



Product/Service Brief

DMS-100/DMS-500 Systems

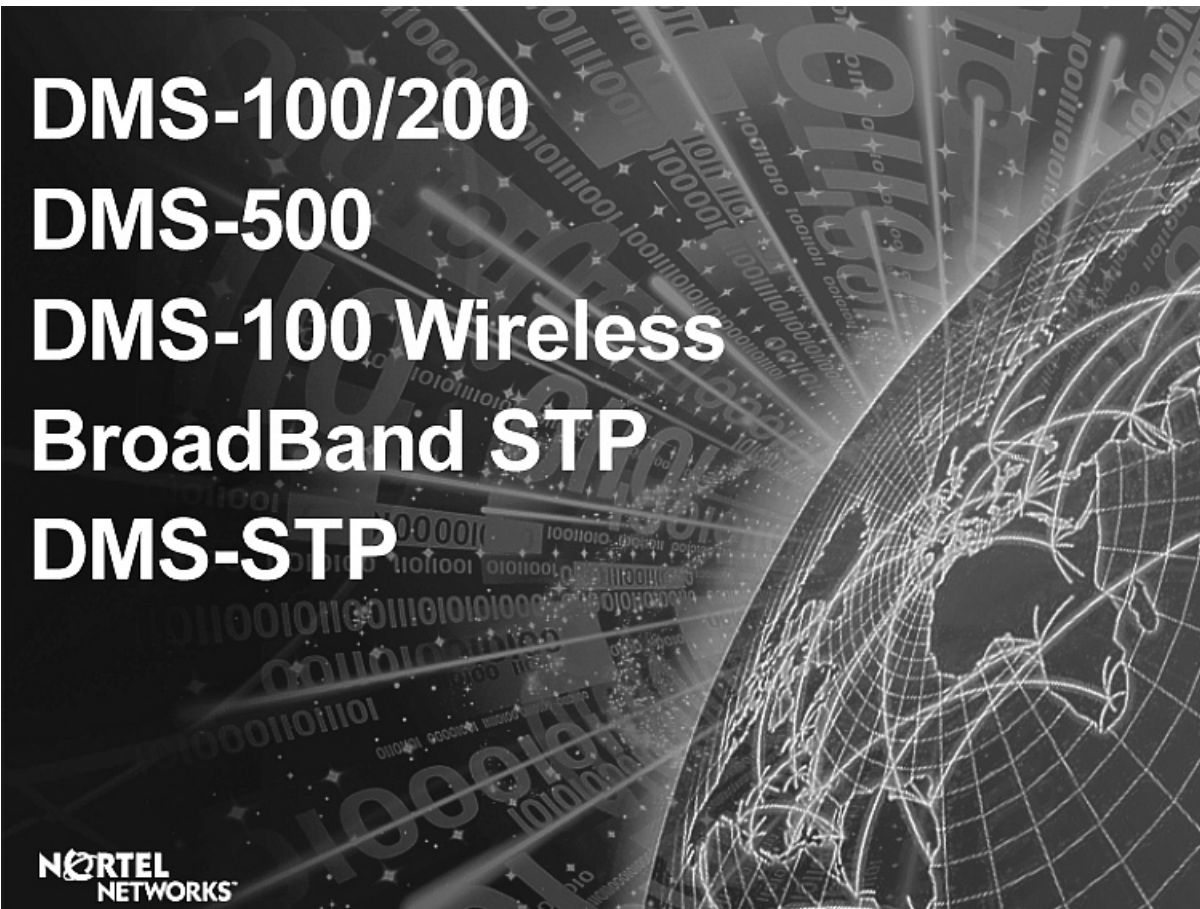
Feature Planning Guide

Local Access DMS Systems

Year 2000

NORTEL
NETWORKS™

How the world shares ideas.



DMS-100/200
DMS-500
DMS-100 Wireless
BroadBand STP
DMS-STP

NORTEL
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DMS-100 / DMS-500

FEATURE PLANNING GUIDE

LOCAL ACCESS DMS SYSTEMS

YEAR 2000

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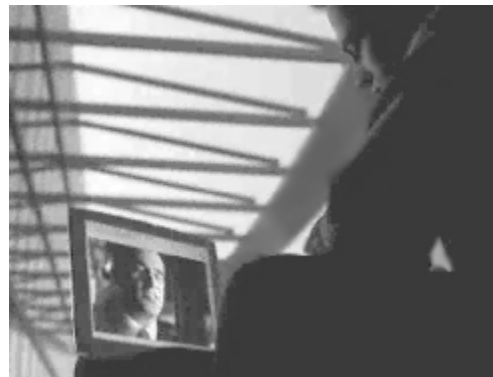
DMS SuperNode Opportunities

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HOW THE WORLD SHARES IDEAS

Nortel Networks delivers Unified Networks solutions to customers around the world, spanning mission-critical telephony and Internet Protocol (IP)-optimized networks. Customers — including public and private enterprises and institutions; Internet service providers; local, long distance, cellular, and Personal Communications Services (PCS) communications companies, cable television carriers, and utilities — rely on our proven leadership in telephony and IP-based data, wireline, and wireless networking.

- ◆ For service providers, we offer a wide range of solutions, including products for traditional switching, data networking, fiber-optic transport, mobility, access, cable networks, next-generation Internet Protocol networks, and more.
- ◆ For corporations and institutions, we offer private branch exchanges, wide area networks, local area networks, metropolitan area networks, call centers, routing systems and gateways, terminals, and more.



Our portfolio — the broadest in the industry — delivers greater price/performance and lower operational/support costs with robustness, security and scalability.

AT THE HEART OF THE INTERNET REVOLUTION

In the last century, we were a major contributor to the creation of the original telecom network. And now, Nortel Networks again plays a dominant role, this time in the Internet Revolution.



The systems and facilities we provide to carriers carry over 75 percent of all North American Internet traffic.

Our Optical Internet, Internet Telephony, Wireless Internet, and Intranet Service solutions are building the new, high-performance Internet that is faster and more reliable — and offer an entirely new set of economics to businesses and service providers alike.

Every nine months we've doubled the capacity of our fiber-optic solutions — while cutting the cost by half.

We've accomplished this with our ability to carry tremendous amounts of information over our fiber-optic systems. We can place 6.4 terabits per second (Tbps) of Internet and other traffic over a single, hair-thin strand of dispersion-managed fiber through dense-wavelength division multiplexing (DWDM) technology. Over conventional single-mode fiber, we can demonstrate transmission speeds of up to 40 gigabits per second per channel.

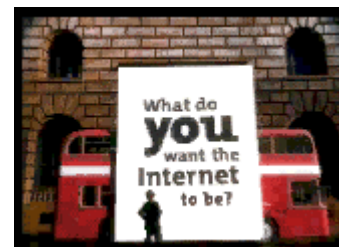
Being at the heart of the Internet Revolution also means that we are in the vanguard of companies responding to the dramatic changes the Internet brings about.

WHAT DO **you** WANT THE INTERNET TO BE?™

The new high-performance Internet is dramatically changing the way businesses, service providers, and customers communicate, collaborate, and conduct commerce. But *how* will this help build a world that's more interdependent, interconnected, and interactive? Nortel Networks asks the simple question, "What do **you** want the Internet to be?" And then we listen — to our customers, to end users, to all who answer — so we can fine-tune solutions to address real time needs and prepare for future opportunities.

COME TOGETHER

Nortel Networks stands at the center of the real-time convergence of voice and data, wireless and wireline, and circuit and packet switching. With our industry-leading portfolio in convergence technologies, disparate networks come together with common high-bandwidth backbones with open, multivendor access methods.



Our next-generation packet-based portfolio, Succession Solutions, delivers tomorrow's packet services with carrier-grade quality, turnkey simplicity, and professional services for new providers wanting to install a new network — and for established service providers wanting to transition today's communications equipment.

We're in a powerful position to unify networks and deliver the new services — such as optical Internet and e-mobility IP services — that usher in new global economics and a new era of collaboration, communication, and commerce.

RIGHT NOW

Every four minutes a new network opens up; every four-tenths of a second a new user comes on line. An exploding, competitive environment where trends and market conditions can change overnight creates new challenges for everyone. The priorities today are speed and agility — to anticipate and facilitate change.



Time is at the cutting edge of competitive advantage, and Nortel Networks has demonstrated new dexterity in delivering new solutions with condensed delivery schedules. We slashed *in half* Moore's Law by doubling optical capacity every nine months in the last four years. Our research and development groups produce an average of three patents a day in our accelerated search to find new ways to help customers exploit the power of next-generation packet networking — right now, today.

OVER ME

As the first and only company of its kind in the world, our experience is unmatched by anyone else in building Unified Networks. Some 42,000 customer-facing professionals stand ready to provide service and solutions in all types of networks — data, voice, video, wireline, wireless, public, and private — on a global scale. With this excellent worldwide reach — with operations in more than 180 countries and territories — we're often already established where our customers want to expand.



Nortel Networks has research capabilities around the world, including a network of research and development facilities, affiliated joint ventures, and other collaborations fostering innovative product development and advanced design research in 17 countries. Our 20,000 engineers — in 41 research labs worldwide — focus on delivering global, scalable, high-capacity public and private networks built on the innovation, IP technology, and application-focus driving the Internet.

KEY PLAYERS: DMS SUPERNODE SYSTEMS

Nortel Networks continues to enhance the Digital Multiplex System (DMS) Family to help migrate the reliability, ruggedness, capacity, and security taken for granted in the traditional circuit-switched voice network into carrier-class, next-generation, data-centric networking.

We continually expand our extensive DMS portfolio to better design and deliver digital communication networks for incumbent and competitive local exchange carriers, independent operating companies, Internet service providers, cable and utility companies, and new startup entrants.

ALL DMS SUPERNODE SYSTEMS

The modular, scalable DMS SuperNode architecture enables network providers to cost-effectively add components, facilities, and services as they are needed through incremental additions. In many cases, enhanced processors, additional switching matrices, peripherals, line cards, and trunk cards can be added without redesigning the system or interrupting service.

And, since field-proven DMS SuperNode switches — from local to international systems — operate on a common hardware base platform, the network provider's investment is protected even as the business takes new directions and the network changes to packet-based solutions in our Succession Solutions portfolio.

Our extensive portfolio of revenue-generating services makes extensive use of advanced signaling systems such as Signaling System No. 7 (SS7) and ISDN Primary Rate Interface (PRI) — as well as Intelligent Network (IN) capabilities.

With our redesigned modular software, it is easier than ever to create new capabilities and enhance existing features. And our operations, administration, maintenance, and provisioning (OAM&P) solutions help ease new service introduction, deliver high-quality services, and integrate technologies in a multivendor environment.



DMS-100 SYSTEM

The DMS-100 system is a DMS SuperNode application that provides superior local exchange (Class 5) services. Today, Nortel Networks offers the largest menu of fully digital telephony and data services in the industry to support the growing demands of a network provider's subscriber base — including corporations, small- to mid-sized businesses, universities, residences, and work-at-home accounts.

The order codes for DMS-100 software loads begin with the characters **LEC** to represent a complete Local Exchange Carrier solution.

DMS-200 AND DMS-100/200 SYSTEMS

The DMS-200 system is a DMS SuperNode application that supports advanced Access Tandem (Class 4) toll office services that can support as many as 112,000 trunks in a Large Tandem configuration. A hybrid DMS-100/200 system combines DMS-100 line-side features with DMS-200 trunk-side capabilities in a single system.

Software load order codes for these systems can begin with:

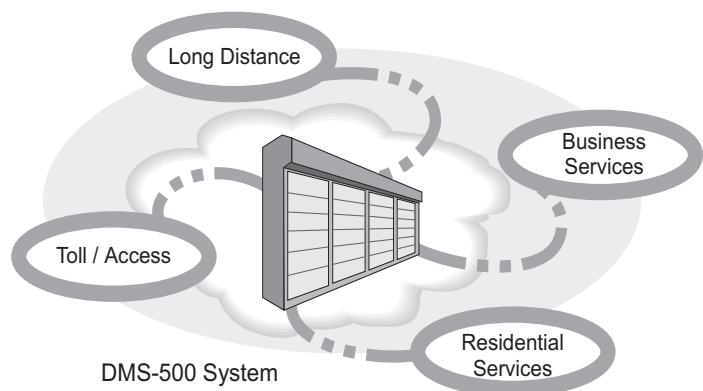
- ◆ The characters **LEC**, the same as a Local Exchange Carrier.
- ◆ The characters **LET** to represent the addition of Traffic Operator Position System (TOPS) operator services capabilities.

DMS-500 SYSTEM

The DMS-500 Local and Long Distance system is a DMS SuperNode application that combines the local residential and business features of the DMS-100 system, toll and operator capabilities of the DMS-100/200 Traffic Operator Position System (TOPS), and Long Distance services of the DMS-250 system in a single, robust platform.

This total solution hosts one of the industry's most application-rich portfolios of carrier services — loaded with major capabilities that are market-ready today.

The order codes for DMS-500 software loads begin with the characters **LLT** to represent its Local, Long Distance, and TOPS capabilities.

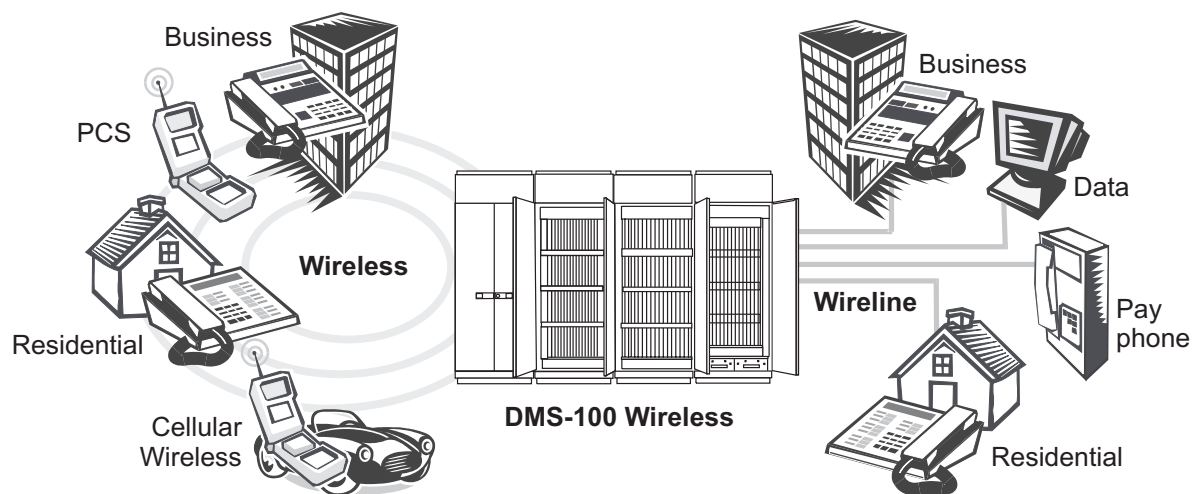


KEY PLAYERS: DMS SUPERNODE SYSTEMS, *continued*

DMS-100 WIRELESS SYSTEM

The DMS-100 Wireless system is a DMS SuperNode application that integrates DMS-100/200 (local/toll) wireline and DMS Mobile Telephone Exchange (MTX) wireless capabilities on a single platform. This solution offers a single point-of-presence for a network provider in both markets. Its innovated integrated subscriber services — including centralized voice mailbox, one-number capabilities, and feature transparency — offer new revenue opportunities.

The order codes for DMS-100 Wireless software loads begin with the characters **LWW** to represent its Local Wireline/Wireless capabilities.



SIGNALING TRANSFER POINT (STP) SOLUTIONS

Based on the DMS SuperNode architecture, the DMS-STP system provides high-capacity message transfer among the nodes of the SS7 network. Capable of handling up to 432 links, each system can process up to 348 million SS7 messages per hour. The order codes for DMS-STP software loads begin with the characters **STP**.

The innovative BroadBand STP system, based on Nortel Networks Signaling Server Platform, offers advanced STP capabilities in one of the smallest footprints in the industry. Its fully redundant, modular design uses ATM switching as the internal transport system to reduce the possibility of congestion problems when the system runs at high capacity levels. The order codes for BroadBand STP software loads begin with the characters **SSR**.

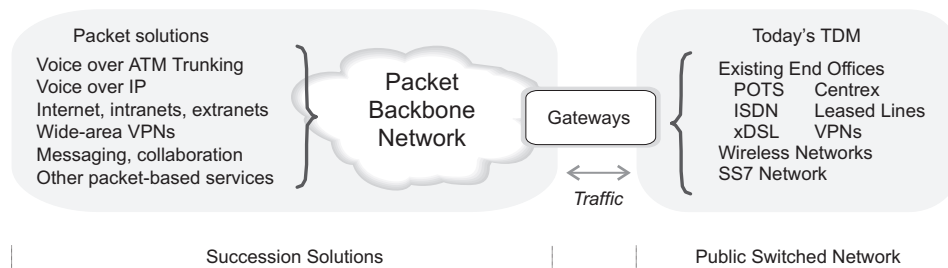
CARRIER-GRADE PACKET NETWORKING: SUCCESSION SOLUTIONS

In the emerging data-centric environment, public carrier networks will be data networks that carry voice, in place of today's voice networks that carry data. New services and packages that could not be delivered on the existing infrastructure will help differentiate service providers and help curb the rising costs of doing business, with new scalability and flexibility.

No single cookie-cutter solution can meet the diverse needs of incumbents, newcomers, Internet Service Providers, cable operators, wireless carriers, and others looking to set up packet-based networking. To meet these challenges, Nortel Networks offers a wide-ranging **Succession Solutions** portfolio, with applications as diverse as Voice over IP (VoIP), Voice Trunking over ATM (VToA), Switched Lines over ATM (SLoA), Voice over Digital Subscriber Line (VoDSL), and more. Open, carrier-grade solutions accelerate the integration of the world's disparate data and telephony networks into a Unified Network, with the option to either:

- ◆ Transition an existing network, or
- ◆ Build a new network.

Carriers can create a multiprotocol, standards-based architecture that transports all of today's revenue-generating services, while supporting competitive, next-generation services to many different types of users from one unified infrastructure.



Unifies Next-Generation Packet Solutions with Existing Time-Division Multiplexing (TDM) Investments and Revenue Streams through Multi-service Gateways

Succession Solutions options enable service providers to break free of today's constraints to create a multivendor, multi-service network that helps open new market opportunities, protect revenue streams, and reduce the total cost of network ownership. Built on a simplified, distributed design, this standards-compliant packet data network delivers end-to-end, high-bandwidth solutions with mission-critical reliability.

For more information about this portfolio's capabilities and benefits, refer to the "Succession Solutions" chapter, starting on page 34.

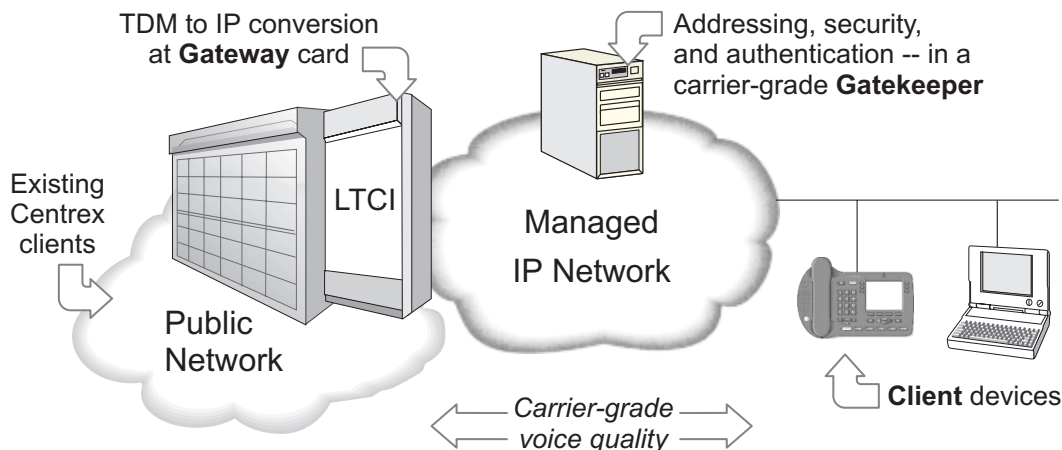
SERVICES ANYWHERE WITH CENTREX IP

Now telecommuters and road warriors can have access to the same fully featured voice services they have in the office: the same extension, voice mail, corporate dialing plan, and productivity features (such as Call Forwarding, Conference Calling, Calling Line ID, and more). Centrex IP delivers the full set of industry-leading Nortel Networks Centrex business services over a managed, carrier-grade Internet Protocol (IP) network — with carrier-grade reliability and voice quality.

Centrex IP

— brings the industry's richest Centrex feature set into the world of IP, extending the reach of business networks and enabling an exciting new portfolio of integrated data and telephony services such as multimedia conferencing, whiteboarding, file sharing, and unified messaging.

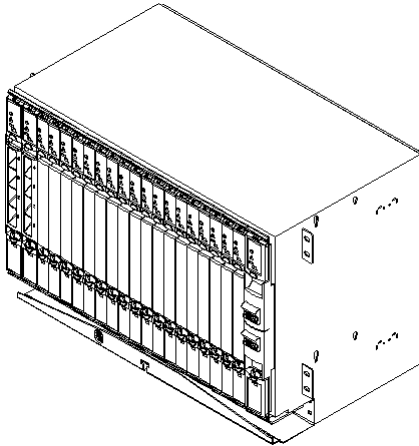
Because it is an evolutionary, not revolutionary, approach, Centrex IP is the ideal vehicle for migrating from today's circuit-switched narrowband network into the future of next generation business services — without disrupting day-to-day operations or sacrificing today's high-demand productivity features.



Centrex IP is scheduled to be generally available in May 2000 with Rel•12 PCLs. For more details, see the "Centrex IP" chapter, starting on page 136.

VOICE AND DSL WITHOUT SPLITTERS: UNIVERSAL EDGE 9000

The convergence of voice and data networks and the migration of intelligence from the center to the edges of the network have created new service opportunities, prompting Nortel Networks to introduce a new breed of DMS peripheral. Delivering a full suite of voice and broadband services *today* from the network edge is the revolutionary Universal Edge 9000 shelf. Its unique, integrated voice and data design enables new revenue streams through delivery of voice, data, and future broadband services on a single high-density platform.



With the Universal Edge 9000's initial releases, service providers can extract greater value from their networks by deploying Web access using 1-Meg Modem, Asymmetric Digital Subscriber Line (ADSL), G.Lite, Symmetric DSL, and other services — plus integrated POTS support — with carrier-class reliability and quality. And, to enhance life-cycle investment costs, the Universal Edge 9000 can be used as a Media Gateway (between circuit-switched and packet networks) in the transition to Succession Solutions in the future.

For more information about the Universal Edge 9000, see pages 96 to 100 in the “Build the New Internet” chapter later in this document.

TRAINING FOR PRODUCTS DISCUSSED IN THIS DOCUMENT

Thousands of telecommunications professionals expand their expertise each year by taking courses offered through Nortel Networks Training and Documentation Services for Global Customer Service. Our growing portfolio of self-paced courses — including Computer-Based Training (CBT), videos, and workbooks — offers significant cost-effectiveness and convenience. And, our extensive portfolio of instructor-led courses provides the live interaction and hands-on exercises to maximize work performance.

Nortel Networks continues to expand course offerings so service providers can access the latest information on DMS products, AccessNode, TransportNode, Succession Solutions, 1-Meg Modem, Preside, Wireless solutions, and more.

For more information on our complete training portfolio, contact your company's training coordinator, or, in North America:

- ◆ Call Nortel Networks Global Customer Service at 1-877-662-5669.
- ◆ Browse our Internet Web page at:

<http://www.nortelnetworks.com/td>

QUICK GUIDE TO KEY SERVICES IN THIS DOCUMENT

To help you find the information you need quickly, the following associates a few key services, using industry-standard terminology, with various chapters in this document.

Service (industry term)	See Chapter	Starting Page
911 services	Emergency Number Services (E911)	187
Advanced Intelligent Network	Advanced Intelligent Networking	116
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Residential/Small Business Services	Residential Enhanced Services (RES)	163
SS7 Signaling Network	<ul style="list-style-type: none"> ◆ Optional Base Features ◆ DMS-STP System ◆ BroadBand STP 	55 279 287
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Voice over ATM/DSL	Succession Solutions	34
Voice over IP	<ul style="list-style-type: none"> ◆ Succession Solutions ◆ Centrex IP 	34 136
Voice Trunking over ATM	Succession Solutions	34
Wireless Services	DMS-100 Wireless	244

Software Overview

This chapter introduces a number of basic concepts and terms used to describe the standard and optional features in DMS-based software loads.

Use this chapter to become familiar with the various terms found throughout this document that refer to software components within and across releases. Since different vendors use the same terminology in varying ways, it is advisable to read this chapter before progressing to the actual software descriptions.

Expanded Feature Planning Guide

For the first time, this *Feature Planning Guide* discusses new software features for both the DMS-100/200 family and DMS-500 systems in one convenient document.

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Release Terms Used in this Document	28

SOFTWARE STRUCTURE

Designed for the fast-changing, expanding global marketplace, the DMS SuperNode system's advanced distributed-processing software design provides a continually evolving, fault-tolerant communications engine.

THE BENEFITS OF STANDARD LOADS

Nortel Networks delivers DMS SuperNode system software with a simplified product structure that features a layered software architecture. With a limited number of well-defined interactions among software components, the layered design is easier to develop and test than traditional approaches that rely on thousands of interactions among hundreds of features. And, making feature interactions more predictable and the software design less complex contribute to producing more reliable software.

Software releases for DMS SuperNode platforms are delivered in *Product Computing-Module Loads* (PCLs). Each PCL contains the full set of generally available features for a particular type of switching application. New capabilities are always readily available in the switch, ready to be deployed without the delay of reloading software.

"PCL"

— a universal software load for a particular type of DMS system.

Standardized loads offer the benefits of rapid feature activation, streamlined switch maintenance and administration, and flexible marketing capabilities for the network provider.

Each network provider establishes a unique, custom mix of active and inactive features for each switch by licensing certain optional *order codes* (and leaving other optional order codes inactive).

"Order Codes"

— the individual software modules within a PCL.

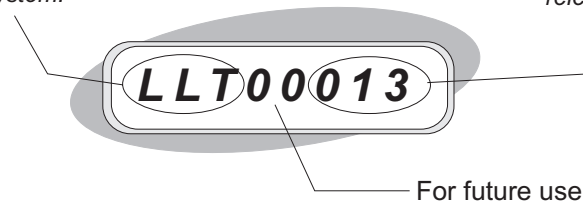
Whenever features need to be activated, network providers contact Nortel Networks for licensing and activation information. Since the software is loaded on the switch already, *no software reloading* is required.

PCL CODES

The code given to a PCL contains eight characters, with the following conventions:

The PCL's switch application
The first part of the PCL name is an acronym that identifies the specific switch application for the load. For example, LLT pertains to the combination Local, Long Distance, and TOPS capabilities of the DMS-500 system.

Sequential release number
Increments with each new PCL release for this switch application



PCL Code Conventions

INITIAL CHARACTERS

The first part of the PCL code is an acronym that identifies the particular type of switch the software is designed to support. The prefixes seen most often in this document are:

Prefix	Switch Application
LEC	North American local exchange office [DMS-100]
LET	North American local exchange office with operator services (TOPS) features [DMS-100/200; DMS-200]
LLT	North American combined Local, Long Distance, and TOPS office [DMS-500]
LWW	North American combined Local Wireline and Wireless office [DMS-100 Wireless]
STBA	North American DMS-STP (Signaling Transfer Point)
STSE	North American DMS-STP with added SEAS (Signaling, Engineering, and Administration System) functionality
SSR	North American BroadBand STP node

FINAL DIGITS

The last characters in the PCL code increment with each new release. The numbering sequence used varies somewhat across different switching platforms.

SOFTWARE STRUCTURE, *continued***TRACKING LEC, LET, LLT, AND LWW PCLs WITH “REL•”**

When this document discusses a new software feature, the description always identifies which PCLs are planned to include the feature. For example, a feature called Line Option Capacity Expansion is scheduled to be generally available with LEC00012, LET00012, LLT00012, and LWW00006 PCLs.

However, in a number of places in this document, it can become confusing or unnecessarily tedious to list a full lineup of three or four PCLs. Particularly with the combination of the DMS-100/200 and DMS-500 families, with their differing NA0xx and NCS0xx Product Releases, a new shorthand method of referring to these common PCLs as a group is needed:

“Rel•xx”
— a new informal shorthand method of referring to LEC, LET, LLT, and LWW PCLs that share the same base software (and a number of the same new features) as a group. For example, “Rel•13” refers to LEC00013, LET00013, LLT00013, and LWW00007 PCLs.

Here are a few examples of this “Release” convention used throughout this document:

Release	Refers to, as a group:
Rel•14	LEC00014, LET00014, and LLT00014
Rel•13	LEC00013, LET00013, LLT00013, and LWW00007
Rel•12	LEC00012, LET00012, LLT00012, and LWW00006
– <i>and so forth</i>	

The “•” in the middle of this new Release term helps to differentiate these ‘releases’ at a glance from other platform software releases, such as Release 1 and Release 2 of Succession Solutions.

In this document, DMS-STP releases (PCLs that start with STBA and STSE) continue to be grouped by their Product Release, as was done in past *Feature Planning Guides*.

Product Release	Refers to, as a group:
STP006	STBA0060, STSE0060
STP005	STBA0050, STSE0050

SCHEDULED PCL AVAILABILITY

The following identifies the planned general availability of the DMS platform PCLs for North American customers discussed in this document. Availability dates in this publication refer to Nortel Networks projected release dates, and are subject to change based on market need and engineering requirements.

AVAILABLE NOW

Switch Type	PCL Name
DMS-100/200	LEC00012
DMS-100/200/TOPS	LET00012
DMS-500	LLT00012

AVAILABLE 1Q00

Switch Type	PCL Name
DMS-100 Wireless	LWW00006

AVAILABLE 2Q00

Switch Type	PCL Name
DMS-100/200	LEC00013
DMS-100/200/TOPS	LET00013
DMS-500	LLT00013
DMS-STP	STBA0050 STSE0050

AVAILABLE 4Q00

Switch Type	PCL Name
DMS-100/200	LEC00014
DMS-100/200/TOPS	LET00014
DMS-500	LLT00014
DMS-100 Wireless	LWW00007
DMS-STP	STBA0060 STSE0060

PCL SUPPORT POLICY

In North America, a DMS system's PCL is supported — including both emergency outage and non-emergency support — for a full two years from its general availability (GA) date. During this time, the network provider may “skip” up to two releases. The DMS system PCL support policy uses four terms to define software release status:

- ◆ **VO (Verification Office)**

When design, coding, and internal laboratory/quality testing of a new PCL software release are complete, the software is loaded into one or more customer DMS systems (verification offices). These offices serve voluntarily as “real-world” applications and are closely monitored and supported by Nortel Networks. After successful completion of the VO and subsequent “ramp-up” activities, the PCL software release is declared ready for general availability (GA).

- ◆ **PRODUCTION**

Once a VO software release becomes GA, it is considered the “Production” release until the next release reaches its GA date. The network provider can choose either to deploy the new PCL in sequence or skip up to two releases. The Production release is the standard load for DMS system initials and extensions. Nortel Networks offers full software support for each Production release, including emergency outage and non-emergency support.

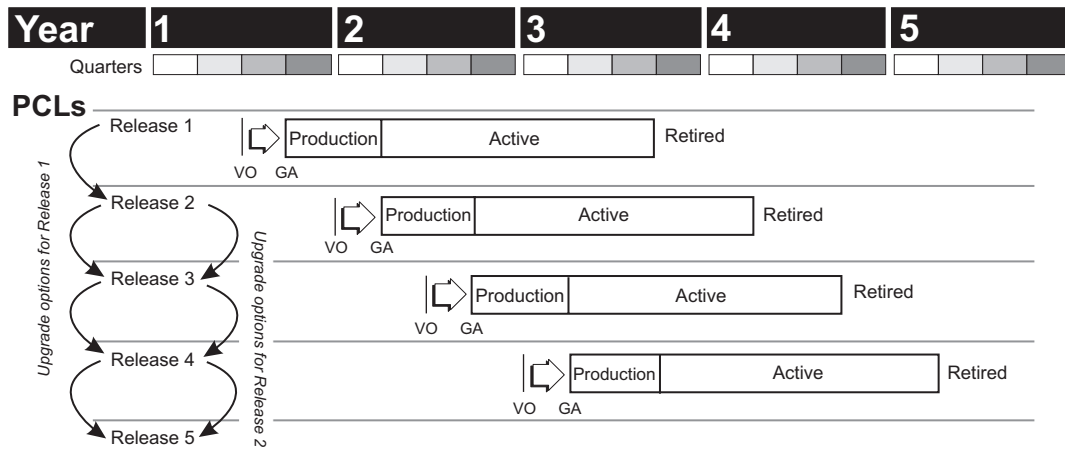
A DMS system software load can be ordered before, or within two years after, its GA date — priced according to contract terms for right-to-use and generic load insertion fees.

- ◆ **ACTIVE**

Other than the current “Production” release, all software releases generally available within their two-year window are considered “Active.” Although a Production release is strongly recommended and routinely deployed to DMS system initials, an Active release can be used in either an initial or an existing DMS system by customer request. As with Production releases, Nortel Networks offers full software support for every Active release.

- ◆ **RETIRED**

Software is considered “Retired” two years after its GA date and is not recommended for in-service offices (it is not available for deployment in DMS system initials or extensions). New PCL upgrades must be deployed prior to the retirement of the release currently in the switch. Support for Retired releases is available only under a separate service contract, and is limited to support that does not require patching or other design effort.



North American PCL Support Policy at a Glance

A DMS system can upgrade smoothly from an existing release to a more current Production or Active software release. As shown above, a system can upgrade from one release to the next (for example, from Release 1 to Release 2), or skip one release (Release 1 to Release 3), or skip two releases (Release 1 to Release 4). All transitions must result in the loading of a Production or Active release, since Retired releases are not recommended for in-service offices. Refer to the table below for the schedule when current PCLs are scheduled to become Retired releases.

Supported Releases (as of February 2000)

Release Status	PCL Order Code	Retires
Production	LWW00006	Dec 2001
	LEC00012, LET00012	Nov 2001
Active	LEC00011, LET00011 LLT00011	May 2001
	LWW00005	Dec 2000
	LEC00010, LET00010 LLT00010	Nov 2000
	LWW00003	June 2000
	LEC00009, LET00009, LLT00009	May 2000
Retired	LEC00008, LET00008 LLT00008	

For more information, refer to the *DMS-100 Family North American Software Release and Support Policy* (document number 50113.16).

OPTIONAL SOFTWARE IN A PCL

Each PCL contains many standard features. However, the network provider can choose from many options within the PCL to tailor the service set and meet the provider's operational requirements.

Each software capability within the switch that can be licensed is associated with an eight-digit order code. Some order codes contain one or two software features. Other order codes contain a large number of features.

All the available software associated with an order code is already present in a PCL — there is no need to load new software before using a generally available feature.



Order Code Conventions

The initial characters of the code identify the software for a specific type of *service*. As examples, all order codes beginning with AIN refer to Advanced Intelligent Network options; all order codes beginning with RES refer to Residential Enhanced Services options.

The final digits of a code are simply assigned to differentiate one or more software features from all other features in a service. For example, AIN00008 (Display Services) offers a completely different set of software features than AIN00007 (Call Model Control) or AIN00009 (AIN Services Support).

The majority of order codes are *optional*: the network provider must license these optional software modules for right-to-use access. Some order codes are *standard*: the network provider already has access to these software functions and no licensing decisions need to be made.

Please note the *FPG* describes *new* software features only; an order code discussed in this document might have other features already generally available.

NON-COMPUTING MODULE LOADS (NCLs)

This *FPG* also discusses a number of software loads that reside on equipment other than the Computing Module of the DMS SuperNode system. Information on these Non-Computing Module Loads (NCLs) appears in the following pages:

NCL Products Discussed in this Document
(arranged alphabetically)

Product	Starting Page
BroadBand STP	
• SSR2.0	292
• SSR2.1	293
• SSR2.2	294
Centrex Call Center	
• CCMIS	149
• CTI	154
• Symposium portfolio	156
Centrex IP Gatekeeper	144
Modular Voice Processor (MVP)	238
Preside uEMS: management platform for Universal Edge 9000	99
Spectrum Peripheral Module (SPM)	
• SPM00033 through SPM00039	196
SuperNode Data Manager (SDM)	
• SDMN0012 through SDMN0014	230
xEMS: management platform for 1-Meg Modem	102

Also, the “Non-CM Software Baseline” table on pages 302 and 303 in the “Reference” chapter identifies the Computing Module product releases needed to support a long list of NCLs.

RELEASE TERMS USED IN THIS DOCUMENT

The following table defines and gives examples of the software release terms used throughout this document. These terms have been arranged in order from the most general to the most specific.

Term	Description	Examples
Release	— a new <i>informal</i> shorthand method of referring to a number of PCLs as a group (specifically, PCLs that begin with the letters LEC, LET, LLT, and LWW).	Rel•14 Rel•12
PCL (Product Computing-Module Load)	— a single universal software load containing all the software modules available at a given time for a particular type of DMS switch.	LLT00014 LET00012 STBA0050
Service	— an <i>informal</i> grouping of order codes (see next), based on common functionality in the network. Although a “service” is a convenient way to discuss a number of software modules, the software options in a service are not ordered together as a single block. Network providers always license optional software at the individual order code level. Chapters in this document have been arranged by informal <i>service</i> categories.	Residential Enhanced Services Advanced Intelligent Network Centrex IP
Order Code	— software modules containing one or more features. Most order codes are <i>optional</i> (these must be licensed separately), but a few order codes are <i>standard</i> (no licensing decisions need to be made). Network providers license optional software using the eight-character codes discussed on page 26.	AIN00260 NI000052 CIP00001
Feature	— the smallest division of software associated with a discrete capability. Features are not individually available for order (network providers make licensing decisions at the order code level). Note: If there is only one feature assigned to an order code, then the feature and the order code share the same name.	Talking Call Waiting Line Option Capacity Expansion

Feature Planning Guide Overview

The *Feature Planning Guide (FPG)* is a planning tool for network planners, marketers, and others in service provider companies who require detailed information about our software plans — and how these plans can help generate new revenue, cut costs, and streamline operations.

This *FPG* is part of the continuing commitment at Nortel Networks to provide as much advance-planning information as possible so our customers can confidently make informed investment decisions. By discussing future software developments for the North American market, the *FPG* informs network providers of new software features designed to help them succeed in the fiercely competitive telecommunications market.

IN THIS CHAPTER

Section	Starting Page
About this Edition	30
General Layout	30
How to Read the Software Descriptions	31
In the <i>Reference</i> Chapter	33

Please Note

The *FPG* is an advance-planning document, and is not intended to be used as a provisioning guide. Availability dates are subject to change based on market need and engineering requirements. Network planning and provisioning should always be conducted in close cooperation with regional Nortel Networks representatives, and with reference to appropriate technical publications.

Availability dates in this publication refer to our projected release dates, and will not necessarily correspond to the exact availability dates for individual network providers. Businesses and other subscribers should check with their network provider about availability in their areas.

ABOUT THIS EDITION

Software descriptions in this guide provide summaries of new capabilities developed with input from customers, Telcordia's Technical References (TRs), and emerging industry and international opportunities and standards. Our developments take full advantage of today's high-speed, wide-area, packet-intensive, and mobile communications network — so our customers can add high-demand services to their service portfolios and attract new subscribers.

Expanded Feature Planning Guide

For the first time, this *Feature Planning Guide* discusses new software features for both the DMS-100/200 family and DMS-500 systems in one convenient document.

This *Feature Planning Guide* primarily discusses new **software** capabilities. For more information on new **hardware** capabilities, refer to the latest issue of the *DMS-100/200 Hardware Planning Guide* (document number 50041.08).

GENERAL LAYOUT

The information in this *FPG* appears in *chapters* that contain any number of different *sections*.

A chapter begins with a box like this

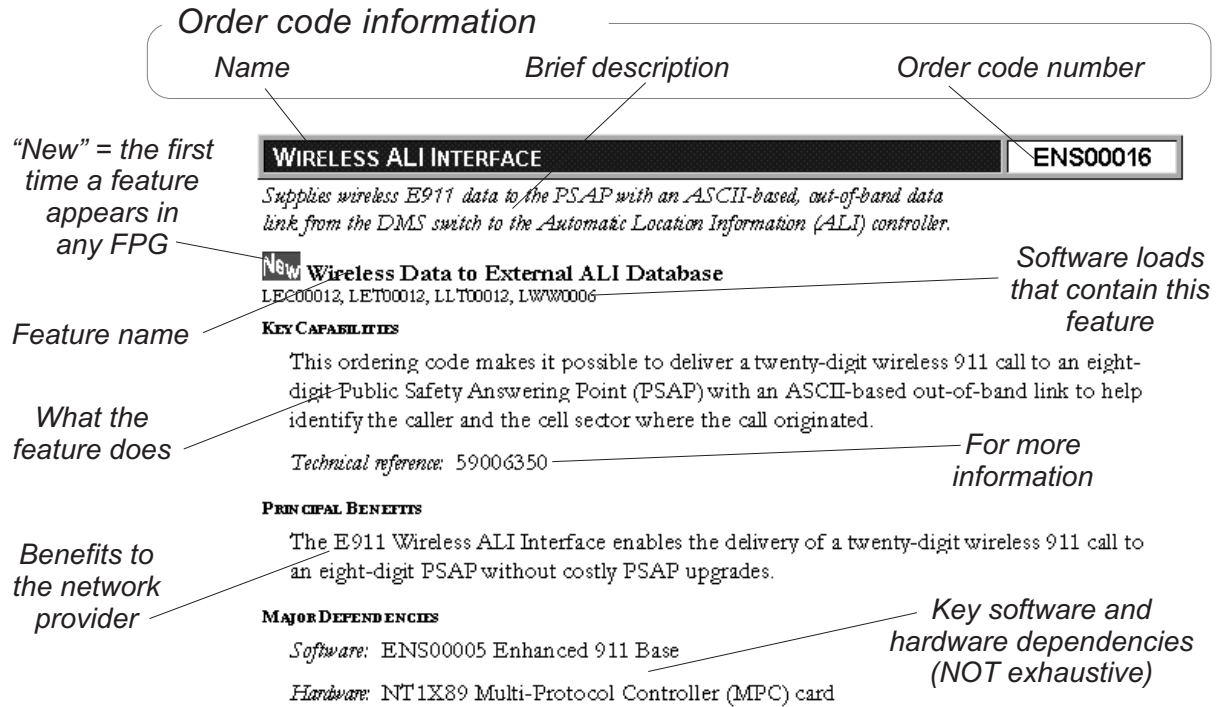
A SECTION BEGINS WITH A TITLE SIMILAR TO THIS

The name of a chapter appears in the *outside margin* of the header at the top of each page (with the exception of the first page of a chapter). The main chapters in this document may contain:

- ◆ A very brief summary about the chapter or service on the first page.
- ◆ *In this Chapter* table of the chapter's contents, listed by sections.
- ◆ An overview of the service's benefits, capabilities, and future plans.
- ◆ A section on Standard Base software that details the new "standard" features in a release. These are software features that do *not* have to be licensed separately.
- ◆ All remaining sections detail new "optional" order codes. Optional software is already part of the PCL loaded into the switch, but must be licensed (by order codes) for access and right-to-use. Refer to the next page for details on the layout of a typical software description found in these sections.

HOW TO READ THE SOFTWARE DESCRIPTIONS

The following example illustrates the typical layout for a software description in this edition of the *Feature Planning Guide*.



ORDER CODE INFORMATION

The first part of a software description pertains to the order code and *not* the specific features. To help you find information quickly, a distinctive dual-box header visually separates one order code description from another.

- ◆ The large solid box on the left identifies the order code by name (“Wireless ALI Interface” in the above example).
- ◆ The smaller box on the right identifies the actual eight-character order code number (“ENS00016” in the above example). This is the number needed to license all the features that follow.

Immediately underneath the solid box, in *italics*, is a brief summary of the entire order code as a whole (*not* of any particular feature in the order code). After the order code’s summary appear all the new features available with an order code. Most order codes only have one or two features. But, in some cases, a larger number of features follow after the order code header/summary, one after the other. Where possible, we arrange the features available in Rel•12 ahead of the features available in Rel•13, followed by features available in Rel•14.

HOW TO READ THE SOFTWARE DESCRIPTIONS, *continued*

FEATURE INFORMATION

Each feature description starts with the name of a feature in **bold print**. If there is only one feature available with an order code, then the order code and feature share the same (or similar) name.

The name of a feature begins with a **New** icon if this issue is the first time that a particular feature appears in any *Feature Planning Guide*. This icon helps those readers that need to carefully track features from one *FPG* to another.

Important note about the “New” icon

This icon is often misunderstood to mean a particular feature is new to DMS SuperNode systems. Actually, *all* the software features discussed in this document are new.

The “New” icon only identifies a particular feature that appears for the first time in any *Feature Planning Guide* publication.

Please note that the **New** icon may appear on a feature that *was* discussed in an earlier issue if the functionality of that software changed significantly.

On the very next line, in PRINT, are the PCL(s) that plan to have the feature available (see pages 21 to 23 for details on PCL names and current availability schedules). If the software loads onto a platform other than the Computing Module, the name of a Non-Computing Module Load (NCL) appears on this line.

The body of a typical feature’s write-up divides into separate easy-to-read parts, each with a separator in **PRINT**:

- ◆ **KEY CAPABILITIES** summarize the feature’s functionality. When available, a number appears at *Technical reference* so the reader can request more information about a particular feature from a Nortel Networks representative using this eight-digit development code.
- ◆ **PRINCIPAL BENEFITS** list target applications and key benefits of a feature from the standpoint of a network provider.
- ◆ **MAJOR DEPENDENCIES** highlight significant prerequisites for the particular feature in hardware, other software, or both. This information simply serves as a convenient flag, and is not comprehensive (a complete list of dependencies varies according to a network provider’s particular service mix).

If a feature’s description is brief (as many of the Standard Base software descriptions are), then these separators do not appear.

IN THE *REFERENCE* CHAPTER

To help you find the information you need quickly, the *FPG* provides extensive cross-referencing indexes in the back of this document, showing the page(s) in this publication where an item appears. The tables and indexes include:

- ◆ Minimum hardware baseline information by software product release
- ◆ Minimum hardware baseline information to support optional features
- ◆ Manufacture discontinued equipment and their replacements
- ◆ Last release scheduled to support a number of manufacture discontinued products
- ◆ Product releases required in the switch to support Non-Computing Module Loads (NCLs)
- ◆ Changes in existing feature information since the previous *FPG*
- ◆ Features that appear in any *FPG* for the first time
- ◆ Software planned for general availability in upcoming releases
- ◆ Software planned for general availability on platforms other than the Computing Module
- ◆ Indexes by feature technical reference, feature name, and order code
- ◆ An *indexed* comprehensive list of acronyms and abbreviations that appear in this *FPG*

Also, a special reader response card appears at the end of this document. Nortel Networks encourages you to use this postage-free form to comment on this publication and to offer suggestions to improve this document in the future. This edition of the *FPG* incorporates many changes suggested by readers.

If you happen to be reading this publication online you can click on the **Comments and Suggestions** button to the right. This will automatically bring you to a Web page where you can enter your comments.

**Comments
and
Suggestions**

Click here to comment

Succession Solutions

Today, network provider revenues rely on traditional services (such as telephony and data) and, increasingly, from IP-based services such as the Internet and corporate intranets/extranets. Eventually, packet-based networks will surpass today's capabilities to provide Voice over IP, unified messaging, multiple virtual lines delivered over high-speed connections, multimedia conferencing, intelligent agents, information services, and other emerging services — with a simplified network that's easier to manage and administer.

With **Succession Solutions**, Nortel Networks offers the options of transitioning an existing network or building a new network to create new applications and services simply and cost-effectively. This Unified Network approach delivers revenue opportunities from telephony, data, and latest packet services over a single infrastructure. Whether the provider is an incumbent, newcomer, or an established full service carrier — or a cable operator, Internet Service Provider, or mobile network operator — Succession offers solutions to meet specific business plans and goals in the marketplace.

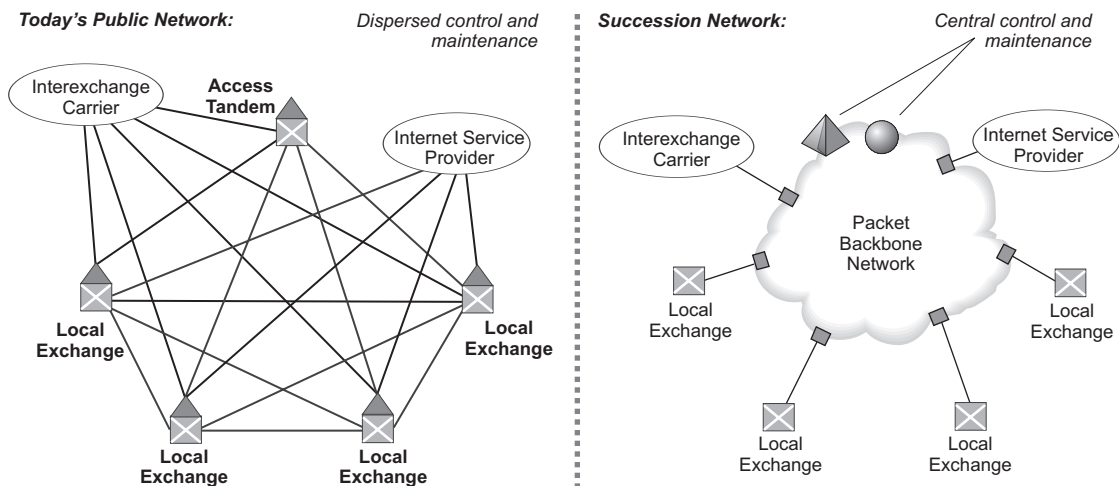
IN THIS CHAPTER

Section	Starting Page
Start Today to Build Competitive Advantage	35
Build New or Transition Existing Investments	36
Transition Existing Networks	37
Distributed, Multivendor Design	37
Benefits	39
Initial Rollout	40
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START TODAY TO BUILD COMPETITIVE ADVANTAGE

Traditional telephony services deliver close to 80% of today's revenues across North America, making it an attractive and vital sector for existing carriers and new providers alike. At the same time, providers that embrace packet networking can find new operating cost savings and service differentiation with new services and packages that were not possible on legacy systems. These two worlds — the established telephone network and new data packet networks — *come together* with the Succession Solutions portfolio.

With this breakthrough, business objectives can be mapped to new, end-to-end, packet-intensive (IP, frame, cell) services that the market is demanding, while supporting current time-division multiplexing (TDM) investments and revenue streams — through Multi-service Gateways.



Built on a Simplified Network Design

The Unified Network vision starts with a single, multi-service, open, standards-based network that brings together a diverse set of end users, access methods, and services. These solutions use a distributed, open architecture, where value-added services are hardware independent and run on general computing platforms. This distributed architecture provides unprecedented flexibility and helps ensure that the network matches the accelerating performance and decelerating cost curves. Distributing these elements built for high reliability and quick recovery throughout the network helps maximize redundancy and efficiency.

BUILD NEW OR TRANSITION EXISTING INVESTMENTS

Every service provider faces a different set of challenges. An Internet Service Provider wanting to deliver voice services, or an incumbent competing with new operators, or a mobile operator needing to evolve to multimedia services all have unique goals and requirements that cannot be met with a ‘one size fits all’ offering.

To address a variety of requirements, Nortel Networks offers a wide Succession Solutions portfolio. Whether the need is Internet Protocol (IP), frame relay, or Asynchronous Transfer Mode (ATM) — over a connectionless or connection-oriented fixed or mobile network — our applications offers the freedom to choose the solutions that best fit the needs of individual providers.

Four main cornerstones of the Succession Solutions portfolio help define a new public network and establish a blueprint for tomorrow’s communications:

- ◆ **Optical Internet** is the physical packet network, providing a multi-service transport and service delivery platform that matches or exceeds the quality and reliability of today’s telephone network.
- ◆ **Wireless Internet** delivers mobility and the freedom to access services without geographic constraints.
- ◆ **Internet Telephony** solutions deliver conventional, revenue-earning services efficiently, while supporting the latest next-generation applications and services. While putting voice into packets is easy, offering the full range of services that transparently interfaces with today’s telephone network is dauntingly complex. With anything less than the quality, reliability, and ease of use of today’s services, a new telephony service cannot live up to market expectations and will have difficulty growing beyond a niche offering. We are ideally equipped to help build networks to:
 - Support today’s complete range of high-quality, reliable telephony services with no need for subscribers to change their behavior. Support extends to the whole range of current SS7-based intelligent network solutions.
 - Interoperate with existing TDM network elements, back office, and billing systems.
 - Scale to accommodate millions of users — all needing to be connected, managed, billed, and administered.
- ◆ **Intranet Services** focus on the value-added applications and end user devices enabled by the other three cornerstones.

Succession applications include Voice Trunking over ATM (VToA), Voice over Internet Protocol (VoIP), Voice over Digital Subscriber Line (VoDSL), Switched Lines over ATM or IP (SLoA / SLoIP), Integrated Voice and Data, Cable Multi-Service Network, Virtual Private Networks, Centralized Remote Access Server (RAS), and more.

Transition Existing Network Investments

Since the majority of *Feature Planning Guide* readers are in service provider organizations that want to extend the life of existing DMS investments into the new world of packet-based networking, the remainder of this chapter discusses this portion of the Succession Solutions portfolio. Readers wanting to know more about building data networking from the ground up should contact their Nortel Networks representative, or visit the Succession Solutions Web site available through: <http://www.nortelnetworks.com/Succession>

TRANSITION EXISTING NETWORKS

The Succession Solutions helps transform today's multivendor investments "from circuits to packets." Network providers can protect current investments and revenue streams while beginning the transition to a multi-service network. This Unified Networks solution enables carriers to rapidly build significant competitive advantage without putting today's revenue-generating services and network investments at risk.

The multi-service dexterity of this next-generation network offers new ways to attract more subscribers with new compelling solutions that could not be supported on legacy networks. Yet, it delivers all the network values required by global network providers, including reliability, scalability, and Quality of Service (QoS).

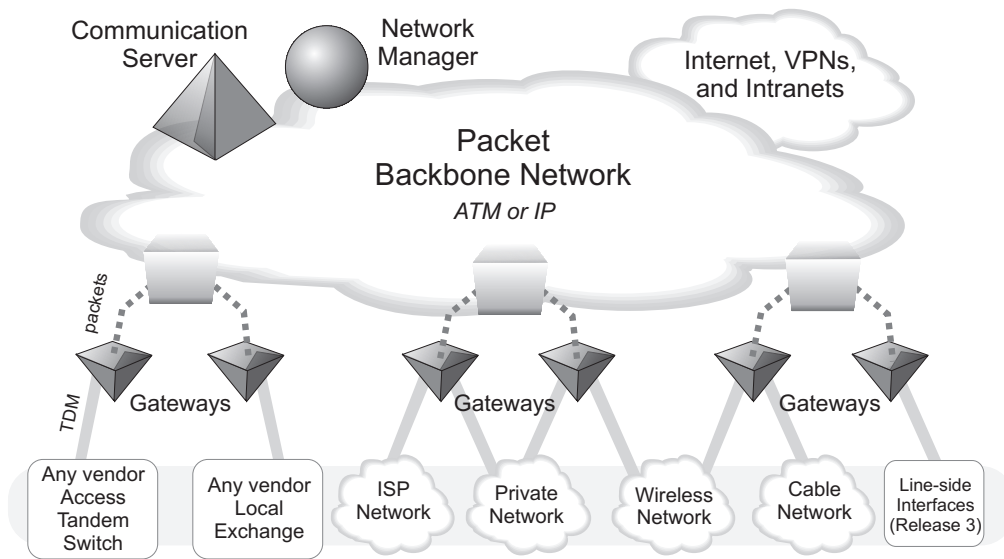
DISTRIBUTED, MULTIVENDOR DESIGN

The cornerstone of the Succession Solutions architecture is its modular, distributed network design that performs like a single, unified, distributed switch. It transforms today's node-centric hierarchical structure to a flattened and distributed architecture — with no requirement for an overlay payload network. The solution's *distributed* architecture, with the following key elements, offers a distributed-access, central-control architecture where service initiation and delivery break free of today's constraints.

- ◆ **Current TDM equipment** continue to provide line-side telephony services, enhancing the return-on-investment for years to come.
- ◆ **ATM backbone network** offers a robust, packet-based transport for all types of traffic with very high reliability, scalability, and proven QoS.
- ◆ **Succession Communication Server (CS)** performs multiple roles:
 - As a centralized routing server, controlling the routing of multimedia information over switched virtual circuits (SVCs) through the network, as well as providing a physical and message interface to the Signaling System No. 7 (SS7) network.
 - As a leading-edge application server, delivering a wide range of new revenue-generating, multimedia services alongside the full breadth of existing DMS features and services.

TRANSITION EXISTING NETWORKS, *continued*

- As an open, programmable server, helping network providers reduce time to market and expand portfolio differentiation with new, customized, multimedia, revenue-generating services using industry-standard programming languages, tools, and protocols.
- ◆ **Succession Network Manager (NM)** streamlines operations, administration, maintenance, and provisioning across the network and helps lower operating costs with a higher quality of service, greater subscriber satisfaction, and faster time-to-market of new services.
- ◆ **Succession Multi-service Gateways** provide scalable interfaces to tie the TDM and packet worlds together. These carrier-grade gateways can be deployed where needed, without geographic limitations, and can flexibly evolve to interwork with new MultiFinder solutions.



The Distributed Succession Solutions Incorporates Current Network Investments

Building a network that acts like a fully distributed switch:

- ◆ Offers the flexibility to help enhance operating cost structures and help build profitability even in the midst of shifting market pressures.
- ◆ Simplifies the network topology to help eliminate a number of cross-connects, multiplexers, facilities, and peripherals now in use. Having fewer elements to manage offers associated gains in network reliability, survivability, and costs.
- ◆ Unbundles connectivity and services, moving applications and services to the edge of the network. TDM local exchange switches continue to produce revenue as servers at the edge of a high-speed packet backbone.
- ◆ Offers seamless connections to a wide range of access infrastructures, including data streams originating on IP, wireless, or cable networks.
- ◆ Causes existing and emerging services to become access- and network-independent — providing “anywhere, anytime” availability.

BENEFITS

This global network meets the specific needs of a wide range of service providers with several long-term benefits, including:

- ◆ **Deploys bandwidth efficiencies** that give *immediate* relief to trunk congestion problems and quickly expand network capacity through dynamically flexible Voice Trunking over ATM (VToA) capabilities, available in the first release.
- ◆ **Reduces total cost of ownership.** The simplified network offers greater service variety and expanded traffic capacity with fewer network elements distributed over a common, robust, broadband packet backbone. This advanced design consolidates layers, eliminates cross-connects, reduces trunk administration, and cuts operating costs. And, since call processing is separate from connectivity processing, the network provider can evolve to an IP backbone when IP Quality of Service (QoS) standards achieve carrier-grade reliability.
- ◆ **Delivers carrier-grade service** by using an ATM backbone with inherent QoS, low latency, and reliability benefits. This yields the quality and security needed for mission critical services: 99.999% availability, 24 hours a day, 7 days a week.
- ◆ **Protects current revenues.** Network providers can transition, at their own rate, present TDM-based network investments from virtually any vendor to a broadband, data-centric infrastructure. Succession Solutions separate connectivity from services, so there is no need to modify current TDM devices or to re-develop software features. Since this standards-based solution is compatible with virtually any vendor's switching and ATM equipment, the presence of Succession Solutions is transparent — with continuing support for today's profitable services including custom calling features, Centrex, data access, and SS7-based services.

To further investment protection, key Succession Solutions elements can be transitioned from existing DMS investments (that meet upgrade specifications) — beginning in Release 2. Specifically, the Communication Server can be transitioned from an existing DMS Access Tandem office; the Network Manager can be transitioned from an existing DMS SuperNode Data Manager (SDM) platform, and trunk gateways can be transitioned from current Spectrum Peripheral Modules (SPMs).

- ◆ **Enables a new breed of revenue opportunities.** A simplified network design enables network providers to enter the market with a comprehensive service portfolio that, beginning in Release 2, mixes the full range of services in the network today with new high-demand, packet-based services that weren't previously possible.
- ◆ **Employs industry-standard protocols and interfaces** for compatibility with virtually any vendor's TDM switching equipment, operations support systems (OSSs), and ATM equipment. Network elements meet industry standards of regulating bodies such as the ATM Forum, Telcordia, International Telecommunications Union (ITU), American National Standards Institute (ANSI), and European Telecommunications Standards Institute (ETSI).

TRANSITION EXISTING NETWORKS, *continued*

- ◆ **Remains scalable and flexible** with a modular, distributed architecture and built-in engineering efficiencies for easy growth and cost-efficiency. For example, the processing module for the Communication Server, the Extended Architecture Core (XA-Core, see pages 58 to 64), permits memory and processing capabilities to be expanded with the simple addition of circuit packs alongside existing memory and processor cards — no processor swap-out is needed.

INITIAL ROLLOUT

Succession Solutions gracefully transition today's nodal/hierarchical narrowband network to a distributed/simplified broadband network in a *phased* approach. Initial release highlights include:

RELEASE 1: TANDEM OFFICE / VOICE TRUNKING OVER ATM

VERIFICATION OFFICE (VO): 2Q00

The network's first release concentrates on Voice Trunking over ATM (VToA) High Usage Group capabilities. This initial application lays the foundation for the future delivery of next-generation services — such as global virtual private networks (VPNs), multimedia conferencing, e-commerce, and more — across an ATM switching fabric. Trunk-side gateways integrate standard TDM trunking into the packet backbone network. Release 1, for initial installations only, is planned to offer a network-wide capacity of 900,000 Busy Hour Call Attempts (BHCA) and fan-out of 112,000 DS-0s (“ports”), with a standard DMS-200 system feature set supported at the Communication Server. (BHCA estimates based on a North American Tandem call model.)

RELEASE 1.5: LONG DISTANCE OFFICE / VOICE TRUNKING OVER IP

VO: 3Q00

The network's 1.5 release, for initial installations only, introduces an IP backbone with an evolution to H.248 support. Trunk-side gateways integrate standard TDM and H.248 IP trunking into the backbone, with a standard DMS-250 system feature set supported at the Communication Server.

RELEASE 2: VOICE OVER ATM/IP CABLE INTERFACE

VO: 3Q00

The network's second major release introduces line-side gateways, specifically for cable networks, with a DMS-100/500, DMS-200, or DMS-250 system feature set supported at the Communication Server. Packet backbone can be either IP or ATM. This is the first release that enables optional transitions from existing DMS equipment:

- ◆ Qualifying DMS office to Communication Server
- ◆ Qualifying DMS SuperNode Data Manager (SDM) to Network Manager
- ◆ Qualifying Spectrum Peripheral Modules (SPMs) to trunk gateways

Trunk support broadens to introduce certain ISDN Primary Rate Interface (PRI) features, while the choices of trunking gateways expand. This release is planned to offer a network-wide capacity of 1.3 million BHCA and fan-out of 165,000 ports.

RELEASE 3: VOICE OVER IP OR ATM FOR LOCAL OFFICE LINES

VO: 1Q01

The third major Succession Solutions release incorporates wireline gateways with a DMS-100, DMS-500, DMS-200, or DMS-250 system feature set supported at the Communication Server. Packet backbone can be either IP or ATM. Nailed-up connections enable Private Line routes through the backbone. This release is planned to offer a network-wide capacity of 2 million BHCA and fan-out of 256,000 ports.

Please contact your Nortel Networks representative for scheduled general availability dates on these, and other, Succession Solutions releases.

RELEASE 1 SOFTWARE OVERVIEW

The various elements in the network have software releases projected to be available at varying intervals to ensure that a software release can be available to service providers at the earliest possible time. To minimize disruption in transition and maintenance of the network, all software-ordering processes remain intact, with new software release stream naming conventions.

AT THE SUCCESSION COMMUNICATION SERVER

Succession Communication Server (CS) software is based on familiar DMS Product Computing-Module Load (PCL) development with a new release stream, SL00000x. Based on the NA012 software release, the Release 1 software, SL000001, combines key DMS Family features with new Succession Solutions capabilities, to:

- ◆ Introduce Voice Trunking over ATM capabilities.
- ◆ Introduce new Connection Broker run-time mediator software for call processing-related functions (for example, translations and routing), connection processing, and cache management for end-to-end ATM switched virtual circuit (SVC) resources.
- ◆ Support the new XA-Core processing components.
- ◆ Provide protocol and associated interfaces to enable communication between the Succession CS and all Succession Solutions elements.
- ◆ Monitor and maintain the STM-1/OC-3 links connecting the CS to the ATM switch. The user interface is on the Maintenance and Administration Position (MAP) with the standard set of DMS maintenance features, including logs, alarms, and operational measurements.
- ◆ Continue to support complete access tandem/transit features, such as:
 - Intelligent Networking, including Local Number Portability and enhanced toll-free services.
 - SS7 messaging, testing, and gateway screening.
 - Automatic Message Accounting (AMA) and Centralized AMA (CAMA) billing support.
- ◆ Support a specialized Multi-service Gateway at the Communication Server that interfaces existing trunking to the backbone network and also provides miscellaneous trunk circuits for

TRANSITION EXISTING NETWORKS, *continued*

services, such as conferencing and announcements. This special gateway (called the Interworking Spectrum Peripheral Module, or IWSPM) has its own software stream, SPMI000x, based on the general gateway release contents, plus support for:

- Service circuit features.
- Fiber interfaces to the ENET switching fabric in the Communication Server.
- ◆ Perform a number of other functions on behalf of Succession Solutions.

AT THE MULTI-SERVICE GATEWAY

MG4D000x, a new software stream for Release 1 Gateways, develops from SPM releases. Based on the SPM00033 (SP12) software release, the gateway's first load, MG4D0001, combines existing SPM features with new Succession Solutions capabilities, including:

- ◆ Support for new hardware components in the SPM, such as a circuit pack to support ATM links.
- ◆ Introduction of the peripheral portion of the new Connection Broker run-time software for switched virtual circuit (SVC) cache management and connection setup and teardown under the direction of the Succession Communication Server.
- ◆ Optional support of integrated Echo Cancellation.
- ◆ The processing of control messaging from the ATM domain, including support of ATM adaptation layer version 5 (AAL 5) messaging from the Succession CS.
- ◆ A number of other maintenance and operational functions, including element and carrier fault detection, isolation, reporting, and clearing in cooperation with the Network Manager.

AT THE NETWORK MANAGER

SNML000x, a new software stream for the Succession Network Manager, develops from the DMS SuperNode Data Manager (SDM) platform releases. Based on the SDMPLO12 software release, the Release 1 software, SNML0001, brings forward existing SDM features, such as:

- ◆ Enhanced base platform/operating system software.
- ◆ Existing DMS SDM management capabilities, such as SuperNode Billing Application and DMS Data Management System (DDMS).
- ◆ Succession Solutions-specific features such as:
 - Software downloading.
 - Automated recovery.
 - Succession Solutions performance management.
 - Succession Solutions configuration and maintenance.

Standard Base Features

All the software features detailed in this chapter are *standard* on existing DMS SuperNode applications. That is, all are available for immediate use with a PCL and are not licensed separately.

Just as the DMS hardware architecture provides the flexible foundation for a range of different applications, the DMS SuperNode system also hosts a software base that supports a wide variety of service capabilities. Forming the common core of this foundational software are the features discussed in this chapter.

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XPM PROCESSOR TRANSITION FOR REL.12

The number of features and capabilities being added to peripheral loads is causing the “MX77” processor on some peripherals to reach an exhaust point. To support the expanding portfolio of new revenue-generating services, those remotes reaching saturation have a planned replacement of the NTMX77 pack with new processors having expanded capacity and power:

- ◆ **NTAX74AA.** This 16-megabyte processor expands both real time and memory capacity to support high bandwidth demands such as a peripheral-based Embedded Operations Channel (EOC) protocol stack for the Expanded SCM-100A (ESMA) for GR-303 implementation. The card’s lower power consumption offers long-term operating cost reduction and its on-board Error Detection and Correction (EDAC) circuitry enhances the pack’s in-service time. Since Rel.6, the NTAX74AA has been mandatory with the ESMA. Now, in Rel.12, it becomes mandatory with the RCC2 remote.
- ◆ **NTSX05AA.** This new processor, introduced in Rel.11, features a fast PowerPC 603e processor with 64 megabytes of dynamic random access memory (DRAM) — four times the memory available on the NTAX74AA processor — and world-class reliability through EDAC protection.

The following table lists the currently planned schedule when specific DMS peripheral modules need to be upgraded from the NTMX77 to the NTAX74AA or NTSX05AA processor.

Software release	Peripherals affected	Upgrade to this processor
Rel.6	Expanded SCM-100A (ESMA)	NTAX74AA
Rel.12	Remote Switching Center-S (RSC-S)	
Rel.12	<ul style="list-style-type: none"> ▶ ISDN Peripherals: <ul style="list-style-type: none"> — Line Group Controller for ISDN (LGCI) — Line and Trunk Controller for ISDN (LTCI) — Digital Trunk Controller for ISDN (DTCI) ▶ <i>Non</i>-ISDN Line Group Controllers (LGCs) and Line and Trunk Controllers (LTCs) supporting the ISDN Line Drawer for Remotes (ILDR) subtended in a: <ul style="list-style-type: none"> — Remote Line Concentrating Module (RLCM) — Outside Plant Access Cabinet (OPAC) — Star Remote Hub / Star Remote Module 	NTSX05AA

STANDARD SOFTWARE IN PCLs

The following DMS system software modules comprise the standard software features for the DMS SuperNode Platform in North America.

Name	Code *	Summary of software functionality
Base Layer	BASE0001	These layers, sometimes collectively referred to as a Communications System Platform (CSP), provide the basic infrastructure for all other order codes.
Telecom Layer	TEL00001	
BAS Generic	BAS00003	Contains a long list of fundamental software modules.
Product Upgrade Manager (PUMA)	PUMA0001	Delivers the Product Upgrade Manager software that automates software loading.
SS7 Base	TEL00008	Provides the basic software for the DMS SuperNode system to interact with the Signaling System No. 7 (SS7) signaling network.
XPM Load	(XPM0xx)	Software needed for DMS Extended Peripheral Modules (XPMs).
ESMA (GR-303) Enhancement	SMA00007	Enhances the GR-303 capabilities of the Expanded Subscriber Carrier Module-100A (ESMA) peripheral.
SERVORD	SERV0001	Streamlines operations of the Service Order (SERVORD) utility.
Operator Services Basic (LET and LLT PCLs)	OSB00001	Provides the software foundation for a broad portfolio of directory and operator services. New feature descriptions appear on pages 213 to 215.

- * The order codes shown in this table are for reference only. The network provider does not need to know these codes for ordering purposes.

STANDARD BASE SOFTWARE

The following are planned to be delivered as “standard” features; they do not have to be licensed separately.

DMS SUPERNODE PLATFORM	STANDARD
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Provides the software infrastructure for all other order codes.

Line Option Capacity Expansion

LEC00012, LET00012, LLT00012, LWW00006

Each DMS line has a number of features (“options”) assigned that define the capabilities and feature set for that line. In today’s fiercely competitive environment, network providers can now datafill a larger number of features on any line, supporting new opportunities for business and work-at-home accounts. To accommodate the demand for multiple services, this optional software extends the upper limit for the number of options per line to 60. By doubling the number of revenue-generating features that can be datafilled on a line, this expansion opens the door to better customer service and significantly enhanced revenue potential.

Technical reference: 59007815

Directory Number Inventory Expansion

LEC00012, LET00012, LLT00012, LWW00006

This enhancement expands the Directory Number Inventory (DNINV) table to support the spread of directory numbers over all the possible 8171 NPA/NXX combinations in a DMS SuperNode system. Such an expansion addresses Competitive Local Exchange Carrier (CLEC) table exhaust issues — calculated to be possible for large offices spanning multiple NPA/NXX combinations (say, in a regional switch deployment scheme) — that result in numerous discontinuous directory numbers.

Please note that order code NPE00002 Numbering Plan Evolution II, generally available since Rel•9, is required for full functionality.

Technical reference: 59005926

Multi-LPP External Routing

LEC00012, LET00012, LLT00012, LWW00006

This feature removes the restriction that requires Link Interface Unit for SS7 (LIU7) external routers to be provisioned on the same Link Peripheral Processor (LPP) as the SS7 links. Removal of this restriction permits network providers to expand the number of SS7 links (when using LIU7 external routers) beyond the capacity of a single LPP, and have more flexibility in the provisioning of equipment within LPPs. The current maximum of eight external routers per office remains.

Technical reference: 59009996

Expanded LIU7 Support

LEC00012, LET00012, LLT00013, LWW00006

This feature introduces software support for an enhanced version of the LIU7 hardware that includes the new NTEX22CA Integrated Processor and Frame Bus Interface (IPF) circuit pack. This enhanced LIU7 can be used as an SS7 link or as a high-capacity LIU7 external router. Of particular importance to the DMS Large Tandem offices with large ISUP trunk requirements or busy-hour-call-attempt (BHCA) ratings beyond 720,000, the expanded hardware/software external router capabilities can help increase BHCA ratings on the DMS Large Tandem system to beyond the 1 million mark.

This feature is available on PCLs for the DMS-100 Family systems in Rel•12 and on the DMS-500 system in Rel•13. For more information about the NTEX22CA circuit pack, see pages 56 and 57.

New Network Management Code Block

LEC00012, LET00012, LLT00012, LWW00006

With the implementation of Local Number Portability (LNP) and multiple Numbering Plan Areas (NPAs) and the increasing use of 10-digit dialing patterns, the use of the same digit patterns for NXXs (office codes) and NPAs (area codes) has become more visible. For example, “888” can be both an NXX and an NPA.

This environment affected the DMS system’s Code Blocking capabilities when the network provider applied code controls to 10-digit directory numbers with ambiguous NXXs. The Network Management Code Block feature helps ensure that these controls (area code [ACODE] controls) are applied correctly.

This standard feature enables the network provider to apply 10-digit ACODE controls to a 10-digit directory number that has an ambiguous NXX. This feature is applicable only to the use of code controls on North American translations.

Technical reference: 59007297

Star Remote System – 1-Meg Modem Support

LEC00012, LET00012, LLT00012, LWW00006

The flexibility and revenue-generating potential of the Star Remote System, introduced in Rel•10, are scheduled to expand in Rel•12 with support for the Nortel Networks 1-Meg Modem digital subscriber line solution on the Star Remote Hub, beginning in mid-1Q00. The Star Remote Hub is the densest remote solution Nortel Networks provides, with support for up to 558 1-Meg Modem lines in a frame.

Note: This software can be patched back to Rel•11 and Rel•10.

STANDARD BASE SOFTWARE, *continued***ESA Processor Support**

LEC00012, LET00012, LLT00012, LWW00006

This feature delivers XPM software support of a new processor for DMS-100, DMS-500, and DMS-10 system remotes. The new NTMX45AA processor replaces the existing NT6X45AF processor and NT6X47AC processor memory in new installations for Remote Line Concentrating Module (RLCM) and Outside Plant Access Cabinet (OPAC) remotes. For more information, see BAS00012 on page 206.

New Virtual Facility Group Billing Enhancement

LEC00012, LET00012, LLT00012, LWW00006

With the increasing implementation of Numbering Plan Area (NPA) splits and overlays (and the resulting rise in the number of ambiguous codes), the Virtual Facility Group (VFG) Billing Enhancement feature conveniently flags POTS/IBN VFG calls so an incorrect NPA is not selected for seven-digit billing numbers.

If a customer group using VFG routing spans more than one NPA, the ten-digit billing number — obtained by prefixing an NPA to the seven-digit billing number datafilled in the BILLNUM field — may not be correct. The seven-digit billing number may be mapped to more than one NPA and, as a result, the NPA selected may be incorrect.

The VFG Billing Enhancement feature addresses this potential problem by inserting three zeros into the AMA/SMDR billing records for POTS/IBN VFG calls if the BILLNUM field in the VIRTGRPS/VFGDATA tables contains a seven-digit billing number. When this happens, the system still writes the AMA/SMDR record to the AMA journal file, but adds the three zeros to alert downstream processes that manual intervention is required to determine the correct Serving Numbering Plan Area.

Apart from the insertion of zeros in the AMA/SMDR record, this feature causes no billing format or AMA functionality changes. Also, this feature is invoked only if there are seven digits in the BILLNUM field. If ten digits are datafilled, the feature will not be activated. Use of the TABAUDIT tool conveniently identifies BILLNUM fields that do not have ten-digit billing numbers.

New Polling Automation

LEC00012, LET00012, LLT00012, LWW00006

Rel•12 enables the network provider to schedule automatic polling and storage (NTDEV, or other) procedures. This automation helps ensure that a current poll file is available for Nortel Networks personnel in preparation for upgrades, extensions, and other engineering activities.

Note: This capability is also available as a patch back to Rel•9 PCLs.

Technical reference: 59007577

New PANTHER Enhancements

LEC00012, LET00012, LLT00012, LWW00006

Rel•12 enhances the Peripheral Module Upgrade Automation (PANTHER) utility to:

- ◆ Deliver time- and labor-reducing features for software loading on DMS Peripheral Modules, including regular releases for the Spectrum Peripheral Module (SPM).
- ◆ Integrate patching during software loading for special SPM maintenance and emergency loads.

Technical reference: 59012079

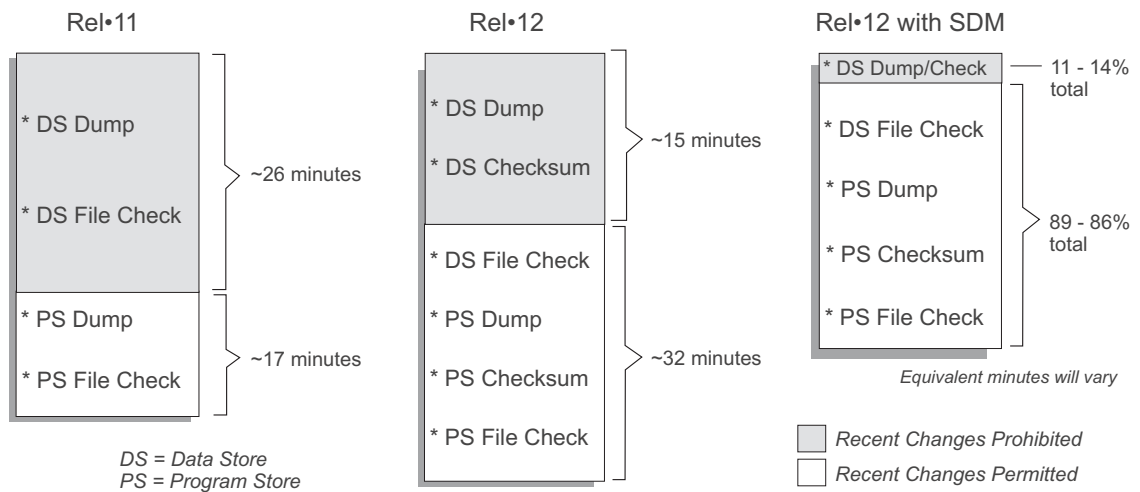
Image Dump Enhancements

LEC00012, LET00012, LLT00012, LWW00006

The Rel•11 product release introduced ways to permit Recent Changes (RCs) — in the form of SERVORD, DMOPRO, or Table Control commands — to be supported during about 40% of an Image Dump procedure. Previous to Rel•11, all RCs were restricted for the entire duration of a Computing Module image backup.

The duration when RCs are permitted during an Image Dump expands in Rel•12 with the introduction of:

- ◆ **Check Phase software enhancement.** The Check Phase in at least the Data Store portion of the Image Dump is enhanced with a Checksum. With this, the inhibition of Recent Changes is further reduced by, on the average, another 25%, depending on the type of load involved. (Please note that total image dump time may exceed previous dump durations by 10%.) With this enhancement, a *pre-Rel•11* office that required up to 43 minutes in image dump time (and inhibited Recent Changes during the whole process) now permits changes for as much as 32 minutes over the total 47-minute procedure.



Comparison of Recent Changes Permitted During Image Dump between Rel•11 and Rel•12

STANDARD BASE SOFTWARE, *continued*

- ◆ **Direct spooling of CM image to SuperNode Data Manager (SDM).** The Computing Module software now can spool the Computing Module (CM) image to the SDM during the Image Dump process to further reduce the inhibition of Recent Changes down to an average of between 11 and 14% of the Image Dump time. As an added benefit, the total time for an Image Dump is reduced (duration varies with configuration) with this option. With the SDM, an office currently taking up to 120 minutes for an Image Dump can reduce the inhibition of Recent Changes to around 15 minutes. This enhancement requires the presence of the DMS SuperNode Data Manager in the DMS office configuration.

The following table gives general guidelines to help decide whether to take advantage of the Rel•12 base software enhancement alone, or in conjunction with the SDM option:

Rel•12 Software Enhancement is likely sufficient for:	The SDM option should be considered for:
Offices whose Image Dump procedure lasts less than 43 minutes to complete	Offices whose Image Dump procedure takes between 43 and up to 120 minutes to complete

These options meet Telcordia LSSGR GR-2932-CORE specifications, until a future time when very large offices begin to exceed a Run Time image size of 400 Megabytes. At that point, enhancements planned for the XA-Core (initial release described next) are planned to continue to support the GR-2932 time parameters.

Beyond meeting GR-2932 guidelines, these enhancements enable the network provider to:

- ◆ Invoke data changes with minimal delay during maintenance timeframe
- ◆ Set up revenue generating services in quick turn-around time
- ◆ Potentially provide a 24-hour response to set up general services

Technical reference: 59007562

Image Dump Enhancement: XA-Core

LEC00013, LET00013, LLT00013, LWW00007

In Rel•13, overall time required to dump an image is significantly reduced with the XA-Core processor architecture. Benefits are similar to those made possible by the SuperNode Data Manager (see above). Furthermore, the Image Dump Enhancements delivered on the CM processor in Rel•11 and Rel•12 are being made available on XA-Core with the LEC00013 and LET00013 PCLs.

The XA-Core option is recommended (instead of the Rel•12 software or SDM options, see above) for offices whose Image Dump procedure takes longer than 120 minutes to complete.

Technical reference: 59014706

New Maintenance Arbitrator on RSC-S and ESMA

LEC00013, LET00013, LLT00013, LWW00007

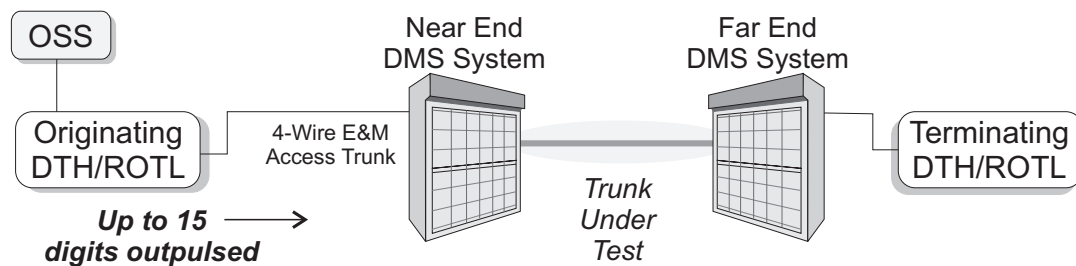
Maintenance Arbitrator (MtcArb) was introduced in Rel•7 on host Line and Trunk Controllers (LTCs), Line Group Controllers (LGCs), and Digital Trunk Controllers (DTCs). In Rel•8, it was included for Digital Trunk Controllers for SS7 (DTC7s). Now, with XPM13, this feature extends the MtcArb functionality to the Remote Switching Center – S (RSC-S) and the Expanded Subscriber Carrier Module-100 Access (ESMA).

Maintenance Arbitrator delivers an enhanced maintenance system with a new architecture for diagnostic testing and identification of potential issues before they develop into outages. This solution has already proven to enhance reliability for the current set of host peripherals with MtcArb, and similar benefits are now anticipated in the RSC-S and ESMA. Messaging, symptom, and cardlist generation software have all been enhanced to improve robustness, error detection, and fault identification within the XPM maintenance system.

New 10/15-Digit ROTL Enhancement

LEC00013, LET00013, LLT00013, LWW00007

This feature enables the network provider to outwardly dial up to 15 digits from the Nortel Networks Remote Office Test Line (ROTL) unit to test trunks in central offices that have 10-digit local dialing translations. Potential candidates for this enhancement are offices that have or will in the near future experience an NPA overlay requiring 10-digit local dialing.



Test Trunks in an Environment with Ten-Digit Local Dialing Translations

The simple upgrade to the Networks Digital Test Head (DTH) ROTL unit can be made in minutes with a single card change out (replacing the ROTL ROM NT7F26AD circuit pack with a new NT7F26BA version) with no downtime required for the DMS system.

Technical reference: 59010005

STANDARD BASE SOFTWARE, *continued***New ONP Enhancements**

LEC00013, LET00013, LLT00013, LWW00007

Rel•13 enhances the One Night Process (ONP) in two ways:

- ◆ Carries more Nortel Networks Centrex provisioning details through an ONP, specifically Do Not Disturb (DND) and Make Set Busy (MSB) features.
- ◆ Removes the requirement for the network provider or subscriber to manually re-establish DND and MSB attributes following an ONP.

Technical reference: 59012624

New Prevent Delete Option

LEC00013, LET00013, LLT00013, LWW00007

To assure uninterrupted service to critical subscribers and services, the Prevent Delete Option (PDO) can now be assigned to a line, and to most hunt groups, using SERVORD. When the PDO option is assigned to a Directory Number, the following SERVORD commands are blocked:

CDN	CKLN	OUT
SUSGRP	CHDN	CLN
PLP	SWAP	CHG
DEL	SUS	

SERVORD responds with an error message if a craftsperson attempts to enter one of the above commands.

Technical reference: 59013430

New Increase UserIDs

LEC00013, LET00013, LLT00013, LWW00007

The Base software's Switch Operating System in Rel•13 expands the number of userIDs possible in an office from a maximum of 360 to 1024. This expansion helps eliminate shared IDs and broadens security options in an expanding network.

Technical reference: 59013356

New Flexible Restore

LEC00014, LET00014, LLT00014

Network providers are being challenged to minimize outages. One cause of service disruption is a translations input error. Once an incorrect change has been made, service impact may result until the original translations data are restored.

This Rel•14 feature captures recent translation changes, and the time they were entered, in a readily available read-only history table. The craftsperson can access this data through standard table control commands (such as Display, Print, or both) as a tool to help determine the root cause of a service outage. Also, this feature enables the craftsperson to produce an editable file that can be used to more quickly restore translations data.

With the Flexible Restore feature, the network provider can reduce the time required for data access, data analysis, and data restoration after a major outage has occurred, particularly service outages caused by inadvertent deletion of a range of tuples (digilator collapse) in core translations tables. By focusing on selected translation tables closely related to call processing, this software feature simplifies identifying and correcting the recent changes that led to a translation-related outage.

New Automatic Line Insulation Test (ALIT) Enhancement

LEC00014, LET00014, LLT00014

The growth in an office (such as the addition of new peripheral modules) requires coordination between different network provider work groups to ensure that Automatic Line Insulation Test (ALIT) procedure includes the latest “last OE” [Office Equipment, such as Line Equipment Numbers (LENs)] in the office. With the intense pressure to provide services quickly, it can be difficult for a work group to update tables in time for ALIT testing. Up until now, there has not been an easy way for a network provider to know which OE/LENs were untested.

Now, this Rel•14 ALIT enhancement generates a log that informs the network provider of an existing or new OE/LEN (including HASU lines) that:

- ◆ Lacks access to test equipment (not datafilled in table MTAVERT)
- ◆ Is not scheduled for ALIT (not datafilled in table ALTSCHED)

These logs can be generated on a weekly basis (the default), or at a frequency and time-of-day specified by the craftsperson, for Line Insulation Testing (LIT) only.

STANDARD BASE SOFTWARE, *continued***New** Call Forward Activation

LEC00014, LET00014, LLT00014

Provisioning staff can now assign Call Forwarding to a line from the provisioning center. This capability simplifies the rerouting of calls in situations where access to the subscriber's terminal may not be possible due to fire, storm, or other emergency.

This new efficiency can help reduce the operating costs of providing emergency call rerouting. The subscriber can cancel the Call Forwarding service when access to the telephone set becomes available again.

Technical reference: 59017416

New HMI Enhancements for C7LKSET

LEC00014, LET00014, LLT00014

To prevent the DMS system from becoming accidentally isolated from the signaling network, this enhancement to C7LKSET Maintenance and Administration Position (MAP) operation prevents a craftsperson from accidentally busying out the last SS7 link in service. This MAP-level human-to-machine interface (HMI) safeguard feature pertains to standard Busy command operations — a new, specific sequence of Command Interpreter (CI) commands are required to manually isolate the office from the SS7 network.

Optional Base Features

All the base-level software features in this chapter are planned to be *optional*. Although they are all delivered with a PCL load, they must be licensed separately before they are available for use.

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NTEX22CA EXPANDS TO OFFER HIGH-CAPACITY EXTERNAL ROUTER

The following NTEX22CA information pertains to Rel•11/Rel•12 PCLs on the DMS-100/200 family only. For the DMS-500 system, this pack becomes generally available in Rel•13, with all the capabilities discussed below.

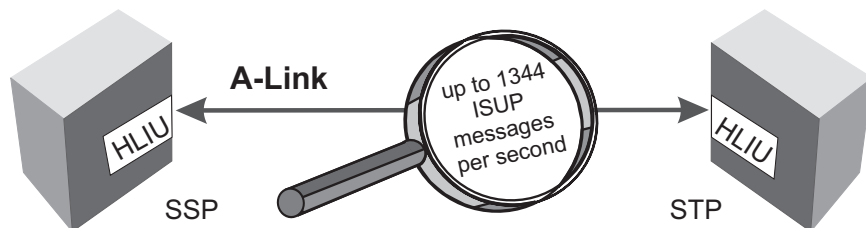
The new NTEX22CA Integrated Processor and Frame Bus Interface (IPF) circuit pack, introduced in Rel•11 on DMS-100/200 Family systems, expands in Rel•12 to include more SS7 applications. In Rel•11, the new pack is part of the High-Speed Link Interface Unit to support new High-Speed Links (1.544 Mbps) to the SS7 network. In Rel•12, the processor expands to also be available to be part of a higher-capacity 32-megabyte Link Interface Unit for SS7 (LIU7) for external router or SS7 link functions.

The NTEX22CA offers a high-performance Motorola MC68060 processor, to offer the speed and processing requirements of revenue-generating services, such as those built on GR-based Advanced Intelligent Networking (AIN) capabilities. Another key advantage is the circuit pack’s fourfold increase in processor memory for program and data store. For applications requiring large amount of SS7 datafill — such as routesets, Message Transfer Part (MTP) routing and distribution, ISUP trunk messaging, global title translations (GTT), and gateway screening — the NTEX22CA provides sufficient capacity and spare memory for future expansion.

ONE CARD: MULTIPLE USES

As of Rel•12 on DMS-100/200 Family systems (Rel•13 on DMS-500 systems), the higher-performance NTEX22CA circuit pack can be part of three different SS7 applications:

- ① As part of the **High-Speed Link Interface Unit (HLIU)** required to support new High-Speed Links (HSLs) to the SS7 network. HSLs are ideally suited to help network providers stay ahead of the significant expansion in SS7 signaling traffic due to the dramatic growth in such services as AIN; Local Number Portability (LNP); and interconnections to cellular, wireless, and Personal Communications Service (PCS) providers. To meet these demands on the signaling network, and to enhance feature penetration, HSLs provide a 1.544-megabits per second signaling data link (SDL) interface to the SS7 network with:
 - Expanded link capacity and linkset bandwidth
 - Reduced link delay, required for emerging services



HSLs have a Capacity that is Six to Sixteen Times Greater than Low-Speed Links

The platform that physically houses these new HLIUs is either an existing LPP that has been upgraded to a Fiberized LPP or the Enhanced Link Peripheral Processor (ELPP, on the DMS-STP system only).

- ② As part of a **Link Interface Unit for SS7 (LIU7)** terminating a “traditional” SS7 link in one of the following interfaces:
- DS-0 (56 kbps or 64 kbps rate)
 - V.35
 - Channelized access
- ③ As a higher-capacity **LIU7 external router**, using either the ANSI or the ITU protocol. When used as a router, NTEX22CA offers a messaging capacity that is between 2.5 and 2.7 times the capacity of the 8-megabyte LIU7 external router for Large Tandem applications. This can translate into an increased number of:
- Routesets in the C7RTESET table, from 255 up to 2047
 - Supported total number of trunks, up to 112,000
 - SS7 links, when DTCs are in use, from 108 to 180

Between the current 8-megabyte and new 32-megabyte versions of this circuit pack, the maximum number of supported busy hour call attempts (BHCAs) expands to greater than 1 million.

KEY EXTERNAL ROUTER GUIDELINES

The 32-megabyte LIU7 External Routes are required only for systems that exceed 720,000 BHCA and can coexist with the earlier 8-megabyte version. (However, all links within a linkset must be 32-megabyte versions to take advantage of the increased capacity.) Routers are provisioned in pairs, with a minimum of two and a maximum of eight per office.

LIU7 external routers should be distributed evenly between left and right shelves of the Link Peripheral Processor (LPP) in the office. This will help ensure that a single point of failure within the cabinet will not bring down all routers of the switch and isolate the office from the SS7 network.

The new hardware can help increase capacity from 90,000 BHCA per 8-megabyte LIU7 router to 250,000 BHCA per 32-megabyte LIU7 router (with 100% ISUP tandem traffic). Maximum office BHCA capacity with external routing is subject to various engineering factors — such as Computing Module real time, ENET switching capacity, number of trunks, call hold times, and SS7 link bandwidth — and so needs to be considered on an office-by-office basis.

XA-CORE HELPS TAKE THE RISK OUT OF PLANNING

The new multi-processing platform, the Extended Architecture-Core (XA-Core), gives the network provider the power and flexibility to provision emerging real-time intensive services. The scalable XA-Core introduces a new paradigm in capacity planning and engineering with a multi-processor engine that distributes call processing and system overhead functions across multiple, independent-processing elements. With this modular Core, a service provider expands capacity and memory by adding circuit packs, instead of hardware swap out. This simplified expandability offers significant improvements in real time capacity, memory size, and cost-of-ownership.

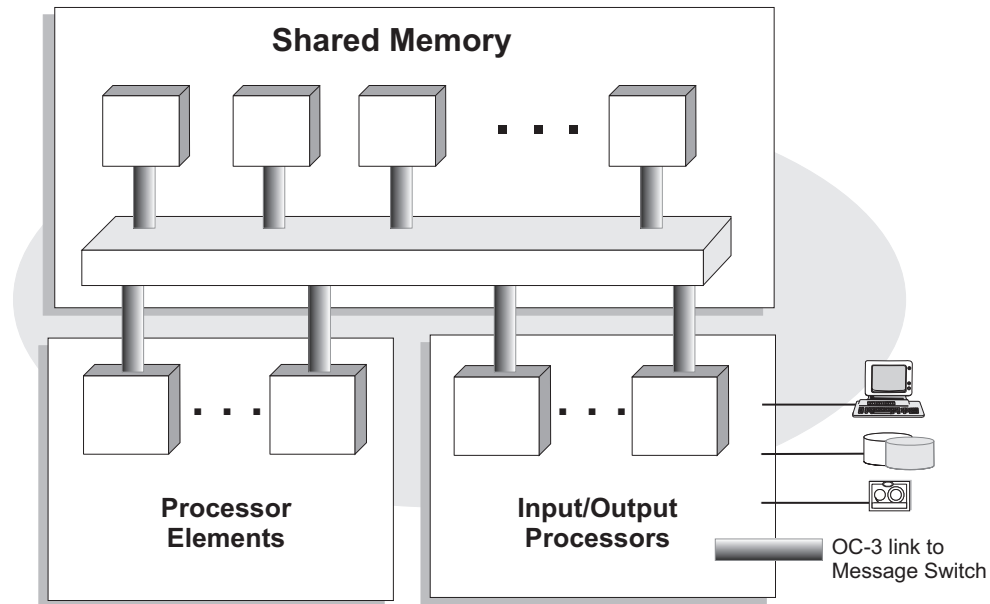
The XA-Core builds on advances in modern computing technology to provide a multi-processor, shared-memory architecture. Modularity permits true seamless growth through incremental additions, instead of entire processor assembly replacement, to significantly prolong the life cycle of each circuit pack in use. Changing processing capacity by simply adding or removing cards reduces the future impact of obsolescence while supporting the use of next generation technologies.

Network providers are faced with the task of evolving Time Division Multiplexing (TDM) networks to support next-generation packet-based services in a prudent, cost-effective manner. While Nortel Networks rolls out the transitional Succession Solutions (see pages 34 to 42 for more information) over time, many large Class 4 and Class 5 offices will continue to grow to keep pace with exploding subscriber demand.

Nortel Networks developed the XA-Core to help in this transition. Service providers can install XA-Core today to meet increased trunking, service, and real time demands — then fully use their XA-Core investment later as a key component of a Communication Server in a transition to a Succession Solutions network. All that's required is a software upgrade with minimal plug-and-play hardware additions.

MODULAR DESIGN

The new XA-Core replaces the Computing Module and System Load Module components and maintains full compatibility with the DMS SuperNode architecture to protect existing DMS investments.



Conceptual Layout of the Multiprocessor XA-Core

To provide a broad range of processing capacity solutions, the new architecture uses in a single shelf:

- ◆ Multiple **Processor Elements** (PEs) that dynamically share the processing load. Even the PE provided for redundancy actively participates in the processing (instead of remaining in standby mode) to enhance reliability and help accommodate faults gracefully.
- ◆ Multiple, duplicated **Shared Memory** (SM) cards provide a scalable shared memory system that serves all PEs. For enhanced performance, each card supports up to 384 megabytes of dynamic random access memory (DRAM) for both global program and data store.
- ◆ Multiple **Input/Output Processors** (IOPs) cards provide mass storage media and various input/output interfaces, such as 8-gigabyte disk drives, and digital audio tape (DAT) drives with capacity up to 4 gigabytes without compression.

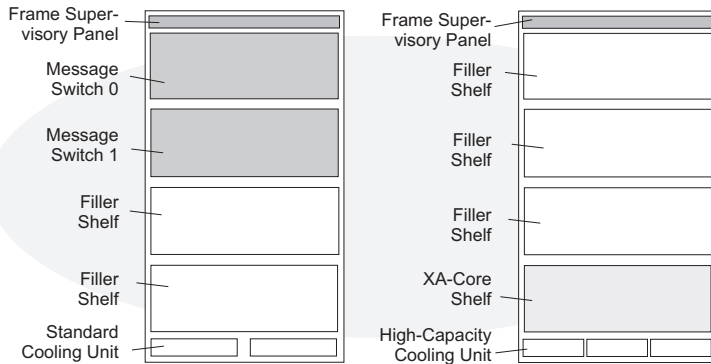
XA-CORE HELPS TAKE THE RISK OUT OF PLANNING, *continued*

FRAME CONFIGURATIONS

◆ **Configuration 1: Two cabinets for Message Switch and XA-Core**

For standard transitions from a Computing Module (CM) to XA-Core in existing offices, the new Core occupies an extension cabinet within 300 feet of the Message Switch. This two-frame configuration is needed for a flash cutover from an existing processing platform to the new Core, with a minimum of outage.

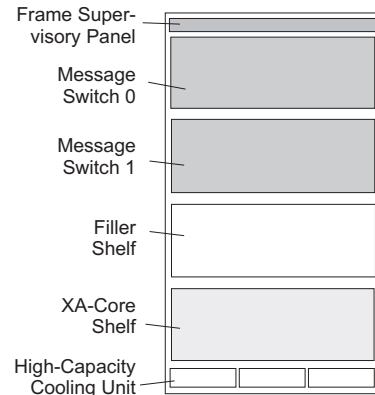
Standard Upgrade:



◆ **Configuration 2: One cabinet for Message Switch and XA-Core (new Core on bottom shelf)**

- For new installations, the Message Switch occupies the upper two shelves of the same cabinet that has the XA-Core.
- This same configuration is used for a transition from a CM to XA-Core in an existing office where floor space is limited. This special *Shelf Replacement* installation takes up less floor space, but involves two cutovers (the first is to a temporary, portable XA-Core to decommission and remove the existing CM, the second is to the actual XA-Core in place of the former CM).

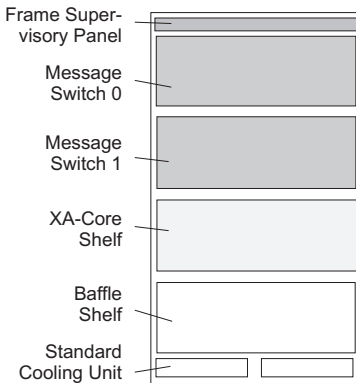
New install or shelf replacement:



◆ **Configuration 3: One cabinet for Message Switch and XA-Core (new Core on second shelf)**

For transitions from a CM to XA-Core in an older NT9X01BA or NT9X01JA cabinet, the cooling unit requires baffling to direct air to the back of shelves. This requires the XA-Core to rest immediately below the Message Switch with a special baffle shelf under it. This configuration is not needed with the newer NT9X01JB cabinet, first available in 1994.

Upgrade in pre-NT9X01JB frame:



BENEFITS

The deployment of the XA-Core in the DMS SuperNode system offers various long-term benefits:

- ◆ **Scalable processing capacity** — With the potential for six times the capacity of any previous DMS processor, the XA-Core is scalable with incremental additions. Also, the new Core’s dynamic call-processing load distribution and a 1.7-gigabyte addressable memory range expand call processing capacity and speed — to favorably enhance life cycle costs.

Expanding Memory Options in Initial Releases

Release	Duplicated memory options (in megabytes)			
Rel•12	768			
Rel•13	768	1152	1728	
Rel•14	768	960	1152	1728

- ◆ **Enhanced reliability and performance** — Each component includes extensive on-board diagnostics, error detection, and correction capabilities. The expanded capacity and speed contribute to enhanced processing and fault isolation, as well as increased run-time performance. The new core also provides a unique checkpoint mechanism that can undo erroneous processing transactions to eliminate the transient effects of a failure and support a no-loss recovery.
- ◆ **Versatility** — The new core’s inherent flexibility opens new market opportunities for the service provider. XA-Core helps boost capacity for high-end offices hosting large trunk or line sizes or feature-rich services, such as Advanced Intelligent Network.

In the new Succession Solutions portfolio (see pages 34 to 42), it is the XA-Core’s capacity, speed, and performance that enable a single Communication Server element to control call routing for an entire Succession Solutions network.

- ◆ **Reduced cost of ownership:**
 - With simplified “plug-and-play” provisioning of components, the new XA-Core enables the network provider to make incremental capacity adjustments easily and cost-effectively. The life cycle of XA-Core components is significantly extended in contrast to today’s single-processor architecture. Instead of completing an upgrade by replacing the entire processor hardware assembly, new XA-Core components can be simply added alongside existing ones.
 - The PE provided for redundancy broadens reliability and enhances failure-mode responsiveness and recovery. The system’s enhanced performance can translate into tangible subscriber satisfaction benefits.

XA-CORE HELPS TAKE THE RISK OUT OF PLANNING, *continued*

- Key operations, administration, maintenance, and provisioning (OAM&P) enhancements include autoprovisioning of new processor elements, enhanced fault detection and isolation, simpler extraction of failed cards, and faceplate LEDs that meet the requirement of the recently revised Telcordia GR-2914. These enhancements can contribute to significant savings in craftsperson time spent on maintenance activities.
- ◆ **Low-Risk Transition** — In the upgrade from an old to new Core, established calls can stay up during a No-Restart Cutover switch-of-activity (SWACT) procedure.
- ◆ **DMS SuperNode system compatibility** — Existing components developed for the DMS SuperNode system — such as the Message Switch (MS), Enhanced Network (ENET), Link Peripheral Processor (LPP), and peripheral modules — continue in service with XA-Core, minimizing the cost of the transition to the new front end. Similarly, Maintenance and Administration Position (MAP) terminal displays and commands have the same look and feel as those used for the current DMS-Core, to minimize training requirements and reduce changes to local practices.

AVAILABILITY

The XA-Core can be installed in a DMS SuperNode (not DMS SuperNode SE) system that has the Enhanced Network (ENET) switch fabric.

MULTIPLE ACTIVE PE CONFIGURATION

The General Availability of the multiple-PE (“3+1”) version of the XA-Core is scheduled to be:

Multiple PE XA-Core Availability by Switch Application

Switch Application	First PCL Supported
DMS-100/200 System	LEC00014, LET00014
DMS-500 System	LLT00014
DMS-100 Wireless System	LWW00008 (<i>tentative</i>)

SPECIAL SINGLE PRIMARY PE CONFIGURATION

For local exchange or tandem offices with Series 70 EM processors experiencing exhaust conditions, an early release of the XA-Core is available for Rel•12 and Rel•13, with the LEC00012, LEC00013, LET00013, LLT00013, and LWW00007 PCLs *only*. This special interim configuration raises processing power by a factor of 1.3 to 1.5 using one primary PE plus one secondary PE for redundancy (“1+1” configuration).

XA-CORE SOFTWARE

XA-CORE 1 + 1

NXAC0010

Provides a special “1+1” version of the XA-Core for a limited time, intended to address exhaust conditions in offices that have the Series 70 EM processor.

New XA-Core Release 1

LEC00012, LET00013, LLT00013, LWW00007

Please Note

This special order code is available on LEC00012, LEC00013, LET00013, LLT00013, and LWW00007 PCLs **only**. Beginning with Rel•14, the multiple PE configuration will be available (see NXAC0300, next) and NXAC0010 will no longer be offered.

KEY CAPABILITIES

The new Extended Architecture Core (XA-Core) replaces today’s Computing Module and System Load Module assemblies with a single shelf that offers immediate exhaust condition relief, and, in Rel•14 and beyond, permits memory and processor elements to be simply added on, incrementally, as the service provider’s network grows.

For large offices approaching real time exhaust conditions, NXAC0010 expands processing resources with a special release of the XA-Core. This introductory “1+1” version uses tandem Processor Elements (PEs) operating serially.

PRINCIPAL BENEFITS

For a limited time, an early release of the XA-Core is available for local or tandem offices that are nearing real time exhaust conditions due to such pressures as large wire center consolidations, extensive tandem switching, and mass deployment of complex services. Offices deploying this new core benefit from expanded processing power (by a factor of 1.3 to 1.5 over the Series 70 EM processor), along with a simplified migration path to the XA-Core’s Release 2 configuration.

MAJOR DEPENDENCIES

Hardware: DMS SuperNode (not DMS SuperNode SE) system with Series 70 EM processor and Enhanced Network (ENET) switch fabric. The following need to be installed in the Message Switch:

- Port card: NT9X17AD
- OC-3 Paddleboard: NT9X63AA/AB
- Processor Board: NT9X13DG

XA-CORE HELPS TAKE THE RISK OUT OF PLANNING, *continued*

XA-CORE 3 + 1**NXAC0300**

Supports a scalable, multiple-processor core on DMS SuperNode systems. This version offers a configuration of three primary and one redundant (3+1) processors.

New XA-Core Release 2

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This order code is the first in a series of multiple PE configurations that collectively represent the XA-Core's Release 2. NXAC0300 supports the new core's initial *multiprocessor* configuration of "3+1" — three primary PEs and one PE for redundancy.

PRINCIPAL BENEFITS

This expanded XA-Core configuration helps reduce the time-to-market of new complex services, expands service penetration, supports larger line and trunk concentrations, and enhances performance and reliability.

With a capacity of up to 1.7 gigabytes of duplicated memory, the "3+1" XA-Core configuration is expected to provide over two times the real time capacity of the current Series 70 EM processor. Release 2 offers a simple upgrade path for switches that have XA-Core's Release 1 installed.

MAJOR DEPENDENCIES

Hardware: An upgrade to XA-Core, Release 2, from an existing switch can be made from a DMS SuperNode that has either a Series 60 or Series 70 EM Computing Module and has the Enhanced Network (ENET) switch fabric installed.

The components that need to be installed in the Message Switch are the same as those listed for NXAC0010 (see previous).

NEW SS7 FEATURES

The following optional features provide enhanced interactions with the Signaling System No. 7 (SS7) network.

TCP/IP CALL PROCESSING SUPPORT

TEL00014

Supports Computer-Telephony Integration applications that require fast Ethernet access to the DMS-Core.

New TCP/IP Call Processing Support

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This order code provides access to the following capabilities as required by certain Call Processing applications that require an Ethernet interface to the DMS-Core:

- ◆ **Transmission Control Protocol/Internet Protocol (TCP/IP)** transports information at OSI Reference Levels 3 and 4, supported by the DMS Ethernet Interface Unit (EIU) hardware.
- ◆ **Address Resolution Protocol (ARP)** helps resolve IP to Ethernet (logical IP to Level 1 hardware) addressing. Proper functioning of ARP is required for reliable routing of data into the DMS system via the SuperNode Protocol Stack.
- ◆ **Routing Information Protocol (RIP)** enables the EIU to inform neighboring routers of its availability. Proper functioning of RIP implementation is required for DMS SuperNode IP connectivity to network routers.
- ◆ **Maintenance software** supports various EIU administrative tasks.

Technical reference: 59010458

PRINCIPAL BENEFITS

TEL00014 offers TCP/IP functionality separate from the Telnet/FTP capabilities. This licensing convenience facilitates the deployment of Computer-Telephony Integration (CTI) applications, such as DMS Intelligent Call Management (ICM), that require fast Ethernet access into the DMS-Core platform.

MAJOR DEPENDENCIES

Hardware: Ethernet Interface Unit (EIU) circuit pack comprising NT9X84AA, NT9X85AA, and NTEX22BB

NEW SS7 FEATURES, *continued***ROUTESET INCREMENT****TEL0004**

Expands, in conjunction with external routers, the maximum number of SS7 routesets supported on the DMS SuperNode system.

Routeset Expansion to 2047 with Table C7NETSSN

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new feature expands the maximum number of remote point codes for Signaling Connection Control Part (SCCP) messaging (to network nodes and their applications) up to the same level as ISUP and MTP protocols.

By expanding the C7NETSSN table from 256 to 2047 entries, the system now provides a one-to-one mapping between C7NETSSN and C7ROUTESET tables.

Technical reference: 59009743

PRINCIPAL BENEFITS

This expansion to table C7NETSSN, offering additional connection capacity and flexibility, is especially valuable to network providers with large routeset requirements that maintain SCCP subsystem management with more than 255 destination point codes.

HIGH SPEED LINK**TEL00013**

Expands signaling network messaging capacity to help reduce facilities costs on the DMS system.

New SS7 Transport Over ATM

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

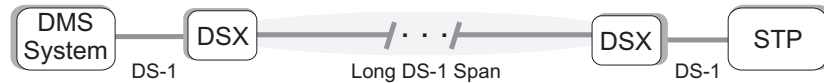
TEL00013, available in Rel•11, introduced 1.544 megabit per second High Speed Links (HSLs) to the signaling network using DS-1 facilities. In some areas, commissioning DS-1 connections between signaling points, end-to-end, can result in long spans that limit routing flexibility and could degrade signals without extra engineering. The new feature in TEL00013 enables the network provider to use an existing Asynchronous Transfer Mode (ATM) network to carry SS7 signaling between a DMS system and remote signaling points.

In place of long spans, short HSL DS-1 facilities route SS7 signaling from the DMS system to the Digital Signal Crossconnect (DSX) panel serving an ATM edge switch. The HSL information then routes either as:

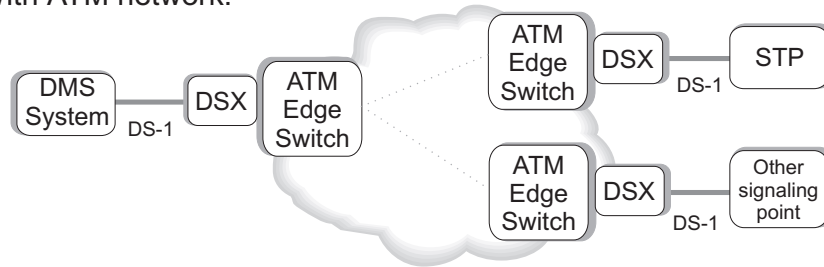
- ◆ A permanent virtual circuit (PVC) through the packet network, or

- ◆ A soft permanent virtual circuit (SPVC), to permit dynamic rerouting if a connection fault occurs in the network. In this SPVC configuration, the connection:
 - From the DMS system to the ATM edge switch is a PVC connection
 - From the edge switch across the ATM network is a switched virtual circuit (SVC) connection

With dedicated DS-1:



With ATM network:



A Flexible ATM Network Replaces Long DS-1 Spans

To enable the ATM transport, this feature removes the formerly hard-coded values in the following two message header fields and enables the network provider to datafill these fields to set up unique paths for HSLs across the packet network:

- ◆ Virtual Path Identifier (VPI); valid range: 0 to 255
- ◆ Virtual Channel Identifier (VCI); valid range: 0 to 65535

Technical reference: 59014614

PRINCIPAL BENEFITS

The use of a packet network, instead of dedicated DS-1s, offers higher flexibility, lowers per-message transport costs, and simplifies engineering for network growth. The new datafill capabilities in this feature play an active role in network modernization to enable the network provider to:

- ◆ Optimize the use of ATM facilities to gain new network flexibility and survivability.
- ◆ Speed the integration between SS7/TDM environments and an ATM backbone.
- ◆ Simplify the deployment of High Speed Links between signaling points.

NEW NUMBER PLAN EVOLUTION FEATURES

The following optional features help simplify the management of numbering plans in a complex environment fueled by recent regulatory, competitive, and industry-wide number exhaust developments.

ENHANCED MULTIPLE NPA SUPPORT

NPE00004

Lifts cross-NPA restrictions in DMS offices with (or will undergo) NPA splits or overlays.

NPA Split/Overlay Support

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

NPE00004 offers a number of software features.

- ◆ **Hunt Group support** enables members of a hunt group to be assigned to a different Numbering Plan Area (NPA) than the one assigned to the pilot directory number (DN) of the hunt group.
- ◆ **Teen Service Secondary DN support** allows a secondary DN (SDN) to be assigned to a different NPA than the one assigned to the primary DN (PDN).
- ◆ **Provisioning enhancements** modify Service Order (SERVORD) commands NEW, ADD, ADO, DEO, CHF, EST, CDN, and CHDN to support multiple NPAs for SDNs and hunt group members. This software also enhances translations tables LENFEAT, IBNFEAT, HUNTMEM, and PREFHUNT to process ten-digit SDNs and hunt group member DNs.
- ◆ **Multi-NPA Support for Multi-Party Lines** enables DNs on a multi-party line (2FR, 2MR, 4FR, and 8FR) to be assigned to different NPAs.

Technical reference: 59007190, 59007186, 59006893

PRINCIPAL BENEFITS

These features lift cross-NPA restrictions for multiple party lines and primary/secondary directory numbers to simplify cross-NPA support in DMS offices for a range of revenue-generating features.

NUMBERING PLAN EVOLUTION I**NPE00001**

Supports non-unique seven-digit directory numbers brought about by NPA exhaust, local number portability, and demand for additional directory numbers.

New CNA Software Enhancement

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

The currently available Calling Number Announcement (CNA) feature enables a crafts-person to hear the directory number associated with a line by dialing an access code. This feature can be used to verify service orders, conduct troubleshooting, and a number of other tasks. Without NPE00001 licensed, the CNA feature announces seven digits. Now, with NPE00001 activated, CNA now announces ten digits.

PRINCIPAL BENEFITS

This expansion to ten-digit announcements provides the greatest benefit in those areas where ten-digit dialing is (or will soon be) required.

New QDNSU Command Support

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

With the market rollout of Duplicate NXX software, starting in Rel•9, numerous Command Interpretive (CI) and SERVORD commands have been modified to accept ten-digit DN's. With NPE00001 in Rel•13, these ten-digit enhancements now include the QDNSU (Query Directory Numbers Unassigned) command — used to list all (or a range of) the software-unassigned directory numbers in an office.

PRINCIPAL BENEFITS

This feature provides the greatest benefit during office translations setup in areas where ten-digit dialing is required because of LNP, NPA overlay implementation, or both. Plus, for those markets where order code NPE00003 *E164 Open Numbering Plan* can be implemented, the QDNSU command can be used to conveniently view directory numbers of ten or more digits.

NEW NUMBER PLAN EVOLUTION FEATURES, *continued***1000-BLOCK NUMBER POOLING****NPE00005**

Addresses number exhaust by dividing an office code into thousand-number blocks that may be used across different switches.

New 1000-Block Number Pooling

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Number Pooling is a key conservation method to address the exhaust of the North American Numbering Plan. With Number Pooling, the service provider can assign telephone numbers in blocks of a thousand and use Local Number Portability to route calls to the correct terminating switch. This feature, 1000-Block Number Pooling, divides an office code (NPA-NXX) into 10 blocks of 1000 numbers (NPA-NXXX) that may be used by service providers on different switches.

Standards Committee T1 has released new technical requirements for this Number Pooling method entitled *TRQ No. 04 July 1999 – Thousand Block Number Pooling Using Number Portability*. Order code NPE00005 provides the service switching point (SSP) switch compliance to these requirements, as well as these additional features:

- ◆ Prevention of Cause Code 26 for unassigned pooled numbers
- ◆ Foreign Location Routing Number (FLRN) LATA-marking enforcement
- ◆ User interface for Number Pooling provisioning
- ◆ Directory number (DN) marking for Aging Ported Numbers
- ◆ Enhanced reporting tools that recognize pooled-in and pooled-out DNs
- ◆ Feature-interactions support for multi-DN groups
- ◆ Automatic data updates for Local Number Portability tables during NPA splits

Technical reference: 59007321, 59012182, 59012192, 59012468, 59012574, 59013762

PRINCIPAL BENEFITS

User requests for new telephone numbers have increased dramatically with the explosive market growth for wireless handsets, fax machines, and the demand for Internet access. This growth has strained the availability of telephone numbers within existing area codes, resulting in the introduction of new area codes and the need to conserve the use of ten-digit number resources.

This 1000-Block Number Pooling feature offers new, convenient ways to ease the strain on number exhaust, along with a user interface for the provisioning of Number Pooling and other expanded tools and enhancements that simplify complex DN assignment tasks.

MAJOR DEPENDENCIES

Software: LNP00200 Local Number Portability GR-2936

NEW LOCAL SERVICES FEATURES

These features address the special needs of switch owners in the new competitive local environment, with streamlined methods to identify, screen, provision, and bill the appropriate service provider.

GENERIC CALLING PARTY NUMBER

LOC00032

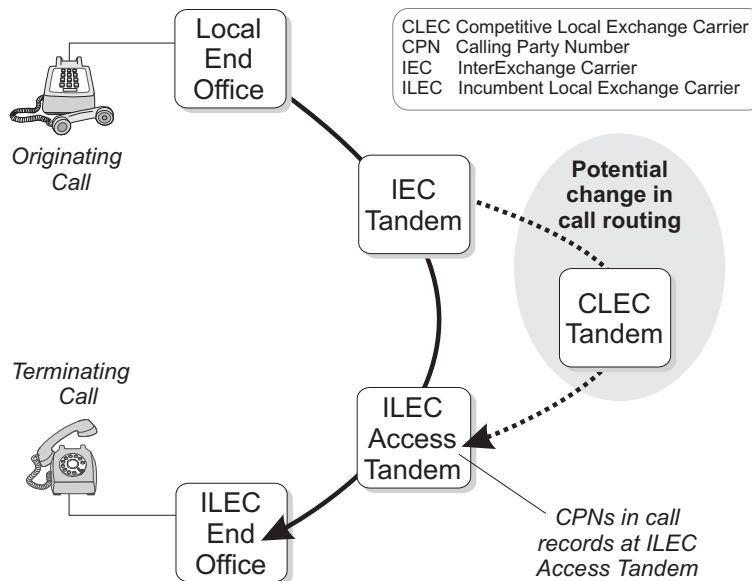
Simplifies the management of certain ILEC/CLEC arrangements with the addition of the Calling Party Number (CPN) in billing records.

Telecom Reform Act AMA Enhancement

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

With more players in the telecommunications industry, the balance of call traffic is shifting with the emergence of new Competitive Local Exchange Carriers (CLECs) and Wireless Service Providers (WSPs). For the Incumbent Local Exchange Carrier (ILEC), this has made connection arrangements more complex and previous rate/tariff arrangements invalid. To simplify the management of these arrangements and to more accurately rate a call, identification of the Calling Party Number (CPN) is needed in Automatic Message Accounting (AMA) records.



CPNs in AMA Call Records Can Help ILECs with Billing Reconciliation, Especially as the Network Migrates Away from Traditional Call Routing

Technical reference: 59006616

PRINCIPAL BENEFITS

Combining the (previously) unknown CPN with the known called number in AMA records can assist the incumbent LEC to better determine local and toll charges on a call-by-call basis.

NEW LOCAL SERVICES FEATURES, *continued***ENHANCED LOCAL TRANSLATIONS****LOC00025**

Provides simplified translations for blocking, screening, routing, rate area schemes, and implementation of NPA splits and overlays.

Line Attribute Table Restructure Rel•12

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Introduced in Rel•11, Line Attribute Table (LINEAT•TR) Restructure simplifies the datafill required to support existing and new blocking, screening, routing, and rate area schemes in the public network.

Rel•12 provides two additional capabilities to LOC00025:

- ◆ A tool that enables the network provider to easily rename the keys in the XLAPLAN and RATEAREA tables (introduced in Rel•11) and update all the corresponding references to those keys in other translation tables.
- ◆ The introduction of mandatory SERVORD parameters on a line as an additional, optional way to provision XLAPLAN and RATEAREA against a line.

Technical reference: 59007050, 59007043

PRINCIPAL BENEFITS

Rel•12 continues the rollout of LINEAT•TR Restructure features that streamline a variety of translations procedures to lower operating costs and enhance craftsman productivity.

- ◆ The labor-saving renaming tool can assist network providers in standardizing line attribute datafills more quickly across all the switches in their network.
- ◆ The new method to provision XLAPLAN and RATEAREA against a line now brings to three the number of different provisioning methods the network provider can choose from that best fits the local operations environment as it evolves. As in Rel•11, the provisioning approach selected is controlled via a new office parameter.

SNPA/STS Decoupling

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Due to changes driven by the Telecommunications Reform Act, competition, number exhaust, and number/location portability, a subscriber's area code (SNPA) should no longer dictate which serving translation scheme (STS) is applied to calls originating from that customer's line. This feature provides the flexibility needed by network providers to support the assignment of a translation scheme regardless of the SNPA of the line.

Technical reference: 59007038

PRINCIPAL BENEFITS

For the introduction of new area codes (NPA splits/overlays and customer number/location portability), the proven translation, routing and screening datafill already in place can continue to be used, rather than commissioning new datafill. In addition to the savings in setup costs, ongoing operating costs will be reduced since maintenance of duplicate sets of datafill are no longer required.

This decoupling also supports tailored local translation schemes for lines inside or outside the area code served by either the Incumbent or Competitive Local Exchange Carrier.

New Enhanced Table Compression Tool

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This Rel•14 LINEATTR Compression Tool feature is the final step in the multi-release LINEATTR Restructuring project. This Command Interpreter (CI) tool streamlines the content of the LINEATTR translation table by eliminating redundant data. In Rel•12, LOC00025 introduced the mandatory SERVORD parameters option (see *Line Attribute Table Restructure* on page 72). With this option turned on, the schema of table LINEATTR changes so that the LTG, DFLTXLP, and DFLTRA fields are eliminated for new entries to the table. Elimination of these fields results in multiple tuples in table LINEATTR that contain the redundant datafill.

The LINEATTR Compression Tool provides an automated way to eliminate the redundant tuples that are no longer required. Further, the tool updates any other tables that reference the tuples that are to be removed. Built-in safeguards protect data when the switch is shared between a LEC and one or more CLECs. No company-specific data can be changed, unless requested by the data owner as determined by the loginID.

Technical reference: 59017776

PRINCIPAL BENEFITS

The LINEATTR Compression Tool can reduce up to 70% the number of tuples in table LINEATTR. This enhancement provides a labor-saving method of removing the data and helps ensure that remaining table references are accurate.

NEW LOCAL SERVICES FEATURES, *continued***FLEXIBLE ANI TANDEM SCREEN****UDD00002**

Converts Flexible ANI information to ANI II codes for specific interexchange carriers that do not want to receive Flexible ANI digits.

Flexible ANI Tandem Screen

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature, for DMS-100, DMS-200, and DMS-500 systems, provides greater intelligence and flexibility to the handling of Automatic Number Identification (ANI) digits for transfer to the Interexchange Carrier (IEC).

In Rel•12, order code UDD00002:

- ◆ Screens incoming ANI II digits and the Number Service Code (NSC)
- ◆ Determines whether the ANI II digit pair is a standard ANI II code or a Flex ANI code
- ◆ Decides whether or not to send the Flexible ANI digits to the destination IEC on a per-carrier basis

If Flex ANI is not to be sent to the IEC, this software substitutes an ANI II code derived from the network provider's switch datafill.

Technical reference: 59007034

PRINCIPAL BENEFITS

This optional order code enables the DMS SuperNode system to comply with FCC Ruling 98-1101 Docket No. 96-128 (adopted June 10, 1998) and FCC Ruling 98-0481 Docket No. 96-128 (adopted March 9, 1998) in the area of payphone compensation. Now toll-free calls at access tandem SSPs can have their Flexible ANI codes converted to ANI II digit pairs for specific IECs that require alternative coding.

MAJOR DEPENDENCIES

Software: UDD00001 United State Direct Distance Dialing Services Base

TANDEM AMA CONTROL**EQA00030**

Saves disk-storage space and simplifies downstream processing by suppressing certain Call Codes at a DMS-200 system when another node generates billing records.

New Tandem AMA Control

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature suppresses Call Code (CC) 110 and CC119 for specific scenarios in the DMS-200 Access Tandem (AT) system. The suppression is controlled by the EQA00030 order code and two new Access-to-Carrier (ATC) trunk group options in table AMATKOPT.

Technical reference: 59008538

PRINCIPAL BENEFITS

The CC110 and CC119 records are not required in some network arrangements where another network node has the responsibility of generating the billing records. Suppressing these records eliminates the need for storing these unneeded files and relieves Automatic Message Accounting (AMA) downstream systems from having to identify and discard these records from processing.

MAJOR DEPENDENCIES

Software: EQA00002 Equal Access for Toll Office

NEW LOCAL SERVICES FEATURES, *continued*

ALTERNATE OUTGOING TRUNK GROUP SELECTION

LOC00033

Distributes calls uniformly across a set of trunk groups in a route list.

New **Alternate Outgoing Trunk Group Selection**

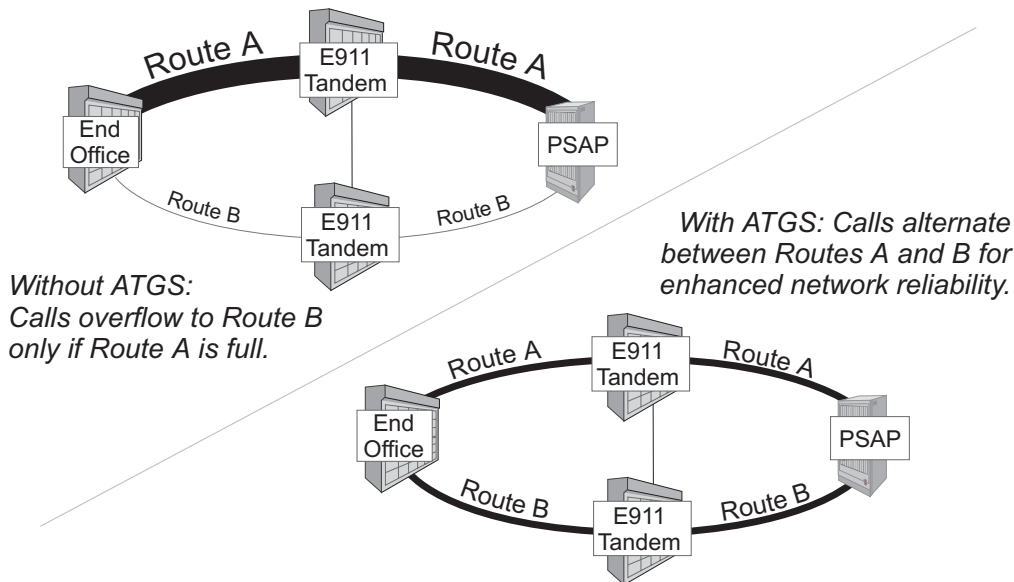
LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Today, the DMS system offers a number of ways to route calls using different hunt group and Supertrunk options. LOC00033 introduces one new routing scheme that can benefit certain network scenarios. With the Alternate Trunk Group Selection (ATGS) feature, calls can be uniformly spread over a set of trunk groups so traffic can be distributed as evenly as possible over all the elements in the route list.

For example, with ATGS, a system with two trunk groups (routes A and B) has one call route to A, the next call to B, the next to A, and so forth — with no regard to traffic patterns or idle durations.

The following illustration shows ATGS for an E911 service. Here, Route A from the end office to the Public Safety Answering Point (PSAP) is considered “primary” and Route B is considered “secondary.” Under some call routing options, Route A would carry the vast majority of calls, leaving Route B for overflow and redundancy only. With ATGS, however, both routes A and B alternate the transmission of calls, so each trunk group receives about the same traffic, with redundancy still available in case of trunk failure.



**Alternate Outgoing Trunk Group Selection Offers
More Efficient Use of Trunking Facilities**

One application for this alternating routing feature is for improved call completion and fault detection in the event of a transmission point failure with equipment that does not return call supervision signaling (say, at a digital cross connect). Without ATGS, this kind of fault can cause the channels at the primary route to fill up with uncompleted calls — and only when the filled route triggers overflow procedures do calls finally travel over the back-up route.

While the replacement of non-signaling transmission equipment with intelligent elements that can signal call status is the *preferred* method of preventing this situation, LOC00033 offers an immediate, cost-effective solution.

Technical reference: 59013383

PRINCIPAL BENEFITS

For those network configurations that benefit from the end office spreading calls equally across trunk groups, the Alternate Outgoing Trunk Group Selection offers a simple way to distribute calls. Although there are different ways to manually provision call routing of this type, the network provider runs the risk of translations input errors with the complex datafill. ATGS offers a built-in capability that removes this risk, and simplifies future trunk group growth in the route list.

E911 Tandem arrangements, such as the one described above, can especially benefit from this feature. LOC00033 can help:

- ◆ Improve call completion when there is an undetectable fault in the “primary” route’s transmission path.
- ◆ Enhance trunk fault detection. Since calls are sent on a regular basis over the “secondary” route, there is continuous validation of its availability — a verification that would demand manual testing in the past.

NEW NETWORK BROADCAST DELIVERY FEATURES

The United States Congress passed in 1994 the Communication Assistance for Law Enforcement Act (CALEA) act to assist law enforcement agencies in the interception of digital and other communications. The CALEA law, U.S. standards bodies, and Federal Communications Commission (FCC) rulings have defined the functional requirements for telecommunications service providers to assist law enforcement agencies in conducting lawfully authorized electronic surveillance. To meet the provisions of CALEA, this DMS service began in Rel•10 the rollout of features to lawfully access and deliver call content and call-identifying information of DMS switch-based subjects to legal authorities.

U.S. NETWORK BROADCAST DELIVERY

NBD00003

Enables United States carriers to meet the provisions of the Communications Assistance for Law Enforcement Act (CALEA).

Packet Data Interception

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

In Rel•10, NBD00003 supports functional basic surveillance, including subject-redirected calls, on DMS POTS, RES, Centrex, and ISDN lines.

In Rel•11, this order code supports call content using non-signaling trunks.

Now, in Rel•12, this order code expands to include the interception and delivery of ISDN B- and D-channel packet data, making the DMS system J-STD-025 Core standard ready.

PRINCIPAL BENEFITS

CALEA functionality uses standard DMS Maintenance and Administration Position (MAP) and Command Interpreter interfaces and standard DMS hardware. Access to the surveillance information is restricted to authorized service provider personnel. The service provider and law enforcement agencies have extensive options for call data and call content facilities.

By completing the support of ISDN Basic Rate Interface (BRI) surveillance in Rel•12, NBD00003 is J-STD-025 Core standard ready.

MAJOR DEPENDENCIES

Software: Needed for enhanced call content reporting for ISDN subjects using the XPM Hold Notification feature:

NI000050 National ISDN-2/3 BRI Services Phase I

NI000051 National ISDN-2/3 BRI Services Phase II

Hardware: Dedicated links for each law enforcement agency's monitoring center (maximum of five centers per monitored line), subject to legal authorization:

For call data: X.25 facility

For call content: Loop-start line, ground-start line, or dedicated non-signaling trunk

New Punch-list Capabilities

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

In Rel•14 order code NBD00003 includes the Packet Data requirement and the Punch list items as identified in the FCC ruling 99-230, adopted August 26, 1999.

The Punch List includes:

- ◆ Content of subject-initiated calls
- ◆ Part hold, join, and drop on conference calls
- ◆ Subject-initiated dialing and signaling information
- ◆ In-band and Out-of-band signaling
- ◆ Timing Information
- ◆ Dialed digit extraction

PRINCIPAL BENEFITS

NBD00003 continues to expand so the network provider can meet regulatory requirements as they become defined. The euphemistic “punch list” is the latest suite of requirements from the FCC, in consultation with the FBI and other government agencies, designed to enhance lawfully authorized electronic surveillance to more effectively thwart illegal activities.

NEW EADAS INTERFACE FEATURES

This software stream enables the DMS system to support Engineering and Administrative Data Acquisition System (EADAS) interfaces. This multivendor interworking helps maximize the efficiency of available network resources to enhance call completion ratios.

EADAS DATA COLLECTION INTERFACE

OAM0004

Provides the data link protocols to communicate with the Engineering and Administrative Data Acquisition System (EADAS) data collection center.

Four-Digit CIC

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

At the rate that the public network added new carriers each year, the industry expanded the Feature Group D Carrier Identification Code (CIC) dialing format from three to four digits. Instead of supporting a maximum of 970 different carriers with unique codes, now close to 10,000 carriers can be identified uniformly across the network. The CIC is actually the final digits of a larger Carrier Access Code (CAC) a subscriber dials on a per-call basis to specify a carrier. With the expansion of CIC, the overall length of a CAC also expanded — from five to seven digits. This Rel•12 feature enables the DMS interface to the EADAS/NetMinder to support the larger 4-digit CIC and 7-digit CAC formats.

Technical reference: 59007680

PRINCIPAL BENEFITS

Rel•12 supplies early support for the NetMinder software upgrade to accept the longer CIC and CAC number formats from the DMS system, anticipated to be generally available in 2H00. The expanded formats address the exhaust of codes to uniquely identify different carriers across the network.

TCP/IP Interface to EADAS

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

The Rel•12 enhancement to OAM00004 delivers Computing Module support for the DMS system to communicate with the EADAS/Net using a flexible, cost-effective Transmission Control Protocol/Internet Protocol (TCP/IP) interface. For more information on this capability, refer to NMDC0001 “EADAS via TCP/IP” for the DMS SuperNode Data Manager, page 237.

PRINCIPAL BENEFITS

In conjunction with the SDM platform, this enhancement supports messaging between the DMS SuperNode system and the EADAS platform over a more flexible TCP/IP interface over local area networks or wide area networks. This offers long-term facilities costs savings over dedicated links.

EADAS MAINTENANCE BUSY USAGE**OAM00010**

Delivers Trunk Group Maintenance Busy Usage Measurements in the 5-minute Network Manager polling.

New EADAS Maintenance Busy Usage

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This feature provides Maintenance Busy Usage measurements of Trunks Groups identified to the Network Traffic Management Operations System during the five- minute polling for Network Management data.

PRINCIPAL BENEFITS

With this feature, a network provider can better assess why trunks are overflowing or why blockage has occurred by identifying trunk outages due to maintenance activity. Improved root-cause data can help enable the Network Traffic Management Operations System to provide automated congestion relief to the network.

Technical reference: 59016574

MAJOR DEPENDENCIES

Software: OAM00004 EADAS Data Collection and Hardware Inventory Interface

Plus either:

OAM00005 Network Management Interface

OAM00006 NetMinder Interface

NEW ISUP SERVICES FEATURES

ISDN User Part (ISUP) SS7 trunking capabilities help increase the efficiency of interoffice trunking facilities and the opportunities for revenue by supporting network-wide services. With SS7 ISUP trunk signaling, premium services, such as Custom Local Area Signaling Services (CLASS) and a wealth of customized AIN-based services, can be easily and efficiently extended across the network. ISUP improves call setup times for inter-office calls, including 800 service, E911, Operator Services, and Private Virtual Network calls.

SS7 OPERATOR SERVICES NETWORK CAPABILITIES (OSNC)

ISP70006

Provides the DMS-100 or DMS-500 end office with traditional operator service capabilities using ISUP Intertoll or ISUP ATC trunks.

New SS7 Operator Services Network Capabilities (OSNC)

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Based on new ANSI T1 standards and Telcordia GR-1277 specifications, this order code delivers the following OSNC features using ISUP Intertoll (IT) or ISUP Access-to-Carrier (ATC) trunks.

- ◆ **Operator Services Originating Connection Network Capability** establishes and releases a network connection between a user and one or more operator services.
- ◆ **Connection Hold Network Capability (with Ringback)** disables a calling user's ability to release the call. Connection Hold also enables network entities to indicate that the calling user has requested disconnect (or reconnect) without initiating release procedures. Operator ringback is also provided as part of this capability.
- ◆ **Coin Station Control Network Capability** enables network services to collect and return coins and activate/deactivate fraud-prevention mechanisms.
- ◆ **Network Service Recall Network Capability** enables the calling party to draw the attention of an active network service (generally by flashing the switchhook).

Technical reference: 59011294

PRINCIPAL BENEFITS

ISP70006 enables the service provider to use high-speed SS7 ISUP trunks to provide traditional Operator Services from the end office to a Telcordia GR-1144 compliant Operator Services platform, such as the DMS Traffic Operator Position System (TOPS). In addition to providing a reliable high-speed interface, SS7 ISUP supports a platform that can deliver future advanced revenue-generating Operator Services capabilities, such as Release to Pivot.

SS7 OSNC also enables certain types of operator and non-operator traffic to be combined on the same trunk group to further reduce network costs.

MAJOR DEPENDENCIES

Software: ISP70001 ISUP Base
ISP70005 ISUP Charge Number / OLI Parameter

Note: Intermediate DMS-200 Access Tandem switches must be at Rel.13 or above to support the combined traffic capabilities.

FLEXIBLE ISUP CAUSEMAP**ISP70008**

Enables the local service provider to customize the DMS Cause to Treatment Map.

New Flexible ISUP CAUSEMAP

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

When an SS7 ISUP Release (REL) or SS7 ISUP Address Complete (ACM) message delivers a cause value indicator, the DMS system accesses the Cause to Treatment Map (CAUSEMAP) table to determine what treatment to apply to the call. Currently, this hardcoded internal table is not visible to or customizable by the service provider.

ISP70008 converts CAUSEMAP to an external table that may be viewed and altered by the DMS-100/DMS-500 service provider, using standard table editor commands.

Technical reference: 59015296

PRINCIPAL BENEFITS

A customizable ISUP CAUSEMAP enables service providers greater flexibility in configuring their networks to meet the challenges of managing both inter-network and intra-network traffic in today's competitive environment.

MAJOR DEPENDENCIES

Software: ISP70001 Base ISUP

NEW NUMBER TRANSLATION SERVICES FEATURES

The following optional features simplify the routing to *physical* destinations for calls made to *logical* numbers. Actual routing is determined by routing profiles involving Intelligent Network inquiries over the signaling (SS7) network.

In the U.S.: Payphones, Toll-Free Services, and the FCC

Concerning payphone use, the Federal Communications Commission (FCC) requires interexchange carriers to compensate location providers for “dial around calls” (toll-free calls routed to a different interexchange carrier than the one presubscribed to the payphone). Order codes NTS00025, NTS00026, and NTS00027 — appearing on the next few pages — address different situations that can arise in a serving area as a result of this requirement.

These three order codes involve two ANI II digit pairs:

- **25** identifies a toll-free call, translated as POTS-routable, that originated from a payphone.
- **24** identifies a toll-free call, translated as POTS-routable, that originated from a terminal that is *not* a payphone.

FLEXIBLE ANI FOR TOLL-FREE SERVICE

NTS00025

Supports payphone compensation by interworking Flexible ANI (FANI II-digits) with toll-free services in the Intelligent Network environment.

Flexible ANI for Toll-Free Service

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

NTS00025 modifies the DMS system so that Flexible ANI (FANI) II-digits — associated with a subscriber’s class of service — are supported on toll-free service calls (when the FANI feature is tuned “ON” through existing provisioning routines).

No translations datafill changes are required to support this new functionality. Also see NTS00026 and NTS00027, next.

PRINCIPAL BENEFITS

This optional feature interworks existing toll-free service and payphone compensation requirements. Although sourced in Rel•12, software bridges are generally available back to Rel•4 PCLs.

MAJOR DEPENDENCIES

Software: NTS00005 Enhanced 800 (E800) – United States
 UDD00001 United States Direct Distance Dialing Services
 NTS00016 – NTS00023 E800 Expansion Codes (888 through 822)

TFS PAYPHONE WITH POTS CONVERSION**NTS00026**

Supports the new ANI II-digit pair, “25,” that identifies a toll-free call that was translated as POTS routable and originated from a payphone.

Toll-Free Service (TFS) Payphone with POTS Conversion

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

With a toll-free call, the end office or tandem switch that performs the service switching point (SSP) functionality launches a query to the toll-free number database. If the database returns a plain old telephone service (POTS) number, the SSP replaces the original ANI II digits with a “25” to indicate to the interexchange carrier that the POTS number received corresponds to a dialed 800 number.

No translations datafill changes are required to support this new functionality. Also see NTS00025, above, and NTS00027, next.

Technical reference: 59006171

PRINCIPAL BENEFITS

NTS00026 continues the rollout of features that interwork existing toll-free service and payphone compensation requirements. Although sourced in Rel•12, software bridges are generally available back to Rel•4 PCLs.

MAJOR DEPENDENCIES

Software: NTS00025 Flexible ANI for Toll-Free Service
 NTS00005 Enhanced 800 United States
 UDD00001 United States Direct Distance Dialing Services
 NTS00016 – NTS00023 E800 Expansion Codes (888 through 822)

ANI II 25 SCREENING**NTS00027**

Expands NTS00026 to screen non-compliant carriers that are unable to process the new “25” ANI II digit pair.

New ANI II 25 Screening

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Order code NTS00026, above, provides the ANI II digits “25” to alert an interexchange carrier that a POTS number received from the toll-free number database corresponds to a dialed toll-free number. Order code NTS00027 addresses situations where carriers are non-compliant with the ANI II “25” digits. Toll-free calls will complete, but without support for payphone compensation.

NEW NUMBER TRANSLATION SERVICES FEATURES, *continued*

A software check verifies the status of Flexible ANI (FANI) for the carrier and:

- ◆ If FANI = Y, then “25” will be sent, according to order code NTS00026’s capability
- ◆ If FANI = N, then “24” will be sent, until the carrier alerts the signaling point that it is able to support the new requirement. ANI II digits “24” identify toll-free calls (translated as POTS routable) that originate from *non*-payphones

No translations datafill changes are required to support this new functionality. Also see NTS00025 and NTS00026 on previous pages.

PRINCIPAL BENEFITS

NTS00027 provides carrier-specific support for the new industry-standard “25” ANI II digits. Although sourced in Rel•12, software bridges are available back to Rel•4 PCLs.

MAJOR DEPENDENCIES

Software: NTS00026 TFS Payphone with POTS Conversion
 NTS00025 Flexible ANI for Toll-Free Service
 NTS00005 Enhanced 800 (E800) – United States
 UDD00001 United States Direct Distance Dialing Services
 NTS00016 – NTS00023 E800 Expansion Codes (888 through 822)

CLID SOUTHBOUND TOLL-FREE SERVICE**NTS00024**

This Canadian market feature treats southbound toll-free calls the same as other southbound calls for passing Calling Line Identification (CLID) information.

New 800+ Southbound CLID Delivery Enhancements

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

800 Plus “southbound” calls originate in the Canadian market but route to destinations outside network boundaries (to the United States and elsewhere). Presently, the Canadian network does not pass Calling Line Identification (CLID) information for certain Calling Party address types, such as calls that are forwarded to a toll-free number. NTS00024 extends CLID for *all* calls leaving Canadian boundaries, regardless of the Calling Party address type.

PRINCIPAL BENEFITS

Intended for Canadian offices, this software-only solution delivers CLID information to all carriers on all toll-free calls that have a Calling Party Number (CgPN) is available at the SSP. As a result, the CgPN is delivered in a uniform manner in the customer’s network as in other carrier networks and toll-free “southbound” calls receive the same CLID benefits (such as specialized answering by agents at call centers) as direct dial “southbound” calls. Although sourced in Rel•13, software bridges will be available back to Rel•10 PCLs.

MAJOR DEPENDENCIES

Software: NTS00014 E800 Canada Gateway

NEW SERVICE ORDER FEATURE

REDUNDANT FEATURE

SERV0003

Saves time and operating costs by reducing manual intervention in flowthrough operations between the DMS switch and provisioning systems.

New Redundant Feature Enhancements

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

These enhancements continue the rollout of features begun in Rel•9 and continued in Rel•11 that enable the Service Order (SERVORD) utility to accept certain add and delete functions formerly rejected during the flowthrough process.

Without SERV0003, a service order is rejected when an attempt is made to:

- ◆ Add a line option that is *already* assigned on a line.
- ◆ Delete a line option that is *not* presently assigned to the line.

With SERV0003, in both cases, SERVORD permits the flowthrough process to continue and simply indicates whether the command sequence was successful or not.

New Rel•14 enhancements to order code SERV0003:

- ◆ Extend Redundant Feature support to an additional set of features for Call Forwarding.
The supported Call Forwarding features are: CFB, CFBL, CFD, CFDA, CFDVT, CFE, CFF, CFGD, CFGDA, CFI, CFIND, CFK, CFMDN, CFO, CFRA, CFS, CFTANN, CFTB, CFTD, CFTOD, CFU, CFW, CFWN, CFX, CFXDNCT, CFXVAL, CUSD, SCF, IECFB, IECFD, CBU, CDU, CBI, CBE, CDI, and CDE.
- ◆ Add Redundant Feature support to the CHF (Change Feature) command in SERVORD.
The CHF command supports the above Call Forwarding features as well as these features previously supported only for ADO and DEO commands: ACB, AIOD, AR, CDT, CNDB, CTD, COT, DSCWID, FCTDNTRA, FRO, FRS, LPIC, PIC, INTPIC, SC1, SC2, SC3, CCW, CWT, DENYU3WC, 3WC, XFER, MWT, SCRJ, DRCW, ACRJ, DGT, CND, CNAMD, LVM, ADSI, DCF, CUSD, DISCTO, FGA, GLTC, LCDR, PPL, PRK, VMEADENY, and WUCR.

Technical reference: 59017494

PRINCIPAL BENEFITS

These Rel•14 software enhancements to SERV0003 significantly expand the list of features (“line options”) that no longer produce two major causes of SERVORD rejects at the network provider’s provisioning system. The costly, time-consuming provisioning rework formerly needed to respond to “Feature Does Exist” and “Feature Does Not Exist” responses is eliminated.

NEW SERVICE ORDER FEATURE, *continued*

The network provider can also expand operating cost savings with Redundant Feature capabilities added to the CHF command. This efficiency can eliminate rejects formerly encountered when the craftsperson tried to change a feature that was not previously assigned to a line.

NEW BILLING FEATURE

VFG MDR SUPPRESSION

AMA00006

Helps prevent the possibility of double billing to MDR calls that overflow to VIRTGRP facilities.

New VFG MDR Suppression

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Optional order code AMA00006 introduces a new virtual group (VIRTGRP) level option that suppresses call code (CC) 159 creation.

If Message Detail Recording (MDR) calls overflow to VIRTGRP facilities, it is possible that additional call codes (such as CC 110 or CC 006) could be generated, that could result in double billing. This feature can be enabled (and disabled) on a per-VIRTGRP basis to suppress call code creation.

Technical reference: 59013421

PRINCIPAL BENEFITS

By suppressing CC 159 in all VIRTGRP call records, AMA00006 helps eliminate the likelihood of double billing MDR-related calls because of the “extra” call code. All other billing records generated by VIRTGRP calls continue to be recorded for standard billing by downstream processes.

MAJOR DEPENDENCIES

Software: MDC00001 Meridian Digital Centrex Minimum
MDC00003 Meridian Digital Centrex Standard

Build the New Internet

As more and more of the critical systems across the globe migrate to packet-based solutions, public networks need to be reengineered so data can flow with the kind of reliability, integrity, and security taken for granted in voice networks today. At the same time, the economics of network deployment have to ensure both broadly based access to network services and a healthy return on investment for network operators.

This chapter discusses several data access and voice-over-data access solutions that help service providers leverage their existing infrastructure while migrating to packet technologies and provide ideal platforms for multi-network convergence.

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KEY BUSINESS SERVICES SOLUTIONS AT A GLANCE

Today's business networks seamlessly combine public and private facilities. Nortel Networks central office solutions extend, enhance, and complement private enterprise networks — even providing business customers the functionality of private networks using public network facilities.

Now employees in different countries can communicate as easily as they do with colleagues in the same building. Entire supply chains, from supplier to customer, work interactively to meet higher levels of consumer expectations by relying on robust e-commerce and communications systems. Nortel Networks solutions exploit network resources in innovative ways to securely deliver voice, data, video, and multimedia between business enterprises. Public network solutions:

- ◆ Enable enterprises to focus on their core business instead of on-going telecommunications support.
- ◆ Offer a “pay-as-you-go” approach that reduces risk and stranded investment.
- ◆ Link hundreds of business locations so employees in different regions can work together with seamless voice and data communications.
- ◆ Provide bandwidth on demand and advanced calling features for productivity, convenience, and security.
- ◆ Extend to all corners of the globe, reaching network services that are well beyond the practical limits of private networks.
- ◆ Support network call centers with up to 12,000 agents in diverse locations and served with automated computer interfaces.

CENTREX SERVICES FOR BUSINESS

– delivers more than 350 enhanced productivity features to businesses of every size. Our central office-based solutions provide convenience, productivity, and call control features that rival any PBX system for voice and data. For more information, see the “Nortel Networks Centrex” chapter in this document, starting on page 125.

CENTREX IP

– extends the reach of Nortel Networks Centrex features into the Internet Protocol (IP) world, so Centrex services can be accessed anytime, anywhere. For more information, see the “Centrex IP” chapter in this document, starting on page 136.

DIGITAL SUBSCRIBER LINE

– delivers a variety of highly publicized, standardized, high-speed, voice-over-data solutions over existing outside copper plant. The new Universal Edge 9000 delivers Digital Subscriber Line (DSL) services such as full-rate, industry-standard Asymmetric DSL (ADSL), industry standard Universal ADSL (known as G.Lite), and future offerings, such as Symmetric DSL (SDSL). For more information, refer to the Universal Edge 9000 section that starts on page 96.

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

– meets large, medium, and small business requirements by easily integrating voice and data into an existing Nortel Networks Centrex environment. Applications, such as Internet access, telecommuting, modem replacement, leased line replacement, and leased line back-up, enable businesses to improve productivity while saving operating costs. In this market, ISDN provides powerful benefits for both line access (Basic Rate Interface; BRI, starting on page 104) and trunk access (Primary Rate Interface; PRI, starting on page 109), both detailed in this chapter.

CALL CENTER SOLUTIONS

– provide automation, computer-telephony integration (CTI), Web integration, and management capabilities for business operations that place and receive a large volume of calls, such as telemarketing firms or customer-service centers. For more information see the “Centrex Internet-Enabled Call Center Solutions” chapter in this document, starting on page 146.

BUSINESS CPE

– provide the desktop capabilities to take advantage of network features such as displays for caller ID and message waiting, additional line appearances, and pushbutton access to calling features. For more information see the Centrex phone section of the “Nortel Networks Centrex” chapter, starting on page 132.

NETVENUE GATEWAY

– provides easy public or community-of-interest access to the Internet, e-commerce applications, email, on-line banking, telephony, and information services in one convenient, easy-to-use, customizable device that can connect to the Intranet, intranets, extranets, Local Area Networks, and Wide Area Networks.

VIRTUAL PRIVATE NETWORKS (VPNs)

– enable enterprises to extend private network services beyond the reach of private network facilities by using secured resources on shared service provider networks. A few key Nortel Networks solutions that support VPNs and other advanced business services include:

- ◆ **CVX 1800** aggregates high-volume dial-up traffic for reliable transport via the public network and the Internet. A unique Virtual POP technology supports wholesale access and VPN outsourcing services with 5.8 Gbps aggregate bandwidth and flow-through switching.
- ◆ **Contivity Extranet Switch** offers three models in an integrated family that serves remote access, branch office networking, and extranets. Ideal for managed IP VPN services, the Contivity options handle VPN and non-VPN traffic (tunneled and non-tunneled traffic) at the same time.
- ◆ **Versalar Switch Router 15000** offers high-performance, high-density IP access for service provider networks. This complete carrier-class solution for dedicated IP access and access concentration supports VPNs, Internet access, voice over IP (VoIP), mission-critical enterprise applications, and more.

KEY WORK AT HOME SOLUTIONS AT A GLANCE

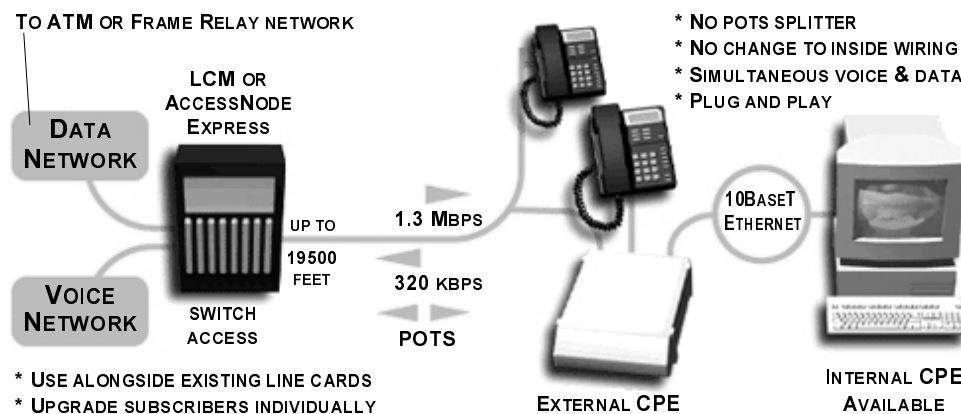
In the U.S. alone, over 20 million full-time employees telecommute, work at home, or in small branch offices. Nortel Networks offers a variety of high-demand services to deliver business-quality voice and data services to these sites — often referred to as the small office/home office (SOHO) or small office/branch office (SOBO) market.

Our work-at-home solutions enable a carrier's business subscribers to:

- ◆ Extend the reach of Centrex productivity, convenience, and call control features beyond the desktop telephone, to wireless phones and IP networks anywhere.
- ◆ Enjoy all the latest communications capabilities on a pay-as-you-go basis, with no risk or upfront investment.
- ◆ Use multiple services simultaneously over existing twisted copper outside and inside plant.
- ◆ Boost productivity with e-commerce, a Web presence, and all the information/research advantages of fast data over voice access.

1-MEG MODEM

— uses digital subscriber line (DSL) technology to deliver a quick-to-market, high-speed, data over voice solution using existing plant — and requires no POTS splitter at the customer premise. This plug-and-play, *always-available* connection eliminates dialing in, busy signals, and slowdowns. The easy-to-install digital modem (available in standalone external or internal PCI bus versions) supports 1.3 Mbps downstream and 320 kbps upstream with simultaneous analog voice services using any existing telephone jack.



A Simple Upgrade to LCM or AccessNode Platform Provides a Plug-and-Play, Voice over High-Speed Data Service

For more information on this award-winning solution, refer to the “1-Meg Modem” section in this chapter, starting on page 101.

DIGITAL SUBSCRIBER LINE

–standards-based voice-over-data solutions, including G.Lite service, use existing outside plant to deliver high-demand, high-speed services to residences and work-at-home subscribers. For more information, refer to discussion on the Universal Edge 9000, starting on page 96.

CUSTOM CALLING/CLASS

– features enable small office/home office/branch office (SOHO/SOBO) subscribers to be more productive with a portfolio of sophisticated and convenient call capabilities. See the “Nortel Networks Centrex” chapter, starting on page 125, for more information.

CENTREX IP

– enables road warriors and telecommuters to dial into a corporate-managed IP network from anywhere and gain local area network (LAN) connectivity as well as the same voice services they have the office, including extension, voice mail, corporate dialing plan, and more. For more information, refer to the “Centrex IP” chapter in this document, starting on page 136.

INTERNET VOICE BUTTON

– launches a voice call right from a Web page. This ease-of-access can be a competitive advantage for SOHO/SOBO sites seeking to be more agile than their big-business competition using the combined power of the Web and the public switched telephone network (PSTN).



**Internet Voice
Button Example**

INTERNET CALL WAITING

– solves the problem of missing phone calls while connected to the Internet. The subscriber can find out who’s calling along with the power to decide what to do with the call.

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

– delivers advanced voice and data solutions that are easily customized for specific user needs. ISDN products bring high-speed data/voice connections to markets as diverse as education, advertising, publishing, finance, health care, retail, engineering, and manufacturing. For line-side solutions, see the Basic Rate Interface (BRI) features, starting on page 104.

RESIDENTIAL, CAMPUS, AND SMALL BUSINESS DSL OPPORTUNITIES

MEGABITS TO THE MASSES

The burgeoning demand for higher data-access speeds in the consumer market has been driven by multiple influences — including email with attachments, e-commerce, distance learning, Web-based research, telecommuting and work-at-home, multimedia entertainment/on-line gaming, and new home networking devices such as WebTV. To address this expanding consumer market, new data services based on various digital subscriber line (DSL) technologies must have the same simplicity as analog modems today, with:

- ◆ Play-and-play installation
- ◆ No new wiring
- ◆ Wide availability
- ◆ Optimum speeds in balance with affordable pricing

Nortel Networks offers data solutions, discussed in this section, that meet these consumer high-speed access demands.

ATTRACTIVE PRICE POINTS: 1-MEG MODEM

The field-proven 1-Meg Modem (see discussion, beginning on page 101) stands as the industry leader in splitterless technology. By leveraging existing network investments, this solution offers price points that enable service providers to gain mass market share quickly and compete with cable modem offerings. Key benefits of this asymmetric 1.3 Mbps/320 kbps service include:

- ◆ Quick-to-market deployment
- ◆ Consumer-friendly installation and operation
- ◆ Customer premises equipment (CPE) choice: Standalone external or internal CPE card
- ◆ Multiple PC access through the same CPE modem
- ◆ Simultaneous voice service
- ◆ Dedicated bandwidth, instead of the shared-resource design of cable modems
- ◆ Proven, award-winning technology

With the 1-Meg Modem, service providers can deploy a proven, consumer-friendly DSL service today at price points that appeal to the mass market and support a profitable business model. While industry-standard technologies — such as Asymmetric Digital Subscriber Line (ADSL) and G.Lite — gain maturity, carriers can use proven 1-Meg Modem technology to capture market share and meet consumer demand. Then, as network providers become comfortable with maturing G.Lite technology, the many similarities between 1-Meg Modem and G.Lite services enable carriers to build on the valuable operational and field experience gained from deploying 1-Meg Modem to transition easily and cost-effectively to G.Lite.

**How G.Lite Can Transition Smoothly from
Today's 1-Meg Modem Deployment Model**

Model Attribute	1-Meg Modem	G.Lite
Service definition	Dedicated bandwidth Rate adaptive	Dedicated bandwidth Rate adaptive
Operational characteristics Provisioning Voice testing Data testing	Flow-through provisioning Switch-based Centralized	Flow-through provisioning Switch-based Centralized
Core networking Service selection gateways and ATM switches	No Change	No Change

ULTIMATE FLEXIBILITY: UNIVERSAL EDGE 9000

The Nortel Networks Universal Edge 9000 platform enables service providers to deploy a variety of services for both the consumer and business market. With support for a range of DSL technologies, the Universal Edge 9000 introduces additional revenue opportunities by offering new broadband access and applications.

Initial services available on the Universal Edge 9000 include ADSL and G.Lite offered from a Service Adaptive ADSL ServiceModule (see discussion, beginning on page 96). This line card supports *programmable* full-rate ADSL and G.Lite with the same hardware and industry-standard CPE. Although G.Lite is anticipated to eventually become the volume mass-market DSL service of choice, this flexible ServiceModule offers a simple, service-adaptive pathway to upgrade bandwidth from G.Lite to full-rate ADSL.

G.LITE WITH A DIFFERENCE: ENHANCED G.LITE

While Nortel Networks will initially deliver G.Lite on a Service Adaptive ADSL ServiceModule, we plan to deliver to market a second version of G.Lite that offers improved performance. Using the real-world experience gained in developing the mass-market, splitterless 1-Meg Modem solution, Nortel Networks will deliver an *Enhanced G.Lite* product that provides the functionality required to meet mass-market demand with the following benefits:

- ◆ Optimize line card design with high density and low cost
- ◆ Increased bandwidth capability — up to 4 Mbps downstream and 1 Mbps upstream
- ◆ Drive standards to provide improved performance and increased service area coverage
 - Extend loop reach and reduce microfilters
 - Enhance performance when using voice and data simultaneously
 - Improve immunity to ingress radio frequency / limit egress radio frequency
 - Enhance power management

UNIVERSAL EDGE 9000: INTEGRATED VOICE AND DSL SERVICES

The Nortel Networks Universal Edge 9000 is the ideal solution to supporting emerging revenue-generating data services — such as Asymmetric Digital Subscriber Line (ADSL) offerings — in addition to traditional POTS services, along with a simple transition to a Succession Solutions Multi-service Gateway.

Unlike a Line Concentrating Module (LCM) peripheral that uses line drawers containing multiple line cards, the Universal Edge 9000 peripheral uses shelves hosting Multi-Circuit Line Cards called ServiceModules. The Universal Edge 9000 architecture supports plug-and-play provisioning of these ServiceModules to provide a flexible and scalable data access solution across a network.

This adaptable solution can be configured:

- ◆ As a shelf serving as a GR-303 Digital Loop Carrier: *Universal Edge 9000 Broadband DLC*

For network providers with existing AccessNodes (Access Bandwidth Manager and Copper Distribution Shelves), the addition of Universal Edge 9000 shelves can greatly increase POTS capacity and enable delivery of new, revenue-generating DSL services. With support for a full suite of narrowband as well as a range of DSL services, the Universal Edge 9000 can be deployed with an Access Bandwidth Manager (ABM) to provide a flexible, high-density solution for new DLC implementations.

- ◆ As a voice and data peripheral off a DMS host or Remote Switching Center-S (RSC-S): *Universal Edge 9000 DMS*. The following discusses this DMS peripheral configuration.



**The Universal Edge 9000 DMS Can Mount in a DMS Bay
with a Mix of ServiceModules**

Nortel Networks offers a variety of different ServiceModules for these shelves to accommodate a wide variety of subscriber loop services, from POTS to emerging data access technologies — including 1-Meg Modem, full-rate industry-standard ADSL, industry-standard Universal ADSL (known as G.Lite), and Symmetric DSL (SDSL). To ease deployment of data services to the consumer market, its service portfolio includes ADSL ServiceModules that integrate voice and data functionality onto a single line card interface to deliver voice service and multi-megabit data access with operational simplicity.

The Universal Edge 9000 supports a range of network interfaces so service providers can make full use of existing transport architectures.

- ◆ Voice traffic travels over standard DS-30B time-division multiplexing (TDM) interfaces from the Universal Edge 9000 peripheral to DMS system facilities [to a Line Group Controller (LGC) or Line/Trunk Controller (LTC)] and routes through existing DMS equipment.
- ◆ Data traffic routes over an Asynchronous Transfer Mode (ATM) interface [initially over Inverse Multiplexing for ATM (IMA) DS-1s, with DS-3 and OC-3 transports planned for later releases] into the service provider's data network for delivery to wide area networks (WANs), Internet Service Providers (ISPs), and campus or corporate LANs.

As part of our evolutionary portfolio, the Universal Edge 9000 helps service providers seamlessly transition to a universal data network without interrupting current service offerings — or requiring the time and expense of building an entirely new network — by serving as a Multi-service Gateway into a Succession Solutions network.

UNIVERSAL EDGE 9000: INTEGRATED VOICE AND DSL SERVICES, *continued*

SWITCH-BASED CAPABILITIES

UNIVERSAL EDGE 9000 PLATFORM

UEDG0001

Supports new switch peripherals that deliver traditional narrowband POTS, plus new revenue-generating broadband service capabilities, from a single platform.

New Universal Edge 9000 Base Provisioning

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This order code enables the service provider to provision Universal Edge 9000 peripherals, shelves, common equipment and ServiceModules. New broadband services — including industry-standard, consumer-optimized Universal ADSL (known as G.Lite), full-rate Asymmetric Digital Subscriber Line (ADSL), and, in the future, Symmetrical DSL (SDSL) services — can be delivered to subscribers served off either a:

- ◆ DMS SuperNode switch hosting a Universal Edge 9000 peripheral, or
- ◆ DMS Remote Switching Center-S (RSC-S) hosting a Universal Edge 9000 peripheral

This software provides a time-saving, man-to-machine user interface and supports normal maintenance functions, maintenance audits, routine exercise (REX) tests, logs, and operational measurements (OMs) for Universal Edge 9000 peripherals. This order code enables the same basic testing diagnostics and procedures used with the Line Concentrating Module (LCM) to be used to test each line of the Multi-Circuit Line Cards, known as ServiceModules, in the Universal Edge 9000 peripheral.

This feature also enhances the Service Order (SERVORD) provisioning tool to enable flow-through provisioning for line options associated with data services on the Universal Edge 9000 Multi-Circuit Line Cards. With the Universal Edge 9000 peripheral provisioned as an LCM variant through table LCMINV, the DMS Computing Module software views each Multi-Circuit Line Card as a separate line drawer and automatically adds tuples to table LCMDRINV when a corresponding entry is added in the LCMINV table — to save time and reduce errors.

PRINCIPAL BENEFITS

Provisioning enhancements in UEDG0001 help:

- ◆ Reduce operating costs by streamlining the manual table-entry tasks for the data management platform (the Preside Universal Edge 9000 Manager, discussed on pages 99 to 100). Since data provisioning information is stored in the DMS tables, the Preside Universal Edge 9000 Manager can poll the DMS switch, pull the data provisioning information (service status, data speeds, and data service provider ID) from the appropriate tables, and provision the basic data service automatically without manual craftsperson entry.
- ◆ Increase the accuracy of table entry to reduce the possibility of system troubles from errors.

- ◆ Reduce inconsistencies between the voice management software (on the switch) and the data management software (on the Universal Edge Manager) with operations, administration, and maintenance (OAM) tools that enhance the synchronization of data between these two subsystems.
- ◆ Enhance craftsperson efficiency by displaying data provisioning information in a user-defined format. This release also helps minimize training requirements by providing system prompts during the provisioning of key parameters.

PRESIDE MANAGEMENT PLATFORM

Providing data management of the Universal Edge 9000 shelves across a service provider's network is the Nortel Networks Preside Universal Edge 9000 Manager (Preside uEMS). NCL UEMS0001 provides the software for remote management of Universal Edge 9000 data elements from a centralized workstation.

PRESIDE UEMS PLATFORM

UEMS0100

Simplifies management of all the data services provided on Universal Edge 9000 peripherals in the service provider's network.

New Preside Universal Edge 9000 Manager Release 1

UEMS0001

KEY CAPABILITIES

The Preside Universal Edge 9000 Manager (Preside uEMS) enables network providers to easily manage the data services provided on Universal Edge 9000 peripherals throughout a service provider's network. This operations, administration, and maintenance (OAM) solution, orderable as NCL UEMS0001, can be used from a remote location to manage up to 150 Universal Edge 9000 shelves (with ATM cards, associated ServiceModules, and subscriber modems) from a single Hewlett-Packard workstation.

Universal Edge Manager software accesses and launches system testing and diagnostic routines — and stores performance data for each interface. Also, the software monitors per-line traffic and congestion statistics for network management.

Additionally, the Preside Universal Edge 9000 Manager software helps troubleshoot digital modem customer premises equipment (CPE) by enabling the service provider to:

- ◆ Initiate a loopback at the CPE to test the physical connection.
- ◆ Detect whether the computer connected to the modem is active or not.
- ◆ “Ping” data CPE to test data signal transmission.

UNIVERSAL EDGE 9000: INTEGRATED VOICE AND DSL SERVICES, *continued***PRINCIPAL BENEFITS**

- ◆ The system's wide range of configuration options and comprehensive remote monitoring capabilities enable centralized network management of multiple Universal Edge 9000 peripherals throughout a network.
- ◆ The diagnostic and monitoring capabilities of this system heighten service reliability and availability for high-speed data access subscribers.
- ◆ Full-featured remote features enable the network provider to troubleshoot CPE from a remote location, to help reduce service calls to customer sites.

MAJOR DEPENDENCIES

Software:

- HP UX-Unix 10.20 or higher
- Hewlett-Packard OpenView Network Node Manager, release 5.01 or higher
- LET00012/LET00012 (or higher) PCL in the Computing Module, with order code UEDG0001 licensed [see page 98 for more information]

Hardware:

Model:	Hewlett-Packard HPC 3000
Memory:	512 megabytes (minimum)
Disk size:	4 gigabytes
Color graphics:	1024 x 768
Disk swap space:	512 megabytes (recommended)
Free disk space:	300 megabytes
Options:	CD-ROM; Ethernet Network Interface Card

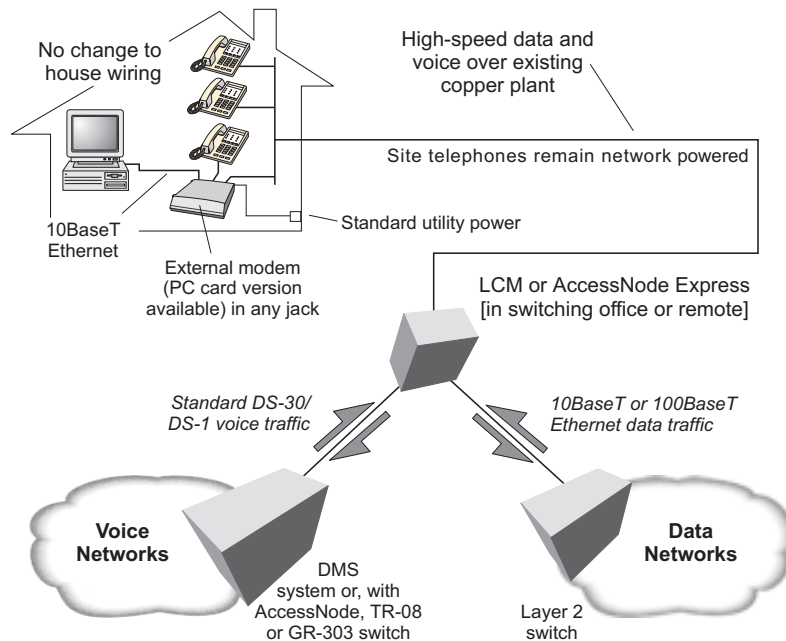
1-MEG MODEM: LEVERAGE CURRENT INVESTMENTS

The award-winning 1-Meg Modem service leverages the network provider’s current DMS and copper plant investments to quickly deliver a splitterless, high-speed, data-over-voice digital subscriber line (xDSL) solution. Now telecommuters, students, work-at-home families, researchers, and small businesses can surf the Internet and transact with corporate or campus LANs at megabit speeds at price points that are attractive to both the carrier and the subscriber.

This plug-and-play service can be started without a service call to the customer premises (there are no requirements for POTS splitters or site rewiring). Its *always available* connection eliminates dial-in sequences and busy signals. The digital modem (external standalone and internal PCI bus models available) supports 1.28 Mbps downstream and 320 kbps upstream with *simultaneous* analog voice services using any existing wall jack. Since phones at the site remain network powered, there’s no impact to lifeline protection (even if the modem loses power) and today’s residential and display services continue to be supported. And, with an inexpensive hub, up to two PCs can independently share the 1-Meg Modem service from one modem.

Deployed on DMS-100, DMS-500, and DMS-10 systems, an upgrade to this robust service only requires a swap of some circuit packs. This simplicity enables network providers to use existing investments to derive new revenues, including use of existing non-loaded loops that, subject to characteristics, can now reach:

- ◆ 19,500 feet with 24-gauge plant
- ◆ 16,500 feet with 26-gauge plant; longer with mixed-gauge plant



Cost-Effectively Transforms Existing Copper Plant and DMS Investments into New Revenue Source

1-MEG MODEM: LEVERAGE CURRENT INVESTMENTS, *continued*

RELEASE 4 FEATURES

Release 4, now available, is specifically for use on host office Line Concentrating Module (LCM) peripherals and frame-based Remote Switching Center-S (RSC-S) DMS switch remotes. New functionality includes:

- ◆ Improved line drawer density that raises the number of 1-Meg Modem line cards per drawer from 16 to a new maximum of 31 cards.
- ◆ A new autosensing 10BaseT/100BaseT interface from the Line Concentrating Module drawer to a data network.
- ◆ Important xDSL Element Manager System (xEMS) enhancements with NCL order code XEMS0004, including:
 - Ability to poll DMS system for flow-through provisioning information.
 - Ability to poll DMS system for telephone number to facilitate data troubleshooting and maintenance.
 - Optional address field to assign the termination point for the Ethernet link.

To support this release, the Computing Module needs order code HSTP0002 licensed with LEC00010, LET00010, LLT00010, LLW00005 — or higher — PCL. To support flow-through provisioning with the xEMS, PCLs built from Rel•11 or higher are required.

RELEASE 5 FEATURES

Release 5, scheduled to be available in 1Q00, introduces 1-Meg Modem support on Remote Line Concentrating Modules (RLCMs), Star Remote System Hubs, and AccessNode Express systems without a co-located Host Digital Terminal (HDT). For the RLCM and Star Remote System Hub DMS remotes, Release 5 equipment provides all the features of Release 4 equipment including the ability to provision up to 31 line cards per drawer.

Key xEMS enhancements with NCL order code XEMS0005 include:

- ◆ A convenient Software Installation Wizard to enable easy CPE firmware upgrades.
- ◆ A data collector to capture historical xEMS operational measurements.
- ◆ An interface to pass xEMS alarms to the Nortel Networks Preside system (a comprehensive portfolio of integrated network management solutions) for enhanced network surveillance.

Please note Release 5 is *not* for use with host peripherals or RSC-S (continue to deploy Release 4 for those platforms). The Computing Module requirements to support Release 5 are the same as those listed for Release 4, above.

EXTENDS TO MORE PLATFORMS

The 1-Meg Modem solution extends its support in Rel•12 PCLs to flexible Star Remote System DMS peripherals, introduced in Rel•10. Beginning in mid-1Q00, the Star Remote Hub supports up to 558 1-Meg Modem lines in a frame.

1-Meg Modem technology will also be ported to the new Universal Edge 9000 platform, with availability scheduled for 2H00. Availability of this technology on the multi-service Universal Edge 9000 platform will enable network providers to deploy the proven, low-cost 1-Meg Modem service today and migrate to higher bandwidth services in the future as application requirements demand.

DMS HARDWARE EVOLUTION

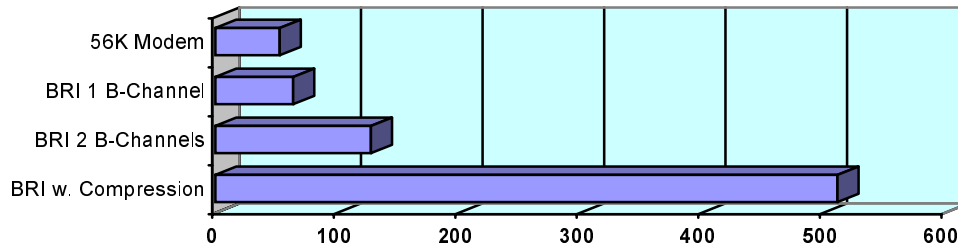
1-Meg Modem hardware has been rolling out in stages (refer to the table below for DMS-specific components). Now that Release 4 line cards and Data-enhanced Bus Interface Card (DBIC) packs for LCM drawers are available, previous hardware releases (shaded in table) are being manufacture discontinued. Although these cards in the field continue to receive full Nortel Networks customer service support, they are scheduled to no longer be orderable after May 28, 2000.

DMS System Component	Initial Releases	Release 3	Release 4	Release 5
Line Card	NTEX17AA	NTEX17BA	NTEX17CA	NTEX17DA
DBIC	NTEX54AA	NTEX54AB	NTEX54BA	NTEX54CA

Note: NTEX17DA line cards require the NTEX54CA DBIC card. In turn, the NTEX54CA DBIC requires use of NTEX17DA line cards.

BASIC RATE INTERFACE (BRI)

ISDN Basic Rate Interface (BRI) far outperforms today's analog modems by providing fully integrated voice and data services at speeds up to 128 kbps (512 kbps with four-to-one compression). With an ISDN modem and full-featured CLASS display telephone, home office professionals have the potential to experience the same professional image and work productivity as corporate office counterparts.



Relative Data Speeds: Analog Modem vs. ISDN BRI Options

BRI service brings the digital network to the individual user by providing integrated voice, circuit-switched data, and packet-switched data services, all over a standard telephone line. Standards-based ISDN BRI delivers:

- ◆ Two 64-kbps B-channels for voice and data
- ◆ One 16-kbps D-channel for packet data and call-control messaging

The same twisted-pair copper telephone line that traditionally could carry only one voice, one computer, or one fax “conversation” can now support up to eight physical devices and two circuit-mode calls. Digital access to the worldwide telecommunications network begins with ISDN’s support of:

- ◆ **Packet-Switched Data** — ISDN’s direct, permanent interconnection of its D-channel opens the door to an array of new packet-based applications — available *today*.
- ◆ **Circuit-Switched Data** — The ISDN user has access to digital circuit-switched data service over one or both B-channels. ISDN BRI dramatically increases the speeds of data and document transfer compared to dialup solutions, enabling service providers around the world to provide increased capabilities, reduce costs, and improve productivity.
- ◆ **ISDN Voice Services** — With over 200 Telcordia-compliant National ISDN-standard features, DMS ISDN is a complete business service that offers the largest number of productivity-enhancing voice features in the industry. National ISDN enables service providers to offer a consistent grade of service to all customers, regardless of the serving switch. And standard ISDN supports a wider choice of telephones and terminals.

ISDN BRI empowers a whole new set of applications such as telecommuting, Internet access, access to on-line services, small office/home office (SOHO), video conferencing, LAN-to-LAN connectivity, teleradiology, remote health care, point of sale, teleteaching, remote broadcasting and sound transfer, interactive publishing, and more.

NEW BRI CAPABILITIES

NATIONAL ISDN-2 BRI FUNCTIONALITY

NI000052

Adds new features and enhanced capabilities for NI-2 services on the DMS system.

Privacy Redirecting Number

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature enables ISDN subscribers to specify whether or not their names/numbers will display on remote devices when their calls are forwarded. The different types of Call Forwarding (Call Forward Universal, Call Forward Don't Answer, Call Forward Busy) can be separately provisioned to specify whether or not the receiving device displays the forwarded number, name, or both.

Technical reference: 59005918

PRINCIPAL BENEFITS

Being able to control whether or not their caller IDs are displayed enables users to more efficiently manage call privacy, helping to increase their satisfaction with ISDN services.

Calling Number Service Uniformity for NI-2

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature supports delivery of the E.164 international numbering format on a switch-wide basis, enabling the DMS system to receive more detailed caller ID information for international calls.

Technical reference: 59005908

PRINCIPAL BENEFITS

The delivery of more detailed caller ID information for international calls promotes increased convenience and satisfaction for ISDN subscribers.

Call Forwarding Service Uniformity for NI-2

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This enhancement to the Call Forward Validation (courtesy call) operation can be provisioned to occur during the programming of a remote call-forwarding location. Now, Call Forward activation can occur even if the initial validation call is not answered; a second unanswered validation call is no longer required. With this enhancement, it is possible to have call forwarding automatically activated after the completion of the first unanswered call.

Technical reference: 59005942

BASIC RATE INTERFACE (BRI), *continued***PRINCIPAL BENEFITS**

Making the programming of call forwarding more convenient for the end user encourages more frequent use of the feature and enhances customer satisfaction.

EKTS Service Uniformity for NI-2

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature enables the DMS system to provide additional options for Electric Key Telephone Service (EKTS) members participating in bridged call sessions.

- ◆ EKTS members can enter a bridged call before the call is answered.
- ◆ If an EKTS member has activated the Hold feature while on a bridged call, another EKTS member can exclude the first member from re-entering the call by activating the Privacy feature.

Technical reference: 59005931

PRINCIPAL BENEFITS

This enhancement offers greater privacy for EKTS members participating in bridged call sessions.

Layer 3 Service Disruption

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Should Layer 3 service be disrupted, this feature supports frame-check, sequence-based performance monitoring, protocol abnormality monitoring, logging and altering, and protocol capture to perform network-level (Layer 3) maintenance between the DMS switch and terminal equipment.

Technical reference: 59006381

PRINCIPAL BENEFITS

Enhanced monitoring and maintenance of Layer 3 services promote fast resolution of potential problems in the network and help reduce the possibility of service disruption to subscribers.

SS7 Procedures for ISDN Call Forward

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

These Signaling System No. 7 (SS7) enhancements provide continued ringing treatment, rather than a busy signal, for Call Forward-Don't Answer (CFD) destinations that are busy

when a forwarded call attempts to terminate. Previously, if a subscriber forwarded a call from an ISDN phone (with CFD activated) to a phone in the busy state, the user would hear several rings, then a busy signal.

Technical reference: 59006550

PRINCIPAL BENEFITS

This enhancement promotes a more intelligent ISDN network and eliminates a potential point of confusion for those who call ISDN phone users.

User Loop Testing (X.25 Echo Station)

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

The User Loop Testing feature enables field technicians to initiate test and loopback capabilities for packet data on a BRI line. The technician is able to set up a test session by calling a number that terminates directly to the packet handler in the central office.

Technical reference: 59006435

PRINCIPAL BENEFITS

This feature promotes faster, more direct resolution of packet-data problems on BRI lines, while providing more efficient use of resources.

New On Demand B-Channel Packet

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

In addition to transmitting packet-mode data on the D-channel, the user can now activate X.25 packet data on either (or both) 64 kilobit B-channels, on an on-demand basis for much faster packet performance. This enhancement enables the B-channels to be used for both packet and circuit applications.

While one B-Channel is being used for packet mode data, the second B-Channel can be used for a simultaneous voice or circuit switched data session. Upon completion of the B-channel packet-mode data call, that B-channel can then be used for circuit-mode calls. Previously, packet data over a B-Channel was available only on a non-dialable, nailed-up basis.

Technical reference: 59013206, 59013267

PRINCIPAL BENEFITS

Packet data can now be transmitted at a very high rate of speed, using the same ISDN line the subscriber already has in service. Since B-Channel packet transport is now a dialable service, the user can direct an X.25 data call to any destination. Previously, a subscriber needed to purchase a dedicated nailed-up data connection aimed at a single location.

BASIC RATE INTERFACE (BRI), *continued*

New Uniform Display Text

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This feature expands the text information appearing on the display of end-user ISDN customer premises equipment, such as the Nortel Networks M5317TDE ISDN telephone. The display feedback presents easy-to-understand text messages before, during, and after a call that enhance the user's understanding of call status. Display messages can also include non-call activities, such as call-forwarding status.

Technical reference: 59005970

PRINCIPAL BENEFITS

By presenting dynamic display information during all phases of a call, subscribers are prompted to help them take advantage of the most useful ISDN voice and data features.



Example of ISDN Display Telephone
M5317TDE ISDN Terminal

PRIMARY RATE INTERFACE (PRI)

Enterprises using private branch exchange (PBX) phone systems and Internet Service Providers (ISPs) both have highly variable needs for access capacity. Demand peaks at certain times, diminishes at others, and is sometimes difficult to predict. One could overprovision to be prepared for occasional peaks, but this means underusing these expensive links at all other times.

Nortel Networks provides a better answer with ISDN **Primary Rate Interface (PRI)**, a trunking technology that delivers 23 64-kbps “B” (bearer) channels for payload traffic and one single 64 kbps “D” (data) channel for all signaling and call control. Because of its higher throughput, adaptable bandwidth, and fast call set-up, PRI connectivity is ideal for ISP and PBX trunking, or to serve as a trunk interface between central offices.

A few of the key benefits offered by PRI include:

- ◆ Premium quality offers greater subscriber satisfaction.
- ◆ Virtually error-free transmission helps eliminate interruptions in fax and modem sessions.
- ◆ Out-of-band signaling makes call setup times seem almost instantaneous.
- ◆ Single channel for all signaling and call control significantly enhances trunk efficiency.
- ◆ PRI enhances hybrid private/public networking. Public trunks over PRI offer direct access to private and Long Distance networks and a mix of other services, including call-by-call service selection.

WELL-SUITED FOR ISP/ASP ACCOUNTS:

PRI has proven to be the access trunk of choice for Internet Service Provider/Application Service Provider (ISP or ASP), due to such features as:

- ◆ **Integrated access.** With one ISDN PRI link and one access phone number, an ISP can terminate calls from both analog modems and digital ISDN BRI lines. Now the ISP only needs one PRI to serve a neighborhood where some customers dial in with 28.8 and 56 kbps modems and others are surfing at ISDN BRI speeds.
- ◆ **Greater throughput than T1.** A traditional channelized T1 requires signaling in each channel. But ISDN PRI consolidates the signaling for 23 channels into one “D” channel. This strategy makes call setup and teardown much faster, and enables the ISP to serve more customers per trunks. Optionally, ISPs can use one “D” channel to control up to 20 PRI spans for even greater efficiency.
- ◆ **Large circular hunting.** An automatic algorithm distributes calls evenly across ISP/ASP ports. That means one director number can support up to 220 PRI links. ISPs value the ability to support many more subscribers with one access number, plus the way call distribution helps reduce modem burnout.

PRIMARY RATE INTERFACE (PRI), *continued*

WELL-SUITED FOR PBX ACCOUNTS:

PRI has proven to be the trunk of choice to serve business accounts with Private Branch Exchanges (PBXs) due to such features as:

- ◆ **Dynamic channel allocation** accommodates changing traffic requirements (say, from INWATS to OUTWATS) instead of static service designations, as in traditional T1 channels.
- ◆ **More PBX users** can be supported than over traditional T1 spans. Further efficiencies can be gained by supporting as many as 20 PRI spans with one “D” channel (plus a back-up “D” channel for redundancy).
- ◆ **Advanced network services** such as Calling Line ID, Message Services, Hotel/Motel services, and videoconferencing. PRI transparently extends Centrex features from the central office, and enables PBX and Centrex users to enjoy the same features just as though they all had the same service.
- ◆ **Two B-channel transfer** capability causes a PBX to immediately release an ISDN trunk after transferring a call to provide more trunk capacity. This efficiency is particularly ideal for organizations that use centralized attendants, automatic call distribution, voice mail systems, and interactive voice response systems.

CROSS-PLATFORM ROLLOUT

Leading-edge Nortel Networks PRI features extend to different platforms at slightly different schedules. The following two tables detail the scheduled availability of key PRI capabilities across the DMS system’s XPM platform, SPM platform, and on a Multi-service Gateway in a Succession Solutions network.

Earliest Availability for NI-1 ISDN PRI Features

Feature	XPM Platform		SPM Platform		Succession Solutions		
	available	order code	available	order code	available	order code	
PRI NI-1, Phase 1							
Circular Hunt	Rel•12	NI000036	Rel•12	NI000036	Rel 2	NI000036	
Basic Call		NI000033		SPMS0015		TBD	
Calling Name and Number							
D-Channel Back-up / NFAS							
PRI NI-1, Phase 2							
ISA (call-by-call)	Rel•12	NI000033	Rel•13	SPMS0015	Rel 2	TBD	
Network Redirection / Reason		NI000024		NI000024		Rel 4	NI000024
Release Link Trunk							

Earliest Availability for NI-2 ISDN PRI Features

Feature	Order Code	XPM platform	SPM platform	Succession
PRI NI-2, Phase 1				
Basic Call	NI000043	Generally Available (GA)	Rel•12	Rel 2
Calling Name and Number	NI000030			
D-Channel Back-up / NFAS	NI000043			
Circular Hunt	NI000035			
Hotel/Motel	NI000032			
Screening	NI000043			
Call-by-call	NI000043			
Location Indicators	NI000043			
OFM 13 Data Link Monitor	NI000043			
OFM 14/130 D-Chnl Backup	NI000043			
PRI NI-2, Phase 2				
Message Svcs SMDI Replace	NI000037	GA	Rel•13	Rel 2
Two B-Channel Transfer	NI000018			Rel 4
Dialable Wideband Service	NI000040			TBD
B-Channel Packet	NI000034		Rel•14	TBD
E911 Screening	NI000038	Rel•12	Rel•12	Rel 2
PRI Across Multiple PMs	NI000039		TBD	TBD
Call Forward Interface Busy	NI000047	Rel•13	Rel•13	Rel 2

PRIMARY RATE INTERFACE (PRI), *continued*

NEW PRI CAPABILITIES

DISTRIBUTED PRI

NI000039

Offers new flexibility to service providers to provision PRI B Channels across peripherals that do not contain the controlling D Channel.

New Distributed PRI

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

For enhanced use of PRI facilities, order code NI000039 enables ISDN PRI B Channels to be:

- ◆ Provisioned across multiple Extended Peripheral Modules (XPMs).
- ◆ Added without taking the trunk group out of service.

Technical reference: 59006561

PRINCIPAL BENEFITS

Distributed PRI enables service providers to aggressively implement Non-Facility Associated Signaling (NFAS) and D Channel Backup, especially beneficial for Internet Service Provider (ISP) customers.

- ◆ Provides provisioning flexibility.
- ◆ Significantly reduces provisioning and administrative costs.
- ◆ Eliminates service disruptions for customers that request additional B channels where the controlling D channel is not present.
- ◆ Promotes more efficient use of PRI resources. For example, peripherals can be used fully — without having to save capacity for future individual customer growth.

MAJOR DEPENDENCIES

Software: NI000043 PRI NI-2 Base

Hardware: Digital Trunk Controller for ISDN (DTCI)

PRI NI-2 BASE**NI000043**

Provides basic, standardized NI-2 ISDN Primary Rate Interface services.

New NI-2 1+/0+ Dialing Enhancement

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new feature enhances the PRI NI-2 Interface to enable customer premises equipment the flexibility to dial 1+/0+ prefixes to the DMS system. This is an enhancement over the previous requirements for NI-2 0+/1+ dialing.

PRINCIPAL BENEFITS

This enhancement supports 1+ and 0+ ten-digit dialing to broaden 0+ revenue opportunities for the service provider, such as operator assistance and calling card services. Now the dialed number can be coded with a national number from an E.164 numbering plan rather than with an unknown number in an unknown numbering plan.

MAJOR DEPENDENCIES

Hardware: DTCI or Spectrum Peripheral Module (SPM)

New Calling Number Screening

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature helps ensure the delivery of a valid number to the public network for calls over PRI NI-2 interfaces that originate on a PBX or key system. This software:

- ◆ Enables the DMS system to verify the calling number against a software table.
- ◆ Supports detailed individual station level billing.
- ◆ Is available back to Rel•8 PCLs.

Technical reference: AF6863

PRINCIPAL BENEFITS

Available in Rel•12, Calling Number Screening:

- ◆ Provides central office-based, station-level billing.
- ◆ Helps ensure service provider billing accuracy, even with 800/900, Long Distance, and other complex calls.

MAJOR DEPENDENCIES

Software: NI000022 ISDN PRI Base

Hardware: DTCI or SPM

PRIMARY RATE INTERFACE (PRI), *continued***PRI E911 SCREENING NI-2****NI000038**

Provides an E911 public safety feature, as well as greater robustness to the base software.

E911 Screening

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

The E911 Screening feature enables the service provider to provision the actual customer premises equipment (CPE) station directory numbers so that emergency services can be directed to the CPE's actual station location rather than to the CPE's billing directory number location.

Technical reference: 59007374

PRINCIPAL BENEFITS

The E911 Screening feature provides a valuable community service by promoting quick, accurate station identification. The faster response time can be critical when responding to crisis calls.

MAJOR DEPENDENCIES

Software: NI000043 PRI NI-2 Base

CALL FORWARD INTERFACE BUSY NI-2**NI000047**

Helps Internet Service Providers (ISPs) increase call-completion success rates.

Call Forward Interface Busy NI-2

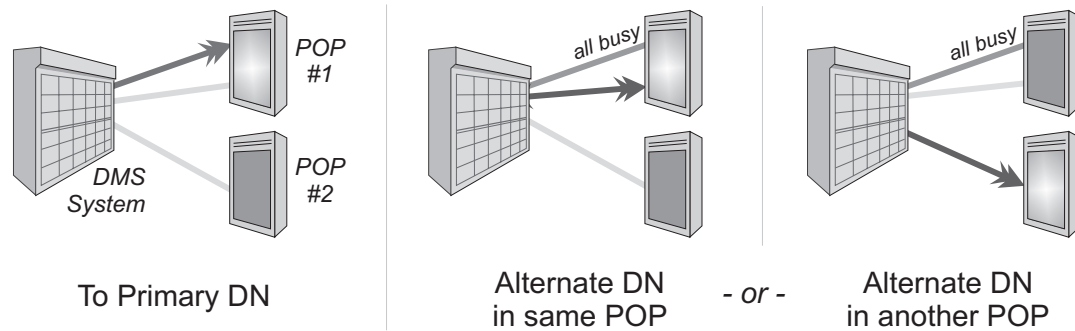
LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

When all B-channels on an ISDN PRI route are unavailable, this feature enables calls to be redirected to an alternate directory number (DN).

Calls can be rerouted:

- ◆ Within a point of presence (POP)
- ◆ Between POPs in the same Local Access Transport Area (LATA)
- ◆ Between POPs in different LATAs
- ◆ To the service provider's access server
- ◆ To another ISP via a service agreement (Long Distance charges, if any, can be offset by quality of service)



**Automatically Forwards Calls to Alternate Routes
when all Trunks are Busy**

Technical reference: 59006586

PRINCIPAL BENEFITS

PRI Call Forward Interface Busy increases call-completion success rates for ISPs by automatically forwarding calls to alternate routes when all trunks are busy. With market studies showing call completion as the most important consideration for end users to gauge the service quality of ISPs, this new order code can help:

- ◆ Increase call completion for ISP customers, resulting in higher customer loyalty and reduced customer churn.
- ◆ Generate a new source of tariff revenue for incumbent and competitor local access carriers.
- ◆ Divert calls during scheduled maintenance downtime and disaster recovery.

MAJOR DEPENDENCIES

Software: NI000043 PRI NI-2 Base

CALL FORWARD INTERFACE BUSY NI-1

NI000049

Helps ISPs in a National ISDN-1 environment increase call-completion success rates.

New Call Forward Interface Busy NI-1

LEC00013, LET00013, LLT00013, LWW00007

This order code offers similar functionality as NI000047 (see previous) for deployment on National ISDN-1 (NI-1). Major software dependency is NI000033 PRI NI-I Base.

Advanced Intelligent Networking

AS THE NETWORK EVOLVES, WE INNOVATE

Since 1987, Nortel Networks has proven its commitment to intelligent networking. We have been in the forefront of early intelligent network (IN) initiatives, such as IN/1, IN2, IN1+, and MVI (Multivendor Initiative). And we have been a development leader in the Telcordia-defined Advanced Intelligent Network (AIN) from the start by providing Signaling System No. 7 (SS7) capabilities on the DMS SuperNode Family. This dedication to intelligent networking remains apparent in our continuing support for both Telcordia-specified AIN releases and the international Capability Set (CS-1) standards defined by the International Telecommunications Union (ITU).

The DMS SuperNode system is evolving in concert with the intelligent network on multiple fronts. From platform-level software enhancements to application-level services, our leading-edge development is focused on supporting:

- ◆ **Network communications** with improved base switching and trunk signaling capabilities.
- ◆ **Optimum network operations** with service switching point (SSP) and signaling transfer point (STP) software enhancements that meet Network Reliability Council performance standards.
- ◆ **Higher network usage** with new revenue-generating services that invite customer use and take advantage of the expanding intelligent network.

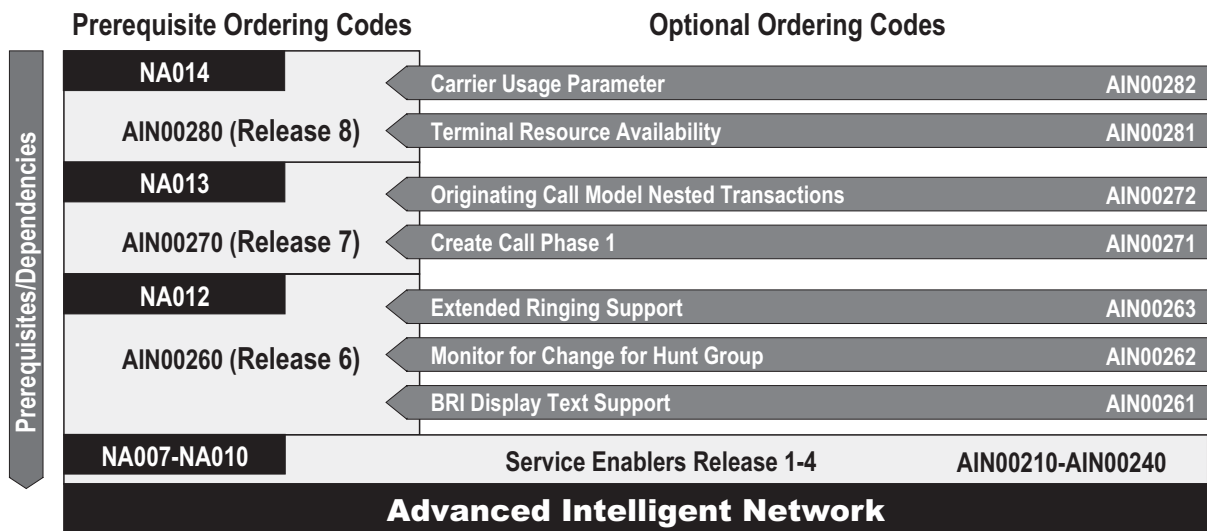
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AIN SERVICE ENABLERS

Introduced in 1997, the AIN Service Enablers software provides expanded trigger support for Telcordia's AIN Release 0.2 call model. Now, AIN service providers can expand *call routing* services to include a broad set of revenue-enhancing *interactive* services. Service Enablers software provides a continuous evolution path and more effective call control, network interactive voice response, and conditional call routing.

Nortel Networks releases this premier AIN-enabling software in a planned series of software loads driven by customer service priorities and close compliance with Telcordia requirements GR-1298 and GR-1299 (SSP-to-SCP messaging), GR-1129 (Intelligent Peripheral platform support), GR-2892 (toll-free service), and others. These successive rollouts bring new levels of network integration and service capabilities to service provider networks.



AIN Service Enablers Software Base and Optional Order Codes

NEW AIN CAPABILITIES

SERVICE ENABLERS BASE RELEASE 6

AIN00260

Provides base functions required to support continuing rollout of GR-1298/1299-based AIN Service Enablers.

Service Enablers Base Release 6

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

AIN00260 is planned to provide:

- ◆ Continuing updates for AIN Service Enablers operations, administration, maintenance, and provisioning (OAM&P) and Automatic Message Accounting (AMA) capabilities.
- ◆ Ongoing regression testing to promote a smooth integration of powerful Release 6 trigger capabilities into provider networks.
- ◆ Removal of the AIN Primer (AIN 0.0) software code.
- ◆ Additional functionality, such as XA-Core support and Automatic Number Identification (ANI) II Enhancements for AIN Toll-Free Service.

Technical reference: 10202203, 10206878, 10214224, 59006039

PRINCIPAL BENEFITS

Gives service providers new differentiators and expanded revenue opportunities by marketing display-based services over a much larger subscriber base and by developing new services based on two new capabilities — an enhanced subscriber ability to reach a called party and more efficient call distribution in hunt groups.

MAJOR DEPENDENCIES

Software: AIN00250 Service Enablers Base Release 5

BRI DISPLAY TEXT SUPPORT

AIN00261

Extends line support for the AIN Display Text feature to BRI, MADN, and EBS lines.

New BRI Display Text Support

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new capability extends line support for the AIN Display Text feature to three additional line types. Since Rel•5, AIN Display Text has given service providers the AIN service logic they have needed to process display information and send it to subscriber display phones during an AIN call or AIN Message Waiting Indication (MWI) message. Prior to Rel•12, this

feature supported Residential Enhanced Services (RES) and Nortel Networks Centrex lines. Now BRI Display Text Support expands this support to include ISDN Basic Rate Interface (BRI), Multiple Appearance Directory Number (MADN), and Meridian Business Set lines.

New ISDN BRI support includes NI-1 (National ISDN 1) and NI-2 (National ISDN 2) lines currently supported on the DMS system. BRI Display Text Support also includes additional testing of MFT (Meridian Feature Transparency) lines, which use existing AIN Display Text functionality provided for Nortel Networks Centrex lines.

Display Text can be received in either of the following response messages:

- ◆ An Authorize Termination response message that is received at the Termination Attempt trigger detection point (TDP).
- ◆ An Offer Call response message that is received at T Busy event detection point (EDP) or TDP.

This feature also supports the non-call-related Update Message function.

Technical reference: 10206792, 59006414

PRINCIPAL BENEFITS

BRI Display Text Support enables a far greater number of subscribers to take advantage of display-based services than ever before. In doing so, it gives service providers expanded revenue opportunities by developing and marketing display-based services over a much larger subscriber base.

MAJOR DEPENDENCIES

Software: AIN00260 AIN Service Enablers Base Release 6

MONITOR FOR CHANGE FOR HUNT GROUP

AIN00262

Provides status monitoring and reporting in Multi-Line Hunt (MLH) groups, enabling enhanced call distribution.

Monitor for Change for Hunt Group

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new capability allows the Monitor for Change feature to work for hunt groups. It provides the software enhancements required to enable a Service Control Point (SCP) to monitor hunt groups for a change in busy/idle status. The resulting status information enables service providers to offer intelligent call distribution services to automatic call distribution centers, Internet Service Providers (ISPs), and other hunt group users.

Technical reference: 59006290

NEW AIN CAPABILITIES, *continued***PRINCIPAL BENEFITS**

Monitor for Change for Hunt Group gives hunt group users a far more efficient way to distribute calls, resulting in faster connection times and more evenly distributed calling patterns over time, which, in turn, provides equipment cost savings. These user benefits allow service providers to more effectively differentiate and market their services and help create new revenue-generating service opportunities.

MAJOR DEPENDENCIES

Software: AIN00260 AIN Service Enablers Base Release 6

EXTENDED RINGING SUPPORT**AIN00263**

Gives end users the ability to reach or communicate with a called party even when the initial status is busy.

Extended Ringing Support

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new capability enhances services such as Enhanced Busy Call Return and Access to Messaging by continuing to ring the called subscriber while the AIN Send to Resource function interacts with the calling subscriber. The called party is monitored for an answer status while a Send to Outside Resource announcement is in progress. If the called party answers during the announcement, the SSP connects the calling and called parties.

Technical reference: 59006320

PRINCIPAL BENEFITS

Extended Ringing Support gives end users the ability to reach or communicate with a called party even when the initial status is busy. Subscribers benefit from an enhanced ability to complete calls or leave messages — especially valuable in large-volume and other mission-critical business applications, but attractive to residential users also. As a result, providers can improve existing service (creating greater price flexibility for the provider) and develop and market new services (opening up new revenue streams).

MAJOR DEPENDENCIES

Software: AIN00260 AIN Service Enablers Base Release 6

SERVICE ENABLERS BASE RELEASE 7**AIN00270**

Provides base functions required to support the continuing rollout of GR-1298/1299-based AIN Service Enablers.

New Service Enablers Base Release 7

LEC00013, LET00013, LLT00013

KEY CAPABILITIES

AIN00270 is planned to provide:

- ◆ Continuing updates for AIN Service Enablers operations, administration, maintenance, and provisioning (OAM&P) and Automatic Message Accounting (AMA) capabilities.
- ◆ Ongoing regression testing to promote a smooth integration of powerful Release 7 trigger capabilities into provider networks.

Technical reference: 59013251

PRINCIPAL BENEFITS

Gives service providers new differentiators and expanded revenue opportunities by enabling them to develop and market call-originating and multi-event call services.

MAJOR DEPENDENCIES

Software: AIN00260 AIN Service Enablers Base Release 6

CREATE CALL PHASE 1**AIN00271**

Enables an SCP to initiate a connection between a device served by the SSP and a destination directory number (DN).

New Create Call Phase 1

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

This new feature enables the service control point (SCP) to initiate a connection between a device (such as a phone, PC, or fax machine) served by the service switching point (SSP) and a destination DN. The SCP sends an unsolicited call-related message to the SSP, which then sets up the requested connection. The origination DN must be on hook or idle to establish a call.

Technical reference: 59011907

PRINCIPAL BENEFITS

With the ability to *originate* a call, the AIN network enables a new range of services and a new stream of revenue opportunities. With the Internet and other emerging communications environments providing a wealth of communications and interactive tools, the possibilities

NEW AIN CAPABILITIES, *continued*

are far-reaching. For example, this feature can work with a browser or speech-recognition-based Unified Messaging service to automatically initiate calls based on user interactions. This new ability enhances the value of these new tools and offers new revenue possibilities to both network providers and ISPs (Internet Service Providers).

MAJOR DEPENDENCIES

Software: AIN00270 AIN Service Enablers Base Release 7

ORIGINATING CALL MODEL NESTED TRANSACTIONS**AIN00272**

Adds nested transactions to the originating call model, enabling the DMS system to process multiple events on a single call.

New **Originating Call Model Nested Transactions**

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

This new feature adds nested-transaction capability to the originating call model. It enables the DMS system to process multiple events — and thus multiple SCP-based services — on a single call. During a multi-service call, the software informs the SCP of conditions like Busy, Answer, or No Answer in the proper sequence, so that the call is processed appropriately and transparently to the user.

Technical reference: 59013226

PRINCIPAL BENEFITS

The ability to process multiple events and services on a single call gives service providers an unprecedented ability to develop new revenue-producing services. Since it is delivered through the AIN segment of the network, this feature allows providers to quickly and rapidly maximize its benefit by using Nortel Networks, in-house, or third-party rapid-development and testing tools, such as Flexible Service Logic (FSL), ready-made services, Service Independent Building Blocks (SIBBs), and other modular or streamlined service capabilities.

MAJOR DEPENDENCIES

Software: AIN00270 AIN Service Enablers Base Release 7

INTERWORKING WITH DYNAMICALLY CONTROLLED ROUTING**AIN00060**

Enables AIN to interwork with Dynamically Controlled Routing, giving service providers added flexibility in routing DCR calls.

New Interworking with Dynamically Controlled Routing

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Designed for Canadian offices that use the Nortel Networks Dynamically Controlled Routing (DCR) product, this new feature enables AIN to interwork with DCR, giving service providers added flexibility in routing DCR calls. It supports the DCR route selectors DCRT and NODE during AIN response processing and removes the DCR handicap during an AIN retranslation/redirection. This gives providers the ability to dynamically route overflow traffic from an originating switch after encountering AIN triggers.

Technical reference: 59013169

PRINCIPAL BENEFITS

AIN00060 enhances the revenue potential of Canadian service providers by enabling them to reduce interaction issues with DCR, and thus deploy AIN Release 0.1-based services more effectively.

MAJOR DEPENDENCIES

Software: AIN00009 Services Support

SERVICE ENABLERS BASE RELEASE 8**AIN00280**

Provides base functions required to support continuing rollout of GR-1298/1299-based AIN Service Enablers.

New Service Enablers Base Release 8

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

AIN00280 is planned to provide:

- ◆ Continuing updates for AIN Service Enablers operations, administration, maintenance, and provisioning (OAM&P) and Automatic Message Accounting (AMA) capabilities.
- ◆ Ongoing regression testing to promote a smooth integration of powerful Release 8 trigger capabilities into provider networks.

PRINCIPAL BENEFITS

Improves network efficiency and expands revenue opportunities by enhancing signaling and information processing and increasing messaging flexibility.

MAJOR DEPENDENCIES

Software: AIN00270 AIN Service Enablers Base Release 8

NEW AIN CAPABILITIES, *continued***TERMINAL RESOURCE AVAILABILITY****AIN00281**

Supplies a lookahead trigger for determining the availability of terminating lines, thus enhancing terminating service efficiency.

New Terminal Resource Availability

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This new feature supplies a lookahead trigger for determining the availability of terminating lines. At any point in the Terminating Call Model (TCM) where originating or terminating lines have not yet been alerted, it allows the DMS system to launch a query to a terminating line. This feature implements the TRA Trigger of the AIN TCM, enhancing current AIN Trigger Detection Point Processing capabilities.

Technical reference: 59016005

PRINCIPAL BENEFITS

The Terminal Resource Availability feature gives service providers more efficient signaling and service processing capabilities for terminating services. It can decrease signaling traffic volume for a given service and reduce processing load across multiple network elements.

MAJOR DEPENDENCIES

Software: AIN00280 AIN Service Enablers Base Release 8

CARRIER USAGE PARAMETER**AIN00282**

Allows the SCP to indicate to the SSP how to process accompanying carrier information.

New Carrier Usage Parameter

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This new feature allows the local SSP to select the appropriate carrier for a particular call. By sending the appropriate codes in the Carrier Usage Parameter field of a message, an SCP can now indicate to an SSP whether to use the specified carrier signaling trunks or to specify another trunking option. This feature implements the SSP response processing capability for this feature in the Analyze Route, Forward Call, and Create Call messages from an SCP.

Technical reference: 59016134

PRINCIPAL BENEFITS

Enables the SSP to match an appropriate carrier to a call type (local, intraLATA, or interLATA). This feature simplifies carrier selection and call completion, since an SCP-based solution would be very complex in comparison.

MAJOR DEPENDENCIES

Software: AIN00280 AIN Service Enablers Base Release 8

Nortel Networks Centrex

Our ever-expanding Centrex features connect people, computers, and networks in local, regional, and global organizations. As business evolves to include more distributed work groups, and as work-at-home and outsourcing become even more common, the benefits of Centrex as a communications hub increase. The rapid pace of change in telecommunications technology places a premium on flexibility and network expertise, two key elements of the Centrex service model. Centrex enables a business to keep pace with telecommunications advances and regulatory requirements (with the support of full-time Centrex resources in the service provider's switching office) — but without the constant upgrading, maintenance, and disposal requirements of capital equipment.

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FLEXIBLE, CUSTOMIZED NETWORKING

Nortel Networks Centrex offers a broad portfolio of competitive feature offerings for large and small businesses — at a single location, or multiple, distant locations. It includes products, services, and applications that exploit network resources in almost limitless ways to bring the end user a flexible, customized telecommunications solution without having to worry about housing and maintenance requirements for capital equipment. This flexible platform provides opportunities to integrate other vendors' products into a customized solution that meets unique business needs.

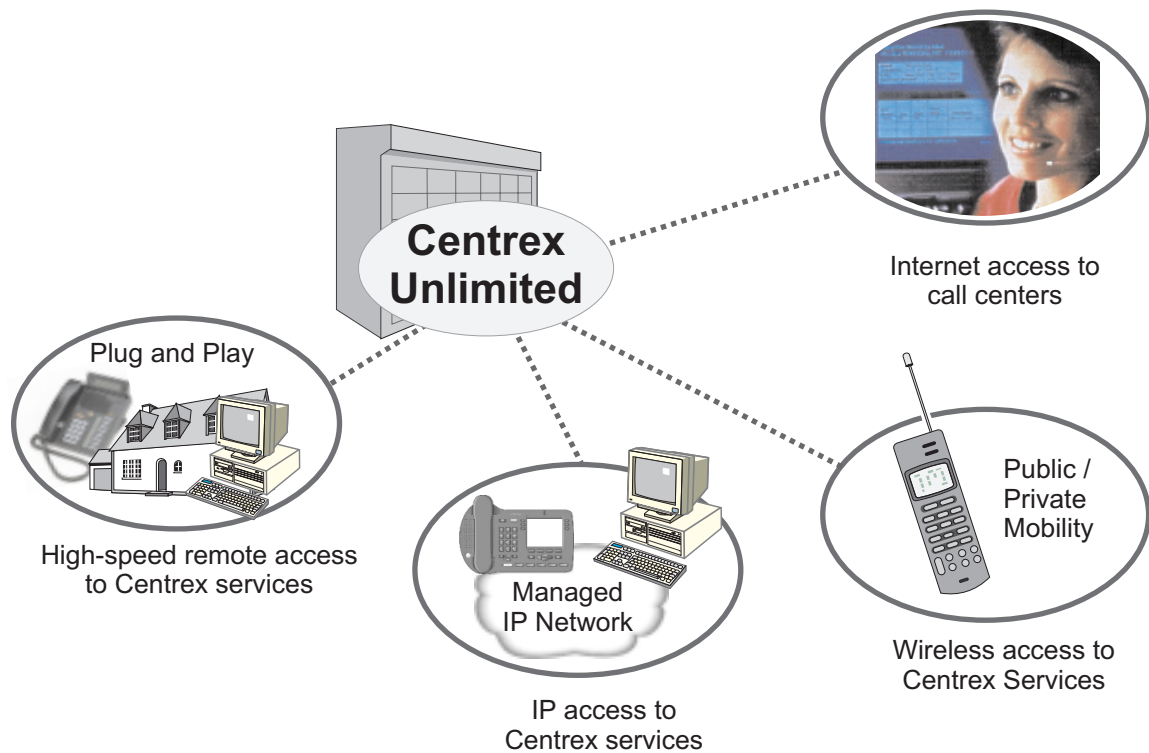
- ◆ **Voice Features.** Centrex subscribers can choose from a large selection of features that help enhance call coverage, improve call handling, and increase the convenience of placing and answering calls. Service providers also benefit from features designed to reduce costs associated with fraud and network management. New scheduled features include Multiple Appearance Directory Number (MADN) Transaction Capabilities Application Part (TCAP) Name, which delivers calling-party names to MADN phones, and Call Transfer Fraud Prevention, which helps companies save money by preventing transfers to unauthorized numbers.
- ◆ **ISDN Services.** Centrex supports a full range of analog and digital data technologies, including ISDN BRI (Basic Rate Interface) as an optional service, providing 128 kbps of bandwidth. ISDN satisfies the data needs of the increasing number of telecommuters, as well as providing telecommuters with access to the main office's voice Centrex services.
- ◆ **End User Management.** Third-party vendors work with Nortel Networks to provide an end user and service provider management platform for delivery of Centrex services via interfaces to the DMS system. These vendor services include adds/moves/changes, Station Message Detail Recording (SMDR), and operational measurements — with near real-time updates.

CENTREX UNLIMITED

Today, business is not done in the usual way. Taking advantage of new networking technologies and speeds, the number of telecommuters, road warriors, and people who bring work home after hours is growing every day. People who work outside the traditional office need to have the same voice and data capabilities as main-office workers — and the ability to take those capabilities wherever they go.

To provide solutions for these new business situations, Nortel Networks presents Centrex Unlimited. Centrex Unlimited combines the rich feature set of DMS SuperNode Centrex with the radical new access capabilities of managed IP networks and wireless technologies. This Unified Networks solution for Centrex users combines IP telephony, integrated wireless

Centrex, Internet-enabled call centers, and 1-Meg Modem data access for communications anytime, anywhere. The Centrex Unlimited solution delivers familiar desktop business services through one phone number, by wireline call, IP call, or wireless.



Unified Networks Solution for Communications Anytime, Anywhere

Centrex Unlimited services include:

- ◆ Centrex IP — Uses an integrated DMS IP Gateway to support up to 50,000 users, mixing traditional Centrex and Centrex IP in the same customer group.
- ◆ 1-Meg Modem — Easily-deployed voice and high-speed data bundle.
- ◆ DMS-100 Integrated Wireless Centrex — Extends Centrex dialing plans and features to “twinned” wireless phones.
- ◆ Internet Enabled Call Centers — Allows users to interact with call centers by email, fax, and voice.

WHY OFFER CENTREX SERVICES?

There is a proven and growing demand from business for managed services — the highest value network service you can offer in a competitive and deregulated telecommunications marketplace. Nortel Networks Centrex is the benchmark, offering a comprehensive portfolio of telephony and business services solutions, with marketing and operational support services that help ensure easy market entry and business success.

The benefits to service providers of offering Nortel Networks Centrex services include:

- ◆ Centrex adds value to the relationship between the service provider and the customer. When you are able to provide tailored services for a business, you learn what's important to that business. With an established partnership, providers can then offer other services to help their customers succeed, such as long distance or virtual private networks.
- ◆ Once a switch has Nortel Networks Centrex software, providers can offer Centrex services to additional businesses served by that switch at little additional cost, increasing revenue opportunities for providers.
- ◆ Because Centrex is a value-added service, providers can compete on service and feature offerings, not just on price. Centrex customers lease the service and don't purchase equipment, so the service element adds value and enables differentiation.
- ◆ A long-term relationship between a service provider and a customer will provide higher revenue than is available from a commodity trunk circuit.
- ◆ Nortel Networks Centrex offers more than 350 features and services — key features are packaged in blocks for easy deployment.

THE NORTEL NETWORKS CENTREX LIBRARY

The Nortel Networks Centrex Library (formerly called the Meridian Digital Centrex Library) is a comprehensive listing of all generally available Centrex features that we offer on the DMS system. With detailed descriptions of voice, automatic call distribution, ISDN, and data software, the Centrex Library is a great resource for Centrex service providers, end users, or anyone who wants to learn about this powerful and flexible offering. The Centrex Library is available on the Nortel Networks Web site for convenient, anytime access.

Centrex features online

View our Centrex Library on the Web:

<http://www.nortelnetworks.com/mdc>

NEW NORTEL NETWORKS CENTREX FEATURES

MADN TCAP NAME

MDC00066

Extends Centrex TCAP Name Delivery to include Multiple Appearance Directory Number (MADN) lines.

MADN TCAP Name

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Currently, appearances sharing MADNs do not support the Transaction Capabilities Application Part (TCAP) name delivery feature. With MDC00066, all MADN members can enjoy TCAP name display capabilities.

Technical reference: 59005587

PRINCIPAL BENEFITS

As an incremental expansion of the Nortel Networks Centrex portfolio, now the many attractive benefits of TCAP Name Delivery can be extended to appearances sharing directory numbers. With MADN TCAP Name, the caller's name is delivered on the MADN instead of just the telephone number, providing the subscriber with additional information on incoming calls.

MAJOR DEPENDENCIES

Software: MDC00024 TCAP Name Delivery

HUNT LINE OVERFLOW TO DN EXPAND

MDC00067

Expands the number of digits to define a Hunt Line Overflow to DN destination from eleven to thirty to support Long Distance, toll-free, and international options.

New Hunt Line Overflow to DN Expand

LEC00013, LET00013, LLT00013

KEY CAPABILITIES

The Hunt Line Overflow to Directory Number (LOD) feature enables a call to be directed to a specified DN when all lines in a Hunt Group are busy. This specified DN can be outside the customer group, and may, in many cases, be at a remote location in a different serving area.

This optional software enhancement expands the LOD DN's maximum length to thirty digits, easily accommodating 9+1+NPA+NXX-XXXX and a range of international dialing options. This applies to all hunt group types compatible with LOD (specifically DLH, MLH, and DNH) for RES, IBN, M5XXX, PSET, and ISDNKSET line types.

Technical reference: 59013034

NEW NORTEL NETWORKS CENTREX FEATURES, *continued*

PRINCIPAL BENEFITS

The current maximum length for the LOD DN, eleven digits, made it difficult for the redirected LOD call to be long distance, toll-free, or international without workaround provisioning. Expanding the upper limit to the LOD DN digit length to 30 digits significantly simplifies the provisioning of LOD calls. This expansion also extends to Key Short Hunt (KSH) overflow DN digits.

MAJOR DEPENDENCIES

Software: MDC00003 Meridian Digital Centrex Standard

CALL TRANSFER FRAUD PREVENTION

MDC00069

Helps prevent loss of revenue from fraudulent call transfer operation.

New Call Transfer Fraud Prevention – Centrex

LEC00013, LET00013, LLT00013

KEY CAPABILITIES

The Call Transfer Fraud Prevention (CTFP) feature helps limit fraudulent use of existing call transfer functionality by enabling the service provider to define limits to call transfer through:

- ◆ **Dial plan screening.** This capability validates outgoing and incoming portions of the call transfer against the dial plan and call code restrictions in a new Dial Plan Screening (DPLNSCRN) table. If either party is invalid, this feature drops the call when the controlling party attempts a call transfer. Dial Plan codes that can be restricted include:

Dial Plan Codes and Associated Dial Plans

Code Category	Dial Plan Examples
Feature Group B	1+950+WXXX
Carrier cut-through	101+ Carrier Identification Code
Intertoll, Intratoll	Toll calls (all types), including the translation of a Speed Call code
Coin	A DN that is a coin line on the same switch as the CTFP feature
Digit Sequence	Pre-translation digits (such as 1-800 or 911), or Post-translation digits (such as NPA or NPA-NXX)
International Direct Dial	011+ international calls (end-to-end ISUP signaling needed)
Operator Assisted	0+/0-, 00-, 01+ (end-to-end ISUP signaling needed)

- ◆ **Call transfer throttling.** This capability regulates the number of times the controlling party can initiate valid call transfers over a given time period. So, even if a call passes the dial plan screening, it must still be checked against the Call Transfer Fraud Prevention Information (CTFP_INFO) office parameter in the Office Engineering (OFCENG) table. In CTFP_INFO the service provider can specify the time period and number of permitted transfers at any station through:
 - The DURATION field, specifying a time period between 30 and 240 minutes.
 - The MAXTRANSFER field, specifying between 1 and 30 transfers (or a “zero” to disable the throttling on an office-wide basis).

Technical reference: 59011902

PRINCIPAL BENEFITS

An unscrupulous user of a site’s telephone facilities can enable an external party to bypass toll charges through the unauthorized use of call transfer, resulting in lost revenue and expensive fraud investigations for the service provider.

MDC00069 is a software-based safeguard that enables the service provider to significantly reduce this type of fraudulent activity — while maintaining call transfer functionality to those customer groups where (and when) the feature is required. For flexibility and reduced provisioning time, the service provider can customize the CTFP service either:

- ◆ As office-wide parameters that can be disabled on a line-by-line basis.
- ◆ As unique parameters set on a customer group basis.

This software is also available for the residential and home-office markets with order code RES00095, described on page 170.

MAJOR DEPENDENCIES

Software: MDC00003 Meridian Digital Centrex Standard

CENTREX TERMINALS

TERMINAL RECORD EXPANSION UNIT (TREX)

The new Terminal Record Expansion (TREX) unit from Nortel Networks introduces the basic features of computer telephony integration (CTI). Designed to work with Meridian Business Set (MBS) and MBS II phones, the TREX provides basic call management and helps increase productivity.

TREX provides basic CTI between Centrex terminals and personal computers, acting as an interim step to let the telephone and computer work in concert as a single, flexible communications tool. Using CTI with TREX is the first step in rethinking how to handle everyday calls. As a bridge to more advanced capabilities, TREX provides screen pops, call logs, and message waiting indication — all appearing on a PC screen.



TREX Enables MBS Phones to Perform Basic CTI Functions

Feature Highlights:

- ◆ Provides entry-level CTI functions, such as screen pops and call logs
- ◆ Displays message-waiting indicators on the TREX unit or on the PC screen
- ◆ Functions as a call management tool — sorts call records and documents pertinent call information
- ◆ Provides screen pops for incoming and outgoing calls, log scroll, call timer, and comment entry
- ◆ Documents pertinent information in call comments, with search capabilities. Call parameters can be defined and edited.
- ◆ Provides the following call log functions:
 - Records incoming and outgoing call numbers
 - Records call time, date, and duration
 - Provides up to 2000 name and number call record logs
 - Permits comments to be added to records
 - Supports multiple lines (used with Centrex auto-displayed)
 - Enables logs to be sorted and exported
- ◆ Message waiting indication tracks messages on the MBS phone, and provides alerts on the TREX unit and on the PC.

MERIDIAN BUSINESS SET II

The M5000 Series of Meridian Business Sets is a comprehensive line of featured voice terminals offering solutions for business. MBS II offers improved styling, high quality, and additional features. The portfolio includes the M5316 high-end terminal with display, 16 line or feature keys, handsfree, and the capability to add up to two Meridian Mate 22 units. Other members of the portfolio include the M5216, recommended for Centrex Automatic Call Distribution (ACD) and answering position application, the M5208, with display capabilities, and the M5008, that provides eight system-programmable keys for feature or directory number access.



The M5316 Terminal Introduces Enhanced Styling and New Features

Key enhancements on the MBS II include:

- ◆ Additional line and feature keys for the M5316 and M5216
- ◆ Local feature keys for M5316 and M5216 set customization:
 - Local time and date display
 - Call timer
 - Save name and number redial capability
 - Program key for user control of set characteristics such as:
 - Alerter volume
 - Predial enable
 - Call timer enable
 - Language selection
 - Memory storage
 - Time and date set
 - Enable local features
 - Visual ringing indicator

CENTREX TERMINALS, *continued*

- Larger button keypad
- Loop power for M5008 & M5208

MBS II Terminals — available in ash, gray, and black — require a minimum Rel•12 software load for datafill and additional feature capabilities. The Nortel Networks M8000/M9000 Series terminal portfolios may be revisited in the future in response to market influences. This may include Call Waiting Identification capabilities for the M9000 Series.

MERIDIAN 9000 SERIES TERMINALS**M9316 CW — CALL WAITING DISPLAY HANDSFREE**

The M9316 combines features such as Caller ID and a built-in speakerphone with new advances such as Call Waiting Display for added convenience. Call Waiting Display lets the user prioritize incoming calls and take care of important items first. After the Call Waiting Display alerts the user of an incoming call, the SuperFlash button provides access to the call from multiple extensions. With a three-line, backlit display, more call information can be displayed on one screen, providing easier viewing in various levels of lighting. Also, invisible passwords enable the user to enter personal codes without revealing them on the display screen, for additional privacy and security.

Feature Highlights:

- ◆ Call Waiting display
- ◆ SuperFlash button
- ◆ Three-line, backlit display
- ◆ Invisible password
- ◆ CLASS features including Caller ID
- ◆ One-button access to CLASS, customer calling, or Centrex features
- ◆ Name/number Call Log
- ◆ Personal phone directory
- ◆ Speakerphone
- ◆ Line Release/Hold keys
- ◆ Parallel line jack for extension, fax, or modem
- ◆ Programmable call timer
- ◆ CLASS/voltage/message waiting indication

M9417 CW — CALL WAITING DISPLAY TWO-LINE

The M9417CW combines standard features such as two lines, a 100-name Call Log, and distinctive ringing, with many new advances. Among them is Call Waiting Display, which lets the user prioritize incoming call traffic. Once Call Waiting Display alerts the user of an incoming call, the SuperFlash button provides access to the call from multiple extensions. With a three-line, backlit display, more call information can be displayed on one screen for easier viewing in all lighting levels. In addition, invisible passwords let the user enter personal codes without revealing them on the display screen.

***M9417 CW Offers Two Lines and 100-Entry Call Log*****Feature Highlights:**

- ◆ Call Waiting display
- ◆ SuperFlash button
- ◆ Three-line, backlit display
- ◆ Invisible password
- ◆ CLASS features: Caller ID, Call Directory
- ◆ Two lines
- ◆ 100 name/number Call Log
- ◆ Personal directory
- ◆ Speakerphone
- ◆ Four ringing cadences
- ◆ Line Release/Hold keys
- ◆ Parallel line jack for extension, fax, or modem
- ◆ CLASS/voltage/message waiting indication

Centrex IP

This chapter discusses the new Centrex IP service for the DMS SuperNode system that offers network providers the best of both the TDM and packet worlds. Centrex IP is a next-generation Internet Protocol (IP) solution completely compatible with today's Centrex — with carrier-grade reliability and voice quality. This solution combines all the feature-rich services of Nortel Networks Centrex with the efficiency of merging voice and data on a managed IP network.

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CENTREX IP: CARRIER-GRADE QUALITY

With data traffic growing at ten times the rate of voice, and businesses searching to find a single network structure for all communications, Internet Protocol (IP) networks are the wave of the future — for voice as well as data. The applications for IP telephony in the business environment extend far beyond toll bypass to virtual extensions, multimedia services, unified messaging, and many other revenue-generating services.

While few in the communications industry today dispute the long-term benefits of a service-rich, converged network, both businesses and network providers are concerned about the strategy and pace of change. They would like to realize the projected benefits without wholesale replacement of the current infrastructure, without disrupting day-to-day operations, and without diminishing existing benefits to businesses (such as cost-effective, efficiency-enhancing services) and to providers (such as continued revenue streams).

To accomplish this, network providers are seeking a way to gradually and gracefully consolidate data and voice at the same level of quality, security, and reliability delivered for two decades in the traditional Centrex environment. That solution has now been found with **Centrex IP** from Nortel Networks. The carrier-grade Centrex IP is a next-generation technology completely compatible with today's Centrex — so compatible, in fact, that the two interoperate within the same Centrex customer group, offering network providers the best of both worlds.

A RATIONAL APPROACH TO VOICE AND DATA INTEGRATION

Centrex IP's path to integrated data and voice is an *evolution* — not a *revolution*. For this reason, the DMS system, aggressively evolving as a key element of the new converged network, is the ideal vehicle for migrating Centrex from today's narrowband circuit-switched network to tomorrow's wideband and broadband service-enabling network. Centrex IP is cost-effective, because the mix of IP and traditional Centrex services takes advantage of existing subscriber investments in business sets, LAN equipment, and user training. For the network provider, this new service builds on current DMS system investments without disrupting current revenue streams.

Centrex IP is also scalable. Just as in today's public network, service providers can add one line at a time, and add or change features line by line.

A RICH SUBSCRIBER FEATURE SET — ANYTIME, ANYWHERE

With transparent public network and private network access, Centrex IP interworks with today's telephones and Centrex services. This solution provides a personalized business service profile that follows subscribers anywhere — with the same phone number and feature set on IP or public network calls. With Centrex IP, road warriors and telecommuters can dial into corporate IP networks from anywhere — whether it's home, the branch office, an airport, or hotel. Now, wherever users go, they benefit from an extension of their office phone, with services that can include LAN data connectivity, voice mail, corporate dialing plans, and productivity features such as Call Forwarding, Conference Calling, Calling Line ID, and Message Waiting.

Centrex IP is designed for today's global, highly collaborative approach to business. By combining data and voice, this service opens the door to new integrated applications, such as multimedia conferencing, unified messaging, file sharing, and whiteboarding.

STANDARDS-BASED DESIGN

To streamline the migration to data-optimized networking, Nortel Networks goes the extra mile to integrate industry standards as they become defined, offering a Centrex IP solution that is based on global ITU and industry standards. Our solution conforms to H.323 network specifications, with support for emerging standards, including:

- ◆ H.225.0 and H.245 — call control (H.323 v2)
- ◆ H.323+ — supplementary services and access to Centrex services

The H.225 and H.245 standards provide call setup and call signaling specifications. H.323 calls for an H.245 channel to be established in one of two ways — either 1) after the H.225 call signaling channel has been established or 2) within the H.225 channel, using the Fast Connect parameters specified in H.245. Nortel Networks has taken the second approach, using the Fast Connect parameters.

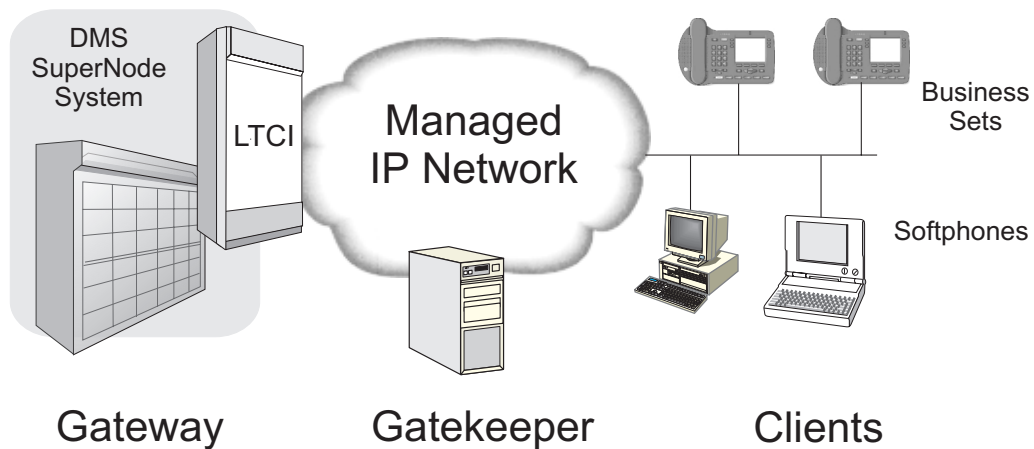
In addition, codec (coder/decoder) converters align with industry standards, including:

- ◆ G.711 — 64 kbps (kilobits per second) standard
- ◆ G.723.1 — 5.3 kbps and 6.3 kbps standards
- ◆ G.729A — 8 kbps standard

Codecs provide compression of the call stream to enable greater throughput using narrowband facilities. Nortel Networks offers several standard codec protocols to allow a larger pool of end devices, such as IP phones, to communicate end to end. During call setup, the negotiation of end points includes an agreement on which codec to use during the call. The codec protocols must match on each end point for successful call completion.

CENTREX IP BUILDING BLOCKS

Centrex IP follows the H.323 network model, with gateways, gatekeepers, and various client devices populating the network. These elements are discussed in the following subsections.



Centrex IP Architecture Follows the H.323 Network Model

▶ GATEWAY

The Centrex IP Gateway resides in a new Line and Trunk Controller for ISDN (LTCI), a DMS system peripheral. The robust, reliable DMS system serves as a bridge between the public and IP networks, giving the gateway access to IP traffic. A new gateway circuit pack, that packetizes calls with Digital Signal Processing (DSP) codecs, plugs into any trunk slot in an LTCI having the NT6X0240 backplane. Each LTCI can host up to ten gateway cards, two of which are recommended as hot spares for failover. Each gateway module can support between 240 and 512 subscribers, with the actual number depending on the provider's traffic engineering preferences. Standard Ethernet 10BaseT/100BaseT interfaces multiplex the packetized calls for transport to a managed IP network.

Because it is standards-based and uses the DMS system as a gateway, Centrex IP offers carrier-grade reliability and voice quality.

▶ GATEKEEPER

A gatekeeper provides critical addressing, security, authentication, and bandwidth management services. In addition, it coordinates voice services with the DMS SuperNode and standards-based multimedia signaling with the IP network. The Nortel Networks solution runs under the Microsoft Windows NT operating system and operates on a variety of hardware platforms at a range of processor speeds. The provider's hardware selection should be based on redundancy and standards requirements.

CENTREX IP BUILDING BLOCKS, *continued*

▶ **CLIENTS**

Centrex IP supports Business Set and Softphone clients.

- ◆ **Business sets** deliver traditional functionality. Current support is for the new i2004 Internet Telephone from Nortel Networks.



The Nortel Networks i2004 Internet Telephone provides a wealth of next-generation handset capabilities

The Nortel Networks **i2004 Internet Telephone** provides a wealth of next-generation handset capabilities, including:

- Carrier-grade voice quality
- Multiple voice codecs for narrowband transmission
- Automatic negotiation on call setup
- Headset and hands-free speakerphone capability
- Large, multi-field LCD display screen, with calling name and number support
- Context-sensitive soft-keys for feature flexibility
- Six special-purpose keys for access to new services
- Support for multiple lines, multiple appearance directory numbers (MADN), and message waiting/additional call offering

The i2004 operates behind the terminal proxy server (TPS) in the end office. It communicates with the TPS using the publicly available UNISTIM (Unified Network IP Stimulus) protocol from Nortel Networks. The TPS communicates with the DMS SuperNode gateway and gatekeeper.

- ◆ **Softphones** (PC-based phone software applications) enable users to communicate without a traditional business set (for example, a mobile user will be able to talk to the home office over a laptop microphone). Softphones operating in the Microsoft Windows environment can support call initiation, call answer, feature activation, and message waiting capabilities. With such rich service possibilities, road warriors and other mobile users can take full advantage of the communications tools built into their laptop computers to connect to Centrex IP services through the managed IP network — regardless of where they are and where services originate.

INITIAL BUSINESS SERVICES SUPPORTED IN CENTREX IP/H.323+

With a large number of Centrex contracts due to renew across North America in the next two years, service providers must be able to promote and maintain subscriber loyalty. The best way to do that is to use Centrex IP to continue to support high-value, high-demand services.

Centrex IP's H.323+ builds on a strong foundation of business services that subscribers feel comfortable with and have come to rely on. For example, the initial release of Centrex IP is planned to support:

- Call Hold
- Call Waiting / Additional Call Offering
- Call Forwarding
 - Universal
 - Intra-group
 - Busy
 - Don't Answer
- Call Park / Call Pickup
- Calling Name Display
- Calling Number Display
- Four-Digit Corporate Dial Plan
- Multiple Appearance Directory Numbers
- Message Waiting Indication
- Conference Calling:
 - Three-Way
 - Six-Way
 - Thirty-Way
- Call Transfer
- Speed Calling
- Automatic Call Back
- Intercom Dialing
- 800 / Credit Card calls

Supported system services include Centrex Group, Automatic Route Selection, Advanced Intelligent Networking, Local Number Portability, and Billing.

SWITCH-BASED CENTREX IP SOFTWARE

CENTREX VOICE OVER IP

CIP00001

Delivers standards-based, carrier-grade reliability and voice quality over managed Internet Protocol (IP) networks.

Centrex Voice over IP

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This order code introduces an entirely new service to the DMS SuperNode system. Centrex Voice over IP delivers carrier-grade reliability and voice quality over managed Internet Protocol (IP) networks. To offer a gradual, graceful migration to the voice-optimized, service-enabled data network, this next-generation technology is completely compatible with today's Nortel Networks Centrex solution.

For example, it offers remarkable flexibility and compatibility, transparently supporting PSTN-to-IP network calls, IP-to-PSTN calls, and IP-to-IP calls — using traditional or IP-enabled phones and Centrex IP applications for the PC. In addition, the service provider can mix Centrex IP and traditional Centrex services and can add Centrex IP members to Centrex groups from anywhere.

Technical reference: 59006459, 59006469, 59008193

PRINCIPAL BENEFITS

Since its path to integrated data and voice is an *evolution*, not a *revolution*, Centrex IP on a DMS-100 / DMS-500 system is the ideal vehicle for migrating from today's circuit-switched narrowband network to next-generation packet-based services.

This new service offers:

- ◆ **Standards-based design.** By adhering to H.323, G.72x, G.711, Q.931, SS7, SNMP, and other established and emerging industry standards, Centrex IP enables providers to migrate from circuit-switched to packet-based services at their own pace, while leveraging existing network investments.
- ◆ **Carrier-grade quality.** Based on the DMS SuperNode and designed to today's voice quality standard, Centrex IP provides carrier-grade reliability and voice quality.
- ◆ **Evolutionary growth.** The new Centrex IP interworks with traditional Nortel Networks Centrex to enable the provider to leverage its existing network investments and customer base. As an entry point for data network services, Centrex IP presents new revenue opportunities for integrated services without disrupting current revenue streams. And Centrex IP is driven with today's operations system interfaces — including operations, administration, and maintenance (OAM) and billing.
- ◆ **Attractive, differentiating solutions.** Centrex IP enables providers to serve customers beyond the reach of classic circuit-switched dial tone. Remote satellite offices can be served from the same DMS SuperNode that serves the corporate customer office. Work-

at-home subscribers and traveling road warriors can access the same feature set available to office-based workers connected to the DMS SuperNode. And Nortel Networks is first to market with a long list of Centrex group features supported by Centrex IP. See the previous subsection for a list of initially supported features.

MAJOR DEPENDENCIES

Software: NI000052 National ISDN-2 Basic Rate Interface Functionality
MDC00001 Meridian Digital Centrex Minimum

Hardware: – New NT7X07AA Centrex IP Gateway cards
– New Line and Trunk Controller for ISDN (LTCl) with NTSX05AA processor,
NT6X0240 backplane, and NTMX76 Messaging circuit pack

OFFBOARD CENTREX IP SOFTWARE

CENTREX IP SERVERS

CIPL0001

Provides packet-based functionality for packet assembly/disassembly, authentication, IP element management, terminal communication, and IP address allocation.

New Centrex IP Servers

[Orderable on CD-ROM]

KEY CAPABILITIES

This order code complements the new CIP00001 functionality (see previous). CIPL0001 provides the packet-telephony side capabilities to complete the delivery of Centrex IP services with:

- ◆ Packet assembly/disassembly functions for the gateway
- ◆ IP network element management from Packet Telephony Manager Server software
- ◆ Registration, authentication, and call signaling from the gatekeeper server
- ◆ IP terminals communication from Terminal Proxy Server software
- ◆ Dynamic IP address assignments from Dynamic Host Configuration Protocol (DHCP) Server software
- ◆ Other elements necessary to access and load the Centrex IP components

PRINCIPAL BENEFITS

CIPL0001 enables the service provider to securely control the IP network to the enterprise point of service. By enabling entry to only designated subscribers, providing logging and quality of service (QoS) views, and mapping subscriber IP addresses to directory numbers, CIPL0001 simplifies the management of the IP side of the Centrex IP service for the network provider. This software provides:

- ◆ **Element Management.** Simple Network Management Protocol (SNMP)-based system management software provides visibility into the devices, software, and processes in the system gateway, gatekeeper, and IP terminals. Alarms and controls provide views of transmission protocols on devices operating in the service provider zone. The use of standard Internet Engineering Task Force (IETF) Management Information Bases (MIBs) is planned to enable the evolution of the management system to also manage standards-compliant third-party network elements.
- ◆ **Client Communication.** The Terminal Proxy Server software processes H.323 requests from the IP terminals, performs admissions control for terminals, and handles H.225+ call signaling for terminal end points.
- ◆ **Security.** Admissions control allows or denies an endpoint's request to access the network based on call authorization and authentication. Authentication is accomplished after subscription is defined on the DMS Centrex IP terminal profile and at the time the subscriber physically connects an IP terminal to the network.

- ◆ **Control and Call Signaling.** The gatekeeper inserts the calling party number into the H.225 SETUP message sent to the gateway and forwards call signaling messages to the endpoints. Call signaling messages for supplementary services will be supported in future releases.

MAJOR DEPENDENCIES

Software: CIP00001 Centrex Voice over IP in the DMS SuperNode system

Hardware: Compaq Proliant CL1850 dual 550 MHz PC

Centrex Internet-Enabled Call Center Solutions

We are a part of an extraordinary turning point — a technology revolution that has ushered in the multimedia age. The most pronounced effect of these new solutions on today's businesses has been its profound influence on consumers. The World Wide Web is exploding self-service, multimedia information dissemination, and electronic business (e-business), while the Internet's email facilities are changing public access, two-way, and person-to-person messaging. E-business is changing the world — and, as a result, the traditional call center is changing as well.

Access and connectivity are what call centers are about. As North America and the rest of the world rapidly shift to the digital storefront, it is the customer's new service expectations that will have the greatest consequences on the call center. No longer confined to processing traditional telephone calls, call centers are evolving into Customer Contact Centers. The successful enterprise will be the one that understands the call center's impact on establishing and building long-term relationships with customers, develops the best understanding of the underlying changes, and acts on them.

The Nortel Networks Centrex Internet-Enabled Call Center portfolio can equip any kind of business with the tools for next-generation Customer Contact Centers. These solutions can help improve customer service value — while helping to reduce costs in attracting, securing, and retaining customers.

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THE PORTFOLIO AT A GLANCE

Nortel Networks Centrex Internet-Enabled Call Center Portfolio offers a comprehensive range of products and features so businesses can benefit from state-of-the-art call center operations in a rapidly changing and increasingly competitive business environment.

Call Control	Enablers	Administration, Management, Configuration, & Reporting	Applications	Agent Desktop	Symposium Centrex Professional Services	Symposium Centrex Partners Program
• Centrex ACD	• Centrex ACD	• CCMIS for Centrex ACD and Network ACD	• Agent Screen Pops	• MBS phones	• Business Consulting	• Co-marketing Contracts
• Skills-Based Routing	• ICM Link		• Visual Web Integration	• Liberation Headsets	• Implementation	• Nortel Networks Order Process
• SkillSet Routing	• TAPI Driver	• Mini MIS	• Web Server	• Wallboards	• Support	• Nortel Networks Tested
• Symposium Call Center Server	• Centrex IP	• Symposium Centrex Call Center Server	• Skills-Based Routing	• Application Screen Pops	• Optimization	• Nortel Networks Triaged
• Time-in-Queue; Position-in-Queue			• Integrated Voice Response	• IVR-Controlled Screen Pops	• Education	• Target Market
• Centrex Network ACD				• Remote Agent	• Design and Development	
				• TAPI Desktop		
				• Web Agent		

MORE ABOUT CENTREX CALL CENTERS

The Nortel Networks Centrex Call Center solutions provide a comprehensive portfolio of products and features to support from basic to advanced applications — a solid portfolio aligned with the business needs of call centers of today and tomorrow.

- ◆ **Centrex Automatic Call Distribution (ACD)** handles large volumes of incoming calls by distributing them equitably among a designated group of answering positions. Multiple directory numbers (DNs) are assigned to a group of answering positions rather than to a single line. Centrex ACD presents incoming calls to the agent who has been idle the longest based on the priority of the call and in the order that they were received.
- ◆ **Centrex Network ACD (NACD)** enables multi-site call centers to be treated as if they were one center. This offering also gives a business added call center advantages with a complete set of features, including system configuration. NACD allows up to 48 groups to be networked into one large group with a maximum of 10,000 agents per switch and 12,000 agents per network. This solution supports work-at-home scenarios throughout the network and makes intelligent decisions about which NACD group will receive a call, helping to manage trunk costs and improving service levels.
- ◆ **SkillSet Routing** uses SuperGroup functionality to help ensure that customers reach the agent with the skills best suited to meet individual needs, whether it's fluency in a foreign

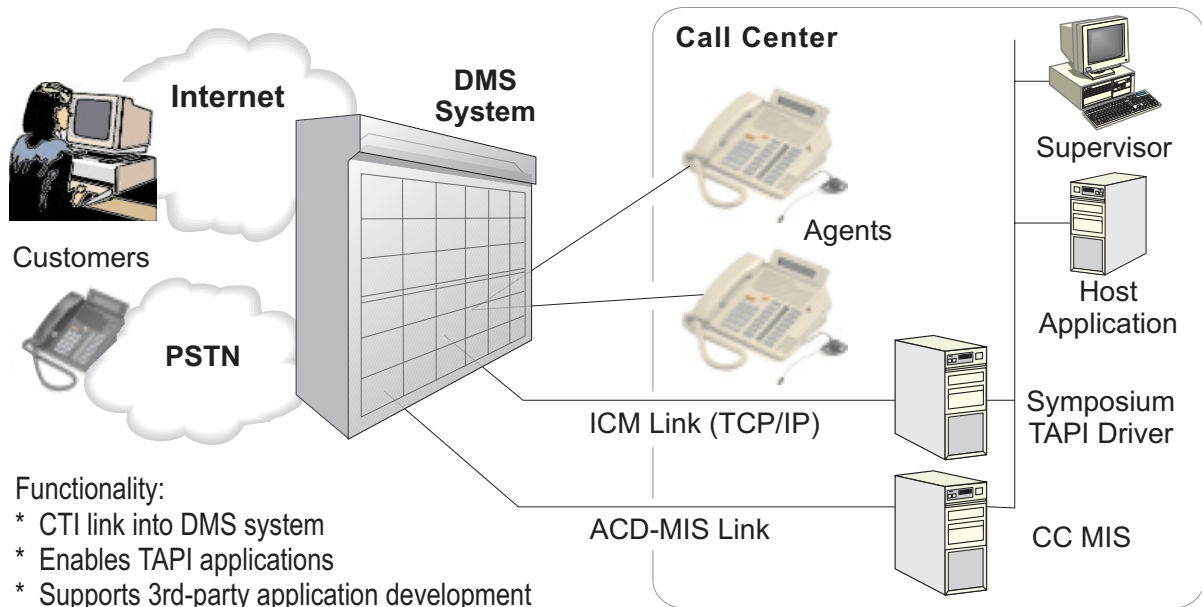
MORE ABOUT CENTREX CALL CENTERS, *continued*

language or expertise in a certain product or other specific area. This feature reduces the need to transfer a caller multiple times and provides more personalized service.

- ◆ **Load Management/Configuration Control** enables a business to quickly and easily view and adjust call center parameters, giving them the power to be more proactive in areas such as traffic control, call queue modification, and staff reassignment. The ability to optimize resources and serve customers faster and more effectively supports the bottom line.
- ◆ **Skills-Based Routing** defines and controls functions such as the logic for call processing, call treatment, call handling, call presentation, making full use of a scalable, client-server architecture to deliver high performance, cost-effective solutions for organizations of any size. Skills-Based Routing automates highly detailed and complex call routing schemes, further adding to the ability of the subscribing business to create sustainable, one-to-one relationships with customers.
- ◆ **Centrex Computer-Telephony Integration (CTI)** provides the power to transform the desktop into a highly flexible multimedia communications center. Centrex CTI merges the capabilities of today's PCs, LANs, and telephone systems, enabling businesses to provide improved customer satisfaction through the delivery of faster, more accurate service from the desktop. Equally important, Centrex CTI applications can help reduce the cost of operating call centers of any size.
- ◆ **Interactive Voice Response (IVR)** automates routine inquiries and other transactions by enabling the caller to communicate with a host computer through touch-tone key presses or voice recognition. This process gives customers direct, confidential access to information and services 24 hours a day. It can also reduce agent call volume significantly — often resulting in substantial offloading of calls. Also available are time-in-queue and position-in-queue announcements.
- ◆ **Intelligent Call Management (ICM) Interface** provides Ethernet TCP/IP (Transport Communications Protocol/Internet Protocol) connectivity between the DMS system and the host computer at the customer premises. Easy to install and maintain, the cost-effective ICM link offers the bandwidth required to support many sophisticated Centrex CTI applications.

Key Internet Call Center Enablers

- **Intelligent Call Management (ICM):** The first Ethernet TCP/IP protocol CTI link into the DMS family of switches. This intelligent link provides an interface between the customer premise-based call center or knowledge worker environment and the telephony service provider's switch. Now customer premise-based applications can interwork with the DMS system to provide call routing, screen pops to the agent desktop, and agent desktop CTI.
- **Symposium TAPI Driver:** The TAPI (Telephony Application Programming Interface) Driver, a 'translator' to TCP/IP, enables third-party developers to write applications for the DMS Call Center environment using the TAPI interface. The Microsoft TAPI interface is a non-proprietary standard incorporated in Microsoft's operating systems.



***A Centrex Internet-Enabled Call Center
 Built on the ICM and Symposium TAPI Driver Enablers***

- ◆ **Outdialing** automatically places outbound calls during agent lulls. When the dialer finds a live prospect, it links the agent immediately. Skills-based routing helps ensure that the most qualified agent receives the call. The feature makes the best use of an agent's time and eliminates unnecessary downtime.
- ◆ **Predictive dialing** helps outbound telemarketers by verifying the availability of agents and the probability of reaching a customer in person to determine the rate to automatically place outbound phone calls. Dialing is automatic, providing increases in efficiency ranging from 70 to 300%.
- ◆ **Agent telephones and headsets** feature ergonomically designed single-line or multi-line phones for fast, convenient access to the Centrex Call Center capabilities. The latest in display technology is built in, including a tiltable, 2-line, 24-character liquid crystal display. Many phones offer headset capability with headsets designed to be as comfortable as they are efficient.
- ◆ **Remote agent capabilities** enable agents to work from off-site locations with the same productivity and customer service as those in the main call center. Agents receive calls and information on their screens just as if they were actually sitting in the call center. Remote agents appear on supervisor screens along with other call center agents, providing integrated monitoring and management.
- ◆ **Call Center MIS (CCMIS)** grows with a business, supporting operations from a small, single location to a 30,000 active agents, in a multi-location network. Businesses can manage their call centers proactively with such features as flexible-interval reporting of historical data and real-time agent and group performance monitoring — on individually customizable

MORE ABOUT CENTREX CALL CENTERS, *continued*

screens. With CCMIS, supervisors can see displays for agent status and queue statistics in real time. This solution also provides historical archiving, profile maintenance, and ad hoc and scheduled reporting.

Incorporating a comprehensive reporting and management package gives more power to optimize a call center's performance. Reporting services can enhance the ability to monitor and control a call center environment by providing the choice of a multitude of options, tailoring the system to meet specific needs. All the business needs to know to deliver the fastest and best customer service is at one's fingertips.

Call center configuration changes can be scheduled or made in real time, and can handle current or forecasted calling traffic. Businesses also benefit from consolidation of real time and historical data across partitions (multiple tenants) or across a CCMIS network, plus much more.

CCMIS Release 4.0 offers the following features:

- Standard features
 - Statistics and Reporting for two secondary agent lines
 - Walkaway code reporting by agent
 - Locate agent function
 - Multi-line/multi-color wallboard support
 - Full Windows support in all modes
 - Time synchronization – between CCMIS and DMS
- Optional features include:
 - Networking capability (up to 20 CCMIS systems/12 DMS switches per CCMIS)
 - Partitioning across the network (multiple tenants)
 - DMS MIS Link Redundancy
 - Variable interval schedule enhancements for reports (0, 5, 10, 15, 30, and 60 minutes)
- ◆ **Wallboards** keep agents informed by enabling supervisors to communicate visually with agents. This often includes letting agents know, at a glance, how many calls are waiting, how long they've been waiting, overall call center productivity, and other customer-critical information. Supervisors are also able to use wallboards to track the status of the call center — even when they are not at their desks.

CCMIS now supports a line of 11 wallboards, ranging from single-color/single-line to multi-color/multi-line display. These can be attached directly to a supervisor's PC or to the CCMIS and daisy-chained for added coverage. In addition, thresholds can be set for various agent and queue statistics to allow an audible alarm, along with the data, to be displayed on the wallboard. CCMIS also has a generic wallboard interface that allows connections to other wallboard systems.

- ◆ **Symposium Centrex Professional Services** tailor communications solutions to fit a company's unique priorities with highly specialized expertise. The Nortel Networks Professional Services staff are experienced professionals who know multimedia communications technology and can match it to address unique business goals. Working with our worldwide network of distributors, our multi-disciplinary team offers one-stop shopping to enterprises of any size, scope or complexity.

Nortel Networks Professional Services include:

- Business consulting
 - Application development and systems integration
 - Implementation services
 - Support services
 - Call center optimization
 - Customized workshops
- ◆ **Symposium Centrex Partners Program** enables Nortel Networks to offer a wide variety of new and complementary call center applications by co-marketing third-party solutions from some of the world's premier multimedia application developers. The Partners Program offers a single point of contact for comprehensive solutions through existing Nortel Networks distributors. This enhances the value of call center investments by providing a broad portfolio of products and services that can improve the way an organization communicates.

MORE ABOUT INTELLIGENT CALL MANAGEMENT (ICM)

ICM, the evolution of CompuCALL, helps end users manage their growing computer-telephony integration (CTI) needs with improved speed and productivity.

ICM enhances the link between the DMS system and the subscriber's computing equipment using an industry-standard Transport Communications Protocol/Internet Protocol (TCP/IP) transport. ICM provides cost-effective, flexible configurations using industry-standard Ethernet technology — replacing the original CompuCALL X.25 transport capability. This new message link supports a number of new benefits and features, detailed on the following pages.

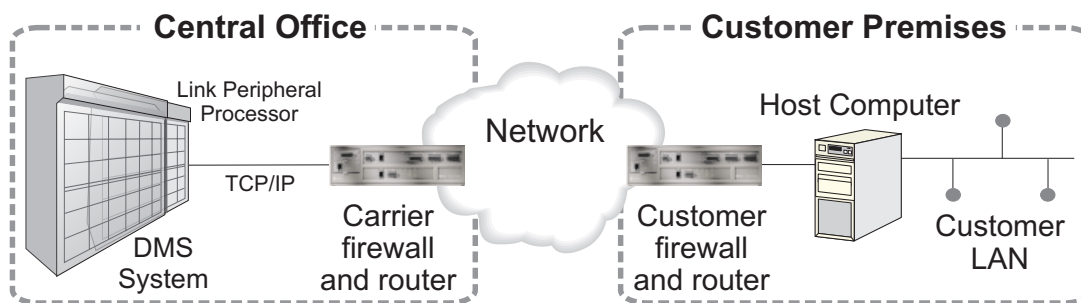
OFFERS A LESS EXPENSIVE, OPEN TRANSPORT

REDUCES FACILITIES COSTS

Intelligent Call Management offers the immediate benefit of a less costly link. Now, the data portion of an incoming call can travel over an industry-standard TCP/IP transport. This flexible link may even involve the Internet or a corporate Intranet for all or part of the connection.

SUPPORTS THIRD-PARTY SOLUTIONS

Use of an open TCP/IP transport introduces the Internet's standard transport-level protocol to Centrex Computer-Telephony Integration. Since many applications depend on TCP/IP for reliable, full-duplex operation for connectionless, best packet delivery service, the new ICM link enables the use of a wide range of applications immediately available on the market.



*Intelligent Call Management Expands
Centrex Computer Telephony Integration (CTI)*

EXPANDS CAPABILITIES AT SITES THAT RECEIVE DMS SYSTEM CENTREX ACD

OFF-LOADS COMPUTING MODULE

The ICM link introduces to the subscriber new local control of call processing. Instead of the DMS system being responsible for all the call processing (including routing and treatments), ICM permits an on-premises host computer to share in the call handling decisions and capabilities. This provides the dual benefits of enhancing subscriber satisfaction with greatly expanded control of their own operations — while at the same time reducing the real time load on the Computing Module in the DMS system.

OFFERS NEW FUNCTIONALITY

ICM enhances existing functionality and offers a number of features, including:

- ◆ Enabling a subscriber's processor to selectively manage call queues, including adding or removing calls from any place in the queue.
- ◆ Permitting the processor to share in the control of routing announcements and treatments.
- ◆ Displaying the use of the Emergency Key feature and recording statistics on its use.
- ◆ Enabling the subscriber's computing equipment to decide where to terminate an incoming call in a networked ACD configuration. The host computer makes the decision based on application data it receives in a CALLID parameter or from the end user's responses to an Interactive Voice Response (IVR) system. This efficiency enables a number of new routing features, such as re-directing calls based on specific skill sets.
- ◆ Allowing each call to be uniquely identified to support interswitch transfers and applications that track call history.

SUPPORTS SITES THAT USE CTI APPLICATIONS FOR LOCAL CALL PROCESSING

The ICM link and ICM TAPI Driver enable any business with a local area network (LAN) to enjoy the productivity gains and cost savings of computer-telephony integration — without the expense of custom development or a private phone system.

Because TAPI-S is an industry standard, call centers have a large pool of TAPI applications and TAPI-application software vendors to select from.

MORE ABOUT CENTREX COMPUTER-TELEPHONY INTEGRATION (CTI)

Centrex CTI integrates the capabilities of PCs, Local Area Networks (LANs), and telephone systems into a powerful and flexible multimedia desktop communications system. Using a variety of network information, including caller identification data and Interactive Voice Response (IVR) input, Centrex CTI applications enable users and agents to access database information about callers and to automate many outbound calling functions.

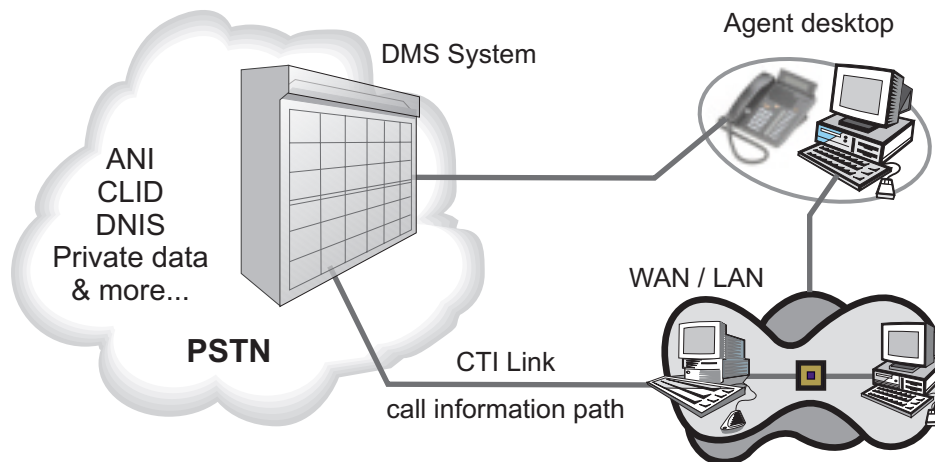
Centrex Call Center and Centrex knowledge workers can deploy a variety of “off-the-shelf,” industry-standard client-server CTI applications based on Microsoft’s Telephony Applications Programming Interface (TAPI).

Today, many new CTI applications are written by a variety of application developers for TAPI environments. TAPI has become a *de facto* industry standard for developing CTI applications.

The Nortel Networks Centrex Automatic Call Distribution (ACD) service was the first Centrex product to support TAPI CTI applications. The ICM TAPI Driver enables developers to write Centrex CTI applications to Microsoft’s TAPI Release 2.1 for Nortel Networks Centrex users with Windows 95, Windows 98, and Windows NT platforms.

ADVANTAGES FOR CENTREX USERS

Using the ICM link, Centrex customers enjoy the productivity and cost-saving advantages of Centrex CTI without having to invest in custom development or an on-premises telephone system. TAPI CTI applications for Centrex customers include personal call-logging, point-and-click directory dialing, and automatic call routing based on user-defined criteria, such as time-of-day or automatic number identification (ANI). Using the ICM TAPI Driver, Centrex customers can automate other capabilities such as “fax-back” and unified messaging (voice, fax, email messages all deposited in a single mail box) — with ICM as the switch interface link.



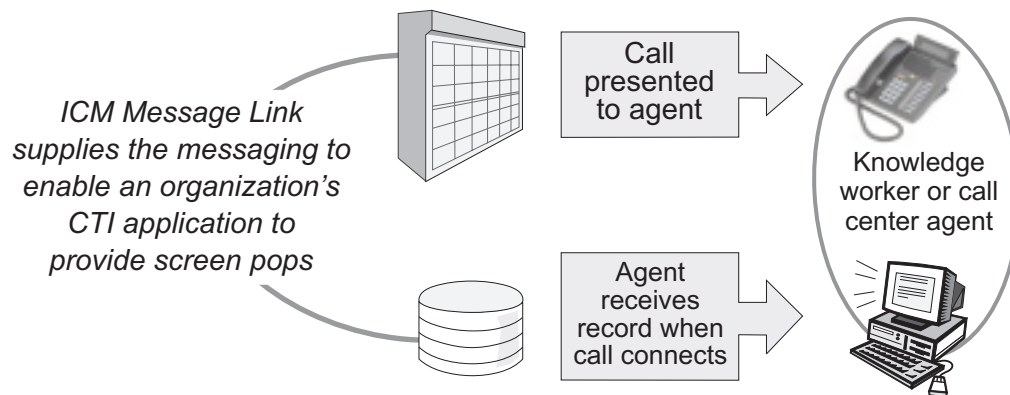
***The Intelligence of the Public Network, Coupled with Customer Resources,
Enhances Customer Service with Lower Operating Costs***

ADVANTAGES FOR CALL CENTERS

A growing number of organizations see the benefits of outsourcing their telephony service requirements and moving to the feature-rich environment of Centrex services offered by their local service provider. Many organizations realize the power of Centrex CTI services, using ICM and the ICM TAPI Driver. The ICM TCP/IP link is the CTI messaging connection to the end customer's computing system.

With Centrex CTI, businesses using call centers, telemarketing organizations, customer service departments, and answering positions can increase productivity and improve customer service through the following capabilities:

- ◆ *Screen displays* of caller information initiated by incoming Caller ID or ANI can save as much as 45 seconds per call.



"Screen Pop" Data Display

- ◆ *Point-and-click dialing* enables call-placement from a directory on a PC or host computer, call answering from a PC screen, and call transfers with a single mouse click.
- ◆ *Intelligent call routing* enhances call center efficiency and customer satisfaction through faster call handling.
- ◆ *Predictive dialing* increases outbound call center productivity by automatically dialing and directly connecting the agent only to the person called — not to answering machines, voice mail, or busy signals.
- ◆ *Internet callback and Internet agents* can provide immediate service to customers ordering from a World Wide Web page.

CENTREX CTI SUPPORT WIDELY AVAILABLE

Known and established worldwide, our global high-value network services can be readily harnessed to support new revenue-generating and productivity-enhancing CTI applications. Centrex CTI, ICM, and Centrex ACD are commercially available services from public network service providers, including many PTT (Post, Telephone, and Telegraph) entities around the world.

MORE ABOUT SYMPOSIUM PRODUCT SOLUTIONS

Nortel Networks Symposium product portfolio affirms the Nortel Networks commitment to provide a feature-rich, solid product and service solution-set for the Centrex Call Center and CTI markets. New applications and services include:

- ◆ CTI and desktop integration
- ◆ Web Server (Symposium Web Response Server)
- ◆ Screen pops (Symposium Agent)
- ◆ Skills-Based Routing (Symposium Call Center Server)
- ◆ Symposium Professional Services

The ICM link introduces new and expanded Call Center and *non*-Call Center functionality. The following offer new capabilities for screen-based telephony, call handling, messaging, and more are available today through the ICM and Symposium TAPI Driver:

- ◆ **Symposium WebResponse Server** — provides routing, real-time management, and reporting of customer-generated messages on the Web. Customers browsing a Web page can use customized pull-down lists and free-form text boxes to send an inquiry. The WebResponse Server stores this message and routes it to the most qualified agent who can process the electronic inquiry quickly and efficiently using the same process as a normal ACD call.



Example of a Transaction Window

- ◆ **Symposium Agent** — a desktop automation solution, brings complete control and the tools the call center needs to deliver superb customer service. Symposium Agent automates data access from multiple databases and places it on custom-designed screen pops that fit an agent's preferences. In an instant, agents can be responsive to customer needs and help resolve issues, introduce new products, and build relationships — instead of spending time collecting customer information. The results can be better customer service, improved employee satisfaction, lower call center costs, and increased revenues.
- ◆ **Symposium Call Center Server** — available early 2000, this client/server-based multimedia application offers advanced and powerful customer-relationship management features for call centers. Running on industry-standard hardware, the Symposium Call Center Server brings new power to customer relationship management by offering advanced skillset routing, call tracking, customizable reports, networking capabilities, multimedia integration, computer telephony integration, and Internet capabilities to handle different types of customer requests. Through the system's customizable, Windows-based screens, managers can monitor and rapidly respond to changing call center conditions. Call center information can be viewed in real time and merged with other data from corporate databases to generate meaningful reports. Its CTI capabilities intelligently interface with host databases, bringing more relevant information to the agent's desktop computer and faster handling of calls. Symposium Call Center also incorporates Internet-enabled applications that seamlessly blend Internet contacts with advanced skills-based routing to send calls to the most qualified available agents.

NEW INTELLIGENT CALL MANAGEMENT (ICM) FEATURES

ENHANCED ICM FUNCTIONALITY

ICM00050

Provides a number of automated call center features for the Intelligent Call Management (ICM) solution.

3-Way Conference Status Report

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This optional enhancement improves how the system monitors and reports on the call status of each of the parties in an ICM 3-Way Conference. Currently, ICM does not indicate when a non-ICM associated party on a 3-Way Conference releases the call or adds parties. With this new enhancement, ICM generates messages whenever a party transfers, releases, or adds to a call already in a conference.

Technical reference: 59006736

PRINCIPAL BENEFITS

This enhancement to ICM00050 reports to greater detail the call history for a call center. With these new ICM messages, complete 3-way call party status is tracked. Detailed messages are provided for party transfers, releases, or additional parties added to a call already in a conference. As a help to customer service tracking, troubleshooting, and agent productivity, reports now include if and when any of the three parties drops from a conference, based on messaging received from the signaling network.

MAJOR DEPENDENCIES

Software: ICM00001 Intelligent Call Management Interface

TAPI Extensions

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This enhancement interworks ICM messaging with the Telephony Applications Programming Interface (TAPI) standard to better report usage of the Call Hold feature. Now TAPI-based applications report when an ICM-associated party puts a call on Hold or releases Hold on a call.

Technical reference: 59006746

PRINCIPAL BENEFITS

By adding more activities to agent monitoring and reports, this feature enables call center managers to have more detailed reporting information, on a per-agent basis, to more effectively track agent productivity.

CALLED PARTY DN IN ICM MESSAGES**ICM00003**

Helps route a redirected ICM call to a specific ACD directory number, based on the original number dialed.

New Called Party DN in ICM Messages

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

This optional software retains a call's originally dialed digits (as received by the ICM incoming agent) even if the call is conferenced, transferred, or redirected through application software. A new parameter (CPADIGS) in ICM messages retains a *Called Party Address* (CPA) as found in ISUP's initial address message (IAM)/subsequent address message (SAM) or equivalent messages in other signaling protocols.

Technical reference: 59011948

PRINCIPAL BENEFITS

With the CPA, application software can identify the destination the caller desires — even in cases of redirection — so it can make intelligent routing decisions to enhance call distribution and call completion within an ACD system.

Since the CPA can be up to thirty digits long, a range of dialed-digit schemes are supported. Also, the CPA can be transported as a new parameter over Network Intelligent Call Management (NICM) links that extend calls from one switch to another.

MAJOR DEPENDENCIES

Software: ICM00001 Intelligent Call Management Interface

NEW INTELLIGENT CALL MANAGEMENT (ICM) FEATURES, *continued***INCREASE ACD GROUPS AND SESSIONS****ICM00002**

Enhances the use of Transport Communications Protocol/Internet Protocol (TCP/IP) connections on the DMS system for ICM links.

New Increased ACD DN Association Limit

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Rel•13 significantly expands the maximum number of ACD DNs that can be associated to a single ICM session from 20 to 100. The network provider can datafill the number of ACD DNs to be associated with ICM sessions through a NUMACDDN parameter (in a new NHASSOC option) in the SCAICOMS table.

Technical reference: 59011953

PRINCIPAL BENEFITS

Now smaller call centers, having only a few agents, can control more ACD groups in a single session. This expansion optimizes agents and facilities, to help small or satellite call centers operate more efficiently and competitively.

MAJOR DEPENDENCIES

Software: ICM00001 Intelligent Call Management Interface

INTELLIGENT CALL MANAGEMENT INTERFACE**ICM00001**

Provides Ethernet TCP/IP connectivity between the DMS system and a subscriber's host computer.

New Increase ICM Sessions

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This optional software significantly expands the maximum supported number of simultaneous ICM sessions beyond the current limit of 16. The new ceiling, 96, actually varies depending on how many other services are also using Ethernet Interface Unit (EIU) resources at the Link Peripheral Processor (LPP), such as Telnet and File Transport Protocol (FTP) sessions.

Technical reference: 59016386

PRINCIPAL BENEFITS

The significant increase in simultaneous ICM sessions enables the network provider to offer ICM functionality to a greater number of different customer sites without new platform hardware investments.

ICM SUPPORT FOR BRI**ICM00075**

Permits CTI applications to report on ISDN Basic Rate Interface (BRI) line activities.

New ICM Support for BRI

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

ICM00075 expands ICM messaging to include ISDN Basic Rate Interface (BRI) lines. This enables CTI applications to receive phone status information and to perform third-party call control functions on ISDN BRI in the same manner now available for other types of business and residential lines.

Technical reference: 59016379

PRINCIPAL BENEFITS

This capability expands revenue opportunities by enabling ISDN BRI lines to interwork with off-switch applications, such as Nortel Networks Symposium products or similar CTI products, in the same way as other types of DMS business lines. This feature also provides the foundation to interface with H.323-based terminals in the future.

MAJOR DEPENDENCIES

Software: ICM00050 Enhanced ICM Functionality

NEW CENTREX ACD FEATURES

INCREASE SECONDARY DNS

ACD00081

Enhances call flexibility by expanding the maximum number of SDNs in a group.

New Increase Secondary DNS

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

Each ACD Group has a single Primary Directory Number (DN) and a list of Secondary DNS (SDN) associated with it. This software feature expands the maximum number of SDNs for any group from a current maximum of 16 to as many as 63, with ACD00001's current four-tier priority options.

PRINCIPAL BENEFITS

This expansion in Secondary DNS associated with each ACD Group enables the service provider to publish more numbers for any group for greater call center flexibility and expanded marketing options.

MAJOR DEPENDENCIES

Software: ACD00001 Automatic Call Distribution Base

NOT READY ON SDN ENHANCEMENT

ACD00082

Simplifies agent operations by automatically activating a Not Ready status on calls terminating on Secondary Directory Numbers.

New Not Ready on Secondary Directory Number Enhancement

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

The current Not Ready on SDN feature, delivered with ACD00001, automatically activates the Not Ready agent status on calls that *originate* on SDNs. ACD00082 expands this feature to also activate the Not Ready agent status on calls that *terminate* on SDNs.

PRINCIPAL BENEFITS

- ◆ By activating ACD Not Ready, this feature prevents new ACD calls from terminating at a set while the agent is still engaged in a SDN call.
- ◆ This optional order code offers the convenience of making an SDN set unavailable to incoming ACD calls without requiring the agent to manually activate the Not Ready status.

MAJOR DEPENDENCIES

Software: ACD00001 Automatic Call Distribution Base

Residential Enhanced Services (RES)

Everyday life has put greater demands on data access and bandwidth. The number of households that telecommute or bring work home continues to multiply. About one-third of North American residences have access to the Internet, changing the way we bank, invest, and shop. With this demand comes the need for more cost-effective bandwidth and more intelligent services to help simplify everyday life.

Market research conducted by Nortel Networks and others has indicated that residential subscribers want better control of their privacy. They want more information about who's calling them before they would interrupt a call in progress or respond to a call they've missed. Because of these factors, the penetration rates of popular services among residential users — Caller ID (30%), Call Waiting (46%), voice mail service (12%) — are at an all-time high in the U.S. market. In Canada, these services also have impressive penetration rates: Caller ID at 41%, Call Waiting at 36%, and voice mail service at 29%.

The research also indicated that residential subscribers are willing to pay an additional amount per month for enhanced versions of services that offer these benefits. At the same time, service providers are coming up with unique revenue-boosting strategies to best fit these services into their networks.

To help make your offerings more compelling, Nortel Networks provides the industry's most extensive and innovative service portfolio. As competition in these market sectors intensifies, our Residential Enhanced Services (RES) solutions offer the power and flexibility to respond quickly and cost-effectively to changing market opportunities.

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New RES Features	165

OFFER MORE FLEXIBILITY AND VALUE

A few of the many benefits of our RES portfolio include:

- ◆ Builds subscriber interest and demand with industry-leading display-based telephony services and powerful call management capabilities.
- ◆ Enhances ease of use to lower barriers to service usage, stimulate growth of services, and increase customer satisfaction.
- ◆ Helps improve call completion with subscriber features for busy/no answer conditions, call waiting handling, and more.

KEY RES FEATURES

DMS system solutions discussed in this chapter include:

- ◆ Know who's calling
 - **Automatic Recall with Name** adds the name of the last caller to the standard Automatic Recall (*69) announcement, which only provides a phone number.
 - **Who's Calling** screens incoming calls by prompting all anonymous callers to record their name or a brief message. The subscriber can then listen to the message and decide whether to accept the call.
- ◆ Handle waiting calls better
 - **Talking Call Waiting** enhances standard Call Waiting by speaking the name of a waiting caller.
 - **Call Redirect** provides two innovative functions. Subscribers can now send calls from telemarketers directly to a pre-recorded message that tells the telemarketer to add the subscriber's name and number to their "do not call" list. This feature also lets residential users transfer a call directly into voice mail, just as they would in an office.
- ◆ Offer solutions for mobility: **Simultaneous Ring and MADN Compatibility** expands the popular Simultaneous Ring feature — which enables a call to a single number ring multiple phones at the same time — by allowing Simultaneous Ring to interwork with standard MADN call-pickup arrangements.
- ◆ Deliver solutions that save money: **Call Transfer Fraud Prevention** (also a Nortel Networks Centrex feature) can help subscribers limit the fraudulent use of Call Transfer by not letting end users transfer calls to certain types of numbers, such as 900-numbers.

NEW RES FEATURES

TALKING CALL WAITING

RES00091

Plays an audible notification of the name of a call-waiting caller when the subscriber is already on a call.

Talking Call Waiting

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Call Waiting is by far the most popular residential service today. Talking Call Waiting (TCW) leverages the proven success of this service and enhances it by providing the name of the call waiting party after the first call-waiting alerting tone. When a waiting call comes in to a Talking Call Waiting subscriber's line, the name of the caller is translated to an audible announcement via the text-to-speech technology provided by an offboard service node platform.

Talking Call Waiting does not alter how end users experience the Call Waiting feature. The TCW subscriber simply flashes the switchhook to answer the incoming call, either during or after the audible announcement of the waiting caller's name. And the subscriber can deactivate TCW — along with Call Waiting — by simply pressing the Cancel Call Waiting access code (such as *70).

While the Talking Call Waiting subscriber hears the tone and calling party name, the other party on the active call hears silence — in the same way as these parties hear interruptive silence during Call Waiting tones today. And, as with Call Waiting, the new calling party only hears ringing tone until the subscriber elects to connect to the new call.

Technical reference: 59007568

PRINCIPAL BENEFITS

This subscription-based feature offers an attractive overlay service on top of the Call Waiting service, already in high demand across North America. Currently, basic Call Waiting provides the subscriber with no identifying information about a new calling party, which can ultimately result in the subscriber answering unwanted calls. By removing the mystery behind the call waiting tone, Talking Call Waiting subscribers can better determine whether they want, or need, to interrupt a current conversation to answer the waiting call. Talking Call Waiting is an attractive offering to both the well-established base of Call Waiting subscribers as well as to potential new subscribers.

MAJOR DEPENDENCIES

Hardware: The Talking Call Waiting software works in conjunction with an offboard service node platform, using text-to-speech technology to translate the name of the calling party from the Name database into an audible name announcement played back to the TCW subscriber.

NEW RES FEATURES, *continued***AUTOMATIC RECALL WITH NAME****RES00089**

Plays an audible notification of the name of the last caller — with the option of returning the call — when the subscriber activates Automatic Recall.

Automatic Recall with Name

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This new service enhances the traditional Automatic Recall (*69) feature by providing the name of the last caller, in addition to the standard announcement of the last calling party's number, and the date and time of the call.

After dialing the Automatic Recall feature access code (*69), the last calling party's phone number is mapped to a name, and an offboard service node platform uses text-to-speech technology to convert this name into an audible announcement. The user then hears an announcement on the order of, "The last call you received was from (name). The last number that called your line was from (number). This call was received on (date) at (time). To call this number, enter 1, otherwise, hang up now."

When Automatic Recall with Name is turned on in an office, it replaces the number-only version.

Technical reference: 59007670

PRINCIPAL BENEFITS

This feature enhances the proven Automatic Recall service by removing the mystery behind the last calling party's telephone number. Often, the number itself is not easy to recognize; matching a name with the number lets the user better determine whether they want, or need, to return the call. As with traditional *69, Automatic Recall with Name can be offered on both a subscription and pay-per-use (PPU) basis, helping increase revenue through new subscribers and occasional users who are attracted to the enhanced convenience and time savings.

MAJOR DEPENDENCIES

Software: RES00005 Non-Display Services

Hardware: Automatic Recall with Name works in conjunction with an offboard service node platform, using text-to-speech technology to translate the name of the last calling party into an audible name announcement played back to the Automatic Recall with Name subscriber.

SIMULTANEOUS RING**RES00081**

Offers a simple and effective “Find Me” service, in real time, for subscribers who are mobile but don’t want to miss important calls.

New Simultaneous Ring and MADN Compatibility

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

The Simultaneous Ring feature enables a call to a single directory number (DN) to ring up to five DNs in multiple locations at the same time; the first phone to go off-hook answers the call. Simultaneous Ring requires that one of these DNs be designated as a primary DN (PDN). The PDN typically is an office landline DN, and one or more of the secondary DNs can be a mobile phone. Currently, the PDN cannot be an office line that is the primary member of a Multiple Appearance Directory Number (MADN) Single Call Appearance (SCA) group — a common configuration for office call-handling arrangements. By allowing Simultaneous Ring and MADN to be provisioned on the same line, this feature lets a MADN SCA DN be the PDN of a Simultaneous Ring group.

Technical reference: 59005798

PRINCIPAL BENEFITS

This feature is especially useful for mobile business subscribers, who can now use the Simultaneous Ring feature with more business lines. Making Simultaneous Ring and MADN compatible expands calling options and increases subscriber satisfaction.

MAJOR DEPENDENCIES

Software: RES00002 Advanced Custom Calling Features

NEW RES FEATURES, *continued***CALL REDIRECT****RES00099**

Provides subscribers with an easy way to forward answered calls to either a voice mailbox or a prerecorded announcement.

Call Redirect

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

The flexible Call Redirect feature introduces two new distinctive services that enable residential customers to transfer answered calls to preassigned destinations.

- ◆ **Sales Blocker.** Residential subscribers can transfer answered, but unwanted, telemarketing calls to an announcement. When an end user receives one of these calls, the subscriber flashes the switchhook and presses a feature access code (determined by the provider). The system automatically transfers the calling party to a prerecorded announcement created by the provider.
- ◆ **Residential Call Transfer.** Residential subscribers can transfer answered calls to voice mail. If a subscriber discovers that a caller wants to speak to a person that is not currently at the premises, then (in place of taking a message that can be misplaced or illegible) the user can have the system transfer the calling party to the intended person's voice mailbox. All the subscriber needs to do is flash the switchhook then press a feature access code (determined by the service provider).

In both cases, the subscriber can either hang up after dialing the access code or wait for treatment to verify the transfer was completed successfully. The service provider determines whether this verification treatment is a tone, an announcement, or a transfer to an external platform.

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Technical reference: 59007494

PRINCIPAL BENEFITS

Call Redirect is two revenue opportunities rolled up into one service. This versatile feature can be used creatively to offer new revenue-generating residential services that were not previously possible. For instance, with Sales Blocker, service providers can relieve customers from having to think of a graceful way to end an unwanted sales call. As a convenient alternative to being rude or abrupt, a simple flash and access code sequence lets an announcement bring the call to a close by indicating the end user's desire to be added to the telemarketer's "do not call" list. The Residential Call Transfer to Voice Mail feature can be bundled with a voice mail package to help retain the current base of subscribers with enhanced functionality, while also helping to attract new voice mail subscribers.

CALL SCREENING, MONITORING, AND INTERCEPT (CSMI)**RES00047**

Enables subscribers to monitor and intercept calls currently being handled by a network-based answering service.

New CSMI Message Enhancement

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Call Screen, Monitor, and Intercept (CSMI), introduced in Rel•5, has been enhanced in Rel•13 to allow the removal of a “stub” message that is generated when the subscriber intercepts a message being left on a Voice Messaging System (VMS). CSMI makes it possible to screen calls coming into a voice mail service, just as you can listen to a message being left on an answering machine. The CSMI subscriber receives a ring splash when a caller enters their VMS. They can then dial a feature access code to monitor the message as it is being left, and if they decide to intercept the message and answer the call, they simply press flash to be connected with the calling party.

Prior to this feature, any messages intercepted by the subscriber were recorded by the VMS until the point of interception — creating a “stub” message. CSMI Message Enhancement removes this extraneous “stub” message from the subscriber’s voice mail.

Technical reference: 59013873

PRINCIPAL BENEFITS

With CSMI Message Enhancement, voice mail subscribers receive notification of new voice mail messages only, and not messages that were intercepted through CSMI. This enhancement brings the best features of an answering machine — being able to intercept messages, along with automatic removal of messages that were picked up in the middle of a call — to voice mail. Call Screen, Monitor, and Intercept is an attractive addition to a voice mail package, encouraging new subscribers as well as helping to retain the current base.

MAJOR DEPENDENCIES

Software: RES00002 Advanced Custom Calling Features

NEW RES FEATURES, *continued***CALL TRANSFER FRAUD PREVENTION****RES00095***Helps prevent loss of revenue from fraudulent call transfer operation.***New Call Transfer Fraud Prevention – RES**

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

The Call Transfer Fraud Prevention (CTFP) feature helps limit fraudulent use of existing call transfer features by enabling the service provider to define a set of limitations to the use of call transfer through:

- ◆ **Dial plan screening.** This capability validates outgoing and incoming portions of the call transfer against the dial plan and call code restrictions in a new Dial Plan Screening (DPLNSCRN) table. If either party is invalid, this feature drops the call when the controlling party attempts a call transfer. Dial plan codes that can be restricted include:

Dial Plan Codes and Associated Dial Plans

Code Category	Dial Plan Examples
Feature Group B	1+950+WXXX
Carrier cut-through	101+ Carrier Identification Code
Intertoll, Intratoll	Toll calls (all types), including the translation of a Speed Call code
Coin	A DN that is a coin line on the same switch as the CTFP feature
Digit Sequence	Pre-translation digits (such as 1-800 or 911), or Post-translation digits (such as NPA or NPA-NXX)
International Direct Dial	011+ international calls (end-to-end ISUP signaling needed)
Operator Assisted	0+/0-, 00-, 01+ (end-to-end ISUP signaling needed)

- ◆ **Call transfer throttling.** This capability regulates the number of times the controlling party can initiate valid call transfers over a given time period. Thus, even if a call passes the dial plan screening, it must still be checked against the Call Transfer Fraud Prevention Information (CTFP_INFO) office parameter in the Office Engineering (OFCENG) table. In CTFP_INFO the service provider can specify the time period and number of permitted transfers at any station through:
 - The DURATION field, specifying a time period between 30 and 240 minutes.
 - The MAXTRANSFER field, specifying between 1 and 30 transfers (or a “zero” to disable the throttling on an office-wide basis).

Technical reference: 59011902

PRINCIPAL BENEFITS

This optional feature helps prevent an unauthorized telephone user from enabling an external party to bypass toll charges or caller identification through call transfer. This software is also available for the Nortel Networks Centrex business market with order code MDC00069, described on page 130.

MAJOR DEPENDENCIES

Software: RES00002 Advanced Custom Calling Features

GENERIC NAME PARAMETER**RES00096**

Resolves interaction issues with other-vendor switches for delivery of the CLASS Calling Name Delivery feature.

New Generic Name Parameter

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

The Custom Local Area Signaling Services (CLASS) feature Calling Name Delivery (CNAMD) delivers a calling party's name to the CPE of a CNAMD subscriber. Currently, to deliver this feature, the DMS system uses proprietary Party Information Parameter (PIP) messaging. Other-vendor switches use Generic Name (GN) parameters for this messaging.

This feature enables a DMS system to send and receive a calling party's name in the GN parameter of the Integrated Services Digital Network User Part (ISUP) Initial Address Message (IAM). With this ability, the DMS system will be able to send and retrieve CNAMD information in concert with other-vendor switches.

Technical reference: 59013088

PRINCIPAL BENEFITS

This feature resolves interaction issues between systems in the U.S. and in Canada, enhancing the CLASS CNAMD feature to comply with current Telcordia standards. Allowing the DMS system to deliver calling party names to other-vendor systems will also increase subscriber satisfaction by making available more information about calls.

MAJOR DEPENDENCIES

Software: RES00003 Display Functionality and Privacy

Hardware: Customer premises equipment with display capabilities is required to receive and display the incoming information.

NEW RES FEATURES, *continued***WHO'S CALLING****RES00094**

Enhances Caller ID by screening all anonymous calls to a subscriber's line and providing various disposition options for handling the call.

New Who's Calling

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

Who's Calling is a service that screens incoming calls to a subscriber's line before the telephone rings. With Who's Calling, all calls from numbers that are marked "unavailable," "blocked," "private," and "out of area" are intercepted and sent to an offboard service node platform. This offboard platform prompts the caller to record their name or a brief message, and only upon receipt of this recording will the subscriber's telephone ring. The service node then plays that recorded information to the Who's Calling subscriber, who is then presented with a number of options for handling the intercepted call, including:

- ◆ Accept the call.
- ◆ Refuse a telemarketing call. The service node plays an announcement back to the caller requesting that the subscriber's name and telephone number to be added to the telemarketer's "Do Not Call" list.
- ◆ Reject a call. The service node plays an announcement back to the caller stating that the person they are calling is unavailable and to try calling back later.
- ◆ Send the call to voice mail.

Technical reference: 59012655

PRINCIPAL BENEFITS

With Who's Calling, Caller ID subscribers no longer receive anonymous calls. Approximately one-third of incoming calls are unidentified, and the majority of these are from telemarketers. RES00094 significantly reduces the number of unwanted disturbances: market trials have shown that approximately 70% of callers will hang up when prompted to record their name or a brief message.

Who's Calling addresses the growing demand for more intelligent call management through enhanced caller identification. With Who's Calling, the subscriber may accept, reject, or even send a call to voice mail based on the caller's identification and the subscriber's preference.

MAJOR DEPENDENCIES

Hardware: Who's Calling software works in conjunction with an offboard service node platform, responsible for prompting the unidentified caller to record their name, as well as playing back the respective announcements to both the subscriber and calling party.

DMS-500 Long Distance Services

The DMS-500 Local and Long Distance system is a DMS SuperNode application that combines local services of the DMS-100 switch, toll and operator services of the DMS-100/200 Traffic Operator Position System (TOPS) portfolio, and Long Distance services of the DMS-250 system. In addition to the trunk connections supported by the DMS-250 switch, the DMS-500 system delivers all line types currently supported by the DMS-100 system for residential and business applications.

The DMS-500 system is a total solution with one of the industry's most application-rich portfolios of carrier services loaded with major capabilities that are market-ready today. These include local services, Long Distance services, call center services, operator services, data services, and more. And, as part of the Nortel Networks Succession Solutions plan, the DMS-500 system is uniquely positioned for the evolution to data-centric communications.

The descriptions of new *Local* features in LLT00012, LLT00013, and LLT00014 PCLs appear throughout this document. This chapter discusses the DMS-500 system as a whole — and then details new *Long Distance* features.

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COMPETITIVE ADVANTAGES

The DMS-500 system offers the following benefits to the service provider:

- ◆ **Accelerated delivery of new features** to quickly generate new revenue through new services, new markets, and new end-to-end telephony offerings. This full-featured Local and Long Distance system delivers revenue opportunities on both sides of the switching business.
- ◆ **Easy growth to match market needs** with a modular, scalable system architecture. Network providers can add processing capacity, memory capacity, trunk capacity, and services — as they are needed. For example, a DMS-500 system can easily grow from a relatively small configuration to 100,000 ports through incremental additions. Enhanced processors, additional switching matrices, peripherals, and trunk cards can be added without redesigning the system or interrupting service.
- ◆ **Maximum market flexibility** for service providers:
 - Selling or reselling Long Distance services
 - Operating with or without operator services
 - Offering business and residential line services
- ◆ **Lower costs and higher operational efficiencies** gained in combining DMS-100/200 and DMS-250 system services:
 - Reducing front-end hardware requirements
 - Reducing office site and environmental requirements
 - Centralizing operations, administration, maintenance, and provisioning (OAM&P)
- ◆ **Expanded pre- and post-sales service support** to build a network, train the staff, and operate the network, if needed
- ◆ **Multi-vendor network operability** with the DMS-500 SuperNode system's open architecture.

THE CHANGING LONG DISTANCE MARKET

The convergence of regulatory, technology, and market forces is opening up new opportunities for shares of the multi-billion-dollar Long Distance market. Today, this industry is served by widely divergent types of enterprises — from the full-service carrier that owns its own nationwide network to the reseller who offers customers a discounted price on services it buys from others and delivers on leased facilities. The Nortel Networks DMS-500 switching system offers widely divergent types of network providers new opportunities for profitability and growth in this era of heightened competition. These providers can be:

- ◆ **“Facilities-based” carriers** tend to own almost all of their own network facilities (such as switches, transmission systems, and special access lines). Their own business offices manage their accounts, provide customer service, and bill subscribers.
- ◆ **“Switchless” resellers**, sometimes known as “true resellers,” lease network facilities to provide Long Distance services. From the subscriber’s perspective, these companies look like Long Distance companies (as they market and sell services branded with their name) but, in fact, they are reselling a carrier’s switching, access, transmission, and billing systems.
- ◆ **Wholesalers**, also known as “aggregators,” do not own or lease Long Distance facilities; they simply resell volume blocks of Long Distance service provided and billed by others.

The wholesale market gave rise to a new type of Long Distance company, the “carriers’ carrier”, that builds extensive fiber optic and microwave circuits primarily to sell to other carriers, rather than to retail to end customers.

BUSINESS CONSIDERATIONS

The question is whether it is advantageous to serve as a carrier — owning and controlling its own switches — or as a reseller, capitalizing on facilities provided by other companies. Here are some considerations that weigh into this decision:

- ◆ **Network costs.** Carriers that own their own switches and transmission systems are in control of operating costs. In addition, as new technologies become available to reduce operations costs — such as improvements in access and transmission systems, and centralized network management systems — the savings can be seen immediately. Carriers that rely on others to provide facilities may or may not see these savings passed along in lease rates. Consider that for switchless resellers, network acquisition and management costs (which can represent 60 to 70 percent of total costs) are determined and controlled by a third party that is also likely to be a competitor in the retail market.
- ◆ **Features.** Network features, such as sophisticated new calling capabilities, are controlled by the network provider. Carriers that own their own switches determine which features to purchase, based on their own knowledge of their customers. Given that many sales are won or lost on features and feature flexibility, providers would be hard-pressed to offer a competitive edge when they do not control the set of features they could offer. Resellers that don’t own the switches are also unlikely to be invited into the feature design process.

THE CHANGING LONG DISTANCE MARKET, *continued*

- ◆ **Customer information.** The organization that owns the Long Distance switch and billing system also has the customer information it produces, including name, number, billing data, and usage trends. The billing data produced by switches is extremely valuable input for target marketing programs. Which customers bill more than \$1000 a month in Long Distance calls? Which ones are candidates for more sophisticated services or a new bundling of services? Which business customers are new or have grown more than 25 percent in the last three years? For switchless resellers, this kind of information is in the hands of a carrier who could also be a competitor.
- ◆ **Fraud.** Typically, the reseller that does not own its own Long Distance switch is responsible for the costs of fraudulent use of the phone system — over which it has no control. On the other hand, carriers that own their switches can implement fraud prevention systems to control or eliminate this cost.
- ◆ **Quality.** The provider that owns and maintains a switch has the control and responsibility over its quality of service. In the event of a service problem, customers may become aware that the service is not actually provided by the “branded” carrier but by another carrier. In this case, customers may question whether they should be getting their service directly from the carrier that owns the facilities.
- ◆ **Brand identification.** Whether the carrier owns its own switches or procures switch services from another carrier, it is essential that the call be “branded” appropriately. When Long Distance customers reach directory assistance and recorded announcements, for example, they should hear the name of the company selling the service — which might or might not be the company that owns the switch. The technology is available to have switches and audio processing platforms brand calls for different carriers, but the control for implementing this capability correctly will rest with the carrier that owns the switch platform.

WHY SELECT THE DMS-500 SYSTEM?

Competition in the Long Distance market is aggressive. Price discounting, prevalent through the 1980s, has given way to brand recognition and market differentiation. Since divestiture in 1984, Long Distance revenues continue to show strong growth. Carriers are investing heavily in promotion and advertising, service customization, and international expansion in order to continue the high growth levels they previously experienced. New entrants will fuel higher levels of competition based on price, branding, differentiation, and niche marketing.

The successful interLATA and international Long Distance carrier provides these services, all available with the DMS-500 system:

- ◆ **Service parity with the big players.** At a minimum, new entrants are expected to offer 1+ outbound, toll-free, and calling card services — all with operator backing. The DMS-500 platform provides all these services, including the world's most widely deployed operator services system.
- ◆ **Differentiating services.** The DMS-500 system offers an impressive portfolio of enterprise network services, information database services, data and video services, custom dialing plans, and trunk routing capabilities — the tools for competitive differentiation.
- ◆ **Speed to market.** Success can depend on a close partnership with a key supplier, such as Nortel Networks, that has the experience, resources, and financing necessary to support rapid business launch and service delivery.
- ◆ **Brand recognition and image.** DMS-500 switch software triggers call branding for calls that bypass the end office, such as dedicated access line calls, to help ensure that a particular carrier's name is known.
- ◆ **Premium service quality.** Extensive performance monitoring, surveillance, and troubleshooting capabilities built into the DMS-500 operations, administration, maintenance and provisioning (OAM&P) platform make it possible to maintain premium levels of service quality.
- ◆ **Competitive price.** The DMS-500 system — by reducing operations cost — enables carriers to offer competitive pricing to their wholesale and retail customers.
- ◆ **Successful selling in niche markets.** The DMS-500 system can be partitioned to serve multiple customers for this type of scenario — with separate branding, billing, and service capabilities available to each customer. This makes the DMS-500 solution ideal for carriers wishing to resell blocks of capacity or services to others.

WHY SELECT THE DMS-500 SYSTEM?, *continued*

COMPREHENSIVE NETWORK SOLUTIONS

Nortel Networks offers the broadest portfolio of network products in the industry, designed specifically for turnkey solutions in Long Distance markets. With end-to-end products and services for the complete Long Distance network, Nortel Networks removes the negatives associated with multi-vendor networking: the need to coordinate development activities and interoperability issues with representatives from multiple vendors.

Nortel Networks products are designed and built to work together, with common components, operational practices, and interfaces. This strategy reduces costs for training, administration, maintenance, and provisioning. It also enables the flexible reuse of equipment from the local exchange network. And when regulators permit incumbents to merge their toll and local business, the DMS architecture makes this transition easy.

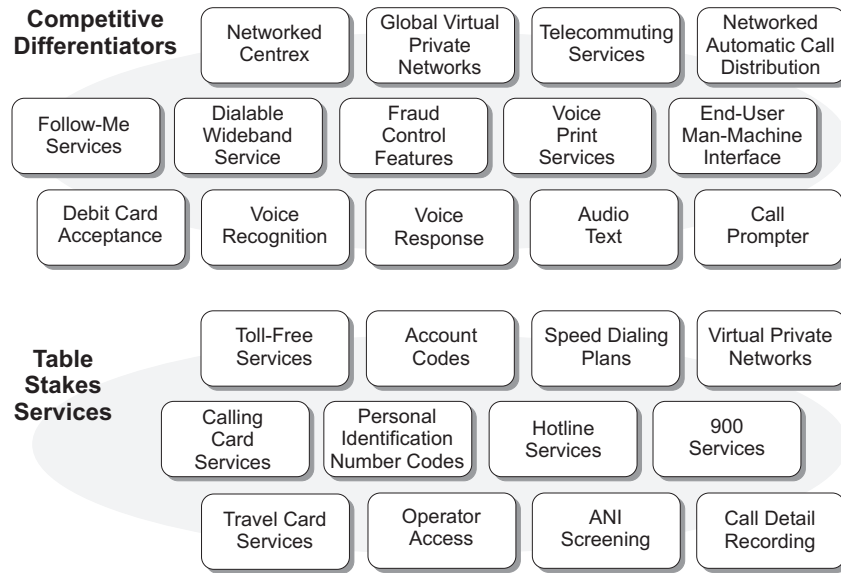
In addition, a full portfolio of compatible products — from key systems to international gateway switches — makes it possible to develop and market truly unique and customized services for end users. With an industry-leading Advanced Intelligent Network (AIN) service creation environment, these services can be developed quickly to lead the market.

A COMPLETE PORTFOLIO OF REVENUE-GENERATING SERVICES

For new and established players alike, success in the Long Distance market is inevitably linked to the portfolio of service offerings. With a host of choices before them, subscribers are more likely to choose the provider they perceive to have a superior service selection. And with a Long Distance provider already in hand, customers are not likely to go through the trouble of switching providers unless they can see a clear advantage to doing so.

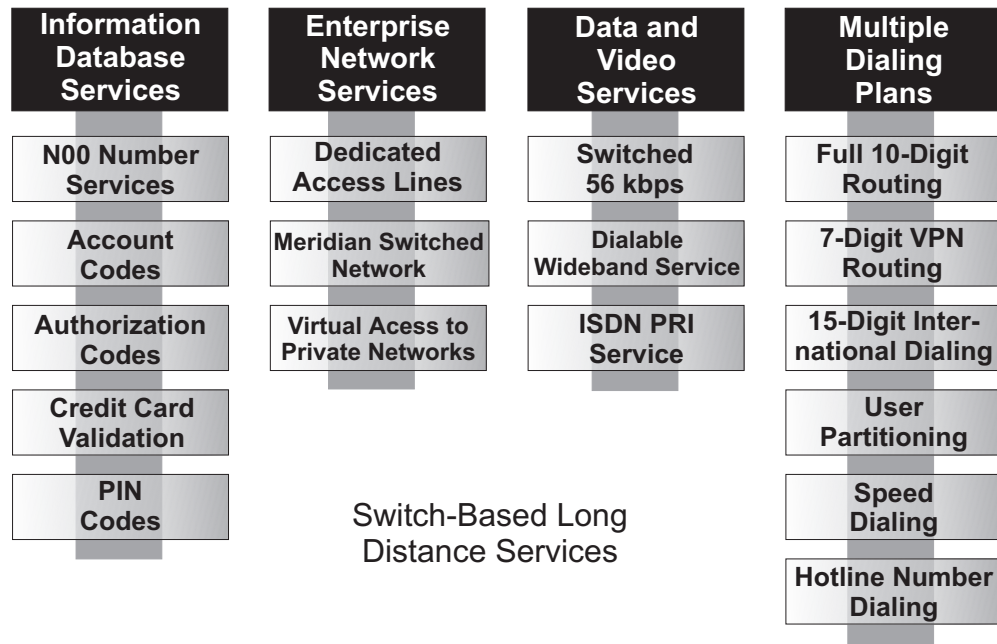
At a minimum, Long Distance providers are expected to offer outbound 1+, toll-free, and calling card services — all with operator backing. Competitive advantage, however, requires more than service parity. It will require strategic differentiators, such as debit card acceptance, voice recognition, global virtual private networks, and telecommuting services.

Basic and *differentiating* service portfolios are both required for success. All these services, and more, are available on the DMS-500 switching system — and can be creatively packaged to match the network provider's business strategy.



Value-Added Long Distance Services

In addition to basic Long Distance services, that provide basic toll revenues, the competitive Long Distance provider offers additional revenue-generating services — such as information databases, enterprise networking, data and video services, and multiple dialing plans such as International Direct Distance Dialing (IDDD). These services make extensive use of advanced signaling systems such as SS7 and ISDN PRI, as well as Intelligent Network (IN) capabilities.



Key Revenue-Generating Services

WHY SELECT THE DMS-500 SYSTEM?, *continued*

SIMPLIFIED SERVICE CREATION: SERVICEBUILDER

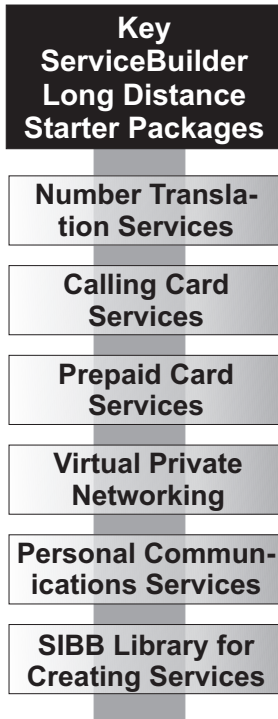
Design and develop custom services on the platforms of choice — independent of their network switching infrastructure.

ServiceBuilder implements standards-compliant Advanced Intelligent Network (AIN) capabilities

with several competitive advantages. For one, it offers true portability: services are created and deployed on an industry-standard UNIX processing platform, not a proprietary one. Based on standard C++ programming, ServiceBuilder makes it easy to find programming talent to create and maintain applications — and to transfer those applications across different hardware environments.

Creation of new services is made even easier by the availability of a graphical user interface (GUI) and software “building blocks.” Developers don’t have to build from the ground up; they build from a foundation and framework, with modular components that are easily modified to form new services.

Stock, “off-the-shelf” services are offered in a Long Distance Service Package for interexchange carriers. This package enables network providers to offer number translations services, such as Toll-Free services and other inbound and outbound screening and translation functions. The Long Distance Service Package also delivers Virtual Private Networks and flexible network access and carrier selection services for small businesses, telecommuters, and work-at-home employees.



NEW LONG DISTANCE CAPABILITIES

The following *Long Distance* features are all planned to be optional with the DMS-500 platform. New *Local* features, available with LLT PCLs, appear throughout this document.

NETWORKBUILDER LOCAL NUMBER PORTABILITY

CAIN0700

Provides DMS-500 system support for the accurate routing of calls to offices with ported telephone numbers.

LNP Intra-IMT RX Selector

LLT00012

This feature provides the Long Distance side of the DMS-500 system the ability to query on Local Number Portability (LNP) calls that originate over Intra-IMT (Inter-Machine Trunk) agencies and encounter the Retranslation (RX) route selector. It enables network providers that use Intra-IMT agencies to traverse their network to route calls at the terminating switch using the RX selector and continue to support LNP.

Technical reference: 60072607

New NOJIP Option

LLT00013

The Rel•8 feature AX0198, *LNP on NetworkBuilder — Phase 2*, allowed a default Jurisdiction Information Parameter (JIP) to be provisioned for a call on a per-trunk-group basis. This software enabled the JIP to be built on an outgoing Initial Address Message (IAM) — and sent the JIP to the Service Control Point (SCP).

The NOJIP option feature expands this functionality by blocking the sending of JIP on a specific node if the NOJIP option is datafilled in table ADJNODE.

Technical reference: 60097313

New LNP Sub-System Number (SSN)

LLT00013

Some of the service control points (SCPs) currently deployed in the network to support Local Number Portability (LNP) queries will recognize only one subsystem number (SSN) per node. The LNP SSN feature enables LNP to work on both sides of a DMS-500 switch — one subsystem number for the DMS-100 side and another subsystem number for the DMS-250 side. It enables either version of LNP (CAIN or AIN) to initiate queries to the SCP using a common SSN, and allows the responses to be received on the correct side of the DMS-500 platform. To the SCP, both versions of LNP on the DMS-500 appear to share a single SSN.

Technical reference: 60101062

NEW LONG DISTANCE CAPABILITIES, *continued***New LNP RX Selector**

LLT00013

The Rel•8 feature AX1016, *LNP Support of RX Selector*, enables calls that subscribe to NetworkBuilder and encounter the Retranslation (RX) selector from incoming Local Number Portability (LNP) information (or from an LNP information response with a change in the called party number) to potentially perform an LNP query. (The RX selector allows the system to retranslate a call and choose another outgoing route on a route-choice basis.)

This feature enhances the AX1016 feature to include calls that encounter the RX selector from incoming LNP information or from an LNP information response with a change in the serving translation scheme (STS) to potentially perform an LNP query.

Technical reference: 60008135

UCS DMS-500 DNIS TRUNK OPTION**NXXR0003**

Gives service providers the option to send the original dialed NXX number on a per-trunk-group basis.

UCS DMS-500 DNIS Trunk Option

LLT00012

This feature buffers an NXX number on origination. On the terminating side, the number is:

- ◆ Placed in a Generic Address Parameter (GAP) of the outgoing IAM for SS7 agencies,
- ◆ Sent as the called party information in a SETUP message for ISDN agencies, or
- ◆ Outpulsed as the called party address for Per-Trunk Signaling (PTS) agencies.

This feature gives service providers the option to send the original dialed NXX number on a per-trunk-group basis. Also, if the service provider receives a call with an untranslated NXX number, the Long Distance side of the DMS-500 system can pass Dialed Number Inward Service (DNIS) information through the network without using an SCP, or by using the SX selector to route through table RTEAT*TR.

Technical reference: 60078696

LONG DISTANCE TRANSLATIONS AND ROUTING**UTRS0001**

Provides routing based on the Carrier Identification Code (CIC) rather than the ANI.

TR-533 CIC Routing

LLT00012

This feature enables the Long Distance side of the DMS-500 switch to route calls based on a Carrier Identification Code (CIC) and a Local Access and Transport Area (LATA). This feature enhances the functionality provided by feature AX1377, *TR-533 Database Interworking*, in Rel•11.

Technical reference: 60089224

UCS BASE**UCSB0001**

Provides the basic Long Distance software on the DMS-500 switch.

Calling Card GTT

LLT00012

This feature adds a new office parameter, TCN_ENHANCED_GT_CDPA, to indicate that the format of the Signaling Connection Control Part (SCCP) Global Title Translations (GTT) called party address parameter is to contain the first six digits of the Travel Card Number (TCN) rather than a “0” or “00.” This enables interaction with IN/1 SCPs requiring the first six digits of the TCN in the SCCP called party address parameter.

Technical reference: 60091564

Enhanced Reorigination with STR Card

LLT00012

This feature provides the Long Distance side of the DMS-500 switch with a minimum short duration of 40 milliseconds (ms) for reorigination on PTS and SS7 originating legacy and AXXESS reorigination-capable agents. This enables callers to reoriginate by using the asterisk or octothorpe key at 40 ms duration. Previously, the Special Tone Receiver (STR) card hardware and software could only detect reorigination at a minimum of 500 ms duration.

Technical reference: 60006720

Short-Digit Duration Reorigination on the SPM

LLT00012

This feature provides short duration recognition of the reorigination digit using the Spectrum Peripheral Module (SPM). Tones with a duration as short as 40 ms can be detected by the SPM. This permits reorigination service on SPM trunk groups from customers who may be using PBXs, electronic phone systems, or cellular phones that are only capable of transmitting short-duration Dual Tone Multi-Frequency (DTMF) signaling tones.

Technical reference: 60007298

New Suspend Resume Message Handling Passed to DMS-300

LLT00012

This feature optionally enables an international DMS-300 system to process ISUP Suspend (SUS) and Resume (RES) messages, rather than the DMS-500 system.

When the new office parameter, DMS300_ORIG_BOUNCe_SUS_RES, is set to “Y”, SUS and RES messages are sent to the DMS-300 system over originating SS7 IMT trunks with the TRKSGRP field ADJNODE datafilled with the value “DMS300.”

Technical reference: NR90253

NEW LONG DISTANCE CAPABILITIES, *continued***CDR Management for Rel•12**

LLT00012

This feature updates call detail recording (CDR) fields as a result of additions, deletions, or modifications of data needed to support LLT00012 Long Distance features.

Technical reference: 60006696

New CDR Management for Rel•13

LLT00013

This feature updates CDR fields as a result of additions, deletions, or modifications of data needed to support LLT00013 Long Distance features.

Technical reference: 60007776

New Find File Tool — FINDIT

LLT00013

The FINDIT Command Interpreter (CI) tool searches for a file on the switch.

- ◆ If the file exists on the switch, the CI responds with the location(s) of the file name
- ◆ If the file does not exist on the switch, the CI responds with a message stating that the file was not found.

Technical reference: 60008214

New CLID Delivery Enhancements

LLT00013

This feature optionally delivers a calling party number (CPN) rather than charge number parameter (CGN) for ISUP terminations when a CPN information element (CPNIE) is not present in the setup message on PRI originating agencies. This gives the service provider the ability to have the DEFCLID displayed at the far end, based on the Presentation Indicator (PI) field in the received CPN parameter. This reduces the blocking of calls by customer premises equipment (CPE) when the PI bit is not set to “allowed.”

Technical reference: 60097639

New Information Digit Reversal

LLT00013

In Rel•7 and Rel•8, patch GKX00 outpulsed the Originating Line Information (OLI) or Information (II) Digits on PRI terminations within the setup message, based on a new TRKGRP parameter, INFODIGS. Now, the Info Digit Reversal feature gives the service provider the ability to control the reversal of digit order for the information digits in the outgoing PRI setup messages. This enhancement adds a subfield to the INFODIGS option on PRI trunks that indicates the order of the info digits (NORMAL or REVERSE).

Technical reference: 60098029

NETWORKBUILDER MESSAGES**CAIN0100**

Provides a variety of tools to improve network routing.

New NetworkBuilder Routing Log

LLT00013

This feature provides the DMS-500 switch with a new log (CAIN303) to assist craftspersons with the identification and resolution of network routing problems. The log contains the following information:

- ◆ Date
- ◆ Time
- ◆ Originating trunk group
- ◆ Terminating trunk group
- ◆ Automatic Number Identification (ANI)
- ◆ Dialed number — the original number dialed by the end user
- ◆ Backend number — digits from the CalledPartyID parameter received from the SCP in an Analyze_Route message
- ◆ Called number — the number normally used by the DMS-500 switch to translate and route a call
- ◆ Cause Code information — description of the event causing the routing problem (translation error, database failure, incomplete number, or unassigned number)

Technical reference: 60089576

New Table TANDMRTE T Selector Addition

LLT00013

This feature adds the “T selector” to table TANDMRTE, used by NetworkBuilder features for direct termination routing to tandem trunks connecting switches in an interexchange carrier network.

The T selector enables the use of Dynamically Controlled Routing (DCR) with direct NetworkBuilder terminations. The T selector indicates that a route is to be chosen in another routing table, enabling a call to be directed to another table (such as OFRT, which supports the routing selectors specific to DCR).

Technical reference: 60093018

NEW LONG DISTANCE CAPABILITIES, *continued***TAKEBACK AND TRANSFER****CAIN0802**

Allows a terminator to transfer or redirect the calling party to a third party.

New NetworkBuilder Short Duration Tone Detection on Takeback and Transfer

LLT00013

This feature enhances the Rel•11 feature AX1372, *NetworkBuilder Midcall Services Framework*, by providing short duration tone detection for NetworkBuilder Takeback and Transfer. Hookswitch flash events within the range of 40 to 300 ms and 500 to 3000 ms can be detected using either an NT6X62EA Special Tone Receiver (STR) card in both XPMs or an SPM.

Technical reference: 60007655

LONG CALL FRAUD DETECTION**UBFR0006**

Provides fraud detection and prevention tools for the DMS-500 switch.

New Long Call Audit Enhancements

LLT00013

This feature enables the DMS-500 switch to optionally run the long call duration audit more often than the previous functionality of once every 24 hours, set by a new office parameter. UBFR0006 also enables the selection of specific originating agencies for the long call audit and the option of disconnecting long calls based on terminating country code.

Technical reference: 60007650

ROUTING ENHANCEMENTS**UTRS0003**

Provides carriers with enhanced routing capabilities.

New NETSEC Screening Expansion

LLT00013

This feature increases the number of country codes that can be datafilled in the country code criterion selector of table NETSPROF. In addition, this feature expands the information digit criterion selector of table NETSPROF to include Originating Line Information (OLI) digits, which are the ISDN User Part (ISUP) equivalent of the Per-Trunk Signaling (PTS) information digits currently supported.

Technical reference: 60007645

Emergency Number Services (E911)

With the Nortel Networks DMS Tandem-based E911 Emergency Number Service (ENS), a caller needing urgent help can quickly reach the emergency service best able to respond. E911 selectively routes and transfers an emergency call to the appropriate Public Safety Answering Point (PSAP) agency serving the location of the calling party — regardless of geographic location or telephone-service provider boundaries.

The benefits that make Enhanced 911 (E911) different from Basic 911 service are:

- ◆ The ability to selectively route an E911 call so that it automatically reaches the emergency service located closest to the caller.
- ◆ Delivery of caller-related data, such as address and other geographic information.

Emergency calls can be processed quickly because all required information is available as soon as a calltaker answers. With E911 service, emergency assistance is available immediately — even if the connection is broken, help can still be sent.

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BENEFITS OF DMS E911

Benefits the service provider can offer the serving area:

- ◆ The caller automatically routes to the answering point best able to respond
- ◆ Emergency response time is significantly reduced by correct first-time routing
- ◆ Answering agent receives accurate caller/location information
- ◆ Built-in multiple routing options help ensure emergency calls are answered

Benefits the service provider can offer with a central office-based Integrated Public Safety Answering Point (PSAP):

- ◆ Only limited capital investment needed — traditional PSAP customer premises-based switching equipment is not required
- ◆ Central-office based system delivers a high level of reliability
- ◆ No hidden costs, such as maintenance, power, and battery back-up
- ◆ Optional Management Information System (MIS) capability enables trends and performance to be analyzed
- ◆ An integrated DMS Centrex Automatic Call Distribution (ACD) solution is available
- ◆ Evolution path available to Centrex IP-based PSAPs.

UNIQUE IN THE MARKETPLACE

By meeting ANSI standards and Telcordia generic requirements, Nortel Networks E911 tandems can provide:

- ◆ E911 Inter-tandem routing in a multivendor environment. This ability includes initial routing of calls, selective transfer of calls, and fixed transfer of calls.
- ◆ A Selective Routing Database that resides within the switch — not as an adjunct processor — and requires less space for the same amount of data. The advantages include lower cost, higher reliability, and faster operation.

Note: if a network provider opts to use an external industry-standard Service Control Point (SCP) database, this capability is available with the ENS00011 *E911 Routing via AIN* order code.

- ◆ Centrex Line and ACD PSAP provide the same functionality as customer premises equipment solutions but with lower costs and higher reliability. This solution benefits from interworking with the DMS Centrex Automatic Call Distribution system.
- ◆ Proper routing of Wireless 911 calls to meet FCC Phase I requirements and the ability to provide Phase II service today (with all other necessary network components in place).

NEW CAPABILITIES

WIRELESS ALI INTERFACE

ENS00016

Supplies wireless E911 data to the PSAP with an ASCII-based, out-of-band data link from the DMS switch to the Automatic Location Information (ALI) controller.

Wireless Data to External ALI Database

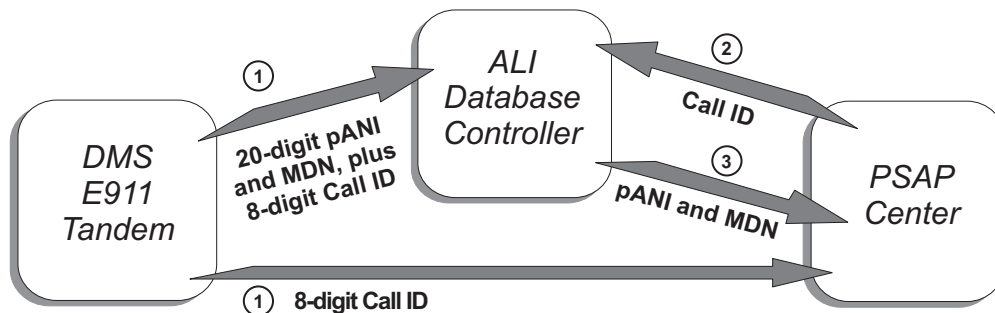
LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

In Rel•12, ENS00016 makes it possible to deliver a twenty-digit wireless 911 call to an eight-digit PSAP with an ASCII-based out-of-band link. Currently, when the DMS E911 Access Tandem receives a twenty-digit wireless 911 call, the system sends the pseudo-ANI (pANI) and Mobile Directory Number (MDN) to the PSAP. To support full emergency capabilities, this method generally requires updates to PSAP equipment and software to receive and process the additional digits.

Now, with ENS00016, a wireless 911 call causes (numbers refer to the illustration below):

- ① The DMS E911 Access Tandem to send:
 - An eight-digit Call ID to the PSAP using the existing CAMA trunk
 - The pANI, MDN, and Call ID to the ALI controller using an RS-232 or X.25 data link
- ② The PSAP queries the ALI database using the eight-digit Call ID
- ③ The ALI database sends the pANI and MDN data to the PSAP to identify the caller and the cell sector where the call originated



Support Wireless 911 Calls without PSAP Upgrades

Technical reference: 59006350

PRINCIPAL BENEFITS

The E911 Wireless ALI Interface enables the delivery of a twenty-digit wireless 911 call to an eight-digit PSAP without costly PSAP upgrades, and serves as a partial solution to FCC Docket 94-102, Wireless E911 Phase 1.

NEW CAPABILITIES, *continued*

MAJOR DEPENDENCIES

Software: ENS00005 Enhanced 911 Base
 ENS00001 Line Appearance on a Digital Trunk PSAP
 ENS00012 E911 Wireless Phase 1

Hardware: NT1X89 Multi-Protocol Controller (MPC) card

E911 ROUTING VIA AIN**ENS00011**

Supplies wireless E911 data to the PSAP with an AIN-based data link from the DMS switch to the ALI controller.

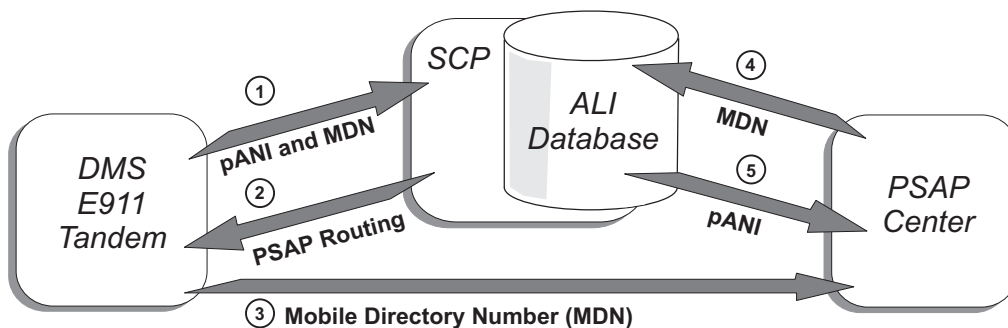
E911 Parameter Expansion

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Similar to ENS00016, this enhancement to ENS00011 delivers a twenty-digit wireless 911 call to a PSAP — using an intelligent Advanced Intelligent Networking (AIN) query data link between the DMS switch and the ALI database. With this new ENS00011 enhancement, a wireless 911 call triggers the following (numbers refer to the illustration below).

- ① The DMS E911 Access Tandem sends the pseudo-ANI (pANI) and Mobile Directory Number (MDN) to the ALI database using a Transaction Capabilities Application Part (TCAP) data link
- ② The SCP returns PSAP routing information
- ③ The DMS E911 Access Tandem sends the MDN to the PSAP
- ④ The PSAP queries the ALI database using the MDN
- ⑤ The ALI database sends the pANI data to the PSAP to identify the cell sector where the call originated



Use the Power of AIN to Handle Wireless 911 Calls without PSAP Upgrades

Technical reference: 59006358

PRINCIPAL BENEFITS

This feature enables the DMS system to support FCC Wireless E911 Phase 1 requirements. Through an intelligent interface to the ALI controller, an eight-digit PSAP can now process twenty-digit wireless E911 calls without costly upgrades.

Although developed initially for wireline calls, this enhancement makes ENS00011 capable of handling wireless calls as well.

MAJOR DEPENDENCIES

Software: ENS00005 Enhanced 911 Base
 AIN00002 AIN Essentials
 AIN00006 AIN Call Management
 AIN00007 AIN Call Model Control
 AIN00009 AIN Services Support

ENHANCED 911 BASE**ENS00005**

Offers essential E911 service capabilities.

New E911 ISUP Enhancements

LEC00013, LET00013, LLT00013, LWW00007

KEY CAPABILITIES

This enhancement to ENS00005:

- ◆ Adapts for E911 calls over ISUP trunking:
 - SS7 OSNC (Operator Services Network Capabilities) connection hold and ringback features.
 - E911 Enhanced Call Party Hold (ECPH).
- ◆ Provides two new ISUP Initial Address Message (IAM) parameter values to enhance the DMS E911 Tandem system compliance to Telcordia GR-2956:
 - A new “emergency service call” value of 11100000 for the existing Calling Party Category parameter in the IAM.
 - A new “cellular services (type 1)” value of 00111101 for the existing Originating Line Information Parameter (OLIP) in the IAM to support wireless 911 calls.

Technical reference: 59006371

PRINCIPAL BENEFITS

OSNC connection hold and ringback features match the existing Origination Hold (ORIGHOLD) and ringback capabilities currently available on multi-frequency (MF) E911 trunks. Service providers who need to supply hold and ringback capabilities for E911 can now do so on SS7 ISUP trunks.

NEW CAPABILITIES, *continued*

The 911 network is evolving from a single E911 tandem supporting a cluster of end offices to a multi E911 tandem network offering increased reliability and routing capabilities. The new ISUP IAM parameter values improve platform interoperability in a multivendor environment. These strategic parameters may be used in the future to route 911 calls across the public telephone network instead of 911 dedicated facilities.

MAJOR DEPENDENCIES

Software: ISP70001 ISUP Base

ISP70005 ISUP Charge Number / OLI Parameter (required in all DMS-100/DMS-500 end offices and DMS E911 Tandem systems to support SS7 OSNC)

ISP70006 SS7 OSNC (required in all DMS-100/DMS-500 end offices and DMS E911 Tandem systems to support connection hold and ringback, described next)

OFF-BOARD SELECTIVE ROUTING**ENS00017**

Supports proprietary links to an external ALI/Selective Routing database server as an alternative to deploying the internal DMS Selective Routing Database (SRDB).

New Off-Board Selective Routing Interface

LEC00014, LET00014, LLT00014

KEY CAPABILITIES

This order code supports proprietary links to an ALISA-type database for network providers that choose to deploy this external Automatic Location Information (ALI)/SRDB platform as an alternative to the DMS SRDB offering.

Technical reference: 59016808

PRINCIPAL BENEFITS

Previous to ENS00017, the off-board server could operate as a combined ALI/SRDB platform only on E911 Tandem switches manufactured by the same vendor as the server. Now, this order code supports dedicated links from the DMS E911 Tandem to the external server so the network provider can:

- ◆ Enhance investments by having the same off-board platform serve more tandems.
- ◆ Terminate wireline and wireless emergency calls uniformly.
- ◆ Simplify the multivendor network by having PSAP-directed features offered by the proprietary server also extend to calls reaching the DMS E911 Tandem.

MAJOR DEPENDENCIES

Software: ENS00005 Enhanced 911

DMS SuperNode Access Solutions

INTERFACES LINES AND TRUNKS

DMS Remotes make the geographic distribution of advanced digital services very flexible and cost-effective. These solutions provide powerful platforms for digital integration, network simplification, exchange area consolidation, and penetration into new markets or territories. **Switch remotes**, including the new Star Remote System, extend DMS SuperNode host switch services deeper into the network. **Remote access vehicles** — operating as digital loop carriers (DLCs), next generation digital loop carriers (NGDLCs), and sophisticated servers — offer a variety of high-speed data and wideband business services.

The new, versatile **Spectrum Peripheral Module (SPM)** provides high-speed OC-3 trunking, significant footprint savings, reduced operating costs, and carrier-class reliability — on a scalable, evolvable, multi-application platform. Beyond helping to reduce office cost of ownership, the SPM can also become an integral component of the next-generation multiservice Succession Solutions.

The Nortel Networks family of **Subscriber Carrier Modules (SCMs)** offers service providers a wide choice of switch access interfaces that flexibly meet a variety of applications for both DMS system and third-party transmission products. These direct digital interfaces offer numerous economic and operational benefits to network providers deploying digital loop carrier and residential broadband access systems. This chapter discusses enhanced features for the newest member of the SCM family — the **Expanded Subscriber Carrier Module-100 Access (ESMA)** — for GR-303 capabilities.

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SPECTRUM PERIPHERAL MODULE (SPM)

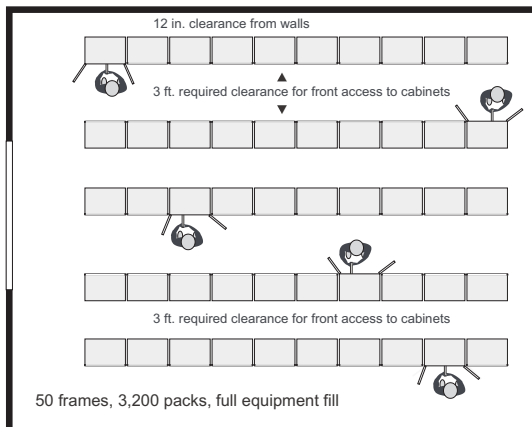
REDUCE COST OF OWNERSHIP WITH DIRECT SONET TRUNKING

The Nortel Networks Spectrum Peripheral Module (SPM) opens the door to new opportunities by introducing Optical Carrier signal-level 3 (OC-3) interfaces directly into the DMS SuperNode system. This flexible, multiple-application platform brings the latest high-speed trunking technology to the evolving DMS Family with a modular, scalable, world-class design that prepares the DMS office for the transition to next-generation multi-service networking.

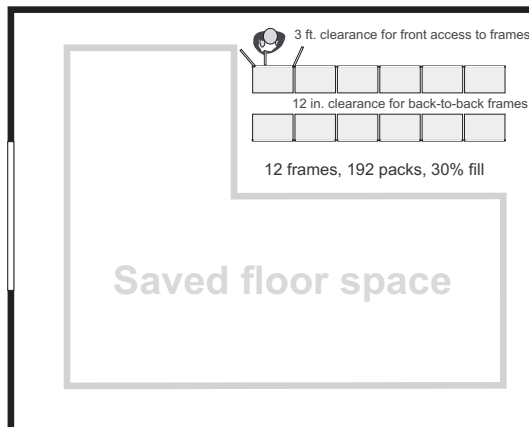
Now tandem and large end offices can gain new operating cost savings by simplifying office operations, cabling, powering, planning, engineering, and heating-ventilation-air-conditioning (HVAC) — while enhancing the quality of service to subscribers. A single frame with two SPMs has the same footprint as a Digital Trunk Equipment (DTE) frame, yet supports up to 4032 DS-0s with OC-3 links. This significantly reduces the number of switching-peripheral frames — helping to trim the trunking footprint at least 4.2 times over current configurations. And, since the SPM is a full “front-access” cabinet, even more floorspace can be recaptured by installing SPMs back-to-back or up to 6 inches away from walls.

Plus, Nortel Networks designed spare processing capacity and hardware slots (near 70% free shelf space in initial releases) to help make the SPM future-ready for other trunk services, to meet network provider requirements.

Interfacing 48,000 trunks to the DMS system with Digital Trunk Controllers...



Interfacing 48,000 trunks to the DMS system with Spectrum Peripheral Modules...

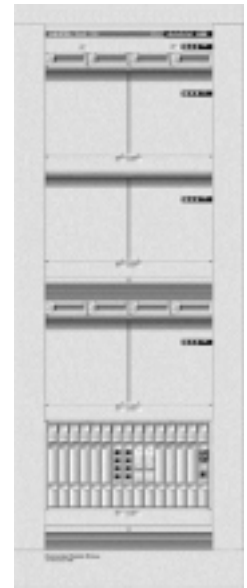


Recapture Valuable Floor and Shelf Space with the Cost-Reducing SPM

The reduction in peripheral frames, batteries, and rectifiers in the office can translate into lowering power expenses — some five to ten times less than existing lineups. Engineering, planning, and physical provisioning tasks associated with adding new trunks are cut by as much as 48 times over a DS-1 office — with the potential to reduce total cable termination by 21 times the equivalent DS-0 configuration.

Beyond reducing operating costs and significant space savings, the SPM also helps:

- ◆ **Simplify maintenance** by integrating with DMS operations, administration, and maintenance (OAM) systems, such as the Maintenance and Administration Position (MAP) and logs. Many hardware modules support hot insertion / hot extraction — helping to reduce service disruptions. And the modular, scalable frame — with space-saving front access — offers a long list of fault detection and isolation enhancements.
- ◆ **Enhance reliability** by reducing the number of points-of-failure in the system. *Redundant* optical switch links, impressive low bit error rate, duplicated crossover links, and no optical-to-electrical conversions also contribute to high in-service time. Hot standby common equipment can switch over without dropping current stable calls.
- ◆ **Open revenue opportunities.** The SPM's wide bandwidth, scalable processing, and flexible SONET payload mapping makes this an ideal integrated platform for easy entry into data services, video (including video conferencing), and other high-bandwidth offerings. And the SPM's multiple-application architecture simplifies the deployment of new revenue-generating services, quickly, without increasing peripheral count.
- ◆ **Protect investments.** Not only does the SPM provide an ideal DMS-integrated platform to expand high-bandwidth services, reduce the cost of switching office ownership, and enhance service reliability today — but it also can support an upgrade to an integral platform in a future, next-generation, multi-service network.



***Helps Reduce Costs
with Direct
Optical Trunking***

Superiority of OC-3 Trunking

Optical-based OC-3 trunking has proven to be superior to electrical-based STS-1 options. Field-tested OC-3 is more reliable with a higher class of service due to its full redundancy, high resistance to noise, and low bit error rate. Not only are fiber cables and connectors easier to handle than coax; they also support a greater reach.

SPECTRUM PERIPHERAL MODULE (SPM), *continued*

PLANNED ENHANCEMENTS

Beyond handling high-capacity OC-3 local exchange carrier (LEC) ISDN User Part (ISUP) and Per-Trunk Signaling (PTS) trunking, more enhancements are planned for the SPM. ISDN Primary Rate Interface (PRI) trunking for ISP NI-1 and NI-2 services will be available beginning with the Rel•12 release. Echo Cancellation for long haul LEC ISUP trunks will be available in Rel•13.

And, as discussed earlier, SPMs can be transitioned into multi-service gateways in a Succession Solutions network, with simple circuit pack changes and a software upgrade. This evolution protects and expands SPM investments after the convergence of voice and data networks.

SPM NON-COMPUTING MODULE LOADS (NCLs)

Separately orderable NCLs provide software functionality locally on the SPM. These software releases are downward compatible with PCLs at the DMS-Core (for compatibility details, refer to the Non-CM Software Baseline table on page 302) and align with Computing Module (CM) releases in the following way:

SPM release name	NCL Order Code (used in this chapter)	Associated CM Release
SP11	SPM00031	Rel•10 and Rel•11
SP12	SPM00033	Rel•12
SP13	SPM00035	Rel•13
SP14	SPM00039	Rel•14

Because software functionality requires a certain PCL release at the CM and a certain NCL release at the SPM, both PCL and NCL order codes appear under the feature name in the software descriptions in the remainder of this section.

OTHER INFORMATION

The SPM is available with DMS SuperNode systems having the Enhanced Network (ENET) switch fabric. Also required, for Rel•11 or earlier software loads, are the 32-megabyte Link Interface Unit for SS7 (LIU7) external routers.

For a brief multimedia tutorial on SPM benefits and evolution, access this URL:

<http://www.nortelnetworks.com/spmtutorial>

NEW SPM CAPABILITIES

SPM PRI ON NA-100

SPM00018

Addresses demand for larger bandwidth interfaces to Internet Service Providers (ISPs), businesses, and other heavy-bandwidth accounts.

NI-2 PRI on SPM

PCL: LEC00012, LET00012, LLT00012, LWW00006

NCL: SPM00033

KEY CAPABILITIES

SPM00018 extends key National ISDN-2 Primary Rate Interface (PRI) features over OC-3 links. Now ISPs and business accounts can use direct optical trunking, without sacrificing functionality. NI-2 PRI functionality supported over optical trunking (as defined in SR-2120) originate with the following ISDN PRI order codes:

NI-2 PRI Functionality Supported Over SPM OC-3

Order Code	Order Code Name	Order Code Availability
NI000043	PRI NI-2 Base (previously NI000015)	Rel•12
NI000030	Calling Name Delivery	
NI000032	Hotel/Motel Services	
NI000035	Circular Hunt Services	
NI000018	Two B-Channel Transfer	Rel•13
NI000037	Messaging Services	
NI000040	NI-2 Dialable Wideband Services	
NI000047	Call Forward Interface Busy	
NI000034	B-Channel Packet Provisioning	Rel•14

Technical reference: 59007501

PRINCIPAL BENEFITS

With order code SPM00018, the Spectrum Peripheral Module can help network providers decrease facilities costs while serving a wider variety of accounts. The direct high-bandwidth optical links into these destinations address the demand for higher-bandwidth interfaces.

MAJOR DEPENDENCIES

Software: SPMS0001 Spectrum Peripheral Module Base

Hardware: NTLX72AA Data Link Controller (DLC) pack in SPM

SPECTRUM PERIPHERAL MODULE (SPM), *continued***NTNA ISP PRIMARY RATE INTERFACE****SPMS0015**

Provides basic NI-1 capability to meet the needs of the growing ISP market and those NI-1 customers with needs for particular features.

New ISP Basic Call

PCL: LEC00012, LET00012, LLT00012, LWW00006

NCL: SPM00033

The following NI-1 capabilities are introduced on the SPM with order code SPMS0015:

- ◆ Basic Call, including provisioning, operational measurements, Automatic Message Accounting (AMA), SS7 interworking, and maintenance.
- ◆ Calling Name and Number Delivery features, on a local basis.
- ◆ D-Channel Backup with Non-Facility Associated Signaling (NFAS) for multiple PRI links assigned to the same SPM.

The optional NI-1 feature, Circular Hunt, NI000036, can be assigned to PRI links assigned to SPM. Once DS-1 links are established on the SPM, assignment and operation of the features are generally consistent with the implementation used on the Digital Trunk Controller for ISDN (DTCI) DMS peripheral.

PRINCIPAL BENEFITS

This feature makes it possible to meet the needs of the expanding PRI market with an optical peripheral that provides greater bandwidth and economical interfaces with the Inter-Office Facilities network. The increasing size of Internet Service Provider (ISP) groups can be handled more effectively with the increased capacity of the SPM.

The same SPM can support these NI-1 features, the NI-2 services shown above, and supported ISUP and PTS trunk types. This results in a multi-service peripheral that provides all the benefits of SPM and consolidates different trunking types on the same peripheral for increased efficiency and performance of network provider resources.

MAJOR DEPENDENCIES

Software: SPMS0001 Spectrum Peripheral Module Base

Hardware: NTLX72AA DLC pack in SPM

New SPM NI-1 PRI Functionality

PCL: LEC00013, LET00013, LLT00013, LWW00007

NCL: SPM00035

KEY CAPABILITIES

The following NI-1 base capabilities are added to this order code with Rel•13:

- ◆ Integrated Services Access (ISA) for Call-by-Call Service Selection
- ◆ Network Redirection and Reason

In addition, this software also supports the assignment of NI000024 Release Link Trunking to PRI links on the SPM.

PRINCIPAL BENEFITS

This software offers network providers an expanded list of NI-1 capabilities over PRI links, while expanding the efficiencies of SPM deployment. With this software, the following NI-1 PRI capabilities are supported (shown with originating ISDN PRI order codes):

NI-1 PRI Functionality Supported in SPMS0015

Order Code	Order Code Name	Availability on SPM
NI000033	PRI NI-1 Base Basic Call Calling Name/Number D Channel Back-up/ NFAS	Rel•12
NI000036	Circular Hunt Services	
NI000033	PRI NI-1 Base ISA for Call-by-Call Network Redirection and Reason	Rel•13
NI000024	Release Link Trunking	

MAJOR DEPENDENCIES

Software: SPMS0001 Spectrum Peripheral Module Base

Hardware: NTLX72AA DLC pack in SPM

SPECTRUM PERIPHERAL MODULE (SPM), *continued***SPECTRUM PERIPHERAL MODULE BASE****SPMS0001**

Delivers software support for Nortel Networks next-generation, high-speed, optical inter-office trunking.

Large System Support

PCL: LEC00012, LET00012, LLT00012, LWW00006

NCL: SPM00033

KEY CAPABILITIES

The DMS Series 70 EM processor option supports up to 20 SPMs in Rel•10 and Rel•11 — and up to 56 SPMs in Rel•12. With 56 SPMs, this large system support feature enables a DMS-100 or DMS-500 office to handle over 100,000 ports. As with any system of this size, a traffic capacity study should be performed to verify system capacity.

PRINCIPAL BENEFITS

Rel•10 and Rel•11 support the bulk loading feature (originally developed for Rel•12), that loads up to 20 SPMs at once. Customers can now take advantage of a substantially reduced time for Open Network Provisioning (ONP) of large system offices.

MAJOR DEPENDENCIES

Software: AJ5244 INM Large System Support and accompanying patches

New Crossover Messaging

PCL: LEC00012, LET00012, LLT00012, LWW00006

NCL: SPM00033

KEY CAPABILITIES

By enabling each common equipment module (CEM) to send messages through both planes of the Enhanced Network (ENET) switch fabric, this feature provides redundancy with four bi-directional DS-512 serial links. Also, this feature supports an in-service upgrade from LX63AA to LX82AA CEM in a dual shelf (reconfiguring from a dual shelf to a single shelf is not recommended).

Technical reference: 59008910

PRINCIPAL BENEFITS

This feature provides the redundancy to enhance the robustness of SPM-to-Core messaging, thereby permitting a single ENET shelf installation for the SPM.

MAJOR DEPENDENCIES

Hardware: NTLX82AA

PANTHER Support for the SPM

PCL: LEC00012, LET00012, LLT00012, LWW00006
NCL: SPM00033

KEY CAPABILITIES

In Rel•11, Peripheral Module Upgrade Automation (PANTHER) supported automated upgrades with milestone loads. In Rel•12, maintenance and emergency loads are also supported for automated upgrades. Additionally, PANTHER now provides concurrent support for the following configurations:

- ◆ In-service loading of resource modules (RMs) in up to four different protection groups.
- ◆ Mate-loading RMs in some protection groups and in-service loading RMs in other protections groups.
- ◆ In-service loading of up to four common equipment modules (CEMs) on four different SPMs.

Technical reference: 59009203, 59009208

PRINCIPAL BENEFITS

Currently, maintenance loads and emergency loads deliver fixes for the SPM — but PANTHER only supports functionality introduced during milestone loads. With this new feature, maintenance and emergency loads can be included as supported loads for PANTHER automated upgrades. This reduces the time and manual intervention required to complete these software upgrades.

Further efficiencies, especially for large office systems, can be gained with the introduction of concurrent loading functionality.

Patching on the SPM

PCL: LEC00012, LET00012, LLT00012, LWW00006
NCL: SPM00035

KEY CAPABILITIES

This functionality simplifies the delivery of software patches to the Spectrum Peripheral Module. The same infrastructure in use today for supplying and applying patches to the DMS applies to this feature. SPM patching is modeled on the XPM patching tool set. Although imaging the current patched load to the flash memory will be available with NCL SPM00035, the capability to image to disk is not yet available. Also, ACT and OP patches are not supported in this release.

Technical reference: 59009197

PRINCIPAL BENEFITS

Currently, fixes for the SPM are delivered by maintenance loads, which require the SPM to be reloaded in order to apply software fixes. With the introduction of patching, network providers can use the existing Post Release Software Manager (PRSM) database to perform an in-service application of SPM patches in the same manner currently used for XPMs.

SPECTRUM PERIPHERAL MODULE (SPM), *continued*

Black Box Fraud Prevention Over OC-3 PTS

PCL: LEC00013, LET00013, LLT00013, LWW00007

NCL: SPM00035

KEY CAPABILITIES

This enhancement extends the revenue protection of the “Black Box Fraud” feature in BAS00064 (first generally available in Rel•8) to OC-3 links using the per-trunk signaling (PTS) protocol. Billing systems use answer supervision signals to mark the start of charges in a call billing record. Although fraudulent, it is possible to suppress or delay the return of answer-supervision signals from a PBX (or other terminating device, euphemistically called a “black box”). This practice resulted in improper billing and lost revenues to the network provider.

This feature helps inhibit fraud by allowing only a one-way transmission path until the terminating device returns answer supervision signals. The originating party still hears call progress and comfort tones, but two-way communication is impossible before the DMS system receives answer supervision.

This software also offers an optional timer that will tear down the call if answer supervision has not been received within one, two, three, four, or five minutes (datafilled on a trunk-group basis). If this timer is used, the DMS SuperNode system pegs an operational measurement (OM) and creates a log (TRK 610) whenever the black box fraud timer expires before receiving answer supervision signals.

Technical reference: 59010382

PRINCIPAL BENEFITS

Black Box Fraud Prevention can help recoup revenues to the network provider from calls that were previously not billed due to fraud by “black box” customers, resellers, and carriers at the terminating end. SPMS0001 now extends this simple, effective revenue protection to optical spans with PTS signaling. To help the network provider identify possible fraud violators, the TRK 610 log contains key information, including the originating agent, terminating trunk, called number, calling number, and time-out value.

New LEC Echo Cancellation

PCL: LEC00013, LET00013, LLT00013, LWW00007

NCL: SPM00035

KEY CAPABILITIES

This feature provides internal SPM Echo Cancellation for these LEC ISUP trunk types: IT, ATC, TI, TO, T2, IBNTI, IBNTO, and IBNT2. This enables deployment of long haul trunks from the DMS SPM to a distant switch without the requirement to de-multiplex the SPM OC-3. Voice Service Processors (VSP) must be installed in the SPM for integrated Echo Cancellation. There are three circuit packs available from Nortel Networks providing either 64 ms or 128 ms tail delay in varying increments. Resources may be dedicated or pooled, based on traffic characteristics.

Datafill determines which trunks are eligible for Echo Cancellation. The SPM then dynamically applies cancellation when required. In the case of fax/data calls, the SPM does not allocate echo cancellation — based on the reception of a valid G.164/G.165 tone or the USI field in the IAM. This feature also provides additional logs and surveillance information.

Technical reference: 59013302

PRINCIPAL BENEFITS

SPM-integrated Echo Cancellation saves network providers the cost of investment in external cancellation equipment and associated inter-connection points and their associated powering and floor space requirements. And, since there are fewer connections and possible points of failure, integrated Echo Cancellation can also enhance reliability.

MAJOR DEPENDENCIES

Software: SPM NCL: SPM00035

Hardware: NTLX66BA, NTLX85AA, or NTLX66AA

New Internal Routing

PCL: LEC00013, LET00013, LLT00013, LWW00007

NCL: SPM00035

KEY CAPABILITIES

This feature implements Message Transport Protocol (MTP) internal routing for the SPM to route SS7 call processing messages to the correct SS7 signaling link for transmission. With the implementation of this feature, the engineering rules for determining when external routers are required are now based on the trunk and message quantities, rather than the peripheral type installed. External routers are still required for large offices.

Technical reference: 59013504

PRINCIPAL BENEFITS

With this feature, External Routers (LIU7s) in the Link Peripheral Processor (LPP) are no longer automatically required with an SPM, helping to save capital investments, operating costs, and LPP card slots. Current SPM sites with external routing activated have the option of continuing with that implementation or change to internal routing, consistent with engineering rules.

SPECTRUM PERIPHERAL MODULE (SPM), *continued*

New DS-1 Assignment Control

PCL: LEC00014, LET00014, LLT00014

NCL: SPM00039

KEY CAPABILITIES

This feature provides two parameters in table OFCOPT to set the maximum number of DS-1s that can be assigned for ISUP/PTS message trunks and PRI links. The limits are separately set on an individual office basis to allow network providers full flexibility in trunk assignment.

Note: Initial quantity limit and the size of increments will be defined in a contract between the network provider and Nortel Networks.

Technical reference: 59018431

PRINCIPAL BENEFITS

This DS-1 assignment feature allows network providers to match purchases of DS-1 capacity with network requirements. Once hardware is installed, additional DS-1s can be purchased based on an existing contract.

OC-3 LINE TIMING

SPMS0040

Aligns SPM's OC-3 interface to Telcordia GR-253 synchronization standards.

OC-3 Line Timing

PCL: LEC00013, LET00013, LLT00013, LWW00007

NCL: SPM00035

KEY CAPABILITIES

This new, optional functionality exploits the high phase resolution and sampling frequency provided by the SPM to improve synchronization performance and meet the optical (SONET) synchronization standards GR-253 on the SPM's OC-3 output.

Technical reference: 59013912

PRINCIPAL BENEFITS

The Message Switch (MS) clock can be configured to use the SPM as a source of timing for the entire DMS office, as an option to operating the SPMs in a loop-timed configuration.

MAJOR DEPENDENCIES

Hardware: NT9X53AD Digital Phase Lock-Loop Clock Card

SPM ECHO CANCELLER SUPPORT**SPMS0002**

Expands SPM echo cancellation functionality on the DMS-500 system.

New SPM ECAN Call Control

PCL: LLT00013

NCL: SPM00035

KEY CAPABILITIES

This feature, for the DMS-500 system, enhances the Echo Cancellor (ECAN) Call Control algorithm first implemented as a part of feature AD9959, *SPM ECAN Call Control*. EC Bit setting and automatic ECAN allocation has been introduced on the SPM for ISUP trunks (SPM00031) and PRI trunks (SPM00033). However, the ECAN Allocation Algorithm on the Computing Module (CM) did not use these new SPM features prior to Rel.13.

PRINCIPAL BENEFITS

This feature optimizes the SPM ECAN Algorithm on the CM to take advantage of the EC Bit setting and automatic ECAN allocation via supervision messages to the SPM. These supervision messages are no longer required on ISDN User Part (ISUP) and ISDN Primary Rate Interface (PRI) trunks because of automatic ECAN allocation on the SPM, and have been removed. The CM also ensures that EC Bits from incoming messages propagate to the EC Bits of outgoing messages from the CM.

Technical reference: 60007747

MAJOR DEPENDENCIES

Software: SPMS0001 Spectrum Peripheral Module Base

New ATR Dialing Plan Enhancements to Support ECRM/ECRN Selection

PCL: LLT00013

NCL: SPM00035

KEY CAPABILITIES

This feature, for the DMS-500 system, enables the craftsperson to enter the ECAN Resource Module (ECRM) and ECAN Resource Number (ECRN) to be used for Automatic Route Trunk (ATR) call termination to an SPM trunk. The enhanced ATR dialing plan also recognizes the direction of the ECAN. This value can be forward (0), backward (1), or back-to-back (2). For back-to-back ECAN, the craftsperson enters two ECRMs and ECRNs.

Technical reference: 60007752

MAJOR DEPENDENCIES

Software: SPMS0001 Spectrum Peripheral Module Base

NEW DMS REMOTE FEATURES

With DMS System remotes, high-demand services — such as Centrex, CLASS/Call Management Service, 1-Meg Modem, ISDN, and more — can be extended as much as 650 miles away from the host office (over facilities supporting a roundtrip delay of 13 milliseconds or less).

Robust and efficient in either standalone or bi-directional ring configurations, these flexible remotes provide:

- ◆ Emergency Standalone service to continue local call service even if the connections between the host and a switch are severed.
- ◆ Resource savings by enabling calls that originate and terminate within the switch remote to connect without tying up links back to the switch, except during initial call setup.
- ◆ Pair-gain and feeder relief by fine-tuning line concentration to reduce facilities costs.

In 1999, the supported maximum number of host links on the Remote Switching Center-S (RSC-S) and Dual RSC-S switch remotes expanded from 16 to 20 DS-1s. This increase in host-to-remote (“C-Side”) links can support 29% more traffic with a simple, nondisruptive upgrade.

REMOTES GENERIC

BAS00012

Extends revenue-generating DMS system services deeper into the network.

RLCM ESA Processor Upgrade

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

This feature offers software support of a new processor, NTMX45AA, for DMS-100, DMS-500, and DMS-100 Wireless remotes. This global replacement processor is needed to support the Emergency Standalone (ESA) capability whenever host-to-remote communication is lost (during ESA, local call service continues even if the connections between the host and the remote are severed). In Rel•12, this new NTMX45AA processor is available for new shipments of the Remote Line Concentrating Module (RLCM) and Outside Plant Access Cabinet (OPAC) remotes.

Technical reference: 59008339, 59008344, AF7870

PRINCIPAL BENEFITS

Nortel Networks is introducing a new ESA processor to deliver to network providers the latest components available. The new NTMX45AA processor, needed for ESA protection, is *not* gating hardware with Rel•12: replacement of existing NT6X45AF processors and NT6X47AC memory in the field is not required, *except* on RLCM, OPAC, and Outside Plant Module (OPM) remotes to support order code BAS00078 LNP Duplicate NXX Remote (see next).

LNP DUPLICATE NXX REMOTE**BAS00078**

Supports Duplicate NXX numbering plans when host links are cut and remotes enter Emergency Standalone mode to continue providing local calling services.

Duplicate NXX for DMS Remotes in ESA

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

“Duplicate NXX” applies to having the same NXX office code for different Numbering Plan Area codes (NPAs) on the same DMS system. Order codes NPE00001 and NPE00002, both introduced in Rel•9 for the host, expand DMS call processing, provisioning, and line maintenance to support the use of Duplicate NXX in the same switch.

Now order code BAS00078 extends Duplicate NXX dialing to the following DMS remotes while in Emergency Standalone (ESA) mode:

- ◆ Star Remote System (Hub and Modules)
- ◆ Remote Switching Center-S (RSC-S)
- ◆ Remote Line Concentrating Module (RLCM)
- ◆ Outside Plant Access Cabinet (OPAC)
- ◆ Outside Plant Module (OPM)

Technical reference: 59007412

PRINCIPAL BENEFITS

BAS00078 is required to support Duplicate NXX dialing for DMS remotes while in Emergency Standalone mode. This enhancement helps ensure that local calls can be completed during ESA operation in areas having Duplicate NXX dialing plans.

MAJOR DEPENDENCIES

Software: BAS00012 Remotes Generic
NPE00001 Numbering Plan Evolution I

Hardware: NTMX45AA ESA processor pack (see previous) for RLCM/OPAC/OPM
NTAX74AA processor pack for RSC-S

NEW DMS REMOTE FEATURES, *continued***ISDN LINE DRAWER FOR REMOTES****ISDN0003**

Provides software support for the hardware that delivers low line-size Basic Rate Interface (BRI) ISDN services to an installed base of DMS-100 remotes.

ILDR Multipoint Embedded Operations Channel Support

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

For the ISDN Line Drawer for Remotes (ILDR), the Multipoint Embedded Operations Channel (MP-EOC) feature offers enhanced ILDR maintenance and diagnostic capabilities. With MP-EOC, the network provider can reset ISDN line repeaters, as well as monitor and diagnose various B1, B2, and 2B+D loopback configurations.

Technical reference: 59007278, 59007422

PRINCIPAL BENEFITS

As a maintenance enhancement to the existing ILDR hardware, the MP-EOC functionality significantly enhances the maintainability of lines on extended loops off the ILDR on DMS-100 remotes. Network provider craftspersons can now remotely test individual sections of the BRI loop to isolate problems from a central network location. This ISDN maintenance feature helps improve the Quality of Service and reduces the ongoing costs of delivering and maintaining ISDN services.

GR-303 ESMA FEATURE

The Nortel Networks Expanded Subscriber Carrier Module-100 Access (ESMA) provides digital integration of our next generation GR-303 business access vehicle, the AccessNode platform, as well as Telcordia GR-303 compliant remote digital terminals (RDTs) from other vendors.

ESMA WITH INTEGRATED CHANNEL BANK (ICB)

SMA00012

Enhances the Expanded Subscriber Carrier Module-100A (ESMA) to directly terminate D4 channel bank DS-1s.

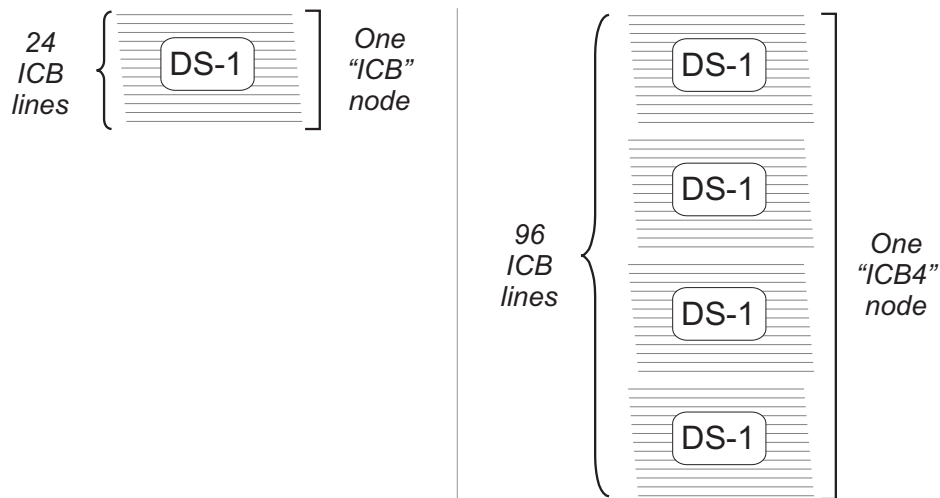
Integrated Channel Bank Line Capacity Increase

LEC00012, LET00012, LLT00012, LWW00006

KEY CAPABILITIES

Expanding local-service competition and burgeoning Internet traffic has increased line access demands, addressed in part by the addition of Integrated Channel Bank (ICB) lines. To leverage the dramatic growth in ICB configurations, SMA00012 is scheduled to expand the line capacity for this type of interface.

Currently, the “ICB” node type represents one DS-1 (with the capacity for 24 ICB lines). This new software introduces a new node type, “ICB4”, that permits up to four DS-1 spans to be datafilled as a single, nonconcentrating node.



“ICB” Node Type Contrasted with the New “ICB4” Node Type

Technical reference: 59008509, 59008693, 59008707

PRINCIPAL BENEFITS

The introduction of a new node type provides an increase of four times the current capacity of 24,000 ICB lines. On a fully configured DMS system, this enhancement permits up to 96,000 ICB lines to be datafilled — to help keep ahead of exploding access traffic demands at the local loop.

Directory and Operator Services

The Nortel Networks portfolio of directory and operator services builds on the robust and reliable Traffic Operator Position System (TOPS) platform combined with innovative database and information technology, and leads the industry in automation, computer-telephony integration (CTI), and the convergence of data and voice in the public network.

At the center of the TOPS network is the DMS TOPS tandem switch — supporting up to 1000 operator positions defined into 30 operator teams. The DMS TOPS switch connects operator positions with directory assistance systems, operator reference databases, voice service nodes, and other systems and databases.

This chapter discusses the new software features that will reside in the Computing Module (CM) of the DMS TOPS switch to support a variety of services, operator positions, and databases that subtend from the switch.

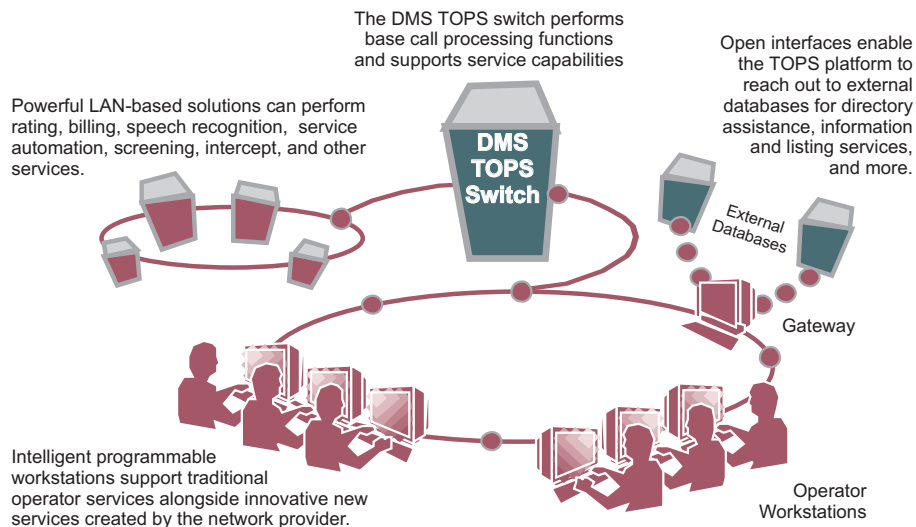
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BUILDING ON MORE THAN TWO DECADES OF EXPERIENCE

In the changing world of telecommunications, new opportunities and challenges are the order of the day. Deregulation of the industry and explosive advances in computer, communication, and information technologies have opened markets to tremendous potential growth.

Nortel Networks is currently the only vendor to provide end-to-end operator services — from the operator workstation to the switch, database applications, and audio processors — across the network. We are proud to offer the broadest portfolio of directory and operator services in the industry with highly customizable solutions based on standard operating hardware and open interface software. To optimize the value of these services, Nortel Networks offers comprehensive support packages, including technical education; computer-based and on-site training; systems integration and testing; warranty and maintenance contracts; and much more.



Nortel Networks Offers End-to-End Operator Services

Nortel Networks is now delivering a new generation of TOPS functionality within the Intelligent Services Environment (ISE), featuring the TOPS Intelligent Services Switch (ISS), the Intelligent Services Node (ISN), and the Intelligent Workstation (IWS). The ISE affords service providers tremendous versatility in configuring the precise network they need to compete and win in today's dynamic marketplace. Built to Nortel Networks Open Automated Protocol (OAP) specification, the ISE is a truly open and flexible environment, allowing full network integration and attendant backing at any time.

Our commitment to Directory and Operator Services is founded on more than two decades of experience in the business. As our industry moves toward an era of intelligent networking, the operator's role is evolving to that of a service attendant for an ever-increasing array of network services. Nortel Networks has expanded and advanced our product portfolio to accommodate these changes. The products and services available today are the platforms for building a profitable future for our customers.

THE FUTURE OF DIRECTORY AND OPERATOR SERVICES

The Nortel Networks portfolio of directory and operator services offerings is moving in step with customer initiatives toward Succession Solutions and the efficiencies of Internet Protocol (IP). For more information on the transition to a packet-based network, see the “Succession Solutions” chapter in this document, beginning on page 34.

Many new and advanced TOPS features that interwork in packet-based environments will be introduced in LET00013 and LET00014.

- ◆ LET00013 introduces “MIS Over IP” (see page 214) that allows service providers to consolidate their network information into one format. This release also lays the groundwork for centralization of operator networks over IP.
- ◆ LET00014 is planned to include a feature called “TOPS and Succession Solutions Interworking” (see page 215), which helps existing customers to leverage their installed base of Nortel Networks products while following a managed migration path to IP. This release is also planned to feature important infrastructure advances to allow Directory Assistance voice traffic to be transported over the IP network.

Nortel Networks is committed to providing customers with the latest advances in technology so service providers can benefit from improved speed to market, expanded revenue opportunities, and lowered operating costs.

PRODUCT EVOLUTION STATUS

Nortel Networks continuously refines product offerings to keep customers current with the latest technological advances. As we add new capabilities to our portfolio, development for some of our older products cannot keep up with new requirements. Please note the evolution status for the following products.

- ◆ **TOPS 03/04 Operator Positions.** No additional feature development will be undertaken for the TOPS 03 and 04 positions. Hardware and software will continue to be supported through regular customer-service channels and within existing contractual terms.
- ◆ **TOPS MP Operator Position.** Support for the TOPS MP position is now limited to required Additions and Maintenance (A&M) work, and software development support is limited to selected enhancements to traditional services and regulatory features implemented on the switch. Hardware and software will continue to be supported through regular customer channels and within existing contractual terms.
- ◆ **Voice Services Node (VSN).** The Voice Service Node product has reached manufacture discontinued status.
- ◆ **Interactive Voice Subsystem (IVS).** The Interactive Voice Subsystem product has reached manufacture discontinued status.

STANDARD OPERATOR SERVICES BASE SOFTWARE

The following are planned to be delivered as “standard” features; they do not have to be licensed separately.

Table LATANAME Expansion

LET00012, LLT00012

KEY CAPABILITIES

Service providers use table LATANAME to define the Local Access Transport Areas (LATAs) served by their switches. Currently, this table permits up to 31 entries. This feature expands the maximum number of LATAs handled by Table LATANAME to 255.

Technical reference: 59006827

PRINCIPAL BENEFITS

In today’s new environment, 31 entries may no longer be sufficient for network providers using TOPS switches to wholesale services across the United States. By increasing the maximum number of LATA names handled by TOPS to 255, this feature allows wholesalers using TOPS switches to have greater flexibility in the markets they serve.

On/Off Switch for TOPS

LET00012, LLT00012

KEY CAPABILITIES

This feature allows access to TOPS call processing to be enabled or disabled using Software Optionality Control (SOC):

- ◆ When SOC option OSB00001 is **enabled**, the network provider can access TOPS functionality.
- ◆ When SOC option OSB00001 is **disabled**:
 - Operator login is denied.
 - Calls coming in on TOPS trunks are sent to reorder treatment.
 - Calls requiring operator assistance are sent to reorder treatment.
 - Operator Services System Advanced Intelligent Network (OSSAIN) session pools cannot be brought into service.

This safeguard feature is available in North American and global TOPS loads.

Technical reference: 59007019

PRINCIPAL BENEFITS

On combo switches incorporating TOPS functionality, this software helps prevent TOPS switch functionality from accidentally being turned on or off.

STANDARD OPERATOR SERVICES BASE SOFTWARE, *continued*

MD Code Removal and Re-Engineering

LET00012, LLT00012

KEY CAPABILITIES

This feature, MD Code Removal, removes outdated and manufacturer discontinued (MD) TOPS Automatic Call Distribution (ACD) code from TOPS software.

There are neither new functionalities nor new customer hardware dependencies introduced by this feature. It should be noted, however, that TOPS ACD operator positions will no longer operate. Therefore, it is imperative that customers upgrade all of their office equipment to TOPS QMS before upgrading their DMS switches to LET00012.

Technical reference: 59006865

New MIS over IP

LET00013, LLT00013

KEY CAPABILITIES

The QMS Management Information System (MIS) over IP feature provides event-driven data about TOPS positions and call queues using an IP interface. Intended for use in driving off-board reporting facilities and real time displays, the IP link terminates on a DMS Extended Peripheral Module (XPM) containing an Ethernet equipped NTSX05DA card. With this feature, a TOPS office is able to use either the existing X.25 interface or the new QMS MIS IP interface for QMS MIS data, but not both at the same time.

Technical reference: 59007458

PRINCIPAL BENEFITS

This feature consolidates all MIS data — whether TCP/IP, X.25, TCAP, or ISDN — onto one data network, simplifying network administration and support. The QMS MIS data provided to the off-board facilities uses the existing QMS MIS protocol that is in use today, to help reduce the impact of this new feature.

MAJOR DEPENDENCIES

Software: TOPS Queue Management System (QMS) with QMIS

Hardware: NTSX05DA card

New Billing Enhancements for EA Calls to Served Carriers

LET00013, LLT00013

KEY CAPABILITIES

This feature enables a network provider to generate two billing records for 0- call originations that become Equal Access (EA) calls destined to carriers that contract with the network provider for operator services.

Technical reference: 59013695

PRINCIPAL BENEFITS

By creating two different billing records, the network provider has both billable records and access records that can be used for billing both the subscriber and the carrier. This offers greater flexibility for providers who offer both local and long distance services.

New TOPS and Succession Solutions Interworking

LET00014, LLT00014

This feature enables TOPS features to continue to operate in nodes in a Succession Solutions environment. Prior to this feature, an existing Tandem system that has TOPS software operating could not be converted to a Succession Solutions Communication Server.

Technical reference: 59015896

New End of Life Activities in TOPS14

LET00014, LLT00014

This feature removes outdated functionality from the base TOPS software code, including:

- ◆ Delayed outpulsing
- ◆ Inward validation
- ◆ Table SPLNDID
- ◆ AMR5 signaling

The removal of end-of-life features helps keep the TOPS software processing at peak operating levels and helps contain memory and real time requirements.

Technical reference: 59015901

OPERATOR SERVICES SYSTEM AIN

This software grouping provides value-added Signaling System No. 7 (SS7) based Advanced Intelligent Network (AIN) capabilities that can interwork with DMS operator service features, bringing basic AIN functions and benefits to the operator services environment.

OSSAIN ENHANCEMENTS

OSAN0007

Provides additional functionality for Operator Services System AIN.

OSSAIN 12 Enhancements

LET00012, LLT00012

KEY CAPABILITIES

This feature enhances Operator Services System Advanced Intelligent Network (OSSAIN) software in the following ways:

- ◆ Allows trigger profiles to be set based on CT4Q
- ◆ Limits transitions between an operator and the service node
- ◆ Supports TOPS blocking of Open Automated Protocol (OAP) operations
- ◆ Provides OSSAIN Centralization (OSSAC) ability for remote call processing to handle OSSAC release/acknowledge
- ◆ Creates new extension blocks containing context block and passthrough messages
- ◆ Delivers options for return answer when a voice link is connected to a call
- ◆ Permits service nodes to indicate when local number portability (LNP) screening should be bypassed
- ◆ Enables service nodes to populate LNP GAP via the DMS switch
- ◆ Supports Calling Party Pays (CPP) wireless

Technical reference: 59006766

PRINCIPAL BENEFITS

These enhancements provide additional functionality and expand the value of TOPS OSSAIN capabilities.

MAJOR DEPENDENCIES

Software: OSAN0001 Operator Services AIN (OSSAIN)

New OSSAIN 13 Enhancement

LET00013, LLT00013

KEY CAPABILITIES

This feature enhances Operator Services System Advanced Intelligent Node (OSSAIN) to support Directory Assistance (DA) automation functionality that is database independent. These enhancements allow service nodes to provide an automated, interactive DA application that is similar to the existing Automated Directory Assistance Service (ADAS).

Technical reference: 59011611

PRINCIPAL BENEFITS

This feature gives service providers more flexibility in choosing directory assistance automation options, including switch-based or *nonswitch*-based applications from multiple vendors and use on multiple Nortel Networks platforms.

MAJOR DEPENDENCIES

Software: OSAN0001 Operator Services AIN (OSSAIN)

ENHANCED SERVICES

TOPS Enhanced Services software includes a collection of optional capabilities that enhance the basic functionality of TOPS call processing in various ways.

SECONDS-BASED ANNOUNCEMENTS

ENSV0025

Provides a finer degree of measurement for callers requesting Time and Charge information.

Seconds-Based Announcements

LET00012, LLT00012

KEY CAPABILITIES

Currently, Automated Coin Toll Service (ACTS) plays time duration announcements in per-minute increments for post and pre-paid calls from coin phones. Now, with this feature, ACTS can play the time duration to the second for post-paid calls from coin phones, and perform Time and Charge functions for calls, including hotel calls. Also, two other call types now reflect duration in seconds:

- ◆ External real-time rated calls that arrive at the operator position
- ◆ External rated hotel calls that go to a Hotel Billing Information Center (HOBIC) device

Technical reference: 59006873

PRINCIPAL BENEFITS

This feature enables the ACTS announcement to more accurately reflect the time information provided by an external rater.

MAJOR DEPENDENCIES

Software: ENSV0001 Enhanced Services

TOPS IP OPERATOR CENTRALIZATION**ENSV0026**

Lays the groundwork to move Nortel Networks' directory and operator services offerings to the world of Internet Protocol.

New TOPS IP Operator Centralization

LET00013, LLT00013

KEY CAPABILITIES

This feature creates the provisioning and data infrastructure to support the transition of TOPS Operator Centralization (OC) voice and data links to IP transport. The feature enables:

- ◆ TOPS OC **voice traffic** to be carried over an IP data network through the use of the NT7X07 Gateway card.
- ◆ TOPS OC **data traffic** to be carried over an IP data network through the use of the NTSX05DA processor.

It also provides the DMS switch maintenance infrastructure to support TOPS OC voice and data links in the IP environment.

Technical reference: 59012723, 59013928, 59013932, 59013936

PRINCIPAL BENEFITS

This feature provides the necessary infrastructure for TOPS to run in an Internet Protocol (IP) environment. IP promises lower costs of transport, simplifies reconnection of hosts and remotes, greater flexibility in the use of host and remote switches, and decreased operational costs for maintaining network connections.

MAJOR DEPENDENCIES

Software: ENSV0001 Enhanced Services

Hardware: – New NT7X07 Centrex IP Gateway cards
– New Line and Trunk Controller for ISDN (LTCl) with NTSX05DA processor, NT6X0240 backplane, and NTMX76 Messaging circuit pack

UNBUNDLING

The *Unbundling* software group introduces a range of features to help service providers benefit from the unbundling and wholesaling of directory and operator service features.

UNBUNDLING

UNBN0001

Simplifies operator service unbundling for incumbent service providers.

Unbundling OPRTRANS

LET00012, LLT00012

KEY CAPABILITIES

This enhancement expands on UNBN0003 Translations and Routing to provide mandated unbundling capabilities required by the Telecommunications Reform Act for Operator and Equal Access translations.

Technical reference: 59006822

PRINCIPAL BENEFITS

UNBN0001 helps make translations easier by enabling them to be performed by one table. This functionality is optional and can be implemented on a per-tuple basis.

CALL RESTRICTIONS FOR WHOLESALING

UNBN0006

Adds flexibility for service providers operating in a wholesale environment.

Call Restrictions for Wholesaling

LET00012, LLT00012

KEY CAPABILITIES

UNBN0006 enables the network provider to restrict calls on a trunk group or on a Carrier Identification Code (CIC) basis if no restriction is found for the directory number (DN) in either tables SPLDNID/TDBCLASS or OLNS.

Technical reference: 59006832

PRINCIPAL BENEFITS

This optional software gives wholesalers greater control over how calls are restricted and makes it easier to offer call restriction on a per-call basis.

MAJOR DEPENDENCIES

Software: UNBN0001 Unbundling

SCREENING FOR BILLING AGREEMENT**UNBN0007**

Provides greater control and certainty where billing questions might arise in an unbundled environment.

New Screening for Billing Agreement

LET00013, LLT00013

KEY CAPABILITIES

The Screening for Billing Agreement feature screens each call at call setup (prior to connecting to the terminating party or floating the call) for billing agreements between the service provider of the originating party and the service provider of the billed-to party/entity. The billed-to party/entity can be a Directory Number (DN) in the cases of a collect, third party, or calling card provider.

Technical reference: 59011929

PRINCIPAL BENEFITS

In an unbundled environment, helps service providers to ensure that service agreements exist before completing a call, preventing unbillable records from being generated.

MAJOR DEPENDENCIES

Software: UNBN0001 Unbundling
ABS00012 Originating Line Number Screening (OLNS) Interface

OPERATOR SERVICES DIRECTORY ASSISTANCE

The *Operator Services Directory Assistance* software group provides basic Directory Assistance (DA) call handling capability, protocols for communicating between the switch and directory assistance systems, and support of DA and intercept announcements made using Enhanced Digital Recorded Announcement Machine (EDRAM) technology.

DIRECTORY ASSISTANCE VOICE OVER IP

OSDA0009

Adds the benefits of IP to the Nortel Networks portfolio of Directory Assistance (DA) offerings.

New Directory Assistance Voice over IP

LET00014, LLT00014

KEY CAPABILITIES

This feature provides the ability to transport directory assistance (DA) and intercept audio data between the TOPS switch and the Intelligent Services Node (ISN) DA Audio Server via an IP network. In addition, this feature will allow a single ISN DA Audio Server to be accessible via any TOPS switch in a TOPS network.

Technical reference: 59015305

PRINCIPAL BENEFITS

This order code moves the connection between TOPS and the ISN DA Audio Server into the IP environment, along with all the inherent efficiencies and cost savings of packet-based transport.

MAJOR DEPENDENCIES

Software: OSDA0001 Operator Services Directory Assistance

ADVANCED QUEUING SERVICES

With the *Queue Management System (QMS)*, the DMS TOPS switch supports up to 255 unique queues of calls to operator positions — and up to 255 unique operator profiles that define the service capabilities of individual operators and teams.

QMS CUSTOMER SERVICE ENHANCEMENT

ADVQ0006

Adds increased customer support capabilities and flexibility to operators using QMS CASE.

QMS Customer Service Enhancement

LET00012, LLT00012

KEY CAPABILITIES

This feature provides a sonalert signal when a call requiring special assistance is in queue and the Service Assistant (SA) is busy or has calls withheld, excludes SA time and monitoring time from office Customer Service Time (CST) and automatic message accounting (AMA) records, and adds softkeys that display when the SA receives an assistance request.

Technical reference: 59006877

PRINCIPAL BENEFITS

The sonalert notification of a call waiting in queue gives added flexibility to the Customer Service Expert (CSE) position, adding capabilities previously available only on Service Assistant/In-Charge positions.

MAJOR DEPENDENCIES

Software: ADVQ0001 Advanced Queuing

ADVANCED QUEUING

ADVQ0001

Provides next-generation queuing capabilities, including support for hundreds of unique queue types and agent profiles.

Force Management CRT Elimination

LET00013, LLT00013

KEY CAPABILITIES

This feature develops an alternative for the Force Manager cathode ray tube (FMCRT) and eliminates out-of-date equipment, specifically the TOPS IV and TOPS Multi-Purpose (MP) positions and DMODEMS.

Technical reference: 59006812

PRINCIPAL BENEFITS

This feature eliminates the necessity for service providers to maintain manufacturer-discontinued TOPS IV or MP positions solely for force management use.

OPERATOR SERVICES EQUAL ACCESS

This software group provides the features required to deliver TOPS services in the Equal Access environment, including FGB (Feature Group B) and FGD (Feature Group D) carrier code expansion.

OPERATOR SERVICES NETWORKING CAPABILITY

OSEA0013

Allows service providers to standardize their trunking, leading to greater efficiency and ease of maintenance.

New Operator Services Networking Capability

LET00013, LLT00013

KEY CAPABILITIES

This feature brings operator calls routed on incoming OSNC trunks into the TOPS environment. Operator calls (which include call originations, intercept, and inward calls) are identified by the called digits and the Modified/Basic Nature of Address. This feature also formulates an Address Complete Message (ACM) — that may include coin signaling and a connection hold request — for sending to the incoming connection. With this feature, the Local Service Provider Identifier is retrieved from the initial address message (IAM) for branding and automatic message accounting (AMA).

This feature also formulates IAMs to establish outgoing OSNC connections for call completion, inward, and transfer calls. To establish end-to-end signaling, this feature saves the information in the ACM, CPG, and ANM received on the outgoing connection to forward to the incoming connection when these connections are cut-through. This feature also formulates CPG to send incoming connections to establish end-to-end signaling when the connection is cut-through. This feature also formulates the FAC for coin signaling, and for forwarding FAC messages from one connection to the other when a call has been transferred to an interexchange carrier's Operations Support System (OSS).

And finally, this feature formulates RELs to release incoming and outgoing OSNC connections independently, for formulating CPGs when a call recalls to an operator, for formulating an REL to support RLT version 1 on Automated Directory Assistance Call Completion (ADACC) calls, and for generating AMA records.

Technical reference: 59012548, 59014261, 59014265, 59014276

PRINCIPAL BENEFITS

This feature handles coin signaling, operator hold, and operator recall in an ISUP network. Now service providers can standardize on more efficient ISUP trunks for more efficient provisioning.

MAJOR DEPENDENCIES

Software: OSEA0001 Operator Services Equal Access

OAM&P Applications

To simplify the management of complex services, unbundling, and the demands of real-time communication, service providers have migrated their internal operations data networks to provide TCP/IP connectivity for provisioning, translations, surveillance, network management, maintenance, billing, and software delivery over high-capacity networks. Coupled with this drive, the costs of networking facilities and workstation equipment have fallen, making the use of shared graphical applications over industry-standard interfaces expected requirements of a modern operations network.

Nortel Networks offers leading-edge operations, administration, maintenance, and provisioning (OAM&P) applications that exploit the benefits of this new environment to provide time- and labor-saving capabilities. The new OAM&P applications can help give network providers the edge in delivering new features and services by enabling switch technicians to provision and activate services more quickly than before. These software tools can also lower the life-cycle cost of DMS SuperNode system ownership by significantly reducing the time and effort required to complete provisioning, commissioning, performance testing, fault isolation, and recovery procedures.

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KEY BENEFITS OF ADVANCED OAM&P APPLICATIONS

By simplifying OAM&P, the new applications offer high-value information and intuitive software tools — over standard interfaces — to improve the OAM&P fit with a network provider's operations environment. Some of the advantages of this new software include:

- ◆ **Streamlines procedures** to help reduce operating expenses, significantly simplify data input, and cut training requirements. The software provides a high degree of automation for data collection, fault isolation, and command execution.
- ◆ **Accelerates service activation.** These applications give network providers the edge in delivering new services by enabling switch technicians to provision and activate complex features in less time than previously required. The software's advanced design reduces repetitive operations and performs datafill cross checking and range verification to capture data entry errors.
- ◆ **Simplifies operations support systems (OSS) synchronization.** A stable, service-level view of the DMS SuperNode system simplifies custom programming at the OSS to support new services — streamlining the work of managing a multivendor network.

The new OAM&P applications filter DMS SuperNode-specific details to provide a streamlined functional view of the DMS SuperNode switch to the OSS. This insulates the operations support system from switch-specific changes, lessens OSS processing demands, and reduces the need to update the OSS after DMS SuperNode software upgrades.

- ◆ **Introduces revenue-generating opportunities** with high-demand capabilities such as high-volume, near real-time billing to business accounts.
- ◆ **Lowers DMS skill set requirements.** Service-based point-and-click graphical user interface (GUI) applications, with intuitive screen layouts, replace existing syntax-intensive commands. A consistent human-to-machine interface (HMI) keeps keystrokes to a minimum, displays messages in everyday language, and offers online help.
- ◆ **Enhances employee satisfaction** by making information more readily available and presenting it more intuitively. The software's client/server design with Web-enabled access dramatically reduces response times.
- ◆ **Delivers enhanced, centralized security.** Standard Distributed Computing Environment (DCE) software offers expanded security capabilities, based on individual user profiles.

OAM&P APPLICATIONS PLATFORM

The dedicated server for OAM&P processing is the DMS SuperNode Data Manager (SDM). This fault-tolerant, carrier-grade OAM&P platform offers the computing power and robustness to support the full array of OAM&P applications with superior performance and reliability. Operating in the Element Management layer of the Telecommunications Management Network (TMN) model, this high-availability management solution delivers the power and capacity to process complex OAM&P applications to speed provisioning, fault isolation and troubleshooting, configuration management, and billing operations.

The SDM platform offers network providers a number of long-term benefits:

- ◆ **Provides fault-tolerant operation.** The robust SDM frame makes full use of dual processor/hard drive domains and fault-tolerant software to provide high availability that can survive a point of failure with no loss of service. The carrier-grade hardware provides redundant buses, mirrored disk storage, hot-swappable circuit packs, and redundant interfaces.
- ◆ **Helps lower DMS SuperNode system cost of ownership.** Besides time-saving human-to-machine interfaces, the SDM also supports open machine-to-machine interfaces to help curb secondary costs, such as reducing the need to reprogram operations support systems (OSSs). Distributed processing also reduces the computing demands on the OSS and simplifies monitoring and fault-correction tasks across multiple DMS SuperNode systems.
- ◆ **Integrates with the DMS system.** Unlike an adjunct processor, the high-performance SDM integrates with the DMS architecture, offering a high level of alignment with standard DMS logs, alarms, power, and maintenance. This reduces impact on local practices, builds on existing office systems, and reduces training requirements.
- ◆ **Helps reduce work force requirements.** Supporting remote operation helps maximize available resources and paves the way for unmanned offices.
- ◆ **Optimizes communications costs.** In place of low-speed, dedicated, point-to-point communications, the SDM relies on high-speed Ethernet (and, in the future, Asynchronous Transfer Mode) connectivity into a data packet network to reduce total network facilities required.
- ◆ **Uses commercially available components** so network providers can benefit from the latest technology as it becomes available, such as 350 MHz PowerPC 750 microprocessors in 2000.
- ◆ **Accommodates new technologies and standard interfaces** as they become available. Standard platforms, protocols, and interfaces promote interworking among multivendor elements across the network.

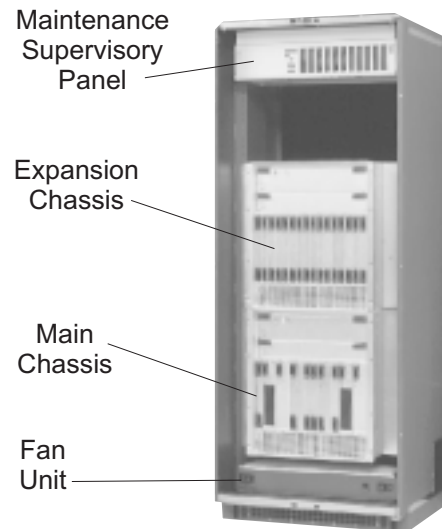
A BRIEF LOOK AT THE SDM FRAME

Housed in a C28 Model B streamlined DMS SuperNode cabinet, this frame consists of a main chassis, an expansion chassis, Modular Supervisory Panel (MSP), cooling fan units, interconnect modules, and associated cabling.

The main chassis, near the bottom of the cabinet (above the fan unit), consists of a mid-mount backplane, 16 front slots, and 16 “personality module” slots in the back to accept external cabling connections.

The expansion chassis, installed above the main chassis, provides additional slots for dual-drive hardware modules for configurations needing more than 18 gigabytes of redundant data storage.

The SDM communicates with the Computing Module over duplicated high-bandwidth DS-512c fiber links directly to the DMS-Bus. Redundant 10BaseT Ethernet links via a hub or LAN concentrator connect the SDM to the network provider’s operations data network (see next).

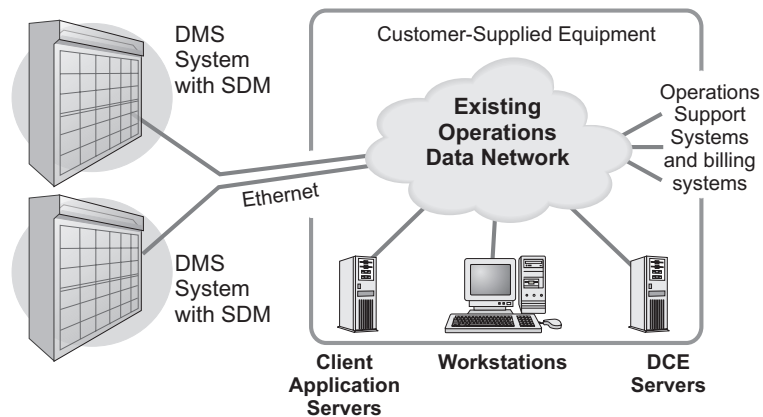


SDM IN THE OPERATIONS DATA NETWORK

The SDM’s high-speed connectivity lets network providers use their existing LAN or WAN operations data network resources and expertise to securely transfer OAM&P data among DMS systems, workstations, billing systems, and OSSs.

Besides the Nortel Networks-provided frame, the SDM also relies on the following customer-provided elements:

- ◆ **The operations data network.** For open, secure, cost-effective connectivity with workstations, servers, OSSs, and other geographically dispersed elements, the SDM communicates over the same packet network used for operations today.
- ◆ One or more **workstations** so craftspersons can have Web-browser enabled or command-line access to OAM&P applications.
- ◆ One or more **Client Application Servers** to respond to user software requests and make Web browser-enabled operations on workstations possible.
- ◆ A **DCE Server** to provide authentication and access control for multiple DMS SuperNode systems across an entire network.



Customer-Supplied Equipment in the Operations Data Network

Details on these components can be found in *DMS OAM&P Evolution* bulletin. Call 1-800-4 NORTEL to order this document (request the latest issue of document number 50165.16).

AN INTEGRAL ELEMENT OF SUCCESSION SOLUTIONS

The network provider's investment in the SDM and associated elements in the operations data network can carry over to the new Succession Solutions from Nortel Networks.

Succession Solutions can help smooth the way for a carrier to transition to next-generation packet services and transport by installing a new packet network *or* by transitioning today's circuit-switched investments to a multi-vendor packet-based Unified Network. For more information, refer the "Succession Solutions" chapter in this document.

An SDM frame can be transitioned to a network-wide Network Manager (NM) — to extend OAM&P applications and management controls across the new network from a central location — if it is at an office that will be transitioned to a Succession Communication Server (CS).

In the transition to a Succession Solutions network, no new platforms are introduced in the operations data network and only new 350 MHz Central Processing Unit (CPU) modules and new software are needed at the SDM frame (some sites may need to replace existing hard disk modules with new 9-gigabyte ones). Asynchronous Transfer Mode (ATM) interface cards are planned for Release 2.

Operating as a Succession Network Manager, a transitioned SDM offers centralized OAM&P for Succession elements across the new network, along with many of the applications running today on SDMs on individual DMS systems.

CURRENT CAPABILITIES

As of SDMN0012, the SDM offers:

OAM&P Application	Order Code
<i>Base Capabilities</i>	
Standard Base Platform Software, including: Fault-Tolerant Platform Base High-Speed Log Interface Software Inventory Management (SWIM)	PLAT0005
Enhanced Terminal Access	ENTA0001
ASCII Terminal Access	ATA00001
Secure File Transfer	SFT00001
<i>Accounting Management</i>	
SuperNode Billing Application (Base)	SBM00001
SuperNode Billing Application – Automatic Message Accounting Data Networking Standard (AMADNS)	SBM00003
<i>Performance Management</i>	
Exception Reporting	SURV0003
Operational Measurements Delivery	CNOM0001, CNOM0002
<i>Configuration Management</i>	
DMS Data Management System (DDMS)	DDMS0001

NEW CAPABILITIES

The SDM Non-Computing Module Loads (NCLs) discussed in this chapter are:

Planned general availability	SDM release order code
4Q99	SDMN0012
2Q00	SDMN0013
4Q00	SDMN0014

To maintain full feature compatibility between SDM applications and the DMS system, the Computing Module needs the latest available PCL installed. Short of full feature support, the following table shows operational compatibility between SDM and CM releases.

NA008	NA009	NA010	NA011	NA012	NA013	NA014
SDMN0010						
SDMN0011						
	SDMN0012					
		SDMN0013				
			SDMN0014			

The feature descriptions on the following pages discuss:

OAM&P Application	Order code	Availability (NCL)	Starting page
<i>Base Capabilities</i>			
Standard Base Platform enhancements:			
Direct Spooling of CM image	PLAT0005	SDMN0012	232
512 MB/350 MHz CPU		SDMN0013	232
9 GB Disk Drive		SDMN0013	233
Network User Administration		SDMN0014	233
<i>Accounting Management</i>			
Multi-destination per Billing Stream	SBM00001	SDMN0012	234
SMDR Delivery	SBM00006	SDMN0012	235
<i>Performance Management</i>			
Event Record Manager	EVNT0002	SDMN0012	236
EADAS via TCP/IP	NMDC0001	SDMN0013	237

NEW CAPABILITIES, *continued*

BASE CAPABILITIES

The software on this and the following page are planned to be part of the standard SDM platform.

SDM PLATFORM - FAULT TOLERANT

PLAT0005

Offers a dual-processing environment to maximize the performance and availability of OAM&P applications.

Direct Spooling of CM Image

SDMN0012

KEY CAPABILITIES

With SDMN0012, the Computing Module (CM) can spool the CM image to the SDM during the image dump process to reduce the inhibition of recent changes to an average 11 to 14% of the image-dump time. As an added benefit, this feature reduces the total time needed for an image dump (duration varies with configuration). For example, an office that currently needs up to 120 minutes for an image dump can reduce the inhibition of recent changes to about 15 minutes.

PRINCIPAL BENEFITS

Permitting recent changes during the majority of an image dump procedure can help the network provider set up and fine-tune revenue-generating services more quickly. For more information on a range of other Image Dump Enhancements in this time period, refer to pages 49 and 50.

New 512 MB/350 MHz Central Processing Unit

SDMN0013

KEY CAPABILITIES

SDMN0013 offers a 350 MHz Central Processing Unit (CPU) option for the SuperNode Data Manager. The faster processing speed will be critical as additional features are added to the SDM and as offices begin deployment of XA-Core (see pages 58 to 64) to process more calls and generate more operations data.

PRINCIPAL BENEFITS

Faster processing speeds present the opportunity for the SuperNode Data Manager to meet the processing requirements of large DMS systems. By integrating a leading-edge processing engine with the DMS SuperNode system, the SDM can take advantage of the aggressive computer industry performance curve.

New 9 Gigabyte Disk Drive

SDMN0013

KEY CAPABILITIES

SDM system software in SDMN0013 can support larger individual disk drives for data storage. The larger storage increments offer more economical use of space in the SDM frame. For example, using 9-gigabyte (GB) disk drives more than doubles the current storage capacity (18 GB versus 8 GB) in the SDM main chassis.

PRINCIPAL BENEFITS

Larger storage increments reduce the frequency of incremental storage additions for offices with growing data storage needs.

New Network User Administration

SDMN0014

KEY CAPABILITIES

Network User Administration (NUA) is an optional administrative interface to administer access to terminal-access applications. Administration can be viewed by individual user, user group, or switch group. Through NUA, an administrator can establish session profiles for users.

NUA makes it easy to perform repetitive tasks very quickly. Most tasks are drag-and-drop or point-and-click. Network User Administration makes it easy for administrators to view user profiles and privileges clearly, to ensure that the administrator's intent agrees with the actual implementation.

This first release of NUA client software is supported on the Sun Microsystems workstation.

Note: the first release of NUA administers terminal access to the DMS system/SDM only. Subsequent releases are planned to extend NUA to administer users within other applications (such as Secure File Transfer, SuperNode Billing Application, DDMS, or Exception Reporting).

PRINCIPAL BENEFITS

- ◆ **Flexible administration:** Password control can be centralized with one administrator, or that function can be distributed among multiple administrators assigned by geographic region or by function.
- ◆ **Saves time and contains costs:** Less time is needed to administer DMS system user IDs and passwords. User IDs and passwords can be changed through bulk distribution or one at a time, and most changes can be done with a simple point-and-click or drag-and-drop.

NEW CAPABILITIES, *continued*

ACCOUNTING MANAGEMENT

SUPERNODE BILLING APPLICATION – BASE SOFTWARE

SBM00001

Serves as a DMS SuperNode system automatic message accounting (AMA) repository and supports the transport of data.

New Multi-Destination per Billing Stream

SDMN0012

KEY CAPABILITIES

This feature adds a new registration interface that enables multiple users to register for pushes of billing data on a per-stream basis. The billing data sent to the far-end destination (downstream processing) is unfiltered.

Each destination is activated by logging onto the SDM's Remote Maintenance Interface. A scheduled billing file transfer is then datafilled in the SuperNode Billing Application (SBA). This multi-destination capability can be applied to multiple billing streams, such as:

- ◆ Bellcore AMA Format (BAF)
- ◆ Call Detail Recording (CDR)
- ◆ Station Message Detail Recording (SMDR)

PRINCIPAL BENEFITS

Network providers can benefit from the delivery of billing data to multiple locations in two ways:

- ◆ Fast delivery for time-sensitive applications.
- ◆ Reduced overall storage costs and less manual intervention to move data to downstream processes.

Examples of applications that can use a direct feed of billing data include:

- ◆ Fraud detection applications.
- ◆ The Event Record Manager application (see page 236 in this chapter).

SUPERNODE BILLING APPLICATION – SMDR**SBM00006**

Serves as a DMS SuperNode Station Message Detail Recording (SMDR) repository and supports the transport of data.

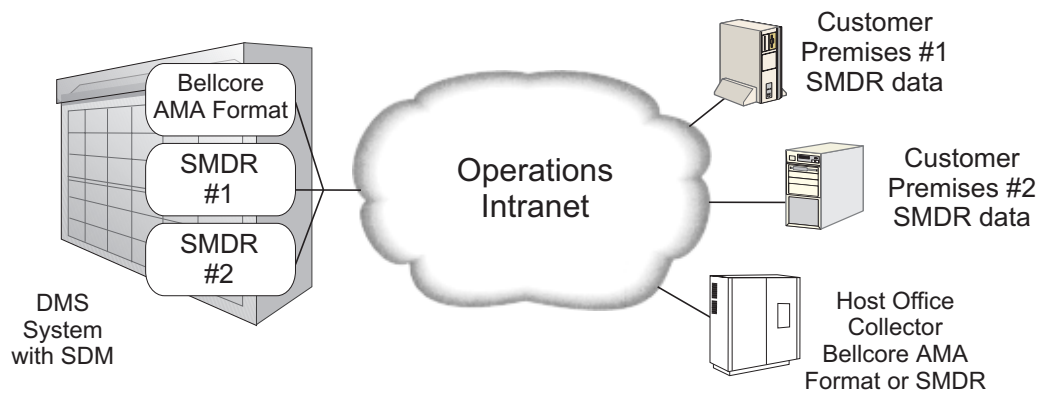
SuperNode Billing Application – SMDR Delivery

SDMN0012

KEY CAPABILITIES

Now, in addition to delivering Bellcore AMA Format (BAF) records, the SuperNode Billing Application can deliver Station Message Detail Recording (SMDR) records within the framework of the AMA Data Networking Standard (AMADNS) architecture (as specified in Telcordia GR-1343-CORE). With this feature, the SDM delivers multiple record streams from the DMS system through a common device.

One SuperNode Billing Application platform can handle up to ten SMDR customer groups, with near real-time delivery of SMDR records using standard File Transport Protocol (FTP) over Ethernet.



Deliver up to Ten Different SMDR Customer Group Records to Ten Locations for Teleprocessing

PRINCIPAL BENEFITS

Now that the SDM delivers multiple billing record streams, there is no longer a need for separate collection devices and communications infrastructures for SMDR records. This efficiency helps reduce the costs of providing SMDR through:

- ◆ Extremely flexible routing of SMDR for processing
- ◆ Use of a low-cost data-communications solution

MAJOR DEPENDENCIES

Software: SBM00001 SuperNode Billing Application Base
 SBM00003 SuperNode Billing Application – AMADNS
 Requires SMDR provisioning on the DMS system

NEW CAPABILITIES, *continued***PERFORMANCE MANAGEMENT****EVENT RECORD MANAGER****EVNT0002**

Collects fault, performance, and accounting data with filtering and summarizing capabilities for troubleshooting and analysis.

New Event Record Manager

SDMN0012

KEY CAPABILITIES

Event Record Manager (ERM) is a Web-based fault, performance, and accounting record management solution. ERM adapts and adds value to the Nortel Networks SDM by easily collecting, storing, and analyzing DMS system:

- ◆ Fault (logs, alarms)
- ◆ Performance (operational measurements)
- ◆ Accounting (BAF records)

The ERM Web Application Server can collect data from multiple SDM element managers, via SDM data delivery interfaces, for a network view of fault, performance and accounting information. The system stores the data on the ERM Web Application Server for processing and Web publishing.

The Event Record Manager's Web-based client interface is easy to use and can be integrated with other Web-enabled services. The client runs on PCs supporting Microsoft Windows 95/98/NT. Data can be explored using graphical Java views. Online Help includes descriptions of fault, performance, and accounting records.

PRINCIPAL BENEFITS

The Event Record Manager enables network providers to increase their competitive advantage, delivering Web-based solutions to improve productivity and decision-making processes. This provides better, more timely access to data collected from SDM-managed DMS network elements.

The Event Record Manager can be used for data collection and analysis in the areas of:

- ◆ Feature Testing (say, to help analyze if the right billing records are being generated)
- ◆ Specialized Surveillance
- ◆ Troubleshooting
- ◆ Customer Marketing

MAJOR DEPENDENCIES

Software: Distributed Computing Environment (DCE) software
Browser: Microsoft Explorer or Netscape Navigator

Hardware: Storage hardware on a Windows NT or Sun workstation

EADAS VIA TCP/IP

NMDC0001

Transports Data Collection data (TR-740) and Network Management data (TR-746) from the DMS system over an Ethernet network using TCP/IP.

EADAS via TCP/IP

SDMN0013

KEY CAPABILITIES

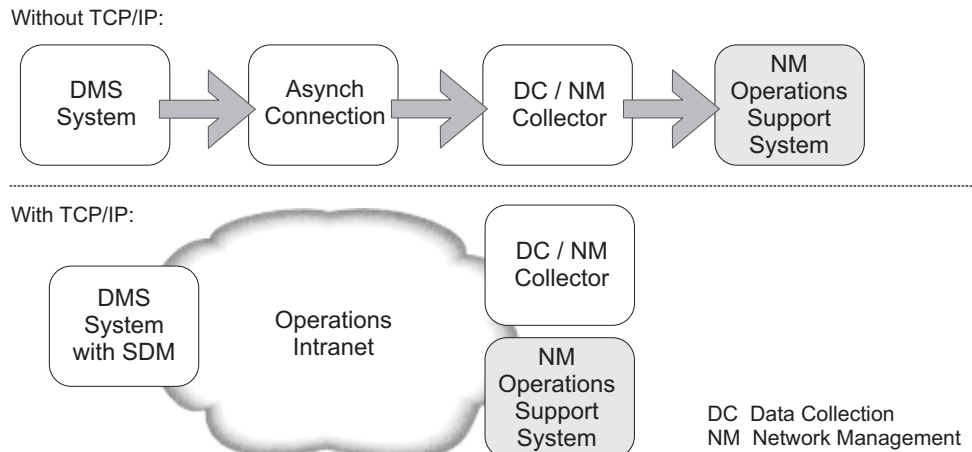
This optional order code provides the data link protocols for the DMS system to communicate with the Engineering and Administrative Data Acquisition System (EADAS) over a cost-effective Transport Communications Protocol/Internet Protocol (TCP/IP) interface.

Now Data Collection and Network Management information can be sent for collection either to the same IP address, or to separate IP addresses, as needed to suit a provider’s network.

PRINCIPAL BENEFITS

NMDC0001 supports messaging between the DMS system and the EADAS platform using TCP/IP over local area networks or wide area networks. This configuration offers:

- ◆ Long-term facilities cost savings over dedicated links.
- ◆ Simple accommodation of the growth in volume of this data.
- ◆ Near real-time routing of Network Management information to the Network Management OSS without the potential for a single point-of-failure inherent with a dedicated facility.



Direct Near Real Time Routing to the NM OSS Removes Single Point of Failure

MAJOR DEPENDENCIES

Software: OAM00004 EADAS Data Collection and Hardware Inventory

MVP Multiapplication Messaging

This chapter discusses key features and benefits of the Modular Voice Processor (MVP) 4240 for public access multiapplication messaging.

This multinode solution, capable of serving as many as 2400 ports as one virtual system, is generally available today for interworking with the DMS SuperNode and DMS-10 systems to deliver such high-demand features as Universal Mailbox, Multi-Network Messaging, Automatic Call Return, and more.

IN THIS CHAPTER

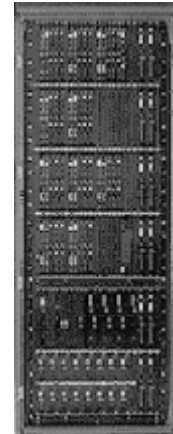
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MULTIAPPLICATION MESSAGING WITH THE GLENAYRE MVP 4240

Now there's a feature-rich, high-capacity voice-processing system available at a competitive price. Nortel Networks, in partnership with Glenayre Electronics, offers the Glenayre Modular Voice Processor (MVP) 4240. The MVP 4240 goes beyond the limitations of traditional voice messaging systems to support a variety of advanced capabilities and applications running simultaneously on a single, enhanced service platform.

The MVP 4240 is a multi-application, multi-media/voice processing platform designed specifically to meet the requirements of public access applications on all DMS-100, DMS-500, and DMS-10 systems. Able to support both corporate and residential customers, the MVP 4240 can support up to 2400 ports as one virtual system — with up to ten nodes located anywhere (each node in the system can handle up to 240 ports/10 T1s). The MVP 4240 cabinet fully complies with FCC, UL, BABT, CE, and CSA requirements, using standard switching interfaces to the DMS system. The platform is also NEBS-compliant and certified for Earthquake Zone 4 operation.

In addition, this cost-effective voice messaging system supports multiple user interfaces simultaneously, enabling most network operators to gracefully transition from other voice-mail platforms to the MVP.



*One MVP Node
Handles Ten T1s*

KEY FEATURES AND APPLICATIONS

A number of high-demand features are available with the MVP 4240, including:

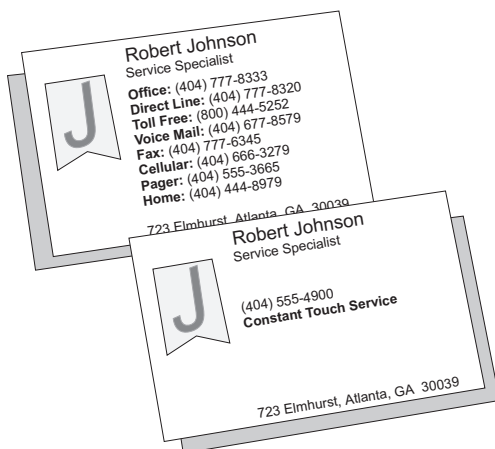
- ◆ **Call Answering** allows subscribers to divert their calls to the MVP on busy or ring/no answer situations. The DMS system sends the identity of the called party to the MVP. The MVP answers the call with the subscriber's personal greeting, inviting the caller to leave a message. The caller does not need to press any DTMF keys.
- ◆ **Personal Greeting.** The MVP allows up to five personal greetings that can be changed by the subscriber as often as desired and recorded in the person's own voice. The multiple greeting functionality enhances standard mailbox applications, such as auto attendant and information services, by providing morning/afternoon and out-of-office/after hours greetings. Time-dependent greetings allow a subscriber to associate a time-of-day and day-of-week indicator. When this feature is enabled, the MVP selects the appropriate greeting to play depending on the time a call to the mailbox was received.
- ◆ **Virtual Telephony/Office** enables a service provider to offer customers without a wireline phone the convenience of a telephone number that is directed to a voice mailbox. The phone number for the standalone voice mailbox is distributed to family, friends, and business associates — while a separate number is given to the mailbox owner for retrieving messages.

KEY FEATURES AND APPLICATIONS, *continued*

- ◆ **Message Waiting Notification.** When a message arrives in a mailbox, the subscriber can be notified in one of four ways:
 - Message waiting indicator lamp.
 - Alphanumeric or numeric display on the subscriber's pager.
 - Callback to the subscriber's telephone.
 - Stutter dial tone when the subscriber goes offhook.

- ◆ **Universal Mailbox.** Subscribers don't want to aggravate callers with busy tones or intercept messages, but many are hesitant to subscribe to a full-featured voice mailbox. For them, the Universal Mailbox is the answer. This application operates like an answering machine; so there's no user interface or learning curve. It is also an excellent bundling opportunity for the service provider. The Universal Mailbox uses the MVP voice mail system to answer all unanswered calls with a "modified" voice mailbox. When the voice message is recorded or a callback number is entered, the subscriber is notified via a stutter dial tone or a Message Waiting Indication (MWI) lamp.

- ◆ **Multi-Network Messaging.** To provide the subscriber more flexibility, the MVP can use up to three separate telephone numbers to provide message notification, Constant Touch (see below), or message waiting indication. These numbers may be from PBX phones, wireline phones, and cellular phones — and may be in networks that are separate from the one that hosts the MVP.



Constant Touch *one number does it all*

Constant Touch, a premier feature on the MVP platform, offers subscribers on the move a single number for all their phone numbers — business, mobile, home, fax, pagers, and voice mail — so they can be reached virtually anywhere. Now mobile subscribers have expanded access and control of all their communications.

- ◆ **Review and Edit Message.** Just as someone can prepare a draft of a written document, review, edit, and refine it prior to distribution, the MVP subscriber can perform similar tasks with Voice Messaging.

- ◆ **Mailing List/Message Broadcasting.** Subscribers using the voice messaging system can address a message to several individuals "on-the-fly" at the time of message creation. This eliminates the need to re-record the same message many times. Once a recording has been reviewed and is ready to distribute, the subscriber can use a predefined mailing list.

- ◆ **Non-Delivery Notification.** Subscribers can request the MVP to send a notice if recipients have not listened to new or replied messages by a date and time they specify.
- ◆ **Advanced Automatic Call Return with Caller ID – Rapid Response.** In many installations, the MVP can capture Automatic Number Identification (ANI) or Calling Line Identification (CLID) information from the switch and present it along with the voice message. When combined with Automatic Call Return, the subscriber can listen to the message, press a key, and place a call back to the ANI/CLID number. After the call, the subscriber can return to the mailbox, listen to other messages, and complete other mailbox tasks.
- ◆ **Future/Deferred Delivery.** The MVP enables a subscriber to create messages and have them delivered at some future date and time. Future Delivery messages can be delivered up to 364 days into the future. The subscriber's class of service determines how far into the future a message can be scheduled for delivery.
- ◆ **Personal Reminders.** With the Future Delivery feature (above), MVP subscribers can also send a deferred delivery message to themselves to serve as a personal memo or reminder. These personal reminders can be scheduled up to one year in advance, based on class of service settings.
- ◆ **Family Mailbox** partitions one mailbox for a residential household into separate mailboxes for family members. Now several users can share a single account, while maintaining separate and private messages. Each user is identified with a separate user ID, a spoken name, and a unique security code. When a caller reaches the subscriber's mailbox, a prompt asks the caller to identify which user should receive the message. A Family Mailbox account provides each family member with convenience and privacy.
- ◆ **Closed User Group.** In a Closed User Group, subscribers can send messages, reply to messages, and redirect messages within a group. There are other features available through this option, including:
 - Incoming callers can leave a callback number.
 - A subscriber can select a pre-programmed message to send to another subscriber as a short voice message or alphanumeric text to a pager.

This application works well for businesses, social groups, government offices, and schools.

- ◆ **Operator Revert** increases call completion by enabling the caller or subscriber to press a single key to transfer the call to a subscriber's personal assistant, dispatch center, or answering service. This feature is most important to a business or professional user.
- ◆ **Direct Dial.** Because of the MVP's switching capability, subscribers can conveniently make a series of calls directly from the voice mailbox without hanging up and re-acquiring a dial tone after each call. This feature can drive additional toll revenue by allowing subscribers to make phone calls directly from their mailboxes.

- ◆ **Automatic Call Return.** As seen in the previous feature, the MVP allows subscribers to make calls quickly from their voice mailboxes. With Automatic Call Return, the calling party's callback number can be captured while the caller is leaving a message, allowing the subscriber to return the phone call with a single keystroke. When the returned call is finished, the system returns the subscriber directly to where the user left off in the voice mailbox. This feature can be a significant revenue generator since it saves subscribers time and effort.
- ◆ **Simplified Operations, Administration, and Maintenance (OAM).** Since MVP nodes can be networked by TCP/IP addressing, mailbox administration and maintenance tasks for geographically dispersed nodes can be completed from a central location. This streamlines operations and helps lower the overall cost of MVP ownership.

OPTIONAL FEATURES

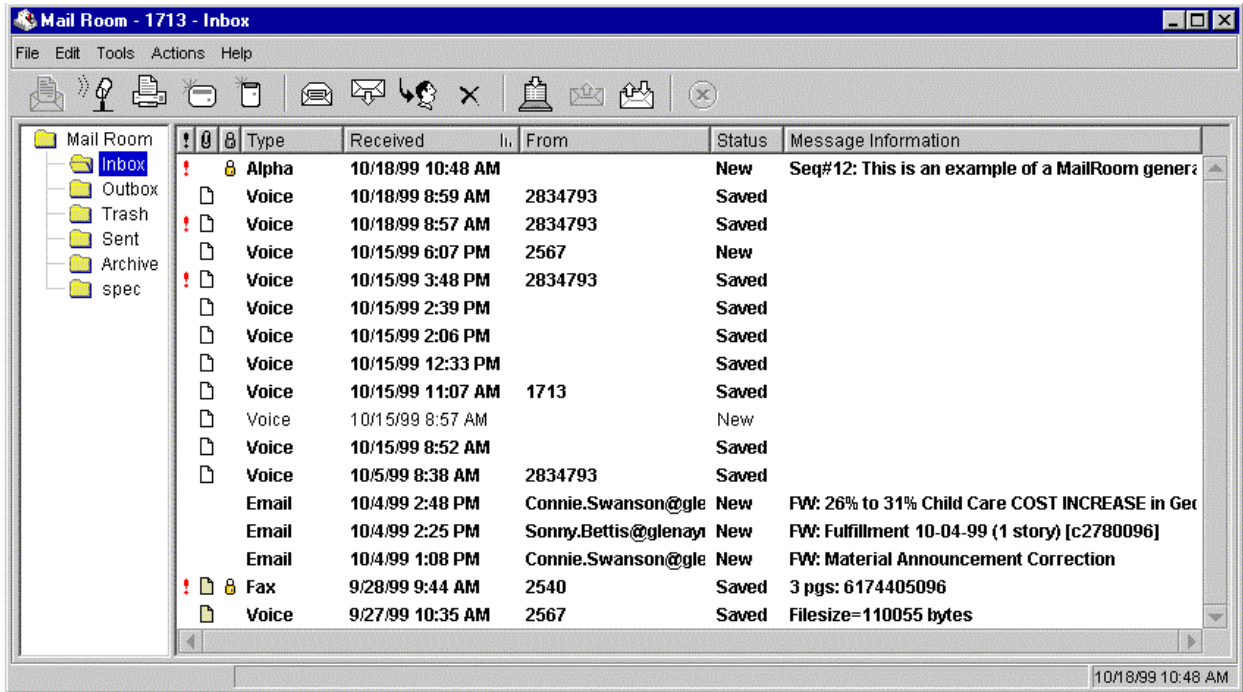
Also available with the MVP 4240 are a number of advanced options, including:

- ◆ **Fax Mail (Integrated with Voice).** The MVP system accommodates both voice and fax messages within the same mailbox. Subscribers can send, receive, store, forward, save, erase, notify, and deliver facsimile messages in a manner similar to voice messages, using the integrated menu structure.
- ◆ **Constant Touch** consolidates all of a subscriber's phone numbers — business, mobile, pager, fax, and home — into a single personal number.
- ◆ **Voice-Activated Dialing (VAD)** is a completely hands-free dialing solution that enables subscribers to place calls and manage directories by using only spoken commands.

FUTURE SOLUTIONS

A number of high-demand features are being considered for future releases, starting in the 1Q00 time frame, including:

- ◆ **Voice Navigation** enables subscribers to control their mailboxes using voice commands in place of DTMF commands. This time-saving capability is a natural complement to Voice-Activated Dialing (above). With Voice Navigation, subscribers can manage their messages during playback, change their greetings, create messages, address and send messages, outdial using their VAD directory, and return a call using the automatic call return feature.
- ◆ **Unified Messaging.** Using Internet technology, subscribers can manage voice, fax, and email messages through a Web-based graphical environment that offers more convenient ways to communicate. With a simple point-and-click graphical user interface (GUI), subscribers can access their messages using their Personal Computer — with the look and feel of traditional email.



*Unified Messaging Offers Central Control
of all Messages: Voice, Fax, and Email*

AVAILABILITY

The MVP 4240 is generally available today integrated with the DMS-100, DMS-500, and DMS-10 systems. To learn more about the many features and benefits of this multi-application voice-processing solution, contact your Nortel Networks representative.

DMS-100 Wireless

The state-of-the-art DMS-100 Wireless system is a multi-functional switching solution that integrates local/toll *wireline* (DMS-100/200 system) and digital *wireless* (DMS MTX system) capabilities onto the same robust platform. Summaries of *wireline* features in LWW00006 and LWW00007 releases are discussed throughout this document. Summaries of the *wireless* features in LWW00006 and LWW00007 releases appear in this chapter.

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WIRELINE AND WIRELESS FEATURES ON A SINGLE PLATFORM

The DMS-100 Wireless offers a flexible and cost-effective way for a service provider to establish a single point of presence in both traditional wireline and wireless markets, as well as new data and internet telephony markets. And, by delivering new integrated customer services — such as a single voice mail box, one-number capabilities, and feature transparency — service providers can pursue new revenue opportunities, increase customer satisfaction, and establish a market presence as a technology leader.

Providing true software integration of the wireline and wireless platforms, this platform supports unique integrated services, such as the new integrated Wireless Centrex (see page 247). Leveraging the system's integrated software structure also enables popular wireline features to be quickly ported to wireless phones. Nortel Networks is currently working with service operators on defining new integrated features and services that will make communication easier.

As part of Succession Solutions, this system delivers unified wireless and wireline capabilities while providing a seamless evolution path from traditional voice-based, circuit-switched technology to new packet-switched solutions supporting voice, data, and Internet based services.

Having shared hardware support both wireline and wireless capabilities yields significant efficiencies, including sharing of signaling links (such as SS7 ISUP/TCAP and IS-41) and inter-switch trunks by wireline and wireless subscribers. Typically, to support wireless capabilities on an existing DMS-100 system requires only two new cabinets and the radio subsystem.

With support for Code Division Multiple Access (CDMA), Advance Mobile Phone Systems (AMPS) and Time Division Multiple Access (TDMA), the DMS-100 Wireless system enables operators to select the technology that best addresses their particular market requirements.

FEATURES

As an integrated wireless and wireline switching system, the DMS-100 Wireless platform delivers a fully featured set of services including:

- ◆ Full mobility wireless PCS/cellular capabilities, including Short Message Service (SMS), IS-41 Networking, Wireless data, and Wireless Local Loop (WLL) applications.
- ◆ Revenue generating and service-differentiating DMS-100 system wireline features, such as xDSL, IP telephony, ISDN, AIN, and advanced Centrex and Residential services.
- ◆ An extensive portfolio of radio access technologies, including CDMA, TDMA, and AMPS wireless equipment, allowing operators to leverage system efficiencies regardless of which wireless access technology or combination of technologies is deployed.
- ◆ *Unique* integrated features combined with Intelligent Networking (AIN/WIN) capabilities to support flexible, advanced services, such as single voice mail box, Integrated Wireless Centrex, and a switch-based, one-number service solution.

WIRES LINE AND WIRELESS FEATURES ON A SINGLE PLATFORM, *continued*

BENEFITS

Offered as an upgrade to an existing DMS-100/200 or DMS-MTX system, or as an initial deployment, the DMS-100 Wireless system offers the most cost-effective option for service providers to diversify their communications offerings. In addition to reducing up-front capital costs, the DMS-100 Wireless system offers on-going operational costs savings by:

- ◆ Reducing trunking costs with integrated PSTN trunks for wireline and wireless calls.
- ◆ Reducing signaling costs with integrated SS7 links to carry wireline and wireless messaging.
- ◆ Reducing floor space costs with a small incremental footprint to leverage the existing wireline infrastructure and minimize office powering requirements and investments.
- ◆ Reducing additional power costs with minimal additional power requirements.

SIMPLIFIED DMS-MTX TO DMS-100 WIRELESS UPGRADE

By a simple overnight software upgrade, an existing DMS-MTX system can be converted to the DMS-100 Wireless platform. Now, existing wireless switching facilities can be leveraged to pursue revenue opportunities in the emerging Competitive Local Exchange Carrier (CLEC) market, cost-effectively.

The following provides some guidelines for a carrier considering a conversion of an existing DMS-MTX switch to a DMS-100 Wireless system.

- ◆ Software and hardware requirements
 - Existing software must be at least MTX07 with corresponding hardware minimums
 - Series 60 or Series 70 Extended Memory (EM) processor (a Series 70 processor must be upgraded to Series 70 EM)
 - *For CDMA:* NTEX22CA cards are needed to support CIU/CAU with LWW00005
 - *For AMPS/TDMA:* Integrated Cellular Remote Modules (ICRMs) must be ICRM+ (RCMI supported per MTX07 guidelines)
- ◆ Market considerations
 - A capacity study should be done to ensure deployment viability for an existing DMS-MTX office with:
 - Over 110,000 subscribers with a Series 70 EM processor
 - Over 65,000 subscribers with a Series 60 processor

Please contact your Nortel Networks representative for an evaluation

- Network providers with MTX Data Servers need to have the conversion evaluated on a case-by-case basis. Please contact your Nortel Networks representative for an evaluation

INTEGRATED WIRELESS CENTREX

Wireless Centrex extends subscriber access to key business features beyond the confines of one's office walls. The list of integrated features supported includes items such as:

- ◆ Mobile access to corporate dialing plans (such as 4- or 5-digit abbreviated dialing plans)
- ◆ Single-number service that enables simultaneous ringing of a subscriber's existing business set and a standard "twinned" PCS or cellular phone
- ◆ A single, unified voice mailbox that serves as a common repository for all messages targeted to a Wireless Centrex subscriber

FEATURES

- ◆ Subscribers only need one mobile phone for communication access in both private and public mobility environments. A subscriber can be talking on the wireless phone using the public wireless network, and, when the party walks into the office building, the subscriber is seamlessly handed off to the "private" mobile system: one phone, one number, one voice mailbox.
- ◆ Wireless Centrex, using the DMS-100 Wireless system, combines the world's largest portfolio of Centrex features from the DMS-100/200 wireline system and the full complement of PCS and cellular services from the DMS-MTX mobile system.
- ◆ Cell site controllers and wireless networking interface equipment can be centralized at the central office. That means less equipment needed at customer premises, with greater opportunity for multiple subscribers to share resources.
- ◆ A range of PCS and cellular air interface technologies (CDMA, TDMA, and AMPS) support delivery of services, including Wireless Centrex, to most analog and digital subscribers.
- ◆ A portfolio of mini-, micro-, and picocells offers flexible solutions for diverse coverage and capacity requirements.
- ◆ Currently not supported: Cellular Digital Packet Data (CDPD) functionality, Integrated Node (INODE) configuration, and International capability.

BENEFITS

- ◆ Leveraging the strengths of the DMS-100 Wireless platform, Wireless Centrex extends the benefits of Centrex well beyond office walls. Because Wireless Centrex can be deployed as an upgrade to existing systems, service providers enjoy significant flexibility and cost savings.
- ◆ Wireless Centrex provides the means to integrate everyone into the Centrex system. Users who don't have an office and wireline phone can use standard mobile phones (cellular or PCS) to enjoy the same corporate dialing plan and voice mail system as wireline users.

INTEGRATED WIRELESS CENTREX, *continued*

- ◆ Users with desktop and mobile phones benefit from convenient “twinning” of both wireless and wireline phones: incoming calls ring both phones that have similar Centrex features.
- ◆ Mobile users move freely and seamlessly between private wireless systems and public cellular/PCS systems without interruption. Calls can be transparently handed off between systems.

DMS-100 WIRELESS SYSTEM HARDWARE REQUIREMENTS

To operate a DMS-100 Wireless system, the *minimum* system components requirements are:

- ◆ **Processor (baseline).** The Series 60 processor is the baseline processor. The Series 70 Extended Memory (EM) processor is used for initials and is required for larger wireless systems. **Note:** a Series 60 DMS SuperNode SE system configuration can be upgraded to a DMS-100 Wireless system without changing the processor.
- ◆ **Digital Trunk Controllers (DTCs)** provide voice trunks between the DMS-100 Wireless switch and the radio subsystem — and interswitch trunking to other nodes and networks.
- ◆ **Base Transceiver Stations (BTSs)** provide the air interface to the mobile phones. Many BTSs are required to cover a given geographical area. They are collocated with the antenna towers commonly referred to as “cell sites.”
- ◆ *For CDMA (only):*
 - **Base Station Controller (BSC),** collocated with the DMS-100 Wireless system, provides CDMA voice coding, intrasystem soft handoff and advanced power control required by the CDMA technology.
 - **Fiberized Link Interface Shelf (FLIS) or Link Peripheral Processor (LPP).** When deploying Nortel Networks BSCs, this cabinet is equipped with CDMA Interface Units (CIUs), CDMA Application Units (CAUs), and Resource Manager Units (RMUs) to interface to the radio subsystem components for mobile phone call setup, registration, and intersystem handoff control messaging. For Open-A Interface, the LPP is configured with A-Interface Control Elements (ACEs) and Base Station Application Part (BSAP) LIUs.
- ◆ *For AMPS and TDMA (only):* **Intelligent Cellular Peripheral (ICP) Module,** a peripheral module of the DMS-100 Wireless system, provides the interconnection to the AMPS and TDMA cell sites, and works with the DMS-Core to provide mobility and subscriber management, handoff control, and cell site OAM connectivity.
- ◆ *For TDMA (only):* **Enhanced Digital Signal Processing Module (EDSPM),** a peripheral module of the DMS-100 Wireless system, provides performs the digital voice coding required by the TDMA technology.

LWW00006 FEATURES

LWW00006, now available, continues the rollout of multi-functional, capacity-expanding features. This software load combines the key features of the LEC00012 (wireline) release and the key features of the MTX08 (wireless) release.

Some of LWW00006's key capabilities include:

- ◆ **Dual Base Station Controllers (BSCs)** to significantly expand capacity. With two BSCs, the system can serve a greater number of cell sites, offering the service-penetration and revenue-expansion opportunities provided by an expanded range of coverage off a single switch.
- ◆ **Multiple-Carrier Base Transceiver Station (BTS)** broadens capacity at the cell site. By supporting multiple radio frequency (RF) carrier signals, the system significantly expands the maximum number of simultaneous calls supported at each cell, enhancing the overall use of network investments while expanding revenue potential.
- ◆ **Enhanced Emergency Service (E911)** complies with the FCC's Report and Order, Phase I requirements provided by PN-3581. As required, the caller's number is sent to the Public Safety Answering Point (PSAP) along with the location of the base station or cell site receiving the call. The system routes all 911 calls to the PSAP without performing credit checks or validation.
- ◆ **Group Conferencing** enables AMPS, TDMA, and CDMA operators to provide a vendor-independent and handset-independent conferencing service to their wireless subscribers. A subscriber can conference up to seven other group members located in a WIN Phase 1-compliant network simply by pressing two digits and “#” or locating an entry in the personal directory associated with the wireless handset. Ideal for corporations with campus environments, geographically dispersed work teams, and small mobile businesses.
- ◆ **SuperNode Data Manager (SDM)** provides a dedicated, scalable server designed to support processing of billing, performance measurements, and logs in a high-volume, service-intensive network environment. As wireless and wireline operators add more subscribers and sophisticated new services to their networks, the SDM expands their ability to meet growing capacity, traffic and service demands and can dramatically increase the efficiency of existing switch and operational support systems.

Wireline features in LWW00006 are detailed in other chapters in this document. The following pages discuss key **wireless** features only.

LWW00006 FEATURES, *continued*

STANDARD BASE FEATURES

The following are planned to be delivered as “standard” features; they do not have to be licensed separately.

DMS SUPERNODE PLATFORM	STANDARD
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Provides the software infrastructure for all other order codes.

New Wireless Intelligent Network (WIN)

LWW00006

With Wireless Intelligent Network (WIN) triggers, the system acts on particular events and instructions to activate services with a Wireless Service Node or third-party service platform.

The LWW00006 release contains the following triggers:

- ◆ **Billing trigger** provides WIN service indicators in a call detail record (CDR) to highlight which WIN services are used during a call.
- ◆ **Feature Request trigger** allows notification of Feature Code (FC) calls to enable feature activation and deactivation.
- ◆ **Registration trigger** provides a mobile’s active or inactive registration status.
- ◆ **Originating trigger** provides notification of call originations when the appropriate trigger criteria are met, such as the number of digits dialed.
- ◆ **Terminating trigger** provides notification of a call termination to a wireless phone.
- ◆ **Release Link Trunk (RLT) trigger** (single and dual port) facilitates the delivery of advanced services by freeing up the trunks connecting the DMS-100 Wireless switch and an Intelligent Peripheral (IP) for other trunk-based services or additional traffic for the same service.
- ◆ **Number Portability Phase I** enables the DMS-100 Wireless system to query a database to determine routing information to terminate a call to a ported wireline directory number.

New WIN-Compliant Mobile Terminations

LWW00006

This feature reorganizes mobile termination software for call processing to enable support for WIN call models and off-board advanced services. This feature also updates the QMOB tool to display both per-call services and VLR information specific to a mobile.

Technical reference: 60000148

New DMS-100 Wireless International Direct Distance Dialing

LWW00006

This feature enables the DMS-100 Wireless system to support up to 15-digit International Direct Distance Dialing (IDDD) in accordance with CCITT Recommendations E.164. With the new the International Numbering Plan, the maximum number of digits supported for the National Significant Number increases from 11 to 14. When Equal Access is taken into account, the maximum number of dialed digits for IDDD increases from 22 to 25.

Technical reference: 60000258

New ICP Metro XA

LWW00006

The Intelligent Cellular Peripheral (ICP) provides control for multiple cell sites from a centralized location, increasing the efficiency of cell site maintenance and reducing the amount of expensive hardware needed per site. Trunks connect an ICP at the DMS-100 Wireless system to an Integrated Cellular Remote Module (ICRM) located at a cell site. While the ICP manages trunks to the cell sites, the ICRM assigns radio channels and provides voice and messaging capabilities to individual mobile phones. This feature:

- ◆ Helps operators meet the ever-increasing demands for Central Processing Unit (CPU) and messaging capacity on the ICP.
- ◆ Postpones the need for additional ICPs due to capacity constraints.
- ◆ Reduces maintenance by decreasing ICP reload time (with optional 60 MB flash memory).
- ◆ Alleviates bottlenecks resulting from unexpected or rapid subscriber growth by increasing the processing power and capacity of ICPs.

Technical reference: 60000174, 60000175

New DMS-100 Wireless SDM Introduction

LWW00006

This feature offers software support for a dedicated, scalable operations, administration, maintenance, and provisioning (OAM&P) server to meet the ever-expanding demands that new services place on a network's operations infrastructure. The SuperNode Data Manager (SDM) helps service providers maintain and provision sophisticated services and provides a solution that can evolve OAM&P capabilities from existing low-speed, point-to-point connectivity to a high-capacity TCP/IP interface.

The LWW SDM load, SDML0006, supports both wireless and wireline billing records.

Technical reference: 60000321

For more information on the SDM, see the "OAM&P Applications" chapter, starting on page 225.

LWW00006 FEATURES, *continued*

New ICRM Buffer Based Overload Controls

New ICRM Loading Enhancements

New ICRM Shelf and P-side Card Product Equipment Code (PEC) Support

LWW00006

These features introduce enhancements that help improve the performance of the Integrated Cellular Remote Module (ICRM) shelf:

- ◆ **Overload Controls** monitor the messaging buffer resource and automatically put the ICRM into an overload state when triggering criteria are met, alleviating some of the load on messaging buffer resources
- ◆ **Load compression** reduces load time by enabling operators to use a compressed file to upgrade to a new ICRM(O)+ software release
- ◆ **Selective reject** enhances Computing Module efficiency to handle errors during the loading of new software from the Intelligent Cellular Peripheral (ICP) to the ICRM(O)+
- ◆ **P-side Card PEC support** enables the craftsperson to datafill the new PECs for the ICRM shelf, CSI shelf, and Remote Module Digital Port (RMDP) cards in table ICRMINV

Technical reference: 60006203, 60000285, 60006024

New Fraud Service Hotline

LWW00006

The RVR (Roamer Verification Reinstatement) / SPINA (Subscriber PIN Access) features restrict a caller from originating calls in a fraudulent Mobile Switching Center (MSC) serving area. Thus, when a subscriber in a RVR restricted area originates a call, the caller receives treatment, such as recorded instructions to hang up and call the Customer Service Center.

Similarly, a SPINA-locked mobile cannot originate calls until the subscriber enters a PIN code to unlock the phone. Thus, if a subscriber forgets the PIN, it is an inconvenience to hang up and call the operator.

The RVR/SPINA Hotline feature is an enhancement to the RVR and SPINA features. The RVR Hotline feature will automatically dial the RVR Hotline directory number (DN) or other predefined route when the subscriber attempts to originate. Similarly, when a mobile is SPINA-locked, any origination is automatically routed to the SPINA Hotline DN. RVR and SPINA can each specify a unique DN.

The hotline capability is optional on a per MSC-range basis. If not configured for hotline, RVR and SPINA continue to function as previously implemented.

Technical reference: 60000386

New R1 ANI and Feature Group D Enhancement

LWW00006

This feature enhances the current R1 functionality of the DMS-100 Wireless system by supporting the reception of Automatic Number Identification (ANI) and spilling this information to the next exchange for tandeming.

The feature enables the system to:

- ◆ Receive ANI over incoming R1 trunks to help ensure that proper ANI and billing information is captured.
- ◆ Spill the received ANI over incoming R2 or ISUP trunk to the outgoing R1 trunk.
- ◆ Eliminate the need to use equal access to outpulse complete Feature Group D (FGD) functionality on the DMS-100 Wireless system when equal access is not required for connecting to external platforms. This enables an offboard platform to obtain the subscriber's Mobile Identification Number (MIN) and dialed digits.

Technical reference: 60000187

New Digital Control Channel Measurements**New Digital Control Channel Datafill Simplification**

LWW00006

These features offer a number of performance measurements enhancements:

- ◆ Enhances the previously-released RF Measurements feature including:
 - New per-call diagnostic measurements.
 - Digital Control Channel (DCCH) measurements as part of periodic categories.
 - Encryption of the invisible portion of the reports.
- ◆ Updates to table CCHINV to simplify the modification of various configuration parameters that define the operation of digital and analog control channels.

Added performance measurements are useful in analyzing and tuning DCCH performance to meet growing demands, and the changes to the operation of table CCHINV greatly simplify the modification of control channel parameters and reduce associated expenses and risks.

Technical reference: 60000694, 60005906, 60068225

New Enforce MSRs

LWW00006

This feature enables operators to restrict service for roamers to the subset of cell sites that define the subscriber's Mobile Service Region (MSR). This efficiency helps decrease revenue loss due to unbilled calls by roamers outside their MSR.

Technical reference: 60000571

LWW00006 FEATURES, *continued***New** Answered Call Screening

LWW00006

This feature enables the network provider to screen out Call Detail Records (CDR) for tandem and zero-duration calls answered by the system. Applications for this feature include:

- ◆ Operators of large networks who typically route calls through multiple switches within their network can use this feature to avoid creating unnecessary CDRs for tandem calls.
- ◆ Any operator who does not require CDR collection for zero-duration calls answered by the system can use this feature.

Note: The system generates logs for these calls even if a CDR is screened out.

Technical reference: 60000319

New Visitor Location Register (VLR) Delete Tool

LWW00006

When a change is made to an entry in table SERVCHNG, a proper warning is displayed to the service provider, indicating the correct tool to use for deleting VLR entries. This feature introduces two new Command Interpreter (CI) commands: VLRDEL and VLRCNTR.

- ◆ **VLRDEL** is a password-protected CI command that enables the service provider to delete a range of VLR entries.
- ◆ **VLRCNTR** enables the service provider to count a range of VLR entries.

Technical reference: 60062323

New ACCH Dynamic Page Size

LWW00006

This feature allows the service provider to economize FOCC (FORward Control Channel) bandwidth by specifying which ACCH (Analog Control CHannel) registered mobiles should be paged using the one-word page message format versus the two-word page message format.

Technical reference: 60000154

New LCR Optimization

LWW00006

This feature reduces the number of Locate Receiver (LCR) measurement requests sent to the serving cell during handoff, freeing the LCR to handle requests from adjacent cells and resulting in improved handoff performance. This feature also enables the serving voice channel (VCH) to handle a serving cell self-locate request, freeing the LCR to handle LCR requests from adjacent cells.

Technical reference: 60000338

New Handoff Trigger Enhancement

LWW00006

In this feature, bit-error rate (BER) thresholds are separated into Vector Sum Excited Linear Prediction (VSELP) and Enhanced Full Rate Codec (EFRC) voice coding methods thresholds. This enables service providers to define different BER threshold values for VSELP and EFRC in tables CIHODATA and PWRCTRL.

Technical reference: 60000339

New Intersystem Handoff Timing Enhancements

LWW00006

This feature optimizes the time a target DMS-100 Wireless switch waits for local Locate Receiver (LCR) measurement responses during an intersystem handoff to minimize the probability of cell dragging. Previously, this timer was fixed at two seconds. If the responses came back to the target switch sooner than this, the target switch still waited two seconds before sending the ANSI-41D measurement response message back to the serving switch. Now, the timer value can be determined dynamically (the default remains at two seconds).

Technical reference: 60000340

New Flexible Billing ID for Intersystem Handoff

LWW00006

This feature enhances Nortel Networks intersystem handoff capabilities to support non-compliant handoff procedures implemented by other vendors. Now the DMS-100 Wireless can determine which Mobile Switching Center Identification (MSCID) to use when performing an intersystem handoff to a system with non-Nortel Networks equipment. This helps prevent calls from being dropped when the target system's Mobile Switching Center (MSC) is expecting the MSCID of the anchor MSC rather than the MSCID of the originating MSC in the BillingID parameter, as defined in ANSI-41D.

Technical reference: 60000381

New Mobile Assisted Handoff (MAHO) Pre-screening, Phase 2

LWW00006

In earlier Nortel Networks cellular systems, before the DRU generated below_hotl MAHO handoff requests, it performed pre-screening on the handoff candidates with a different algorithm than the LWW00006 Computing Module (CM). This difference could result in the pre-screening failing in the CM, causing a retry to be sent to the radio with associated cell dragging. This feature helps improve processing time by enhancing the pre-screening algorithm in the DRU and eliminating the need for pre-screening in the CM.

Technical reference: 60000504

LWW00006 FEATURES, *continued***New** TDMA Mute Reduction

LWW00006

This feature minimizes the handoff mute on the reverse link. By speeding radio synchronization with an adaptive interval to establish the reverse path audio connection over to the target radio channel, the muting interval upon handoff is kept to a constant minimum regardless of the current messaging delays. Also, this software enhancement reduces the time to synchronize the handoff with the current Time Alignment (TA) of the serving radio during maintenance handoffs.

Technical reference: 60000336, 60000337

New AFT Volume Management

LWW00006

Automatic File Transfer (AFT) previously required files to be copied to tape before they could be marked as Processed. Until the file is marked as Processed, the Device Independent Recording Peripheral (DIRP) system cannot make use of the disk space upon which the file resides. Thus, files that do not need to be copied to tape had to be manually removed. This feature removes the “copy to tape before marking as processed” requirement for files in all DIRPs subsystems which are transferred using AFT except for the AMA billing subsystem.

Technical reference: 60000318

New Load Compression TRUIII

LWW00006

Load compression reduces load time by enabling operators to use a compressed file to upgrade to a new ICRM(O)+ software release. After transferring the compressed file, the ICRM(O)+ automatically runs the extractor software. After completing the file transfer process and load extraction/decompression, the system returns control to the Maintenance and Administration Position (MAP), indicating that loading is complete. The ICRM(O)+ is then ready to process a Return to Service (RTS) request.

New ORREQ/FEATREQ Query Enhancements

LWW00006

This feature updates IS-41 Origination Request (ORREQ) and Feature Request (FEATREQ) queries to be more compliant with the IS-41 Rev C Standards. These enhancements:

- ◆ Enable a subscriber to invoke origination services when using a hookswitch flash to originate the second call leg of a three-way call.
- ◆ Trigger originating services by dialing the star (*) digit.

Technical reference: 60000181, 60000182

New VMS to DMS-100 Wireless HLR Message Waiting Count

L.WW00006

This feature enhances the HLR Message Waiting Notification (MWN) to receive the number of messages waiting for a subscriber from the voice mail system by using the ANSI-41 Short Message Service Request Invoke message (SMSREQ). The system stores this value in the subscriber's HLR database entry. The Message Waiting Notification service provides the functionality of informing the subscriber of messages waiting in a Voice Messaging System (VMS). This service can be provided by a Message Waiting Indication (MWI) lamp or audible Message Waiting Tone (MWT).

New BCH Control Message TRUIII

L.WW00006

This feature replaces 8 kbps signaling with 64-kbps signaling for TRUIII radios provisioned as DCCH or 2T+C. This includes TRUIII 800 (PEC AW99AA), TRUIII 1900 (PEC TG90AA), Picocell 800 (PEC MQ30AA), and Picocell 1900 (MQ70AA).

Technical reference: 60000310, 60000311

New Idle Channel Test Enhancement

L.WW00006

This feature adds a Continuity Test to the digital voice channel RTS (return to service) sequence of the digital radio to provide outage detection and automatic recovery at the individual DS-0 level. It also enhances the Bit Error Rate (BER) audit performed in the Enhanced Digital Signal Processing Module (EDSPM).

New Intelligent DUMPHLR

L.WW00006

By enabling the service provider to generate meaningful reports sorted by a number of criteria, this feature enhances the existing DUMPHLR command used to generate a list or a count query based on filtered data in the Home Location Register (HLR).

Technical reference: 60000199

New Additional SERVORD Commands – ASG/DSG

L.WW00006

This feature implements two new commands for the service provider to change particular aspects of a subscriber's service list. The user interface created by this feature offers the convenience to add/delete service groups to/from the cellular SVCLIST. This addition to the DMS-100 Wireless system's OAM functions adds new operational speed and flexibility.

LWW00006 FEATURES, *continued***OPTIONAL FEATURES**

The following features are all planned to be optional. Although they are delivered with a PCL load, they must be licensed separately.

INTEGRATED WIRELESS CENTREX**LWW00066**

Adds Centrex capability to wireless applications.

New Integrated Wireless Centrex

LWW00006

KEY CAPABILITIES

This order code provides a powerful wireless office solution for corporate accounts that includes wireless extensions and “twinning” of wireless phones (CDMA, TDMA, AMPS) with existing wireline business sets.

Technical reference: 59006698

PRINCIPAL BENEFITS

With Wireless Centrex, users who don't have an office and wireline phone can use standard mobile phones (cellular or PCS) to enjoy the same corporate dialing plan and voice mail system as wireline users. For a discussion of other benefits, see pages 247 and 248.

MAJOR DEPENDENCIES

Software: MDC00001 Centrex Base Minimum
 MDC00005 Multilocation Business Group Minimum
 RES00004 Interface Functionality (for SMDI voicemail)
 RES00027 Visual Message Waiting
 RES00081 Simultaneous Ring (for phone twinning)
 A0716503 Wireless Message Waiting Indication

ANSI ISUP**AACC0001**

Provides ISUP enhancements to the DMS-100 Wireless platform.

New ANSI ISUP**New DMS-100 Wireless ISUP GR-394****New Flexible ISUP IAM — Phase I**

LWW00006

KEY CAPABILITIES

- ◆ Provides Software Optionality Control (SOC) capability for American National Standards Institute (ANSI) ISUP implementations in compliance with Telcordia TA-NWT-000317 and GR-394-CORE.

- ◆ Implements the ANSI ISUP GR-394 protocol.
- ◆ Enables wireless service providers to connect to various offboard platforms (such as voice mail systems and prepaid systems) or to the PSTN via the ISUP.

Technical reference: 60000256, 60000261, 60000263

PRINCIPAL BENEFITS

- ◆ Provides faster call setup to and from the public switched telephone network (PSTN)
- ◆ Enables non-circuit-related data transfer for future enhanced services
- ◆ Can enable substantial trunk savings
- ◆ Offers end-to-end transfer of the Calling Party Number (CPN) parameter for presentation of Calling Number Identification (CNID) across local access and transport areas (LATAs)
- ◆ Gives wireless service providers flexibility to connect to and comply with their PSTN or various offboard platforms using ISUP

MAJOR DEPENDENCIES

Software: Base ISUP (ANSI) software

Hardware: XPM+, Link Interface Unit for SS7 (LIU7), Digital Trunk Controller for SS7 (DTC7)

ANET ADVANCED NETWORKING MSC

ANET0003

Adds advanced networking capabilities to the DMS-100 Wireless offering.

New AWS Networking Mobile Switching Center (MSC)

LWW00006

KEY CAPABILITIES

ANET0003 reduces the elapsed time for the Home Location Register (HLR) to be notified after a mobile becomes inactive in the Visitor Location Register (VLR). The new audit updates the HLR on mobile inactivity in less time. This fast mobile inactivity notification enhances the accuracy of velocity checks in the DMS-100 Wireless system.

Technical reference: 60000406, 60050725

LWW00006 FEATURES, *continued***AUTHENTICATION CENTER****ACTR0001**

Introduces the Authentication Center, the IS-41 network entity required to confirm the identity of a mobile subscriber.

New ACTR Authentication Center Phase II**New AWS Authentication CDR Enhancement****New Authentication on Termination**

LWW00006

KEY CAPABILITIES

The Authentication Center (AC) is the IS-41 network entity required to confirm the identity of a mobile subscriber by maintaining mobile authentication information data, validating mobiles, controlling authentication-related data shared with the Mobile Switching Center (MSC), and determining the actions on all authentication failures. The authentication process protects a network by ensuring that only valid mobiles are granted network access. New functionality in Phase II includes:

- ◆ Enhanced security for A-Key storage within the Authentication Center
- ◆ An option of defining a list of MSCIDs to allow sharing of shared secret data (SSD) as the subscriber roams
- ◆ System-initiated periodic SSD updates
- ◆ Ability to route SSD update failures to specific customer care personnel

AWS Authentication CDR Enhancement adds four flags in the CDR (Call Detail Record) to indicate Mobile Switching Center authentications or failures.

Authentication on Termination enhances the existing call processing software to enable the service provider to verify the identity of a mobile upon receiving a page response.

Technical reference: 60000227, 60000231, 60050907, 60000485

PRINCIPAL BENEFITS

- ◆ Enables the AC to reside on any DMS-100 Wireless switch in the network
Offers added flexibility and scalability
- ◆ Supports multiple Home Location Registers (HLRs) and permits a centralized AC
- ◆ Enables the network to protect itself from unauthorized users
- ◆ Contributes to efforts to curb cellular fraud

MAJOR DEPENDENCIES

Hardware: The AC requires NTEX22CA cards in the Link Peripheral Processor (LPP). If the MSC is present on the same DMS-100 Wireless as the Authentication Center, both entities can share the cards.

VOICE MAIL COMPANIONS**ASVS0002**

Offers a number of enhancements to the voice mail offering.

New Voice Mail Deposit and Retrieval

LWW00006

KEY CAPABILITIES

This feature provides voice mail services which move the DMS-100 Wireless system toward ANSI-41D compliance. These services include two basic functions:

- ◆ **Voice Mail Deposit (VMD)** allows calls intended for a subscriber to be directed to the Voice Messaging System (VMS) in order for the calling party to leave a message.
- ◆ **Voice Mail Retrieval (VMR)** enables a subscriber to dial a feature code to listen to voice mail messages.

Technical reference: 60000268, 60000383

PRINCIPAL BENEFITS

- ◆ Instead of translating on a specifically constructed number, a Temporary Local Directory Number (TLDN) which is understood in the PSTN is used to route the call.
- ◆ Private facilities are no longer required between the MSC-O and Voice Mail Host.
- ◆ With a new call forwarding type (Call Forward Default, CFDF) used for voice mail, Call Forward Busy (CFB) and Call Forward No Answer (CFNA) are freed and activation/de-activation restrictions are no longer needed to be enforced for voice mail subscribers.

New Call Forward Default**New Call Forward Rollover**

LWW00006

KEY CAPABILITIES

This feature implements Call Forward Default (CFDF) and Call Forward Rollover (CFR) on the Home Location Register (HLR). A called subscriber with CFDF can redirect incoming calls to a designated voice mailbox or to another directory number when the subscriber is engaged in a call (busy), not answering, or inaccessible. This feature also supports standardized ANSI-41 message encoding and proprietary IS-41+ encoding for seamless intersystem CFDF signaling.

CFR redirects a call that was forwarded by Call Forward Unconditional (CFU), Call Forward Busy (CFB), or Call Forward No Answer (CFNA) — and whose forward-to number timed out, was busy, could not be located, or otherwise is unable to terminate — to the CFDF forward-to number only.

Technical reference: 60000141

LWW00006 FEATURES, *continued***PRINCIPAL BENEFITS**

The addition of two new call forwarding features expands revenue opportunities, while enhancing ANSI compliance of the DMS-100 Wireless system. By aligning to both ANSI-41D Revision D and TIA-664 standards, this new feature adds support for configurable ANSI-41D Termination Triggers sent by the HLR based on preferences set by the service provider. And it provides ANSI-41D partial compliance toward the nomenclature of Call Forwarding features for CFU and CFNA (CFW is renamed to CFU, and CFD is renamed to CFNA.)

SERVICE CODE DIALING**ASVS0003**

Dynamically routes calls based on the user's service profile to provide seamless interworking within a multivendor network.

New Service Code Dialing

LWW00006

KEY CAPABILITIES

This feature dynamically routes calls based on the mobile's service profile by using the ANSI-41D Origination Request message to provide seamless interworking within a multivendor network.

In a multivendor network, such as one involving resellers, an operator can automatically route subscribers to their appropriate customer service centers. When a subscriber roams in networks with non-Nortel Networks MSCs and calls customer service, Service Code Dialing routes the call to the subscriber's home service center.

Technical reference: 60050220

PRINCIPAL BENEFITS

This feature can help enhance customer satisfaction by enabling subscribers to quickly reach their home service provider anywhere in the network, even while roaming.

DIGITAL CONTROL CHANNEL PSID/RSID**DCCH0002**

Adds tiered billing capability to the DMS-100 Wireless offering.

New Digital Control Channel IS-136 PSID/RSID Tiered Billing

L.WW00006

KEY CAPABILITIES

This feature offers a means to bill a call differently based on the locations during a call and which systems (public or non-public) are supported in the locations the mobile traverses during the call.

Technical reference: 60000694, 60005906, 60068225, 60000176

PRINCIPAL BENEFITS

- ◆ Tiered billing enables registration on a non-public system and:
 - Enables each DCCH to optionally broadcast a list of up to 16 non-public systems that it supports in any one partition.
 - Supports the test registration response, which includes an alphanumeric list of supported non-public systems.
 - Includes the originator and terminator registered PSID/RSIDs (if either party is registered on a non-public system) in the Call Detail Record (CDR) for a call.

DIGITAL CONTROL CHANNEL PAGE CONTINUATION**DCCH0003**

Provides support for subscriber and feature growth.

New Digital Control Channel Page Continuation

L.WW00006

KEY CAPABILITIES

This feature enables the system to spread pages across different slots in the event that pages become queued for a specific slot.

Technical reference: 60005860

PRINCIPAL BENEFITS

Operators with very high-capacity TDMA networks can use this capability to maximize the use of existing DCCHs. They can also use this feature to support aggressive subscriber growth and the addition of new revenue-generating features.

MAJOR DEPENDENCIES

Hardware: TRUIII Digital Radio

LWW00006 FEATURES, *continued***FLEXIBLE IS-41 OI****NTWK0009**

Enables service providers to use non-standard IS-41 OI values to meet specific requirements.

New Flexible IS-41 Origination Indicators

LWW00006

KEY CAPABILITIES

Some service providers require origination indicators (OIs) outside of the eight standard IS-41 OIs. These OI values might be specified by a customer's local or national requirements. This new feature provides flexible configuration of OIs by allowing an alternate set of OIs to be used, based upon a subscriber's CUSTGRP, as defined by translations.

Technical reference: 60000558

PRINCIPAL BENEFITS

This feature enables the service provider to flexibly "fine-tune" OIs to meet local and national requirements by overwriting the standard IS-41 eight OI values in translations. Two new tables — CUST2OI and OI2CUST — map customer groups to origination indicators and origination indicators to customer groups. An enhancement in table NWKOPT indicates whether the MSC or HLR is capable of using the custom OI values or not.

SMS ORIGINATION**NTWK0011**

Enhances SMS origination messaging services in the DMS-100 Wireless system.

New IS-136 TDMA DTC/DCCH SMS Origination

LWW00006

Short Message Service (SMS) transmits and receives limited-size messages across two endpoints of a cellular network (either one or both of the end network users may be a mobile subscriber). Short messages transmitted:

- ◆ Within a cellular network are encoded on ANSI-41 standards
- ◆ Over an air interface are encoded on TDMA IS-136 standards

Mobile Originated SMS enables a Mobile Station (MS) to create an alphanumeric Short Message and send it via the serving Mobile Switching Center (MSC) to the originator Message Center (MC), which in turn delivers the message to the destination MC. Mobile SMSs include numeric paging services, alphanumeric paging services, dispatch service notifications, and automatic vehicle location services. With this feature, the Computing Module (CM) and Intelligent Cellular Peripheral (ICP) can process short messages originated from a mobile subscriber over an IS-136 TDMA air interface.

This software also provides:

- ◆ Support of SMS originations from mobile stations that are camped on a DCCH or in a digital voice call
- ◆ Transport of SMS originations received over the IS-136 air interface to the originator's MC
- ◆ Transport of SMS origination responses to the originator's MS
- ◆ SMS origination Operational Measurements (OMs)

Technical reference: 60000146, 60000205

New SMS Traffic Channel Delivery

LWW00006

KEY CAPABILITIES

This feature delivers a message from an SMS Center (SMSC) to a subscriber's mobile, whether the handset is involved in a voice call or is idle, and then sends a delivery acknowledgment back to the SMSC.

Technical reference: 60000144, 60000145

PRINCIPAL BENEFITS

This message delivery helps operators address subscriber demands for "anytime, anywhere" messaging services and:

- ◆ Enhances revenue potential through increased network use and decreased customer churn
- ◆ Enables operators to differentiate themselves from TDMA carriers who provide only voice services

MAJOR DEPENDENCIES

Hardware: X TDMA infrastructure (with IS-41C and SMSC)

IS-136 terminals with Automatic Retransmission Request (ARQ) mode on the DTC ICP, ICRM+, TRUs (TRUI, TRUII, TRUIII-DTC; TRUII- or TRUIII-DCCH)

New TDMA HLR OTAF Gateway Phase II

LWW00006

KEY CAPABILITIES

The Home Location Register/Over the Air Activation Function (HLR/OTAF) Gateway provides the IS-41 network accessibility to the OTAF Server. On one side, upon receiving a message (with UDP/IP format) from the OTAF Server, the HLR/OTAF Gateway converts the UDP/IP information into IS-41 message and sends it out to the IS-41 network. On the other side, upon receiving a message from the IS-41 network, the HLR/OTAF Gateway converts the IS-41 message into a UDP/IP proprietary message and sends it to the OTAF Server.

LWW00006 FEATURES, *continued*

The first phase of the HLR/OTAF Gateway was implemented in the feature called *Nortel Networks OTAF Gateway Phase I* (technical reference: 60000226). This feature adds new capabilities to the OTAF Gateway, including:

- ◆ Support of the OTASPREQ operation.
- ◆ Support of the ORREQ operation.
- ◆ Enhancement of the SMDPP operation.

Technical reference: 60000178, 60000179

PRINCIPAL BENEFITS

This solution enables one Nortel Networks HLR/OTAF to cost-effectively support multiple Message Service Centers (MSCs), or HLRs, or both using a gateway into the IS-41 network.

New Variable Length DN

LWW00006

KEY CAPABILITIES

This feature enables the DMS-100 Wireless to accommodate numbering plans outside North America by supporting directory numbers (DNs) varying in length from 7 to 15 digits. In addition, the feature allows table control changes that disassociate the DN from the mobile identification number (MIN), laying the foundation for International Mobile Station Identity (IMSI) and Local Number Portability (LNP).

Technical reference: 60000394

PRINCIPAL BENEFITS

This feature enables the DMS-100 Wireless system to support non-10-digit numbering plans — as well as laying the groundwork for LNP and IMSI — by permitting the separation of the MIN and DN.

DISTINCTIVE CALL SCREENING**PSRV0006**

Extends sophisticated wireline call screening features to the wireless user.

New Incoming Call Screening

LWW00006

KEY CAPABILITIES

As a general call screening service, Incoming Call Screening (ICS) enables mobile subscribers to accept, divert, or block a set of calls. ICS includes the following features:

- ◆ Selective Call Acceptance (SCA)
- ◆ Selective Call Diversion (SCD)
- ◆ Distinctive Ringing (DR)
- ◆ Anonymous Call Diversion (ACD)
 - Anonymous Call Forwarding (ACF)
 - Anonymous Call Blocking (ACB)
- ◆ Do Not Disturb (DND)

Technical reference: 60000138

PRINCIPAL BENEFITS

These features offer value-added services that offer service providers revenue-generation opportunities and marketing advantage.

New Durable Cancel Call Waiting

LWW00006

KEY CAPABILITIES

This feature gives the cellular subscriber the ability to remotely control the Call Waiting (CWT) feature within a network by use of a feature code, explicitly implementing Durable Cancel CWT (DCCW) functionality by using the ANSI-41 messaging protocol.

Technical reference: 60000251

PRINCIPAL BENEFITS

- ◆ The idle subscriber is allowed to inhibit the call waiting functionality at any time. During a call, any further incoming calls will receive busy treatment.
- ◆ During an in-progress call, the subscriber can inhibit CWT by entering a feature code after a flash request.
- ◆ Along with the Per-Call CCW feature (A0000238), this feature provides full control to the subscriber to activate/deactivate CWT at any time and at any place within the network.

LWW00006 FEATURES, *continued***New IS-41C DMH Redirect**

LWW00006

KEY CAPABILITIES

This feature provides partial compliance to the IS-41C Specification for Mobile Termination, ensuring that the DMS-100 Wireless system meets the requirements for the IS-41C parameter DMH (Data Message Handling) Redirection Indicator (REDIND). The new DMH REDIND parameter informs the Mobile Switching Center the type of call being completed for billing purposes and the reason for extending an incoming call.

Technical reference: 60000239

New ANSI-41 Per-Call Feature Activation/Deactivation Compliance

LWW00006

KEY CAPABILITIES

This feature provides compliance to the ANSI-41 specification for per-call feature cancellation by the originating mobile station for call waiting (CWT) and calling number identification restriction (CNIR), as well as feature activation/deactivation for both the originator and the terminator during a call. This feature also removes the cancel call waiting (CCW) provisioning option, combining CCW capability with CWT.

Technical reference: 60000238

PRINCIPAL BENEFITS

This new feature:

- ◆ Adds support for feature activation/deactivation after flash
- ◆ Brings the full capabilities of Call Waiting and Cancel Call Waiting to the subscriber

New Distinctive Ringing

LWW00006

KEY CAPABILITIES

Distinctive Ringing offers an ANSI-41D HLR-based Call Screening Service for incoming calls. Activation of this feature presents calls from numbers in the screening list to the termination number with a distinctive ring.

PRINCIPAL BENEFITS

This new feature:

- ◆ Gives subscribers greater control over incoming calls
- ◆ Provides a new source of revenue for service providers

E911/W911 SOC**PSRV0007**

Adds the ability to transfer wireless E911 calls.

New E911/W911 SOC

L.WW00006

KEY CAPABILITIES

This feature enables network providers to selectively route and transfer emergency 911 calls to the appropriate Public Safety Access Point (PSAP) agency serving the location of the calling party.

Technical reference: 60000262

PRINCIPAL BENEFITS

With PSRV0007, Nortel Networks offers network providers a choice between a trunk-based solution and a Wireless Intelligent Networking (WIN) based trigger to meet the E911 Phase I requirements of the Federal Communications Commission (FCC) June 1996 Report and Order on Emergency 911 (E911) Services.

PREMIUM SERVICES PHASE 1**PSRV0012**

Introduces the first of a series of order codes extending premium features to wireless subscribers.

New Abbreviated Dialing

L.WW00006

KEY CAPABILITIES

Abbreviated Dialing enables a mobile subscriber to dial an extension rather than an entire directory number (for example, to reach a PBX extension).

PRINCIPAL BENEFITS

Appealing to a wide range of subscribers, abbreviated dialing helps make telephone numbers easier to memorize and quicker to dial.

MAJOR DEPENDENCIES

Hardware: DMS SuperNode Data Manager

LWW00006 FEATURES, *continued***FLEXIBLE ANI AND CLID****PSRV0013**

Combines the existing Flexible Calling Line Identification feature with the Flexible ANI feature to create a uniform user interface.

New Flexible ANI and CLID

LWW00006

KEY CAPABILITIES

Designed for areas that do not support the standard North American dialing plan of 7 to 10 digits, this feature allows operators to send or receive between 1 and 15 ANI digits for R2 trunks and between 1 and 24 digits for the Calling Party Number and/or Charge Number Parameter on ISUP trunks. This order code, which only affects calls terminating on the DMS-100 Wireless system, enables operators to:

- ◆ Send incoming calls to treatment that have an unrecognized ANI stream or an insufficient number of ANI digits.
- ◆ Manipulate (add to, delete from, or change) the Automatic Number Identification (ANI) at the DMS-100 Wireless switch before outpulsing it to a far end office. CDR files capture changes made to the incoming or outgoing ANI.
- ◆ Screen a range of ANI numbers that require special modification/handling. This could be used to assist with an area code split or citywide number changes.

Technical reference: 60000214

PRINCIPAL BENEFITS

- ◆ Enables the service provider to add digits to the incoming ANI stream where there are older switches that do not have the ability to generate enough ANI to accurately bill calls. This feature promotes billing accuracy by recording ANI modifications in the CDR.
- ◆ Allows digits to be added or deleted to the calling party number before displaying that number on the mobile subscriber receiving the call.
- ◆ Permits network providers to add the long distance access code (1 + National Significant Number) to the CLID that displays on the terminating mobile handset.

New Privacy and Unknown Display for CNIP

LWW00006

KEY CAPABILITIES

This software enables the DMS-100 Wireless switch to send a text string to a mobile when the Calling Line ID (CLID) is private or unavailable. This feature also enables the system to send the Privacy Indicator bits in the Alert with Info and Flash with Info messages so that the mobile can decide how to inform the subscriber that the CLID is private or unavailable.

Technical reference: 60000395

PRINCIPAL BENEFITS

- ◆ Extends CLASS-type capabilities to the wireless subscriber
- ◆ Helps enhance customer satisfaction and generate new revenue opportunities.

New Text Message to Mobiles

LWW00006

KEY CAPABILITIES

This feature delivers HLR-originated text messages to the mobile subscriber by introducing the first application of Mobile Text Messaging (MTM). Now the mobile subscriber can retrieve Incoming Call Screening (ICS) lists and supply a text confirmation message for ICS service status changes.

Technical reference: 60000253, 60000390

PRINCIPAL BENEFITS

- ◆ Enables mobile subscribers to remotely configure text-screening features without having to memorize feature codes.
- ◆ Supports different sets of text strings that are selectable on a per-subscriber basis, depending upon language preference or other criteria.

EFRC NOISE CONDITIONING**TDMA0001****New** EFRC Noise Conditioning

LWW00006

EFRC NOISE REDUCTION**TDMA0002****New** EFRC Noise Reduction

LWW00006

KEY CAPABILITIES

These order codes enhance the quality of Enhanced Full Rate Codec (EFRC) calls working in non-bypass mode. Developed and patented by Nortel Networks, EFRC Noise Conditioning conditions background noise in signals that do not contain speech. Conditioning the background noise delivers more natural audio.

EFRC Noise Reduction minimizes the perceived level of noise mixed with the speech signal to enhance its quality. This feature lowers the perceived background noise level throughout a call, and is most effective on stationary background noise, such as wind or engine sounds.

Technical reference: 60006029

PRINCIPAL BENEFITS

These order codes:

- ◆ Provide the best TDMA audio quality in the industry.
- ◆ Improve the quality of EFRC calls that are made in hands-free mode.
- ◆ Condition the background noise in EFRC calls.
- ◆ Reduce the level of background noise during EFRC calls.

LWW00006 FEATURES, *continued***WIRELESS INTELLIGENT NETWORK STANDARDS — PHASE I****WIN00010**

Introduces WIN standards compliance functionality within the DMS-100 Wireless switch.

New WIN Standards Compliance Phase I

LWW00006

This feature introduces Wireless Intelligent Network (WIN) standards compliance within the DMS-100 Wireless system, including the capability to network with other nodes using the WIN protocol.

Technical reference: 60000228

WIN GLOBAL TITLE TRANSLATIONS**WIN00011**

Provides the ability to route WIN queries based on GTT.

New WIN Global Title Translations

LWW00006

KEY CAPABILITIES

This feature supports datafilling of a global title as a WIN trigger address and provides the ability to route WIN queries based on global title translations (GTT).

Technical reference: 60000200

PRINCIPAL BENEFITS

This new feature:

- ◆ Allows wireless operators to deploy WIN services on a mated-pair SCP for redundancy.
- ◆ Enables wireless operators to simplify routing table administration.

KEY CDMA FEATURES

ENHANCED SELECTOR CARD WITH EVRC

CDMA0001

Introduces an important hardware and software upgrade to the Base Station Controller.

New Enhanced Selector Card with EVRC

LWW00006

KEY CAPABILITIES

The Enhanced Selector (ESEL) card with Enhanced Variable Rate Codec (EVRC) is a hardware and software upgrade to the BSC. The hardware consists of the ESEL and the new Selector Bank Subsystem (SBS) Common Interface (SCI). The ESEL has 16 selectors, doubling the capacity of the previous Selector (SEL) card. One ESEL-populated shelf supports twice the number of subscribers as an SEL-equipped shelf. The fully backwards compatible new SCI, required to support ESEL, replaces the current SCI for new shipments of SELs, as well as ESELs. Nortel Networks continues to support SCIs in the field when used in SEL shelves. Retrofits to the new ESEL-capable SCI are not required unless SEL-based shelves are being upgraded to support ESEL. Due to the double capacity of the ESEL, shelves fully populated with the ESEL capability require two of the new SCI cards.

Software consists of the EVRC function of the ESEL card, as well as the Q13 (QCELP) vocoder. Thus, ESEL supports EVRC-capable phones to enhance network capacity as well as earlier Q13 phones to provide backward compatibility. ESEL does *not* support the original IS-96A 8 Kbps vocoder (now rare). Circuit-Switched Data (CSD) and fax are planned to be added in a later release.

Services Supported	Existing SEL	New ESEL
EVRC	No	Yes
Q13	Yes	Yes – ESEL is the preferred platform for Q13 services
IS-96A 8 kbps		No
CSD/Fax		

Technical reference: 60000359, 60000360

PRINCIPAL BENEFITS

- ◆ Enables the EVRC vocoder to offer the RF capacity of an 8 Kbps vocoder and maintain the equivalent voice quality of the Q13 vocoder.
- ◆ Provides a higher selector density (2x that of the SEL) that reduces footprint requirements by up to 50 percent, thereby reducing costs associated with the Selector Bank Subsystem (SBS) cabinet, shelf, power converters, and SBS Controller.

LWW00006 FEATURES, *continued*

- ◆ Offers an ESEL platform designed to accommodate future service evolution.

MAJOR DEPENDENCIES

Software: CDMA NBSS 8.0

Hardware: ESEL cards (NTGB06CA)
New SCI cards (NTGB08AB)

New IS-41C CDMA Hard Handoff

LWW00006

KEY CAPABILITIES

This feature enables bidirectional hard handoffs between the Nortel Networks CDMA system and another vendor's IS-41C compliant CDMA system across an IS-41C link.

Technical reference: 60000379, 60000380

PRINCIPAL BENEFITS

With this software feature, operators with Nortel Networks CDMA equipment can hand off calls to a neighboring operator with another vendor's CDMA equipment. Or, a single operator can overlay Nortel Networks CDMA equipment onto another vendor's CDMA equipment.

MAJOR DEPENDENCIES

Hardware: Other vendor equipment must support the IS-41C Hard Handoff feature.

OPEN A-INTERFACE FOR CDMA**CDMA0002**

Allows carriers to deploy third-party base station subsystems.

New Open A-Interface for CDMA

LWW00006

KEY CAPABILITIES

This feature enables a CDMA carrier to deploy third-party base station subsystems (BSSs), while continuing to use Nortel Networks DMS-100 Wireless switches. Based on the TIA/EIA IS-634 industry standard, the Open A-Interface for CDMA consists of the message protocol, administration features, and SS7-based message transmission capabilities.

Nortel Networks developed this capability on the A-Interface Control Element (ACE) and the Base Station Application Part Link Interface Unit (BSAP-LIU7). These applications are based on the NTEX22CA hardware and reside in the Link Peripheral Processor (LPP).

Technical reference: 60000374

PRINCIPAL BENEFITS

This enhancement provides network providers with significant flexibility in selecting MSC and BSS equipment.

MAJOR DEPENDENCIES

Hardware: LPP, A-Interface Control Element, BSAP LIU7 CDMA infrastructure

MULTI-MODE HARD HANDOFF**CDMA0003**

Enhances hard handoffs to provide continuous coverage between overlaid systems.

New Multi-mode Hard Handoff

LWW00006

KEY CAPABILITIES

This feature enhances hard handoffs by taking into account the capability of the mobile during target system selection (previously not required). Hard handoffs include:

- ◆ From 1900 MHz CDMA to 800 MHz CDMA
- ◆ From 800 MHz CDMA to 1900 MHz CDMA
- ◆ From 800 MHz CDMA to 800 MHz AMPS
- ◆ From 1900 MHz CDMA to 800 MHz AMPS

Operators can deploy this feature anywhere a hard handoff is required to provide continuous coverage between overlaid systems in a trimode network.

Technical reference: 60005909, 60005997

PRINCIPAL BENEFITS

- ◆ Provides continuous coverage in a trimode network.
- ◆ Maintains trimode-capable phones on a CDMA system (1900 MHz or 800 MHz) in a trimode network as long as possible before handing them down to AMPS.
- ◆ Hands dual-mode phones in a trimode network directly down to AMPS when the source CDMA system no longer has coverage.
- ◆ Maintains single mode CDMA phones on CDMA longer at the edge of the CDMA system.

MAJOR DEPENDENCIES

Software: CDMA NBSS 8.0

Hardware: CDMA infrastructure. **Note:** Requires Multi-mode capable handsets.

LWW00006 FEATURES, *continued*

New CDMA OM Upload Optimization

LWW00006

KEY CAPABILITIES

This feature provides a solution for the overflow problem of CDMA operational measurement (OM) upload by consolidating frequency and cell/sector based OM data on the LPP. Also, this software evenly distributes OM traffic during OM data uploads.

Technical reference: 40047930, 60000140

PRINCIPAL BENEFITS

- ◆ Consolidates cell/sector and frequency based OM data on LPP to reduce the traffic over DS-30 links and the message-processing burden on the Computing Module.
- ◆ Uniformly distributes OM upload traffic during OM data uploads to reduce the bursty nature of OM messages.

New RMU Introduction

LWW00006

KEY CAPABILITIES

The LWW00006 software release uses a new Resource Manager Unit (RMU) to allocate resources and handle the associated transactions with the Selector Bank Subsystem (SBS) Resource Managers (RMs). The RMU has a global view of all resources in the CDMA system and implements service option preferences defined in the Computing Module.

Technical reference: 60000142, 60000364

PRINCIPAL BENEFITS

- ◆ Doubles the processing capacity and quadruples the available memory.
- ◆ Offers signification card count and cost reduction along with enhanced robustness.
- ◆ Reduces blocking by determining exactly how many resources are available at a given time.

MAJOR DEPENDENCIES

Hardware: Requires the new RMU to deliver advanced features.

TIERED BILLING FOR CDMA**CDMA0004**

Adds billing enhancements to CDMA applications.

New Tiered Billing for CDMA

LWW00006

KEY CAPABILITIES

This feature enables Cellular/PCS operators to offer more flexible billing arrangements, tailoring them to subscribers' calling patterns (such as where a subscriber typically makes and receives calls). Operators can offer this feature for home zone, residential, campus, corporate, and office solutions. Please note that some mobiles do not fully support the messaging used in this feature. Please contact your Nortel Networks representative for information on which handset vendors/models support this CDMA feature.

Technical reference: 60005928, 60005929

PRINCIPAL BENEFITS

- ◆ Enables operators to offer a feature-rich “campus” service to corporate customers.
- ◆ Enables operators to provide a residential or “neighborhood” service to communities replacing or augmenting wireline service.
- ◆ Encourages airtime use and revenue opportunities in areas where usage is normally low.

MAJOR DEPENDENCIES

Software: CDMA NBSS 8.0

Hardware: CDMA infrastructure

CDMA PAYPHONE SUPPORT**PROX0001**

Supports answering supervision for payphone applications on CDMA

New Proximity CDMA

LWW00006

KEY CAPABILITIES

This feature supports answering supervision for Public Call Office (PCO) or payphone applications on Nortel Networks CDMA and complies with IS-95B specifications.

PRINCIPAL BENEFITS

- ◆ Leverages an existing CDMA mobility architecture for fixed wireless applications.
- ◆ Enables markets without regular wireline service to provide tariffed telephone service to individuals on a per-use basis.
- ◆ Helps fixed wireless operators to compete more effectively against wireline carriers.

MAJOR DEPENDENCIES

Software: CDMA NBSS 8.0

Hardware: IS-95B Line Access Unit for Line Reversal OEM payphone or metering box

LWW00007 FEATURES

LWW00007, scheduled to be available in 4Q00, introduces the first phase of support for the new XA-Core processor, as well as important industry-compliance features. This software load combines the key features of the LEC00013 (wireline) release and the key features of the MTX09 (wireless) release.

Some of the key capabilities planned to be introduced in LWW00007 include:

- ◆ **XA Core Release 1 (1+1).** LWW00007 supports the new, scalable XA-Core to replace the existing Computing Module and System Load Module. For more information, see pages 58 to 64 in this document.
- ◆ A number of features expands the Open A-Interface, including:
 - **Tiered Billing Enhancement** extends tiered billing to CDMA radios using the Open A-Interface. In addition to call detail records that track a mobile subscriber's movement in up to eight different zones, the feature provides audible tones for origination, termination, and entry (while on a call) into a public zone.
 - **Enhanced Variable Rate Codec (EVRC)** service option for A-Interface (AIF) originations, terminations, and handoffs.
 - **15-Digit International Mobile Station Identity (IMSI)** on the Open A-Interface overcomes the current "originate-only" limitation to provide full service origination and termination capabilities for Canadian roamers.
 - **A-Interface IOS CDG 2.2 Compliance.** This feature provides support in the Computing Module (CM) and A-Interface Control Element (ACE) processing elements to comply with the *CDMA Development Group Inter-Operability Specification (CDG IOS)*, version 2.2.0; April 23, 1999. These enhancements are planned to include:
 - Table Control and messaging updates to support CDG IOS 2.2.0 for the CM and ACE
 - Support for inter-Base Station handoff while ringing for AIF terminations (for Intra-MS-C and IS-41P Inter-MS-C)
- ◆ **Three-Way Call Chaining** enables a non-controlling party on a three-way call in the DMS-100 Wireless system to add another conferee to the call by sending a "flash" message to the system and dialing the new party.
- ◆ **Mid-Call Wireless Intelligent Network (WIN)** provides WIN support of mid-call operations for services supported by an SCP.
- ◆ **Prepay with WIN Mid-Call Operations** support prepaid services in concert with an SCP to keep track of time and money information. If the Mobile Subscriber runs out of time, the call can be interrupted by the SCP (mid-call operation) to tell the DMS-100 Wireless system to terminate the call.

DMS-STP System

This chapter discusses the new software and hardware scheduled to become generally available for the Nortel Networks flagship signaling transfer point (STP), the DMS-STP system.

The DMS SuperNode-based DMS-STP system provides robust, economical, and high-capacity message transfer among signaling points — such as service switching points (SSPs), service control points (SCPs), and other STPs — in the Signaling System No. 7 (SS7) network. First introduced in 1986, this solution has maintained its reputation as the premier STP system in the global market. Designed with one of the most robust architectures in the telecommunications industry, the DMS-STP system provides the power and flexibility for easy, economical growth in the constantly evolving Intelligent Networking/Advanced Intelligent Networking environment.

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FIELD-PROVEN SOLUTION

By achieving consistent year-over-year improvements in DMS-STP reliability, Nortel Networks has made the DMS-STP system the most reliable large-capacity STP on the market today. Capable of handling up to 432 links, each DMS-STP system can process up to 348 million SS7 messages per hour, with 25-byte message signaling units (MSUs) under a no-fault condition.

This system supports American National Standards Institute (ANSI) Message Transfer Part/ Signaling Connection Control Part (MTP/SCCP) signaling, and International Telecommunications Union (ITU) MTP/SCCP signaling. As a result, the DMS-STP system has been chosen by over 60 local, interexchange, and international gateway carriers for its high message throughput, capacity, and reliability. Over 400 DMS-STP systems have been deployed globally in support of AIN/IN services, including the varied market applications of both local exchange carriers (LECs) and interexchange carriers (IECs).

As one of the most robust STPs on the market, the DMS-STP architecture complies with key performance reliability objectives — including those set by LATA Switching System Generic Requirements (LSSGR) and Telcordia — with a fault-tolerant, high message-handling capacity system. The system achieves and exceeds reliability objectives associated with downtime and outage performance measurements defined by Telcordia specifications in *Reliability and Quality Measurements for Telecommunications Systems (RQMS)*.

DMS-STP evolution includes a comprehensive program built to support Network Reliability Council (NRC) items for improved SS7 network integrity and robustness. In addition to new operations support functions — such as MTP Routing Verification Test (MRVT) and Gateway Screening Validations — many of the NRC items address the challenges inherent in the rapid, multi-provider, network growth that LNP creates. Linkset Expansion and High-Speed Link initiatives help meet this growth demand.

Another important area of DMS-STP software development is focused on Local Number Portability (LNP) — a key capability and compliance issue for LECs as they move toward an increasingly open and competitive network. Leading-edge feature development in support of LNP — such as the ability to load share across more than two service control points — permits optimized network configurations and capital cost savings through innovative load sharing scenarios such as N+1 sparing.

Besides providing several advanced capabilities considered part of the base product and key to the evolving network, the DMS-STP system undergoes extensive product, feature, and patch testing in large (432-link system) verification facilities. Rigorous testing builds high quality into each new DMS-STP software release.

The DMS-STP program recognizes significant existing network provider investments. Product releases STP005 and STP006, discussed in this chapter, expand the system's large feature portfolio with even more capabilities, demonstrating Nortel Networks commitments to our installed base.

PCLs IN STP005

Product Release STP005 introduces Low-Speed Link/High-Speed Link (HSL) mix support for the Enhanced LPP; increased HSL support from 24 to 36; multiple point code support; network indicator interworking; linkset expansion to 432; routeset expansion to 4000; HSL transport over ATM, and support of a Number Portability Co-Processor.

Scheduled to be generally available in the 2Q00 time period, STP005 is planned to offer the following PCLs:

- ◆ STPBASE050, order code **STBA0050**. This STP005 PCL provides the same type of functionality as the previous PCL, STPBASE042, with the addition of new features that become available with the STP005 product release.
- ◆ STPSEAS050, order code **STSE0050**. This STP005 PCL provides the same type of functionality as its previous PCL, STPSEAS042, with the addition of new SEAS features that become available with the STP005 product release.

NEW HARDWARE SUPPORTED WITH STP005

In response to North American customer requests and industry evolution of SS7 signaling, Nortel Networks plans to introduce the Signaling Server platform with the STP005 product release. The Signaling Server Platform is scheduled to be introduced as a Number Portability (NP) Co-Processor with the ability to provide Location Routing Number (LRN) and Global Title Translation (GTT) capabilities on the DMS-STP system for varying network topologies.



Signaling Server Platform

PCLs IN STP006

Product Release STP006 is currently planned to include ITU Signaling Link Selector (SLS) load balance enhancements, linkset expansion to 511, usage measurement enhancements, and multiple point code enhancements. Scheduled to be generally available in the 4Q00 time period, STP006 is planned to offer the following PCLs:

- ◆ STPBASE060, order code **STBA0060**. This STP006 PCL provides the same type of functionality as the previous PCL, STPBASE050, with the addition of new features that become available with the STP006 product release.
- ◆ STPSEAS060, order code **STSE0060**. This STP006 PCL provides the same type of functionality as its previous PCL, STPSEAS050, along with the new STPBASE060 features that become available with the STP006 product release.

STANDARD FEATURES

The following features are *standard* capabilities; they do *not* need to be ordered separately.

DMS SUPERNODE PLATFORM	STANDARD
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Provides the platform infrastructure required for all other order codes.

Linkset Expansion to 432

STBA0050, STSE0050

KEY CAPABILITIES

To address expanding network interconnection requirements, Nortel Networks plans to increase the number of linksets available on the DMS-STP platform. In STP005, the total number of linksets supported per DMS-STP system is planned to increase to 432 to align with the number of links supported.

Technical reference: 19007799

PRINCIPAL BENEFITS

A greater number of linksets provides the DMS-STP system with increased capacity to handle more connections.

ITU (14 Bit) OMAP MRVT

STBA0050, STSE0050

KEY CAPABILITIES

The International Telecommunications Union (ITU) Operations, Maintenance, and Administration Part (OMAP) Recommendations Q.750 and Q.755 describe the management of SS7 signaling point network elements based on Telecommunication Management Network (TMN) principles.

STP005 is scheduled to introduce Recommendations Q.753 and Q.754 that describe the Message Transfer Part Routing Verification Test (MRVT) for the 14 point code variant. These tests enable the verification and validation of MTP routing tables using OMAP messages exchanged between the signaling points. MRVT can be used to detect pathologies, such as circular routes and open routing chains, in provisioned Message Transfer Part (MTP) routing.

Technical reference: 19007797

PRINCIPAL BENEFITS

ITU OMAP MRVT can help improve network management techniques by enabling the network provider to test routing data before a potential problem occurs in the network.

Low-Speed Link/High-Speed Link Mix Support on ELPP

STBA0050, STSE0050

KEY CAPABILITIES

For more efficient use of resources, this enhancement supports a mixture of High-Speed Link (HSL) and Link Interface Unit for SS7 (LIU7) modules on an Enhanced Link Peripheral Processor (ELPP).

Technical reference: 19007668

PRINCIPAL BENEFITS

Increasing the ELPP's flexibility decreases the required central office floor space, offering the network provider potentially lower operating costs.

ITU SLS Load Balancing Enhancements

STBA0060, STSE0060

KEY CAPABILITIES

The current implementation of ITU Signaling Link Selector (SLS) load balancing implemented by Nortel Networks and other vendors may cause problems in the network under specific failure conditions and configurations. This feature improves the SLS load balancing in ITU networks.

PRINCIPAL BENEFITS

This software enhances robustness and survivability of services under certain failure conditions through ITU SLS load balancing.

New Linkset Expansion to 511

STBA0060, STSE0060

This enhancement increases the capacity of the DMS-STP system from 432 to 511 links, to support future growth due to increased interconnects and network consolidation.

OPTIONAL FEATURES

The remaining features in this chapter are all planned to be optional. Although they are delivered with a PCL load, they must be licensed separately.

PLATFORM CAPACITY ENHANCEMENTS

STPE0006

Increases signaling link capacities in anticipation of new services and future internetwork connections.

New Increase HSL support from 24 to 36

STBA0050, STSE0050

KEY CAPABILITIES

For enhanced use of resources, this enhancement increases the number of High Speed Links (HSL) supported on the DMS-STP system from 24 to 36.

Technical reference: 19007800

PRINCIPAL BENEFITS

Allowing the provisioning of a greater number of HSLs helps to increase the number of high-speed points of interconnect the DMS-STP system can support.

New HSL SS7 Transport over ATM

STBA0050, STSE0050

KEY CAPABILITIES

This feature enables the network provider to connect and route HSL links through a packet-switched Asynchronous Transfer Mode (ATM) network.

Technical reference: 19007658

PRINCIPAL BENEFITS

This provisioning enhancement increases flexibility and can help reduce cost of deployment of HSLs within the network by switching SS7 messages through the ATM network.

NP CO-PROCESSOR

BSTP0210

Adds Number Portability (NP) capabilities to extend existing network flexibility and reduce network complexity.

NP Co-Processor Introduction

STBA0050, STSE0050

KEY CAPABILITIES

This feature provides Location Routing Number (LRN) and Global Title Translation (GTT) capabilities on the DMS-STP system to support Number Portability (NP) for various network topologies. The software includes scalable processing and number of LRN and GTT entries

and supports a Service Management System (SMS) interface to the Local SMS (LSMS) for Number Portability Administration Center (NPAC) access to simplify number administration.

PRINCIPAL BENEFITS

For established networks, this feature provides flexibility in addressing NP requirements using the installed base. For new installations, the combined functionality minimizes network complexity. All configurations benefit from the Local SMS interface for automated updating of bulk LRN data or GTT data, or both.

MULTIPLE POINT CODE SUPPORT

TEL00012

Supports Multiple Point Codes for each Network Indicator to broaden the flexibility of SS7 network operation and to accommodate future expansion.

Multiple Point Code Support

STBA0050, STSE0050

KEY CAPABILITIES

This phase of the Multiple Point Code rollout supports up to 16 specific STP point codes per network indicator (for example, “National”) for the STP products. The point code network types (ANSI, ITU, and NTC7) can be either shared or different.

Technical reference: 19007804

PRINCIPAL BENEFITS

Multiple Point Code capability significantly increases the flexibility of how network providers define their SS7 network, addressing both current field issues and anticipated growth of the SS7 network. Among other benefits, this capability enables:

- ◆ International operators to support both ANSI and ITU networks.
- ◆ Domestic operators to use separate backbone networks for ISUP and IS-41 transport.
- ◆ Point codes transparency to be maintained during network consolidation.

Multiple Point Code Support Enhancements

STBA0060, STSE0060

This phase of the Multiple Point Code rollout introduces some customer-driven enhancements that enable this functionality to be used in a broader spectrum of applications.

OPTIONAL FEATURES, *continued***NETWORK INDICATOR INTERWORKING****TEL0015**

Interworks between different network indicators in the same network type.

New Network Indicator Interworking

STBA0050, STSE0050

On a per-linkset basis, the user can change the Network Indicator (NI) of the incoming and outgoing message from one NI to another. This enables transparent interconnection of traffic to more than one NI.

Network Indicator Interworking enables users to interconnect an STP between two or more NIs within the same network type. This increased flexibility removes the need to add external conversion boxes to the SS7 links, decreasing the number of nodes to maintain in the network.

Technical reference: 19007803

ROUTESET EXPANSION**STPE0004**

Offers greater interconnect and routing.

Routeset Expansion to 4000

STBA0050, STSE0050

KEY CAPABILITIES

This enhancement expands system routeset capacity to meet emerging network evolution requirements. The maximum capacity increases from 2047 to 4095 with full routeset management on all routes.

Technical reference: 19007801

PRINCIPAL BENEFITS

With the doubling of routeset support, the DMS-STP system can route to over 4000 destinations to accommodate a network provider's increased market share, signaling point code growth, and other network modernization factors.

SS7 USAGE MEASUREMENT ENHANCEMENTS**STPE0007**

Offers measurements to determine network usage to address regulatory requirements.

SS7 Usage Measurements Enhancements

STBA0060, STSE0060

This feature supports the requirement of SS7 network providers to measure the usage of their network by providing peg counts of the number of message types sent from one Originating Point Code (OPC) to a specific Destination Point Code (DPC) and capturing OPC, DPC, SIO, and SSN for each message.

This software supports billing based on network use — as well as billing reconciliation when a SS7 user is billed by another provider — without the use of external probe-based solutions.

BroadBand STP

This chapter discusses the new software and hardware scheduled to become generally available for the BroadBand STP — the first product on Nortel Networks Signaling Server platform and the newest solution in the Nortel Networks STP portfolio.

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INNOVATIVE BROADBAND STP SOLUTION

As a highly reliable, compact, and flexible Signaling System No. 7 (SS7) entry point for service providers, the Nortel Networks BroadBand STP is an advanced, innovative solution to the increasing demands for efficient and scalable telecommunications services. It is the first solution implemented on our leading-edge Signaling Server platform and the newest product in the Nortel Networks STP portfolio. With the availability of the BroadBand STP, network providers now have a choice to continue with the proven DMS-STP technology or, based on network requirements, consider BroadBand STP technology for new initial installations.

With one of the smallest footprints in the industry, the BroadBand STP occupies just four square feet — significantly reducing installation floor space and environmental costs such as heating, ventilation, and air conditioning (HVAC).

Built-in fault-tolerant hardware and software systems help ensure that network provider reliability objectives can be met. For example, key subsystems — such as central control processors, A/B shelf power, Ethernet LAN, data storage units, and messaging paths — are fully redundant.



***Space-Saving BroadBand STP and OAM&P
Graphical User Interface Workstation***

The BroadBand STP is designed around a flexible, modular platform that enables providers to create fully functional applications from only seven circuit cards. As requirements change, additional cards and shelves can be easily added to the BroadBand STP's simple-to-upgrade system. This ability to expand without a major hardware re-investment helps contain costs while meeting new market requirements.

In addition, the incorporation of proven high-performance commercial technology for processing and data communications removes much of the investment risk associated with implementing a new system. For example, the BroadBand STP uses PowerPC cards with standard PCI bus electronics and VME-sized transition modules to create specific functional elements within the system. By combining asynchronous transport mode (ATM) technology with the PCI bus structure, system performance stays consistently high even as SS7 links and other functions are added.

The base BroadBand STP system configuration consists of one Communications Applications Module (CAM) shelf — supporting up to 40 signaling data links — and its associated operations, administration, maintenance, and provisioning (OAM&P) workstation. Designed with expansion in mind, additional links (up to 104) can be supported with an extension CAM shelf — with further expansion to 440 links planned in the SSR3.0 release. In addition to the current DS-0A and V.35 interface support, planned enhancements include a channelized E1, High Speed Link (T1, E1), and High Speed Internet Protocol Link interfaces.

Because the BroadBand STP CAM shelf features standardized control hardware, the system is easy to configure for specific site considerations. The OAM&P workstation features an easy-to-use Graphical User Interface (GUI) specifically designed to enable the network provider to retrieve answers quickly and reduce both training requirements and system downtime. Workstation features include on-line documentation and a complete on-line Help system.

A fully distributed architecture enables application processing elements to co-exist on the same BroadBand STP platform. System co-residency offers service providers a highly scalable and flexible option for the deployment of Calling Name, Number Portability, and other network services.

The BroadBand STP is the first STP to use ATM switching as the internal transport system. With a fully duplicated ATM backplane, the BroadBand STP is designed so that no single failure can cause a message to be blocked to its destination SS7 link.

Finally, compared to other technologies, ATM significantly reduces congestion problems when an STP runs at high capacity levels. By combining ATM switching technology with commercial computing hardware, the BroadBand STP is an economical solution to existing SS7 needs, while preparing for direct interconnection to the broadband network.

RELEASE PLANS

Introduced in 1998, the BroadBand STP offers software releases with expanding capabilities as shown below.

Release	What's new in this release	Scheduled GA
SSR2.0	Dual shelf (104-link) system, ANSI and ITU (14-bit) protocol, V.35 and E-1 interfaces, Calling Name Enhancements	Available now
SSR2.1	Integrated North American Number Portability (Universal NP Master); LSMS support for AIN 0.1, IN 1.0, and IS-41; and NPA-NXX split administration for Number Portability	
SSR2.2	Windows NT support, Preventive Cyclical Retransmission, and Multiple Point Code Expansion	2Q00
SSR3.0	Eight-shelf system (440 links), European Number Portability, and High Speed Links (T1 interface)	4Q00

► SSR2.0

The currently available software release supports up to 104 data-signaling links (40 by the control CAM shelf and 64 by the extension CAM shelf). Both DS-0A and V.35 signaling interfaces are supported, as well as ANSI and International Telecommunication Union (ITU) signaling protocols, and an E-1 interface via channel bank multiplexer. The hardware configuration of this release consists of a control CAM shelf, an extension CAM shelf, and an associated OAM&P workstation interface.

The basic system platform includes 14-bit ITU support with ANSI and ITU co-existence, global title address range expansion to 22 digits, OAM&P interface enhancements, and an In-Service Software Upgrade feature that allows generic software upgrades to be performed without system interruption. The release also offers enhancements to the BroadBand STP's Calling Name (CNAM) application (including support for city and state display, as well as ability to count and record Calling Name queries).

► SSR2.1

SSR2.1 provides the Universal NP Master — a value-added, highly-scalable North American Number Portability (NP) solution with initial support of up to 5000 Global Title Translation (GTT) or Local Routing Number (LRN) queries per second, and five million ported number records. Universal NP Master also provides an integrated Service Management System (SMS) capability, a crucial intelligent network interface for ported number administration, and support for Number Portability NPA-NXX split administration.

▶ **SSR2.2**

SSR2.2 supports the Microsoft Windows NT operating system for the OAM&P workstation, Special Studies operational measurements for the Number Portability NPA-NXX split administration feature, Preventive Cyclical Retransmission capability for satellite transmission, and expansion of multiple point code support from four to 16.

▶ **SSR3.0**

SSR3.0 is planned to expand the BroadBand STP configuration to eight CAM shelves, supporting up to 440 signaling links. Optional features include the introduction of European Number Portability and many enhancements to North American Number Portability, including support for number pooling. In addition to the existing DS-0A and V.35 interfaces, new signaling interfaces include channelized E1, High Speed Links (T1 Interface), and High Speed Internet Protocol Link interfaces. In addition, to the current GUI based PC user interface, support for network OAM&P (GR-310-CORE) interface is also planned.

▶ **SSR4.0 AND SSR5.0**

Many other enhancements are currently being planned for our SSR4.0 and SSR5.0 based releases. To find out more information about these releases please contact your local Nortel Networks representative.

SSR2.0

HARDWARE

SSR2.0 introduces a dual-shelf configuration, with two Communications Application Modules (a control CAM shelf and an extension CAM shelf). This configuration supports up to 26 link system nodes, providing 104 signaling data links, as follows:

- ◆ **Control CAM (CAM 1)** 10 link system nodes (40 signaling data links)
- ◆ **Extension CAM (CAM 2)** 16 link system nodes (64 signaling data links)

New hardware interfaces in this release extend to:

- ◆ **V.35 Link System Node Interface** to support V.35 (64 and 56 kbps) data signaling links.
- ◆ **E-1 Interface via Multiplexer** to provide an E-1 interface to customer equipment using a V.35 Link System Node Interface and peripheral channel bank equipment.

STANDARD SOFTWARE CAPABILITIES

SSR2.0 includes the standard base software for the BroadBand STP, packaged in order code BSTP0011. New functions include:

- ◆ **14-Bit ITU** — supports MTP and SCCP per ITU-TS Specifications of Signaling System 7, 1992 White Book (Q701-Q716 and Q763 recommendations).
- ◆ **ANSI and ITU Co-Existence** — supports both ANSI and ITU protocols simultaneously.
- ◆ **Point Code Enhancements** — support increases from one to 4 point codes. Each point code can have any Network Indicator (NI) value (0 – 3) assigned, and each can have either an ANSI or ITU protocol type assigned.
- ◆ **Global Title Address Range Expansion** — supports variable address digit ranges from 3 to 22 digits.
- ◆ **OSS Log/Alarm Spooling Interface** — enables the transport of BroadBand STP logs and alarms (as they occur) to a designated IP address. The BroadBand STP acts as a File Transfer Protocol (FTP) server and the external Operations Support System (OSS) acts as the FTP client.
- ◆ **OSS FTP Spooling** — enables the transport of BroadBand STP operational measurement (OM) files to a designated IP address. The BroadBand STP acts as an FTP server and the external OSS acts as the FTP client.

OPTIONAL CAPABILITIES

- ◆ **Remote Point Code Expansion** — extends the support for multiple remote point codes from 256 to 1000.
- ◆ **Network Indicator Interworking** — enables interworking between switches in different countries with differing regulatory requirements by allowing incoming and outgoing network indicators to be changed for internal processing by the BroadBand STP. This effectively enables the BroadBand STP to appear as multiple STPs within a single network.
- ◆ **CNAM Enhancements** — supports the Nortel Networks Application Peripheral software release 3.2 that includes city and state display, as well as dip count reports for the BroadBand STP's Calling Name (CNAM) application.

SSR2.1

HARDWARE

SSR2.1 delivers the Universal NP Master number portability solution by supporting up to two BroadBand STP SSR2.0 shelves (Control CAM Shelf and Extension CAM shelf) configured to deliver up to 5000 ported number queries per second. The shelves are configured with a combination of Number Portability Controller (NPC) system nodes, NPC Number Portability Server (NPS) system nodes, and SS7 link system nodes to meet the desired performance requirement.

STANDARD SOFTWARE CAPABILITIES

SSR2.1 builds on the standard SSR2.0 BroadBand STP configuration by providing value-added Universal NP Master hardware and software to deliver a high-performance number portability solution.

OPTIONAL CAPABILITIES

This value-added release bundles the Universal NP Master number portability solution with the BroadBand STP software, along with a number of software and hardware options:

- ◆ **Universal NP Master** — provides a highly-scalable and flexible number portability solution bundled with BroadBand STP functionality and Service Management System (SMS) with:
 - Initial support for up to five million ported numbers
 - GTT support for CNAM, CLASS, Interswitch Voice Messaging (ISVM), and LIDB services
 - Initial support of up to 5000 GTT or LRN queries per second
 - Support for scalable service order capacities (initially up to five updates per second)
 - Support of AIN 0.1, IN 1.0, and IS-41 protocols (wireline and wireless) supported
 - An integrated STP/NP database

SSR2.1, *continued*

- ◆ **Service Management System (SMS) Capability** — In the Advanced Intelligent Network, the SMS component interfaces to a Local SMS (LSMS) to perform validation and conversion of LSMS data into internal Service Manager Interface (SMI) format. For NP, the LSMS interfaces to the Number Plan Administration Center (NPAC) network for number administration. This SMS solution also:
 - Uses an industry-leading, commercially available solution: the latest Sun Microsystems Enterprise 4500 Server with Solaris 2.5.1 software
 - Supports 25 updates per second from NPAC to LSMS
 - Initially supports five service order updates per second from LSMS to NP database
 - Electronically bulk-downloads provisioning and recovery information
 - NANC 1.9 and 2.0 compliant
- ◆ **NPA-NXX Split Support.** As an enhancement to Universal NP Master's number portability solution, this feature defines an NPA (area code) split based on old and new NPAs, Activation Time for the new NPA, and Permitted Dialing Period for the old NPA.

SSR2.2

HARDWARE

The SSR2.2 release builds on the BroadBand STP SSR2.0 platform, featuring a dual-shelf (up to 104-signaling data links) configuration.

STANDARD SOFTWARE CAPABILITIES

This release builds on the BroadBand STP SSR2.0/SSR2.1 software releases, providing enhancements to BroadBand STP system maintenance features as well as value-added options (next).

OPTIONAL CAPABILITIES

SSR2.2 is scheduled to include the following optional features for the BroadBand STP:

- ◆ **Windows NT Support** — provides support for the Windows NT operating system for the OAM&P workstation.
- ◆ **Special Study NPA-NXX Enhancements** — provides enhanced Special Study operational measurements related to NPA-NXX criteria.
- ◆ **Preventive Cyclical Retransmission (PCR)** — provides error recover for SS7 signaling connections, such as satellite, with high propagation delays. PCR prevents long delays by continuously retransmitting a message until a positive acknowledgement is received from the destination point.
- ◆ **Multiple Point Code Expansion** — increases support for provisioning SS7 point codes from four to 16 per BroadBand STP.

Reference

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MINIMUM HARDWARE BASELINES

The following tables list the base-level hardware that must be in place to upgrade to listed PCLs. This information is for planning purposes and should not be used solely for provisioning.

Notes:

- Each release must meet the previous software release's hardware baseline.
- For Computing Module hardware, run the Flexible Advanced Capacity Engineering Tool (FACET) to determine specific office requirements.

LEC00012, LET00012, LLT00012

Subsystem	Minimum Hardware	Order Codes
Computing Module: Processor Option	<ul style="list-style-type: none"> • Minimum: Series 60 (96-megabyte memory) with NT9X12AD Port Card and NT9X26DC Remote Terminal Interface • Series 70 Extended Memory is required if the office has greater than 65,000 lines with medium amount of business services deployed <i>or</i> greater than 40,000 lines with high amount of business services. <p>LEC00012 offices with greater than 100,000 lines or 60,000 trunks are recommended to upgrade to XA-Core.</p>	NT9X10AA NT9X14EA NT9X12AD NT9X26DC NT9X10CA NT9X26FA
System Load Module (SLM)	SLM III required for all DMS SuperNode systems.	NT9X44AD
Extended Peripheral Modules (XPM)	This expanded processor (see page 44) required in: <ul style="list-style-type: none"> • ISDN Peripherals (LGCI, LTCL, and DTCL) • Host LGCs and LTCs supporting ISDN Line Drawer for Remotes (ILDR) in subtending remotes (including the new Star Remote Module) 	NTSX05AA
	Requires Enhanced ISDN Signaling Preprocessor (EISP) at one of these vintage levels	NTBX01AB NTBX01AC <i>or</i> NTBX01BA
Remote Switching Center-S (RSC-S)	Requires 16-Megabyte Processor	NTAX74AA
	Requires Enhanced ISDN Signaling Preprocessor (EISP) at one of these vintage levels	NTBX01AC <i>or</i> NTBX01BA

OPTIONAL FEATURE CONFIGURATIONS

The following table lists optional features and identifies the additional hardware required to support them. Over time, technical requirements may upgrade the following feature-specific hardware to become baseline.

Please note that actual hardware availability may be later than the software availability shown in the first column.

Release	Feature/service	Hardware required
Rel•12	Duplicate NXX dialing to DMS based remotes during ESA mode – BAS00012, page 206	Emergency Standalone (ESA) Processor pack, NTMX45AA
	32-megabyte Link Interface Unit for SS7 (LIU7) – standard software, pg 56	NTEX22CA Integrated Processor and Frame Bus Interface (IPF) circuit pack
	TCP/IP Call Processing Support – TEL00014, pg 65	Ethernet Interface Unit (EIU) hardware with NT9X84AA, NT9X85AA, NTEX22BB
	Distributed PRI – NI000039, pg 112	Digital Trunk Controller for ISDN (DTCI)
	NI-2 1+/0+ Dialing Enhancement <i>and</i> Calling Number Screening – NI000043, pg 113	Digital Trunk Controller for ISDN (DTCI) or Spectrum Peripheral Module (SPM)
	Talking Call Waiting – RES00091, pg 165 Auto. Recall w/Name – RES00089, pg 166	Offboard service node platform
	Centrex IP service CIP00001, pg 142	<ul style="list-style-type: none"> • Centrex IP Gateway circuit pack NT7X07AA • New Line and Trunk Controller for ISDN (LTCI): <ul style="list-style-type: none"> – NTSX05AA Processor – NT6X0240 Backplane • NTMX76 Messaging circuit pack
	<ul style="list-style-type: none"> • EADAS via TCP/IP • SuperNode Billing Application – SMDR 	SuperNode Data Manager (SDM) NTRX50FA

OPTIONAL FEATURE CONFIGURATIONS, *continued*

Release	Feature/service	Hardware required
Rel•12	E911 Wireless Data to External ALI Database – ENS00016, pg 189	Multi-Protocol Controller (MPC) card NT1X89
	NI-2 PRI on SPM – SPM00018, pg 197 ISP Basic Call – SPMS0015, pg 198	NTLX72AA Data Link Controller (DLC) pack in SPM
	Crossover Messaging – SPMS0001, pg 200	NTLX82AA
	ANSI ISUP features – AAC0001, pg 258	Link Interface Unit for SS7 (LIU7), Digital Trunk Controller for SS7 (DTC7)
	Auth Center features – ACTR0001, pg 260	NTEX22CA cards in the Link Peripheral Processor (LPP).
	DCC Page Continuation – DCCH0003, pg 263	TRUIII Digital Radio
	SMS Traffic Channel Delivery – NTWK0011, pg 264	X TDMA infrastructure (with IS-41C and SMSC) and more. See page 265 for detailed list.
	Abbreviated Dialing – PSRV0012, pg 269	DMS SuperNode Data Manager
	Enhanced Selector Card with EVRC – CDMA0001, pg 273	ESEL cards (NTGB06CA) New SCI cards (NTGB08AB)
	Open A-Interface, CDMA – CDMA0002, pg 274	LPP, A-Interface Control Element, BSAP LIU7 CDMA infrastructure
	Proximity CDMA – PROX0001, pg 277	IS-95B Line Access Unit for Line Reversal OEM payphone or metering box
Rel•12 (LEC00012 only)	XA-Core – NXAC0010, pg 63	DMS SuperNode (not available on DMS SuperNode SE) with Series 70 EM processor and Enhanced Network (ENET) switch fabric <i>Needed in Message Switch:</i> NT9X17AD, NT9X63AA/AB, NT9X13DG
Rel•13	10/15-Digit ROTL Enhancement – standard software, pg 51	Nortel Networks Digital Test Head (DTH) ROTL unit needs the NT7F26BA ROTL ROM circuit pack

Release	Feature/service	Hardware required
Rel•13	Who's Calling – RES00094, pg 172	Offboard service node platform
	SPM NI-1 PRI – SPMS0015, pg 199	NTLX72AA Data Link Controller (DLC) pack in SPM
	LEC Echo Cancellation – SPMS0001, pg 202	NTLX66BA, NTLX85AA, or NTLX66AA
	OC-3 Line Timing – SPMS0040, pg 204	NT9X53AD Digital Phase Lock-Loop Clock Card
	TOPS IP Operator Centralization – ENSV0026, pg 219	<ul style="list-style-type: none"> • Centrex IP Gateway circuit pack NT7X07 • New Line and Trunk Controller for ISDN (LTCD): <ul style="list-style-type: none"> – NTSX05DA Processor – NT6X0240 Backplane
	QMS MIS over IP – TOPS Base, pg 214	IP link terminates on a DMS XPM containing an Ethernet-equipped NTSX05DA card
Rel•14	XA-Core – NXAC0300, pg 64	Same as above, but upgrade to existing DMS Super-Node can have either a Series 60 or Series 70 EM Computing Module

HARDWARE EVOLUTION

To keep ahead of rapid technology drives moving forward in all parts of the network, hardware is continuously enhanced. New hardware offers the latest features and supports current functionality with new efficiencies and cost-saving capabilities.

Existing equipment in the field scheduled to be manufacture discontinued *still receive full Nortel Networks customer service support*. Product replacement is not required unless feature or baseline driven (shown in the previous tables). The following lists major equipment only (this listing is not exhaustive). For more details, including lists of circuit packs involved, refer to the following *Product/Service Information* bulletins:

- 50198.16/11-99 (for 3Q99)
- 50196.16/05-99 (for 1Q99)
- 50194.16/02-99 (for 4Q98)
- 50189.16/12-98 (for 3Q98)
- 50185.16/07-98 (for 2Q98)
- 50181.16/04-98 (for 4Q97)
- 50178.16/12-97 (for 3Q97)
- 50151.16/10-97 (for 2Q97)
- 50168.16/06-97 (for 1Q97)
- 50149.16/12-96 (for 3Q96)
- 50138.16/06-96 (for 1Q96)
- 50133.16/03-96 (for 4Q95)
- 50127.16/11-95 (for 3Q95)

The entries in this table are arranged by the Manufacture Discontinued (MD) date of the replaced hardware.

Replaced hardware	MD date	New hardware
NT1X61AG Input/Output Controller (IOC) shelf	1Q00	Input/Output Module NTFX30AA, NTFX31AA
Office Alarm Unit (OAU)		NT3X83BA
DMS Magnetic Tape Drive unit (MTU)		NTFX32CA Digital Audio Tape (DAT) module
NT3X68AA Tone Generator		NT1X80AA NT1X80BA
Miscellaneous alarm panels and circuit packs		See 50198.16/11-99 document
Frame Mounted Lighting (FML)		Center Aisle Lighting (CAL)
DMS 1-Meg Modem Release 3, and earlier, circuit packs	2Q00	Releases 4 and 5 circuit packs (see table on page 103)
Billing Media Converter (BMC) 3½" SCSI disk subsystems	4Q00	SuperNode Billing Application (SBA) on the SuperNode Data Manager (SDM)

FINAL COMPUTING MODULE SUPPORT

After products have been announced as MD, subsequent software releases continue to support them — up to an announced software release. The following table identifies the last Computing Module PCLs that will support the following products, along with recommended replacement products. All products have been previously announced as manufacture discontinued.

Product	Last CM Support	Replacement Product
Advanced Intelligent Network (AIN) 0.0 Software (Primer)	Rel•10	AIN Essentials (AIN 0.1) order codes
TOPS Automatic Call Distribution (ACD)	Rel•11	Queue Management System (QMS)

The following features of manufacture discontinued order code AIN00001:

- AIN Automatic Message Accounting (AMA)
- AIN Announcements
- AIN Overload Controls
 - moved to order code MDC00011 Private Virtual Networking.

SOFTWARE EVOLUTION

In response to customer requests and new software efficiencies, DMS SuperNode software is continuously enhanced. From time to time, to simplify ordering and to support the latest network capabilities, existing software features in some order codes are replaced by (or consolidated into) other order codes. The following table lists order codes that are scheduled to be manufacture discontinued in a future release — along with the order codes that replace them.

LEC00014, LET00014, LLT00014

Discontinued order codes		Replacement order codes	
NXAC0010	XA-Core Release 1	NXAC0300	XA-Core Release 2

NON-CM SOFTWARE BASELINE

Software loads that reside on equipment other than the Computing Module are referred to as “non-CM” loads (or “NCLs”). These loads may require certain levels of PCLs in the switch, as indicated in this table. The following non-CM products appear in alphabetical order within key functional categories. Applications associated with operator services (TOPS) are not included.

For a given Rel•xx release, the corresponding NCL needed to implement a product must not fall below the release level shown.

Product	Rel•9	Rel•10	Rel•11	Rel•12	Rel•13	Rel•14
<i>1-Meg Modem</i>						
Data-enhanced Bus Interface Card (DBIC)	XDSL0003 XDSL0001	XDSL0005 XDSL0004 XDSL0003 XDSL0001	XDSL0005 XDSL0004 XDSL0003 XDSL0001	XDSL0005 XDSL0004 XDSL0003 XDSL0001	XDSL0005 XDSL0004 XDSL0003 XDSL0001	XDSL0005 XDSL0004 XDSL0003 XDSL0001
xDSL Element Manager System (xEMS)	XEMS0001	XEMS0005 XEMS0004 XEMS0003 XEMS0001	XEMS0005 XEMS0004 XEMS0003 XEMS0001	XEMS0005 XEMS0004 XEMS0003 XEMS0001	XEMS0005 XEMS0004 XEMS0003 XEMS0001	XEMS0005 XEMS0004 XEMS0003 XEMS0001
<i>Operations, Administration, and Maintenance (OAM) Applications</i>						
DMS SuperNode Data Manager (SDM) <i>[releases needed for full new functionality]</i>	SDMN0009	SDMN0010	SDMN0011	SDMN0012	SDMN0013	SDMN0014
<i>Access, Remotes, and Loop Carrier Platforms</i>						
AccessNode Platform	AN18 AN17 AN16 AN15 AN14 AN12	AN18 AN17 AN16 AN15 AN14 AN12	AN18 AN17 AN16 AN15	AN18 AN17 AN16 AN15	AN18 AN17 AN16 AN15	AN19 AN18 AN17 AN16
Spectrum Peripheral Module (SPM)	N/A	SPM00031 SPM00033 SPM00035	SPM00031 SPM00033 SPM00035 SPM00039	SPM00033 SPM00035 SPM00039	SPM00035 SPM00039	SPM00039
<i>Customer Premises Equipment</i>						
Real Time-1000 (RT-1000)	RT0 V.32.5 V.32.4	RT0 V.32.5 V.32.4	RT1 RT0	RT1	RT2	RT2

The following non-CM products deploy software without regard to PCL level at the switch:

LOOP CARRIER EQUIPMENT

- ◆ Enhanced SCM-100 URBAN (ESMU)
- ◆ SCM-100 URBAN (SMU)

OTHER PRODUCTS

- ◆ Advanced Call Management Server (ACMS)
- ◆ Audiogram Delivery System (ADS)
- ◆ Billing Medium Converter (BMC)
- ◆ BroadBand STP
- ◆ Call Center Management Information System (CCMIS)
- ◆ Centrex IP (beginning in Rel•12)
- ◆ Digital Cross Connect Support System (DSS)
- ◆ Distributed Processing Peripheral (DPP)
- ◆ Dynamically Controlled Routing (DCR)
- ◆ Enhanced Digital Recorded Announcement Machine (EDRAM)
- ◆ Glenayre Modular Voice Processor (MVP)
- ◆ Magellan Digital Packet Network-100 (DPN-100)
- ◆ Meridian Mail General Purpose (MMGP)
- ◆ Meridian Services Module (MSM)
- ◆ Network Applications Vehicle Intelligent Peripheral/Media Resource Unit (IP/MRU)
- ◆ PowerView Services (PVS)
- ◆ Universal Signaling Point (USP)

CHANGES IN FEATURE INFORMATION

So you can be aware of the changes that have been made to DMS-100 Family software information since the previous *Feature Planning Guide*, the following table lists the major updates made to DMS Computing Module software since the previous edition of the *DMS-100 FPG*.

All page numbers in this table refer to the *Feature Planning Guide 1999 Update (Issue 20)* only.

Page, FPG Issue 20:	Type of change:	FPG Issue 20 showed:	Now, in Issue 21:
94	Feature availability changed	<i>Expanded LIU7 Support</i> (for 32-Meg External Router) was in Rel•11	Now available in Rel•12 PCLs
98		NTS00025 <i>Flexible ANI for Toll-Free Service</i> was planned to be in Rel•11	
136		SPMS0001 SPM Large System Support was planned to be in Rel•11	
153	Program rollout fine-tuned	XA-Core's first release was announced as having 3+1 processor configuration	2nd release will have this processor configuration. See page 62 for details.
157	Standard feature development deferred	<i>Table Capacity Report</i> appeared in Rel•12	Future development on this feature TBD
158	Standard feature redefined	<i>Star Remote System – 1-Meg Modem</i> deployable on Star Remote Hub and Modules	In Rel•12, support for 1-Meg Modem deployable on Star Remote Hub only
159	Orderable software now becomes standard	<i>Line Option Capacity Expansion</i> was planned to be available by order code	Feature now part of the standard base software; no order code involved
	Feature name changed	NPE00004 feature shown as <i>Enhanced Multiple NPA Support</i> in Rel•12	Now named <i>NPA Split/Overlay Support</i> , still in Rel•12
162	Order code changed	<i>Four-Digit CIC</i> shown as part of OAM00005	Now part of order code OAM00004
163		<i>BRI Display Text Support</i> had not been assigned an order code	Now part of order code AIN00261

Page, FPG Issue 20:	Type of change:	FPG Issue 20 showed:	Now, in Issue 21:
163	Order code assigned	<i>Monitor for Change for Hunt Group</i> had not been assigned an order code	Now part of order code AIN00262
		<i>Extended Ringing Support</i> had not been assigned an order code	Now part of order code AIN00263
164	Feature name changed	Rel•12 feature in CIP00001 shown as <i>Centrex IP Base</i>	Matches name of order code, <i>Centrex Voice over IP</i>
177	Feature development deferred	<i>Trunk Operational Measurements Enhancements</i> in LOC00012 was in Rel•12	Future development on this feature TBD
182	Feature availability changed	<i>Force Management CRT Elimination</i> in ADVQ0001 appeared in Rel•12	Features now planned to be available in Rel•13
185		<i>Black Box Fraud Prevention Over OC-3 PTS</i> feature in SPMS0001 was in Rel•12	
191		RES00099, <i>Call Redirect</i> , was in Rel•12	
209	Order code and feature availability changes	<i>EADAS via TCP/IP</i> was in Rel•12 with order code DCNM0001	Feature now planned for Rel•13 with order code NMDC0001

NEW FEATURES INTRODUCED IN THIS DOCUMENT

The following at-a-glance index arranges alphabetically all the new Computing Module features appearing for the first time in any *Feature Planning Guide*.

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
STANDARD BASE SOFTWARE			
Network Management Code Block	Standard	Rel•12	47
PANTHER Enhancements	Standard	Rel•12	49
Polling Automation	Standard	Rel•12	48
Virtual Facility Group Billing Enhancement	Standard	Rel•12	48
Maintenance Arbitrator on RSC-S and ESMA	Standard	Rel•13	51
ONP Enhancements	Standard	Rel•13	52
Prevent Delete Option	Standard	Rel•13	52
Increase UserIDs	Standard	Rel•13	52
10/15-Digit ROTL Enhancement	Standard	Rel•13	51
Automatic Line Insulation Test (ALIT) Enhancement	Standard	Rel•14	53
Call Forward Activation	Standard	Rel•14	54
Flexible Restore	Standard	Rel•14	53
HMI Enhancements for C7LKSET	Standard	Rel•14	54
STANDARD BASE (DMS-100 WIRELESS)			
ACCH Dynamic Page Size	Standard	Rel•12	254
Additional SERVORD Commands – ASG/DSG	Standard	Rel•12	257
AFT Volume Management	Standard	Rel•12	256
Answered Call Screening	Standard	Rel•12	254
BCH Control Message TRUIII	Standard	Rel•12	257
Digital Control Channel Datafill Simplification	Standard	Rel•12	253
Digital Control Channel Measurements	Standard	Rel•12	253
DMS-100 Wireless International Direct Distance Dialing	Standard	Rel•12	251
DMS-100 Wireless SDM Introduction	Standard	Rel•12	251
Enforce MSRs	Standard	Rel•12	253
Flexible Billing ID for Intersystem Handoff	Standard	Rel•12	255

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
Fraud Service Hotline	Standard	Rel•12	252
Handoff Trigger Enhancement	Standard	Rel•12	255
ICP Metro XA	Standard	Rel•12	251
ICRM Buffer Based Overload Controls	Standard	Rel•12	252
ICRM Loading Enhancements	Standard	Rel•12	252
ICRM Shelf and P-side Card PEC Support	Standard	Rel•12	252
Idle Channel Test Enhancement	Standard	Rel•12	257
Intelligent DUMPHLR	Standard	Rel•12	257
Intersystem Handoff Timing Enhancements	Standard	Rel•12	255
LCR Optimization	Standard	Rel•12	254
Load Compression TRUIII	Standard	Rel•12	256
Mobile Assisted Handoff (MAHO) Pre-screening, Phase 2	Standard	Rel•12	255
ORREQ/FEATREQ Query Enhancements	Standard	Rel•12	256
R1 ANI and Feature Group D Enhancement	Standard	Rel•12	253
TDMA Mute Reduction	Standard	Rel•12	256
Visitor Location Register (VLR) Delete Tool	Standard	Rel•12	254
VMS to DMS-100 Wireless HLR Message Waiting Count	Standard	Rel•12	257
WIN-Compliant Mobile Terminations	Standard	Rel•12	250
Wireless Intelligent Network (WIN)	Standard	Rel•12	250

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH AMA, EQA, ISP7, LOC, NBD, NPE, NTS, NXAC, OAM, SERV, AND TEL

ANI II 25 Screening	NTS00027	Rel•12	85
CNA Software Enhancement	NPE00001	Rel•12	69
Tandem AMA Control	EQA00030	Rel•12	75
TCP/IP Call Processing Support	TEL00014	Rel•12	65
XA-Core Release 1	NXAC0010	Rel•12 (LEC)	63
1000-Block Number Pooling	NPE00005	Rel•13	70
800+ Southbound CLID Delivery Enhancements	NTS00024	Rel•13	86
Alternate Outgoing Trunk Group Selection	LOC00033	Rel•13	76
QDNSU Command Support	NPE00001	Rel•13	69
SS7 Operator Services Network Capabilities (OSNC)	ISP70006	Rel•13	82

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
SS7 Transport over ATM	TEL00013	Rel•13	66
VFG MDR Suppression	AMA00006	Rel•13	88
EADAS Maintenance Busy Usage	OAM00010	Rel•14	81
Enhanced Table Compression Tool	LOC00025	Rel•14	73
Flexible ISUP CAUSEMAP	ISP70008	Rel•14	83
Punch-list Capabilities	NBD00003	Rel•14	79
Redundant Feature Enhancements	SERV0003	Rel•14	87
XA-Core Release 2	NXAC0300	Rel•14	64
ADVANCED INTELLIGENT NETWORK (AIN)			
BRI Display Text Support	AIN00261	Rel•12	118
Create Call Phase 1	AIN00271	Rel•13	121
Interworking with Dynamically Controlled Routing	AIN00060	Rel•13	123
Originating Call Model Nested Transactions	AIN00272	Rel•13	122
Service Enablers Base Release 7	AIN00270	Rel•13	121
Carrier Usage Parameter	AIN00282	Rel•14	124
Service Enablers Base Release 8	AIN00280	Rel•14	123
Terminal Resource Availability	AIN00281	Rel•14	124
CENTREX AUTOMATIC CALL DISTRIBUTION (ACD)			
Increase Secondary DNs	ACD00081	Rel•14	162
Not Ready on Secondary Directory Number Enhancement	ACD00082	Rel•14	162
DIGITAL SUBSCRIBER LINE			
Universal Edge 9000 Base Provisioning	UEDG0001	Rel•12	98
EMERGENCY NUMBER SERVICES (E911)			
E911 ISUP Enhancements	ENS00005	Rel•13	191
Off-Board Selective Routing Interface	ENS00017	Rel•14	192
INTELLIGENT CALL MANAGEMENT (ICM)			
Called Party DN in ICM Messages	ICM00003	Rel•13	159
Increased ACD DN Association Limit	ICM00002	Rel•13	160
ICM Support for BRI	ICM00075	Rel•14	161
Increase ICM Sessions	ICM00001	Rel•14	160

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
ISDN BASIC RATE INTERFACE			
On Demand B-Channel Packet	NI000052	Rel•14	107
Uniform Display Text	NI000052	Rel•14	108
ISDN PRIMARY RATE INTERFACE			
Calling Number Screening	NI000043	Rel•12	113
Distributed PRI	NI000039	Rel•12	112
NI-2 1+/0+ Dialing Enhancement	NI000043	Rel•12	113
Call Forward Interface Busy NI-1	NI000049	Rel•13	115
LONG DISTANCE FEATURES (DMS-500 SYSTEM)			
Suspend Resume Message Handling Passed to DMS-300	UCSB0001	Rel•12	183
CDR Management for Rel•13	UCSB0001	Rel•13	184
CLID Delivery Enhancements	UCSB0001	Rel•13	184
Find File Tool — FINDIT	UCSB0001	Rel•13	184
Information Digit Reversal	UCSB0001	Rel•13	184
LNP RX Selector	CAIN0700	Rel•13	182
LNP Sub-System Number (SSN)	CAIN0700	Rel•13	181
Long Call Audit Enhancements	UBFR0006	Rel•13	186
NETSEC Screening Expansion	UTRS0003	Rel•13	186
NetworkBuilder Routing Log	CAIN0100	Rel•13	185
NetworkBuilder Short Duration Tone Detection on Takeback and Transfer	CAIN0802	Rel•13	186
NOJIP Option	CAIN0700	Rel•13	181
Table TANDMRTE T Selector Addition	CAIN0100	Rel•13	185
NORTEL NETWORKS CENTREX			
Call Transfer Fraud Prevention – Centrex	MDC00069	Rel•13	130
Hunt Line Overflow to DN Expand	MDC00067	Rel•13	129
OPERATOR SERVICES (TOPS)			
Billing Enhancements for EA Calls to Served Carriers	Standard	Rel•13	215
MIS over IP	Standard	Rel•13	214
Operator Services Networking Capability	OSEA0013	Rel•13	224
OSSAIN 13 Enhancement	OSAN0007	Rel•13	217

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
Screening for Billing Agreement	UNBN0007	Rel•13	221
TOPS IP Operator Centralization	ENSV0026	Rel•13	219
Directory Assistance Voice over IP	OSDA0009	Rel•14	222
End of Life Activities in TOPS14	Standard	Rel•14	215
TOPS and Succession Solutions Interworking	Standard	Rel•14	215
RESIDENTIAL ENHANCED SERVICES (RES)			
Simultaneous Ring and MADN Compatibility	RES00081	Rel•12	167
Call Transfer Fraud Prevention – RES	RES00095	Rel•13	170
CSMI Message Enhancement	RES00047	Rel•13	169
Generic Name Parameter	RES00096	Rel•13	171
Who's Calling	RES00094	Rel•13	172
SPECTRUM PERIPHERAL MODULE (SPM)			
Crossover Messaging	SPMS0001	Rel•12	200
ISP Basic Call	SPMS0015	Rel•12	198
ATR Dialing Plan Enhancements to Support ECRM/RN Selection	SPMS0002	Rel•13	205
Internal Routing	SPMS0001	Rel•13	203
LEC Echo Cancellation	SPMS0001	Rel•13	203
SPM ECAN Call Control	SPMS0002	Rel•13	205
SPM NI-1 PRI Functionality	SPMS0015	Rel•13	199
DS-1 Assignment Control	SPMS0001	Rel•14	204
WIRELESS FEATURES (DMS-100 WIRELESS SYSTEM)			
Abbreviated Dialing	PSRV0012	Rel•12	269
ACTR Authentication Center Phase II	ACTR0001	Rel•12	260
ANSI ISUP	AACC0001	Rel•12	258
ANSI-41 Per-Call Feature Activation/Deactivation Compliance	PSRV0006	Rel•12	268
Authentication on Termination	ACTR0001	Rel•12	260
AWS Authentication CDR Enhancement	ACTR0001	Rel•12	260
AWS Networking Mobile Switching Center (MSC)	ANET0003	Rel•12	259
Call Forward Default / Rollover	ASVS0002	Rel•12	261
CDMA OM Upload Optimization	CDMA0003	Rel•12	276

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
Digital Control Channel IS-136 PSID/RSID Tiered Billing	DCCH0002	Rel•12	263
Digital Control Channel Page Continuation	DCCH0003	Rel•12	263
Distinctive Ringing	PSRV0006	Rel•12	268
DMS-100 Wireless ISUP GR-394	AACC0001	Rel•12	258
Durable Cancel Call Waiting	PSRV0006	Rel•12	267
E911/W911 SOC	PSRV0007	Rel•12	269
EFRC Noise Conditioning	TDMA0001	Rel•12	271
EFRC Noise Reduction	TDMA0002	Rel•12	271
Enhanced Selector Card with EVRC	CDMA0001	Rel•12	273
Flexible ANI and CLID	PSRV0013	Rel•12	270
Flexible IS-41 OI	NTWK0009	Rel•12	264
Flexible ISUP IAM — Phase I	AACC0001	Rel•12	258
Incoming Call Screening	PSRV0006	Rel•12	267
Integrated Wireless Centrex	LWW00066	Rel•12	258
IS-136 TDMA DTC/DCCH SMS Origination	NTWK0011	Rel•12	264
IS-41C CDMA Hard Handoff	CDMA0001	Rel•12	274
IS-41C DMH Redirect	PSRV0006	Rel•12	268
Multi-Mode Hard Handoff	CDMA0003	Rel•12	275
Open A-Interface for CDMA	CDMA0002	Rel•12	274
Privacy and Unknown Display for CNIP	PSRV0013	Rel•12	270
Proximity CDMA	PROX0001	Rel•12	277
RMU Introduction	CDMA0003	Rel•12	276
Service Code Dialing	ASVS0003	Rel•12	262
SMS Traffic Channel Delivery	NTWK0011	Rel•12	265
TDMA HLR OTAF Gateway Phase II	NTWK0011	Rel•12	265
Text Message to Mobiles	PSRV0013	Rel•12	271
Tiered Billing for CDMA	CDMA0004	Rel•12	277
Variable Length DN	NTWK0011	Rel•12	266
Voice Mail Deposit and Retrieval	ASVS0002	Rel•12	261
WIN Global Title Translations	WIN00011	Rel•12	272
WIN Standards Compliance Phase I	WIN00010	Rel•12	272

GA FEATURES: REL.12

The following index arranges by order code all the new Computing Module features that are generally available for the first time in LEC00012, LET00012, LLT00012, and LWW00006.

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
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STANDARD BASE SOFTWARE

Standard	Directory Number Inventory Expansion	46
Standard	ESA Processor Support	48
Standard	Expanded LIU7 Support	47
Standard	Image Dump Enhancements	49
Standard	Line Option Capacity Expansion	46
Standard	Multi-LPP External Routing	47
Standard	Network Management Code Block	47
Standard	PANTHER Enhancements	49
Standard	Polling Automation	48
Standard	Star Remote System – 1-Meg Modem Support	47
Standard	Virtual Facility Group Billing Enhancement	48

STANDARD BASE (DMS-100 WIRELESS)

Standard	ACCH Dynamic Page Size	254
Standard	Additional SERVORD Commands – ASG/DSG	257
Standard	AFT Volume Management	256
Standard	Answered Call Screening	254
Standard	BCH Control Message TRUIII	257
Standard	Digital Control Channel Datafill Simplification	253
Standard	Digital Control Channel Measurements	253
Standard	DMS-100 Wireless IDDD	251
Standard	DMS-100 Wireless SDM Introduction	251
Standard	Enforce MSRs	253
Standard	Flexible Billing ID for Intersystem Handoff	255
Standard	Fraud Service Hotline	252

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
Standard	Handoff Trigger Enhancement	255
Standard	ICP Metro XA	251
Standard	ICRM Buffer Based Overload Controls	252
Standard	ICRM Loading Enhancements	252
Standard	ICRM Shelf and P-side Card PEC Support	252
Standard	Idle Channel Test Enhancement	257
Standard	Intelligent DUMPHLR	257
Standard	Intersystem Handoff Timing Enhancements	255
Standard	LCR Optimization	254
Standard	Load Compression TRUIII	256
Standard	MAHO Pre-screening, Phase 2	255
Standard	MS to HLR Message Waiting Count	257
Standard	ORREQ/FEATREQ Query Enhancements	256
Standard	R1 ANI and Feature Group D Enhancement	253
Standard	TDMA Mute Reduction	256
Standard	Visitor Location Register (VLR) Delete Tool	254
Standard	WIN-Compliant Mobile Terminations	250
Standard	Wireless Intelligent Network (WIN)	250

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH EQA, LOC, NBD, NPE, NTS, NXAC, OAM, TEL, AND UDD

EQA00030	Tandem AMA Control	75
LOC00025	Line Attribute Table Restructure Rel•12	72
LOC00025	SNPA/STS Decoupling	72
LOC00032	Telecom Reform Act AMA Enhancement	71
NBD00003	Packet Data Interception	78
NPE00001	CNA Software Enhancement	69
NPE00004	NPA Split/Overlay Support	68
NTS00025	Flexible ANI for Toll-Free Service	84
NTS00026	TFS Payphone with POTS Conversion	85
NTS00027	ANI II 25 Screening	85
NXAC0010	XA-Core Release 1 (LEC00012 only)	63

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
OAM00004	Four-Digit CIC	80
OAM00004	TCP/IP Interface to EADAS	80
TEL00004	Routeset Expansion to 2047 with Table C7NETSSN	66
TEL00014	TCP/IP Call Processing Support	65
UDD00002	Flexible ANI Tandem Screen	74
ADVANCED INTELLIGENT NETWORK (AIN)		
AIN00260	Service Enablers Base Release 6	118
AIN00261	BRI Display Text Support	118
AIN00262	Monitor for Change for Hunt Group	119
AIN00263	Extended Ringing Support	120
CENTREX IP		
CIP00001	Centrex Voice over IP	142
DIGITAL SUBSCRIBER LINE		
UEDG0001	Universal Edge 9000 Base Provisioning	98
EMERGENCY NUMBER SERVICES (E911)		
ENS00011	E911 Parameter Expansion	190
ENS00016	Wireless Data to External ALI Database	189
INTELLIGENT CALL MANAGEMENT (ICM)		
ICM00050	3-Way Conference Status Report	158
ICM00050	TAPI Extensions	158
ISDN BASIC RATE INTERFACE		
NI000052	Call Forwarding Service Uniformity for NI-2	105
NI000052	Calling Number Service Uniformity for NI-2	105
NI000052	EKTS Service Uniformity for NI-2	106
NI000052	Layer 3 Service Disruption	106
NI000052	Privacy Redirecting Number	105
NI000052	SS7 Procedures for ISDN Call Forward	106
NI000052	User Loop Testing (X.25 Echo Station)	107

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
ISDN PRIMARY RATE INTERFACE		
NI000038	E911 Screening	114
NI000039	Distributed PRI	112
NI000043	Calling Number Screening	113
NI000043	NI-2 1+/0+ Dialing Enhancement	113
LONG DISTANCE FEATURES (DMS-500 SYSTEM)		
CAIN0700	LNP Intra-IMT RX Selector	181
NXXR0003	UCS DMS-500 DNIS Trunk Option	182
UCSB0001	Calling Card GTT	183
UCSB0001	CDR Management for Rel•12	184
UCSB0001	Enhanced Reorigination with STR Card	183
UCSB0001	Short-Digit Duration Reorigination on the SPM	183
UCSB0001	Suspend Resume Message Handling to DMS-300	183
UTRS0001	TR-533 CIC Routing	182
NORTEL NETWORKS CENTREX		
MDC00066	MADN TCAP Name	129
OPERATOR SERVICES (TOPS)		
Standard	MD Code Removal and Re-Engineering	214
Standard	On/Off Switch for TOPS	213
Standard	Table LATANAME Expansion	213
ADVQ0006	QMS Customer Service Enhancement	223
ENSV0025	Seconds-Based Announcements	218
OSAN0007	OSSAIN 12 Enhancements	216
UNBN0001	Unbundling OPRTRANS	220
UNBN0006	Call Restrictions for Wholesaling	220
REMOTES		
BAS00012	RLCM ESA Processor Upgrade	206
BAS00078	Duplicate NXX for DMS Remotes in ESA	207
ISDN0003	ILDR Multipoint EOC Support	208
SMA00012	Integrated Channel Bank Line Capacity Increase	209

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
RESIDENTIAL ENHANCED SERVICES (RES)		
RES00081	Simultaneous Ring and MADN Compatibility	167
RES00089	Automatic Recall with Name	166
RES00091	Talking Call Waiting	165
SPECTRUM PERIPHERAL MODULE (SPM)		
SPM00018	NI-2 PRI on SPM	197
SPMS0001	Crossover Messaging	200
SPMS0001	Large System Support	200
SPMS0001	PANTHER Support for the SPM	201
SPMS0001	Patching on the SPM	201
SPMS0015	ISP Basic Call	198
WIRELESS FEATURES (DMS-100 WIRELESS SYSTEM)		
AACC0001	ANSI ISUP	258
AACC0001	DMS-100 Wireless ISUP GR-394	258
AACC0001	Flexible ISUP IAM — Phase I	258
ACTR0001	ACTR Authentication Center Phase II	260
ACTR0001	Authentication on Termination	260
ACTR0001	AWS Authentication CDR Enhancement	260
ANET0003	AWS Networking Mobile Switching Center (MSC)	259
ASVS0002	Call Forward Default / Rollover	261
ASVS0002	Voice Mail Deposit and Retrieval	261
ASVS0003	Service Code Dialing	262
CDMA0001	Enhanced Selector Card with EVRC	273
CDMA0001	IS-41C CDMA Hard Handoff	274
CDMA0002	Open A-Interface for CDMA	274
CDMA0003	CDMA OM Upload Optimization	276
CDMA0003	Multi-Mode Hard Handoff	275
CDMA0003	RMU Introduction	276
CDMA0004	Tiered Billing for CDMA	277

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
DCCH0002	Digital Control Channel IS-136 PSID/RSID Tiered Billing	263
DCCH0003	Digital Control Channel Page Continuation	263
LWW00066	Integrated Wireless Centrex	258
NTWK0009	Flexible IS-41 OI	264
NTWK0011	IS-136 TDMA DTC/DCCH SMS Origination	264
NTWK0011	SMS Traffic Channel Delivery	265
NTWK0011	TDMA HLR OTAF Gateway Phase II	265
NTWK0011	Variable Length DN	266
PROX0001	Proximity CDMA	277
PSRV0006	ANSI-41 Per-Call Feature Activation/Deactivation Compliance	268
PSRV0006	Distinctive Ringing	268
PSRV0006	Durable Cancel Call Waiting	267
PSRV0006	Incoming Call Screening	267
PSRV0006	IS-41C DMH Redirect	268
PSRV0007	E911/W911 SOC	269
PSRV0012	Abbreviated Dialing	269
PSRV0013	Flexible ANI and CLID	270
PSRV0013	Privacy and Unknown Display for CNIP	270
PSRV0013	Text Message to Mobiles	271
TDMA0001	EFRC Noise Conditioning	271
TDMA0002	EFRC Noise Reduction	271
WIN00010	WIN Standards Compliance Phase I	272
WIN00011	WIN Global Title Translations	272

GA FEATURES: REL.13

The following index arranges by order code all the new Computing Module features that are generally available for the first time in LEC00013, LET00013, LLT00013, and LWW00007.

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
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STANDARD BASE SOFTWARE

Standard	10/15-Digit ROTL Enhancement	51
Standard	Image Dump Enhancement: XA-Core	50
Standard	Increase UserIDs	52
Standard	Maintenance Arbitrator on RSC-S and ESMA	51
Standard	ONP Enhancements	52
Standard	Prevent Delete Option	52

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH AMA, ISP7, LOC, NPE, NTS, AND TEL

AMA00006	VFG MDR Suppression	88
ISP70006	SS7 Operator Services Network Capabilities (OSNC)	82
LOC00033	Alternate Outgoing Trunk Group Selection	76
NPE00001	QDNSU Command Support	69
NPE00005	1000-Block Number Pooling	70
NTS00024	800+ Southbound CLID Delivery Enhancements	86
TEL00013	SS7 Transport Over ATM	66

ADVANCED INTELLIGENT NETWORK (AIN)

AIN00060	Interworking with Dynamically Controlled Routing	123
AIN00270	Service Enablers Base Release 7	121
AIN00271	Create Call Phase 1	121
AIN00272	Originating Call Model Nested Transactions	122

EMERGENCY NUMBER SERVICES (E911)

ENS00005	E911 ISUP Enhancements	191
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<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
INTELLIGENT CALL MANAGEMENT (ICM)		
ICM00003	Called Party DN in ICM Messages	159
ICM00002	Increased ACD DN Association Limit	160
ISDN PRIMARY RATE INTERFACE		
NI000047	Call Forward Interface Busy NI-2	114
NI000049	Call Forward Interface Busy NI-1	115
LONG DISTANCE FEATURES (DMS-500 SYSTEM)		
CAIN0100	NetworkBuilder Routing Log	185
CAIN0100	Table TANDMRTE T Selector Addition	185
CAIN0700	LNP RX Selector	182
CAIN0700	LNP Sub-System Number (SSN)	181
CAIN0700	NOJIP Option	181
CAIN0802	NetworkBuilder Short Duration Tone Detection on Takeback and Transfer	186
UBFR0006	Long Call Audit Enhancements	186
UCSB0001	CDR Management for Rel•13	184
UCSB0001	CLID Delivery Enhancements	184
UCSB0001	Find File Tool — FINDIT	184
UCSB0001	Information Digit Reversal	184
UTRS0003	NETSEC Screening Expansion	186
NORTEL NETWORKS CENTREX		
MDC00067	Hunt Line Overflow to DN Expand	129
MDC00069	Call Transfer Fraud Prevention – Centrex	130
OPERATOR SERVICES (TOPS)		
Standard	Billing Enhncmnts for EA Calls to Served Carriers	215
Standard	MIS over IP	214
ADVQ0001	Force Management CRT Elimination	223
ENSV0026	TOPS IP Operator Centralization	219
OSAN0007	OSSAIN 13 Enhancement	217
OSEA0013	Operator Services Networking Capability	224
UNBN0007	Screening for Billing Agreement	221

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
RESIDENTIAL ENHANCED SERVICES (RES)		
RES00047	CSMI Message Enhancement	169
RES00094	Who's Calling	172
RES00095	Call Transfer Fraud Prevention – RES	170
RES00096	Generic Name Parameter	171
RES00099	Call Redirect	168
SPECTRUM PERIPHERAL MODULE (SPM)		
SPMS0001	Black Box Fraud Prevention Over OC-3 PTS	202
SPMS0001	Internal Routing	203
SPMS0001	LEC Echo Cancellation	203
SPMS0002	ATR Dialing Plan Enhancements to Support ECRM/RN Selection	205
SPMS0002	SPM ECAN Call Control	205
SPMS0015	SPM NI-1 PRI Functionality	199
SPMS0040	OC-3 Line Timing	204

GA FEATURES: REL.14

The following index arranges by order code all the new Computing Module features that are generally available for the first time in LEC00014, LET00014, and LLT00014.

<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
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STANDARD BASE SOFTWARE

Standard	Automatic Line Insulation Test (ALIT) Enhncmnt	53
Standard	Call Forward Activation	54
Standard	Flexible Restore	53
Standard	HMI Enhancements for C7LKSET	54

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH ISP7, LOC, NBD, NXAC, OAM, AND SERV

ISP70008	Flexible ISUP CAUSEMAP	83
LOC00025	Enhanced Table Compression Tool	73
NBD00003	Punch-list Capabilities	79
NXAC0300	XA-Core Release 2	64
OAM00010	EADAS Maintenance Busy Usage	81
SERV0003	Redundant Feature Enhancements	87

ADVANCED INTELLIGENT NETWORK (AIN)

AIN00280	Service Enablers Base Release 8	123
AIN00281	Terminal Resource Availability	124
AIN00282	Carrier Usage Parameter	124

CENTREX AUTOMATIC CALL DISTRIBUTION (ACD)

ACD00081	Increase Secondary DN's	162
ACD00082	Not Ready on Secondary DN Enhancement	162

EMERGENCY NUMBER SERVICES (E911)

ENS00017	Off-Board Selective Routing Interface	192
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<i>Order code</i>	<i>Feature name</i>	<i>Starting page</i>
INTELLIGENT CALL MANAGEMENT (ICM)		
ICM00001	Increase ICM Sessions	160
ICM00075	ICM Support for BRI	161
ISDN BASIC RATE INTERFACE		
NI000052	On Demand B-Channel Packet	107
NI000052	Uniform Display Text	108
OPERATOR SERVICES (TOPS)		
Standard	End of Life Activities in TOPS14	215
Standard	TOPS and Succession Solutions Interworking	215
OSDA0009	Directory Assistance Voice over IP	222
SPECTRUM PERIPHERAL MODULE (SPM)		
SPMS0001	DS-1 Assignment Control	204

GA FEATURES: DMS-STP RELEASES

The following index alphabetically arranges all the new Computing Module features that are currently scheduled to be available in product releases STP005 and STP006.

<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
STANDARD BASE SOFTWARE			
ITU (14 Bit) OMAP MRVT	Standard	STP005	282
Linkset Expansion to 432	Standard	STP005	282
Low-Speed Link/High-Speed Link Mix Support on ELPP	Standard	STP005	283
ITU SLS Load Balancing Enhancements	Standard	STP006	283
Linkset Expansion to 511	Standard	STP006	283
OPTIONAL SOFTWARE			
HSL SS7 Transport over ATM	STPE0006	STP005	284
Increase HSL support from 24 to 36	STPE0006	STP005	284
Multiple Point Code Support	TEL00012	STP005	285
Network Indicator Interworking	TEL00015	STP005	286
NP Co-Processor Introduction	BSTP0210	STP005	284
Routeset Expansion to 4000	STPE0004	STP005	286
Multiple Point Code Support Enhancements	TEL00012	STP006	285
SS7 Usage Measurement Enhancements	STPE0007	STP006	286

GA FEATURES: NON-COMPUTING MODULE SOFTWARE

This page lists the new software that does not reside in the Computing Module [the features in NCLs (Non-Computing Module Loads)].

<i>Feature name</i>	<i>Order code</i>	<i>NCL name</i>	<i>Starting page</i>
1-MEG MODEM			
XEMS Release 4	XEMS0100	XEMS0004	102
XEMS Release 5	XEMS0100	XEMS0005	102
CENTREX IP			
Gatekeeper software (available on CD-ROM)			144
UNIVERSAL EDGE 9000 MANAGEMENT			
Preside Universal Edge 9000 Manager	UEMS0100	UEMS0001	99
OAM&P APPLICATIONS			
Direct Spooling of CM Image	PLAT0005	SDMN0012	232
Event Record Manager	EVNT0002	SDMN0012	236
Multi-Destination per Billing Stream	SBM00001	SDMN0012	234
SuperNode Billing Application – SMDR Delivery	SBM00006	SDMN0012	235
512 MB/350 MHz Central Processing Unit	PLAT0005	SDMN0013	232
9 Gigabyte Disk Drive	PLAT0005	SDMN0013	233
EADAS via TCP/IP	NMDC0001	SDMN0013	237
Network User Administration	PLAT0005	SDMN0014	233

INDEX BY TECHNICAL REFERENCE

So the network provider can request more information about a particular feature from a Nortel Networks representative, many software descriptions include a development code next to *Technical reference*, listed below.

<i>Technical Reference</i>	<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
STANDARD BASE SOFTWARE				
59005926	Directory Number Inventory Expansion	Standard	Rel•12	46
59007297	Network Management Code Block	Standard	Rel•12	47
59007562	Image Dump Enhancements	Standard	Rel•12	49
59007577	Polling Automation	Standard	Rel•12	48
59007815	Line Option Capacity Expansion	Standard	Rel•12	46
59009996	Multi-LPP External Routing	Standard	Rel•12	47
59010005	10/15-Digit ROTL Enhancement	Standard	Rel•13	51
59012079	PANTHER Enhancements	Standard	Rel•12	49
59012624	ONP Enhancements	Standard	Rel•13	52
59013356	Increase UserIDs	Standard	Rel•13	52
59013430	Prevent Delete Option	Standard	Rel•13	52
59014706	Image Dump Enhancement: XA-Core	Standard	Rel•13	50
59017416	Call Forward Activation	Standard	Rel•14	54
STANDARD BASE (DMS-100 WIRELESS)				
60000148	WIN-Compliant Mobile Terminations	Standard	Rel•12	250
60000154	ACCH Dynamic Page Size	Standard	Rel•12	254
60000174	ICP Metro XA	Standard	Rel•12	251
60000175	ICP Metro XA	Standard	Rel•12	251
60000181	ORREQ/FEATREQ Query Enhancements	Standard	Rel•12	256
60000182	ORREQ/FEATREQ Query Enhancements	Standard	Rel•12	256
60000187	R1 ANI and Feature Group D Enhancement	Standard	Rel•12	253
60000199	Intelligent DUMPHLR	Standard	Rel•12	257
60000258	DMS-100 Wireless IDDD	Standard	Rel•12	251
60000285	ICRM Loading Enhancements	Standard	Rel•12	252

<i>Technical Reference</i>	<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
60000310	BCH Control Message TRUIII	Standard	Rel•12	257
60000311	BCH Control Message TRUIII	Standard	Rel•12	257
60000318	AFT Volume Management	Standard	Rel•12	256
60000319	Answered Call Screening	Standard	Rel•12	254
60000321	DMS-100 Wireless SDM Introduction	Standard	Rel•12	251
60000336	TDMA Mute Reduction	Standard	Rel•12	256
60000337	TDMA Mute Reduction	Standard	Rel•12	256
60000338	LCR Optimization	Standard	Rel•12	254
60000339	Handoff Trigger Enhancement	Standard	Rel•12	255
60000340	Intersystem Handoff Timing Enhancements	Standard	Rel•12	255
60000381	Flexible Billing ID for Intersystem Handoff	Standard	Rel•12	255
60000386	Fraud Service Hotline	Standard	Rel•12	252
60000504	Mobile Assisted Handoff Pre-screening, Phase 2	Standard	Rel•12	255
60000571	Enforce MSRs	Standard	Rel•12	253
60000694	Digital Control Channel Measurements	Standard	Rel•12	253
60005906	Digital Control Channel Measurements	Standard	Rel•12	253
60006024	ICRM Shelf and P-side Card PEC Support	Standard	Rel•12	252
60006203	ICRM Buffer Based Overload Controls	Standard	Rel•12	252
60062323	Visitor Location Register (VLR) Delete Tool	Standard	Rel•12	254
60068225	Digital Control Channel Datafill Simplification	Standard	Rel•12	253

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH:

AMA, EQA, ISP7, ISUP, LOC, NBD, NPE, NTS, NXAC, OAM, TEL, AND UDD

59006171	TFS Payphone with POTS Conversion	NTS00026	Rel•12	85
59006616	Telecom Reform Act AMA Enhancement	LOC00032	Rel•12	71
59006893	NPA Split/Overlay Support	NPE00004	Rel•12	68
59007034	Flexible ANI Tandem Screen	UDD00002	Rel•12	74
59007038	SNPA/STS Decoupling	LOC00025	Rel•12	72
59007043	Line Attribute Table Restructure Rel•12	LOC00025	Rel•12	72
59007050	Line Attribute Table Restructure Rel•12	LOC00025	Rel•12	72
59007186	NPA Split/Overlay Support	NPE00004	Rel•12	68

<i>Technical Reference</i>	<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
59007190	NPA Split/Overlay Support	NPE00004	Rel•12	68
59007321	1000-Block Number Pooling	NPE00005	Rel•13	70
59007680	Four-Digit CIC	OAM00004	Rel•12	80
59008538	Tandem AMA Control	EQA00030	Rel•12	75
59009743	Routeset Expansion to 2047 with Table C7NETSSN	TEL00004	Rel•12	66
59010458	TCP/IP Call Processing Support	TEL00014	Rel•12	65
59011294	SS7 Operator Services Network Capabilities (OSNC)	ISP70006	Rel•13	82
59012182	1000-Block Number Pooling	NPE00005	Rel•13	70
59012192	1000-Block Number Pooling	NPE00005	Rel•13	70
59012468	1000-Block Number Pooling	NPE00005	Rel•13	70
59012574	1000-Block Number Pooling	NPE00005	Rel•13	70
59013383	Alternate Outgoing Trunk Group Selection	LOC00033	Rel•13	76
59013421	VFG MDR Suppression	AMA00006	Rel•13	88
59013762	1000-Block Number Pooling	NPE00005	Rel•13	70
59014614	SS7 Transport Over ATM	TEL00013	Rel•13	66
59015296	Flexible ISUP CAUSEMAP	ISP70008	Rel•14	83
59016574	EADAS Maintenance Busy Usage	OAM00010	Rel•14	81
59017494	Redundant Feature Enhancements	SERV0003	Rel•14	87
59017776	Enhanced Table Compression Tool	LOC00025	Rel•14	73

ADVANCED INTELLIGENT NETWORK (AIN)

10202203	Service Enablers Base Release 6	AIN00260	Rel•12	118
10206792	BRI Display Text Support	AIN00261	Rel•12	118
10206878	Service Enablers Base Release 6	AIN00260	Rel•12	118
10214224	Service Enablers Base Release 6	AIN00260	Rel•12	118
59006039	Service Enablers Base Release 6	AIN00260	Rel•12	118
59006290	Monitor for Change for Hunt Group	AIN00262	Rel•12	119
59006320	Extended Ringing Support	AIN00263	Rel•12	120
59006414	BRI Display Text Support	AIN00261	Rel•12	118
59011907	Create Call Phase 1	AIN00271	Rel•13	121
59013169	Interworking with Dynamically Controlled Routing	AIN00060	Rel•13	123
59013226	Originating Call Model Nested Transactions	AIN00272	Rel•13	122
59013251	Service Enablers Base Release 7	AIN00270	Rel•13	121

<i>Technical Reference</i>	<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
59016005	Terminal Resource Availability	AIN00281	Rel•14	124
59016134	Carrier Usage Parameter	AIN00282	Rel•14	124
CENTREX IP				
59006459	Centrex Voice over IP	CIP00001	Rel•12	142
59006469	Centrex Voice over IP	CIP00001	Rel•12	142
59008193	Centrex Voice over IP	CIP00001	Rel•12	142
EMERGENCY NUMBER SERVICES (E911)				
59006350	Wireless Data to External ALI Database	ENS00016	Rel•12	189
59006358	E911 Parameter Expansion	ENS00011	Rel•12	190
59006371	E911 ISUP Enhancements	ENS00005	Rel•13	191
59016808	Off-Board Selective Routing Interface	ENS00017	Rel•14	192
INTELLIGENT CALL MANAGEMENT (ICM)				
59006736	3-Way Conference Status Report	ICM00050	Rel•12	158
59006746	TAPI Extensions	ICM00050	Rel•12	158
59011948	Called Party DN in ICM Messages	ICM00003	Rel•13	159
59011953	Increased ACD DN Association Limit	ICM00002	Rel•13	160
59016379	ICM Support for BRI	ICM00075	Rel•14	161
59016386	Increase ICM Sessions	ICM00001	Rel•14	160
ISDN BASIC RATE INTERFACE				
59005908	Calling Number Service Uniformity for NI-2	NI000052	Rel•12	105
59005918	Privacy Redirecting Number	NI000052	Rel•12	105
59005931	EKTS Service Uniformity for NI-2	NI000052	Rel•12	106
59005942	Call Forwarding Service Uniformity for NI-2	NI000052	Rel•12	105
59005970	Uniform Display Text	NI000052	Rel•14	108
59006381	Layer 3 Service Disruption	NI000052	Rel•12	106
59006435	User Loop Testing (X.25 Echo Station)	NI000052	Rel•12	107
59006550	SS7 Procedures for ISDN Call Forward	NI000052	Rel•12	106
59013206	On Demand B-Channel Packet	NI000052	Rel•14	107
59013267	On Demand B-Channel Packet	NI000052	Rel•14	107

<i>Technical Reference</i>	<i>Feature name</i>	<i>Order code</i>	<i>Scheduled Avail.</i>	<i>Starting page</i>
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User Loop Testing (X.25 Echo Station)	NI000052	Rel•12	107
V			
Variable Length DN	NTWK0011	Rel•12	266
VFG MDR Suppression	AMA00006	Rel•13	88
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W			
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WIN-Compliant Mobile Terminations	Standard	Rel•12	250
Wireless Data to External ALI Database	ENS00016	Rel•12	189
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X			
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10/15-Digit ROTL Enhancement	Standard	Rel•13	51
1000-Block Number Pooling	NPE00005	Rel•13	70
3-Way Conference Status Report	ICM00050	Rel•12	158
512 MB/350 MHz Central Processing Unit	PLAT0005	Rel•13	232
800+ Southbound CLID Delivery Enhancements	NTS00024	Rel•13	86
9 Gigabyte Disk Drive	PLAT0005	Rel•13	233

INDEX BY ORDER CODE

The following index arranges by order code number the CM-resident features under major service categories. This index does *not* include: features that are standard, whose order codes are still pending, or resides in equipment other than the Computing Module. In response to reader requests, this index also shows in brackets (such as: [Rel•10]) the release when the *order code* first became generally available.

<i>Order code</i>	<i>[code's lst release]</i>	<i>Order code name</i>	<i>Release</i>	<i>Page</i>
		• <i>Feature name</i>		

OPTIONAL BASE SOFTWARE

ORDER CODES THAT START WITH AMA, EQA, ISUP, LOC, NBD, NPE, NTS, NXAC, OAM, AND TEL

AMA00006	[GA: Rel•13]	VFG MDR Suppression		
		• VFG MDR Suppression	Rel•13	88
EQA00030	[GA: Rel•12]	Tandem AMA Control		
		• Tandem AMA Control	Rel•12	75
ISP70006	[GA: Rel•13]	SS7 Operator Services Network Capabilities (OSNC)		
		• SS7 Operator Services Network Capabilities (OSNC)	Rel•13	82
ISP70008	[GA: Rel•14]	Flexible ISUP CAUSEMAP		
		• Flexible ISUP CAUSEMAP	Rel•14	83
LOC00025	[GA: Rel•11]	Enhanced Local Translations		
		• Line Attribute Table Restructure	Rel•12	72
		• SNPA/STS Decoupling	Rel•12	72
		• Enhanced Table Compression Tool	Rel•14	73
LOC00032	[GA: Rel•12]	Generic Calling Party Number		
		• Telecom Reform Act AMA Enhancement	Rel•12	71
LOC00033	[GA: Rel•13]	Alternate Outgoing Trunk Group Selection		
		• Alternate Outgoing Trunk Group Selection	Rel•13	76
NBD00003	[GA: Rel•10]	U.S. Network Broadcast Delivery		
		• Packet Data Interception	Rel•12	78
		• Punch-list Capabilities	Rel•14	79
NPE00001	[GA: Rel•09]	Numbering Plan Evolution I		
		• CNA Software Enhancement	Rel•12	69
		• QDNSU Command Support	Rel•13	69
NPE00004	[GA: Rel•12]	Enhanced Multiple NPA Support		
		• NPA Split/Overlay Support	Rel•12	68

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NPE00005	[GA: Rel•13]	1000-Block Number Pooling • 1000-Block Number Pooling	Rel•13	70
NTS00024	[GA: Rel•13]	CLID Southbound Toll-Free Service • 800+ Southbound CLID Delivery Enhancements	Rel•13	86
NTS00025	[GA: Rel•12]	Flexible ANI for Toll-Free Service • Flexible ANI for Toll-Free Service	Rel•12	84
NTS00026	[GA: Rel•12]	TFS Payphone with POTS Conversion • Toll-Free Service Payphone with POTS Conversion	Rel•12	85
NTS00027	[GA: Rel•12]	ANI II 25 Screening • ANI II 25 Screening	Rel•12	85
NXAC0010	[GA: Rel•12]	XA-Core 1 + 1 • XA-Core Release 1	Rel•12 (I.E.C)	63
NXAC0300	[GA: Rel•14]	XA-Core 3 + 1 • XA-Core Release 2	Rel•14	64
OAM00004	[GA: Rel•06]	EADAS Data Collection Interface • Four-Digit CIC • TCP/IP Interface to EADAS	Rel•12 Rel•12	80 80
OAM00010	[GA: Rel•14]	EADAS Maintenance Busy Usage • EADAS Maintenance Busy Usage	Rel•14	81
SERV0003	[GA: Rel•09]	Redundant Feature • Redundant Feature Enhancements	Rel•14	87
TEL00004	[GA: Rel•04]	Routeset Increment • Routeset Expansion to 2047 with Table C7NETSSN	Rel•12	66
TEL00013	[GA: Rel•11]	High Speed Link • SS7 Transport Over ATM	Rel•13	66
TEL00014	[GA: Rel•12]	TCP/IP Call Processing Support • TCP/IP Call Processing Support	Rel•12	65
UDD00002	[GA: Rel•12]	Flexible ANI Tandem Screen • Flexible ANI Tandem Screen	Rel•12	74

ADVANCED INTELLIGENT NETWORK (AIN)

AIN00060	[GA: Rel•13]	Interworking with Dynamically Controlled Routing • Interworking with Dynamically Controlled Routing	Rel•13	123
AIN00260	[GA: Rel•12]	Service Enablers Base Release 6 • Service Enablers Base Release 6	Rel•12	118

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AIN00261	[GA: Rel•12]	BRI Display Text Support • BRI Display Text Support	Rel•12	118
AIN00262	[GA: Rel•12]	Monitor for Change for Hunt Group • Monitor for Change for Hunt Group	Rel•12	119
AIN00263	[GA: Rel•12]	Extended Ringing Support • Extended Ringing Support	Rel•12	120
AIN00270	[GA: Rel•13]	Service Enablers Base Release 7 • Service Enablers Base Release 7	Rel•13	121
AIN00271	[GA: Rel•13]	Create Call Phase 1 • Create Call Phase 1	Rel•13	121
AIN00272	[GA: Rel•13]	Originating Call Model Nested Transactions • Originating Call Model Nested Transactions	Rel•13	122
AIN00280	[GA: Rel•14]	Service Enablers Base Release 8 • Service Enablers Base Release 8	Rel•14	123
AIN00281	[GA: Rel•14]	Terminal Resource Availability • Terminal Resource Availability	Rel•14	124
AIN00282	[GA: Rel•14]	Carrier Usage Parameter • Carrier Usage Parameter	Rel•14	124

CENTREX IP

CIP00001	[GA: Rel•12]	Centrex Voice over IP • Centrex Voice over IP	Rel•12	142
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CENTREX AUTOMATIC CALL DISTRIBUTION (ACD)

ACD00081	[GA: Rel•14]	Increase Secondary DNs • Increase Secondary DNs	Rel•14	162
ACD00082	[GA: Rel•14]	Not Ready On SDN Enhancement • Not Ready on Secondary DN Enhancement	Rel•14	162

DIGITAL SUBSCRIBER LINE

UEDG0001	[GA: Rel•12]	Universal Edge 9000 Platform • Universal Edge 9000 Base Provisioning	Rel•12	98
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EMERGENCY NUMBER SERVICES (E911)

ENS00005	[GA: Rel•02]	Enhanced 911 Base • E911 ISUP Enhancements	Rel•13	191
ENS00011	[GA: Rel•08]	E911 Routing via AIN • E911 Parameter Expansion	Rel•12	190
ENS00016	[GA: Rel•12]	Wireless ALI Interface • Wireless Data to External ALI Database	Rel•12	189
ENS00017	[GA: Rel•14]	Off-Board Selective Routing • Off-Board Selective Routing Interface	Rel•14	192

INTELLIGENT CALL MANAGEMENT (ICM)

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ICM00002	[GA: Rel•13]	Increase ACD Groups and Sessions • Increased ACD DN Association Limit	Rel•13	160
ICM00003	[GA: Rel•13]	Called Party DN in ICM Messages • Called Party DN in ICM Messages	Rel•13	159
ICM00050	[GA: Rel•09]	Enhanced ICM Functionality • 3-Way Conference Status Report • TAPI Extensions	Rel•12 Rel•12	158 158
ICM00075	[GA: Rel•14]	ICM Support for BRI • ICM Support for BRI	Rel•14	161

ISDN BASIC RATE INTERFACE

NI000052	[GA: Rel•09]	National ISDN-2 BRI Functionality • Privacy Redirecting Number • Calling Number Service Uniformity for NI-2 • Call Forwarding Service Uniformity for NI-2 • EKTS Service Uniformity for NI-2 • Layer 3 Service Disruption • SS7 Procedures for ISDN Call Forward • User Loop Testing (X.25 Echo Station) • On Demand B-Channel Packet • Uniform Display Text	Rel•12 Rel•12 Rel•12 Rel•12 Rel•12 Rel•12 Rel•12 Rel•14 Rel•14	105 105 105 106 106 106 107 107 108
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NI000038	[GA: Rel•12]	PRI E911 Screening NI-2		
	• E911 Screening		Rel•12	114
NI000039	[GA: Rel•12]	Distributed PRI		
	• Distributed PRI		Rel•12	112
NI000043	[GA: Rel•10]	PRI NI-2 Base		
	• NI-2 1+/0+ Dialing Enhancement		Rel•12	113
	• Calling Number Screening		Rel•12	113
NI000047	[GA: Rel•13]	Call Forward Interface Busy NI-2		
	• Call Forward Interface Busy NI-2		Rel•13	114
NI000049	[GA: Rel•13]	Call Forward Interface Busy NI-1		
	• Call Forward Interface Busy NI-1		Rel•13	115

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CAIN0100	[GA: Rel•05]	NetworkBuilder Messages		
	• NetworkBuilder Routing Log		Rel•13	185
	• Table TANDMRTE T Selector Addition		Rel•13	185
CAIN0700	[GA: Rel•07]	NetworkBuilder Local Number Portability		
	• LNP Intra-IMT RX Selector		Rel•12	181
	• NOJIP Option		Rel•13	181
	• LNP Sub-System Number (SSN)		Rel•13	181
	• LNP RX Selector		Rel•13	182
CAIN0802	[GA: Rel•11]	Takeback and Transfer		
	• NetworkBuilder Short Duration Tone Detection on Takeback and Transfer		Rel•13	186
NXXR0003	[GA: Rel•12]	UCS DMS-500 DNIS Trunk Option		
	• UCS DMS-500 DNIS Trunk Option		Rel•12	182
UBFR0006	[GA: Rel•13]	Long Call Fraud Detection		
	• Long Call Audit Enhancements		Rel•13	186
UCSB0001	[GA: Rel•02]	UCS Base		
	• Calling Card GTT		Rel•12	183
	• Enhanced Reorigination with STR Card		Rel•12	183
	• Short-Digit Duration Reorigination on the SPM		Rel•12	183
	• Suspend Resume Message Handling to DMS-300		Rel•12	183

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	• Find File Tool — FINDIT		Rel•13	184
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UTRS0001	[GA: Rel•05] Long Distance Translations and Routing			
	• TR-533 CIC Routing		Rel•12	182
UTRS0003	[GA: Rel•06] Routing Enhancements			
	• NETSEC Screening Expansion		Rel•13	186

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	• MADN TCAP Name		Rel•12	129
MDC00067	[GA: Rel•13] Hunt Line Overflow to DN Expand			
	• Hunt Line Overflow to DN Expand		Rel•13	129
MDC00069	[GA: Rel•13] Call Transfer Fraud Prevention			
	• Call Transfer Fraud Prevention – Centrex		Rel•13	130

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	• Force Management CRT Elimination		Rel•13	223
ADVQ0006	[GA: Rel•06] QMS Customer Service Enhancement			
	• QMS Customer Service Enhancement		Rel•12	223
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	• Seconds-Based Announcements		Rel•12	218
ENSV0026	[GA: Rel•13] TOPS IP Operator Centralization			
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OSAN0007	[GA: Rel•12] OSSAIN Enhancements			
	• OSSAIN 12 Enhancements		Rel•12	216
	• OSSAIN 13 Enhancement		Rel•13	217
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	• Operator Services Networking Capability		Rel•13	224

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UNBN0006	[GA: Rel•12] • Call Restrictions for Wholesaling	Call Restrictions for Wholesaling	Rel•12	220
UNBN0007	[GA: Rel•13] • Screening for Billing Agreement	Screening for Billing Agreement	Rel•13	221

REMOTES

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BAS00078	[GA: Rel•12] • Duplicate NXX for DMS Remotes in ESA	LNP Duplicate NXX Remote	Rel•12	207
ISDN0003	[GA: Rel•07] • ILDR Multipoint EOC Support	ISDN Line Drawer for Remotes	Rel•12	208
SMA00012	[GA: Rel•08] • Integrated Channel Bank Line Capacity Increase	ESMA with Integrated Channel Bank (ICB)	Rel•12	209

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RES00047	[GA: Rel•04] • CSMI Message Enhancement	Call Screening, Monitoring, and Intercept (CSMI)	Rel•13	169
RES00081	[GA: Rel•10] • Simultaneous Ring and MADN Compatibility	Simultaneous Ring	Rel•12	167
RES00089	[GA: Rel•12] • Automatic Recall with Name	Automatic Recall with Name	Rel•12	166
RES00091	[GA: Rel•12] • Talking Call Waiting	Talking Call Waiting	Rel•12	165
RES00094	[GA: Rel•13] • Who's Calling	Who's Calling	Rel•13	172
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		• NI-2 PRI on SPM	Rel•12	197
SPMS0001	[GA: Rel•10]	Spectrum Peripheral Module Base		
		• Large System Support	Rel•12	200
		• Crossover Messaging	Rel•12	200
		• PANTHER Support for the SPM	Rel•12	201
		• Patching on the SPM	Rel•12	201
		• Black Box Fraud Prevention Over OC-3 PTS	Rel•13	202
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		• DS-1 Assignment Control	Rel•14	204
SPMS0002	[GA: Rel•07]	SPM Echo Canceller Support		
		• SPM ECAN Call Control	Rel•13	205
		• ATR Dialing Plan Enhancements to Support ECRM/RN Selection	Rel•13	205
SPMS0015	[GA: Rel•12]	NTNA ISP Primary Rate Interface		
		• ISP Basic Call	Rel•12	198
		• SPM NI-1 PRI Functionality	Rel•13	199
SPMS0040	[GA: Rel•13]	OC-3 Line Timing		
		• OC-3 Line Timing	Rel•13	204

WIRELESS FEATURES (DMS-100 WIRELESS SYSTEM)

AACC0001	[LWW00006]	ANSI ISUP		
		• ANSI ISUP	Rel•12	258
		• DMS-100 Wireless ISUP GR-394	Rel•12	258
		• Flexible ISUP IAM — Phase I	Rel•12	258
ACTR0001	[LWW00005]	Authentication Center		
		• ACTR Authentication Center Phase II	Rel•12	260
		• AWS Authentication CDR Enhancement	Rel•12	260
		• Authentication on Termination	Rel•12	260
ANET0003	[LWW00006]	ANET Advanced Networking MSC		
		• AWS Networking Mobile Switching Center (MSC)	Rel•12	259
ASVS0002	[LWW00006]	Voice Mail Companions		
		• Voice Mail Deposit and Retrieval	Rel•12	261
		• Call Forward Default / Rollover	Rel•12	261

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ASVS0003	[LWW00006]	Service Code Dialing • Service Code Dialing	Rel•12	262
CDMA0001	[LWW00006]	Enhanced Selector Card with EVRC • Enhanced Selector Card with EVRC	Rel•12	273
		• IS-41C CDMA Hard Handoff	Rel•12	274
CDMA0002	[LWW00005]	Open A-Interface for CDMA • Open A-Interface for CDMA	Rel•12	274
CDMA0003	[LWW00006]	Multi-Mode Hard Handoff • Multi-Mode Hard Handoff	Rel•12	275
		• CDMA OM Upload Optimization	Rel•12	276
		• RMU Introduction	Rel•12	276
CDMA0004	[LWW00006]	Tiered Billing for CDMA • Tiered Billing for CDMA	Rel•12	277
DCCH0002	[LWW00806]	Digital Control Channel PSID/RSID • Digital Control Channel IS-136 PSID/RSID Tiered Billing	Rel•12	263
DCCH0003	[LWW00006]	Digital Control Channel Page Continuation • Digital Control Channel Page Continuation	Rel•12	263
LWW00066	[LWW00006]	Integrated Wireless Centrex • Integrated Wireless Centrex	Rel•12	258
NTWK0009	[LWW00006]	Flexible IS-41 OI • Flexible IS-41 OI	Rel•12	264
NTWK0011	[LWW00006]	SMS Origination • IS-136 TDMA DTC/DCCH SMS Origination	Rel•12	264
		• SMS Traffic Channel Delivery	Rel•12	265
		• TDMA HLR OTAF Gateway Phase II	Rel•12	265
		• Variable Length DN	Rel•12	266
PROX0001	[LWW00006]	CDMA Payphone Support • Proximity CDMA	Rel•12	277
PSRV0006	[LWW00006]	Distinctive Call Screening • Incoming Call Screening	Rel•12	267
		• Durable Cancel Call Waiting	Rel•12	267
		• IS-41C DMH Redirect	Rel•12	268
		• ANSI-41 Per-Call Feature Activation/Deactivation	Rel•12	268
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PSRV0012	[LWW00006] • Abbreviated Dialing	Premium Services Phase 1	Rel•12	269
PSRV0013	[LWW00006] • Flexible ANI and CLID • Privacy and Unknown Display for CNIP • Text Message to Mobiles	Flexible ANI and CLID	Rel•12 Rel•12 Rel•12	270 270 271
TDMA0001	[LWW00006] • EFRC Noise Conditioning	EFRC Noise Conditioning	Rel•12	271
TDMA0002	[LWW00006] • EFRC Noise Reduction	EFRC Noise Reduction	Rel•12	271
WIN00010	[LWW00006] • WIN Standards Compliance Phase I	Wireless Intelligent Network Standards — Phase I	Rel•12	272
WIN00011	[LWW00006] • WIN Global Title Translations	WIN Global Title Translations	Rel•12	272

INDEX BY ACRONYMS AND ABBREVIATIONS

The following pages list abbreviations and acronyms that appear throughout this document. As an index, this list also identifies the page numbers where these acronyms appear, as an additional aid to help you quickly find the information you need.

Entries *in italics* indicate pages where the acronym/abbreviation appears in an illustration or table (and not in the general text). To help make this index uncluttered and useful, the word “VARIOUS” appears for an entry that has more than seven references (however, if sections specifically highlight the acronym/abbreviation, then those pages are referenced after the word “ESPECIALLY”).

Note: this list does not include the names of data fields or translation tables.

A

A&M	Additions and Maintenance · 212	AIF	A-Interface · 278
AAL	Asynchronous Transfer Mode Adaptation Layer · 42	AIN	Advanced Intelligent Networking · VARIOUS, ESPECIALLY 116-124
ABM	Access Bandwidth Manager · 96	ALI	Automatic Location Information · 189-192, 298
AC	Authentication Center · 260	ALIT	Automatic Line Insulation Test · 53
ACB	Anonymous Call Blocking · 267	AMA	Automatic Message Accounting · VARIOUS
ACCH	Analog Control Channel · 254	AMADNS	Automatic Message Accounting Data Networking Standard · 230, 235
ACD	Automatic Call Distribution · 133, 146-162, 188, 214, 301; <i>or</i> Anonymous Call Diversion · 267	AMPS	Advanced Mobile Phone System · 245-249, 258, 275
ACE	A-Interface Control Element · 248, 274, 278	ANI	Automatic Number Identification · VARIOUS
ACF	Anonymous Call Forwarding · 267	ANSI	American National Standards Institute · VARIOUS
ACM	Address Complete Message · 83, 224	ARP	Address Resolution Protocol · 65
ACTS	Automated Coin Toll Service · 218	ARQ	Automatic Retransmission Request · 265
ADACC	Automated Directory Assistance Call Completion · 224	ASCII	American Standard Code for Infor- mational Interchange · 189, 230
ADAS	Automated Directory Assistance Service · 217	ASP	Application Service Provider · 109
ADSL	Asymmetric Digital Subscriber Line · 17, 90, 94-98	AT	Access Tandem · 75
AFT	Automatic File Transfer · 256		

ATC	Access-to-Carrier trunk type · 75, 82, 202	CCW	Cancel Call Waiting · 267-268
ATGS	Alternate Trunk Group Selection · 76-77	CDG IOS	CDMA Development Group Inter-Operability Specification · 278
ATM	Asynchronous Transfer Mode · VARIOUS	CDMA	Code Division Multiple Access · 245-249, 258, 273-277, 278
B			
BAF	Bellcore Automatic Message Accounting Format · 234-236	CDPD	Cellular Digital Packet Data · 247
BER	Bit-Error Rate · 255, 257	CDR	Call Detail Recording · 184, 234, 250, 254, 260, 263, 270
BHCA	Busy Hour Call Attempts · 40-41, 47, 57	CD-ROM	Compact Disk - Read Only Memory · 100, 144
BRI	Basic Rate Interface · VARIOUS, ESPECIALLY 104-108	CEM	Common Equipment Module · 200-201
BSAP	Base Station Application Part · 248, 274-275, 298	CFB	Call Forward, Busy · 261
BSC	Base Station Controller · 248-249, 273	CFD	Call Forward - Don't Answer · 106-107, 262
BSS	Base Station Subsystem · 274-275	CFDF	Call Forward Default · 261
BTS	Base Transceiver Station · 248-249	CFNA	Call Forward No Answer · 261-262
C			
CAC	Carrier Access Code · 80	CFR	Call Forward Rollover · 261
CALEA	Communications Assistance for Law Enforcement Act · 78	CFU	Call Forward Unconditional · 261-262
CAM	Communications Applications Module · 289-293	CGN	Charge Number · 184
CAMA	Centralized Automatic Message Accounting · 41, 189	CgPN	Calling Party Number · 86
CAU	CDMA Application Unit · 246, 248	CI	Command Interpreter · 54, 69, 73, 184, 254
CBT	Computer-Based Training · 17	CIC	Carrier Identification Code · 80, 182, 220
CC	Call Code · 75, 88	CIU	CDMA Interface Unit · 246, 248
CCMIS	Call Center Management Information System · 27, 149-150, 303	CLASS	Custom Local Area Signaling Service · VARIOUS
		CLEC	Competitive Local Exchange Carrier · 46, 71, 73, 246
		CLID	Calling Line Identification · 86, 154, 184, 241, 270
		CM	Computing Module · VARIOUS
		CNA	Calling Number Announcement · 69

CNAM	Calling Name · 290, 293	D	
CNAMD	Calling Name Delivery · 171	DA	Directory Assistance · 217, 222
CNID	Calling Number Identification · 259	DAT	Digital Audio Tape · 59, 300
CNIR	Calling Number Identification Restriction · 268	DBIC	Data-enhanced Bus Interface Card · 103, 302
Codec	Coder/Decoder · 138-140, 255, 271, 273, 278	DC	Data Collection · 237
CPA	Called Party Address · 159	DCCH	Digital Control Channel · 253, 257, 263-365
CPE	Customer Premises Equipment · VARIOUS	DCCW	Durable Cancel Call Waiting · 267
CPN	Calling Party Number · 71, 184, 259	DCE	Distributed Computing Environment · 226, 228, 229, 236
CPNIE	Calling Party Number Information Element · 184	DCR	Dynamically Controlled Routing · 123, 185, 303
CPP	Calling Party Pays · 216	DDMS	DMS Data Management System · 42, 230, 233
CPU	Central Processing Unit · 229, 231, 232, 251	DHCP	Dynamic Host Configuration Protocol · 144
CRT	Cathode Ray Tube · 223	DIRP	Device Independent Recording Peripheral · 256
CS	Communication Server · 37, 41-42, 229	DLC	Digital Loop Carrier · 96, 193; <i>or</i> Data Link Controller pack · 197-199, 298-299
CS-1	Capability Set One · 116	DMH	Data Message Handling · 268
CSA	Canadian Standards Association · 239	DMS	Digital Multiplex System · VARIOUS, ESPECIALLY 12-14
CSD	Circuit-Switched Data · 273	DN	Directory Number · VARIOUS
CSE	Customer Service Expert · 223	DND	Do Not Disturb · 52, 267
CSMI	Call Screening, Monitoring, and Intercept · 169	DNIS	Dialed Number Inward Service · 154, 182
CSP	Communications System Platform · 45	DPC	Destination Point Code · 286
CST	Customer Service Time · 223	DPP	Distributed Processing Peripheral · 303
CTFP	Call Transfer Fraud Prevention · 130-131, 170	DR	Distinctive Ringing · 267
CTI	Computer/Telephony Integration · 65, 91, 132, 148, 152-157, 161, 210	DRAM	Dynamic Random Access Memory · 44, 59
CW, CWT	Call Waiting · 134-135, 267-268		

DS	Data Store · 49	E	
DSL	Digital Subscriber Line · 17, 90, 92, 94-97, 101-102, 245	E800	Enhanced 800 · 84-86
DSP	Digital Signal Processing · 139	E911	Enhanced 911 · 18, 76-77, 82, 114, 187-192, 249, 269
DSX	Digital Signal Crossconnect · 66, 67	EA	Equal Access · 75, 215, 224
DTC	Digital Trunk Controller · 51, 57, 248, 264-265	EADAS	Engineering and Administrative Data Acquisition System · VARIOUS
DTC7	Digital Trunk Controller for SS7 · 51, 259, 298	EBS	Electronic Business Set · 118
DTCI	Digital Trunk Controller for ISDN · 44, 112, 113, 198, 296-297	ECAN	Echo Canceller · 205
DTE	Digital Trunk Equipment frame · 194	ECPH	Enhanced Call Party Hold · 191
DTH	Digital Test Head · 51, 298	ECRM	ECAN Resource Module · 205
DTMF	Dual Tone Multi-Frequency · 183, 239, 242	ECRN	ECAN Resource Number · 205
DWDM	Dense-Wavelength Division Multiplexing · 10	EDAC	Error Detection and Correction · 44
		EDP	Event Detection Point · 119
		EDRAM	Enhanced Digital Recorded Announcement Machine · 222, 303
		EDSPM	Enhanced Digital Signal Processing Module · 248, 257
		EFRC	Enhanced Full Rate Codec · 255, 271
		EISP	Enhanced ISDN Signaling Preprocessor · 296
		EIU	Ethernet Interface Unit · 65, 160, 297
		EKTS	Electric Key Telephone Service · 106
		ELPP	Enhanced Link Peripheral Processor · 57, 283
		EM	Extended Memory · 62-64, 200, 246, 298
		email	Electronic Mail · 94, 146, 154, 242-243
		ENET	Enhanced Network · 42, 57, 62-64, 196, 200, 298

ENS Emergency Number Service
· 187-192

EOC Embedded Operations Channel
· 44, 208

ERM Event Record Manager · 236

ESA Emergency Standalone · 48, 206,
207, 297

ESEL Enhanced Selector · 273-274, 298

ESMA Expanded Subscriber Carrier
Module-100A · 44-45, 51, 193, 209

ETSI European Telecommunications
Standards Institute · 39

EVRC Enhanced Variable Rate Codec
· 273, 278, 298

F

FACET Flexible Advanced Capacity
Engineering Tool · 296

FANI Flexible Automatic Number
Identification · 84, 86

FCC Federal Communications Com-
mission · VARIOUS

FEATREQ Feature Request · 256

FGB Feature Group B · 244

FGD Feature Group D · 244, 253

FLIS Fiberized Link Interface Shelf · 248

FLRN Foreign Location Routing Number
· 70

FMCRT Force Manager Cathode Ray Tube
· 223

FOCC Forward Control Channel · 254

FPG *Feature Planning Guide* · VARIOUS,
ESPECIALLY 29-33

FSL Flexible Service Logic · 122

FTP File Transport Protocol · 65, 160,
235, 292

G

GA General Availability · VARIOUS,
ESPECIALLY 24-25

GAP Generic Address Parameter · 182,
216

GB Gigabyte · 231, 233

Gbps Gigabits per second · 91

GN Generic Name · 171

GTT Global Title Translation · 56, 183,
272, 281, 284-285, 290, 293

GUI Graphical User Interface · 180, 226,
242, 289, 291

H

HDT Host Digital Terminal · 102

HLIU High-Speed Link Interface Unit
· 56-57

HLR Home Location Register · 257,
259-268, 271

HMI Human-to-Machine Interface · 54,
226

HOBIC Hotel Billing Information Center
· 218

HSL High-Speed Link · 56, 66-67, 281,
283-284

HVAC Heating, Ventilation, and Air
Conditioning · 194, 288

I		INWATS	Inward Wide Area Telephone Service · 110
IAM	Initial Address Message · 159, 171, 181-182, 191-192, 203, 224, 258	IOP	Input/Output Processor · 59
IBN	Integrated Business Network · 48, 129	IP	Internet Protocol · VARIOUS; <i>or</i> Intelligent Peripheral · 250, 303
ICB	Integrated Channel Bank · 209	IPF	Integrated Processor and Frame Bus Interface · 47, 56, 297
ICM	Intelligent Call Management · 65, 148-149, 152-156, 158-161	ISA	Integrated Services Access · 110, 199
ICP	Intelligent Cellular Peripheral · 248, 251-252, 264-265	ISDN	Integrated Services Digital Network · VARIOUS, ESPECIALLY 104-115
ICRM	Integrated Cellular Remote Module · 246, 251-252, 256, 265	ISE	Intelligent Services Environment · 211
ICS	Incoming Call Screening · 267, 271	ISN	Intelligent Services Node · 211, 222
ID	Identification · VARIOUS	ISP	Internet Service Provider · 97, 109, 112, 114-115, 119, 122, 196-198
IDDD	International Direct Distance Dialing · 179, 251	ISS	TOPS Intelligent Services Switch · 211
IEC	Interexchange Carrier · 71, 74, 280	ISUP	ISDN User Part · VARIOUS, ESPECIALLY 82-83
IETF	Internet Engineering Task Force · 144	ISVM	Interswitch Voice Messaging · 293
ILDR	ISDN Line Drawer for Remotes · 44, 208, 296	IT	Intertoll trunk type · 82, 202
ILEC	Incumbent Local Exchange Carrier · 71	ITU	International Telecommunications Union · VARIOUS
IMA	Inverse Multiplexing for Asynchronous Transfer Mode · 97	IVR	Interactive Voice Recording · 148, 153-154
IMSI	International Mobile Station Identity · 266, 278	IWS	Intelligent Workstation · 211
IMT	Inter-Machine Trunk · 181, 183	IWSPM	Interworking Spectrum Peripheral Module · 42
IN	Intelligent Network · 12, 116-124, 179, 183, 280, 293 [<i>see also</i> AIN]	J	
INM	Integrated Network Management · 200	JIP	Jurisdiction Information Parameter · 181
INODE	Integrated Node · 247		

K

kbps kilobits per second · VARIOUS
 KSH Key Short Hunt · 130

L

LAN Local Area Network · VARIOUS
 LATA Local Access Transport Area · 70, 114, 124, 177, 182, 213, 259, 280
 LCM Line Concentrating Module · 92, 96, 98, 102-103
 LCR Locate Receiver · 254-255
 LEC Local Exchange Carrier · VARIOUS
 LED Light-Emitting Diode · 62
 LEN Line Equipment Number · 53
 LGC Line Group Controller · 44, 51, 97, 296
 LGCI Line Group Controller for ISDN · 44, 296
 LIDB Line Information Database · 293
 LIT Line Insulation Testing · 53
 LIU Link Interface Unit · 248
 LIU7 Link Interface Unit for SS7 · 46-47, 56-57, 196, 203, 259, 274-275, 283
 LNP Local Number Portability · VARIOUS
 LOD Hunt Line Overflow to Directory Number · 129-130
 LPP Link Peripheral Processor · VARIOUS
 LRN Location Routing Number · 281, 284-285, 290, 293
 LSMS Local Service Management System · 285, 290, 294

LSSGR Local Access and Transport Area Switching System Generic Requirements · 50, 280

LTC Line and Trunk Controller · 44, 97, 296

LTCI Line and Trunk Controller for ISDN · 16, 44, 139, 143, 219, 296-297, 299

M

MADN Multiple Appearance Directory Number · 118-119, 126, 129, 140, 164, 167

MAHO Mobile Assisted Handoff · 255

MAP Maintenance and Administration Position · 41, 54, 62, 78, 195, 256

MB Megabyte · 231, 232, 251

Mbps Megabits per second · 56, 92, 94-95, 101

MBS Meridian Business Set · 132-135, 147

MC Message Center · 264-265

MD Manufacturer Discontinue · 214, 300-301

MDN Mobile Directory Number · 189-190

MDR Message Detail Recording · 88

MF Multifrequency · 191

MFT Meridian Feature Transparency · 119

MHz Megahertz · 145, 227, 229, 232, 275

MIB Management Information Base · 144

MIN Mobile Identification Number · 253, 266

MIS	Management Information Services · 147, 150, 188, 212, 214 [<i>see also</i> CCMIS]	N	
MLH	Multi-Line Hunt · 119, 129	NACD	Network Automatic Call Distribution · 147
MPC	Multi-Protocol Controller · 190, 298	NCL	Non-Computing Module Load · VARIOUS, ESPECIALLY 27, 302-303
MP-EOC	Multipoint Embedded Operations Channel · 208 [<i>see also</i> EOC]	NEBS	Network Equipment Building Standards · 239
MRVT	Message Transfer Part Routing Verification Test · 280, 282	NFAS	Non-Facility Associated Signaling · 110-111, 112, 198, 199
MS	Message Switch · 62, 204; <i>or</i> Mobile Station · 264-265	NGDLC	Next Generation Digital Loop Carrier · 193
ms	millisecond · 183, 186, 202	NI	National ISDN · VARIOUS; <i>or</i> Network Indicator · 286, 292
MSB	Make Set Busy · 52	NICM	Network Intelligent Call Management · 159
MSC	Mobile Switching Center · 252, 255, 259-262, 264, 266, 275	NM	Succession Network Manager · 38, 229; <i>or</i> Network Management · 237
MSCID	Mobile Switching Center Identification · 255, 260	NP	Number Portability · 281, 284-285, 290, 293-294
MSM	Meridian Services Module · 303	NPA	Numbering Plan Area · VARIOUS
MSP	Modular Supervisory Panel · 228	NPAC	Number Portability Administration Center · 285, 294
MSR	Mobile Service Region · 253	NPC	Number Portability Controller · 293
MSU	Message Signaling Units · 280	NPS	Number Portability Server · 293
MtcArb	Maintenance Arbitrator · 51	NRC	Network Reliability Council · 280
MTM	Mobile Text Messaging · 271	NSC	Number Service Code · 74
MTP	Message Transfer Part · 56, 66, 203, 280, 282, 292	NTNA	Nortel Networks North America · 198
MTX	Mobile Telephone Exchange · 14, 244, 246-247, 249, 278	NUA	Network User Administration · 233
MVI	Multivendor Initiative · 116	NXX	A generic office code · VARIOUS
MVP	Modular Voice Processor · 18, 27, 238-243, 303		
MWI	Message Waiting Indication · 118, 240, 257		
MWN	Message Waiting Notification · 257		
MWT	Message Waiting Tone · 257		

O

OAM	Operations, Administration, and Maintenance · VARIOUS	OSS	Operations Support System · 51, 82, 191-192, 224
OAM&P	Operations, Administration, Maintenance, and Provisioning · VARIOUS	OSSAC	Operator Services System Advanced Intelligent Network Centralization · 216
OAP	Open Automated Protocol · 211, 216	OSSAIN	Operator Services System Advanced Intelligent Network · 213, 216-217
OC	Operator Centralization · 219	OTAF	Over the Air Activation Function · 265-266
OE	Office Equipment · 53	OUTWATS	Outgoing Wide-Area Telephone Service · 110
OEM	Original Equipment Manufacturer · 277		
OFM	Operations Feature Matrix · 111	P	
OI	Origination Indicator · 264		
OLI	Originating Line Information · 83, 184, 186, 191-192	pANI	pseudo-ANI · 189-190
OLIP	Originating Line Information Parameter · 191-192	PANTHER	Peripheral Module Upgrade Automation · 49, 201
OLNS	Originating Line Number Screening · 220-221	PBX	Private Branch Exchange · 90, 109-110, 113, 183, 202, 240, 269
OM	Operational Measurement · 98, 202, 265, 276, 292	PC	Personal Computer · VARIOUS
OMAP	Operations, Maintenance, and Administration Part · 282	PCI	Personal Computer Interface · 92, 101, 289
ONP	One Night Process · 52; <i>or</i> Open Network Provisioning · 200	PCL	Product Computing-Module Load · VARIOUS, ESPECIALLY 19-28
OPAC	Outside Plant Access Cabinet · 44, 48, 206-207	PCO	Public Call Office · 277
OPC	Originating Point Code · 286	PCR	Preventive Cyclical Retransmission · 294
OPM	Outside Plant Module · 206-207	PCS	Personal Communications Service · 9, 14, 56, 245, 247-248, 258, 277
ORIGHOLD	Origination Hold · 191	PDN	Primary Directory Number · 68, 167
ORREQ	Origination Request · 256, 266	PDO	Prevent Delete Option · 52
OSI	Open Systems Interconnection · 65	PE	Processor Element · 59, 61-64
OSNC	Operator Services Network Capabilities · 82, 191-192, 224	PEC	Product Equipment Code · 252, 257
		PI	Presentation Indicator · 184

PIN Personal Identification Number · 252

PIP Party Information Parameter · 171

PM Peripheral Module · 111 [*see also* XPM]

POP Point of Presence · 91, 114

POTS Plain Old Telephony Service · VARIOUS

PPU Pay Per Use · 166

PRI Primary Rate Interface · VARIOUS, ESPECIALLY 109-115

PRSM Post Release Software Manager · 201

PS Program Store · 49

PSAP Public Safety Answering Point · 76, 187-192, 249, 269

PSTN Public Switched Telephone Network · 93, 142, 149, 246, 259, 261

PTS Per-Trunk Signaling · 182-183, 186, 196, 198, 202, 204

PTT Post, Telephone, and Telegraph · 155

PUMA Product Upgrade Manager · 45

PVC Permanent Virtual Circuit · 66-67

Q

QMS Queue Management System · 214, 223, 301

QoS Quality of Service · 37, 39, 144

R

RAS Remote Access Server · 36

RC Recent Change · 49-50

RDT Remote Digital Terminal · 209

REDIND Redirection Indicator · 268

REL Release message · 83, 224

RES Residential Enhanced Services · 18, 26, 78, 119, 129, 163-172; *or* Resume message · 183

REX Routine Exercise · 98

RF Radio Frequency · 249, 253, 273

RIP Routing Information Protocol · 65

RLCM Remote Line Concentrating Module · 44, 48, 102, 206-207

RM Resource Module · 201, 276

RMDP Remote Module Digital Port · 252

RMU Resource Manager Unit · 248, 276

ROM Read-Only Memory · 51, 298

ROTL Remote Office Test Line · 51, 298

RQMS Reliability and Quality Measurements for Telecommunications Systems · 280

RSC-S Remote Switching Center-S · 44, 51, 96-98, 102, 206-207, 296

RTS Return to Service · 256-257

RVR Roamer Verification Reinstatement · 252

RX Retranslation · 181-182

S

SA	Service Assistant · 223	SMDR	Station Message Detail Recording · 48, 126, 231, 234-235, 297
SAM	Subsequent Address Message · 159	SMI	Service Manager Interface · 294
SBS	Selector Bank Subsystem · 273, 276	SMS	Service Management System · 285, 290, 293-294; <i>or</i> Short Message Service · 245, 264-265, 298
SCA	Single Call Appearance · 167; <i>or</i> Selective Call Acceptance · 267	SMSC	SMS Center · 265, 298
SCCP	Signaling Connection Control Part · 66, 183, 280, 292	SNMP	Simple Network Management Protocol · 142, 144
SCD	Selective Call Diversion · 267	SNPA	Serving Numbering Plan Area · 72
SCI	Selector Common Interface · 273-274, 298	SOBO	Small Office/Branch Office · 92-93
SCM	Subscriber Carrier Module · 44, 193, 303	SOC	Software Optionality Control · 213, 258, 269
SCP	Service Control Point · VARIOUS	SOHO	Small Office/Home Office · 92-93, 104
SDL	Signaling Data Link · 56	SONET	Synchronous Optical Network · 194-195, 204
SDM	DMS SuperNode Data Manager · VARIOUS, ESPECIALLY 225-237	SPINA	Subscriber Personal Identification Number Access · 252
SDN	Secondary Directory Number · 68, 162	SPM	Spectrum Peripheral Module · VARIOUS, ESPECIALLY 194-205
SDSL	Symmetric Digital Subscriber Line · 90, 96-98	SPVC	Soft Permanent Virtual Circuit · 67
SEAS	Signaling, Engineering, and Administration System · 21, 281	SRDB	Selective Routing Database · 192
SEL	Selector card · 273	SS7	Signaling System No. 7 · VARIOUS
SERVORD	Service Order · 45, 49, 52, 68-69, 72-73, 87, 98, 257	SSD	Shared Secret Data · 260
SIBB	Service Independent Building Block · 122, 180	SSN	Subsystem Number · 181, 286
SLM	System Load Module · 296	SSP	Service Switching Point · 70, 74, 85-86, 116-117, 120-121, 124, 279
SLoA	Switched Lines over ATM · 15, 36	STP	Signaling Transfer Point · VARIOUS, ESPECIALLY 279-294
SLoIP	Switched Lines over IP · 36	STR	Special Tone Receiver · 183, 186
SLS	Signaling Link Selector · 281, 283	STS	Serving Translation Scheme · 72, 182
SM	Shared Memory · 59	SUS	Suspend message · 183
SMDI	Simplified Message Desk Interface · 111, 258	SVC	Switched Virtual Circuit · 37, 41-42, 67

T

TA	Time Alignment · 256
TAPI	Telephony Applications Programming Interface · 147, 148-149, 153-156, 158
TBD	To Be Determined · VARIOUS
Tbps	Terabits per second · 10
TCAP	Transaction Capabilities Application Part · 126, 129, 190, 214, 245
TCM	Terminating Call Model · 124
TCN	Travel Card Number · 183
TCP/IP	Transport Communications Protocol/Internet Protocol · VARIOUS
TCW	Talking Call Waiting · 165
TDM	Time-Division Multiplexing · 15, 16, 35-40, 58, 67, 97, 136
TDMA	Time Division Multiple Access · 245-249, 256, 258, 263-265, 271
TDP	Trigger Detection Point · 119
TFS	Toll-Free Service · 85-86
TLDN	Temporary Local Directory Number · 261
TMN	Telecommunications Management Network · 227, 282
TOPS	Traffic Operator Position System · VARIOUS, ESPECIALLY 210-224
TPS	Terminal Proxy Server · 140
TR	Technical Reference · 30, 182, 237
TREX	Terminal Record Expansion · 132

U

UDP	User Datagram Protocol · 265
uEMS	Preside Universal Edge 9000 Manager · 99
UL	United Laboratories · 239
UNISTIM	Unified Network IP Stimulus · 140
URL	Universal Resource Locator · 196
UserID	User Identification · 52
USI	User Service Indicator · 203
USP	Universal Signaling Point · 303

V

VAD	Voice-Activated Dialing · 242
VCH	Voice Channel · 254
VCI	Virtual Channel Identifier · 67
VFG	Virtual Facility Group · 48, 88
VIRTGRP	Virtual Group · 88
VLR	Visitor Location Register · 250, 254, 259
VMD	Voice Mail Deposit · 261
VME	Versabus Motorola Europe · 289
VMR	Voice Mail Retrieval · 261
VMS	Voice Messaging System · 169, 257, 261
VO	Verification Office · 24-25, 40-41
Vocoder	Voice Encoder · 273
VoDSL	Voice over Digital Subscriber Line · 15, 36

VoIP	Voice over Internet Protocol · 15, 36, 91
VPI	Virtual Path Identifier · 67
VPN	Virtual Private Network · 15, 40, 91, 179
VSELP	Vector Sum Excited Linear Prediction · 255
VSP	Voice Service Processors · 202
VTtoA	Voice Trunking over ATM · 15, 36, 39-40

W

WAN	Wide Area Network · 97, 228
WIN	Wireless Intelligent Network · 245, 249-250, 269, 272, 278
WLL	Wireless Local Loop · 245
WSP	Wireless Service Provider · 71

X

XA	Extended Architecture · VARIOUS, ESPECIALLY 58-64
xDSL	Generic Digital Subscriber Line · 14, 101-102, 245 [<i>see also</i> DSL]
xEMS	xDSL Element Manager System · 102, 302
XPM	Extended Peripheral Module · VARIOUS, ESPECIALLY 206-208

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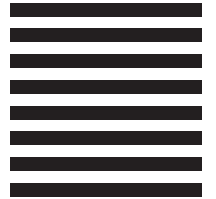


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