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DMS-10 505 Generic

Product Bulletin

DMS-10 505 Generic Release

Release 505 provides several new features designed to help service providers protect access revenues, improve feature usability and operation, and streamline operations.

The DMS-10 505 Generic Release introduces new access revenue protection features including AMA Recording for SS7 Wireless Traffic and Trunk Group Member Usage. Web-Based Subscriber Feature Control enables subscribers to use the Internet rather than voice menus to control feature operation, thus encouraging feature acceptance and modernizing the service provider's image. A variety of other features help improve feature operation for the subscriber while streamlining operations.

About this document

This document is an advance planning tool for network planners, engineers, and marketers who need introductory information about the DMS-10 500 Series 505 release. It has been designed to complement—not replace—more detailed Nortel Networks technical documents.

For more information

For more detailed information about the DMS-10 or other Nortel Networks products and services, please visit our website at *www.nortelnetworks.com/dms-10* or call the Nortel Networks Sales and Marketing Information Center at 1-800-4 NORTEL (1-800-466-7835). For training information, call 1-877-662-5669.

DMS-10 505 release protects and enhances telco revenues

Nortel Networks DMS-10 500 Series capabilities for rural market service providers enable carriers to improve operations and maximize return on investment.

The DMS-10 has long been a market leader in the rural market space. Nortel Networks continues to focus on new features and enhancements for DMS-10 customers with the 505 release. This latest DMS-10 release further demonstrates Nortel Networks commitment to rural market service providers by delivering additional functionality for existing DMS switches and enabling service providers to develop systematic plans to evolve today's TDM infrastructures to a more efficient packet-based network.

At a glance—Standard features of DMS-10 505 release:

- **AMA Recording for SS7 Wireless Traffic**—This feature allows for collection of originating and terminating Automatic Message Accounting (AMA) records on trunk groups directly connected to a wireless carrier via a Signaling System 7 (SS7) trunk group.
- **Hunt Group Voice Mail**—Small businesses served via hunt groups gain better control of their voice mail with this feature. Individual members of hunt groups can be offered full voice mail functionality, including the option of forwarding to voice mail for attempts to hunt group member stations that are busy.
- **EBS Group Name and Number**—Small businesses will enjoy improved branding and visibility as calls from each member of an Enhanced Business Services (EBS) group are branded with the published directory number (DN) and name of the business.
- **Pre-Subscription Enhancements**—Management of carriers is simplified by providing expanded pre-subscription capabilities for Remote Call Forwarding Appearances (RCFAs) and for default carriers associated with all lines in a thousands group.
- **Trunk, Hunt, and Thousands Group Expansion**—The maximum numbers of trunk groups, hunt groups, and thousands groups supported by the DMS-10 have all been increased. This benefits all carriers but is especially important to CLECs.
- **Local Number Portability LRN Expansion**—The use of Local Number Portability (LNP) has increased rapidly. In recognition of this, the DMS-10 505 release supports a larger number of Location Routing Numbers (LRNs) while eliminating existing assignment restrictions.

At a glance—Optional features of DMS-10 505 release:

- **Trunk Group Member Usage Study**—This feature allows the telco to study the calling activity of selected trunk groups. Study records are collected for all calls, originating and terminating, and are stored in AMA formatted records. The use of the Trunk Group Member Usage (TGMU) feature has no impact on the existing AMA process because TGMU records are stored separately from the conventional AMA records. A PC-based analysis program provided with the feature allows the telco to study the records and deliver information on "phantom traffic," overall trunk usage for access reconciliation, traffic engineering, and can be used to enhance trunk maintenance. Phantom traffic can cost a telco thousands of dollars per month in lost access charges. Understanding the nature of these losses is the first step to recovering this revenue.
- **Web-Based Subscriber Feature Control**—This feature provides subscribers with a graphical web interface that enables them to manage DMS-10 features from a PC with Internet access. This capability is designed to enhance any telco's image, reduce telco costs by reducing subscriber feature control errors, and enhances revenue potential by making previously complex features easier to use.
- **Operator Services Network Capability**—Telcos with dedicated operator services (OS) trunk groups can simplify their network and reduce maintenance costs by eliminating dedicated multifrequency (MF) operator trunks and using shared SS7 trunk groups for operator traffic.

Standard features of DMS-10 505 release

AMA Recording for SS7 Wireless Traffic

Overview

This feature allows for collection of originating and terminating AMA records on trunk groups directly connected to a wireless carrier via an SS7 trunk group.

Details

Call Code 63-66 AMA records are specified for recording traffic on type 2B connections to wireless carriers. The 2B type connection is a direct trunk group between an end office and the wireless carrier. The original DMS-10 implementation of the type 2B interface was a line side appearance of the wireless carrier via a Line-Trunk DS-1 interface. This feature extends the benefits of the type 2B wireless AMA recording to connections that utilize SS7 signaling. There is a simple provisioning option in the trunk group data that designates the trunk group as a cellular interface to enable this capability.

Hunt Group Voice Mail

Overview

Small businesses served via hunt groups gain better control of their voice mail with this feature. Individual members of hunt groups can be offered full voice mail functionality, including the option of forwarding to voice mail for attempts to hunt group member stations that are busy.

Details

This enhancement gives the DMS-10 the same call forwarding controls for a hunt group that are available on the DMS-100. Enhancements have been introduced for both calls directed to an individual member DN and to the pilot DN.

A Call Forward on Busy (CFB) parameter can now be assigned on non-pilot numbers in the hunt group. Calls dialed directly to a busy non-pilot DN will then forward to voice mail and messages will be left in that DN's voice mailbox. (Note that the CFB parameter is ignored when the line's busy status is being checked during a hunt operation.)

Similarly, a call dialed directly to an idle non-pilot number, when unanswered, will forward to voice mail if the Call Forward Don't Answer (CFD) parameter is assigned with a destination of the SMDI DN.

Traditional hunt group operation causes a call to the pilot DN to hunt past any busy lines until it encounters an idle line, which it will ring. After a preset number of rings, a timeout occurs and the call will terminate to the generic condition for ringing timeout. In the 505 release, two enhancements have been introduced with the Call Forward Group Don't Answer (CFGDA) option. This option can be set to forward to voice mail or to resume the hunt sequence during a ringing timeout situation.

CFGDA with call forward to voice mail

- Calls dialed to an idle pilot number will time out and be forwarded to voice mail and will terminate on the voice mailbox of the pilot DN.
- Calls dialed to a busy pilot number will hunt to the next idle line. If that line goes unanswered after a preset number of rings, the call will be forwarded to voice mail and will optionally terminate on the voice mailbox of the pilot DN or on the voice mailbox of the Last Redirected Number (LRN).

CFGDA with call forward to hunt (Next DN)

- Calls dialed to a pilot number will hunt to the next idle line. If that line goes unanswered after a preset number of rings, hunting will continue to the next member in the group.

EBS Group Name and Number

Overview

Small businesses will enjoy improved branding and visibility as calls from each member of an Enhanced Business Services (EBS) group will all be branded with the published directory number and name of the business.

Details

Previously, calls originating from an EBS group transmitted the originating station DN as the originating number for Caller ID use. The Calling Name for that DN is then obtained from the database for display at the Called Party. With this feature, a telco may optionally assign an EBS group directory number. This number must be a valid, previously assigned DN and, once assigned, all calls originating from the EBS group will have this number attached as the originating number. In this manner, the called party will receive a single Calling Name/Number ID regardless of the station within the EBS group that originated the call.

An exception exists for intra-EBS group calls where the called party will receive the Calling Name/Number information associated with the individual calling party.

Pre-Subscription Enhancements

Overview

Management of carriers can be simplified by providing expanded pre-subscription capabilities for Remote Call Forwarding Appearances (RCFAs) and for default carriers associated with all lines in a thousands group.

Details

Previously, there were limited capabilities for pre-subscription of RCFAs and thousands groups. With the introduction of the 505 generic, the pre-subscription capabilities have been expanded so that RCFAs and thousands groups have the same capabilities as normal stations. A brief overview of the pre-subscription options follows:

- **PRES**—Used to assign an inter-LATA or international carrier.
- **PRS2**—Used to assign a secondary carrier. The secondary carrier may be an intra-LATA, inter-LATA, or international carrier. The multiple PIC feature is required to use the PRS2 option.
- **PRS3**—Used to assign an additional secondary carrier. The additional secondary carrier may be intra-LATA, inter-LATA, or international. The multiple PIC feature is required to use the PRS3 option.
- **PICL**—PICL is a legacy method that was used to assign secondary carriers before the multiple PIC feature and the introduction of the PRS2 and PRS3 options. PICL may be used to assign the PRES inter-LATA carrier for use as the intra-LATA carrier by the use of the TRAP toll region. The use of the PICL option has largely been replaced by the PRS2 and PRS3 options.

All of the above pre-subscription options (PRES, PRS2, PRS3, and PICL) may now be applied to thousands groups or RCFAs. The pre-subscription enhancement to RCFAs allows for simplified provisioning and translations for advanced services which make use of RCFAs. The pre-subscription capabilities for thousands groups allows for default carriers to be established or changed for large blocks of the numbering plan in a single operation. The thousands group pre-subscription is particularly useful for telephone companies that also provide long distance service.

Trunk, Hunt, and Thousands Group Expansion

Overview

The maximum numbers of trunk groups, hunt groups, and thousands groups supported by the DMS-10 have all been increased. This benefits all carriers but is especially important to CLECs.

Details

Trunk groups, hunt groups, and thousands groups all have limits that are determined by the internal data structures of the DMS-10 software. The DMS-10 is increasingly being used as a platform to expand into surrounding territory as a CLEC. The benefit of this feature is that a CLEC may continue to expand and capture new subscribers without concern about exhaust of key provisioning items. The limits for all of these provisioning items are being increased as follows.

Provisioning item	Current limit	New generic 505 limits
Trunk groups	1 – 511	1 – 2,047
Hunt groups	1 – 1023	1 – 2,047
Thousands groups	1,024 available	2,048 available

Local Number Portability LRN Expansion

Overview

The use of Local Number Portability (LNP) has increased rapidly. In recognition of this, the DMS-10 505 release supports a larger number of Location Routing Numbers (LRNs) while eliminating existing assignment restrictions.

Details

The DMS-10 currently allows the assignment of two LRNs per Home Numbering Plan Area (HNPA). To address the growing use of Local Number Portability, LRN provisioning is being enhanced as follows:

- The number of LRNs is being increased to 64.
- The need to associate LRNs with an HNPA is removed from the provisioning process in the 505 generic. This disassociation is a simplification of the provisioning process.

Optional features of DMS-10 505 release

Trunk Group Member Usage Study

Overview

This feature allows the telco to study the calling activity of selected trunk groups. Study records are collected for all originating and terminating calls, and are stored in AMA formatted records. The use of the Trunk Group Member Usage (TGMU) feature has no impact on the existing AMA process because TGMU records are stored separately from the conventional AMA records. A PC-based analysis program provided with the feature allows the telco to study the records and deliver information on "phantom traffic," overall trunk usage for access reconciliation, traffic engineering, and can occasionally point to maintenance issues. Phantom traffic can cost a telco thousands of dollars per month in lost access charges. Understanding the nature of these losses is the first step to recovering this revenue.

Details

The TGMU feature enables the telco to store AMA-like study records on the DMS-10 hard drive in a file separate from the regular AMA file. The feature is optional and is activated by a feature bit. TGMU also requires that the IBSR feature be activated on the DMS-10.

The TGMU feature is applicable only to inter-office MF and ISDN User Part (ISUP) trunk groups. TGMU may not be assigned to Remote Trunk Groups (RTGs), Line Trunk Groups (LTGs), or PRI trunk groups.

Uses for the TGMU feature include:

- **CABS Verification**—The telco can verify the number of messages and minutes of use (MOU) for each IXC Carrier Access Billing System (CABS) bill and can use this information to diagnose phantom traffic. The telco can confirm that its translations are operating properly and that the minutes of use are accurate.
- **Trunk Maintenance**—Data recorded by the TGMU feature can help detect trunks that have abnormally short or long holding times. Short holding times can indicate a variety of technical issues including poor transmission quality. Long holding times might indicate an issue with answer supervision, other technical problems, or possibly fraud.
- **Trunk Group Engineering**—The data can be used to determine the number of simultaneous calls in a trunk group, the duration of an All Trunks Busy (ATB) condition, and the Hundred Call Seconds (CCS) for the trunk group.
- **Special Studies**—Studies such as the quantity of incoming and outgoing calls or the average holding time by NPA-NXX are possible. Also, analysis of calls to or from a specific phone number or group of numbers can be conducted.
- **Cellular traffic**—Since data can be summarized based on the originating NPA-NXX, a measure of traffic arriving from cellular carriers is possible.

All of these recording capabilities operate independently of the DMS-10 AMA billing record creation or processing.

A new TGMU parameter is provided in the trunk group provisioning sequences to indicate whether TGMU information should be collected. TGMU records will carry a Call Code Type of 951. A Structure Code of 0001 will be used and will always include the following modules:

1) A carrier access—terminating module (020) or a carrier access – originating module (021).
2) A trunk module (104).
3) A TGMU module (900)—This is a new module created for the TGMU feature. It will initially include originating line information and the Jurisdictional Information Parameter (JIP) that is not available in existing modules.
4) An LNP extended module (719 or 720) will be included if LNP is encountered during the call, based on how the DMS-10 is configured for this module.
5) Other modules may be applied as they would be on a conventional AMA billing record. For example, if a call is unanswered, a Circuit Release module (025) is appended.

TGMU operates within a Host Switching Office/Satellite Switching Office (HSO/SSO) cluster much as conventional AMA recording does. An SSO will generate and format a TGMU data record and send it to the HSO. The HSO will then store the record in its TGMU file. Thus, the HSO TGMU file will contain an aggregate of TGMU data records for the entire cluster. TGMU data is analyzed using software provided with the feature. This software, developed by Innovative Systems, Inc. (*www.innovsys.com*) operates on a Windows PC with the following requirements:

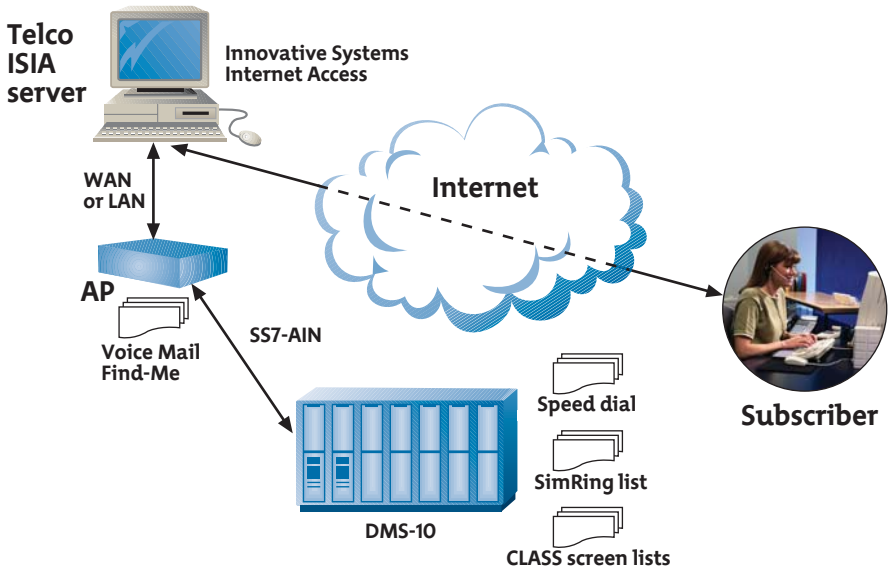
- **Operating System:** Windows® 2000 Professional SP4 or Windows XP Professional® SP1
- **Processor:** Pentium® 3—1.0 GHz. or greater
- **Memory:** 512 MB
- **Drive Space:** 4 GB Free
- **Static IP address**

Web-Based Subscriber Feature Control

Overview

This feature provides subscribers a graphical web interface that enables them to manage DMS-10 features from a PC with Internet access. This capability is designed to enhance any telco's image, reduce telco costs by minimizing subscriber feature control errors, and enhances revenue potential by making previously complex features easier to use.

Figure 1. Configuration for subscriber web control



Details

List-driven CLASS features have been available on the DMS-10 for a long time. Until now, the subscriber managed these lists by using the telephone and interacting with the switch, listening to voice prompts, and responding with touchtone digits. This can be a difficult and cumbersome user interface. One of the improvements in the DMS 10 505 release is a graphical PC interface that allows subscribers to edit lists used to control calling features. The DMS-10 features that may be controlled by the web interface are: Short Speed Calling (SSC), Long Speed Calling (LSC), Selective Call Rejection (SCR), Selective Call Forwarding (SCF), Selective Call Acceptance (SCA), Selective Distinctive Ringing (SDR), and Simultaneous Ringing (SRNG).

Refer to Figure 1 for an overview of the system configuration for the web control feature. The subscriber's PC client interacts with the Innovative Systems Internet Access (ISIA) server, which provides hosting for the web-based service. The ISIA server and the Application Peripheral (AP) are supplied by Innovative Systems. The ISIA server is also used to control Voice Mail and the Find Me-Follow Me services that are implemented in the AP. All of these services are controlled by a common user interface that may be branded with the telephone company trademarks. The ISIA server hosts the web application and requests updates to DMS-10 lists through the AP. The AP formats the requests into Advanced Intelligent Network (AIN) messages and sends the requests to the DMS-10 for processing.

Web-Based Subscriber Feature Control is an optional feature in the DMS-10 505 release. Other requirements include the following:

- Application Peripheral (AP) must be at release 5.0 or greater
- AP must be equipped with the optional software that enables the Web-Based Subscriber Feature Control
- Innovative Systems Internet Access (ISIA) server is required
- DMS-10 and AP must be equipped to provide AIN services
- Subscriber client is available for Microsoft Windows operating systems at or above Windows 98

Operator Services Network Capability

Overview

Telcos with dedicated operator services (OS) trunk groups can simplify their network and reduce maintenance costs by eliminating dedicated MF operator trunks and using shared SS7 trunk groups for operator traffic.

Details

Traditionally, end office connections for operator services calls were routed over MF trunk groups. With the introduction of GR-1277-CORE, *Operator Services: Switching Systems Generic Requirements Using Integrated Services Digital Network User Part (ISUP)* and GR-1144-CORE, *OSSGR Section 6: Signaling*, the feature requirements for routing OS calls over SS7 trunks were defined. With OSNC, a DMS-10 Equal Access End Office (EAEO) can originate or terminate OS calls over SS7 ISUP trunk groups. Similarly, a DMS-10 tandem office can process these calls.

The basic functionality of OS calls remains unchanged with OSNC. These capabilities are simply extended to SS7 trunk groups. One major benefit of OSNC is the ability to merge OS traffic with other traffic types in the same SS7 trunk group. This improves trunking efficiency and simplifies the network. Eliminating the unique requirement for an MF trunk group for OS calls also reduces maintenance issues.

Conclusion

Meeting a wealth of needs with the 505 Generic Release

The DMS-10 505 Generic Release enables service providers to generate new revenue and address the loss of access revenue due to phantom traffic. It also facilitates cost reductions in both facilities and operating expenses. The 505 Generic Release contains a superior balance of features to address the varied needs of DMS-10 operators.

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