XPONSHOP Unbranded Carrier-Grade Layer 2 Aggregation Switch Port Performance Layout - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION

PRODUCT NAME: XPONSHOP UNBRANDED CARRIER-GRADE LAYER 2 AGGREGATION SWITCH

MODEL FAMILY: XPA-9000 SERIES

PRODUCT TYPE: CARRIER-GRADE LAYER 2+ AGGREGATION SWITCH

PORT CONFIGURATION: 48 x 1G/10G SFP+ PORTS + 4 x 40G QSFP+ UPLINK PORTS

This document serves as the definitive technical reference for the XPONSHOP Unbranded Carrier-Grade Layer 2 Aggregation Switch Port Performance Layout (XPA-9000 Series). Engineered for high-density metropolitan area networks (MANs), enterprise campus backbones, and data center aggregation tiers, this platform delivers wire-speed, non-blocking switching performance with a sophisticated port performance layout designed to optimize east-west traffic flows and simplify network architecture. The hardware is purpose-built for OEM integrators, service providers, and enterprises requiring a white-box solution that combines carrier-grade reliability with unparalleled port density and forwarding flexibility.



CORE INTERNAL TOPOLOGY

The XPA-9000 Series internal architecture is centered around a high-capacity, low-latency switching fabric that ensures deterministic performance across all active ports. The port performance layout is segmented into logical groups to facilitate optimal traffic management and hardware-level redundancy.

Forwarding Engine & ASIC Architecture: The platform is powered by a merchant silicon switching ASIC that provides a complete view of the forwarding database. The architecture supports a distributed forwarding model where each port group interfaces directly with the central fabric, eliminating head-of-line blocking and guaranteeing line-rate performance for all packet sizes.

Port Performance Layout (Physical Interface Groups):

- Bank A (Ports 1-24): High-density 1G/10G SFP+ access ports. Designed for aggregation of downstream distribution switches or high-bandwidth servers.
- Bank B (Ports 25-48): High-density 1G/10G SFP+ access ports. Electrically isolated from Bank A to support dual-homing and redundant uplink scenarios.
- High-Speed Uplink Group (Ports 49-52): 40G QSFP+ ports. Dedicated for spine connectivity or core network uplinks, supporting 40G Ethernet and 4x10G breakout modes for flexible deployment.

Backplane Bandwidth: The switch fabric provides a total switching capacity of up to 1.28 Tbps. The internal backplane is designed with a non-blocking shared memory architecture, ensuring that all 48 SFP+ ports can concurrently operate at 10G line rate, while the 4 QSFP+ ports operate at 40G line rate, resulting in an aggregate forwarding rate of approximately 960 Mpps (million packets per second) for 64-byte frames.

SWITCHING SUBSYSTEM CAPABILITIES

Advanced Layer 2 Features: The XPA-9000 Series provides a comprehensive suite of Layer 2 switching functionalities essential for carrier and enterprise aggregation. This includes IEEE 802.1Q VLAN tagging with support for up to 4,096 active VLANs, VLAN translation (Q-in-Q), and Provider Bridges (PBB) for scalable metropolitan Ethernet deployments.

Link Aggregation & Load Balancing: The port performance layout supports dynamic link aggregation (IEEE 802.3ad/LACP) across any combination of SFP+ or QSFP+ ports, allowing for the creation of high-bandwidth trunk groups of up to 200 Gbps per logical interface. Advanced hashing algorithms ensure efficient load balancing of east-west traffic across the aggregated links, maximizing throughput and resiliency.

Spanning Tree Protocol (STP) Enhancements: The switching subsystem incorporates MSTP (IEEE 802.1s) and RSTP (IEEE 802.1w) for loop prevention in complex Layer 2 domains. The platform's rapid convergence ensures network stability even in large-scale aggregation environments.

Multicast Forwarding: The hardware ASIC provides optimized multicast forwarding with full support for IGMP v1/v2/v3 snooping, ensuring that multicast traffic is efficiently directed only to interested receivers. This is critical for IPTV, financial market data, and other broadcast-type applications traversing the aggregation layer.

OPERATIONAL ADVANTAGES

The unbranded XPA-9000 Series offers several strategic operational advantages.

Firstly, the port performance layout delivers high-density 10G access at cost parity with traditional 1G solutions. Secondly, hardware-level traffic prioritization via strict priority or weighted round-robin queuing ensures deterministic latency for real-time traffic. Thirdly, the carrier-grade design supports dual, hot-swappable load-sharing power supplies and redundant fan trays for field-replaceable unit (FRU) maintenance, ensuring a Mean Time Between Failures (MTBF) of over 350,000 hours.

SPECIFICATION MATRIX

HARDWARE SPECIFICATIONS

- Chassis Type: 1-Rack Unit (1RU) Form Factor
- Physical Dimensions: 44.0 x 400 x 350 mm (W x D x H)
- Weight (Fully Loaded): 6.5 kg
- Power Supply: Dual Redundant, Hot-Swappable AC (100-240V, 50-60Hz) or DC (-48V) options. Typical Power Consumption: 120W, Maximum: 150W
- Cooling: 4 x Field-Replaceable, Front-to-Back or Back-to-Front Airflow Fan Trays
- Operating Temperature: 0 to 45 Degrees Celsius
- Storage Temperature: -40 to 70 Degrees Celsius
- Operating Humidity: 10% to 90% non-condensing
- Packet Buffer Memory: 12 MB Shared Buffer Architecture

- MAC Address Table: 128,000 Entries

- Jumbo Frame Support: Up to 10,240 Bytes

- Management Ports: 1 x RJ45 Console, 1 x RJ45 Management Ethernet (10/100/1000BASE-T), 1 x USB Storage Port

PERFORMANCE SPECIFICATIONS

- Switching Capacity: 1.28 Tbps

- Forwarding Rate: Up to 960 Mpps

- Latency (64-Byte Packets): < 1 Microsecond (10G to 10G), < 5 Microseconds (10G to 40G)

- Buffer Size: 12 MB

- VLAN Groups: 4,096

- LAG Groups: 128 groups, up to 8 members per group

PROTOCOL SUPPORT MATRIX

- Layer 2 Protocols: IEEE 802.1D, 802.1w, 802.1s, 802.1Q, 802.1ad, 802.3ad, 802.3x, 802.1AB (LLDP), 802.3az (Energy Efficient Ethernet)

- Management & Security: SNMP v1/v2c/v3, CLI (Telnet/SSHv2), RMON, Syslog, AAA/RADIUS/TACACS+, ACLs (L2-L4), DHCP Snooping, Dynamic ARP Inspection (DAI), IP Source Guard

- QoS Mechanisms: 8 priority queues per port, 802.1p, DSCP, WRED, Strict Priority and WRR queuing

Parameter	Specification
Form Factor	1RU Standard Rackmount Chassis
Switching Capacity	1.28 Tbps (Non-Blocking)
Forwarding Rate	960 Mpps
Port Configuration	48 x 1G/10G SFP+ (Access) + 4 x 40G QSFP+ (Uplink)
Packet Buffer	12 MB Shared Memory
MAC Address Table	128,000 Entries
VLAN Support	4,096 Active VLANs
Power Supply	Dual Hot-Swappable Redundant AC/DC Options
Power Consumption	120W Typical, 150W Maximum
MTBF	>350,000 Hours

REGULATORY COMPLIANCE

The XPA-9000 Series is manufactured to meet stringent industry standards for safety and electromagnetic compatibility. The hardware has undergone rigorous testing to ensure performance in high-density data center environments.

- Safety: UL 60950-1 / CSA C22.2 No. 60950-1, IEC 60950-1, EN 60950-1, EN 60825-1 (Laser Safety)

- EMC: FCC Part 15 Subpart B (Class A), EN 55032 (Class A), EN 55024, VCCI Class A, AS/NZS CISPR 32

- Environmental: RoHS-6/6 Compliant, WEEE Directive Compliant, REACH Directive Compliant

- Carrier Standards: NEBS Level 3 (Compliant with design verification), ETSI EN 300 386

