Hands-On LIVE Virtual DMS-100 Switch Advanced Support Course

Course Description

This extensive Virtual Live Instructor-led course provides the skills required to perform support and a high-degree of troubleshooting for the DMS-series of switches. The course begins with a fast review of key system operating principles and terms, including use of the CI and MAPCI terminals, and advances quickly to more complex subjects like core and network options, including the scalable XA-Core processor. The original Junctor Network (JNET) and later Enhanced Network (ENET) options are discussed, based upon the needs of a given class. The Link Peripheral Processor (LPP) is also a focus, explaining this new processor's role as both a front-end device and a peripheral module.

Peripheral Modules (PM) are then discussed in detail, looking at the PCM and control signal paths, including cable connections between different devices on the P- and C-sides. Remotes are also discussed in some detail, including important sub-modules like the HIE, ESA, and RMM. Power and grounding are also reviewed, plus how alarms are wired. Routine exercises are compared in different MAPCI menus, to see how options differ in modules like ENET, CM, and lines, including line power converters. Special formatting cards used for SLC-96 and GR-303 are also shown, including how EOC & TMC channels support RDT remotes.

The course then looks at various types of documents, including installation docs which describe backplane and cable connections, and how to locate information needed for troubleshooting. Commonly used menus are augmented with hidden or lesser-used options. Certain types of Operational Measurement and debug tools are highlighted. The course then moves to more challenging troubleshooting scenarios, looking at the process to change common equipment devices that affect many circuits, including system recovery steps, such as non-restart SWACT up to a full reload restart.

Previous troubles are reviewed and used as exercises, but time is also reserved for students to present their own experiences or actual troubles which they may currently be working with, providing broad exposure to many different types of faults in a short time. Our non-intrusive exercises equip the student to conduct support activities, including aspects of cabling and the backplane, which helps them to provide assistance to those with less knowledge of the system.

Students Will Learn

- **DMS-100 System Review including all types of remotes**
- **Advanced Access CI, MAPCI & RTIF, plus logs & reports**
- **Core design & cabling - including CM/XAC and JNET/ENET options**

- **How to find trouble symptoms from various sources**
- **Documentation including Alarm Clearing, Recovery, and Cabling**
- **How to find the physical location of a fault**
- **How to trace faults through different modules**
- **Tables - tables such as inventory are demonstrated**
- **Fault examples including CM & PM load scenarios**
- **Restart & reload procedures**
- **And much more**

Target Audience

Technical staff such as Central Office Technicians, combo-techs, and those who are responsible for the maintenance and troubleshooting of Central Office systems, plus NOC/SCC personnel who must provide technical support. Certain management and provisioning personnel will also benefit, providing a greater understanding of the resources needed for the system, and how to support it.

Prerequisites

Students should have previously taken the DMS-100 Maintenance and Troubleshooting course, or have a good working knowledge of DMS-100 switching principles and MAPCI use.

Course Outline

Module 1 : DMS-100 Switching Theory

Review:
- DMS-100, 200, 250, 300, 500
- CM/XAC, MS, Network, LPP
- Lines, Trunking, SPM, GR-303 IDT (incl. VoIP)
- RLCM (incl. OPM), RCU, Clusters, GR-303 RDT, SLC-96
- MTM, 4TEL

IO:
- MAP, Telnet, direct serial, RTIF

PCM:
- Network Review
- Pulse Code Modulation (PCM)
- DS0/1/3
- DS-30, DS-30A, DS-512

Binary & Hexadecimal Review

Commands:
- CI, SYS
- Logutil
- System Restarts

MAPCI:
- Telescoping
- Hidden Commands
- Alarm Interrogation
- Command Options (i.e. _PORT, _CARD, _IOC, etc.)

End-to-End Call

Module 2 : Front-End Architecture

DMS-core:
- CM (9X-Series)
- XA-Core Structure (NTLX-Series)
- Scalability (i.e. PE, SM, TELN)
- RTIF Connections

DMS-bus/MS:
- Message Arbitration
- Clocking
- Cabling - SR-512 (Core), Network

Network - JNET:
- 0X48, 5X13, 7X27, 7X40, 8X11 (as required per class)
- Parallel & Serial Junctors, NMs
- Connections: MS, CM/XAC, LPP

Network - ENET:
- 16K, 64K, 128K XPT
- V-Bus & H-Bus

IOM:
- CONS, RS-232C Serial
- SLM & DDU/SCS

LPP:
- LIM, ASU, F-Bus, C-Bus
- LIU7 & CCS7
- EIU
- NIU
- Packet Connections

Front-End Cabling
- Backplanes
- Address/Control, PCM, packet & Ethernet, TTY consoles, power
- Labeling

Module 3 : Peripheral Architecture

PM:
- I: TM, MTM, OAU/AXU, other relevant modules
- II: LGC/DTC/LTC & ISDN variants, SMU/SMR/SMA2 (incl. ESMA/GR-303), LCM/LCME
- III: LPP, EIU, LIU7
- SPM, Optical-Carrier
- Backplanes
- Peripheral Cabling (DS-30/DS-512, address/control, ringing, power)

REx & COVREX:
- Running, results, on-demand

Interconnections:
- Cable types & locations

Paddle boards
Reading backplanes

Module 4 : Remotes & Links

Types:
RSC, RLCM, OPM, DMS-1U/1R
Supporting equipment:
RCC, HIE, ESA, RMM
Carrier:
Copper, optical links
Data, voice links
SLC-96
GR-303:
EOC, TMC channels
Packet Devices (i.e. Calix C7)

Module 5 : Documentation

Viewers:
Helmsman & PDF viewers
CD-ROM, Corporate Server, or Virtual Machine
Types:
Nortel Technical Publications (NTP) - 297 Series
PLN-5001-001i Technical Specification
Installation Manuals: System Cabling
TAM: Debug Manuals
Equipment Cabling
Exercise:
Looking-up a 6X44 Fault

Module 6 : Alarms & Testing

Investigation:
MAPCI, Queries, Status, Visual Indicators, Reports
Locating:
CKTINFO, CKTLOC, LOCATE, TRNSL C & P (from different origins)
Posting:
POST command options & use scenarios
post dtc, post spm, post trks, post pm, post carrier
Alarms:
Scan points, Distribution points
Office Alarm Unit (OAU), Alarm Extender Unit (AXU)
Clocking:
Backplane clock signals - for oscilloscope reference
PM:
QUERYPM, REx, Logs
Example: PM Reload
REx:
REx, COVREX - Interpreting results
Scheduling, On-demand REx test
Logutil:

open, first, forward, back, last, quit, etc.
Other Tools:
Operational Measurements
Service Problem Analysis
Debug (TAM)
Other alarms:
Power, grounding, frame alarms, alarm sending
Examples (incl. instructor & student provided examples)

Module 7 : Troubleshooting

NOC/SCC Interaction
ESD Precautions
Recovery Documentation
Alarm Clearing & Performance Monitoring
Trouble Locating
Recovery Procedures
Examples:
Line DRWR Replacement
CPU 9X10 Fault
Student Examples (past or current switch alarms)
Restarts & Reloads:
Synopsis - recovery philosophy
NTP 297-8001-545
SWACT (no-restart)
RTIF: JAM, OVERRIDE, BOOT
System Restart - Warm, Cold
Journal File
Tracing:
Interpreting results
TRAVER
REVXLVER

Module 8 : Tables

Fields & Tuples:
pos, count, format pack, list, quit, etc.
Key Tables:
TABLES, OFCSTD, OFCENG, SITE, CLLI, CLLIMTCE, IPNETWRK, etc.
Inventories (LN, DN, PM, LENLINE, PECINV, etc.)
TABREF

Notes

The course is designed to run in a Live Instructor-Led Virtual Classroom setting. More complex troubleshooting concepts are discussed with this course including inter-bay cabling and backplane fault analysis. Students should have physical access to a DMS-100 switch in order to best benefit from exercises. Virtual Field Trips can be added to allow students an opportunity to see and understand where all the parts of the system are found, what they do, and to provide a better end-to-

end understanding of the system.

This course can be combined with other courses like CO Switching Fundamentals, the DMS-100 Maintenance & Troubleshooting Course, and the DMS-100 Translations Course for a customized curriculum.

Delivery Method

LIVE Virtual 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)

Students must have Virtual and/or remote-access to a DMS-100 switch for this training. Physical access is recommended to maximize direct hands-on.

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 experience using their specific equipment.

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Course Length

5 Days