

Hands-On

DMS-100/200 Switch Overview, Hardware, Maintenance and Troubleshooting



Course Description

This extensive course provides the skills required to perform maintenance and a high-degree of troubleshooting, and will walk the student through a practical understanding of the Nortel DMS-100/200 switching system. It discusses the general system architecture used by all Digital Multiplex System switches, with functional block diagrams of the switch and its main modules, including the SN/XA, CCS, IOD, and the various PM types related to trunks, including the DTC, DTCI, SPM, and other special trunk peripherals. The LCM line module used in DMS-100s is discussed briefly, which will demonstrate a simple PCM phone call, and how that call may traverse a trunk to an Access Tandem switch. Use and cabling of the MAP and RTIF terminals is explained, plus remote access through serial TTY. Alarm interpretation from the MAPCI is demonstrated, and how to interrogate alarms further, so the student can locate cards within the system. Log messages are used to lookup alarm descriptions, and form the basis for troubleshooting action. The Helmsman documentation viewer and NTPs are also covered in detail, with an emphasis on documents used for maintenance and troubleshooting procedures.

Previous troubles are reviewed and used as exercises, including TRKS (trunk) maintenance and TTP testing, but also parts of the SuperNode/XA-Core front-end (SN) including the Computing Module (CM), Network (NET), Message Switch (MS), and CCS modules. Peripheral Modules (PM), and modules of particular interest to the students are emphasized. IOD maintenance is also discussed, including procedures to backup Program and Data stores, and a discussion of how hard disks, tape, and BMC devices are connected to the system. The greater SS7 network is also reviewed, and the role of an AT switch.

Our non-intrusive exercises equip the student to conduct day-to-day maintenance activities, perform troubleshooting procedures, and much more. The course is flexible, allowing the most important content for a particular group of students to be emphasized.

Target Audience

Technical staff such as Toll and CO Technicians, NOC/SCC, certain management personnel, and those seeking cross-training or system interoperability with the DMS-200 access-tandem switch.

Prerequisites

A basic understanding of telecommunications and switching principles is helpful due to the accelerated nature of the course. Our Telephony Today for Telecom Technicians Course is available for students with little or no previous telecom background.

Course Outline

Module 1 : Telephony Overview

- Lines versus Trunks
- T&R (2W), T1&R1 (4W), E&M, SG&SB
- Battery
- Supervision
- Analog Signals
- Digital: A/D & D/A Conversion
- Time Division Multiplexing (TDM)
- Pulse Code Modulation (PCM), DS0/1/3
- AMI, B8ZS
- Optical Transport - OC-x
- Stored Program Control (SPC)
- Time-Space-Time
- Class 3/4/5 and Access Tandems
- Signaling: In-Band/Out-of-Band
- SS7 Overview - EAEO/SSP & STP, Link Types
- Equal Access: InterLATA, IntraLATA, LNP/AIN

Module 2 : DMS-100/200 Theory of Operation

- DMS-100/200 Topology
- Functional Block Diagram
- Time Stage/PM
- Space Stage/Network
- Hardware Modules:
 - SuperNode incl. ENI, CM/SLM, MS, LIS (JNET, XA-Core as required)
 - IOE, IOD, MAP, RTIF, DDU
 - CCS, LIU
 - PM - Types I, II, & III (SMU, NIU, etc.)
 - DS-30/512 Links
 - LCM (summary only)
 - DTC/DTCI/SPM/OC-3 Trunking
 - TME, MTM, TM2/4/8, ISM, etc.
 - Remotes (summary only)
 - SE - other Service Equipment, DSX, Terminal Server, etc.

Module 3 : Terminal Access - MAP & RTIF

- Maintenance and Administrative Position (MAP)
- Login (\$\$, Break, ?), Logout
- System Level
 - Sample SL Commands
- Command Interpreter (CI)
 - Sample CI Commands
 - Screen Layout - prompt, CM, MS, IOD, Net, PM, CCS, Trks, Ext, Appl
- Basic Command Structure
- Remote Terminal Interface (RTIF)

- A1 Indicator
- CM cabling
- Local & Remote TTY
- NTP 297-1001-129 - Input/Output System

Module 4 : Commands

- System (SYS) Level: msg, restart, permit, etc.
- MAPCI: MTC, other choices, entering 0
- Trks sub-menus
- CM, MS, IOD, Net, PM sub-menus
- Examples: MTC Status, Query, BSY/TST/RTS
- help, q
- Quit, Abort
- Examples

Module 5 : Documentation

- Helmsman v4.x
- CD-ROM, Server, Virtual Machine
- Nortel Technical Publications (NTP) - 297 Series (issues may vary)
 - 297-1001-120 - Equipment Identification
 - 297-8991-805 - Hardware Description
 - 297-2651-546 - Routine Maintenance
 - 297-8021-543 - Alarm Clearing and Performance Monitoring
 - 297-8021-544 - Trouble Locating and Clearing
 - 297-8021-547 - Card Replacement
 - 297-8021-545 - Recovery Procedures
 - PLN-5001-001i - Technical Specification
- Job Site Documentation
- Examples

Module 6 : Maintenance

- Locating Cards, Trkquery, LISTALM, etc.
- Replacing Cards:
 - ESD Practices
 - POST, OFFL/BSY, TST, RTS
 - Card Compatibility
 - Correct Module Extraction & Insertion
 - CLRALM
- Test:
 - TME, TMx Analog Trunks, MTM
 - PM:TME, TstEquip
- DTC, DTCI & other trunk controllers
- SPM/SPME - Optical Trunking
 - mapci;mtc;trks
 - TRKSTRBL, STAT, etc.
 - mapci;mtc;trks;carrier
 - mapci;mtc;trks;ttp

- DispGRP, TTP, CktInfo, Trkquery, etc.
- Perfmon, BERT (DATA)
- CCS, C7TTP
- Logutil
- System Images: 1X55 DDU, 9X44 SLM
- Alarms:
 - Alarm Levels
 - Status - MMB, SysB, ManB, Offl, Istb, etc.
- Routine Exercises (RExtest)

Notes

This course can be combined with other courses in the DMS-series to provide support and translations training with a customized curriculum best suited to your needs.

Delivery Method

Instructor-Led with numerous exercises throughout.

Equipment Requirements

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

Customer must provide physical or remote access to a DMS Switch for non-intrusive training.

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