Cisco ASR 9904 Router Power Consumption Metrics and Cooling Airflow Guidelines - Official Technical Overview & Hardware Datasheet

CISCO ASR 9904 ROUTER POWER CONSUMPTION METRICS AND COOLING AIRFLOW GUIDELINES - OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

The Cisco ASR 9904 Router represents a compact, carrier-class modular routing platform engineered for high-density edge and aggregation deployments. Within a space-efficient 6-rack-unit form factor, the ASR 9904 delivers exceptional scalability, operational efficiency, and the thermal management sophistication required for modern service provider and enterprise network environments. This technical overview provides comprehensive power consumption metrics, cooling airflow specifications, and deployment guidelines for network architects, facilities engineers, and operations teams responsible for datacenter and central office infrastructure planning.

The ASR 9904 chassis supports two line card slots and dual redundant Route Switch Processors with integrated fabric, achieving a system throughput capacity of up to 8 Tbps. Its pay-as-you-grow architecture enables operators to scale capacity incrementally while maintaining optimized power efficiency and

predictable thermal profiles. The platform incorporates the same innovative power and cooling technologies deployed across the Cisco ASR 9000 Series portfolio, ensuring consistent operational characteristics and proven reliability across the aggregation services router family.



HARDWARE ARCHITECTURE & SILICON

The Cisco ASR 9904 Router is built upon a distributed, nonblocking fabric architecture that separates data plane forwarding from control plane processing. Each line card slot is capable of switching up to 2 Tbps of bidirectional traffic, with the Route Switch Processors providing integrated fabric functionality. This architectural approach ensures that power consumption scales linearly with deployed capacity rather than requiring full-system power budgets from initial deployment.

The chassis accommodates two RSP cards in a dual-redundant configuration. In a redundant configuration with dual RSPs, the system operates in active/active nonblocking mode, with full fabric redundancy ensuring continuous forwarding operations during processor failover events. The RSP cards are shared across multiple ASR 9000 Series chassis, including the ASR 9010, ASR 9006, ASR 9906, and ASR 9910 models.

Power delivery to the ASR 9904 is managed through modular Power Entry Modules available in both AC and DC configurations. The chassis supports multiple power module types to align with varying facility power architectures and redundancy requirements. The Version 2 DC power system accommodates up to four DC power modules, each rated at 2100 W output (2340 W total input power per module). The Version 3 DC power system supports power modules rated at 4400 W output with 4730 W total input power. AC configurations support 3000 W and 6000 W power modules operating from worldwide ranging AC input of 200 to 240 V, 50 to 60 Hz, with a maximum current draw of 16 A.

KEY FEATURES & ROUTING LOGIC

POWER DELIVERY ARCHITECTURE

- Pay-as-you-grow modular power: AC and DC power module options enable capacity alignment with deployed line cards and service requirements.
- Redundancy modes: AC configurations support N+N redundancy; DC configurations support N+1 redundancy, with at least two power modules required for full N+1 protection in a fully configured system.
- A/B feed redundancy: Independent power feeds ensure continued operation during upstream power distribution failures.
- Fully load-sharing infrastructure: No power zone restrictions; all installed power modules share the load proportionally.

THERMAL MANAGEMENT SYSTEM

- Single fan tray design: The ASR 9904 chassis contains one fan tray located on the left side of the chassis, accessible from the rear.
- Twelve high-efficiency fans: The fan tray incorporates twelve variable-speed fans, with every two fans sharing a fan controller.
- 1:1 fan controller power protection: Each fan controller receives protected power, ensuring continued operation during power delivery anomalies.
- Single fan failure tolerance: A single fan failure has no impact on airflow, as the remaining eleven fans compensate to maintain thermal performance.

COOLING AIRFLOW PATH

- Standard configuration: The ASR 9904 uses a side-to-side cooling path. The

inlet is positioned at the right side of the chassis, with exhaust at the left side.

- 23-inch rack configuration: When installed in a 2-post 23-inch rack, airflow is circulated front-to-back. An optional air baffle accessory kit (ASR-9904-BAFFLE=) is available for this mounting configuration to properly segregate intake and exhaust air streams.

COMPLIANCE & STANDARDS

The Cisco ASR 9904 Router complies with applicable industry standards for rack mounting, environmental operation, and safety certification. The chassis is designed for installation in standard EIA-310-D compliant 19-inch equipment racks, with support for 21-inch and 23-inch configurations through adapter plates. The platform meets IEC/EN/UL/CSA 60950 requirements for altitudes up to 2000 meters, with extended operational capability up to 4000 meters.

Environmental specifications align with carrier-grade deployment requirements. The router operates within a nominal temperature range of 41 to 104°F (5 to 40°C), with short-term operation supported from 23 to 131°F (-5 to 55°C) for the ASR 9904 model specifically. Short-term operation refers to periods not exceeding 96 consecutive hours and no more than 15 days in any one-year period, totaling no more than 360 hours annually.

TECHNICAL SPECIFICATIONS

The following specification matrix provides detailed power consumption metrics and cooling system parameters for the Cisco ASR 9904 Router.

Parameter	Specification
Form Factor	6 RU Modular Chassis (10.38 in H x 17.57 in W x 25.02 in D)
Line Card Slots	2 slots, horizontal orientation
Route Switch Processors	Dual redundant RSPs with integrated fabric
Switching Capacity	Up to 8 Tbps system throughput; 2 Tbps per slot bidirectional
Power Module Types	AC: 3 kW, 6 kW; DC: 2.1 kW, 4.4 kW
Power Redundancy	AC: N+N; DC: N+1 (minimum 2 modules for N+1)
DC Input Voltage	-48 VDC nominal (North America); -60 VDC nominal (EU); Range: -40.5 to -72 VDC
DC Input Current	49 A maximum at -48 VDC nominal; 39 A maximum at -60 VDC nominal
AC Input Voltage	200 to 240 VAC, 50 to 60 Hz, 16 A

	maximum
Fan Tray Configuration	Single tray, left-side chassis location, 12 variable-speed fans
Airflow Path (Standard)	Right side inlet to left side exhaust (side-to-side)
Airflow Path (23-inch Rack)	Front-to-back with optional ASR-9904-BAFFLE air baffle kit
Fan Tray Power (25°C)	100 W
Fan Tray Power (40°C)	360 W
Fan Tray Power (55°C)	605 W
Rear Clearance (4-post rack)	Minimum 2.45 inches (6.22 cm)
Side Clearance (per side)	Minimum 6.00 inches (15.24 cm)
Operating Temperature (Nominal)	41 to 104°F (5 to 40°C)
Operating Temperature (Short-term)	23 to 131°F (-5 to 55°C) for ASR 9904
Operating Humidity	10 to 85 percent noncondensing
Operating Altitude	0 to 13,000 ft (0 to 4,000 m)
Acoustic Noise	78 dB at 80.6°F (27°C) maximum

ORDERING SKU INFORMATION

The ASR 9904 chassis is available in AC and DC configurations to match facility

power infrastructure. Primary ordering SKUs include ASR-9904-AC and ASR-9904-DC, each configured with Version 2 Power Entry Modules. Spare chassis configurations use the = suffix convention (ASR-9904-AC=, ASR-9904-DC=).

Power module options include 3 kW and 6 kW AC modules (PWR-3KW-AC-V2, PWR-6KW-AC-V3) and 2.1 kW and 4.4 kW DC modules (PWR-2.1KW-DC-V2, PWR-4.4KW-DC-V3). The cooling subsystem is supported through the ASR-9904-FAN system fan tray and ASR-9904-FILTER fan filter assembly. For 23-inch rack deployments requiring front-to-back airflow, the ASR-9904-BAFFLE air baffle accessory kit must be ordered separately.

