

Network Management of TMS-3000 Multi-aggregate Transport Systems

System Overview

General DataComm's TMS Software (GTS) Version 6.x is an intuitive network management system that provides end-to-end network configuration, control, alarm reporting, and diagnostics of the TMS-3000 network. The GTS software is installed on the PC-based hardware platform and runs on the Linux operating system with MySQL database software.

GTS software communicates with GDC's TMS-3000, OCM-2000 and MINIMUX nodes from the backbone network. Up to six controllers can be supported on each network, allowing management functions to be performed at several locations. An Ethernet interface to the TMS network is also supported for LAN-based logins.

GTS maximizes network performance and reliability, assuring user access to the network. Intelligent Automatic Rerouting (IAR) and Disaster Recovery and Reconfiguration (DRR) protect and re-establish communications in the event of line/data center failures.

Comprehensive fault diagnostics help diagnose and resolve problems quickly, with minimal disruption to users and without the need of trained technical specialists at each network location. GTS software allows the network manager to "test" the rerouting capabilities of the system off-line by simulating network failures and disaster scenarios.

The controller commands the download of module software to capable nodes in the network (TMS-3000, TMS Compact, OCM-2000, and MiniMux TDM nodes). Master-ship control can be assigned from one controller location to another on a time-of-day basis to follow the business day around the world, as needed. Networks can be partitioned and each partition can control their network segment.

GTS supports hybrid public/private network topologies, allows non-disruptive software download to OCM-2000 nodes, supports the OCM-2000 Dual Private Voice module, and supports finer backplane "select" granularity.



GTS V6.x Highlights

- Supports Linux-based operating system with MySQL database on a PC-based hardware platform
- Six controllers per network
- Intelligent Automatic Routing
- Time of Day Reconfiguration
- Disaster Recovery Routing
- Offline modeling
- Full SNMP V3 sets, gets and traps
- Total network backup via CDRW/USB

Legacy Support and Future Proof

In existing TMS networks, GTS software can support the legacy TMS modules as well as the latest upgrades and enhancements of TMS "Plus" series modules (ACC-Plus, ESCC-Plus, UVC-Plus). These enhanced capability modules are used in mission critical applications that require:

- Aggregate rates up to 4.224 Mbps
- Standards based voice
- Expanded clock rates

Network Management Features

AutoPath

AutoPath matches user-defined parameters for each circuit to the optimal aggregate connections through the network. AutoPath streamlines and simplifies the process of designating circuit paths or adding circuits to the network. AutoPath benefits include:

- Optimization of circuit paths via hop counts, transmission delay, Transmission error rate, satellite path, encryption.
- Manual Route and Auto Reroute options
- Load balancing
- Specifies circuit endpoints (routing is calculated automatically).
- Speeds up circuit provisioning and facilitates changes.
- Provides selectable aggregate and circuit parameters.
- Controls and optimizes route selection.

Network Modeling

The GTS software provides a powerful network planning tool for offline, non interruptive network modeling:

- Simulates the network prior to installation or changes.
- Provides “what if” disaster planning for link or node failures.
- Provides statistics on bandwidth utilization within the network.

Redundancy Control

GTS Version 6.x software monitors links, terminations and redundant components throughout the network and dynamically enforces any redundancy and configured recovery strategies.

Disaster Recovery Reconfig (DRR)

- Changes the endpoints of all or some circuits.
- Provides quick, automatic rerouting of circuits to a disaster recovery site.

Intelligent Automatic Rerouting (IAR)

- Automatic rerouting of circuits
- Examines user-defined quality parameters
- Programmable hold-off timers
- Downspeed of voice and data
- Preemption priority
- Unrouted circuit alarms
- Manual or scheduled return to original route

Time-Oriented Reconfiguration (TOR)

This function allows users to alter the configuration of the network to accommodate applications that may change from day to night. For example, during the day most of the network traffic may be voice traffic; at night the traffic may be high speed data transfers. TOR avoids the need to subscribe to and pay for bandwidth that may only be used during a particular time of day.

Monitoring, Alarms and Diagnostics

The TMS-3000 nodes regularly deliver status reports to the GTS software which compiles status displays of major and minor alarm conditions throughout the network. A major alarm reports a failure in an aggregate trunk or a group of channels; minor alarms report a failure in a single channel. All alarms are time and date stamped for easy identification. Comprehensive channel and aggregate-level diagnostics and loopbacks help to troubleshoot the TMS system as well as the entire backbone communication network. For example, the operator can perform a Bit Error Rate Test on any circuit on an end-to-end basis, automatically and without external test equipment

SNMP Support

The GTS software also supports the SNMPv3 compatible GET, SET and TRAP based configuration, alarm reporting, diagnostics, and management interface. Once configured with SNMP host destinations, the controller will transmit all alarms generated at the system, node, device, port, channel, circuit, diagnostic and operator levels.

From 8 to 16 OIDs are associated with each alarm, depending on the alarm trap type. All alarm traps provide alarm name, description, associated TMS element, activation time, alarm level (Critical, Major, Minor or Warning), status (Active or Clear) and the alarm clear time.