Tejas XTN TJ1600
Converged Packet Optical Transport

Advanced Packet Transport
OTN and SONET/SDH Switching
Advanced DWDM Transport
High Capacity & Low Granularity: 2Mb (E1s) to 200G

Network Evolution: Networks designers are constantly looking to drive the lowest cost per bit for services transport while providing high reliability. Leveraging the advantages of statistical multiplexing while minimizing the number of protocol layers used at each node the service passes through helps to minimize costs. The TJ1600 allows network designers to use the most cost effective transport technologies for each service type.

One Device for Packet, TDM and DWDM: The TJ1600 balances Packet and TDM transport in a way unique to the industry. Its hybrid architecture allows for three configurations; TDM with Packet Transport, Hybrid TDM and Packet Transport and all DWDM Optical Transport using the same hardware, software and features. This flexibility creates a unique opportunity for network designs by allowing every service to be optimized based upon the service requirements, not the limitations of a particular transport technology. In addition, the TJ1600 reduces operations costs by having a single platform for all services requirements preventing the need for multiple devices at any site.

Flexible Packet and TDM Switching: With a scalable Packet switch provisioned separately from the TDM switch, the 1600 can quickly and easily adapt

Optimizing Services: With the 1600 services can be matched to the best transport technology whether that is maximizing efficiency with Stat-muxing, reducing costs by using OTN switching or multi-degree ROADMs to by-pass routers, maximizing fiber utilization with DWDM or minimizing latency with optical / OTN switching.

Optimizing Packet to DWDM Interworking: To provide the lowest cost Packet to DWDM interworking the TJ1600 use a unique blend of technologies including 10GE interfaces with OTN wrappers and direct interconnection between Packet and TDM switches to simplify router by-pass in regional / long haul networks.

Lower Packet Transport Costs: The TJ1600 optimizes 1G and 10G transport by using OTN switching to efficiently pack and route traffic through the network. The use of OTN switching also reduces the complexity of the Packet network by offloading high bandwidth services directly onto the OTN/DWDM optical layer.

MPLS-TP: Traffic Engineered Pseudowires
Sub-50ms Protection: 1:1,SNCP, PW & Tunnel Protection
Carrier Ethernet : VLAN and Q-in-Q

Tejas Networks
www.tejasnetworks.com
Software Enabled Transformation
Longer Spans for Lower Costs: Coherent Optics support with Soft Decision Forward Error Correction (SDFEC) technology is used by the TJ1600 to increase optical span length reducing the cost of optical DWDM up to 2000+ kms: With DWDM available for all high speed interfaces, the 1600 can optimize fiber utilization using the latest in amplifier and dispersion compensation technology for reliable transport in metro, regional and long haul networks.

SONET/SDH/front-haul: With a complete suite of SONET/SDH capabilities the TJ1600 provides the reliability and performance expected of your transport network; exceptional performance, deterministic routes, predictable latency, low protection switch times and easy network planning. SONET/SDH/CPRI/OBSAI to OTN and Packet gateway capabilities are available to ensure a seamless interworking of services in the network.

MPLS-TP: The TJ1600 provides MPLS-TP based pseudowires for traffic engineered flows on trunks, which optimizes the network by providing the right amount of control. The cost benefits of stat-muxing are combined with traffic engineering and capacity planning to lower CAPEX by right sizing the network. OPEX reductions come through faster provisioning, robust protection and quicker root cause analysis during failures.

Managing Latency: By matching the services interface to the best switch and the best transport (Ethernet, SONET, OTN and/or DWDM), each service can be delivered with the lowest latency required.

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Network Management: With Tejas Networks’ suite of management tools network evolution is much easier to manage. Point and Click technologies for Packet, SONET and OTN traffic allow for more accurate service designs, more efficient routing and better fault correlation. Accurate alarming and “fault to affected service mapping” enables fault resolution prioritization. Enhanced network element backups and simple remote software upgrades reduce operational costs while enhancing reliability. NMS server redundancy and geographical diversity ensure faster disaster recovery.

Advanced Ethernet Features: The TJ1600 provides best in class packet switching to create networks with the highest performance. Ingress rate limiting prevents any one service/application from congesting/choking the network. Each packet is classified so that the appropriate network policies (like prioritization and scheduling) can be applied. Eight CoS queues and scheduling algorithms ensure that there are sufficient options available to manage the data traffic efficiently. The TJ1600 provides sub 50ms protected packet rings for greater resiliency.

Ethernet OAM: allows real-time monitoring of end-to-end circuits, connections or trunks, enabling quick detection and isolation of faults to a particular subnet, trunk, link or node. The TJ1600 supports BFD based Fault OAM and ping/traceroute at tunnel/pseudowire level. It also supports MPLS-TP based performance OAM for MPLS-TP based PW services.

Circuit Emulation: Circuit Emulation provides an alternative transport method using an all Packet Transport Network. The 1600 supports E1 SAToP and STM-1 CEP for carrying this traffic with the reliability of TDM networks while providing a seamless gateway between Packet and TDM networks.

ASON GMPLS Control Plane: With Tejas Networks’ ITU-T G.8080 based GMPLS control plane software, highly resilient networks with multiple levels of protection can be created with ease. The 1600 supports 1+Reroute and 1+1+ Reroute options by implementing standard protocols.

Flexible Network Architectures: The TJ1600 has a flexible architecture that allows it to build the network best suited for all services linearly for rapid deployment such as hub and spoke for cost effective build outs at the edge of the network, ring and ringlet for high utilization and resiliency, meshed for low latency and flexible protection. This is achieved with a unique combination of functionality including the ability for traffic to be switched at Packet, TDM or the optical layer depending on service requirements.
SDH/OTN Switch Capacity
1T OTN (1:1 fabric)
640G OTN/HO (1:1 fabric)
360G OTN/HO, 120G LO (1:1 fabric)
340G OTN/HO (1:1 fabric)
80G HO/LO (1:1 fabric)

SONET/OTN Switch Capabilities
VT1.5, VC12, VC4, VC-4-4c, VC-4-16c, VC-4-64c, STS-1, STS-4c, STS-16c, STS-64c
ODU2, ODU0, ODU1, ODUFlex
LO and HO Virtual Concatenation
Hairpinning
Ethernet GFP-mapped; VCAT and LCAS

Interfaces Supported
10 Gig E
1 Gig E
10/100/1000bT
10/100bTDS1
DS3 STM1/STM4/STM16/OC-3/OC12/OC48
STM64/OC-192/OTU2/OTU2e
OTU4
200G DWDM
CPRI1-7
FC100/200/400/800/1200

Network Protection
Unprotected, 1+1 APS
UPSR, 2F BLSR
ODUk SNC

Enhanced TDM Services
VLAN to SONET VCG Mapping
VLAN to ODUFLex Mapping

Revertive and non-revertive switching

DWDM/CWDM Optical Layer
SFP, XFP and Tunable SFP+/XFP/CFP
eFEC for 10G ports, SDFEC for 100G ports
FEC for 2.5G and 622M ports
Up to 80 Channels/Lambda per fiber
100G/10G Links up to 2000 km
Fiber Protection Unit
ROADMs, OADMs and Optical Multiplexers
ROADM:
8 degree Colorless, Directionless
4 degree / 2 degree
Optical Mux/DeMux: 8 Ch and 40/80 Ch
OADM: 1Ch and 4 Ch
DCM: Fiber and FBG Based

Amplifiers
17dBm/20dBm/26dBm/Raman
Pre, Post and Inline

Transponders and Muxponders
10 x 10G Transponder
2 x 10G with 16 SFP Muxponder
200G/100G Transponder/Muxponder

Network Management
Web-based Craft UI
Network Management System
SNMP
GMPLS/ASON
Tejas XTN TJ1600
Converged Packet Optical Transport

Ethernet Switch Capacity – Single Shelf
80 to 240 Gbps bidirectional

Interfaces to Ethernet Switch – Single Shelf
10 Gig E – up to 90 ports
1 GigE – up to 288 ports
10/100/1000bT – up to 192 ports
10/100bT – up to 144 ports
DS1 – up to 756 ports

MPLS-TP
MPLS-TP Connection Oriented Ethernet
VPWS, VPLS, H-VPLS
ELAN, EVLAN, EVPL, EPL, E-TREE, E-ACCESS
IGMP snooping v1/v2/v3

Ethernet Switching
VLAN, QinQ based services
Ingress Rate Limiting at 64kbps granularity
Programmable Committed / Peak Rates
Programmable Committed / Peak Burst sizes
Egress rate shaping on all ports
8 classes of service as per IEEE 802.1p
2 Rate, 3 color marking

Ethernet/MPLS-TP OAM
MPLS-TP OAM RFC5860
BFD based Fault OAM
LSP Ping and Traceroute (RFC6426)
PW Ping
On demand LM/DM based at Tunnel/PW level based on MPLS-TP
link OAM
Link integrity (LLCF/LLR)
SNMPv3

Network Protection & Security
1:1 bidirectional Linear Protection LSP (RFC6378)
1:1 bidirectional PW
MPLS-TP Mesh
Link Aggregation Group (LAG)
Port mirroring and loopback

Synchronization
SyncE, DCR, ACR
1588v2 BC with ToD interface

Circuit Emulation
E1 SAToP RFC4553/MEF8
STM1 CEP RFC4842

Power Supply (optional redundancy)
-40V to -60V DC
2500 Watts maximum per unit

Environmental
Operating Temperature : 5°C to 40°C
Short term 0°C to 50°C.
Relative Humidity:
10% to 90%, non condensing.
FCC Part 15 Class A
NEBS Level 3 Compliant
UL60950-1:2007
ICES 003 Issue-4

Dimensions (W x H x D)
372 mm x 445 mm x 258 mm (TJ1600C 11-slot)
178 mm x 445 mm x 258 mm (TJ1600C 6-slot)
89 mm x 445 mm x 258 mm (TJ1600C 2-slot)
19” and 23” rack mount options
All Front Access

Related Products
TJ1400-P 1U Packet Transport Solution
1400-7 2U Converged Packet Optical

*upcoming release
specifications subject to change without notice