



Network Security

N5000 Series

MSI N5000 series is high performance rackmount network security basing on Dual Intel® Xeon E5-2600 v3/v4 series CPU and C612 chipset which is to help telecom, data center, government, campus, enterprise to be flexibly applied to various network security (Firewall, IPS, DLP, Virtualization, etc.), to meet the diverse needs of users for future business development.

Product Appearance

MSI N5000 series contains N5000a and N5000b.



Introduction & Features

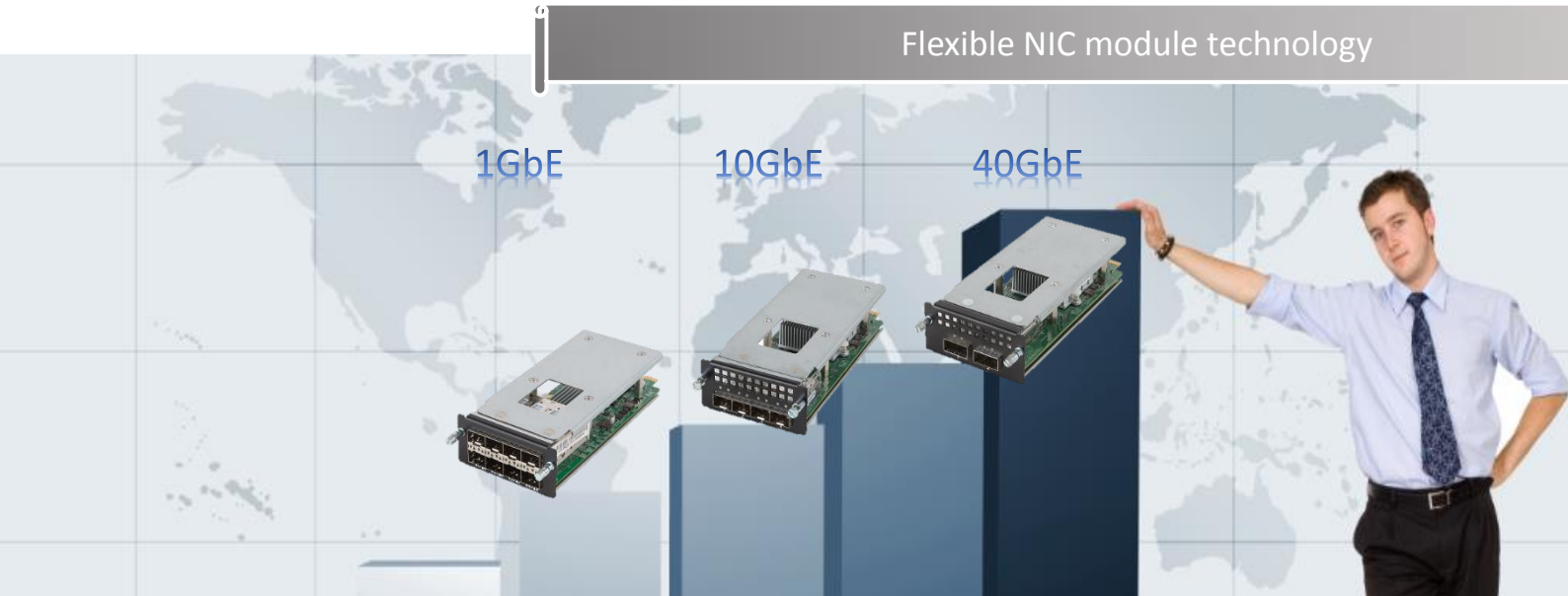
MSI N5000 series is generally located at the intersection between a telecom/ data center/ enterprise's internal network and a wide area network. They built with Intel Xeon E5-2600 v3/v4 series CPU and support flexible swappable NIC modules.

Performance and simplified

- ✓ **Powerful Computing** - Dual Intel Xeon E5-2600 v3/v4 series CPUs provide high performance computing to achieve various networking tasks such as packet processing and cloud computing application demand.
- ✓ **Flexibility** - Flexible plug-in NIC modules enhance N5000 series fit in customized IT environment. As far as our models could provide 1GbE/10GbE/40GbE data rate and flexible scalability configuration.
- ✓ **Security application** - In traditional way, N5000 series is able to be a powerful security solution for Firewall, IPS, DLP, Crypto accelerator, anti-virus, etc.
- ✓ **Network virtualization** - Access virtualization through SDN/NFV technology, the routing control plane of N5000 series can be moved to the aggregation layer router for unified management and high agility, the N5000 series device can be virtualized as aggregation layer remote boards to achieve centralized controller, and all network operations for edge routers or vCPE can concentrate on the aggregation routers. Furthermore, SDN/NFV can drive OPEX savings in large data centers through automated network provisioning, configuration, management.



Model	N5000a	N5000b
Form factor	2U	2U
Dimensions	W(438mm) x H(88.5mm) x D(600mm)	W(438mm) x H(88.5mm) x D(600mm)
Color	Black	Black
CPU	Dual Intel® Xeon®E5-2600v3/v4	Dual Intel® Xeon®E5-2600v3/v4
Chip	Intel® C612	Intel® C612
Memory	8 x DIMM slots, 4 channel DDR4, 2400MHz ECC Registered up to 256GB	8 x DIMM slots, 4 channel DDR4, 2400MHz ECC Registered up to 256GB
Storage	2 x internal 2.5" HDDs (Optional) 1 x SATA DOM (Optional) 1 x CF Card (Optional) 1 x mSATA (Optional)	4 x Hot-swap 3.5" HDDs (Optional) 1 x SATA DOM (Optional) 1 x CF Card (Optional) 1 x mSATA (Optional)
I/O	LAN Modules: Max up to 64 x LAN ports via Network Adapter Front IO: 1 x LED: POWER/HDD/ALARM/HA/BYPASS 1 x COM port 2 x USB3.0 ports 2 x GbE RJ45 ports (One for Mgmt.) Rear IO: 1 x Power Button 1 x VGA port	LAN Modules: Max up to 32 x LAN ports via Network Adapter Front IO: 1 x LED: POWER/HDD/ALARM/HA/BYPASS 1 x COM port 2 x USB3.0 ports 2 x GbE RJ45 ports (One for Mgmt.) Rear IO: 1 x Power Button 1 x VGA port
Security	TPM Header	TPM Header
Power supply	AC Redundant PSU 650W	AC Redundant PSU 650W
NIC module	NIC-100, NIC-101, NIC-102, NIC-103, NIC-104 NIC-200, NIC201, NIC-400	NIC-100, NIC-101, NIC-102, NIC-103, NIC-104 NIC-200, NIC201, NIC-400
Accessory	1 x set Ears(Optional) 1 x Slide rail (Optional)	1 x set Ears(Optional) 1 x Slide rail (Optional)



N5000a support 8 x NIC modules, max up to 64 x LAN ports.

Composing NIC Configuration and cross models for customized needs

Network Interface Card (NIC) greatly enhance the performance and bandwidth of your network appliance according to your needs with these front-facing and easily swappable modules. There are many different Ethernet network modules can be customized, including RJ-45 copper, fiber, bypass and speeds from Ethernet 1GbE, 10GbE to 40GbE. MSI NIC modules is supporting current N5000 series products so that you can allocate NIC modules flexibility on your system by anytime. For an overview of the NIC modules, please see the below NIC modules list.

Insert the network module tray back into the bay.



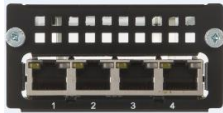
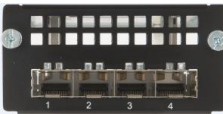




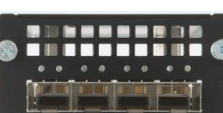
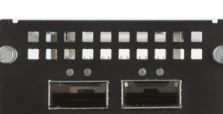
Push in the tray to fully seat the network module.



Tighten the captive screws to secure the network module in place.



MSI NIC Module list

Model	Ports	Chipset	Intel® Virtualization Technology
NIC-100 	4 x 1Gbe RJ45 ports (w/ 2 pairs bypass)	Intel® i350-AM4	✓ On-chip QoS and Traffic Management ✓ VMDq ✓ SR-IOV
NIC-101 	4 x 1Gbe SFP ports	Intel® i350-AM4	
NIC-102 	8 x 1Gbe RJ45 ports	2 x Intel® i350-AM4	
NIC-103 	8 x 1Gbe SFP ports	2 x Intel® i350-AM4	
NIC-104 	4 x 1Gbe RJ45 ports 4 x 1Gbe SFP ports	2 x Intel® i350-AM4	
NIC-200 	2 x 10Gbe SFP ports	Intel® 82599ES	✓ On-chip QoS and Traffic Management ✓ VMDq ✓ SR-IOV
NIC-201 	4 x 10Gbe SFP ports	Intel® XL710-BM1	✓ FPP
NIC-400 	2 x 40Gbe QSFP ports	Intel® XL710-BM2	

Intel® Virtualization Technology (Intel® VT)

✓ **On-chip QoS and Traffic Management**

✓ **FPP**

- Flexible Port Partitioning (FPP) technology utilizes industry standard PCI SIG SR-IOV to efficiently divide your physical Ethernet device into multiple virtual devices, providing Quality of Service by ensuring each process is assigned to a Virtual Function and is provided a fair share of the bandwidth.

✓ **VMDq**

- Virtual Machine Device Queues (VMDq) is a technology designed to offload some of the switching done in the VMM (Virtual Machine Monitor) to networking hardware specifically designed for this function. VMDq drastically reduces overhead associated with I/O switching in the VMM which greatly improves throughput and overall system performance

✓ **SR-IOV**

- Single Root-I/O Virtualization (SR-IOV) allows multiple virtual machines (VMs) to share a single SR-IOV-capable PCIe NIC while retaining the performance benefit of having one PCIe device to one VM association. By assigning a Virtual Function (VF) to each VM, multiple VMs can share a single SR-IOV capable PCIe NIC that may have just one physical network port.
- Network virtualization allows a single adapter port to operate as four separate adapters or more (Figure 1) for the server's operating system.

Quotation: <http://ark.intel.com/products/93099/Intel-Ethernet-Controller-XL710-BM2>



Figure 1. A single physical port handling four virtualized NICs

Data Plane Development Kit (DPDK)

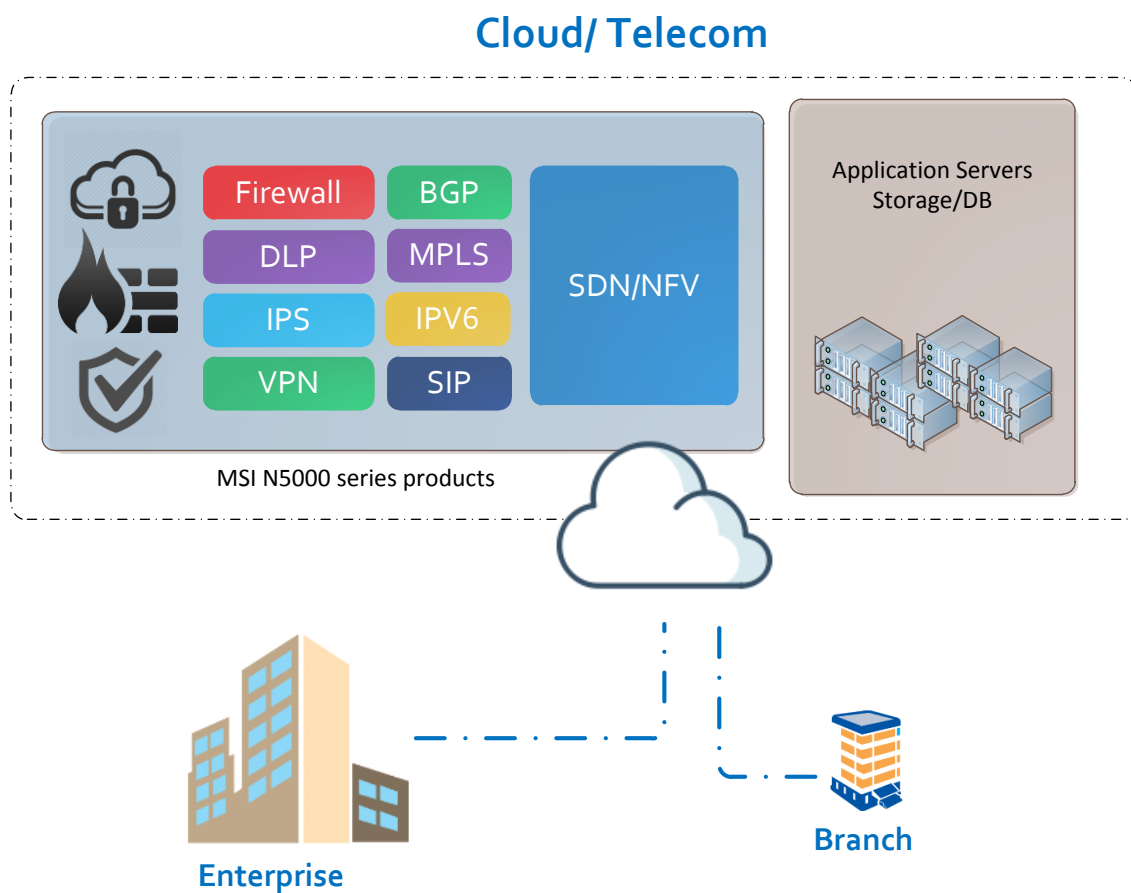
Greatly improving packet processing

All MSI NIC modules supported DPDK which can greatly boost packet processing performance and throughput, allowing more time for data plane applications. As a result, telecom and network equipment manufacturers can lower development costs, use fewer tools and support teams, and get to market faster.

For open networking application, DPDK with OVS (Open vSwitch) gives us tremendous performance benefits. Attribute to DPDK-based applications, we see a huge increase in network packet throughput and much lower latencies. Therefore, DPDK is an important application for open networking solution (e.g. Openstack Neutron, NFV, vCPE etc.).

MSI N5000 series has high computing performance and diversity I/O configuration to fulfill networking security applications for high end Firewall, IPS, DLP, VPN accelerator and SIP etc. Flexible NIC modules for N5000 series offer increased functionality that improves overall performance and networking efficiency. Base on those powerful and diversity NIC modules, N5000 series is able to satisfy networking virtualization SDN/NFV infrastructure. Especially improving data plan performance through OVS with DPDK application. MSI N5000 series is highly recommended for telecom/ data center/ cloud by whose powerful computing and flexible NIC modules to cope with the rapid growth of networking security needs.

Figure 2. N5000 series typical application



For more information, please visit our website.
<http://server.msi.com>

