

# NSS7816-32QE 400G Data Center Switch

## Datasheet

### Product Overview

NSS7816-32QE is Maipu new generation full 400GE VxLAN switch designed for AI computing data center, providing high-throughput, high-density 400GE interfaces, larger buffer and lower latency. By using Maipu MyPowerOS software platform, NSS7816-32QE provide rich data center service features and management capability.

NSS7816-32QE realize large buffer of the interfaces, meeting the burst flow forwarding without packet loss; provide the M-LAG technology for virtualization scenarios; provide the modular power and fan design for high reliability. The key components adopt "overvoltage" designs to ensure that the product has the strong ability of continuous operation.

NSS7816-32QE adopts advanced hardware architecture with up to 32\*400GE ports. It can work together with NSS5830/5930 VxLAN leaf switches to build a complete, scalable, virtualized fabric network that meets the data center requirements.



NSS7816-32QE 400G Data Center Switch

NSS7816-32QE supports 32\*Port 400G QSFP112 interfaces, 2\*Port 25G SFP28 interfaces, 6\*Fan slots, 2\*Power slots.

# Key Features

- **High-density 400G Ports**

The NSS7816-32QE adopts advanced hardware architecture with full 32\*400G interfaces in compact 1U device. The port combination fully satisfies the interface density requirement of data center scenarios.

- **RoCEv2 Lossless Ethernet Technology**

The NSS7816-32QE supports lossless Ethernet (RoCEv2) features such as Priority-based Flow Control (PFC) and Explicit Congestion Notification (ECN) control algorithms which can avoid packet loss and message retransmission that may occur in traditional Ethernet protocols when encountering network congestion, reduce network latency and jitter, and thus achieve higher performance and lower latency.

- **M-LAG for Cross-device Link Aggregation**

The NSS7816-32QE supports multi-chassis link aggregation group (M-LAG), which enables links of multiple switches to aggregate into one to implement cross-device link backup. The rest of switches in the M-LAG group are working actively regardless any switch failure. During the upgrade, other switches in the system take over traffic forwarding to ensure uninterrupted services.

- **VxLAN for Layer2/3 Virtualized Deployment**

The NSS7816-32QE can work with the industry's mainstream virtualization platforms and acts a hardware gateway on an VxLAN overlay network. Virtual extensible LANs (VxLAN), a common network virtualization overlay protocol that expands the layer 2 network address space from 4,000 to 16 million. NSS7830-09C supports BGP-EVPN, which is used as the overlay control plane and provides virtual connectivity between different layer 2/3 domains over an IP or MPLS network.

- **Telemetry for Intelligent OAM**

The NSS7816-32QE provides telemetry technology to collect device data in real time and send the management data to customer network analyzer platform. Telemetry systems, done properly, play an important role in providing you with information about the health of your network, so you can respond intelligently to prevent hardware failure and network downtime. It can help customers to identify and analyze network problems which affect user experience.

- **Netconf & Restconf API Integration**

The NSS7816-32QE supports NETCONF and Restconf API and can work with 3rd party SDN controller for simplified device remote configuration.

- **Reliable Hardware Design**

The NSS7816-32QE uses a standard airflow design which isolates cold air channels from hot air channels. This design improves heat dissipation efficiency and meets design requirements of data center. It adopts hot swap redundant power modules and fans which ensure hardware reliability and non-stopping operation. The fan speed can be adjusted dynamically based on system workload.

- **Free Licensing Policy**

Maipu always insists on “One-time investment” free license policy, the standard features and advanced features will be never divided to different version. For any new firmware version, Maipu will share to customers without extra charge. Compared with other manufacturers, Maipu free license policy can better protect users' short-term and long-term investment.

# Technical Specifications

| Product Model           | NSS7816-32QE  |  |
|-------------------------|---|--|
| Hardware Specification  |   |  |
| Interfaces              | 32*400G QSFP112 + 2*25G SFP28 Interfaces                          |  |
| Management Interface    | One console port, one management Ethernet port, one USB interface |  |
| Switching Capacity      | 25.6Tbps  |  |
| Flash                   | 8G  |  |
| Memory                  | 8G(Default)   |  |
| Interface Buffer Size   | 64M   |  |
| Jumbo Frame             | 12K   |  |
| VLAN Entry              | 4094  |  |
| Max. MAC Address Entry  | 448K  |  |
| Max. ARP Entry          | 251K  |  |
| Max. IPv4 Routing Entry | 768K  |  |
| Max. IPv6 Routing Entry | 384K  |  |
| Max. VRF Entry          | 4K  |  |
| VRRP Group              | 255   |  |
| Max. ECMP Path          | 128   |  |
| IGMP Group              | 8K  |  |
| VxLAN VTEP Instance     | 8K  |  |
| Power Supply Slots      | 2   |  |
| FAN Module Slots        | 6   |  |
| Power Supply            | Input voltage (AC): 100V ~ 240V, 50Hz ~ 60Hz                      |  |
|                         | Input voltage (DC): -40 ~ -72V                                    |  |
| Temperature             | Work temperature: 0°C to 50°C                                     |  |
|                         | Storage temperature: -40°C to 70°C                                |  |
| Humidity                | Work humidity: 10% to 90%, no-condensing                          |  |
|                         | Storage humidity: 5% to 95%, no-condensing                        |  |
| Power Consumption       | Air front in rear out: 823W<br>Air rear in front out: 937W        |  |
| Dimension(W*D*H)        | 442mm*560mm*44.2mm  |  |
| MTBF                    | >200, 000 hours   |  |
| Software specification  |   |  |
| Standard L2 Protocol    | Interface   | Port Type UNI/NNI, Port Speed, Port MTU, Port Loopback, Loopback interface, Tunnel interface, Null interface, VXLAN interface          |
|                         | Ethernet Switching  | LACP Link aggregation, LACP Port Priority, LACP Load Balance, LACP Rate Monitor, LACP Debug, Port isolation, QinQ, VLAN mapping, Super |

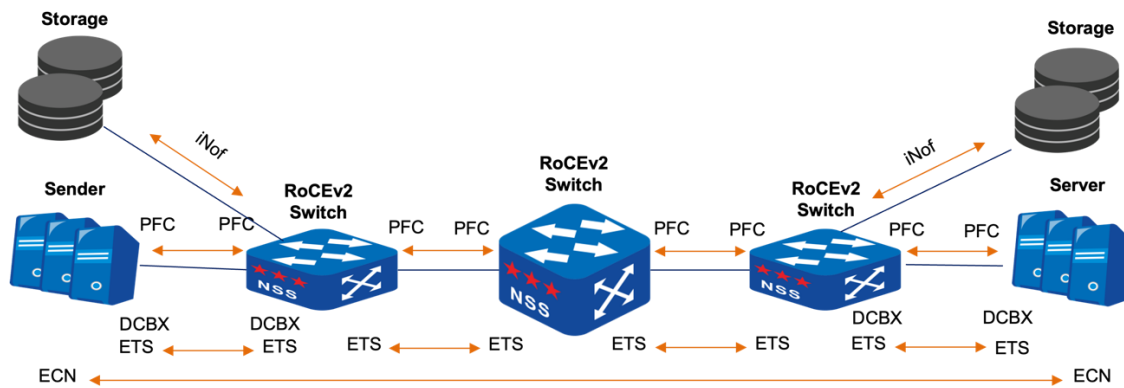
|                                |                     |   |
|--------------------------------|---------------------|---|
|                                |                     | VLAN, PVLAN, Voice VLAN, STP, RSTP, MSTP, Loopback-detection, Error-disable, VIST/VISR+, GVRP, MLAG, MLAG Lite, VLAN isolation  |
| Standard L3 Protocol           | IP Protocol         | ARP, DHCP, DHCPv6, DHCP Server, DHCPv6 Server, DHCPv6 Client, DHCP Relay, DHCPv6 Relay, DHCP Option82, DNS, GRE, IPIP, IPv6 over IPv4, ISATAP, IPv4 over IPv6, IPv6 over IPv6   |
|                                | Routing Protocol    | Static route for IPv4&IPv6, RIPv1/v2, RIPng, OSPFv2, OSPFv3, IS-IS, IS-ISv6, BGP, BGPv6, Policy Route, MP-BGP   |
| Multicast                      | L2 Multicast        | IGMP Snooping, IGMP Snooping over VxLAN, multicast VLAN (MVR, MVP), MLD Snooping, Router-alert Option   |
|                                | L3 Multicast        | IGMPv1/v2/v3, MLDv1/v2, PIM-SM, PIM-DM, PIM-SSM, IPv6 PIM-SM, IPv6 PIM-SSM, MSDP, IGMP Group Filter, MLD Group Filter   |
| QoS & ACL                      | QoS                 | 802.1p, DSCP, Priority Mapping, SP, WRR, WDRR, SP+WRR, SP+WDRR, WRED, Flow classification, Traffic monitoring, Traffic shaping, Congestion management, Congestion avoidance, Flow-based mirroring   |
|                                | ACL                 | Standard IP ACL, extended IP ACL, standard MAC ACL, extended MAC ACL, extended Hybrid ACL, Standard IPv6 ACL, extended IPv6 ACL   |
| Data Center Feature            | Basic Feature       | TRILL, VXLAN, M-LAG, MLAG for VXLAN, VXLAN QoS, ESI Multi-Homing, BGP-EVPN, NLB   |
|                                | RoCEv2              | ECN, EQCN, ETS, PFC, iNOF, DCBX   |
| MPLS L2/L3 VPN                 | L3 MPLS VPN         | MPLS LDP, MPLS GR, M-VRF, MPLS L3VPN, Inter-AS MPLS VPN Option A/B, MPLS OAM, IPv6 MPLS L3VPN, MPLS TE, MPLS QoS  |
|                                | L2 VPLS VPN         | VPWS, Martini/Kompella VPLS, H-VPLS   |
| Precision Time Protocol (PTP)  | IEEE 1588v2         | E2ETC, P2PTC  |
| Virtualization                 | VST                 | H-VST, M-VST  |
|                                | MAD                 | MAD LACP, MAD BFD, MAD Fast-hello   |
| Security & Network Reliability | Security            | ARP Check, AARF, AARF ARP-Guard, CPU Protection, Port Security, IP Source Guard, IPv6 Source Guard, ND-Snooping, DHCP Snooping, DHCPv6 Snooping, Dynamic ARP Inspection (DAI), AARF, Host Guard, P2P MACSec, PPPoE+, 802.1x, Portal Authentication, Anti-attack detect drop flood log, URPF |
|                                | AAA                 | Authentication, Authorization, Accounting, Radius, TACACS+  |
|                                | Network Reliability | HA, ULFD, ERPS, ULPP, Monitor Link, VRRP, VRRPv3, VBRP, BFD, EEP, CPU protection  |
| Management                     | Network Management  | SNMP v1/v2/v3, MIB, RMON, SYSLOG, CLI, Telnet, SSH, HTTP/HTTPS, FTP/TFTP, Debug, NTP, Keepalive Gateway   |
|                                | Network Monitoring  | SPAN, RSPAN, ERSPAN, VLAN SPAN, IPFIX, sFlow, LLDP, LLDP-MED, IP-SLA, CWMP, Telemetry, OpenFlow, Netconf, Restconf, BSM, MOD, Capture Packet  |

# Order Information

| Product Model                   | Description   |
|---------------------------------|---|
| <b>NSS7816-32QE Series Host</b> |   |
| NSS7816-32QE                    | 32*400G QSFP112 Interfaces, 2*25G SFP28 Interfaces, 6*Fan slots, 2*Power slots  |
| <b>Power Modules</b>            |   |
| AD1300M-HV1B                    | CPRS AC Power Supply, AC input 100-127V/12A, output 12V/1000W or AC input 200-240V/8A, output 12V/1300W, current sharing, supporting hot-swap, Air front in rear out. (Note: Need work together with FAN-01K-01B) |
| AD1300M-HV0F                    | CPRS AC Power Supply, AC input 100-127V/12A, output 12V/1000W or AC input 200-240V/8A, output 12V/1300W, current sharing, supporting hot-swap, Air rear in front out. (Note: Need work together with FAN-01K-01F) |
| DD1300M-5V1B                    | CPRS DC Power Supply, DC input 40-72V/40-22A, output 12V/106A current sharing, supporting hot-swap, Air front in rear out. (Note: Need work together with FAN-01K-01B)  |
| DD1300M-5V0F                    | CPRS DC Power Supply, DC input 40-72V/40-22A, output 12V/106A current sharing, supporting hot-swap, Air rear in front out. (Note: Need work together with FAN-01K-01F)  |
| <b>FAN Modules</b>              |   |
| FAN-01K-01B                     | FAN-01K-01B FAN Module, Hot-swappable, Air front in rear out  |
| FAN-01K-01F                     | FAN-01K-01F FAN Module, Hot-swappable, Air rear in front out  |
| <b>Fiber Transceivers</b>       |   |
| SFP-M1-L192P8                   | 10G SFP+, 850nm, 300m, LC, DDM, Multi-Mode  |
| SFP-S1-L192P3                   | 10G SFP+, 1310nm, 10km, LC, DDM, Single-Mode  |
| SFP-S4-L192P5                   | 10G SFP+, 1550nm, 40km, LC, DDM, Single-Mode  |
| SFP-S8-L192P5                   | 10G SFP+, 1550nm, 80km, LC, DDM, Single-Mode  |
| SFP28-M1-L480C8D                | 25G SFP28, 850nm, 100m, LC, DDM, Multi-Mode   |
| SFP28-S1-L480C3D                | 25G SFP28, 1310nm, 10km, LC, DDM, Single-Mode   |
| QSFP28-M1-M1920C8D              | 100Gbps QSFP28, 850nm, 70m(OM3), 100m(OM4), MPO, SR4, DDM, Multi-Mode   |
| QSFP28-M1-100G-LD3-S            | 100Gbps QSFP28, 1310nm, 100m, LC, LX4, DDM, Multi-Mode  |
| QSFP28-S1-100G-LD7              | 100Gbps QSFP28, 1310nm, 2Km, LC, CWDM4, DDM, Single-Mode  |
| QSFP28-S1-L1920C3D              | 100Gbps QSFP28, 1310nm, 10Km, LC, LAN-WDM, DDM, Single-Mode   |
| QSFP28-S4-100G-LD7              | 100Gbps QSFP28, 1550nm, 40km, LC, LAN-WDM, DDM, Single-Mode   |
| Q56-200G-SR4-MM                 | 200Gbps QSFP56, 850nm, 100m(OM4), MPO, SR4, DDM, Multi-Mode   |
| Q56-200G-FR4-LS                 | 200Gbps QSFP56, 1310nm, 2Km(OS1), LC, FR4, DDM, Single-Mode   |
| Q112-400G-VR4-MMA               | 400Gbps QSFP112, 850nm, 50m(OM4), MPO12-APC, VR4, DDM, Multi-Mode   |

# Typical Application

## RoCEv2 Lossless Ethernet Solution for Data Center



RoCEv2 is a network protocol that enables servers in data centers to perform Remote Direct Memory Access (RDMA) directly over Ethernet. RoCEv2 benefits significantly from a lossless Ethernet environment because it relies on high reliability and low latency for performance efficiency. Lossless Ethernet technology ensures that RoCEv2 can deliver its full potential benefits by avoiding the typical challenges associated with standard Ethernet communications.

NSS7816 series fully support the RoCEv2 standards, meeting the requirements for switch performance in high-performance data center scenarios. The NSS7816 supports a wide range of lossless Ethernet technologies, including ETS, PFC, ECN, DCBX, etc. This helps create an end-to-end, zero-jitter, low-latency, lossless Ethernet network that meets the demands of cloud computing, big data, artificial intelligence, and high-performance computing deployments in data centers.

All rights reserved. Printed in the People's Republic of China.

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise without the prior written consent of Maipu Communication Technology Co., Ltd.

Maipu makes no representations or warranties with respect to this document contents and specifically disclaims any implied warranties of merchantability or fitness for any specific purpose. Further, Maipu reserves the right to revise this document and to make changes from time to time in its content without being obligated to notify any person of such revisions or changes.

Maipu values and appreciates comments you may have concerning our products or this document. Please address comments to:

*Maipu Communication Technology Co., Ltd*  
Maipu Mansion, No.16, Jiuxing Avenue  
High-tech Park  
Chengdu, Sichuan Province  
P. R. China  
610041  
Tel: (86) 28-65544850,  
**Fax:** (86) 28-65544948,  
**URL:** [http:// www.maipu.com](http://www.maipu.com)  
**Email:** [overseas@maipu.com](mailto:overseas@maipu.com)

All other products or services mentioned herein may be registered trademarks, trademarks, or service marks of their respective manufacturers, companies, or organizations.