal Access
EACC	Equal Access Circuit Code
EBAF	Extended Bellcore AMA Format
ECD	Equipment Configuration Database
ECOS	End-to-End Class of Service
ECR	Enhanced CIC Routing
EO	End Office
EOT	End of Transmission
ERI	Egress Route Number
ERPI	Routing Pattern Identity
ESB	Emergency Services Board
ESCR	Enhancements for Special CIC Routing
ESI	Egress Switch Indicator
ESRF	Enhancements to Special Routing Features
ESS	Electric Switching System
EUSEC	Enhanced USEC
EV	Edge Vehicle
FAI	Foreign Administration Identity
FEALN	Far-End AT&T Local Network
FEAREA	Far End AREA
FEN	Far End Network
FENPA	Far End Numbering Plan Area
FEOFC	Far End Office Code
FG-C	Feature Group C
FG-D	Feature Group D
FHC	Final-Handling Code
FHT	Final Handling Treatment
FI	Feature ID
FO	Feature Options
FRF	Feature Request Form
FRS	Feature Requirement Specifications
FSD	Feature Specification Document

FVSR	Force Via Switch Routing
FVSRTT	FVSR Trigger Table
GAP	Generic Address Parameter
GETS	Government Emergency Telecommunications Service
GNFMC	Global Network Fraud Management Center
GOP	Generic Operations Parameter
GSDN	Global Software Defined Network
GSDS	Global Switched Digital Service
GSS	GTN Support System
GTT	Global Title Translation
HAS	Hand-off AT&T Switch
HICAP	High Capacity
HOT	HICAP Originating Treatment
HU	High Usage
I/O	Input/Output
I800	International 800
IAM	Initial Address Message
IBSS	In-Band Supervisory Signaling
IBU	In-Band Unit
ICDR	International Call Detail Recording
ICIC	International Carrier ID Code
ICLD	International Consumer Long Distance
ICTRC	International Call Trouble Receipt
IDB	INWATS Database
IDDD	International Direct Distance Dialing
IE	Information Element
II	Inter-exchange Identifier
ILD	International Long Distance
ILEC	Incumbent Local Exchange Company
INPA	Interchangeable NPA
INR	Intelligent Network Register
INRG	International Routing Group
INWATS	Inward Wide Area Telephone Service
IP	Internet Protocol
IPGW	IP Gateway
IRAS	Integrated Routing Assignment System
IRN	Integrated Ring Node
ISAIC	Improved Service Announcement & Information Collection
ISAIC SCS	Improved Service Announcement and Information Collection Service Circuit System
ISC	Incoming Signaling Characteristic

ISC	International Switching Center
ISDN	Integrated Services Digital Network
ISET	Inbound Services Emergency Translation
ISTAT	International Status
ISUP	ISDN User Part
IT	Internet Telephony
ITAMAC	International Transit, Accounting, Maintenance and Analysis of Calls
ITE	Installation Test Equipment
ITFDB	Industry Toll-Free Data Base
ITFS	International Toll Free Service (formerly I800)
ITN	Integrated Test Network
IT-T	International Telecommunications Union-Telecommunications
IVT	International Voice Transit
IWZ1	International World Zone 1
IXC	Interexchange Carrier
JIP	Jurisdiction Information Parameter
LACIDs	Logical Access Identifiers
LAN	Local Area Network
LANI	Local Automatic Number Identification
LATA	Local Access and Transport Area
LATT	Loop Around Transceiver Test
LCC	Local Carrier Connecting
LCC	Local Exchange Carrier Connecting
LCVT	Local Service Validation Test
LD	Long Distance
LDIT	Local Digit Interpreter Table
LDNC	Long Distance Nodal Concentration
LDS	Long Distance Service
LEC	Local Exchange Carrier
LERG	Local Exchange Routing Guide
LNP	Local Number Portability
LRN	Location Routing Number
LSP	Local Service Provider
LTD	Local/Toll Differentiation
LVL	Level
MAP	Mass Announcement Platform
MCC	Master Control Complex
MCS	Micro Control Store
MCT	Multiple Carrier Treatment
MDN	Miscellaneous Distribution Number
MDR	Multiple Destination Routing

MF	Multi-Frequency
MLSS	Machine Load and Service Summary
MML	huMan Machine Language
MMOC	Minicomputer Maintenance Operations Center
MOC	Maintenance Operations Center
MOSS	Modified Operator Services Signaling
MPS	Message Processing System
MR	Modification Request
MRT	Multiple Routing Treatment
MSI	Market Segmentation Indicator
MSN	Miscellaneous Scanner Number
MTP	Message Transfer Part
MTP	Message Transfer Protocol
MUP	MCC Utility Processor
NAI	Network Access Interrupt
NAMACC	National AMA Control Center
NANP	North American Numbering Plan
NAP	Network Adjunct Platform
NCA	No Circuits Available
NCC	Network Control Center
NCP	Network Control Point
NCP&D	Network Capacity Planning & Delivery
NCS	Network Control Point
NDIG	Next Digit
NE	Non Emergency
NEMOS	Network Management Operations System
NESAC	National Electronic Systems Assistance Center
NESV	Network Edge Switch Vehicle
NFM	Network Fault Management (formerly TNM)
NI-2	National ISDN-2
NID	Network ID
NIS	Network Implementation Services
NN	Nation Number
NOC	Network Operations Center
NOC-INM	Network Operations Center-International Network Management
NOE	Network Operations Enterprise
NP	Node Processor
NPA	Numbering Plan Area
NPP	Network Provisioning Platform
NRA	Network Remote Access
NRAMS	Network Remote Access Monitoring System
NRM	Network Recording Management

NRN	Network Routing Number
NS	Network Services
NSA	Network Service Automator
NSAC	Non-Simultaneous Authorization Code
NSD&M	Network Service Delivery & Maintenance
NSF	Network-Specific Facilities
NSM	Network Services Maintenance
NSN	Network Switch Number
NSP	Network Services Provisioning
NTM	Non-Traditional Market
NVT	Network Verification Testing
NWM	Network Management
NWZ1	Non-World Zone 1
OAID	OSPS Access ID
OAR	Originating Access Record
OAS	Originating AT&T Switch
OCC	Other Common Carrier
OCC	Originating Country Code
OCDD/RT	On-line Call Detail Data/Real Time
OCTCPFAI	Originating Carrier/Terminating Carrier Pair Foreign Administration Identification
ODA	Office Data Assembler
ODAD	ODA Data
ODMS	Office Data Management System
ODP	Office Dialing Plan
OE	Operator Express
OGT	Outgoing Trunk
OHD	Off-Hook Delay
OLI	Originating Line Information
OLI	Originating Line Identifier
OLP	Off-Line Processor
OOB	Out of Band
OSC	Outgoing Signaling Characteristic
OSI	Operator Systems Indicator
OSPS	Operator Services Position System
OSPSID	Operator Service Position System Identification
OSSs	Operation Support Systems
OST	Originating Station Type
OTP	Operations Technical Plan
P.CarrierID	Primary Carrier ID
PABO	Protected, Disk-backed, API-Accessible, ODA-Generated
PAS	Public Announcement System

PASP	Public Safety Answering Point
PBX	Private Branch Exchange
PC	Point Code
PCP	Positive Call Processing
PDIT	Prefix/Feature Digit Interpreter Table
PDN	Pseudo-Destination Number
PECC	Product Engineering Control Center
PI	Precedence Index
PIC	Presubscribed Inter-exchange Carrier
PLU	Positive Lookup Table
PMO	Present Mode of Operation
PNLCT	Prohibit No-Loopback Continuity Check Test
POP	Point of Presence
POTS	Plain Old Telephone Service
PRD	Product Release Document
PRI	Primary Rate Interface
PRIT	Primary Rate Interface Type
PRT	Proportional Routing Treatment
PS-ALI	Public Safety-Automatic Location Identification
PSE	Program Store Expansion
PSTN	Public Switched Telephone Network
PTC	Primary Toll Carrier
PTT	Post Telephone and Telegraph
PUC	Public Utilities Commission
PV	Performance Verification
PVC	Permanent Virtual Circuits
QDRS	Quantum Data and Routing System
QH	Quiet Hear
RA	Route Advance
RAM	Random Access Memory
RAO	Revenue Accounting Office
RBC	Rate Based Control
RC	Recent Change
RC/V	Recent Change/Verify
RCAS	Recent Change Administration System
RCC	Radio Common Carrier
RDB	Routing Data Block
RICS	Recorded Information Collection System
RLC	Release Complete Message
RN	Routing Number
RP	Redirecting Party
RPC	Regional Processing Center
RPI	Route Pattern Index

RSI	Route Selection Index
RTNR	Real-Time Network Routing
RUAS	Remote Utility Access System
SAFER	Split Access Flexible Egress Routing
SAN	Service Circuit System Announcement
SC	Structure Code
SCCP	Signaling Connection Control Protocol
SCP	Software Change Package
SCS	Service Circuit System
SCSI	Small Computer Systems Interface
SCU	Service Circuit Unit
SD	Segmentation Directory
SDDN	Software Defined Data Network
SDE	Software Development Environment
SDI	Switched Digital International
SDN	Switched Digital Network
SDN	Software Defined Network
SDN NRA	Software Defined Network-Network Remote Access
SDQ	SD Query
SDR	SD Response
SDS	Switched Digital Service
SDTT	Segmentation Directory Transition Type
SDX	Subsequent Digit Index
SG	Software Generation Data
SI	Service Identity
SI	Service Index
SIC	Service Indicator Code
SID	Station Identification (CPN)
SII	Service Identity Index
SMO	SD Mode of Operation
SMO	Segmentation Mode of Operation
SMS	Service Management System
SNAS	Signaling Network Administration System
SNET	Southern New England Telephone
SNOW-R	Service NOW-Routing
SNOW-T	Service NOW-Trunking
SOP-P	Signaling Operations Platform-Provisioning
SP	Service Processor
SPC	Switching and Permuting Circuit
SPU	Signal Processing Unit
SS7	Signaling System 7
SSC	Special Service Code

SSN	Subsystem Number
SSO	Sub-System Overload
STIM	Satellite TNM Integrator Module
STP	Signaling Transfer Point
STP	Trunk Sub-group
SUR	Standard Usage Record
TA	Telecommunications Administrator
TAN	Trunk Appearance Number
TAS	Terminating AT&T Switch
TBN	True Billing Number
TCAP	Transaction Capabilities Application Part
TCC	Technology Control Center
TCS	Transfer Connect Service
TEC	Terminal Equipment Center
TG	Trunk Group
TG-4	Translation Guide *4ESS*
TIM	Tandem NFM Integrator Module
TNM	Total Network Management
TNS	Transit Network Selection
TOD	Time of Day
TOP	Task Oriented Practice
TOT	Type of Trunk
TOW	Time of Week
TP	Target Party
TPC	Transport Capability
TS	Time Slot
TSG	Trunk Subgroup
TSI	Time Slot Interchange
TSM	Tandem NFM Surveillance Module
TSN	Trunk Scanner Number
TT	Transition Type
TT	Transport Tariff
TTA	Terminating Traffic Architecture
TTUSFI	Transport Tariff Usage Sensitive Feature Indicator
TV	True Voice
UGTT	Universal Global Title Translation
UIFN	Universal International Freephone Number (Format = 800+8-digits)
UMIU	Unidentified Message Investigation Unit
US	Utility System
USDS	Universal Subscriber Data Structure
USDS	Universal Subscriber Data Service

USEC	Universal Services Echo Canceler
USI	User Service Information
UTA	Universal T1.5 Access
UUI	User to User
VAS	Via AT&T Switch
VCA	Vacant Code Announcement
VCR	Voicepath Cancellation Rate
VoIP	Voice Over Internet Protocol
VPA	Voice Path Assurance
VRUs	Voice Response Units
VSSID	Voice Storage System Identity
VTNS	Virtual Telecommunications Network Service
VTOC	Volume Table of Contents
WATS	Wide Area Telephone Service
WATSBN	WATS Billing Number
WCS	Windowed Call Store
WEFOS	WATS Eight Hundred Family of Services
WS	Workstation
XTSI	Expanded Time Slot Interchange
Y2K	Year 2000

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C Master Index of Product Release Documents (PRDs)

Overview

Purpose This appendix contains a complete list of all features documented in Product Release Documents (PRDs). Features are listed by number, name, and PRD number. Revisions to a PRD are shown as, “Rev1, Rev2,” etc. New issues of a PRD are shown as, “Iss 2,” etc.

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4018	End-to-End Class Of Service/AP	234-090-201AC
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4129	Alternate Signaling Transport Network Enhanced ISUP	234-090-184AC
4133	Direct Link Node Throughput Increase-Ph 1	234-090-201AC
4136	Never Miss a Call/ADR on Busy	234-090-182AC

4168	Alternate Signaling Transport Network 56 Kbps for UNITEL	234-090-183AC
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4189	Enhanced I800 Service Using USADirect	234-090-183AC
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4203	ANI Trigger Table Capacity Enhancement-Ph 1	234-090-201AC
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4219	SOP to 4ESS Interface Changes	234-090-223AC
4232	Multiple 4ESS Switch Network Announcements	234-090-183AC
4232a	Multiple 4ESS Switch Network Announcements-Ph 2	234-090-202AC
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4290	Inbound Services 10-Digit GTT Recent Change Packing	234-090-184AC
4291	Inbound Services 10-Digit GTT Data Consistency Check	234-090-184AC
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4317	Service Count Tracer Records Unanswered/Mutilated	234-090-202AC
4322	Foreign-Billed 800 Service	234-090-183AC
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4324	Easy Reach 1+500 Dialing Plan	234-090-202AC
4344	Backward Release After ACM-INUP Trunks	234-090-184AC
4355	SDN ANI Trigger Table Indicator	234-090-201AC
4364	Switched Digital Screening	234-090-213AC
4366	Recent Change Administration System-Ph 2	234-090-202AC
4366a	Recent Change Administration System-MR to Add CLLI	234-090-184AC
4367	SRVT Compatibility With Feature 3957	234-090-184AC
4369	Cellular Mobil II Sets 62/63 ID	234-090-204AC
4372	ANI Trigger Data Proc Data Expn	234-090-203AC
4376	ISDN Operational Improvements	234-090-203AC

4388	IXC-Megacom 800 Service to an IXC With ANI	234-090-184AC
4401	IXC-Megacom 800 Service to an IXC with ANI Ph 2 Inband	234-090-184AC
4404	International Call Detail Record for SDN-Canada Cross-Border	234-090-184AC
4430	International Billing Number Screening-Ph 2	234-090-202AC
4438	Elimination of Via Routed Calls	234-090-221AC
4448	Clearback Suppression/Brazil	234-090-201AC
4449	Tones Announcement on TUP & ISUP	234-090-202AC
4464	CDRP & Multiple 4ESS Streams	234-090-221AC
4472	New Generation-ODA Provisioning Tools	234-090-201AC
4474	SDN 1+10D Dialing on Dedicated Access	234-090-202AC
4477	2NCP/CADCR Svc Assists/Handoff	234-090-212AC
4482	Foreign-Billed 800 Service-Ph 2	234-090-184AC
4506	IXC With ANI Billing Improvements	234-090-203AC
4507	Clearback Suppression Ph 2 Brazil	234-090-203AC
4508	SDN and GETS Service Mixing	234-090-184AC
4529	800 Services Account Codes	234-090-214AC
4530	I800 Billing for Mexico	234-090-202AC
4538	4ESS SPGTT Table Expansion	234-090-202AC
4539	SDI 1536 Kb/s Service	234-090-204AC
4540	SDN Access to SDN-MR to Feature 3857	234-090-202AC
4555	AT&T Trigger Platform Jr – Busy/Ring No Answer MR	234-090-202AC
4557	SDN NRA Using ASR	234-090-211AC
4559	Handling 4ESS SPI ASTN NI Backup	234-090-204AC
4564	Segmentation Directory	234-090-222AC
4569	PCP 10-Digit Delivery to PCP 2NCP	234-090-201AC
4570	Universal 1.5 Access	234-090-204AC
4575	Interim 1+500 Via the 4ESS	234-090-202AC
4579	PZM Triggered iPCC Gateway	234-090-202AC
4590	Call Forwarding for SDN/800	234-090-214AC
4591	SS7 Access to Nodal Services	234-090-203AC
4601	NAI ACG Type of Digit Coding	234-090-184AC
4603	Continuity Check on INUP Circuits 1877	234-090-203AC
4632	CDR Data Tracer Count MR	234-090-203AC
4642	GSDDN International On-Net Data Service	234-090-203AC
4650	10-Digit Trunk Group Rating Number	234-090-204AC
4655	SDN – ASTN/SGGTT Interworking	234-090-203AC
4656	800 Growth to Include 888	234-090-204AC
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4659	Calling Party Number Delivery	234-090-203AC
4673	SDN Customer Outage Protection	234-090-213AC
4677	iPCC Gateway Maintenance Enhancement	234-090-203AC
4677a	iPCC Gateway Maintenance Enhancement	234-090-203AC
4686	Carrier Identification Code Delivery	234-090-212AC

4692	Automatic Call Distributor in the Network-Ph 2	234-090-203AC
4694	Direct Link Node Capacity Upgrade-Ph 2	234-090-221AC
4696	RMS/4ESS Switch Testing Enhancement	234-090-212AC
4706	DTMF Inband ANI Delivery	234-090-204AC
4719	PACR on AT&T Trigger Platform Jr. Rls 1.0	234-090-204AC
4721	PACR to POTS Billing Fix	234-090-211AC
4739	Project Zebra (National Directory Assistance)	234-090-211AC
4741	AT&T Advanced 800 Automatic Speech Recognition Using Call Store	234-090-212AC
4744	PCP for CMC Service Type	234-090-203AC
4751	Improve NEMOS to 4ESS Interface	234-090-212AC
4751a	Merging RNMS and 4ESS/NEMOS-Ph 2	234-090-214AC
4753	MEGACOM 800 IXC With ANI-MR 02	234-090-203AC
4754	XTSI (Was 4043)	234-090-213AC
4760	ISC Composite Circuit Enhancement	234-090-212AC
4760a	ISC Composite Circuit Enhancement	234-090-221AC
4768	4ESS Signaling Management Enhancement	234-090-223AC
4769	Announcement Set B on SCS	234-090-214AC
4769a	Announcement Set B on SCS	234-090-221AC
4776	End-to-End Class Of Service Areas Increase	234-090-221AC
4776a	End-to-End Class Of Service MR 94-02 and 95-01	234-090-212AC
4779	Check Application Status	234-090-211AC
4785	Inbound I800 CSR & Enhanced Call Origination	234-090-214AC
4789	XTSI Rls 3 In-band Supv Signaling	234-090-242AC
4789L	XTSI Rls 3 In-band Supv Signaling	234-090-242AC
4790	CDRP Tracer Count Consistency	234-090-214AC
4795	USDS Phase 1.1 Support for TNR Triggers	234-090-212AC
4800	CDRI Communications Web	234-090-221AC
4800i	CDRI Communications Web-Ph 2 Tracking Encryption	234-090-214AC
4801	SCS Automatic Speech Recognition-Ph 2	234-090-214AC
4815	Disaster Recovery Enhancement-Rls 1	234-090-223AC
4815a	Disaster Recovery Enhancement-Rls 1	234-090-222AC
4815i	SDRP 1B Code	234-090-222AC
4815j	SDRP 3B Code	234-090-222AC
4839	SNPA Expansion and Handling NPA Improvement	234-090-221AC
4839	SNPA Expansion/Handling NPA Improvement LEC	234-090-221AC
4850	Foreign-Billed 800-Ph 3	234-090-212AC
4866	Routing Data Block List Verify Tool	234-090-213AC
4867	Transfer Connect Service 3.0	234-090-213AC
4870	CDRP Software Release Synchronization	234-090-204AC
4875	PACR-ATP OutofBand Enhancements for VRU-BT	234-090-213AC
4880	Segmentation Directory-Ph 2 Pkg1	234-090-231AC, Ad1
4880a	Segmentation Directory-Ph 2 Pkg2	234-090-232AC

4880b	Segmentation Directory-Ph 2 Pkg3	234-090-233AC
4880c	Segmentation Directory-Ph 2 Pkg4	234-090-234AC
4893	Universal T1.5 Access-MR to Feature 4570	234-090-204AC
4898	Service Identity Traffic Data Collection	234-090-224AC
4898b	Service Identity Traffic Data Collection	234-090-223AC
4899	High Speed Links T1 Maintenance Enhancement	234-090-222AC
4903	CCS7 Signaling Transport Footprint	234-090-213AC
4903a	CCS7 Signaling Transport Footprint-Encryption Unit	234-090-213AC
4904	Domestic ECOS Class of Service	234-090-231AC
4920	Dual Sessions for Network Elements-NEMOS	234-090-223AC
4923	Calling Party Pays Airtime-CALIPER	234-090-213AC
4924	Foreign-Billed 800-Ph 4	234-090-213AC
4928	TCAP Parameter for Transmission Enhancement Control	234-090-222AC
4940	GETS Initial Operational Capacity	234-090-213AC
4941	ADR Recording Changes for Interaction with TCS-NAP	234-090-224AC
4957	Per Announcement Information Data (PAID)	234-090-212AC
4958	Global Carrier Selection	234-090-212AC
4965	Billing Fix-Cellular Access/SDN-Ph 2	234-090-212AC
4967	Automatic Routing	234-090-241AC
4967a	Automatic Routing Ph 1 (Pre-ACM)	234-090-233AC
4967b	Automatic Routing Ph 2 (Post-ACM)	234-090-233AC
4967i	Automatic Routing-Pre-AR Structure Work	234-090-231AC
4990	Associate Announcement Number with FHC 1592	234-090-212AC
4991	Removal of Routing Prefix Codes Network Security	234-090-212AC
4995	Recent Change Administration System-MR to Feature 4366	234-090-211AC
4997	Enhanced DIF-E1 Internal Bus Mismatch Diagnostics	234-090-222AC
5000	Single Entry MRTT Counts for SAFER	234-090-211AC
5003	API Capacity Improvements	234-090-221AC
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5005	Assignment I/O for 4ESS Switch	234-090-233AC
5013	1B Processor Tape Unit Elimination	234-090-221AC
5013i	Cable Design for TUC Elimination	234-090-222AC
5020	Short Term D-Channel Expansion	234-090-214AC
5020a	Short Term D-Channel Expansion	234-090-231AC
5024	SUME for 800/900 Number Translations	234-090-224AC
5041	XTSI TM Gen DS3 Alarms Maintenance Channel	234-090-214AC
5051	LYNX Software Upgrade	234-090-213AC
5060	Positive Lookup Table in WCS	234-090-231AC
5064	Idle Link Bandwidth Adjustment NM Controls	234-090-212AC
5072	MR to Univ T1.5 Access	234-090-212AC
5111	XTSI in I/O Msg—5111a,b,c for LEC	234-090-221AC
5111a	XTSI I/O Message Specification	234-090-214AC
5111b	XTSI in I/O Messages	234-090-221AC

5111c	XTSI in I/O Messages	234-090-222AC
5113a	XTSI Software Update Tool – Ph 1	234-090-221AC
5113b	XTSI Software Update Tool – Ph 2	234-090-223AC
5123	Network Support for 8YY	234-090-231AC
5129	Inspection II Digits/Dialed Number	234-090-231AC
5131	Service Control After 2 D3Sus Fail	234-090-221AC
5153	Consolidated 0+/- & 1+ Hotel Traffic	234-090-222AC
5158	Carrier Completion Rate Feature	234-090-241AC
5161	Switch Disaster Recovery Enhancements	234-090-234AC
5163	Positive Lookup Tools (PLUTO)	234-090-231AC
5198	CIC Based Resale	234-090-221AC
5198a	CIC Based Resale	234-090-231AC
5222	3B21D APS Upgrade—Hardware	234-090-231AC
5222i	3B21D APS Upgrade—Software	234-090-231AC
5241	Segmentation Directory Black Hole Detection & Recovery	234-090-224AC
5247	Call Turn Around	234-090-214AC
5252	800 Service DSD Fix	234-090-221AC
5308	Consolidated Access Traffic-Ph 1	234-090-224AC
5341	QuietHear MR for 109 Test Lines	234-090-221AC
5349	Correction of Collusion INUP Release Messages	234-090-222AC
5352	Modify Connected Number Screening	234-090-222AC
5353	Universal International Free Phone	234-090-223AC
5361	Interim D-Channel Expansion—HW	234-090-231AC
5370	Local Service for Nodals on 4ESS-Ph 1	234-090-222AC
5370i	Local Svc for Nodals on 4ESS-Ph 1	234-090-251AC
5371	Local Service for Nodals on 4ESS-Ph 2	234-090-223AC
5371a	Local Service for Nodals on 4ESS-Ph 2	234-090-224AC
5376	SS7 Node Buffer Size Modification	234-090-214AC
5399	Foreign-Billed 800 Service Enhancement-Ph 5	234-090-223AC
5399r	Foreign-Billed 800 Service Enhancement-Ph 5	234-090-223AC
5460	NAI-Ph 3A 4ESS & CDRP	234-090-222AC
5460a	NAI-Ph 3A MR to 5460	234-090-233AC
5505	XTSI Rapid Restore	234-090-223AC
5506	Selective Blocking of Codesets	234-090-224AC
5528	Early Answer for GETS Inbound International Calling Opt 2	234-090-223AC
5529	Interim Speech Recognition ISIAC Call Prompt	234-090-214AC
5531	MR to SI Data Collection-5-minute NEMOS Data	234-090-223AC
5531i	MR to SI Data Collection-TDAS Data	234-090-224AC
5532	Project Radar – Ph 2	234-090-231AC
5538	End Office Local Nodal (AT&T)	234-090-232AC
5563	SCS Software Update Tool	234-090-224AC
5568	9 Gigabyte Disk Units for SCS	234-090-224AC
5578	Transfer Connect Service-MR to Feature 4867	234-090-221AC

5579	SDN Access Via Network Access Platform	234-090-221AC
5589	Modification to 4557	234-090-221AC
5591	Set S DTMF to ASR Switching	234-090-221AC
5594	CPN Anomaly Report	234-090-221AC
5600	XTSI Rls 3—Digital Svc Circuits	234-090-242AC
5600L	XTSI Rls 3—Digital Svc Circuits	234-090-242AC
5613	ISDN Called Party Number Protocol Upgrade	234-090-221AC
5636	SNPA Expansion-MRs to Feature 4839	234-090-221AC
5641	Segmentation Directory Ph 3, Rel 1	234-090-242AC
5641a	Segmentation Directory Ph 3, Rel 2	234-090-243AC, Iss 2
5641b	Segmentation Directory Ph 3, Rel 3	234-090-243AC, Iss 2
5645	Local Service for Nodals Ph 2.1	234-090-224AC
5668	HSL Status Indication Busy Enhancement	234-090-223AC
5670	NAI for Direct Connect Calls	234-090-222AC
5681	Number Portability Open Portability Verify	234-090-223AC
5700	CAT FSD MRs (to Feature 5308)	234-090-224AC
5701	AAP ISDN Loopback Capability	234-090-222AC
5704	ODA Datalinking Software Tool Enhancement	234-090-221AC
5711	API Message Header Reduction-Ph 2	234-090-231AC
5724	Extend ACM Timer for CCS7	234-090-221AC
5742	Improved Codelist Verify	234-090-224AC
5754	Network Access Interruption and Directory Assistance Resell	234-090-221AC
5766	Advantis Default OLI	234-090-222AC
5773	SDN NRA Tollfree Dialed Number for CSCR	234-090-222AC
5791	Long-Term “CIC-Based NAI”	234-090-223AC
5794	SCS Announcement Seconds Expansion	234-090-224AC
5794j	SCS Announcement Seconds Expansion	234-090-224AC
5802	CIC Code Exp for 5198 & 5754	234-090-221AC
5805	Inbound Services 10-Digit GTT Table Expansion	234-090-224AC
5816	CSCI Recording	234-090-231AC
5817	International Originating Satellite Rules Modification	234-090-222AC
5822	Enhanced CIC Routing for Operator Services	234-090-233AC
5835	AAP Disk Copy Enhancement	234-090-224AC
5840	1+CIC Wholesale Features-Ph 1	234-090-224AC
5843	ISDN Operational Enhancements	234-090-242AC
5844	Announcement Set D on ISAIC	234-090-224AC
5844a	Announcement Set D on ISAIC	234-090-231AC
5874	B/RNA Cellular Monitor	234-090-224AC
5876	Segmentation Directory Recovery	234-090-243AC, Iss 2
5887	GCS Capability Near-Term Modification	234-090-222AC
5892	Transfer Connect Capacity 97	234-090-234AC
5898	Code Group Restructure	234-090-231AC
5899	MR on Feature 4323	234-090-224AC

5906	Improved Calling Party # Anomaly Report	234-090-241AC
5907	Cellular B/RNA for TC/ER Service	234-090-224AC
5915	Nodal Egress Sequential Trunk Hunt	234-090-231AC
5917	Expansion of 4ESS OSPS Table	234-090-231AC
5918	Inband Q.931 Signaling for Carrier Solutions Nodal Customers	234-090-232AC
5922	Foreign Admin Identifier Expansion	234-090-241AC
6072	OCTCP & CIC Table Expansion	234-090-231AC
6130	2000 A.D. (AT&T)	234-090-233AC
6137	Domestic ECOS: New RLI & Route Control-MR to Feature 4904	234-090-232AC
6142	Additional Support for 4ESS Local for Nodal	234-090-233AC
6142i	Additional Support for Local Nodal—OSOR	234-090-231AC
6143	Enhanced CIC Routing for Directory Assistance	234-090-233AC
6156	4ESS CMS/ESS Audit Enhancement	234-090-231AC
6164	Payphone Compensation—Ph 2	234-090-224AC
6190	AMA Recording Fix for GETS	234-090-231AC
6231	No-Loopback Continuity Check	234-090-234AC
6266	Enhanced CIC Routing for International Calls	234-090-233AC
6272	Performance Enhancements for Segmentation Directory	234-090-233AC
6273	Tones & Announcements on Unsuccessful Calls After Call Prompting	234-090-242AC
6296	Open Segment 2 of 1B File Store-3BPAS	234-090-241AC
6328	Carrier Completion Rate (5158) MR	234-090-241AC
6330	4E AT&T Digital Link LRN Capabilities	234-090-232AC
6363	Increase Number of MCT Tables	234-090-231AC
6375	Number Portability Ph 1 Architecture Extension	234-090-234AC
6413	OAS Call Processing on Inter-Toll Trunks	234-090-242AC
6426	SD CIC Based Proc & SDN Default Handling	234-090-233AC
6428	Automatic Routing (4967) MR	234-090-241AC
6468	Early Disconnect Project Radar	234-090-231AC
6483	ECOS Support of GNS Call Type (MR-3142)	234-090-231AC
6487	Int'l Toll Free Service TEST:TCAPDSD Support FSID Routing	234-090-233AC
6492	TCAP Parameter for Trans Enhancement Control	234-090-242AC
6494	Digital Link Local Service Measurement Capabilities	234-090-234AC
6500	Carrier Solutions Enhanced CIC-Based Maintenance	234-090-234AC
6512	Domestic End-to-End Class of Service	234-090-234AC
6516	4ESS Switch Routing RC/V Improvements	234-090-241AC
6516a	4ESS Routing RC/V Improvements	234-090-234AC
6516b	4ESS Routing RC/V Improvements	234-090-234AC
6516c	4ESS Routing RC/V Improvements	234-090-234AC
6516i	4ESS Routing RC/V Improvements	234-090-234AC
6563	Universal Int'l Free Phone Numb Enhancement	234-090-234AC
6605	TSAA/AVA with DL Phase 4	234-090-234AC
6617	SDN and 1+DL Feature Interaction MR	234-090-231AC

6620	MR to 5840—1+CIC Wholesale	234-090-234AC
6624	ANI Replacement on Cellular Roamer 8YY Calls	234-090-234AC
6625	Digital Link "0ZZ" on Backhauled 8YY Calls	234-090-234AC
6629	EOLN-PMO Processing of EOLN PCP Calls	234-090-234AC
6638	Ignore Calling Party # on ITFS Calls	234-090-231AC
6643	4E—NEMOS Link Upgrade	234-090-242AC
6657	MR to ADR Recording Change (4941)	234-090-234AC
6665	MR to Payphone Compensation, Phase 2	234-090-231AC
6685	Digital Link Phase 3 Equal Access Capability	234-090-242AC
6745	Terminating Traffic Architecture	234-090-233AC
6750	Dial 1 Service Integration	234-090-242AC
6757	NAI Call Redirection & ATP	234-090-233AC
6759	MR to SI Traffic Data FSD (4898, 5531)	234-090-234AC
6762	MR to 5371 FSD	234-090-242AC
6763	Impaired Via Avoidance	234-090-243AC, Iss 2
6777	DSA Based Architecture for TSAA/AVA	234-090-234AC
6881	4ESS SCS Cache Change to 256 Milliseconds	234-090-242AC, Rev1
6888	Capacity Relief on 1B Processor Memory	234-090-251AC
6896	700 PIC Verification Announcement for CSP	234-090-242AC
6915i	4ESS Switch Signaling Capacity Improvements	234-090-253AC
6938	AT&T Digital Link Phase V Architecture	234-090-251AC
6947	Segmentation Directory ND/CDN Digits Length	234-090-234AC
6955	MR to Digital Link Phase 2.1	234-090-234AC
6982	Expand ANI Trigger Table Structure Size	234-090-241AC
6989	Enhanced Scheduling and Executive Control	234-090-253AC
6990	AT&T Digital Link Ph 3 Equal Access Dial Around Capability	234-090-243AC, Iss 2
7028	Voice Over IP (VoiP) Mexico)	234-090-242AC
7038	AT&T Digital Link Ph 3 911 Capabilities	234-090-243AC, Iss 2
7063	MR to SDN Overflow Routing on Busy with ADL4	234-090-242AC, Rev 1
7064	Further Expansion of OSPS Access ID Table	234-090-251AC
7067	RTNR-Type of Origination for WZ1	234-090-243AC, Iss 2
7102	Removal of Forced Overflow on User Busy for Trunks with Access IDs	234-090-241AC
7106	Non Emergency (NE) Initial Address Message (IAM) Priority Level at the Egress of the Network	234-090-253AC
7148	AT&T Digital Link Announcements – Part 1	234-090-243AC, Iss 2
7157	International Point Code Expansion	234-090-241AC
7181	Removal of NSN for ADL LNP Processing	234-090-241AC
7221	Expanding Route Skip/Cancel-(To,From) Controls	234-090-243AC, Iss 2
7222	4ESS Domain Value Output Enhancement	234-090-242AC
7236	DECOS Incoming Circuit Immediate Release	234-090-243AC, Iss 2
7240	Modified FG-D Support for ANC	234-090-242AC
7240a	Modified FG-D Support for ANC	234-090-243AC, Iss 2

7254	Restructure and Grow the Call Register	234-090-251AC
7285	ANC II/OLI Screening – Phase 1	234-090-243AC, Iss 2
7294	DCI at OLP	234-090-242AC
7312	Killing Fraudulent SDN NRA Calls	234-090-251AC
7323	ANC NANP CIC Routing	234-090-251AC
7335	Transfer Connect on ATP-Out of Band Enhancement	234-090-251AC
7344	1-Digit Translation Table Expansion	234-090-251AC
7429	Mandatory 10-Digits on LSP_LOCAL Trunks – Part 1	234-090-243AC, Iss 2
7429a	Mandatory 10-Digits on LSP_LOCAL Trunks – Part 2	234-090-251AC
7477	ALAMO (AT&T Local Access Management Option)	234-090-243AC, Iss 2
7497	AT&T Network Connection (ANC) Enhancements to Special Routing Features	234-090-253AC
7501	Expand LACIDs to Support 856 D-channels	234-090-251AC
7506	NAI Call Redirection and LNP Interaction	234-090-243AC, Iss 2
7520	ANC Dial-Around (ADA) Blocking	234-090-243AC, Iss 2
7592	Network Routing and Numbering Database for International Routing	234-090-253AC
7619	MR to 5645 – Digital Link Ph 2.1 – 8YY Screen	234-090-243AC, Iss 2
7633	MR to 7038 – Support for Deletion of CPN over AATOS Trunks	234-090-243AC, Iss 2
7673	ANC ECR for Operator Services UTA Update	234-090-243AC, Iss 2
7701	Procedure for Growing ATP TSGs	234-090-251AC
7815	Modified No-Loopback Continuity Check (7815)	234-090-251AC, Rev 1
7880	Location Routing Number (LRN) Recipient Switch Coding of Forward Call Indicator (FCI) for Interswitch Routing of DN	234-090-253AC
7883	Billing Number for Switched Data Video Gateway (SDVG)	234-090-253AC

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D Input/Output Manual Pages

Purpose

This appendix lists the input and output messages for the 4E25 Release 3 Generic. A notation is included indicating whether each message is new, revised, or deleted. If the change is related to a specific feature, the feature number is included in parentheses ( ). Copies of the messages are included at the end of this document.

4ESS Output Messages

The following is a 4ESS output message for 4E25R3. It is included in output manual OM-4B-000-01.

VER:CODEGRP-CCD	Revised (7592)

4ESS Proprietary Input Messages

The following are 4ESS proprietary input messages for 4E25R3. These messages will be included in proprietary input/output manual 4B-000-01AC.

TEST:NRNDB	New (7592)
VER:ASCIT	Revised (7592)
VER:MISC-ESCR	New (7497)
VER:MISC-NEIPAV	New (7106)

4ESS Proprietary Output Messages

The following are 4ESS proprietary output messages for Generic 4E25R3. These messages are included in proprietary input/output manual 4B-000-01AC.

REPT:IAOFC	Revised (7592)
TEST:NRNDB	New (7592)
VER:ASCIT-ANSR	New (7592)
VER:MISC-ESCR	New (7497)
VER:MISC-NEIPAV	New (7106)

□

ID . . . . . VER:CODEGRP-CCD
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E24 and later
APPLICATION . . 4E
TYPE . . . . . Output

1. FORMAT

```
VER:CODEGRP;OPT(CCDCONV);a:
ABC  CCD  LD  CBONLY  FAXPR  CCID  CCCNT  SCLB   RESELL  CCRF
 b    c   d    e        f      g     h     i      j       k
```

2. REASON FOR OUTPUT

To list the entries in table HT4CCONV that are indexed by the specified ABC digits. This message also displays data for the assigned country code or pseudo country code digits.

3. VARIABLE FIELD DEFINITIONS

a — Status of ABC digit:

- CUR — Current.
- INA — Inactive.

b — ABC digit entry (000-999).

c — One, two, or three-digit number (1-999). A one or two-digit number will contain leading zeroes.

d — Language digit (0-9).

e — Routing restriction:

- N — Not cable only.
- Y — Cable only.

f — Foreign Auxiliary Parameter (FAXPR) indicator:

- N — Network Routing Number (NRN) Database transition is not complete.
- Y — NRN Database transition is complete.

g — Type of country code:

- CCD — Country code.
- PCCD — Pseudo-country code.

h — Country code count 1, 2, or 3.

i — Suppress clear-back indicator:

- N — Does not suppress clear-back.
- Y — Suppress clear-back.

SEE PROPRIETARY NOTICE ON COVER PAGE

j Circuit Identification Code (CIC) resell indicator:

N — Not allowed.
Y — Allowed.

k Carrier Completion Rate Feature (CCRF) indicator:

N — CCRF is inactive.
Y — CCRF is active.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENT
VRFYOUT

Translation Guide, 4ESS™, TG-4, Division 8, Section 3m

ID . . . . . TEST:NRNDB
WORK CENTER . . MAC, MOC, NMOC, TOC
GENERIC . . . . . 4E25 Rel. 3 and later
CLASS . . . . . ALL
APPLICATION . . 4E - Proprietary
TYPE . . . . . Input

1. PURPOSE

Requests a test query to be sent to the Network Routing and Numbering Database (**NRNDB**). The responses from the **NRNDB** will be printed.

2. FORMAT

```
TEST:NRNDB:SII a,DNBR b,DIGTYP c(,DIGITS d|,NPA e)[,OFAI f]...
      ...[,TFAI g][,CSR h][,RATE i]!
```

3. EXPLANATION OF MESSAGE

a — Service Identity Index (**SII**) (0-255).

b — Routing digits (1-15 digits).

c — Type of routing digits:

APN — Action Point Numbering Plan.

INTL— International.

NANP — North American Numbering Plan.

d — Country code (1-3 digits). This parameter identifies the country of origin of an inbound call.

e — Far-end Numbering Plan Area (**NPA**) (3 digits).

f — Origination Foreign Administration Identity (**FAI**) (1-31). Identifier of the foreign administration that routed the call to the AT&T network.

g — Termination **FAI** (1-31). Identifier of the foreign administration to which the call is to be routed.

h — Carrier Specific Routing (**CSR**) preference:

0 — **CSR** not required.

1 — **CSR** preferred.

2 — **CSR** mandatory.

i — Used to specify a data rate for Direct Services Dialing (DSD) calls:

0 — Non data (voice call).

1 — 1.536 Megabits Per Second (MBPS) clear.

2 — 1.536 MBPS restricted.

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3 — 384 Kilobits Per Second (KBPS) clear.

4 — 384 KBPS restricted

5 — 64 KBPS clear.

6 — 56 KBPS.

7 — 64 KBPS restricted.

4. SYSTEM RESPONSE

?D	Data field contains an error. Invalid or out-of-range data was received in the input message.
?E	Syntax Error exists in the message but cannot be resolved to the proper field. An invalid keyword combination was discovered.
PF	Printout Follows. The test query has been initiated and a TEST:NRNDB output message will follow.
RL	Retry Later. An error has occurred due to building or sending the query.
RL,CODE 001	Retry Later. Test query register could not be seized.
RL,CODE 002	Retry Later. Received an audit condition when trying to send the query.
RL,CODE 003	Retry Later. Failed to send the query.

5. REFERENCES

PIDENTs
TCAPTEST

Output Message
TEST:NRNDB

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ID . . . . . VER:ASCIT
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E23 Rel. 3 and later
CLASS . . . . . VER
APPLICATION . . 4E - Proprietary
TYPE . . . . . Input

1. PURPOSE

Request the verification of the AT&T Service / Call Identification Type (ASCIT).

2. FORMAT

VER:ASCIT:[**SII** a],[**QRYTYPE** b]**!**

3. EXPLANATION OF MESSAGE

a — Service Identity Index (**SII**) number (0-255).

b — Question Being Asked (**QRYTYPE**) number (1-48). See Table B for a list of questions that can be asked and the corresponding field input.

NOTE: See Table A for valid input entries.

4. SYSTEM RESPONSE

?I,INV KW — Identification field contains an error. An invalid keyword was specified for the **VER:ASCIT** input message.

PF — Printout Follows.

5. REFERENCES

PIDENTs
IOCPIMC4
VRFYCNTL
VRFYINPT
VRFYMISC

Output Message
VER:ASCIT-ANSR

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TABLE A

SII	QRYTYPE	VALID ENTRIES	COMBINATIONS
Y	N	SII = 0-255	(single, range, list)
N	Y	QRYTYPE = 1-48	(single, range, list)
Y	Y	SII = 0-255	(single, range, list)
Y	Y	QRYTYPE = 1-48	(single)

TABLE B

VALUE	MEANING
1	Is this a global Software Defined Network (SDN) call?
2	Can this be a SDN call?
3	Currently not used
4	Should the Universal Services Echo Canceller (USEC) enhancement feature be disabled for this SII?
5	Is this a Remote Adjunct Call Handling (REACH) call for this SII?
6	Should the billing number be sent with this SII?
7	Is this an SDN - Digital Radio Avoidance Routing (DRAR) call?
8	Does Integrated Services Digital Network User Part (ISUP) need to pass routing or Automatic Message Accounting (AMA) data to an AT&T Trigger Platform (ATP) switch or an Network Control Point (NCP) initiated handoff switch?
9	Is this a GETS call?
10	Are End-to-End Class Of Service (ECOS) overflow routes excluded for this SII?
11	Are ECOS alternate routes excluded for this SII?
12	Is this a HIQ call for this SII?
13	Is the terminating recording data set to ON for this SII?
14	Is this a Megacom® 800 call for which we need to check if going to an interexchange carrier?
15	Will a Transmit Negative Rail (TNR) "Start of Call" order be sent for the egress trunk for this SII?
16	Should the access information and/or trunk group rating number be included in the IAM for this SII?
17	Is Forced Via Switch Routing (FVSR) / CSRO to be used to route calls?
18	Can this be an Equal Access (EA) Cellular Positive Call Processing (PCP) Call?
19	Can this be a Segmentation Directory (SD) type call?
20	Can this be an Interexchange Carrier (IXC) originated call?
21	Is the Carrier Completion Rate Feature (CCRF) allowed for this SII?
22	Should 4ESS™ preserve and deliver the Carrier Identification Code (CIC) derived at the access switch, but continue to use the Additional Data Field 2 (AD2) value for Service Switching Point (SSP) call type re-translation for this SII?
23	Is this an emergency call per the AT&T Digital Link Phase 3 - 911 Capabilities?
24	Is the SII for this call eligible for an Network Routing Number (NRN) Database (DB) query?
25-48	Currently not used

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ID . . . . . VER:MISC-ESCR
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E25 Rel. 3 and later
CLASS . . . . . VER
APPLICATION . . 4E - Proprietary
TYPE . . . . . Input

1. PURPOSE

Requests the verification of the Enhancements for Special CIC Routing (**ESCR**) translator. This translator provides domestic and international routing information for a Basic Carrier ID Code (**BCIC**). The routing information is: a Domestic Status (DSTAT) parameter, a Domestic Carrier ID Code (DCIC), an International Status (ISTAT) parameter, and an International Carrier ID Code (ICIC). If the optional input BCIC entry is specified only that specific 4-Digit BCIC will be verified and displayed. Otherwise, all the provisioned entries within the ESCR translator are verified and displayed.

Format 1 is used to specify a specific **BCIC**.

Format 2 is used to specify all the **BCIC** provisioned entries within the **ESCR** translator (maximum of 1024 entries allowed).

2. FORMAT

[1] **VER:MISC ESCR:BCIC** a**!**

[2] **VER:MISC ESCR!**

3. EXPLANATION OF MESSAGE

a Basic Carrier ID Code (**BCIC**) (0000-9999).

4. SYSTEM RESPONSE

PF Printout Follows.

RL Retry Later.

5. REFERENCES

PIDENTs
IOCPIMC4
TRANROUT
VRFYCNTL
VRFYINPT
VRFYMISC

Translation Guide, 4ESS™, TG-4, Division 8, Section 16bv

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Output Message
VER:MISC-ESCR

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ID . . . . . VER:MISC-NEIPAV
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E25 Rel. 3 and later
CLASS . . . . . VER
APPLICATION . . 4E - Proprietary
TYPE . . . . . Input

1. PURPOSE

Requests the verification of the AT&T egress non-emergency Initial Address Message (IAM) Message Transfer Part (MTP) American National Standards Institute (ANSI) priority level value and the on / off status of the corresponding feature.

2. FORMAT

VER:MISC NEIPAV!

3. EXPLANATION OF MESSAGE

See Purpose.

4. SYSTEM RESPONSE

PF	Printout Follows.
RL	Retry Later.

5. REFERENCES

PIDENTs
IOCPIMC4
VRFYCNTL
VRFYINPT
VRFYMISC

Translation Guide, 4ESS™, TG-4, Division 8, Section 16ds

Output Message
VER:MISC-NEIPAV

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ID . . . . . REPT:IAOFC
WORK CENTER . . MOC, TOC
GENERIC . . . . . 4E24 and later
APPLICATION . . 4E - Proprietary
TYPE . . . . . Output

1. FORMAT

```
REPT:IAOFC, TRAPN a, bbb [c]
[defgh [DEL:i, NEXT DIGIT NUM:j, PRE:k] [FINAL ROUTE: l] [IAID: m] ...
nop q r [TOS: s, CID: t, INTL: u ,ITC: v] [w] [TNSI: x, INTL: u] ...
[CAUS: y  DATA: z] [TNSI: a1, INTL: u, CID: t, DRTC: b1] ...
[EAANI: c1  OLIDIG: d1] [ISCAUS: e1  LOC: f1] ...
[SAN: g1 MAN: h1 EXDC: i1] [IIDIG: j1|OLIDIG d1] ...
[TRK GRP: k1, NSN: l1
ORIG: m1, SST: n1, DNST: o1, DEST: p1, TC: q1] ...
[RII: r1, TC: q1] s1 t1 u1 v1 w1 x1 y1 z1 a2 [VALKEY: b2 c2 d2 e2]]
[SDSERV: f2]
[SDPC:g2 SSN: h2]
[SPPC:i2 SSN:j2]
[SDRSN: k2]
[PNG: l2]
[CIC: m2]
[LRN: n2]
[SDTT: o2[,SPQRY: p2]]
[PLU CALL]
[LATA:q2]
[CSI:r2]
FHCODE: s2,IFHCODE: t2,u2,{TRCODE|SVICT}: v2,{TRSUB|SVOGT|EAS}: w2x2
[** DATA LOST **]
y2
z2
```

2. REASON FOR OUTPUT

To report an event specified on an MON:IAOFC input message trap whose schedule is or has occurred. The data relevant to a call irregularity is displayed.

3. VARIABLE FIELD DEFINITIONS

a	Trap number (32-35) of the trap that caused the output.
b	Three characters describing Ineffective Attempt (IA) type. See Practice 234-103-018 for description.
c	Final Handling Announcement (FHI) override. See COMPOOL encoding of XL4RD_FHI.
d	Incoming Trunk (ICT) identity associated with the trapped event.

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e Outgoing Trunk (OGT) identity, if present, associated with the trapped event.

f Service Circuit (SVC), if present, associated with the trapped event.

g Digits (DIG) present when the event was trapped.

h Calling Party Digits (CPDIG), if present, when the event was trapped. May be either a billing number or an Automatic Number Identification (ANI).

i Number of digits that were deleted from the DIG variable.

j The number of the next digit to be outpulsed after deleting and prefixing operations have been applied to DIG data.

k The actual digits to be prefixed prior to outpulsing, blank if none.

NOTE: Example: If DIG = 6903452, DEL = 3, PRE = 1, and NEXT DIGIT NUM = 4, then digit 5 will be the next digit to be outpulsed, since it is the fourth digit left after 690 was deleted and the digit 1 was prefixed.

NOTE: Since the 4ESS™ switch gives up to four digits at a time to the Signaling Processor (SP) for Multifrequency (MF) outpulsing, the TRAP can only indicate what the next group of digits to be given to the SP will be, not what digit the SP will actually cause to be outpulsed next.

l Circuit Identification Number (CIN) of trunk subgroup which was the final route hunted in a No Circuit Available (NCA) condition.

m The internal Public Announcement Service (PAS) frame identity for those call irregularities that are associated with PAS calls, either a customer call to listen to a PAS announcement or a call to create or update a PAS announcement. PAS announcement number.

n Domain Incoming (DOMI) from Call Register (CR). See COMPOOL encoding of CR4DOMI.

o Dynamic Non-Hierarchical Routing (DNHR) Incoming Class Mark (DNHRICM). See COMPOOL encoding of CR4CIDNHRI.

p DNHR Outgoing Class Mark (DNHROCM). See COMPOOL encoding of CR4CODNHRO.

q Blue Box Digits (BBDIG) collected when event was trapped.

r Previously Stored Number (PSN).

s Type Of Service (TOS).

t Carrier Identification (CID).

u International (INTL) flag.

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Use pursuant to Company Instructions.

v	Incoming Trunk Class (ITC).
w	Service index number (see COMPOOL encoding of CR4CBC_SERV).
x	Transit network selection index.
y	Q931 cause value.
z	Octal data (16 bits).
a1	Integrated Services Digital Network (ISDN) User Part (ISUP) dire translation. Transit network selection index.
b1	Data rate transport capability (XL4DRTC).
c1	Originating Line Information (OLI) Equal access Automatic Number Identification (ANI) type.
d1	OLI digits.
e1	ISUP cause value.
f1	Location data.
g1	Subaccount number.
h1	Mandatory / optional subaccount number.
i1	Expected digit count.
j1	Equal access Information Digits (IIs).
k1	Real Time Network Routing (RTNR) class of service. Trunk Group (TRK GRP) circuit identification number.
l1	Network Switch Number (NSN).
m1	Class Of Service (COS) Origination (ORIG).
n1	COS Signaling Service Type (SST).
o1	COS Dial Number Service Type (DNST).
p1	COS Destination (DEST).
q1	Transport Capability (TC).
r1	RTNR service routing information.
s1	Service Circuit System (SCS) expanded Final Handling Announcement (FHANN) value.
t1	Byte Length (BLEN) of User To User Information (UUI) / Access Transport (ATP).
u1	Adjunct Logical Address (ALA).
v1	Originating Point Code (OPC).
w1	Invoke (INVK) Identification (ID).
x1	Credit Card Digits (CARD).

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Use pursuant to Company Instructions.

y1	Destination Point Code (DPC).
z1	Subsystem Number (SSN).
a2	Operator (OPER) requested call.
b2	Validation Key (VALKEY) data. Feature identification.
c2	Trigger identification.
d2	Call state.
e2	Call directionality.
f2	Segmentation Directory (SD) service indicator. Refer to the *4ESS™ Domestic Call-Irregularity Maintenance Reference Handbook*.
g2	SD point code.
h2	SD subsystem number.
i2	SD service processor point code.
j2	SD service processor point code subsystem number.
k2	SD reason. Refer to the *4ESS™ Domestic Call-Irregularity Maintenance Reference Handbook*.
l2	Ported number gap.
m2	Carrier identification code.
n2	Local routing number.
o2	Segmentation Directory (SD) transition type value. See COMPOOL encoding of CR4SD_TRAN_TYPE.
p2	SD service processor query status. See COMPOOL encoding of CR4SD_SPQRY_STAT.
PLU CALL	Positive Look Up (PLU) call.
q2	Local Access Transport Area (LATA) number.
r2	Carrier Selection Information (CSI) number.
s2	Final Handling Code (FHCODE). This is the raw data describing the failure at the level of detail internal to the program. See COMPOOL encoding of FH4FHIDIDEN item.
t2	Input Final Handling Code (IFHCODE). Raw data for the final handling code which was input to TMAD0002 program prior to possible clarification into the more detailed FHCODE variable.
u2	Q931 or ISUP message pointer. COMPOOL encoding is Q94_MESS_TYPE (Q931) and C74 MSGTYPE (ISUP), respectively.
TRCODE	Trunk register code.
SVICT	State vector, incoming trunk.

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Use pursuant to Company Instructions.

v2	Raw data for Call Register (CR) incoming state vector or Trunk Register (TR) code. See COMPOOL encoding for CR4SVICT and TR4CODE, respectively.
TRSUB	Trunk register substate code.
SVOGT	State vector, outgoing trunk.
EAS	Equal Access Signaling (EAS).
w2	Raw data for CR outgoing state vector or TR substate code. See COMPOOL encoding of CR4SVOGT and TR4CODE, respectively.
x2	Equal Access Signaling (EAS) state.
DATA LOST	Possible text stating that data has been lost due to the collection of more data than can be buffered for output. At most, 32 messages can be buffered to all monitoring channels. blank — if no message failed to be buffered prior to the current message and the previous successfully buffered message.
y2	Time of call irregularity occurrence.
z2	Exception code encountered while interacting with the SD or Network Control Point (NCP) database.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPPOM4
TMAD0002
TMAD0005
TMADTRAP

Practice 234-010-315, *4ESS™ Domestic Call-Irregularity Maintenance Reference Handbook*

Practice 234-103-018, *Trunk Operations Center (TOC) - Call Irregularity Raw Data Trap*

Input Messages

```
ALW:IAOFC
INH:IAOFC
MON:IAOFC
STOP:MON-IAOFC
```

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.

ID . . . . . TEST:NRNDB
WORK CENTER . . MAC, MOC, NMOC, TOC
GENERIC . . . . . 4E25 Rel. 3 and later
APPLICATION . . 4E - Proprietary
TYPE . . . . . Output

1. FORMAT

```
TEST:NRNDB:SII a,DNBR b,DIGTYP c(,DIGITS d|,NPA e)[,OFAI f]...
      ...[,TFAI g][,CSR h][,RATE i]!

[FINAL ROUTE RECEIVED
FINAL HANDLING TREATMENT j]
[NO FINAL ROUTE RECEIVED - MORE ROUTING INFORMATION TO COME]
[NRN TIMEOUT]
[EXCEPTION CODE k]
[NRNDB PROTOCOL ERROR - NO OPERATIONS]
[RECEIVED UDS MESSAGE OR QUERY RETURNED]
[MISSING MANDATORY PARAMETER IN THE ROUTE CONSTRUCTOR PARAMETER]
[MISSING MANDATORY FRI PARAMETER]
[INVALID RETURN ERROR REQUEST - NOT A DISCONNECT OR CONNECT REQUEST]
[DETECTED A MESSAGE THAT WAS NEITHER A CONTINUE NOR AN END]
[RECEIVED DISCONNECT REQUEST - CALL HANDLING DID NOT INDICATE NO ROUTE]
[RECEIVED DISCONNECT REQUEST - NM CONTROLLED OR NOT ALLOWED NOT INDICATED]
[RECEIVED DISCONNECT REQUEST - NO CALL HANDLING PARAMETER RECEIVED]
[MISSING STANDARD ANNOUNCEMENT PARAMETER AND OR DISCONNECT OPERATION]
[INVALID CALLER INTERACTION OPERATION]
[INVALID NETWORK MANAGEMENT OPERATION]
[RECEIVED REJECT FROM NRNDB]
[RECEIVED PABORT FROM NRNDB]
[RECEIVED UABORT FROM NRNDB]
[RECEIVED RETURN ERROR FROM NRNDB]
[RECEIVED DUPLEX CC MESSAGE FROM NRNDB]
[RECEIVED DUPLEX NM-ACG MESSAGE FROM NRNDB]
[INVALID INVOKE COMPONENT OPERATIONS FROM NRNDB]
[INVALID CONNECTION CONTROL CONNECT OPERATION]
[INVALID DIGIT TYPE FROM NRNDB]
[INVALID ERROR CODE FROM NRNDB]
[FAILED TO SEND MESSAGE DUE TO STREAM DOWN]
[FAILED TO SEND MESSAGE DUE TO BUFFER OVERFLOW CONDITION]
[MISSING ROUTING RECORD - NO CIRCUITS AVAILABLE]
[UNRECOGNIZED COMPONENT IN THE NRNDB MESSAGE]
[INVALID CONNECTION CONTROL CONNECT PARAMETER]
[INVALID CONNECTION CONTROL DISCONNECT PARAMETER]
[INVALID CALLER INTERACTION PLAY ANNOUNCEMENT PARAMETER]
[INVALID NETWORK MANAGEMENT ACG PARAMETER]
[INVALID NETWORK MANAGEMENT DIGITS PARAMETER]
[INVALID MESSAGE TYPE RECEIVED]
```

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.

```
[DETECTED AN INVALID END MESSAGE]
[CONNECTION CONTROL - DISCONNECT]
[CONNECTION CONTROL - CONNECT]
[CALLER INTERACTION - PLAY ANNOUNCEMENT - VACANT CODE]
[CALLER INTERACTION - PLAY ANNOUNCEMENT - NO CIRCUITS AVAILABLE]
[CALLER INTERACTION - PLAY ANNOUNCEMENT]
[MISSING ROUTING RECORD]
[RECEIVED ACG]
[CALL HANDLING - NOT ALLOWED]
[CALL HANDLING - NM CONTROLLED]

[FAI  NSN  ERI  ESI  CSR

  l,   m,   n,   o,   h,
 •
 •
 •]
```

2. REASON FOR OUTPUT

This output message is in response to a TEST:NRNDB input message. The output from this test query will indicate whether the query was successful or not. If the query is successful, the output will show what operations were requested by the customer and the routing information received from the Network Routing and Numbering Database (NRNDB). If the query is not successful, the output will output a reason form failure or an exception code.

3. VARIABLE FIELD DEFINITIONS

a	Service Identity Index (SII) (0-255).
b	Routing digits (1-15 digits).
c	Type of routing digits: APN — Action Point Numbering Plan. INTL— International. NANP — North American Numbering Plan.
d	Country code (1-3 digits). This parameter identifies the country of origin of an inbound call.
e	Far-end Numbering Plan Area (NPA) (3 digits).
f	Origination Foreign Administration Identity (FAI) (1-31). Identifier of the foreign administration that routed the call to the AT&T network.
g	Termination FAI (1-31). Identifier of the foreign administration to which the call is to be routed.

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Use pursuant to Company Instructions.

h	Carrier Specific Routing (CSR) preference: 0 — CSR not required. 1 — CSR preferred. 2 — CSR mandatory.
i	Used to specify a data rate for Direct Services Dialing (DSD) calls: 0 — Non data (voice call). 1 — 1.536 Megabits Per Second (MBPS) clear. 2 — 1.536 MBPS restricted. 3 — 384 Kilobits Per Second (KBPS) clear. 4 — 384 KBPS restricted 5 — 64 KBPS clear. 6 — 56 KBPS. 7 — 64 KBPS restricted.
j	Final Handling Treatment (FHT) code.
k	Exception code. A number that defines the error (1-255).
l	Foreign Administration Identification (FAI).
m	Network Switch Number (NSN).
n	Egress Route Indicator (ERI)
o	Egress Switch Indicator (ESI)

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
TCAPTEST

Input Message
TEST:NRNDB

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.

ID . . . . . VER:ASCIT-ANSR
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E21 Rel. 2 and later
APPLICATION . . 4E - Proprietary
TYPE . . . . . Output

1. FORMAT

```
VER:ASCIT;OPT(ANSR):

SII   QUESTION   ANSWER

 a       b          c
```

2. REASON FOR OUTPUT

Display the verification of the AT&T Service / Call ID Type (ASCIT).

3. VARIABLE FIELD DEFINITIONS

a	Service Identity Index (SII) number (0-255).
b	Question being asked number (1-48). See Table A for a list of questions that could be asked and the corresponding question number.
c	Answer to question: N — No Y — Yes

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPIMC4
IOCPPVR4
VRFYCNTL
VRFYINPT
VRFYMISC
VRFYOUT

Input Message
VER:ASCIT

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.

TABLE A

VALUE	MEANING
1	Is this a global Software Defined Network (SDN) call?
2	Can this be a SDN call?
3	Currently not used
4	Should the Universal Services Echo Canceller (USEC) enhancement feature be disabled for this SII?
5	Is this a Remote Adjunct Call Handling (REACH) call for this SII?
6	Should the billing number be sent with this SII?
7	Is this an SDN - Digital Radio Avoidance Routing (DRAR) call?
8	Does Integrated Services Digital Network User Part (ISUP) need to pass routing or Automatic Message Accounting (AMA) data to an AT&T Trigger Platform (ATP) switch or an Network Control Point (NCP) initiated handoff switch?
9	Is this a GETS call?
10	Are End-to-End Class Of Service (ECOS) overflow routes excluded for this SII?
11	Are ECOS alternate routes excluded for this SII?
12	Is this a HIQ call for this SII?
13	Is the terminating recording data set to ON for this SII?
14	Is this a Megacom® 800 call for which we need to check if going to an interexchange carrier?
15	Will a Transmit Negative Rail (TNR) "Start of Call" order be sent for the egress trunk for this SII?
16	Should the access information and/or trunk group rating number be included in the IAM for this SII?
17	Is Forced Via Switch Routing (FVSR) / CSRO to be used to route calls?
18	Can this be an Equal Access (EA) Cellular Positive Call Processing (PCP) Call?
19	Can this be a Segmentation Directory (SD) type call?
20	Can this be an Interexchange Carrier (IXC) originated call?
21	Is the Carrier Completion Rate Feature (CCRF) allowed for this SII?
22	Should 4ESS™ preserve and deliver the Carrier Identification Code (CIC) derived at the access switch, but continue to use the Additional Data Field 2 (AD2) value for Service Switching Point (SSP) call type re-translation for this SII?
23	Is this an emergency call per the AT&T Digital Link Phase 3 - 911 Capabilities?
24	Is the SII for this call eligible for an Network Routing Number (NRN) Database (DB) query?
25-48	Currently not used

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Use pursuant to Company Instructions.

ID . . . . . VER:MISC-ESCR
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E25 Rel. 3 and later
APPLICATION . . 4E - Proprietary
TYPE . . . . . Output

1. FORMAT

```
VER:MISC,OPT(ESCR)

 BCIC    DSTAT  DCIC    ISTAT  ICIC

 aaaa,      b, [cccc],     d, [eeee],
[aaaa,      b, [cccc],     d, [eeee],]
[aaaa,      b, [cccc],     d, [eeee],]
  •
  •
  •
```

2. REASON FOR OUTPUT

Provides the ability to verify entries provisioned in the Enhancements for Special CIC Routing (ESCR) translator. This translator provides domestic and international routing information for a Basic Carrier ID Code (BCIC). The routing information is: a Domestic Status (DSTAT) parameter, a Domestic Carrier ID Code (DCIC), an International Status (ISTAT) parameter, and an International Carrier ID Code (ICIC). If the optional BCIC input parameter is used only that specific 4-digit BCIC will be verified and displayed. Otherwise, all the provisioned entries within the ESCR translator will be verified and displayed.

3. VARIABLE FIELD DEFINITIONS

a	Basic Carrier ID Code (BCIC) (0000-9999).
b	Domestic Carrier ID Code (DSTAT) (0000-9999).
c	Domestic Status (DCIC) parameter (ON or OFF).
d	International Carrier ID Code (ISTAT) (0000-9999).
e	International Status (ICIC) parameter (ON or OFF).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPPVR4
TRANROUT
VRFYMISC

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.

VRFYOMSC
VRFYOUT

Translation Guide, 4ESS™, TG-4, Division 8, Section 6bv

Input Message
`VER:MISC-ESCR`

ID . . . . . VER:MISC-NEIPAV
WORK CENTER . . MAC, MOC
GENERIC . . . . . 4E25 Rel. 3 and later
APPLICATION . . 4E - Proprietary
TYPE . . . . . Output

1. FORMAT

```
VER:MISC,OPT(NEIPAV):

ANSI IAM MTP VALUE: a,      FEATURE MODE:   b
```

2. REASON FOR OUTPUT

Provides the ability to verify the AT&T egress non-emergency Initial Address Message (IAM) Message Transfer Part (MTP) American National Standards Institute (ANSI) Priority Level value and the on / off status of the corresponding feature.

3. VARIABLE FIELD DEFINITIONS

a	Recommended non-emergency ANSI IAM MTP priority level value (0-3).
b	Feature operation mode (OFF or ON).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPPVR4
VRFYMISC
VRFYOMSC
VRFYOUT

Translation Guide, 4ESS™, TG-4, Division 8, Section 6ds

Input Message
VER:MISC-NEIPAV

LUCENT TECHNOLOGIES – PROPRIETARY
Use pursuant to Company Instructions.