Nortel Networks

DMS-10 504 Generic Release

The 504 Generic release provides new features designed to help service providers deliver new revenue-generating services while reducing operating and capital expenditures.

The DMS-10 504 Generic release introduces new revenue-generating services, including Simultaneous Ringing and Telemarketer Call Screening. Support for a new Dual Density ESMA lowers capital expenditures for GR-303 DLC line deployments. Security is enhanced through improved account management capabilities and operational efficiencies are increased with the addition of an online output message manual and facility group identification features.

About this document

This document is an advance planning tool for network planners, engineers, and marketers who need introductory information about the DMS-10 504 Generic 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 Web site at *nortelnetworks.com* 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.

NORTEL NETWORKS

At a glance

DMS-10 504 release introduces new revenue-generating services, security

Nortel Networks announces latest DMS-10 500 Series capabilities for rural market service providers. Enables carriers to 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 504 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.

Standard features of DMS-10 504 release:

- **Dual Density ESMA—**Supported in this release, the Dual Density ESMA doubles the number of ESMA modules in a single frame from 2 to 4 and increases the number of IDTs supported in a single frame from 14 to 28.
- **Security enhancements—**With the 504 release, DMS-10 administrators have the ability to assign accounts and passwords to individual technicians, track activity by individual technicians, and configure technician passwords to expire after a programmable interval.

- **Online Output Message Manual—** The Online Output Message Manual allows DMS-10 technicians to locally or remotely query the system for message number definitions, eliminating the need for every central office technician to have access to a hard copy.
- **Facility naming—**The Facility Group Identification by Name feature allows a descriptive alphanumeric name to be associated with trunk and route facilities, improving ease of use.
- **Alarm Point Expansion—**This software feature enables the DMS-10 to monitor an additional 64 external alarm points which are connected to an MDF-mounted third-party remote alarm processor.
- **Network archive of log files—**This feature enables the system administrator to download log files from multiple DMS-10s to a Windows-based PC.
- **I/O Scripting—**The I/O Scripting feature can increase operational efficiency by providing the ability to bundle a series of DMS-10 commands for execution at a later time.
- **DSI T1 Span Coding Options for LTRK—**The DSI DSLK T1 interface will now support the full range of T1 span coding options.
- **CASO for RCFA—**This feature allows Customer Assignable Station Options (CASOs) to be assigned to Remote Call Forwarding Appearances (RCFAs).
- **Expansion of Emergency Regions—** This feature enables the DMS-10 to support up to 16 Emergency Regions.

- **Query translation enhancements—** This enhancement is designed to make screen queries easier to perform.
- **Station administration enhancements—**Three new station administration features have been added.
- **Time reduction for system load and split load operations—**Enhanced algorithms reduce the time to perform either system load or split load operations to less than 6 minutes.

Optional features of DMS-10 504 release:

- **Simultaneous Ringing—**This service allows a subscriber-defined group of up to five physical or virtual Directory Numbers to be alerted simultaneously.
- **Telemarketer Call Screening—** This feature is designed to screen out telemarketer calls to a subscriber by matching incoming calls with an office-wide programmable screening profile.
- **Alarm Dispatch—**Alarm Dispatch is an enhancement to Alarm Sending which uses a call out list of up to five DNs to report the last raised alarm in the switch.
- **Service Node Trunk Control—** This feature is being jointly introduced with Innovative System's Application Peripheral to support three new services enabled on the Application Peripheral:
  - Find Me Service
  - Click to Dial
  - Budget Toll with Disconnect

Standard features of DMS-10 504 release

Dual Density ESMA

Overview

The Dual Density ESMA feature provides the ability to configure 4 ESMA modules per frame. Currently, it is only possible to assign 2 modules per frame in the DMS-10. This increased density is achieved by introducing a new MVDD frame which houses 4 primary ESMA shelves (instead of 2 primary ESMA shelves and an extension shelf).

This feature allows ESMA primary shelves to be assigned to MVDD shelves 2 and 4. This feature also changes the valid slot locations for assigning EDCH and DS1L in shelf 2 when the shelf is assigned as an ESMA primary shelf.

Details

The dual density application is oriented towards POTS service because the ESMA extension shelves are required to achieve desired penetration of ISDN BRI. The elimination of ESMA extension shelves limits the number of ISDN loops that can be supported. Each ESMA module within the new MVDD frame can support a maximum of 83 ISDN loops.

In a Dual Density ESMA frame, a maximum of 83 ISDN loops can be provided per ESMA main shelf. This number has been derived using the following criteria:

- In the recommended ISDN configuration, 2 EDCHs are provisioned on an ESMA main shelf. Only 1 EDCH is active, providing a maximum of 31 channels. Only 27 channels are used for ISDN loops and each channel supports 4 ISDN loops providing a maximum of 108 loops.

- In the recommended ISDN configuration, one DS1 pack is provisioned on an ESMA main shelf, providing a maximum of 8 DS1 links (24 channels per link) for a total of 192 channels. A minimum of 4 channels are reserved for signaling (2 TMC, 2 EOC), leaving a maximum of 188 channels available for ISDN loops.

- Each ISDN loop uses 2.25 channels (2B+1D), providing support for a maximum of 83 ISDN loops.

Security enhancements

Overview

DMS-10 passwords are presently configurable from two separate locations. Passwords for overlay access are managed from the overlay CNFG (PSWD) prompting sequence, while user account passwords are controlled via a telnet connection in overlay SHEL. With this feature, all passwords and accounts will only be configurable by the system administrator in CNFG. There is also a new level of security by allowing login passwords to be administered as unique user names for all technicians that are provided access.

With the 504 release, DMS-10 administrators have the ability to enforce stricter security measures. Each DMS-10 TTY is equipped with an auto-logout capability that can be used to logout any user whose terminal has been idle for an extended period of time. System administrators can enable and disable auto-logout on an individual TTY basis. The system may be configured so users are required to use alphanumeric user passwords, which can be configured to expire after a programmable interval. The user passwords themselves are encrypted before being written to disk, but a means is provided for Nortel Networks support personnel to reset lost passwords upon request by the service provider.

Details

Often, multiple DMS-10s are managed remotely by a central Network Operations Center (NOC). A technician inadvertently opening a telnet session to the wrong switch could make modifications to it before realizing the oversight. To safeguard against this occurrence, the site name is output before the login prompt and a resident "query site" command has been added.

Currently, logins to standard DMS-10 TTYs are virtually anonymous. Users may be aware of each other's presence, but no identifying information is available to distinguish between authorized and unauthorized personnel. By associating user IDs with TTYs, system administrators are able to monitor access to the DMS-10 more closely and take appropriate action if an account has been compromised.

Online Output Message Manual

Overview

The DMS-10 communicates output messages with system administrators and technicians in large part by printing message numbers. To understand these message numbers, a technician must consult a current release of the Output Message Manual (OMM) on CD or a paper copy. The Online Output Message Manual (O-OMM) allows DMS-10 technicians to query the system for message number definitions. This saves time and eliminates the need for every central office (CO) and Network Operating Center (NOC) technician to have access to a CD or paper copy of the OMM.

Details

The O-OMM interface consists of a single command that is valid at any DMS-10 prompt. The command takes a message number and outputs the OMM text associated with that message number.

If the OMM entry references other documentation, the number and type of the referenced document will also be printed. After all relevant information is printed, the prompt that was active before the O-OMM command was invoked is redisplayed.

In order to provide the maximum value to its users, the O-OMM is context-sensitive. For example, many Data Modification Order (DMO) messages have multiple definitions. When multiple definitions exist and the current context allows the correct definition to be determined, the O-OMM makes this determination. If the current context does not allow the "correct" definition to be determined, the O-OMM prints all possible definitions, along with the contexts in which each is valid. When necessary to locate the appropriate message definition, the O-OMM performs pattern matching.

The O-OMM is patchable. On occasion, DMS-10 Software Support must release patches that introduce new message numbers. These messages are not documented in the OMM version associated with the released generic load. With the release of the O-OMM feature, DMS-10 Software Support is able to release OMM updates in parallel with patches that include new message numbers. Thus, the O-OMM will always contain the latest message definitions.

The O-OMM message definitions are stored on all DMS-10 system disks, in the areas reserved for data associated with a particular release. Definitions are read from disk and displayed to the user's TTY when requested.

Facility Group Identification by Name

Overview
Currently certain DMS-10 facilities are identified only by a number or physical equipment location. The Facility Group Identification by Name feature allows a descriptive alphanumeric name to be associated with selected facilities in the DMS-10. The facilities for which a name can be associated are:

- Trunk Groups (TGs) and most "flavors" of TGs
- Routes
- Digital Signal Interface Links (DSLKs)

Once the feature is enabled and facility names are assigned, the names are displayed along with the TG number, route number, and DSLK equipment location in the DMS-10 system.

Details
The Facility Identification by Name feature applies to the following "flavors" of trunk groups (TGs):

- Standard DMS-10 TGs (incoming, outgoing, two-way)
- Line Trunk Groups (LTGs) and Primary Rate Interface (PRI) LTGs
- PRI Simulated Facility Groups (SFGs)
- CALEA (Communications Assistance for Law Enforcement Agencies) Call Content Groups (CCGs)

All facility names are initially unassigned and may be added as desired. There is no requirement to assign names to all facilities affected by this feature, and assignment of facility names is entirely up to the service provider. Facility names are assignable by DMO wherever the various facility types affected by this feature are assigned and configured.

Facility names may consist of a mix of alphabetic, numeric, and special characters, including any symbols in the printable ASCII range. Names need not be unique, and furthermore, can be undefined. A maximum of 28 characters may be used when naming a facility.

If the feature is enabled and a facility name defined, the name is printed in the DMS-10 system output messages in addition to the number or physical location that is output today. The Output Message Manual (OMM) is updated to reflect messages that add a facility name as an optional printed value.

If the Facility Identification by Name feature is enabled and OPM printouts of facility names is also enabled, defined facility names are output in several OPM blocks in addition to the facility number that is output today. Existing queries of TG data in DMO ODQ (Office Data Query) have been enhanced to allow the entry of a facility name in addition to a TG number. All DMO programs that currently output a TG or route number on a query also output the name. Similarly, all DMO programs that output a DSLK equipment location also output the DSLK name.

Alarm Point Expansion

Overview
Currently the DMS-10 supports a maximum of 63 external alarm points (21 defined, 42 service provider programmable). This feature can benefit those DMS-10 offices that have consumed the standard 63 alarm points and there exists a need for alarm point expansion. This software feature enables the DMS-10 to monitor an additional 64 external alarm points. Where the current alarm point hardware on a DMS-10 has been fully configured, a supplementary MDF-

mounted third-party remote alarm processor is required to deploy the 64 additional alarm points. The additional points are all assignable by the service provider.

Details

The Westronic WS1000 is the supported third-party remote alarm processor. It will be controlled via the industry-standard TBOS protocol over an RS-232 serial interface to a 3T80BB circuit pack located on a DMS-10 network shelf.

The existing DMS-10 Alarm Points remain active and functional as currently programmed with the activation of this feature. The expanded alarm points (65 through 128) are all service provider assignable. The expanded alarm points are assigned and provisioned in a manner similar to the procedure for existing alarm points. To support this alarm point expansion, one of the existing DMS-10 alarm points must be consumed to monitor the power leads to the Westronic WS1000.

Scripting of I/O Dialog

Overview

The Script feature provides the ability to bundle a series of DMS-10 commands for execution at a later time. These command sets (or scripts) can be executed by a single resident command or they can be scheduled to run at a specified time. The potential uses of scripts include:

- Standardize office data modifications so that all switches in the network can be updated in a consistent manner

- Collect office data modifications for implementation at a later time

- Simplification of repetitive maintenance activities

- Simplification of installation procedures

- Automation of trouble clearing procedures

Details

The DMS-10 supports two types of scripts based on the script's origin. Any script delivered as part of a generic release (or patch bundle) is a "vendor script." This provides Nortel Networks the ability to supply common scripts to all telco owners as part of the existing software delivery process. All other scripts are "user scripts."

Scripts also have two formats based on the type of functionality supported within the script. "Standard format" scripts support a very limited set of directives and can best be described as simple series of DMS-10 commands to execute. "Advanced format" scripts use the full functionality of the script interpreters on the DMS-10. Currently the only script interpreter supported is based on the Tool Command Language (TCL).

All scripts are stored in the existing DMS-10 generic file structure. Scripts may be created directly on the DMS-10 or may be created off-line using a text editor and then transferred to the DMS-10. Scripts created using either method are user scripts. In addition, switch-based script creation is only supported for standard format scripts.

Once a script resides on the DMS-10 there are several ways to trigger its execution. The simplest way is to issue a new resident command specifying the script to execute. In addition, triggers can be defined and then associated with a script. These triggers can be a specified time or an unsolicited message. When the specified time is reached or message is output, the associated script begins execution.

When a script begins to execute, commands generated by the script are sent to the DMS-10 for processing as if they were being typed at a Teletype (TTY). The script is processed until all commands are sent to the DMS-10 or a new

resident command to stop script execution is issued. The script will also be terminated if any error occurs in its expected behavior.

Network Archive of Log Files

An I/O Logging feature was introduced to the DMS-10 in the 503 release. With this feature, all input to and output from every physical or telnet TTY connected to the switch is captured. The data is stored in Log Files on the DMS-10 hard disk drive. With the I/O Logging feature enabled, one Log File is automatically created, opened, filled, and closed each day. Accumulation of these Log Files for viewing or printing is limited to a maximum disk space of 200 MB and is available for the last 365 days.

This feature enables the system administrator to download Log Files from the DMS-10 to a Windows-based PC. This may be performed either manually by single file or directory, or it can be set up to run unattended to retrieve all new files since the last update. Once the files are downloaded onto a PC, a system administrator may view or search within a single file, or perform searches on all files available.

DSI T1 Span Coding Options for LTRK

Currently the DSI module supports only the AMI T1 line coding format when used for providing LTRK access. With the 504 release, the DSI DSLK T1 interface will now support the full range of T1 span coding options. In either the LTRK or DTRK in-band application, the DMS-10 will now support either AMI or B8ZS line coding format and either SF or ESF framing format.

CASO for RCFA

Currently, Customer Assignable Station Options (CASOs) cannot be assigned to Remote Call Forwarding Appearances (RCFAs). This 504 release feature allows CASOs to be assigned to RCFAs. Like other RCFA options, CASOs must be added using the "New RCFA" prompting sequence in Overlay DN.

CASOs function identically for RCFAs as they currently function for stations. They can be included as translator tests by redefining appropriate translators using Overlay TRNS.

Assigned CASO options for RCFAs can be queried in Overlay ODQ, similar to querying any other RCFA or station option ("LIST CNTS" or "LIST DN" commands).

Expansion of Emergency Regions

Currently, a DMS-10 can support a maximum of 4 Emergency Regions. With the 504 release, the DMS-10 can support up to 16 Emergency Regions.

Query translation enhancements

This enhancement is intended to make screen queries easier to perform. Currently if a technician desires to query the prefix tree or address tree for all entries that apply to a particular screen, the query must include:

- The destination block and screen of interest, or
- The 1000s group and screen of interest

With this enhancement, to query the prefix tree or address tree, a technician needs to know only the screen of interest.

Station administration enhancements

These following are DN moving/managing enhancements in the 504 release:

- The Move Station (MOV STN) command allows a station to be moved to a new line appearance in one step. Currently a station must be deleted and added to move it from one line card to another. Another benefit of the MOV STN command is that it will preserve any subscriber managed lists (speed call, call forward, CLASS station lists) when a station is moved to a new location. This enhancement is currently valid for the following line card moves: 6X17 to 6X17 or 6X18, and 6X18 to 6X18.

- The DMS-10 can now terminate a call in progress on Suspend (SUS). Currently, DNs on the Suspend overlay are prevented from originating/receiving new calls, but administrators are unable to terminate a call in progress.

- With this release, a date stamp will now be added to note when a DN is retired to enable fulfillment of an FCC requirement of allowing retired DNs to age before re-assigning them to another station. This will provide a record of retired DNs sorted by their age since retirement.

Time reduction for system load and split load operations

Enhanced system loading algorithms combined with patching enhancements reduce current recovery time by a factor of four. Currently a system reload operation can take up to 25 minutes to complete while a split load operation can take 25 minutes or longer to complete. With enhanced system loading algorithms and patching enhancements, the time to perform either system load or split load operations with the 504 release will be less than 6 minutes.

Optional features of DMS-10 504 release

Simultaneous Ringing

Overview

The Simultaneous Ringing (SimRing) service allows a subscriber-defined group of up to five Directory Numbers (DNs) to be alerted simultaneously. The SimRing group is comprised of a single Pilot DN (PDN) and up to four Non-Pilot Member DNs (NPMDNs). The simultaneous alert occurs when the Pilot DN receives a call. The first alerted DN that answers the call is connected to the calling party, while the calls to the other alerted member DNs are released. The SimRing Virtual Directory Number (VDN) feature also allows the SimRing option to be added to a Pilot DN that does not have a physical line card appearance on the switch.

This feature can be purchased in 25 subscriber blocks.

Details

The SimRing service allows the subscriber to activate or deactivate the service on the PDN as well as edit the list of NPMDNs via a voice prompting, menu-driven subscriber interface. SimRing can also be set up so the subscriber can perform these tasks remotely from any location through an Access DN (ACDN). The use of Personal Identification Number (PIN) codes provides the subscriber with necessary security protection.

The SimRing service is a terminating end-office feature. All SimRing group MDNs receive simultaneous notification when the PDN receives a call. The first MDN that answers the call connects to the caller, and the other MDNs stop ringing. Toll charges will be incurred by the subscriber if they exist between the PDN and answering MDN. The caller does

not know that the called DN is a Sim-Ring group PDN. The caller does not know that all of the SimRing group MDNs have received notification of the call.

The SimRing group PDN must be on a DMS-10 switch. The NPMDNs can be any valid dialable DN in the North American Public Switched Telephone Network (NA PSTN). Interoffice trunking between the DMS-10 switch and other NPMDNs may use any type of trunk.

A virtual PDN is a DN on a DMS-10 switch that is assigned as the SimRing group pilot DN but it has no physical line appearance. A virtual PDN is used to offer SimRing service to subscribers in the local calling area who are hosted off of a switch that does not provide SimRing service. The subscriber has remote access to the subscriber interface by dialing an Access DN.

Telemarketer Call Screening

Overview
The Telemarketer Call Screening (TCS) feature is designed to screen out telemarketer calls before they ring through to a subscriber. TCS service intercepts calls that are suspected to be telemarketer calls to the subscriber's line. The service plays a screening announcement stating that the party they have dialed does not accept calls from telemarketers, and to dial "1" if the caller wishes to ring through.

This feature can be purchased in 25 subscriber blocks or across the entire office.

Details
Call screening can be performed based on one or more reasons for not identifying a calling number or calling name.

The reasons fall under the following categories:

• Calls with Caller ID unavailable (incoming calls on In-band Signaling Trunks or ISUP calls with no Calling ID)

• Calls with caller information blocked by access code (CNAB, CNB, CNNB) or privacy option

• Calling name is unavailable

• Calls with calling number that matches a digit pattern in TCS list

Calls matching a calling number are anticipated to be telemarketer calls. For these calls, a list is maintained in the office to store the fictitious numbers or blocks of numbers suspected of being used by telemarketers. The numbers in the list can be a digit string of 3 to 10 digits in length. When the list matching criteria is enabled and a TCS subscriber is called, the calling number is matched against those in the list. The same number of digits stored in each entry is matched against the calling number. Calls whose calling number patterns match are connected to the TCS announcement. The calling numbers of all calls are matched against those in the table, including those from 'private' subscribers or those that have blocked their number from the called party.

Alarm Dispatch

Overview
Today, DMS-10 offers the Alarm Sending (ALSD) feature that provides alarm reporting to an operator at a remote location. When an alarm is detected, ALSD seizes a specific trunk and places a tone on it to indicate an alarm has been raised in the switch. ALSD can be configured to report catastrophic, major, and minor alarms in overlay CNFG (ALRM).

Alarm Dispatch (ALDP) is an enhancement to alarm sending. ALDP uses a call out list of DNs to report the last raised alarm in the switch. The service provider can add up to five DNs to the call out list, each tied to call-back timer. These DNs can route to intra-office lines, intra-LATA/inter-LATA numbers, cell phones, pagers, etc. The technician responds to the call by calling the Alarm Checking (ALCK) number defined in the switch.

Details
ALDP can be set up to apply a tone or out pulse a number when the call out DN is answered. The tone indicates to the technician that an alarm has been raised in the office. If the call out DN is to a pager, then the DMS-10 can leave the ALDP calling party number, indicating that an alarm has been raised. Once notified, the technician will need to call the ALCK number to determine the class of alarm.

The ALDP call can be handled in several different ways:

• The call is answered and the tone is applied to the line. The technician hangs up and calls the ALCK number to acknowledge (or accept) the alarm.

• The call is answered, the tone is applied, but the alarm is not acknowledged. Once the acknowledgement timer expires, ALDP will roll to the next DN in the call out list.

• The call is not answered. Once the acknowledgement timer or the ring back timer expires, the call rolls to the next DN.

• If the call fails to terminate because of a busy line, ALDP will retry the number for ten minutes. If the call is not answered within this time, ALDP rolls to the next DN.

• If the call fails to be acknowledged by any of the DNs assigned in the call out list, then ALDP cycles back to the start of the list. The service provider can set up the feature to wait a defined amount of time before restarting the alerting process. Once ALDP cycles through the call out list three times, the alerting process is stopped. However, at the top of each hour, the alerting process will restart if the alarm has not cleared.

Extending capabilities of the DMS-10

Optional Feature
Service Node Trunk Control

Overview

The Service Node Trunk Control (SNTC) feature consists of two complementary functions—Service Node Release (SNR) and Service Node Barge-In (SNB). SNR provides the capability of "dropping" the Service Node (SN) out of a call when its trunks and services are no longer required,

eliminating the SN from the call path. SNB provides the capability of "adding" the SN into a call when requested.

The SNTC feature is designed to be interoperable with any AIN service node. However, the feature is being jointly introduced with the Innovative Systems Application Peripheral. Release 4.2 of the Application Peripheral will support the SNTC interface, concurrent with the 504 release. The Application Peripheral will introduce three new features in release 4.2 that are enabled by the SNTC feature. These are:

• Find Me Service

• Click to Dial

• Budget Toll with Disconnect

Details

The DMS-10 interfaces to the SN with Common Channel Signaling (CCS) links. The SN has its own point code, supports SS7 links, and utilizes ISDN User Part (ISUP) signaling.

The SNR feature provides for the release of trunks to and from the SN when the trunks are no longer required for a call.

When the SN determines that it is no longer required in a call, it will inform the DMS-10 by sending an ISUP Facility Message (FAC).

The SNB feature allows the SN to insert itself into a call. To accomplish this, the SN will set up a call to itself through the DMS-10. It will then inform the DMS-10 that it would like to barge into a call via an ISUP Facility Message.

Billing will not change after a successful SNR or SNB. Each leg of the call will be billed according to current requirements.

Meeting a wealth of needs with the 504 Generic release

The DMS-10 504 Generic release enables service providers to deploy new revenue-generating service as well as enhance administrative security of the switch. Operating efficiencies are enhanced with the Online Output Message Manual, Facility Naming, and Alarm Dispatch features. And deployment of GR-303 DLC lines becomes more economical with support for the new Dual Density ESMA. Overall, the 504 Generic release is a great balance of features for the varied needs of DMS-10 service providers.

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