Hands-On DMS-10 System Translations, Routing, Trunking along with Troubleshooting Techniques

Course Description

This Hands-On course will provide the skills necessary to perform day-to-day Translations and Routing including methods of Trunking. Determine how to troubleshoot translation failures which cause major service-affecting faults, lost and failed calls. Develop non-intrusive exercises to equip the students to conduct translation and routing procedures. Students will also cover various types of documentation including Helmsman , which will help greatly assist the operator working with the switch.

Widely recognized as the worlds first all-digital switching system, the Nortel DMS-10 is one of the most popular digital switches ever produced, and still remains in widespread use today .The DMS-10 Switch Translation Course will focus on providing the student with a detailed system description. Table development and modifying of translation tables created from office routing configurations. System architecture is discussed, with diagrams showing functional blocks, card level call processing, and all main modules including the various peripherals, including remotes typically used in Host/Remote configurations.

The switching network is also discussed in relation to call traffic carrying capacity, describing DS-30 PELP links, and the various types of line and trunk types they connected to specific peripherals for a given system. Miscellaneous Equipment is also discussed, including connections to CCS7, ANA (announcement systems). The DMS-10s command line interface, including System Level commands and menu Overlays are also demonstrated in detail.

Many practical examples such administration of MO system images, line testing, trunk testing, and alarm interrogation are shown. Training may include any topics of particular interest to the student, or to a given region, and may also include optional subjects like alarm descriptions, scan and signal distributor points, network management, Traffic details and external alarming. Finally, the Helmsman documentation viewer and NTPs (Series 602) are covered in detail, with an emphasis on the documents used for data modification, translations and output message systems .

Students Will Learn

- **Switching Fundamentals (Introduction)**
- **Theory of Operation - DMS-10 Topology**
- **The primary equipment bays and modules used in a DMS-10 switching system, including the different types**

of remotes, plus key system features.

- **How to use the Command Interpreter, and the various types of commands**
- **Terminal Access - TTY**
- **Various types of documentation, Helmsman, NTPs, and installation drawings**
- **All translation Tables with emphasis on New and Change**
- **How to trace call progression through translation queries.**
- **How to query directory numbers, trunk groups, and other databases**
- **Where to find Emergency Procedures documentation such as recovery from system failures.**
- **How to use day to day translations (Operations)**

Target Audience

Clerical and Technical staff such as personnel responsible for Central Office Translation, Routing, Trunking, Provisioning as well as CO Technicians, NOCSCC (Network Ops Center), management personnel, and those seeking cross-training on system interoperability. Technicians who are responsible for the maintenance and troubleshooting of Central Office systems, plus NOC personnel who respond to alarms, etc. No previous switching background is required, although some familiarity with CO equipment will be beneficial, providing a greater understanding of the resources needed to maintain and operate the system, and want a better understanding of translations and their crucial role in maintaining the switch.

Prerequisites

A basic understanding of telecommunications and switching principles is helpful due to the accelerated nature of the course. Our BTS Telephony for TeleCom Techs or our TDM Switching Fundamentals Course is available for students with little or no previous telecom background.

Course Outline

Module 1: Switching Fundamentals - T&R, E&M, 2/4/8 Wire Circuits

Negative Talk Battery
AC & DC Superposition
Decibels log scale copper, optical
Digital: A/D & D/A Conversion Nyquist Theorem Multiplexing Samples PCM bit depth
8-bit, 10 bit Binary & Hexadecimal overview
Time Division Multiplexing (TDM) Pulse Code Modulation (PCM) Line Coding DS0/1/3 DS-30, DS-512
Transport: AMI, B8ZS, OC-x, STS-x
Stored Program Control (SPC)
Time-Space-Time

Module 2: DMS-10 Theory of Operation - DMS-10 Topology

Functional Block Diagram
Time Stage/Peripherals - Space Stage/Network incl. different matrix varieties
Hardware Modules (400, 500 and 600 series): CPU - 3T98, memory options, SDI/terminals IOI/GPIO: MO, 8T90 disk drive units, tape Network (Classic, CNI), MLI Interface, DS-x/PELP links Alarm, Ring Monitoring ME-CCS CE/PE Equipment (line, trunk incl. PSHF, DCM, etc.) LCM/LCME (various types), LCA, Drawers
RLCM, RSC, OPM, ESA Option, etc.
End-to-End Call - SS7 Network Routing

Module 3: Terminal DEVICES

TTY 0 & 1, EIO, SMDI
System Passwords
Login, Logout
Resident Commands Sample RES Commands
Overlays, Sample OVLY Types Examples
Basic Command Structure
Telnet (SHEL), RTOS UNIX shell N
TP 297-3601-300 - Input/Output System

Module 4: Commands

Logi, Password, ####, ?, ****, Logo - Resident (RES) Level: LOGI, DEBG, OVLY, QUE, TIME, MSG, STAT, etc. - OVLY: ALO, CED, CKT, DED, DN, IOD, PED, etc. - CKT - LIST, STAT, BUSY, RTS, etc. - CED - CLK, CORE, XTDR, etc.
Critical, Major, Minor indicators
NTP 297-3601-903 - Output Message Manual

Module 5: Documentation

Helmsman v4.x
CD-ROM, Server, Virtual Machine
Nortel Technical Publications (NTP)
297 Series (issues may vary) 297-3601-100
General Description 297-3601-150
Equipment Identification 297-3601-311
Data Modification Manual 297-3601-316
DIP Switch Settings 297-3601-511

Maintenance and Test 297-3601-902
Output Message Manual 298-3601-903 P1&P2
Job Site Documentation
Equipment Assembly
IS - Interconnect Schematic
SD - Schematic Diagram

Module 6: Maintenance (Overview)

Using the LIST Command: LKOT, FALT, BUSY, etc.
Lines: PE (2T0x) LCE (6X17) HAZ
Trunks: PE (6X30/31/32) CE (6X50)
Locating Cards: QUE Examples - Replacing Line Pack: 6X17
Replacing Ring Card: 3T59 vs. 6X30
Test: PE (2T14, 2T19, 2T72) RA (2T85) OVLY TLT: Line Testing, LIT
System Images: DUMP MO
Translations: OVLY CPK NEW LPK (DEL) OVLYDN NEW STN (DEL, CHG, QUE) OVLY ROUT OVLY ALRM & Alarm Points - Exercises

Module 7: Troubleshooting

NOC/SCC Interaction
ESD Precautions
Examples: TTY0 Connectivity, DSDI MO0 Card Change, Format HD Card Change, BKUP
Alarm Investigation: LIST ALM ALPK LIST ALL STAT - CLK: STAT SYNC
OVLY SHEL ARP, Ping, TELN - Emergency Procedures (EP): Cold Start Example
Student Examples

Module 8: Translations (FUNCTIONAL)

Lines/DNs Service Order Commands (ACT, ADO, DEL, DLO, MOV, NEW, etc.) Create a Line Pack
Trunks
OVLY TG (INC) (OGT) (2WAY)
OVLY TRK, OVLY DTRK
QUE TRK
Tracing Translation Tools and Tables OVLY CLI OVLY TRAC
TRVR, OVLY QTRN
OVLY TRNS (ADDR) (PRFX) (SCRN) (CNFG)
OVLY THGP
CREATE OFFICE ROUTING MAP
Create System High Level Overview

Equipment Requirements

(This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

Course Length

5 Days