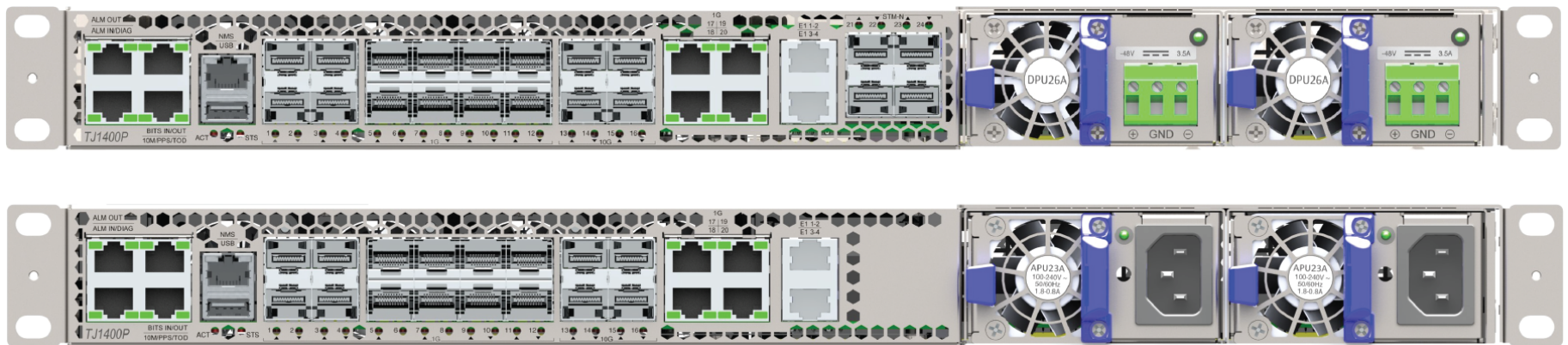
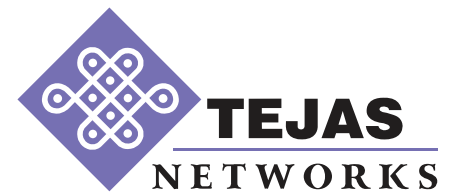


TJ1400-4X



Product Highlights

- ✓ Switch Capacity: 64Gbps full duplex
- ✓ IP/MPLS: Traffic Engineered MPLS, VPLS, L2VPNs, L3VPNs
- ✓ Available in multiple variants
- ✓ SDN ready, SR capable
- ✓ Form factor - 1RU compact service routers
- ✓ Carrier Ethernet : VLAN & Q-in-Q
- ✓ 50ms Protection: MPLS FRR (1:1) & ERPS
- ✓ Packet Synchronization: SyncE, 1588v2
- ✓ STM/E1 support

TJ1400P-4X is an ultra-compact and cost-effective MPLS router that aims to provide multi-service aggregation and transport of the client services over MPLS.

TJ1400P-4X is a platform capable of supporting multiples of 10GE rates on the network side, and has been envisaged to address the growing demand of Ethernet and IP client services in the form of Fast Ethernet (FE) and Gigabit Ethernet (GE). It is also capable of supporting circuit emulation services of E1/DS1 and STM-1/OC-3 interfaces.

TJ1400P-4X equipments can be configured in various topologies such as Linear, Ring, and Mesh.

The general specifications of TJ1400P-4X are the following:

- Standalone pizza-box system, 1 RU half depth.
- Has a base card with interfaces, fabric, Clock & Processor subsystems.
- 2 FRU Redundant Power Supply Units are supported. FRU PSUs can be AC or DC.
- Capable of operating at industrial temperature ranges.

Key Features and Benefits

High Performance Design: State of art silicon powers the TJ1400P-4X ensuring low power consumption. The TJ1400P-4X Next Gen Router are capable of Layer 2, Layer 3 processing along with MPLS label stack that allow for line-rate lookup and forwarding at all packet sizes from 64 bytes to 9K bytes.

The cutting-edge software is designed to operate in the service provider aggregation and access layer to deliver seamless experience of multiple telecommunication services, including video and internet and feature enhancements as the needs of the network evolve.

All the pluggable optical modules are MSA compliant and meet IEEE 802.3 specification and definition.

Carrier Ethernet Switching: Comprehensive Layer 2 feature set includes the ability to offer Ethernet services over double VLAN tagged frames (802.1ad) and over MPLS constructs (LSP/Pseudowires) along with Ring protection using ERPS for 50ms switching capability.

Multicast snooping and forwarding are supported for efficient Video and multicast applications.

Service OAM in the Service Provider realm with CFM (802.1ag) and PM capabilities (Y.1731) provide tools for SLA enforcement and low downtime.

MPLS Framework: Multi Protocol Label Switching (MPLS) is a versatile networking technology on account of simple lookups and the ability to stack labels that can then provide different functionality. The platform provides MPLS-TE based traffic engineered tunnels, onto which L3VPN and L2VPN can be mapped dynamically.

Synchronization: IEEE 1588V2 and SyncE provide the required timing synchronization over Ethernet interfaces for carrying TDM applications and meeting the timing requirements of 4G/5G networks.

IP Routing: Scalable implementation of IP routing is provided in the TJ1400P-4X platform. These include Unicast and Multicast Routing protocols like RIP, OSPF, IS-IS and PIM. Both IPv4 and IPv6 route lookups are supported. Border Gateway Protocol (BGP) is used for scalable IP routing as well as signaling service constructs in the context of VPN setup. IPV6 Dual stack is supported. IP routing supports both IPv4 and IPv6 routing in a mixed environment.

Traffic Engineering and QoS: Restoration of traffic on a network outage is achieved via Ethernet, MPLS and IP techniques. Similarly, the setting up of paths to meet the service constraints can be done via provisioning or signaling, the former by the management APIs and the latter with RSVP-TE.

Hierarchical Quality of Service (QoS) allows for flexibility in meeting various bandwidth requirements. Policing and Shaping can be done at flow, VLAN or port level or bundled interfaces. Additionally, scheduling disciplines like Strict Priority, Weighted Round Robin (WRR) and congestion avoidance techniques like WRED are available.

BGP-LU provides seamless MPLS functionality to carry services across multiple domains.

Management: Management of the nodes can be done locally using the console port or remotely using Secure access through In-Band and Out-of-band Management ports. Access to the Router via CLI using ssh, GUI access via HTTPS, SNMP interface is available for integration with EMS/NMS. Users can be authenticated using TACACS. Commands can be authorized using TACACS. So that all operations are authorized and logged. The nodes have extensive logging that is available locally and can also be directed to syslog servers.

Overview of TejNEOS software

The TJ1400 series of Service Routers run the TejNEOS (Tejas Network Element Operating System) software that provides scalable, feature-rich, high-availability software to ensure high network availability. TejNEOS has a modular architecture with memory protection allowing software modules to be upgraded/restarted without rebooting the system. As part of the high availability framework Stateful Switch Over (SSO) and Non-stop Forwarding (NSF) are supported for controller failure, and failure of a switch fabric results in no loss of capacity on any line card and only packets in transit in the failed fabric are lost.

TejNEOS delivers traditional IP/MPLS capabilities based on distributed in-node

control plane to interoperate with legacy deployments. The key differentiation of TejNEOS is the addition of recent MPLS Transport Profile support that aligns with the modern network design approach of using a controller to provision the services in the network to provide agility, ease of deployment and upgrade of the network.

TejNEOS leverages the hardware support for fast-BFD (Bidirectional Forwarding Detection). As with any Network OS, secure remote management, in-service software upgrades, persistent configuration store, user authentication and command authorization using RADIUS/TACACS+, time synchronization and debug support using SNMP and Syslog are available.

Technical Specifications

Packet Switching Capacity

Upto 64Gbps bidirectional switching capacity

Interfaces

TJ1400P-4X

- Upto 4 x 10G (SFP+)
- Upto 12 x 1G (SFP)
- Upto 4 x 10/100/1000 Base-T
- 4 x E1 CEM
- 1 x RJ-45 1000BASE-T management Ethernet port (MGMT)
- BITS (1.544Mb/s, 2.048MHz/2 Mbps)
- Pulse-per-Second (PPS) input and output
- Time-of-Day (TOD) input and output
- 10MHz input and output
- Local console port

TJ1400P-4XC

- Upto 4 x 10G (SFP+)
- Upto 12 x 1G (SFP)
- Upto 4 x 10/100/1000 Base-T
- 4 x E1 CEM
- 4 x STM-1 CEM
- 1 x RJ-45 1000BASE-T management Ethernet port (MGMT)
- BITS (1.544Mb/s, 2.048MHz/2 Mbps)
- Pulse-per-Second (PPS) input and output
- Time-of-Day (TOD) input and output

- 10MHz input and output
- Local console port

L2 Features

- MAC Learning and Switching
- 802.1Q/QinQ/Hybrid
- LLDP
- EPL, EVPL, EPLAN, EVPLAN
- IGMP snooping

Network Protection

- G.8032v2/ERPS
- Static LAG & Dynamic LAG (LACP)
- MPLS-TE FRR

L3 Features

- Routing Interfaces
- VRRP
- OSPFv2/v3
- Multicast Routing
- ECMP
- IGMP V1,V2,V3
- Protocol Independent Multicast
- Multicast Routing
- Multi-Protocol Label Switching (MPLS)

IP-MPLS Features

- MPLS Framework
- LDP
- RSVP-TE
- MPLS Transport Profile
- PseudoWire
- Fast Reroute (FRR)
- IPv6 over MPLS
- BGP-LU
- MP-BGP
- SR-MPLS
- EVPN

Services

- CE2.0 compliant Carrier Ethernet
- L2VPN VPWS
- L2VPN VPLS
- L3VPN

OAM

- IEEE 802.1ag
- ITU-T Y.1731
- BFD
- Port Mirroring
- PW Ping, Trace
- LSP Ping and Traceroute
- RFC2544, Y.1564

Synchronization

- Sync-E
- 1588v2
- NTP

Multicast

- PIM-SM/SSM
- IGMPv1/v2/v3
- MVPN, P2MP

Other features

- Jumbo Frame support upto 9600 bytes frame size
- Performance Monitoring
- Flow Control

QOS

- 8 Hardware Queues
- Traffic classification based on priority/DSCP/EXP
- Policing(sTCM, srTCM, trTCM), Shaping
- Scheduling Disciplines (Strict and weighted)
- Congestion Management (WRED/Tail-Drop)

Security

- Secure Shell (SSH)
- Secure Socket Layer (SSL)
- Port Security

- RADIUS/TACACS+
- Storm Control
- L2-L4 ACL
- DoS Mitigation

Management

- System Monitoring
- Logging
- Remote Monitoring
- SW Upgrades
- User Management
- Job Management
- Firmware Upgrade
- SNMP (v1, v2, v3)
- Syslog
- CLI
- NTP
- Monitoring and Troubleshooting
- IPv4/IPv6 Dual stack
- HTTPS
- EMS/NMS

Electrical Specifications

- Input Voltage: -40V to -60V DC
- AC: 100V to 240V
- Maximum Power: 95 Watts

Environmental Specifications

- Operating Temperature: -40°C to 65°C
- Storage Temperature: -40°C to 70°C
- Operating humidity: 5% to 95%, non-condensing
- ETS 300 019-1-1, Class 1.2 Storage
- ETS 300 019-1-2, Class 2.3 Transportation
- ETS 300 019-1-3, Class 3.2 Operating stationary use
- QM333: Functional for Environmental testing of Electronic equipment's for Transmission and switching use

Acoustic Noise in dB

- Maximum - With DC PSU: 61.24 , With AC PSU: 64.04

MTBF

- TJ1400P-4X: 49 years
- TJ1400P-4XC: 44 years

EMI/EMC

- FCC Part-15, Subpart B
- EN 55022 Class-B/CISPR-22 Class-B
- EN 55032 Class-B/CISPR-32 Class-B
- EN 55024/CISPR24
- EN 55035/CISPR35
- (EN/IEC 61000-4-2, EN/IEC 61000-4-3, EN/IEC 61000-4-4, EN/IEC 61000-4-5, EN/IEC 61000-4-6,

EN/IEC 61000-4-8, EN/IEC 61000-4-11, and EN/IEC 61000-4-29)
• EN 61000-3-2 & EN 61000-3-3 (applicable to AC power supply products)

RoHS compliant

Directive 2011/65/EU and Directive 2015/863/EU
• UL 62368-1
• CAN/CSA-C22.2 No.60950-1
• CAN/CSA-C22.2 No.62368-1-14

Safety

• Certified for CB-Scheme.
• IEC 60950-1/EN 60950-1
• IEC 62368-1/EN 62368-1
• UL 60950-1
• UL 62368-1
• CAN/CSA-C22.2 No.60950-1

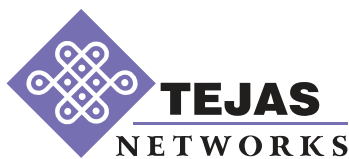
• CAN/CSA-C22.2 No.62368-1-14

Laser Safety

• IEC 60825-1/EN 60825-1
• IEC 60825-2/EN 60825-2
• 21 Code of Federal Regulations (CFR) 1040

Physical

• Rack Size: 1RU
• Dimensions (WxHxD in mm):
444 x 44 x 298
• Airflow: Front to Back
• FAN: Hot Swappable



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