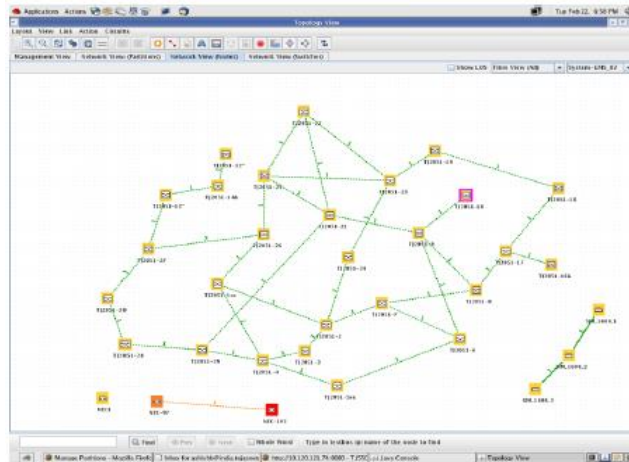


# TJ5500 Intuitive End-to-End Network Management



## Product Highlights

### Integrated Network Management:

For GPON, POTP, PTN, DWDM & SDH

**Point & Click Provisioning** - Automatic Path Computation

### Multiple Graphical Views

- Fiber view, logical links
- Carrier Ethernet Circuits, Services

### MPLS-TP

- Planning & Provisioning
- Pseudowire service, VPLS, H-VPLS

### Ethernet Fault Management:

- Y.1731, Link Trace & Loopbacks
- NMS initiated fault localization

### QoS

- On MPLS-TP & VLAN based services
- CIR/PIR configuration
- QoS domains

### ERPS

- Planning & Provisioning
- Ringlets
- Open ERPS

## Key Features and Benefits

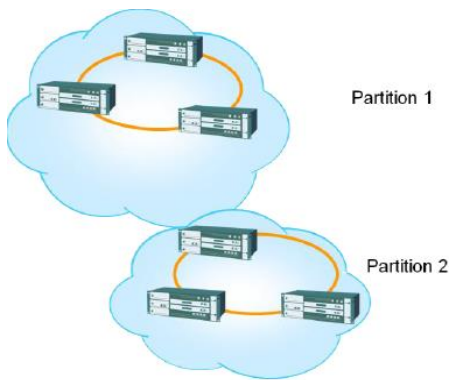
TJ5500 Network Management System is an integrated management application offering single-window operation for end-to-end network management. It supports provisioning, operations & management of GPON, Packet Transport Networks, DWDM, SDH and OTN-based services. This provides a unified management solution to manage multi-technology networks.

With support for sophisticated packet transport features such as MPLS-TP, Ethernet OAM, 50ms protection on ring and linear paths, it helps leverage the most out of the packet capabilities of the network elements.

The TJ5500 is scalable to tens of thousands of Network Elements (NEs) and with an advanced, intuitive user interface enables the NOC teams to optimize operational costs through faster and more efficient operations. It abstracts the feature sets of network elements into intuitive management and service objects, making understanding of the network and the services running on it much easier. It offers restoration in case of multiple network failures to provide continuity of service even in extreme conditions. Multiple Network Views help the operator understand various aspects of the network and take important decisions, which are critical to the performance and efficiency of a network.

**Integrated Management:** The TJ5500 integrates Tejas GPON, PTN, DWDM, OTN and SDH portfolios into one management system. The TJ5500 understands parallel TDM & PTN deployment models or PTN overlays over TDM. Thus, the end user sees an end-to-end PTN network where some of the links can be Ethernet over TDM and appear as logical links in the Packet Network view.

**Partitioning:** The network can be split into multiple partitions for better management of large networks. User Defined Partitions can be created and a subset of the network can be assigned to the partition. Bulk node additions, deletions and circuit provisioning are supported per partition. Alarms and historical performance data can also be viewed and analysed per partition.



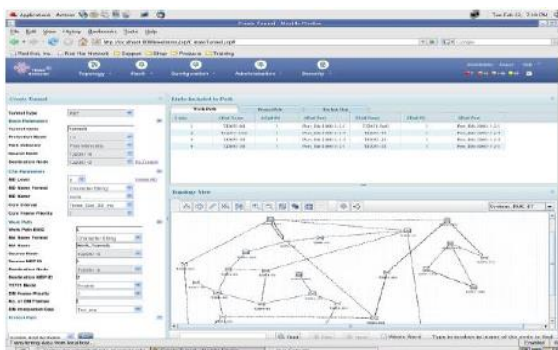
**Point & Click Provisioning:** The TJ5500 supports drag and drop provisioning between two end points. It automatically computes the least cost path based on a few parameters like number of hops or links. It displays the status of circuits as Planned, Provisioned or Pending, thus giving the network operator a workflow while provisioning & commissioning a circuit.

**MPLS-TP Services:** The TJ5500 can be used to manage MPLS-TP tunnels and pseudowires. MPLS-TP based VPLS services can also be provisioned. The TJ5500 affords a lot of flexibility in the deployment models for these services by allowing a large array of options for these services. VPLS services can be either a full mesh of pseudowires or a hub & spoke model (H-VPLS). The pseudowires can be either unprotected or protected, span multiple tunnels, and be multi-segment or stitched in addition to manual & autopath selection. MPLS-TP linear protection ensures a sub-50ms switchover for any network failures and dual homing protects against gateway failures. Seamless provisioning across native-Ethernet links and Ethernet-over-TDM, single-click activation and deactivation of services are also supported. The status of each tunnel is monitored through CFM - LBM/LTM & Y.1731. The NMS automatically correlates the alarms with Links and Services.

**QoS Management:** NMS can manage the QoS for both MPLS-TP and VLAN-based services.

The entire network can be partitioned into QoS and non-QoS domains. 8 classes of service are supported and bandwidth profiles for CIR (Committed Information Rate) and PIR (Peak Information Rate) can be assigned to individual services. Connection admission control ensures that the packets not meeting the bandwidth profiles are either dropped immediately or colored, so that they can be dropped later in case of congestion in the network.

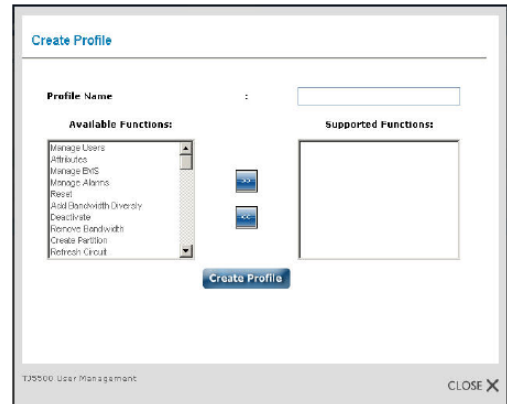
**Views:** The TJ5500 supports multiple views for viewing and managing different aspects of the network. The Management View displays all the EMSs present in the network. Network View (Nodes) displays the nodes present in a particular partition. Resource Management View helps to create partitions, add nodes through auto-discovery and VNE provisioning. Graphical view of Carrier Ethernet network displays physical topology, Ethernet services, MPLS-TP tunnels, pseudowires and their work and protection paths. All these help the operator get a quick bird's eye view of the network.



**Fault Management:** The TJ5500 supports real-time display of faults and alarms in the network. The alarms can be configured as Minor, Major or Critical and are colour-coded. Different rules can be applied to display and sort alarms by severity, date, node etc. Alarms can be grouped by EMS, Node, Partition, Severity, Acknowledgement Status and many other parameters. Based on the alarms, the user can navigate to the affected circuits. User can also export a list or sub-list of alarms to a PDF, CSV, XML or HTML file for offline analyses. Based on alarms, the colours of links and nodes get changed to display alarms in the graphical topology views. Alarm correlation helps reduce the information overload on the operator by displaying only the primary alarms and suppressing the related secondary alarms.

**Performance Management:** The TJ5500 pulls real-time performance data from Network Elements and displays it in various forms. Performance data is collected at Port and Circuit level. NMS stores history of performance data for upto 30 days, and can display it at 15min intervals, 24 hours, weekly or monthly statistics.

The 15 min/24hour collection/monitoring of performance data can be enabled or disabled.



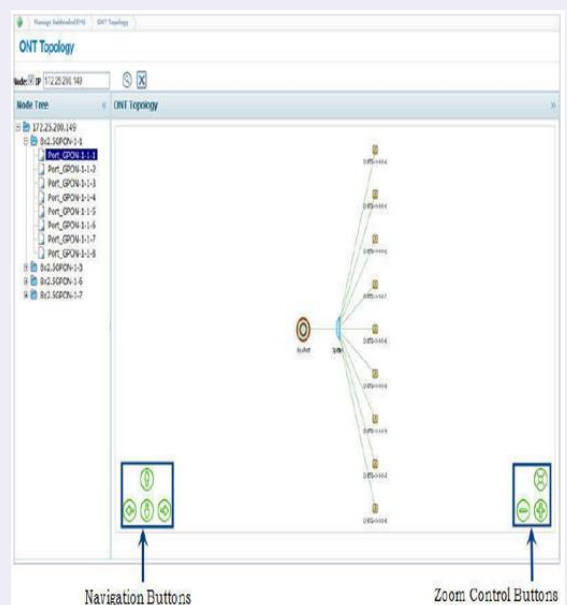
**High Availability:** The TJ5500 supports 1+1 hot standby configuration for redundancy and disaster recovery. All the information is synced between the active and standby NMS in real time. Switchover from active to standby NMS can be automatic or forced. This helps in continuity of operations in the event of failures or unavailability of the NMS at active server location.

## GPON Capabilities of TJ5500

The TJ5500 offers key GPON capabilities too. It affords an easy and exhaustive overview of inventory and topology while offering the user(s) a dynamic deep dive into fault management and performance management.

It also comes with an active ONT Management module that can give the user(s) specific information of ONTs based on the search criteria, indicate faults, if any, as well as communicate ONT status (up/down). It also allows the user to remotely manage the ONTs such as activate/deactivate/configure, reset, reboot or do software upgrades.

The GPON capabilities also include Charged Control Unit (CCU) Integration that specifically designed for rural networks, which face intermittent power cuts. The NMS allows the user to monitor the power status and manage the switch from solar power to main power to battery backups, when required. TJ5500 also supports end-to-end provisioning of GPON services like HSI, VOIP, VBES etc.



## Technical Specifications

### General

- Multi-layered Integrated Management
- Easy & Intuitive GUI to configure all Tejas Products
- Organize the network into Partitions

### Configuration Management

- Auto-Discovery of NEs
- Management VLAN for in-band communication
- Static Routes and IS-IS configuration for reach ability to remote network elements
- Display Physical Link and Logical connectivity map

### Provisioning

- Support for SDH, MPLS-TP, DWDM and OTN Services
- Shortest Path Computation for provisioning optimal paths
- DNI Configuration as per G.842
- Edit Path, Endpoints, Protection Paths & Bandwidth
- Bridge & Roll for hitless editing of paths

### Service Management

- Point & Click Provisioning for P2P Ethernet Service Provisioning
- Traffic Filtering based on CVLAN, SVLAN, Priority, Ports/Interface
- Port Mirroring Configuration

### Fault Management

- Real Time Alarm View
- Custom Alarm Filtering Rules
- Alarm Correlation: Only primary alarm is displayed and secondary alarms are filtered

### Performance Monitoring

- Real Time Performance Data Collection
- Performance Reports at 15 minute, daily, weekly or monthly intervals

### Packet Features

- MPLS-TP Tunnels & Pseudowires
- ERPS Ring Configuration
- End-to-End Ethernet OAM provisioning, SLA Monitoring, based on Y.1731
- NMS initiated link-trace and loopback checks for fault isolation and verification
- Ethernet Performance Data
- Historical Performance Data Reports
- Per Port Rate Limiting & Metering
- Packet Classification & Coloring
- Policing & Discarding packets at Egress
- Per Service Shaping at Egress
- Provisioning of MEF Services like ELine & ELAN
- Classification and Filtering rules on a per ELAN service basis

### Views

Topology View displaying fiber connectivity and virtual topology links

- Real time update for faults and alarms showing link availability
- Partition View : Split the network into user defined partitions
- View Logical links within a partition and between partitions
- Carrier Ethernet Network Graphical View - Display physical topology, Rings, Services, Tunnels, Work and Protect Paths

### Protection

- Pre-planned backup restoration path for protection against multiple network failures
- 1+1 Hot Standby configuration of NMS

### Security

- Centralized user management (via Radius) for entire network
- Password policies, micro-level authorization and accounting
- Real-time push of audit logs via Syslog
- Region based access
- Encrypted communication protocols (HTTPS, SFTP, SSH, SNMPv3)
- Regular vulnerability scans and hardening of the system

\*Specifications are subject to change without notice



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