# N Series IPI<sup>™</sup> OcNOS<sup>®</sup> Switches

IDEAL FOR DATA CENTER NETWORKS AND HIGH-END CAMPUS NETWORKS

Model: N5850-48S6Q; N8550-48B8C; N8550-32C



### Overview

The N Series Data Center Switches are a series of high-performance switches that provide 10G/25G/40G/100G wirespeed connectivity for high-density availability and uplink options, designed to be deployed as Top-of Rack (ToR) or leaf-spine switches in data center applications. Combined with robust, programmable and innovative operating system OcNOS.

OcNOS provides a common software for multiple deployments and hardware. It is designed using several inbuilt abstraction layers which allows the software to run over multiple control plane CPUs and forwarding chipsets. It is highly modular with multiple processes handling individual functions.

### Benefits

- Broadcom Switch Chip
- VXLAN Scales Data Center Capacity
- MLAG (VAP) Enhance Reliability
- 1+1 Redundant Power Supplies
- N+1 Redundant Fan Modules
- Support BGP, OSPF, RIP and Other Protocols
- Support QoS, Netconf
- IP Infusion OcNOS

#### Overview

Web-scale networking requires new solutions to build hyperscale and cloud data centers equipped with a web-scale operations toolset. IP Infusion's NOS running on open networking switches combines the key principles of best-in-class hardware and software. Open Compute Network Operation System (OcNOS) can be used to build both Layer-3 and Layer-2 Data Center fabric as it provides a rich set of control plane features, providing robust quality, ensuring lower costs and at the same time providing vendors the best of breed selection for hardware platforms.

OcNOS provides a common software for multiple deployments and hardware. It is designed using several inbuilt abstraction layers which allows the software to run over multiple control plane CPUs and forwarding chipsets. It is highly modular with multiple processes handling individual functions. As the OcNOS solution is built using standards based definitions, as well as popular vendor specific extensions, it allows for high interoperability.

A key concept that will enable next generation Data Center networks, is the separation of the networking software from the switching or routing hardware. One of the biggest advantages of disaggregation is CAPEX reduction, followed by OPEX savings and deployment flexibility.

Telecom and Hyperscale Datacenter operators need a new approach for network platform development and procurement to enable:

- Faster introduction of technologies, designs, and features by means of a collaborative ecosystem of hardware and software component vendors
- Flexibility in network design and service deployment via plug-n-play hardware and software components that can cost-effectively scale up and down
- Unit-cost reduction through use of standard hardware and software technology components with very large economies-of-scale wherever appropriate

OcNOS provides a unique value proposition in helping build modern Data Centers. It provides robust quality with over 300 OEM and End-users, with hundreds of thousands of deployment in solutions spanning access, core, transport and data centre networking. It is a feature rich solution with extensive legacy and new protocol coverage.

OcNOS also drastically reduces the operational cost as it can be used to address multiple solutions such as Data center, Optical Transport, Cell Site Router, Provider Aggregation & Passive Optical Networks. There is extensive support for multiple hardware vendors, providing continuity of supply and allowing for best of breed selection.

The standards based management Infrastructure plugs into off-the-shelf or home-grown network management systems with ease.

## **Technical Specification**

N series switches come with the industry-standard hardware and OcNOS. Here's a look at the details.

## CHARACTERISTICS

	N5850-4856Q	N8550-48B8C	N8550-32C
Port			
Ports	48x 10G SFP+ and 6x 40G QSFP+	2x 10G, 48x 25G SFP28 and 8x 100G QSFP28	2x 10G and 32x 100G QSFP28
100G QSFP28		8	32
40G QSFP+	6	8	32
25G SFP28		48	
10G SFP+	48	2	2
RJ45 Management Port	1	1	1
Console Port	1	1	1
USB Type A Storage Port	1	1	1
Operating System			
OS	OCNOS-DC-IPBASE-720	OCNOS-DC-IPBASE-1800	OCNOS-DC-IPBASE-3200
Key Components			
Switch Chip	Broadcom BCM56864 Trident II+	Broadcom BCM56873 Trident III	Broadcom BCM56870 Trident III
СРՍ	Intel Atom C2538 2.4Ghz quad- core 2.4GHz x86 processor	Intel <sup>®</sup> Xeon <sup>®</sup> D-1518 processor quad-core 2.2 GHz	Intel® Xeon® D-1518 processor quad-core 2.2 GHz
DRAM	8GB SO-DIMM DDR3 RAM with ECC	2x 8 GB SO-DIMM DDR4	2x 8GB DDR4 SO-DIMM
SPI Flash	16MB	2x 16MB	2x 16MB
SSD	32GB	64GB MLC	64GB MLC

## CHARACTERISTICS

	N5850-4856Q	N8550-48B8C	N8550-32C
Performance			
Layer Type	Layer 3	Layer 3	Layer 3
Switching Capacity	1.44 Tbps full duplex	4 Tbps full duplex	6.4 Tbps full duplex
Forwarding Rate	1 Bpps	2.9 Bpps	4.7 Bpps
MAC Addresses	64K	64K	64K
Packet Buffer	16MB integrated packet buffer	32MB integrated packet buffer	32MB integrated packet buffer
VLAN IDs	4К	4К	4K
Jumbo Frames	Up to 9216 Bytes	Up to 9216 Bytes	Up to 9216 Bytes
Status Indicators			
10G SFP+ Port LEDs	Link Speed, Link Status, Activity		
25G SFP28 Port LEDs		Link Status, Activity, Rate	
40G QSFP+ Port LEDs	Link Status, Activity		
100G QSFP28 Port LEDs		Link Status, Activity, Rate	Link Status, Activity, Rate
Ethernet Management Port LED	Link Status, Activity	Link Status, Activity	Link Status, Activity
Console Port LED	Link Status		Link Status
System LEDs	PSU1, PSU2, Diagnostic, Fans, Locator	Diagnostic, Locator, PSU and Fan Status	Diagnostic, Locator, PSU and Fan Status
Power			
Input Voltage	100-240VAC, 50-60Hz, 6-3A	100-240VAC, 50-60Hz, 6A	100-240VAC, 50-60Hz, 6A max.
Max. Power Consumption	282W	550W	550W

## CHARACTERISTICS

	N5850-4856Q	N8550-48B8C	N8550-32C
Physical and Environmen	tal		
Dimensions (HxWxD)	1.71″x17.26″x18.62″ (43.4x438.4x473mm)	1.71"x17.26"x21.1" (43.5x438.4x536mm)	1.72″x17.26″x20.28″ (43.8x438.4x515mm)
Rack Space	1U	10	1U
Hot-swappable Power Supplies	2 (1+1 Redundancy)	2 (1+1 Redundancy)	2 (1+1 Redundancy)
Hot-swappable Fans	5 (4+1 Redundancy)	6 (5+1 Redundancy)	6 (5+1 Redundancy)
Airflow	Back-to-Front	Back-to-Front	Back-to-Front
Operating Temperature	32°F to 104°F (0°C to 40°C)	32°F to 104°F (0°C to 40°C)	32°F to 113°F (0°C to 45°C)
Storage Temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Operating Humidity	5% to 95% (Non-condensing)	5% to 95% (Non-condensing)	5% to 95% (Non-condensing)
Weight	19.73 lbs (8.95 kg), with two installed PSUs	22.05 lbs (10kg), with two installed PSUs	23.96 lbs (10.87kg), with two installed PSUs
Warranty			
Hardware Warranty	5 Years	5 Years	5 Years

Software Warranty

1/3/5 Years

1/3/5 Years

1/3/5 Years

#### FEATURES

Functionality	Description
Layer 2	<ul> <li>Virtual LANs with Port-based VLANs</li> <li>Layer 2 Tunneling Protocol (L2PT)/Layer 2 Control Protocols (L2CP)</li> <li>Unidirectional Link Detection (UDLD)</li> <li>Multiple Spanning Tree Protocol (MSTP)</li> <li>Rapid Spanning Tree (RSTP)</li> <li>Rapid Per VLAN Spanning Tree (RPVST+)</li> <li>LLDP v2</li> <li>Link Aggregation Control Protocol (LACP)</li> <li>Static link aggregation group</li> <li>Bridge Protocol Data Unit (BPDU) Protect</li> <li>Provider RSTP Support on MC-LAG</li> <li>MC-LAG Active/Standby support as attachment circuit for Layer 2</li> <li>Media Access Control (MAC) Learning disable</li> <li>Customer VLAN (CVLAN)/ Service tag VLAN (SVLAN) translation</li> <li>SVLAN translation</li> <li>Changing the outer TPID (Tag Protocol Identifier) of provider network port</li> <li>Static MAC Address Assignment</li> <li>VLAN Cross Connect with double TAG</li> </ul>
Layer 3	<ul> <li>Ethernet ARP</li> <li>Path Maximum Transmission Unit (MTU) for IPv4 and IPv6</li> <li>Transmission of Internet Protocol (IP) Datagrams over Ethernet</li> <li>Congestion Control in IP/Transmission Control Protocol (TCP) Networks</li> <li>IP Broadcast in the Presence of Subnets</li> <li>Classless Inter-Domain Routing (CIDR)</li> <li>Requirements for IP Version 4 Routers</li> <li>Route Redistribution across RIP, OSPF and BGP</li> <li>Inter Virtual Routing and Forwarding (VRF) Route Leaking</li> <li>Loose default mode</li> <li>Autonomous System (AS) Confederations for BGP</li> <li>Graceful BGP Session Shutdown</li> <li>Inter-VRF route leaking for user-defined VRFs</li> <li>Routing Information Protocol (RIP)</li> <li>OSPF Opaque Link State Advertisements (LSA)</li> <li>OSPF Version 3 for IPv6 Support</li> <li>BFD Trigger for OSPFv3</li> <li>IP Fast Reroute - Loop-Free Alternate for IS-IS</li> <li>BED Over BGP / ISIS / OSPE / Static route</li> </ul>

Functionality	Description
Carrier Ethernet	<ul> <li>Ether OAM (EFM)</li> <li>Maintenance Domain (MD), Maintenance Association (MA), Maintenance domain Intermediate Point (MIP), Down Maintenance association End Point (MEP)</li> <li>Continuity check (multicast CCM)</li> <li>Ping (unicast)</li> <li>Link trace</li> <li>Fault reporting (RDI, MAC Status defect, CCM Cross Connect Defect, Error CCM Defect)</li> <li>CFM over Layer 2 Bridge with xSTP</li> <li>ERPS over CFM on Provider/Customer domain</li> <li>Sub-ring support (Multiple ring and ladder topologies)</li> <li>Support of multiple ERP Instances on single ring</li> </ul>
VxLAN	<ul> <li>Layer 2 EVPN for VXLAN</li> <li>Layer 2 EVPN Multihoming for VXLAN</li> <li>VXLAN - QoS</li> <li>VXLAN - Ethernet Virtual Connection (EVC)</li> <li>VXLAN EVPN ARP/ND cache Ageing</li> <li>VXLAN tunnel over SVI interface</li> <li>SNMP support for VXLAN statistics and traps</li> <li>Static VXLAN</li> <li>VxLAN Trunk as access port</li> </ul>
Multicast	<ul> <li>PIM - Dense Mode (PIM-DM): Protocol Specification (Revised)</li> <li>Support for More than 32 PIM Interfaces</li> <li>Internet Group Management Protocol (IGMP), Version 2 &amp; Version 3</li> <li>IGMP report suppression for v1, v2 and v3</li> <li>Considerations for IGMP Snooping Switches</li> <li>IGMP-based Multicast Forwarding ("IGMP Proxying")</li> </ul>
Quality of Service (QoS)	<ul> <li>DiffServ Field in IPv4/IPv6 Headers</li> <li>Assign matching traffic flow to a specific queue</li> <li>Layer 2 and Layer 3 QoS</li> <li>Weighted Random Early Detection (WRED)</li> <li>Classification based on interface, ACL, DSCP, IP precedence, RTP, 802.1p, and VLAN</li> <li>Trust IEEE 802.1p/DSCP</li> <li>IP SLA (ICMP Echo)</li> <li>Assign matching traffic flow to a specific queue</li> <li>ToS Based queue distribution over L2 Interface</li> </ul>

## FEATURES

Functionality	Description
Management	<ul> <li>Role based CLI management and access</li> <li>CLI access via console, telnet and SSH</li> <li>Authentication using TACACS+/radius client</li> <li>Extended ping and traceroute</li> <li>SNMP v1, v2, and v3</li> <li>DHCP client</li> <li>Syslog</li> <li>Management VRF</li> <li>Routing Protocols in Management VRF (RIP, RIPng, OSPF, and ISIS)</li> <li>Ansible</li> <li>Upgrade Mechanism from ONIE prompt using onie nos install and from OcNOS shell using sys_x0002_update</li> <li>ACL support over Management, VTY and Loopback</li> <li>DHCP Relay over L3VPN</li> <li>Routing Protocols in Management VRF (RIP, RIPng, OSPF, and ISIS)</li> <li>Zero Touch Provisioning (ZTP) (with IPv6)</li> <li>Storing Multiple images on platform</li> </ul>
Network Configuration Protocol (NETCONF)	<ul> <li>YANG 1.0 Data Modelling Language</li> <li>NETCONF Protocol over Secure Shell (SSH)</li> <li>NETCONF Protocol over Transport Layer Security (TLS)</li> <li>NETCONF Event Notifications</li> <li>YANG Module for NETCONF Monitoring</li> <li>NETCONF Base Notifications</li> <li>YANG 1.1 Data Modeling Language</li> <li>NETCONF Access Control Model</li> <li>Transaction based CLI</li> </ul>
Security	<ul> <li>Storm control</li> <li>Flow control</li> <li>DHCP Snooping</li> <li>Source IP address</li> <li>TCP/UDP source port</li> <li>TCP/UDP destination port</li> <li>IP protocol type</li> <li>Source MAC address</li> <li>Destination MAC address</li> <li>Ethertype</li> </ul>

• Timed ACL

#### FEATURES

Functionality	Description	
Hardware Specific Features	<ul> <li>Switched port analyzer (SPAN)</li> <li>Remote switched port analyzer (RSPAN)</li> <li>Unified Forwarding Table (UFT)</li> <li>Load balance</li> <li>Dynamic load balancing (RTAG7 hash)</li> <li>PHY/MAC level interface loopback</li> <li>Port Breakout</li> <li>TCAM space monitoring</li> </ul>	
Accessories		
Console Cable*1	Power Cords*2 Rack Mount Kit Bracket*1	



M4 Screws\*20



Ear-locking Screws\*2

User Manual\*1



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