Carrier-Grade Infrastructure Solution Brief: Deploying High-Capacity Telecom Hardware Supplier Platform

CARRIER-GRADE INFRASTRUCTURE SOLUTION BRIEF: DEPLOYING HIGH-CAPACITY TELECOM HARDWARE SUPPLIER PLATFORM

MARKET POSITIONING

The High-Capacity Telecom Hardware Supplier (HCTHS) Series represents a paradigm shift in metro-edge and core aggregation. Designed for Tier-1, Tier-2 service providers and large-scale enterprise data centers, this platform bridges the gap between legacy Time-Division Multiplexing (TDM) constraints and next-generation Segment Routing over IPv6 (SRv6) fabrics. As network traffic volumes grow at a 35-45% compound annual rate, the HCTHS delivers a future-proof foundation without forcing a forklift upgrade to the existing optical transport network.

HIGH-AVAILABILITY REDUNDANCY

The HCTHS chassis architecture implements N+1 fabric redundancy and 1+1 route processor failover with sub-50ms switchover time. Key uptime features include:

- ISSU (In-Service Software Upgrades) with zero packet loss
- Redundant, hot-swappable power supply units (AC or DC, mixed operation supported)
- Combined 5+1 fan tray modules with variable-speed control and front-to-back airflow
- Hardware-based link-state adjacency recovery (BFD offload to forwarding ASIC)

PROTOCOL INTEROPERABILITY

The platform natively terminates MPLS, Ethernet VPN (EVPN), Virtual Extensible LAN (VXLAN), and Segment Routing (SR-MPLS / SRv6). Control plane integration extends to:

- BGP (IPv4/IPv6 unicast & multicast, Link-State, FlowSpec)
- OSPFv2/v3, IS-IS (including wide metrics and segment routing extensions)
- PIM-SM, IGMPv3, and mLDP for multicast services
- gRPC Network Management Interface (GNMI) and OpenConfig YANG models for telemetry

DETAILED PARAMETERS

- Maximum forwarding rate: 2.4 Tbps (full duplex) for 12-slot chassis variant
- MAC address table: 1 million entries
- IPv4 route scale: 4 million (Unicast) + 1.2 million (Multicast)
- IPv6 route scale: 2 million
- Netflow / sFlow sampling at line rate (1:1 at 100GbE interfaces)
- Jumbo frame support up to 12,000 bytes

TECHNICAL SPECIFICATIONS

Parameter	**Specification**

Form Factor	4RU (12-slot) or 2RU (6-slot) chassis, 19" EIA mounting
Switching Capacity	2.4 Tbps (12-slot) / 1.2 Tbps (6-slot) non-blocking
Power Supply	2+2 or 1+1 Redundant, 200-240V AC or -48V DC, max 850W per PSU
Operating Temperature	-5°C to +55°C (long-term), -40°C to +70°C (short-term excursion)
Packet Buffer Memory	36 MB per line card (dynamic shared pool)
Port Density (Max)	24 x 100GbE QSFP28, or 96 x 25GbE SFP28, or 48 x 10GbE SFP+
Latency (64-byte frame)	Sub-1 microsecond (store-and-forward cut-through)
Management Interfaces	1x RJ45 Console, 1x USB Type-C, 1x 1GbE MGMT, 1x RJ45 Alarm

LIFECYCLE ASSURANCE (MTBF)

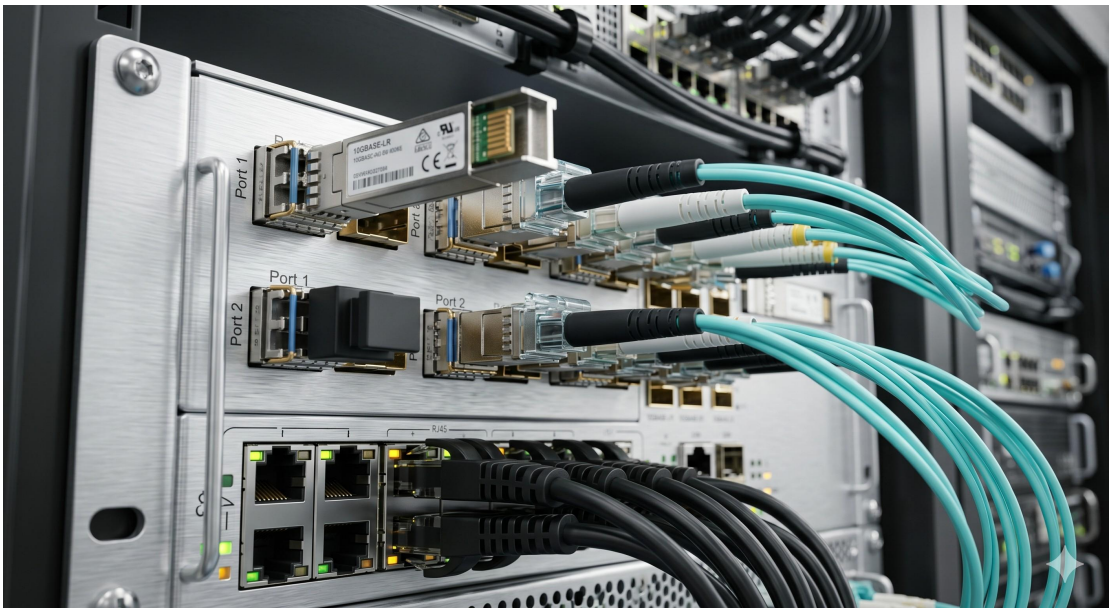
System-level Mean Time Between Failures (MTBF) is calculated at 285,000 hours (Telcordia SR-332, Issue 4, Ground Benign, 40 ° C). The hardware platform

includes a 5-year advanced replacement service level agreement (SLA) as standard, extendable to 7 or 10 years. All field-replaceable units (FRUs) maintain individual MTBF figures exceeding 800,000 hours for fan modules and 550,000 hours for power supplies. Mean Time To Repair (MTTR) for a redundant component is under 15 minutes assuming hot-swap procedure.

TARGET NETWORK TOPOLOGIES

Primary deployment scenarios validated by our systems engineering team:

1. ISP Metro Aggregation – Connecting OLTs (GPON/XGS-PON) to regional core
2. Data Center Leaf-Spine – 100GbE spine layer supporting 4000+ active hosts
3. Mobile Backhaul Hub – Aggregating 25GbE/50GbE eNodeB/gNodeB traffic
4. Secure Enterprise WAN Edge – Site-to-site VPN and SD-WAN underlay


10GBASE-LR
Port 1
Port 2
Port 1
Port 2
RJ45