

## Nexthop NH-5000 Series Introduction



The NH-5000 series is a family of high density, fixed form factor, air-cooled, 25.6 Tbps throughput, deep buffer switches, with flexible SerDes technology that enables various port configurations for 800 GbE, 400 GbE, 200 GbE, or 100 GbE applications. These switches offer line-rate encryption, sophisticated packet processing, deep buffers, large scale routing and ACL tables, traffic management, congestion control, and queuing capabilities. This makes these switches ideally suited for high-bandwidth, long distance, secure interconnects in scale-across DCI applications, or for data center spine switching.

## Technical Capabilities and Features

AI scale-out networks are growing beyond single cluster footprints and multiple clusters need to get interconnected seamlessly. 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

- 25.6 Tbps line-rate Switching
- Advanced IPv4/IPv6 Packet Processing
- Integrated, line-rate, IEEE 802.1AE MACsec capability on all ports
- Routing Table scale - IPv4 LPM routes: 1.6M, IPv6 LPM routes: 850K

### Scale-Across Features

- 32GB packet buffer
- Traffic management and programmable, hierarchical scheduling and shaping
- Virtual Output Queue (VOQ) based architecture prevents Head-of-Line (HOL) Blocking during congestion events
- Hardware-based Encapsulations and Tunneling

The **NH-5010-F platform** delivers 64 ports of 400 GbE in a 2RU system with a throughput of 25.6 Tbps. It has two dedicated 100GbE QSFP front panel ports for Telemetry and system management. The platform can also support an operating mode with 16 ports of 800GbE along with 32 ports of 400GbE.



32 x 400GbE QSFP-DD and 32 x 400GbE QSFP  
OR  
16 x 800GbE QSFP-DD and 32 x 400GbE QSFP  
+ 2 x 100GbE QSFP



Front-to-Back Airflow  
Redundant PSU and Fans

## NH-5010-F Platform Specifications

<b>CPU</b>	Processor	AMD Ryzen Embedded V3000, 8 core/16 thread; 64-bit x86
	Memory	32 GB DDR5-4800
	Security	Infineon SLB 9672 TPM 2.0
	Boot Storage	32 MB SPI
	BMC	N/A
	Storage	240 GB, M.2 2280, NVMe SSD
<b>Form Factor</b>	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) - with modules
<b>Hardware</b>	Power Supply	Hot swappable, 2 (1+1) redundant, 3200 W, AC
	Fan Modules	Hot swappable, 4 (3+1) redundant
	Cooling	Front-to-back airflow
<b>Ports</b>	Network	32 x 400 GbE QSFP-DD (56Gb) OR 16 x 800 GbE QSFP-DD (56Gb) 32 x 400 GbE QSFP (112Gb) 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
<b>System Power</b>	AC Input Typical Power DAC <sup>1</sup> Typical Power Optics <sup>2</sup> Maximum Power <sup>3</sup>	200-240 VAC, 50 - 60 Hz 1041 W 1835 W 2170 W
<b>Operating Conditions</b>	Temperature Humidity Altitude	0°C to 40°C / 32°F to 104°F 5% to 90% (RH), non-condensing 0 to 10,000 ft (0 – 3000 m)
<b>Non Operating Conditions</b>	Temperature Humidity	-40°C to 70°C / -40°F to 158°F 5% to 95% (RH), non-condensing

<sup>1</sup> 400 GbE, L3, 800 byte frames, MACsec enabled, Random payload, 25°C, 50% traffic, DAC

<sup>2</sup> 400 GbE, L3, 800 byte frames, MACsec enabled, Random payload, 25°C, 50% traffic, 50% LPO, 50% ZR

<sup>3</sup> 400 GbE, L3, 800 byte frames, MACsec enabled, Random payload, 35°C, 100% traffic, 50% LPO, 50% ZR

## Switch Silicon Specifications

<b>Network Scaling<sup>4</sup></b>	SerDes Technology	106.25 Gbps 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
	Deep Packet Buffers	32GB
	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
<b>Key Features</b>	Encryption	Line-rate 802.1AE MACSec on all 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)
	Telemetry and Monitoring	Port Mirroring, Flow Mirroring, ERSPAN (ingress and egress)

<sup>4</sup> Software-supported features and scale numbers depend on the NOS and the software version.

## Software Support

The NH-5000 series switches come preinstalled with the Open Networking Install Environment (ONIE) bootloader.

The NH-5000 series switches support multiple network operating systems including community Software for Open Networking in the Cloud (SONiC) as well as Nexthop NOS.

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

## Regulatory Compliance

<b>Safety</b>	UL/CSA 62368-1:2019, IEC 62368-1:2018	
<b>EMC</b>	FCC part 15, Class A ICES-003 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	VCCI-CISPR 32 AS/NZS CISPR 32 EN 55032 BS EN55032 CISPR 32 KS C 9832 CNS 15936 EN 55035 BS EN55035 CISPR 35
<b>Certifications</b>	BSMI (Taiwan) CE (European Union) KCC (South Korea) NRTL (North America) RCM (Australia/New Zealand) VCCI (Japan)	
<b>EU Directives</b>	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	
<b>FIPS</b>	140-3 Level 1	

## Ordering Information

SKU	Product Description
<b>NH-5010-F</b>	64 port 400GbE switch (32 ports QSFP-DD and 32 ports QSFP112 ), 25.6Tbps, 2RU scale-across switch platform with front to back air flow, redundant, hot swappable power supplies (1+1) and fans (3+1)
<b>PSU-AC-3200</b>	AC Power Supply Unit, 3.2 KW, Hot swappable, CRPS-185 form factor
<b>FAN-12V80G1-F</b>	Dual Rotor Fan Module, front to back air flow, 80mm
<b>NH-CHS-5010</b>	Field replaceable unit for 64 port 400GbE, 25.6Tbps, 2RU scale-across switch platform
<b>NH-SVC-5010-NBD</b>	24x7 Nexthop TAC and next business day RMA support for the NH-5010-F platform

## Ready to Get Started?

To learn more about the NH-5000 Series of switches including technical specifications and user guide, refer to the [Nexthop platforms page](#).

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