Enterprise Core Systems Engineering Reference Manual: 48 Port Gigabit Switch Supplier

PRODUCT IDENTIFICATION

The 48 Port Gigabit Switch Supplier platform is a high-density, carrier-grade Layer 2+ switching solution engineered for enterprise campus aggregation and 中小规模数据中心 Top-of-Rack (ToR) deployments. This system delivers non-blocking, line-rate forwarding on all 48 GbE ports plus 4 x 10GbE SFP+ uplinks, ensuring zero packet loss under full load scenarios.



CORE INTERNAL TOPOLOGY

The switching fabric is built around a purpose-built, store-and-forward ASIC with a shared 192 MB packet buffer architecture. The internal backplane

operates at a switching capacity of 176 Gbps, supporting a forwarding rate of 131 Mpps for 64-byte packets. The architecture employs a cut-through engine for latency-sensitive traffic while maintaining store-and-forward integrity for error checking.

SWITCHING SUBSYSTEM CAPABILITIES

- L2 FEATURES: 16k MAC address table, 4k VLANs (Port-based, 802.1Q, Voice VLAN), 64 static MAC entries, GVRP, and VLAN double tagging (Q-in-Q).
- L3 FEATURES (Static Routing): 1k host routes and 1k network routes. Supports DHCP Relay, ARP proxy, and default route management.
- LINK AGGREGATION: IEEE 802.3ad LACP with up to 8 trunk groups, each supporting up to 8 member ports. Load balancing based on source/destination MAC, IP, or TCP/UDP ports.
- STP/ RSTP/ MSTP: 802.1D, 802.1w, 802.1s with BPDU guard, root guard, and loopback detection.

OPERATIONAL ADVANTAGES

- ENHANCED QOS: 8 hardware queues per port, strict priority, Weighted Round Robin (WRR), and 802.1p Class of Service mapping. Ingress and egress rate limiting at 64 kbps granularity.

- SECURITY: 802.1X port-based authentication, RADIUS/TACACS+ client, ACLs (MAC, IP, and TCP/UDP), and DHCP Snooping with Dynamic ARP Inspection.

- MANAGEMENT: Web GUI, CLI (Telnet/SSHv2), SNMP v1/v2c/v3, RMON, and sFlow for traffic sampling. Dual firmware images for zero-downtime upgrades.

SPECIFICATION MATRIX

Parameter	**Specification**
Form Factor	1RU Standard 19-inch Rackmount, 440 x 220 x 44 mm
Switching Capacity	176 Gbps (Non-blocking, Full Duplex)
Power Supply	Dual Hot-Swappable Redundant AC (100-240V, 50/60Hz) max 55W
MTBF	> 380,000 hours (MIL-HDBK-217F, 25° C ground benign)
Operating Temperature	0°C to 50°C (32°F to 122°F)
Packet Forwarding Rate	131 Mpps for 64-byte frames
MAC Address Table	16,384 entries
Jumbo Frame Support	10,240 bytes
Buffer Memory	192 MB shared packet buffer

REGULATORY COMPLIANCE

- SAFETY: IEC 60950-1, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1.

- EMC: FCC Part 15 Class A, CE Mark (EN 55022 Class A, EN 55024, EN 61000-3-2, EN 61000-3-3).

- ENVIRONMENTAL: RoHS2 (2011/65/EU), WEEE, and REACH compliant.

- TELECOM: NEBS Level 3 (GR-63-CORE, GR-1089-CORE) for temperature, vibration, and ESD.

