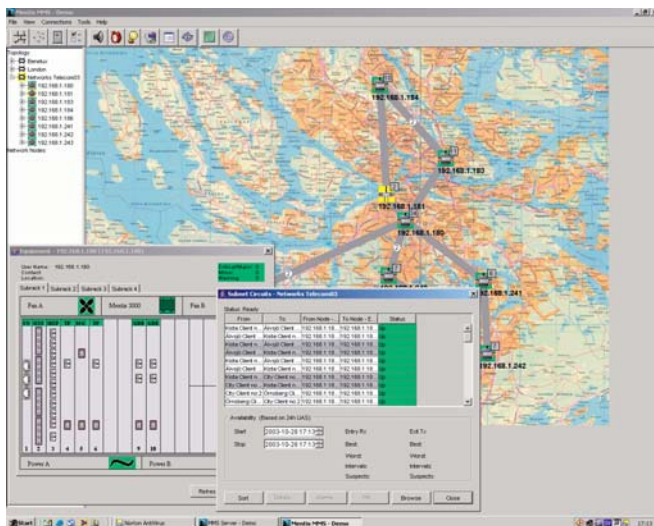


Transmode Network Manager

Large or complex optical networks require advanced management solutions for streamlined operations. The Transmode Network Manager (TNM) is a cost-effective and scalable carrier class Network Management System for Transmode's optical system based on the ITU-T recommendation M.3010.

The purpose of the TNM is to provide a centralized system for OAM and hide the complexity of the underlying optical network to higher order OSS/BSS. The TNM increases the visibility of the network and simplifies many repetitive tasks to increase the performance of the network and lower operational expenses. The TNM is client-server based and provides FCAPS (Fault, Configuration, Administration, Performance and Security Management) for all Transmode's Network Elements. The system offers a full-featured graphical user interface, alarm handling, performance monitoring, northbound interfaces for integration to other OSS and many time-saving features that simplify daily OAM activities.

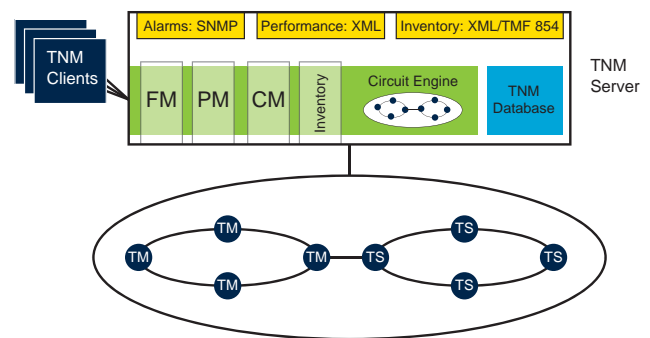
Additionally, the TNM keeps complete topology awareness of individual optical circuits. Its integrated management capabilities extend beyond basic FCAPS functionality to include also network level OAM for end-to-end circuits. Topology awareness and management of circuits are essential for efficient network operations and a foundation for service management.



The TNM can be used as:

- Stand-alone management system for the optical network
- Mediator to higher order management systems
- Complement to higher order network management systems, simplifying troubleshooting and daily OAM activities

Simple optical networks can also be managed without the TNM by the user interfaces in the Embedded Node Manager (ENM),



The TNM provides a complete solution for fault handling and offers the operator information about alarms for both Network Elements and optical circuits. The graphical user interface increases the visibility of the network and assists the operator to quickly isolate and resolve network problems through alarm filtering and root-cause analysis of faults in optical circuits.

The TNM also monitors and presents optical performance parameters according to G.826, signal strengths and network utilization parameters for Gigabit Ethernet. It provides an extensive set of graphical reports for both interfaces and optical end-to-end circuits for pro-active management. The network utilization level can be used to up-sell more bandwidth to a customer once Gigabit Ethernet utilization has reached a threshold.

Furthermore, the TNM allows the operator to partition the network in sub-networks to simplify operational activities and align the system with the operator's organization. A sub-network may represent a geographical area, an end-to-end circuit or a customer end-to-end connection. It is also possible to use hierarchical sub-networks.

The TNM keeps an updated view of physical and logical inventory and the system collects information about all traffic boards, ports and optical end-to-end circuits and tracks hardware and software revisions. There are open and standardized interfaces for integration with higher order management systems.

The security management functionality in the TNM is comprehensive. There are three levels of access-rights, users can be authenticated in the TNM database or in a radius server and the communication is encrypted. The TNM also offers a stand-by server ready to take over if the primary server fails. Alarms and performance reports are delivered to both primary and stand-by servers.

TNM benefits:

- Increased visibility of the network through centralized OAM
- Reduced time for trouble-shooting and network restoration through alarm-filtering and root-cause analysis of faults in optical end-to-end circuits
- Less traffic affecting problems with pro-active management based on performance monitoring of Network Elements and optical circuits
- Many time-saving features for streamlined operations of the network
- Topology awareness for end-to-end management
- Open and standardized interfaces for simple integration with other OSS

TNM Server

Parameter	Value
Hardware Platform	Minimum Intel Pentium/Xeon 2.0 GHz (small systems) or Sun UltraSparc 1.0 GHz, RAM: 2 GB, disk space: 10 GB, CD-drive
Operating System	Windows 2000 Professional, Windows XP Professional or Sun Solaris
TNM Server Capacity	Up to 1500 nodes
Number of simultaneous clients	Max 20
Performance Monitoring	ES, SES, BBE, UAS (G.826), RX and TX signal strengths & GbE utilization for 15min /24h intervals
Access rights	Administrator, operator, read-only
Encryption	SNMPv3 (TM-series), SNMPv2c (TS-series)
Northbound interfaces	Fault Management: SNMP interface Performance Management: proprietary XML/ftp interface Physical inventory export: proprietary XML/ftp interface End-to-end circuit export: TMF 854 compliant XML/ftp interface Interface to Radius, TACACS

TNM Client

Parameter	Value
Hardware Platform	Minimum Intel Pentium/Xeon 2.0 GHz (small systems) or Sun UltraSparc 1.0 GHz, RAM: 356 MB, disk space: 200 MB, CD-drive Intel Pentium/Xeon
Operating System	1.0 GHz or higher