Configuring QoS Priority Queuing (SP/WRR) on Aggregation Ethernet Switches - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview and hardware datasheet for the advanced Quality of Service (QoS) capabilities of our next-generation Aggregation Ethernet Switch Series. Designed for carrier-grade and enterprise campus backbones, this platform delivers deterministic traffic forwarding through a powerful combination of Strict Priority (SP) and Weighted Round Robin (WRR) queuing mechanisms. The architecture integrates a purpose-built forwarding engine, enabling network administrators to enforce granular service-level agreements, prioritize latency-sensitive applications such as voice and video, and ensure efficient bandwidth utilization for data-intensive workloads. This document details the hardware architecture, queuing logic, technical specifications, and ordering information for this robust aggregation solution.



HARDWARE ARCHITECTURE & SILICON

The heart of the Aggregation Ethernet Switch is its advanced, non-blocking switching fabric and a custom QoS co-processor designed for sub-microsecond scheduling decisions. The hardware architecture is built around a high-capacity ASIC that supports a sophisticated multi-level queue structure. The system implements a hardware-based hierarchical QoS (H-QoS) framework that provides eight strict hardware queues per physical port. The scheduling engine supports a dual-mode queuing mechanism, allowing administrators to select between Strict Priority (SP) and Weighted Round Robin (WRR) scheduling. SP ensures that critical control plane protocols and real-time media traffic are processed immediately, preempting lower-priority data. In contrast, WRR guarantees fair bandwidth distribution among competing queues when the network is congested, preventing low-priority traffic from being starved. The

switch's hardware is purpose-built to handle the intense demands of aggregation points, providing wire-speed performance even when advanced QoS policies are enabled.

KEY FEATURES & ROUTING LOGIC

- SP/WRR Hybrid Queuing: Offers the flexibility to assign Strict Priority to latency-sensitive queues (e.g., VoIP, video conferencing) and Weighted Round Robin to best-effort data queues, optimizing for both jitter and throughput.
- Custom Congestion Avoidance: Integrated support for Weighted Random Early Detection (WRED), which proactively drops lower-priority packets to prevent global TCP synchronization and maintain high throughput.
- Granular Packet Classification: Supports advanced classification and marking capabilities based on 802.1p, Differentiated Services Code Point (DSCP), IP Precedence, and MAC addresses, allowing for precise mapping of traffic into the correct hardware queues.
- Flow-Based Policing & Shaping: Hardware-based ingress policing and egress traffic shaping ensures that the switch can meter and shape traffic per-port and per-queue, guaranteeing consistent and predictable application performance.
- Jumbo Frame Support: The switch supports large frame sizes (up to 9216 bytes), enhancing the efficiency of large data transfers while maintaining QoS parameters.

- Link Aggregation: Supports IEEE 802.3ad Link Aggregation Control Protocol (LACP), allowing multiple physical links to be bonded into a single logical trunk for increased bandwidth and link redundancy.

COMPLIANCE & STANDARDS

The Aggregation Ethernet Switch conforms to the most demanding industry specifications to ensure seamless integration and operation in heterogeneous network environments. Full compliance with the IEEE 802.1p standard ensures that Class of Service (CoS) prioritization works effectively in any standards-based network. The device adheres to the globally recognized MEF 14 and MEF 9 specifications for Carrier Ethernet services, validating its suitability for service provider and metro Ethernet deployments. Additionally, the platform meets stringent environmental and safety regulations, including RoHS, REACH, and CE marking. The hardware is designed to meet NEBS Level 3 criteria for telecommunications equipment, offering robustness and reliability in mission-critical network environments.

TECHNICAL SPECIFICATIONS

This section details the core hardware specifications for the Aggregation Ethernet Switch. The platform features a modular and scalable architecture that

supports a wide range of high-density interfaces. It is equipped with redundant, hot-swappable power supplies and advanced cooling systems to ensure 99.999% availability. The non-blocking architecture ensures that all ports can operate at line-rate simultaneously.

Parameter	Specification
Form Factor	1RU Standard Rack-mountable Chassis
Switching Capacity	768 Gbps (non-blocking fabric)
Forwarding Rate	572 Mpps (wire-speed for 64-byte packets)
CPU & Memory	Quad-core ARM Cortex-A72, 4 GB DDR4 RAM
Flash Storage	2 GB eMMC
Queues per Port	8 hardware queues supporting SP/WRR
Buffer Memory	16 MB shared packet buffer per ASIC
Power Supply	Dual Hot-Swappable Redundant AC/DC (100-240V AC, -48V DC)
Typical Power Consumption	150W (fully loaded with optics)
MTBF	> 250,000 hours at 25°C
Operating Temperature	0°C to 45°C (32°F to 113°F)
Dimensions (HxWxD)	4.4 cm x 44.0 cm x 45.0 cm (1.73 in x

	17.3 in x 17.7 in)
Weight	7.5 kg (16.5 lbs) with dual PSUs

ORDERING SKU INFORMATION

For flexible procurement and deployment, the Aggregation Ethernet Switch is available in multiple variants, each offering different port densities and power supply configurations to suit a wide range of application scenarios.

- AGS-48P-L3: 48x 10/100/1000BASE-T PoE+ ports + 4x 1/10G SFP+ Uplink ports. Includes dual hot-swappable AC power supplies. Advanced Layer 3 and QoS licensing.
- AGS-48F-L3: 48x 1G SFP ports + 4x 1/10G SFP+ Uplink ports. Includes dual hot-swappable DC power supplies. Advanced Layer 3 and QoS licensing.
- AGS-24X-L3: 24x 1/10G SFP+ ports + 2x 40G QSFP+ Uplink ports. Includes dual hot-swappable AC power supplies. Advanced Layer 3 and QoS licensing.
- AGS-Q-SKU: Accessory kit for the Aggregation Switch Series, containing all required rack-mounting hardware, console cables, and power cords.

