

Nexthop NH-5010 Introduction



The NH-5010 is a high density, fixed form factor, air-cooled, 25.6 Tbps throughput, deep buffer switch, with flexible SerDes technology that enables various port configurations for 800 GbE, 400 GbE, 200 GbE, or 100 GbE applications. The NH-5010 offers line-rate encryption, sophisticated packet processing, deep buffers, large scale routing and ACL tables, traffic management, congestion control, and queuing capabilities. These attributes make the NH-5010 ideally suited for high-bandwidth, long distance, secure interconnects in scale-across and DCI applications, as well as for data center spine switching.

Technical Capabilities and Features

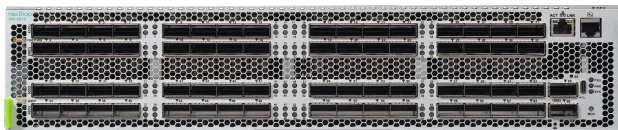
AI scale-out networks are growing beyond single cluster footprints. Connecting multiple clusters requires seamless, high bandwidth and secure connectivity. This has given rise to a new efficient architecture called Disaggregated Spine - a leaf-spine CLOS fabric built with scale-across leaf switches to effectively handle low latency, east-west cluster interconnect traffic with advanced AI features, and scale-across spine switches that can handle advanced QoS, expanded route scale, deep packet buffers and line-rate encryption for long distance connectivity. The NH-5000 family of switches are ideally suited as scale-across spine switches, with 32GB of buffer capacity, VOQ architecture, line-rate MACsec on all ports, support for 400 GbE and 800 GbE ZR optical modules, advanced Telemetry and Monitoring for troubleshooting and traffic visibility.

Performance Highlights	Built for Scale-Across	Scalable Operations
<p>25.6Tbps Line-Rate Switching</p> <p>32GB packet buffer</p> <p>Hardware-based Encapsulation and Tunneling</p> <p>Virtual Output Queue (VOQ) based architecture prevents Head-of-Line (HOL) Blocking during congestion events</p>	<p>Integrated, line-rate, IEEE 802.1AE MACsec capability on all ports</p> <p>Large scale resources for Routing and Security Policies</p> <p>Sophisticated traffic management with programmable, hierarchical scheduling and shaping</p>	<p>Next Generation Data Center Design</p> <p>High Performance Control Plane</p> <p>Flexible NOS Choice</p> <p>Nexthop NOS Community SONiC BYoNOS</p>

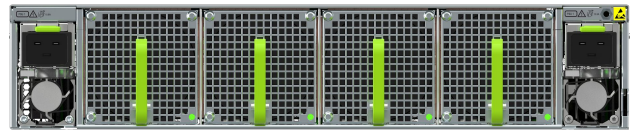
Platform Overview

The NH-5010 platform delivers 64 ports of 400 GbE in a 2RU system with a throughput of 25.6 Tbps. The platform also has 2 dedicated dataplane QSFP28 front panel ports for telemetry and RJ-45 based console along with a 1GbE out-of-band ethernet port for system management.

An 8-core CPU complex allows for demanding control plane applications that are necessary for extremely large scale AI-factory environments.



32 x 400GbE QSFP-DD with support for up to 16 x 800G and 32 x 400GbE QSFP112 + 2 x 100GbE QSFP



Front-to-Back Airflow
1+1 PSU and 3+1 Fans

System Specifications

Model Number	SKU	NH-5010
Control Plane	Processor	AMD Ryzen v3000 8c/16t, 64-bit x86
	Memory	32 GB DDR5-4800
	Security	Infineon SLB 9672 TPM 2.0
	Boot Storage	32 MB SPI
	Storage	240 GB, M.2 2280, NVMe SSD
	Boot Loader	ONIE
Form Factor	Rack Units	2 RU, EIA-310 rack or equivalent type
	Dimensions (H x W x D)	3.48" x 17.3" x 23.6" / 89 mm x 440 mm x 600 mm
	Weight	49.8 lbs (22.59 kg) - without optical modules
Power and Cooling	Power Supply	PSU-AC-3K211B-C20-F (Hot swappable, 1+1 Redundant)
	Fan Module	FAN-8121-F (Hot swappable, 3+1 Redundant)
	Cooling	Front-to-back airflow

System Specifications

Ports	Network	32 x 400 GbE QSFP56-DD or up to 16 x 800 GbE QSFP112-DD 32 x 400 GbE QSFP112 2 x 100 GbE QSFP28
	Management	1 x 10/100/1000BASE-T RJ45
	USB	1 x USB 2.0 Type-C
	Console	1 x RJ45 serial console port
System Power¹	Typical Power (DAC)	1041 W
	Typical Power (LPO/ZR)	1835 W
	Maximum Power (LPO/ZR)	2170 W

Environmental Specifications

Operating Conditions	Temperature	0°C to 40°C / 32°F to 104°F
	Humidity	5% to 90% (RH), non-condensing
	Altitude	0 to 10,000 ft (0 – 3000 m)
Non-Operating Conditions	Temperature	-40°C to 70°C / -40°F to 158°F
	Humidity	5% to 95% (RH), non-condensing

Power Supply Specifications

PSU Model	AC	PSU-AC-3K211B-C20-F
Connector Type	AC	C20
Max Output Power	AC	2400 W
Input Voltage/ Frequency	AC	200-240 Vac, 50-60Hz
Max Input Current	AC	15.8A at 200 Vac
Efficiency	AC	96%

Software Support

Nexthop platforms come preinstalled with the Open Network Install Environment (ONIE) and support multiple Network Operating Systems (NOS), including Nexthop NOS, community SONiC and select third-party NOS.

For software release version support, checkout the [SW Release page](#) or contact support@nexthop.ai.

Switch Silicon Specifications

Network Scaling²	SerDes Technology	100Gbps PAM4, 256 SerDes
	Flexible Port configs	Up to 16 ports 800 GbE Up to 64 ports of 400 GbE Up to 128 ports of 200 GbE Up to 256 ports of 100 GbE
	Packet Buffer	32 GB
	MAC Addresses	600K
	VLANs	4K
	ACLs	25K
	ECMP	128-way Next hop groups: 32K, 128K members
	IPv4 LPM Routes	1.6M
	IPv6 LPM Routes	850K
Key Features	Encryption	Line-rate 802.1AE MACSec (QSFP-DD and QSFP112 ports)
	Queuing and scheduling	Up to 12 queues per port and a variety of scheduling algorithms (SP, RR, WRR, WDRR)
	QoS features	DSCP, Hierarchical ECMP, rate limiting, and shaping
	Advanced AI	ROCEv2, DCQCN (PFC, ECN), high-radix ECMP
	Telemetry and Monitoring	Port Mirroring, Flow Mirroring, ERSPAN (ingress and egress)

Regulatory Compliance

Safety	UL/CSA 62368-1:2019, IEC 62368-1:2018	EMC	FCC part 15, Class A ICES-003 VCCI-CISPR 32 AS/NZS CISPR 32 EN 55032 BS EN55032 CISPR 32 KS C 9832 CNS 15936 EN 55035 BS EN55035 CISPR 35 EN 61000-3-2 IEC 61000-3-2 BS EN IEC 61000-3-2 EN 61000-3-3 IEC 61000-3-3 BS EN 61000-3-3 KS C 9835
Certifications	BSMI (Taiwan) CE (European Union) KCC (South Korea) NRTL (North America) RCM (Australia/New Zealand) VCCI (Japan)		
EU Directives	2014/35/EU Low Voltage Directive 2014/30/EU EMC Directive 2012/19/EU WEEE Directive 2011/65/EU RoHS Directive 2015/863/EU Commission Delegated Directive		
Regulatory Model Number		NH25-50	

Datasheet Notes

1. System Power	Typical Power (DAC):400 GbE, L3, MACsec, 800B frames, Random Payload, 25°C, sea level, 50% traffic Typical Power (LPO/ZR): 400 GbE, L3, MACsec, 800B frames, Random Payload, 25°C, sea level, 50% traffic, 50:50 LPO:ZR Maximum Power (LPO/ZR): 400 GbE, L3, MACsec, 800B frames, Random Payload, 35°C, sea level, 100% traffic, 50:50 LPO:ZR
2. Network Scaling	Software-supported features and scale numbers depend on the NOS and the software version.

Ordering Information

NH-5010-F	64 port 400GbE switch (32 ports QSFP-DD and 32 ports QSFP112), 25.6Tbps, 2RU scale-across switch platform with front to back airflow, redundant, hot swappable power supplies (1+1) and fans (3+1)
NH-5010-CHS	Bare chassis - 64 port 400GbE switch (32 ports QSFP-DD and 32 ports QSFP112), 25.6Tbps, 2RU scale-across switch platform. (No power supplies or fans)
NH-SVC-5010-NBD	24x7 Nexthop TAC and next business day RMA support for the NH-5010-F platform
PSU-AC-3K211B-C20-F	AC Power Supply Unit, 3.2 kW, with C20 connector, hot swappable
FAN-8121-F	Dual Rotor Fan Module, front to back airflow, 80mm

Ready to Get Started?

To learn more about Nexthop switches, download quick start guides, safety & regulatory compliance information, and other technical specifications, please visit the [Nexthop platforms page](#).

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