Cisco Catalyst 3850 Series Layer 3 Switch - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION

The Cisco Catalyst 3850 Series represents a foundational shift in enterprise campus networking, delivering a converged wired and wireless access platform that is purpose-built for the digital transformation era. As a next-generation, stackable Ethernet switch, it integrates advanced routing capabilities, high-availability features, and industry-leading power-over-Ethernet innovations into a compact 1RU form factor. This document serves as the definitive technical reference for the platform's port layouts, interface configurations, and throughput ratings, providing network architects and engineers with the critical data required for designing resilient, high-performance campus and aggregation networks.



CORE INTERNAL TOPOLOGY & FORWARDING ENGINE

At the heart of the Catalyst 3850 architecture lies the Cisco Unified Access Data Plane (UADP) Application-Specific Integrated Circuit (ASIC). This programmable engine is the cornerstone of the platform's performance, enabling hardware-based forwarding for both IPv4 and IPv6 traffic with line-rate speed across all port densities . The ASIC architecture is designed to unify wired and wireless policies, ensuring consistent security and application optimization regardless of the access medium. The switch utilizes a non-blocking architecture that eliminates contention within the switching fabric, guaranteeing that all ports can operate simultaneously at their maximum rated speed without packet loss.

The platform supports a modular uplink architecture, allowing the insertion of

field-replaceable network modules (NMs) directly into the chassis. This provides flexibility for future network upgrades. The supported network modules include options for 4 x 1 Gigabit Ethernet (SFP), 2 x 10 Gigabit Ethernet (SFP+), 4 x 10 Gigabit Ethernet (SFP+), 8 x 10 Gigabit Ethernet (SFP+), and 2 x 40 Gigabit Ethernet (QSFP+) connectivity . Specific module compatibility is dependent on the base switch model.

SWITCHING SUBSYSTEM CAPABILITIES & PORT LAYOUT

The Catalyst 3850 family offers a diverse portfolio of port configurations designed to address varying deployment needs, from high-density copper connectivity to dedicated fiber aggregation.

Copper Port Models (RJ45)

The 24- and 48-port models (e.g., WS-C3850-24T, WS-C3850-48P) provide 10/100/1000 Mbps downlink interfaces. These models are ideal for access layer deployments supporting desktop workstations, IP phones, and wireless access points. Certain models, such as the WS-C3850-12X48U and WS-C3850-24XU, support Multigigabit Ethernet (100M/1G/2.5G/5G/10G BASE-T), leveraging the IEEE 802.3bz standard to deliver speeds beyond 1 Gbps over existing Category 5e and Category 6 cabling infrastructure .

Fiber Port Models (SFP/SFP+)

For distribution or high-performance access roles, the series offers dedicated SFP and SFP+ models:

- **1G SFP Models:** The WS-C3850-12S and WS-C3850-24S switches feature 12 and 24 ports respectively, supporting 1 Gigabit Ethernet SFP transceivers .

- **1/10G SFP+ Models:** High-density 10G aggregation is supported via the WS-C3850-12XS (12 ports), WS-C3850-24XS (24 ports), and the WS-C3850-32XS (32 ports when the C3850-NM-8-10G module is fitted). The flagship WS-C3850-48XS model offers 48 SFP+ ports for 1/10G connectivity, plus 4 fixed 40 Gigabit Ethernet QSFP+ uplink ports for high-speed stacking or backbone connectivity .

Power over Ethernet (PoE)

The platform delivers comprehensive powering capabilities, including full IEEE 802.3at PoE+ (30W per port) and Cisco Universal Power Over Ethernet (UPOE), which supplies up to 60W per port for high-power devices such as digital signage, pan-tilt-zoom cameras, and thin clients . Power supplies are modular and hot-swappable, with options including 350W AC, 715W AC, 750W AC, and 1100W AC units to accommodate varying PoE budgets.

OPERATIONAL ADVANTAGES

StackWise-480 Technology

The Catalyst 3850 utilizes Cisco StackWise-480, which provides a 480 Gbps stack ring throughput. This technology allows multiple switches to be interconnected as a single logical unit, offering high-density port aggregation and simplified management. The stacking architecture ensures that the forwarding capacity scales linearly with the number of switches in the stack.

StackPower

StackPower enables power sharing across stack members. In the event of a power supply failure, power is automatically redistributed among the remaining switches, ensuring that connected PoE devices remain operational and improving overall system reliability .

Integrated Wireless Controller

Unique to the Catalyst 3850 is its embedded wireless controller capability. The UADP ASIC enables the switch to manage up to 100 access points and 2,000 wireless clients per switch or stack, eliminating the need for dedicated hardware controllers in many campus scenarios .

SPECIFICATION MATRIX

Category	**Parameter**	**Specification**

Performance	Switching Capacity (48-Port Models)	176 Gbps
Performance	Switching Capacity (24-Port Models)	92 Gbps
Performance	Switching Capacity (12-Port Models)	68 Gbps
Performance	Stacking Bandwidth	480 Gbps (StackWise-480)
Performance	Maximum Forwarding Rate (64-byte packets)	Up to 250 Mpps (dependent on model)
Physical	Form Factor	1RU Rack-mountable / Desktop
Physical	Port Density (Copper Models)	Up to 48 x 10/100/1000 RJ45 (PoE+/UPOE capable) + Optional Uplink Module
Physical	Port Density (Fiber Models)	Up to 32 x 1/10G SFP+ + 4 x 40G QSFP+ (with module)
Physical	Network Module Slots	1 x Field-replaceable Module Slot
Physical	MAC Address Table Size	32,000 entries

Physical	Jumbo Frame Support	9,198 bytes
Power	Power Supply Options	350W AC, 715W AC, 750W AC, 1100W AC, 440W DC
Power	Power Supply Redundancy	Dual, Hot-swappable
Power	PoE Power Budget	Up to 1100W (UPOE models)
Software	Layer 3 Routing Protocols	RIP, EIGRP, OSPF, BGP (IP Services image)
Software	IPv4 Routes	24,000
Software	Switched Virtual Interfaces (SVIs)	1,000
Software	Integrated Wireless Controller	Up to 100 APs / 2000 Clients per stack

REGULATORY COMPLIANCE & CERTIFICATIONS

The Cisco Catalyst 3850 Series is designed to meet the rigorous demands of enterprise and carrier-grade environments, complying with a comprehensive suite of international standards and regulatory certifications. The platform is

compliant with IEEE standards including 802.3 (Ethernet), 802.3u (Fast Ethernet), 802.3ab (Gigabit Ethernet), 802.3ae (10 Gigabit Ethernet), 802.3at (PoE+), and 802.3az (Energy Efficient Ethernet) .

The hardware adheres to electromagnetic compatibility (EMC) directives such as FCC Part 15 (USA), ICES-003 (Canada), and EN 55022/CISPR 22 (Europe) for emissions, alongside safety certifications including UL 60950-1 and IEC 60950-1. Additionally, the platform supports advanced security protocols, including AES-256 (MACsec-256) for link-layer data encryption on SFP+ and Multigigabit models, ensuring data confidentiality across the network infrastructure .



PRODUCT LIFECYCLE & ASSURANCE

All Cisco Catalyst 3850 Series switches are backed by an Enhanced Limited

Lifetime Warranty (E-LLW) with Next-Business-Day (NBD) advance hardware replacement, providing a strong assurance of investment protection and operational continuity . For the most current information on product end-of-life dates and support status, please consult the official Cisco support documentation, as the series has transitioned through its end-of-sale milestones .