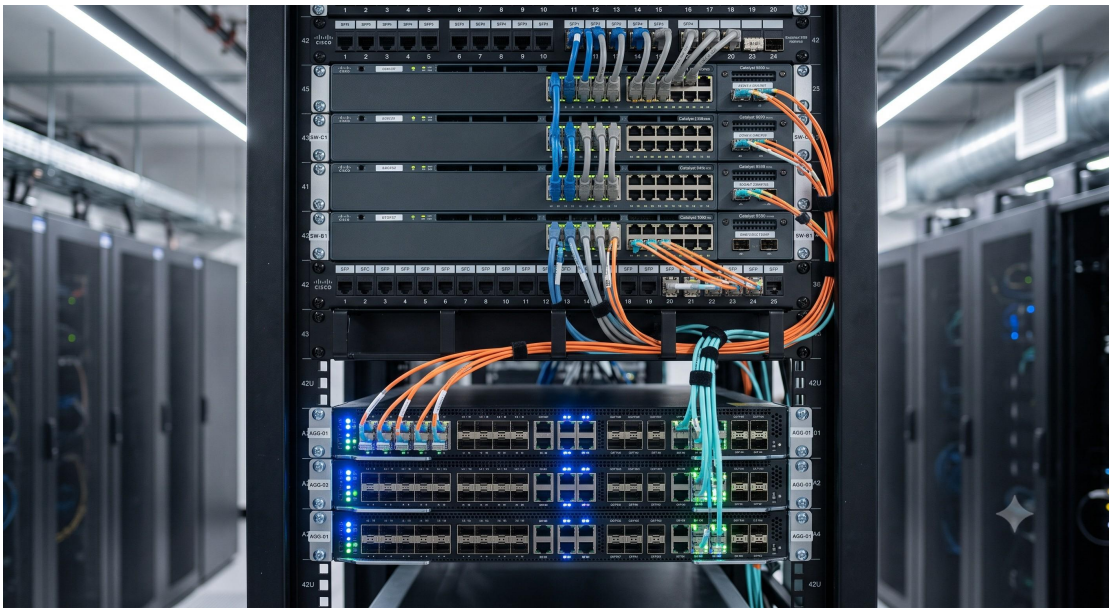
Cisco Catalyst Switch Interfacing with High-Performance Chinese OEM Aggregation Devices - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION

This document serves as the definitive technical reference for the integration architecture and hardware specifications governing the interfacing of Cisco Catalyst switching platforms with high-performance aggregation devices sourced from leading Chinese Original Equipment Manufacturers (OEMs). This whitepaper delineates the engineering principles, forwarding plane interoperability, and physical layer compliance required for seamless co-existence in enterprise campus, carrier-grade, and datacenter spine-leaf topologies. The content is structured for network architects, systems integrators, and procurement engineers seeking a standards-based, multi-vendor aggregation strategy without compromising forwarding performance or operational stability.



CORE INTERNAL TOPOLOGY

The architectural foundation of this integrated solution relies on a multi-layered interconnect model. At the physical stratum, the Cisco Catalyst switch (serving as the leaf or distribution node) interfaces via 10/25/40/100 Gigabit Ethernet optical or copper ports to the Chinese OEM aggregation device (functioning as the spine or core aggregator). The internal topology is predicated on a non-blocking, cut-through forwarding architecture that ensures deterministic latency across the link. The OEM device utilizes a merchant silicon switching ASIC (e.g., Broadcom Trident 3 or Tomahawk series derivatives) that is fully IEEE 802.3-compliant, enabling flawless Ethernet frame encapsulation and forwarding. The Catalyst switch leverages its UADP or custom ASIC to generate standard Ethernet frames with 802.1Q VLAN tags and 802.1p Class of Service (CoS) markings. The topology supports link aggregation groups (LAGs) per IEEE

802.3ad, enabling up to 8 member links per bundle, providing aggregated throughput of up to 800 Gbps. The internal backplane of the OEM chassis is designed for a switching capacity exceeding 3.2 Tbps, facilitating line-rate forwarding for all interfaces simultaneously. A critical engineering note is the dynamic buffer allocation mechanism on the OEM device, which utilizes a shared packet buffer pool of up to 32 MB, optimized for burst absorption from Catalyst uplinks.

SWITCHING SUBSYSTEM CAPABILITIES

The switching subsystem on the OEM aggregation device supports advanced Layer 2 and Layer 3 features that directly complement the Catalyst ecosystem. The device maintains a full IPv4/IPv6 routing table with support for up to 256,000 prefixes, enabling robust inter-VLAN routing and policy-based forwarding. The system employs a distributed forwarding architecture where each line card houses its own forwarding engine, minimizing the reliance on a central supervisor for data plane operations. Multicast forwarding is handled via PIM-SM and IGMP snooping, ensuring efficient bandwidth utilization for IPTV and industrial IoT applications. The Catalyst switch, in turn, can be configured to operate in transparent bridging or routed access mode, depending on the deployment scenario. Key capabilities include Jumbo Frame support (up to 9216 bytes), flow control (IEEE 802.3x), and priority flow control

(IEEE 802.1Qbb) for lossless Ethernet in storage environments. The OEM device offers comprehensive support for MPLS and Segment Routing (SR-MPLS) to facilitate carrier-grade traffic engineering.

OPERATIONAL ADVANTAGES

Interfacing these platforms provides strategic and operational advantages. The solution reduces capital expenditure by deploying cost-effective Chinese OEM devices at the aggregation tier while maintaining Cisco Catalyst's superior software-defined networking (SDN) capabilities and a feature-rich operating system at the access/distribution layer. The integrated approach provides a flexible, vendor-diverse supply chain, mitigating risks associated with single-vendor lock-in. From a field operations perspective, the standardized CLI and SNMP-based management (including MIB support) ensure that existing network monitoring systems (e.g., SolarWinds, PRTG) require minimal modifications. The solution supports Zero-Touch Provisioning (ZTP) for rapid deployment. The combined platform offers high availability through features like UDLD, BFD, and IEEE 802.1w RSTP, ensuring network convergence times of less than 50 milliseconds in the event of link failure.

SPECIFICATION MATRIX

Parameter	Specification
Form Factor	1RU to 4RU Modular Chassis / Fixed Form Factor
Switching Capacity	Up to 3.2 Tbps (Backplane) / 1.44 Tbps (Forwarding)
Forwarding Rate	Up to 2,400 Mpps (Million packets per second)
Power Supply	Dual Hot-Swappable Redundant AC (100-240V) / DC (-48V)
Operating Temperature	0°C to 45°C (Short-term up to 55°C)
Relative Humidity	10% to 90% (Non-condensing)
MTBF	> 250,000 Hours (Bellcore TR-332)
Packet Buffer	32 MB Shared Buffer Architecture

REGULATORY COMPLIANCE

The integrated solution adheres to a comprehensive set of international regulations and telecommunications standards. Both the Cisco Catalyst and the Chinese OEM aggregation devices carry certifications for safety (IEC 60950-1 / IEC 62368-1) and emissions (FCC Part 15 Class A, EN 55032). The solution meets NEBS Level 3 compliance for central office deployments, ensuring robustness

against environmental stress. For carrier Ethernet services, the OEM device is fully certified to the Metro Ethernet Forum (MEF 2.0) specifications, including performance metrics for frame delay, jitter, and frame loss ratio. The system supports Time-Sensitive Networking (TSN) features per IEEE 802.1Qbv, essential for deterministic industrial networks. Transceivers used in the deployment adhere to SFF-8431, SFF-8472, and QSFP MSA standards, guaranteeing interoperability between the Cisco side and the OEM side. Additionally, the system supports Energy Efficient Ethernet (EEE) per IEEE 802.3az, contributing to reduced operational power consumption in low-traffic periods.

