

Cisco Catalyst 9300 Series - Official Technical Overview & Hardware Datasheet

PRODUCT IDENTIFICATION AND EXECUTIVE SUMMARY

The Cisco Catalyst 9300 Series represents the industry's most widely deployed stackable switching platform, purpose-built for the emerging paradigms of Security, IoT, Mobility, and Cloud. As the foundational building block for Cisco's Software-Defined Access (SD-Access) architecture, the Catalyst 9300 Series sets new benchmarks for network scale, performance, and programmability. These switches are engineered to address the exponential bandwidth demands of Wi-Fi 6 (802.11ax) and 802.11ac Wave 2, while providing a seamless transition to a cloud-ready, intent-based networking infrastructure. The platform is distinguished by its Unified Access Data Plane (UADP) 2.0 ASIC architecture, an x86 CPU complex with substantial memory, and support for the open Cisco IOS XE operating system, enabling native container hosting and third-party application integration. This comprehensive datasheet details the hardware architecture, technical specifications, performance metrics, and ordering information for the Catalyst 9300 Series.



SYSTEM HARDWARE TOPOLOGY AND ARCHITECTURE

The Cisco Catalyst 9300 Series is architected around the Cisco UADP 2.0 Application-Specific Integrated Circuit (ASIC), which features a programmable pipeline and micro-engine capabilities. This design allows for template-based, configurable allocation of Layer 2 and Layer 3 forwarding, Access Control Lists (ACLs), and Quality of Service (QoS) entries, ensuring investment protection and adaptability to evolving network requirements. The Catalyst 9300X models further advance this architecture with the UADP 2.0sec ASIC, which adds line-rate hardware-based encryption support, including 100G IPsec.

At the core of the platform is a powerful x86 CPU complex. Standard Catalyst 9300 and 9300L models are equipped with 8 GB of DRAM and 16 GB of flash memory, while the high-performance 9300X models feature 16 GB of DRAM to

support more demanding applications and containerized workloads . An external USB 3.0 SSD pluggable storage slot is also available, delivering up to 240 GB of additional storage for hosting containers and applications .

DATA AND CONTROL PLANE CAPABILITIES

The Catalyst 9300 Series offers exceptional performance and scalability, with metrics varying by model to address diverse deployment scenarios. The platform supports high-performance IP routing through the Cisco Express Forwarding (CEF) hardware routing architecture. This includes support for a comprehensive suite of IP unicast routing protocols such as OSPF, EIGRP, BGPv4, and IS-ISv4, alongside IPv6 routing (OSPFv3 and BGPv6) for maximum performance in next-generation networks . IP multicast routing is supported via Protocol-Independent Multicast (PIM) in Sparse Mode (SM) and Source-Specific Multicast (SSM) .

The series is also designed for high availability, incorporating features such as Nonstop Forwarding with Stateful Switchover (NSF/SSO) when stacked, delivering sub-50-millisecond convergence for the most resilient stackable architecture . The platform supports Audio Video Bridging (AVB) starting with Cisco IOS XE Software Release 16.8, ensuring highly reliable, low-latency, time-synchronized delivery of audio and video streaming services over Layer 2

Ethernet networks .

COMPONENT BREAKDOWN AND SUPPORTED INTERFACES

The Catalyst 9300 Series offers a versatile range of models with flexible downlink and uplink options to suit various access, aggregation, and lean branch deployments.

Downlink Port Configurations:

- Copper (10/100/1000): Models such as the C9300-24T and C9300-48T provide standard Gigabit Ethernet connectivity .
- PoE+ (Power over Ethernet Plus): Models like the C9300-24P and C9300-48P offer up to 437W of PoE budget .
- Cisco UPOE (Universal Power Over Ethernet): High-power models such as the C9300-24U and C9300-48U deliver up to 60W per port for next-generation IoT devices and access points .
- Multigigabit Ethernet: High-bandwidth models like the C9300-24UX and C9300-48UXM support speeds of 1G, 2.5G, 5G, and 10G over existing Category 5e/6 cabling .
- SFP Fiber: Models like the C9300-24S and C9300-48S provide fiber connectivity with 1G SFP ports .
- 25G SFP: High-performance models, including the C9300X-24Y and

C9300X-12Y, provide 25G fiber downlinks for ultra-high-density environments .

Uplink Architecture:

- Modular Uplinks: Catalyst 9300 and 9300X models feature modular uplink bays supporting a variety of modules, including 1G, 10G, 25G, 40G, and 100G interfaces . This provides exceptional investment protection and deployment flexibility.
- Fixed Uplinks: Catalyst 9300L models offer fixed uplink options, including 4x1G SFP, 4x10G SFP+, 2x40G QSFP+, or 4x25G SFP28, providing cost-effective solutions for access layer deployments .

OPERATIONAL SPECIFICATIONS MATRIX

Parameter	Specification
Form Factor	1RU Rack-mountable
Switching Capacity	Up to 2,000 Gbps (C9300X-24Y)
Stacking Bandwidth	Up to 1 Tbps (C9300X)
Forwarding Rate	Up to 1,488 Mpps (C9300X-24Y)
DRAM	8 GB (Standard), 16 GB (9300X Models)
Flash Memory	16 GB
MAC Address Table Size	Up to 64,000 entries

Total IPv4 Routes	Up to 112,000 (48,000 direct, 64,000 indirect)
Jumbo Frame Support	9,198 bytes
Power Supply	1+1 Redundant AC/DC (Hot-pluggable)
PoE Budget	Up to 890W (C9300L-48PF)
Operating Temperature	-5°C to 40°C
MTBF	314,790 hours

HIGH-AVAILABILITY AND REDUNDANCY

The Catalyst 9300 Series is built for maximum resilience. It supports Cisco StackWise-480 technology, which provides up to 480 Gbps of stackable switching bandwidth, and the Catalyst 9300X models scale to up to 1 TBps of local stackable switching bandwidth . This virtualizes up to eight physical switches into a single logical unit, simplifying management and providing high-performance, loop-free topologies . Additionally, Cisco StackPower technology enables intelligent power sharing across stack members, delivering high-density PoE and UPOE while optimizing power consumption and ensuring power redundancy . A modular, 1+1 redundant power supply and field-replaceable fan trays further enhance hardware resiliency.

REGULATORY COMPLIANCE AND CERTIFICATIONS

The Cisco Catalyst 9300 Series adheres to a comprehensive set of industry standards and regulatory certifications, ensuring seamless integration into diverse global enterprise environments. Compliance includes IEEE 802.3 (Ethernet), IEEE 802.1Q (VLAN), IEEE 802.3ad (LACP), IEEE 802.1w (RSTP), and IEEE 802.1s (MST) . The platform meets stringent safety and emissions standards, including UL 60950-1, IEC 60950-1, EN 60950-1, FCC CFR47 Part 15 Class A, EN 55022 Class A, VCCI Class A, and RoHS compliance .

LIFECYCLE ASSURANCE AND SUPPORT

All Cisco Catalyst 9300 Series switches are covered by the Cisco Enhanced Limited Lifetime Warranty (E-LLW), which includes next-business-day replacement and 90-day technical support, ensuring long-term investment protection and peace of mind .

