DMS-100 System Maintenance and Troubleshooting-5

Course Description

The DMS-100 System Maintenance & Troubleshooting course provides extensive information on the design, maintenance, and troubleshooting of the Nortel DMS-100 switching system.

The course will provide the skills necessary to perform day-to-day maintenance, plus show how to troubleshoot service affecting faults. Various types of documentation will be discussed. This course should also greatly assist personnel when working with next-tier technical support.

Our Hands-On non-intrusive exercises equip the students to conduct maintenance activities and perform troubleshooting procedures and much more.

Students Will Learn

- **A review of the basics, including Tip & Ring, battery, A/D & D/A conversion and PCM**
- **The primary bays and modules used in the DMS-100 switching system, including different types of remotes, SS7 connections, and key system features**
- **How to use the MAP Command Interpreter with Level and OVLY commands**
- **Various types of documentation including the Helmsman document viewer, NTPs, and installation drawings**
- **How to find the physical location of a fault**
- **How to change packs in various bays**
- **How to query directory numbers, trunk groups, and other database**
- **Basic service order processing**
- **Where to find Emergency Action Procedures documentation**
- **And much more...**

Target Audience

The course is intended for those who are responsible for the maintenance and troubleshooting of Central Office systems, plus NOC personnel and first responders who respond to alarms. No previous switching background is required, although some familiarity with CO equipment will be beneficial. Certain management and provisioning personnel will also benefit, providing a greater understanding of the resources needed for the system, and how to program it.

Prerequisites

A basic understanding of the DMS-100 system.

Course Outline

Module 1 PSTN Overview

- The Public Switched Telephone Network
- Lines T&R, talk battery, AC & DC
- Analog Transmission including waveforms
- Digital Transmission data transmission, A/D conversion
- PCM 8 & 10 bit, DS-30/60/512 introduction
- Stored Program Control and Time-Space-Time

Module 2 Introduction to the DMS-100

- The DMS Family
- System Theory of Operation
- Modules CPU/CMC, NET, DCM/TRKS, PM, IOD, EXT, etc.
- Frames CC, SN/SNSE, IOE, LCE, CPCE, PE, MS7E, DNSE, etc.
- DS Links
- Service Equipment
- MAPCI Maintenance and Administrative Position Command Interpreter
- Common Circuit Pack Types
- Review/Switch Tour

Module 3 Remotes

- RSC Remote Switching Center
- RCU Remote Carrier Urban
- RLM Remote Line Module
- DMS-100 System Maintenance & Troubleshooting
- RDT Remote Digital Terminal (GR-303)
- RLSE Remote Subscriber Line Equipment
- RSLM/OPM Remote Survivable Line Concentrating Module
- RLCM/OPM Remote Line Concentrating Module
- SRU Small Remote Unit
- SLC-96 Subscriber Carrier Module (Subscriber Loop Carrier 96 Line)

Module 4 Documentation

- Helmsman (4.2.1) & Microsoft Windows Explorer search options
- Nortel Technical Publications NTPs:

- Document Directory (297-8991-001)

- Network (591)

- Input/Output (590)

- Peripheral Module (592)

- External Devices (593)

- Lines (594)

- Trunks (595)

- Site-Specific Documents
- Schematic & Inter-Bay Connection Drawings

Module 5 General Procedures & TTY

- NTPs:

- Input/Output System Reference Manual (129)

- Maintenance System Human-Machine (520)

- Maintenance & Test Manual - General Procedures (GP)

- Basic Administration (300)

- MAP Terminals serial & Telnet, RTIF
- Command Interpreter Level Commands
- Command Interpreter Overlay (OVLY)

- NTPs:

- Common Maintenance Commands (822)

- Hardware Reference Manuals (297-8991-805)

- GP Examples
- Exercises
- Review/Switch Tour

Module 6 Maintenance & Preventative

- NTPs:

- Maintenance System Maintenance Guide (106)

- Maintenance and Administration Tools (107)

- Routine Maintenance Procedures (546)

- Card Replacement Procedures (547)

- Disk Maintenance Subsystem (526)

- Ringing System (131)

  - DIP Switch Settings
  - MAPCI: MTC NET, PM, IOD, CC, CM, MS, TRKS, etc.
  - Define: BSY, OFFL, TST, RTS, QUERY, SWACT, etc.
  - Line Packs Example (6X17)
  - Peripheral Equipment Pack Example (various trunk)
  - Ringing (6X30)
  - DUMP IMAGE, AUTODUMP
  - BMC, AMA
  - DPP (539, 544, 545)
  - BERT
  - CCS7 Maintenance (297-8991-545)
  - Log Reports (840, 129) LOGUTIL, DLOG, FOOTPRT
  - Examples/Exercises
  - Review

Module 7 Troubleshooting

- Alarm System Description
- Service Problem Analysis (318) - DMSMON
- Looking-up Alarms Trouble Locating and Clearing (544)
- LOAD: EN, FW, MS, PM, etc.
- SWACT definition, cold, warm, precautions
- JAM
- Locating Faulty Packs
- Changing a Pack (non-maintenance window)
- Exercises
- Review/Switch Tour

Module 8 Emergencies

- Emergency Action Procedures (EAP)
- Recovery Procedures (545)
- Loading Tape, Disk
- Power & Circuit Breakers
- Review
- Module 9 Provisioning Overview
- Features (801)
- Service Orders (808)

- Directory Numbers & Line Equipment Assignment
- CLASS & CCF Features
- QDN, QPDN, QLEN, QGRP, CONVERT
- Translations (360) TRAVER
- Operational Measurements (OM)
- Office Parameters (855)
- UNIX commands
- Review

Module 10 Summary

- DMS-100 Block Diagram
- End-to-End Call Example
- LCE Example
- Class Exercises (look at real faults and historical fault data)
- Course Evaluation

Notes

This course can also be delivered in a 5-8-10 day formats, depending on the amount of labs and specific topics covered.

The course is designed to run in a classroom setting, but additional length is added upon request to provide a greater understanding of foundational topics, such as telecom network/stored-program control background, PCM theory, hexadecimal-binarydecimal conversion, and the many tracing functions available in the DMS-100. More complex troubleshooting concepts can be introduced with this course including various debug logs, inter-bay cabling, and backplane fault analysis (i.e. to help provide a tier-2 expert level of support) for students who need additional skills. Field trips to actual premises are used to allow students an opportunity to see and understand where all the parts of the system are found, what they do, and provide a better end-to-end understanding of the switch.

Delivery Method

Instructor-led with a flexible approach that adjusts content most relevant to students. Includes various non-intrusive labs, demonstrations, and exercises to help students focus on and retain
the material presented.

Equipment Requirements

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

Access or remote access to a DMS100 Switch is required for this 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