Network Security

N3000 Series

MSI N3000 series is cost-benefit rackmount network security. Basing on Intel® Xeon E3-1200 v3/v4/v5 series CPU and Xeon D-1500 series SoC which is to help enterprise to be flexibly applied to various network security (Firewall, VPN, Virtualization, CPE, etc.), to meet the diverse needs of users for future business development.

MSI N3000 series contains N3000a, N3000b, N3010a, N3010b, N3020a, N3020b and N3030.

N3000a

N3000b

N3010a

N3010b

N3020a

N3020b

N3030

Introduction & Features

MSI N3000 series is generally located at the intersection between an enterprise's internal network and an external network. They built with Intel® Xeon E3-1200 v3/v4/v5 and D-1500 series CPU and support flexible swappable NIC modules.
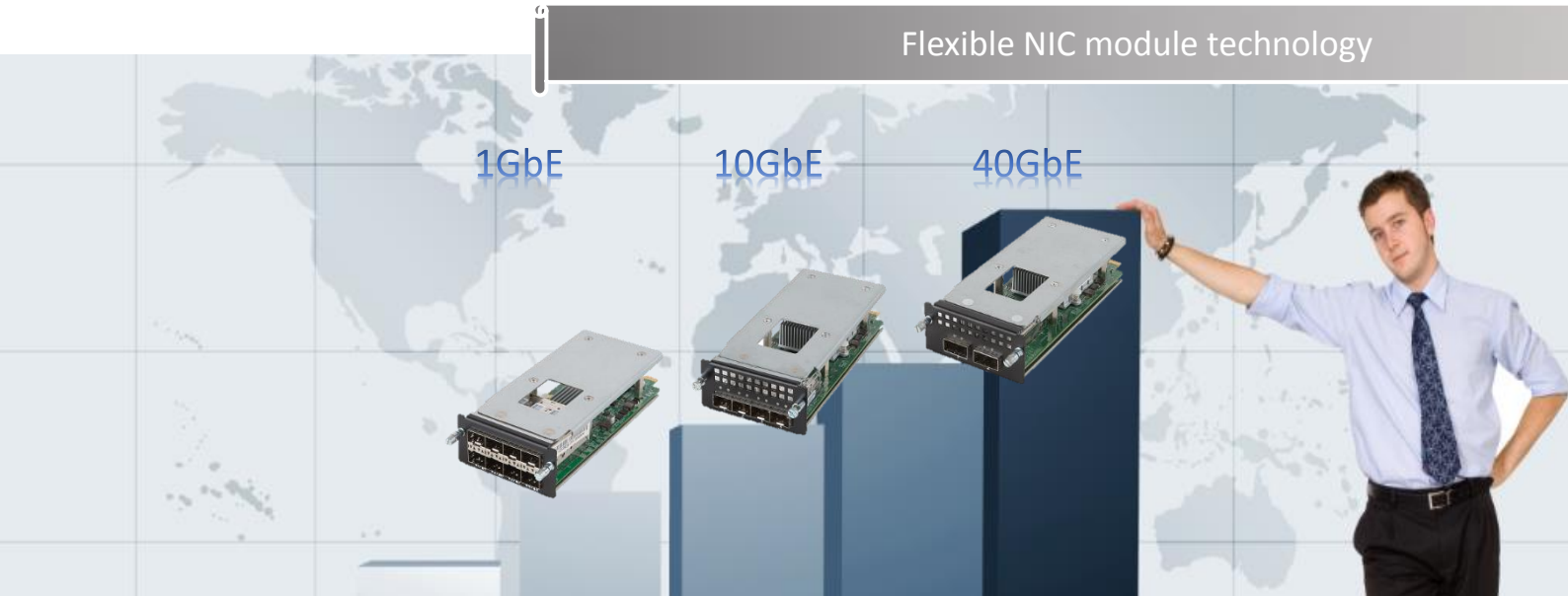
Cost-benefit and simplified

✓ **High efficiency Computing -** Intel® Xeon E3-1200 v3/v4/v5 and D-1500 series CPUs provide efficiency computing and cost-benefit effort to take general security network application. Especially the D-1500 series integrated dual ports 10GbE network and high cores computing ability.

✓ **Flexibility -** Flexible plug-in NIC modules enhance N3000 series fit in customized IT environment. As far as our models could provide 1GbE/10GbE/40GbE data rate and flexible scalability by three NIC modules.

✓ **Security application -** In traditional way, N3000 series is able to be a powerful security solution for enterprise router, Firewall, VPN/ crypto accelerator, anti-virus, DMZ solution etc.

✓ **Network virtualization -** Access virtualization through SDN/NFV technology, the routing control plane of N3000 series can be moved to the aggregation layer router for unified management, the N3000 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.

Model	N3000a	N3000b	N3010a	N3010b
Form factor	1U	2U	1U	2U
Dimensions	W(438mm) x H(44mm) x D(430mm)	W(438mm) x H(88.4mm) x D(430mm)	W(438mm) x H(44mm) x D(430mm)	W(438mm) x H(88.4mm) x D(430mm)
Color	Black	Black	Black	Black
CPU	1 x Intel Xeon® E3-1200v3/E3-1200v4, Core i3, Pentium G, Celeron G	1 x Intel Xeon® E3-1200v3/E3-1200v4, Core i3, Pentium G, Celeron G	1 x Intel Xeon® E3-1200v5, Core i3, Pentium G, Celeron G	1 x Intel Xeon® E3-1200v5, Core i3, Pentium G, Celeron G
Chip	Intel® C226	Intel® C226	Intel® C236	Intel® C236
Memory	4 x DDR4 Slots, 2 channel DDR4, up to 1866MHz UDIMM ECC/non ECC up to 32GB	4 x DDR4 Slots, 2 channel DDR4, up to 1866MHz UDIMM ECC/non ECC up to 32GB	4 x DDR4 Slots, 2 channel DDR4, up to 2133MHz UDIMM ECC/non ECC up to 64GB	4 x DDR4 Slots, 2 channel DDR4, up to 2133MHz UDIMM ECC/non ECC up to 64GB
Storage	1 x internal 2.5" HDD(Optional) 1 x SATA DOM(Optional) 1 x mSATA(Optional) 1 x Slim DVD(Optional)	2 x internal 3.5" HDD(Optional) 1 x SATA DOM(Optional) 1 x mSATA(Optional) 1 x Slim DVD(Optional)	1 x internal 2.5" HDD(Optional) 1 x CF Card(Optional) 1 x mSATA(Optional)	2 x internal 3.5" HDD(Optional) 1 x CF Card(Optional) 1 x mSATA(Optional)
I/O	Front IO: 1 x LCM Module w/ 3 buttons 1 x LEDs 1 x COM port 2 x USB2.0 ports 2 x GbE SFP ports 6 x GbE RJ45 ports Rear IO: 1 x VGA port 1 x Power Button	LAN Modules: 3 x LAN tray max up to 24 x LAN ports via Network Adapter Rear IO: 1 x VGA port 1 x Power/Reset Switch	LAN Modules: 3 x LAN tray max up to 24 x LAN ports via Network Adapter Onboard PCIE Slot 1 x Std. PCIE 3.0 x4 Signal, Slot x8 Front IO: 1 x LCM Module w/ 3 buttons 5 x LED (ALARM, HDD, POWER, HA, BYPASS) 1 x COM port, 2 x USB 3.0 2 x GbE RJ45 ports (One for Mgmt.) Rear IO: 1 x Power Button 1 x VGA port	LAN Modules: 3 x LAN tray max up to 24 x LAN ports via Network Adapter Onboard PCIE Slot 1 x Std. PCIE 3.0 x4 Signal, Slot x8 Front IO: 1 x LCM Module w/ 3 buttons 5 x LED (ALARM, HDD, POWER, HA, BYPASS) 1 x COM port, 2 x USB 3.0 2 x GbE RJ45 ports (One for Mgmt.) Rear IO: 1 x Power Button 1 x VGA port
Security	TPM Header	TPM Header	TPM Header Case intrusion switch	TPM Header
Power supply	AC Single PSU 270W	AC Single PSU 270W	AC Single PSU 350W	AC Redundant PSU 350W
NIC module	N/A	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	NIC-100, NIC-101, NIC-102 NIC-103, NIC-104, NIC-200, NIC201, NIC-400
Accessory	1　set Ears	1　set Ears	1　set Ears	1　set Ears

Model	N3020a	N3020b	N3030
Form factor	1U	1U	1U
Dimensions	W (438mm) x H (44mm) x D (430mm)	W (438mm) x H (88.4mm) x D (430mm)	W(438mm) x H(44mm) x D(420mm)
Color	Black	Black	Black
CPU	Intel® Xeon® D-1527, Four Core, 2.20GHz Intel® Xeon® D-1548, Eight Core, 2.00GHz	Intel® Xeon® D-1527, Four Core, 2.20GHz Intel® Xeon® D-1548, Eight Core, 2.00GHz	Single Intel® 6th Gen Core™i3/i5/i7, Pentium®, Celeron®
Chip	SoC	SoC	Intel® H110
Memory	4 x DIMM slots, 2 channel DDR4, up to 2133/2400MHz, ECC RDIMM up to 128GB, ECC/non-ECC UDIMM up to 64GB	4 x DIMM slots, 2 channel DDR4, up to 2133/2400MHz, ECC RDIMM up to 128GB, ECC/non-ECC UDIMM up to 64GB	2 x DIMM slots, 2 channel DDR4, up to 2133MHz ECC/non-ECC UDIMM up to 32GB
Storage	1 x internal 2.5" HDD(Optional) 1 x SATA DOM(Optional) 1 x mSATA(Optional) 1 x CF card(Optional)	4 x Hot-swap 3.5" HDD(Optional) 1 x SATA DOM(Optional) 1 x mSATA(Optional) 1 x CF card(Optional)	1 x internal 2.5" HDD(Optional)
I/O	LAN Modules: 3 x LAN tray max up to 24 x LAN ports via Network Adapter 1 x LAN tray for customized 2 x 10G SFP+ Network Adapter Front IO: 1 x LEDs 1 x COM port 2 x USB3.0 ports 1 x GbE RJ45 port (for Mgmt) Rear IO: 1 x VGA port 1 x Power Button	LAN Modules: 3 x LAN tray max up to 24 x LAN ports via Network Adapter 1 x LAN tray for customized 2 x 10G SFP+ Network Adapter Front IO: 1 x LEDs 1 x COM port 2 x USB3.0 ports 1 x GbE RJ45 port (for Mgmt) Rear IO: 1 x VGA port 1 x Power Button	LAN Modules: 1 x LAN tray max up to 8 x LAN ports via Network Adapter Front IO: 1 x COM RJ45 port 2 x USB3.0 ports 6 x GbE RJ45 port Rear IO: 1 x VGA port 1 x Power/Reset Button
Security	TPM Header	TPM Header	TPM Header
Power supply	AC Single PSU 350W	AC Redundant PSU 350W	AC Single PSU 300W
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	NIC-100, NIC-101, NIC-102 NIC-103, NIC-104, NIC-200, NIC201, NIC-400
Accessory	1　set Ears	1　set Ears	1　set Ears

1GbE 10GbE 40GbE

N3010a support 3 x NIC modules, max up to 24 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 N3000 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.

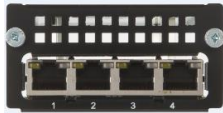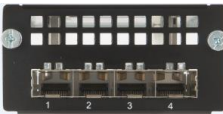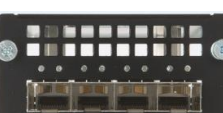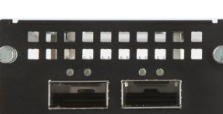Insert the network module tray back into the bay.

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 ✓ FPP
NIC-201	4 x 10Gbe SFP ports	Intel® XL710-BM1	
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

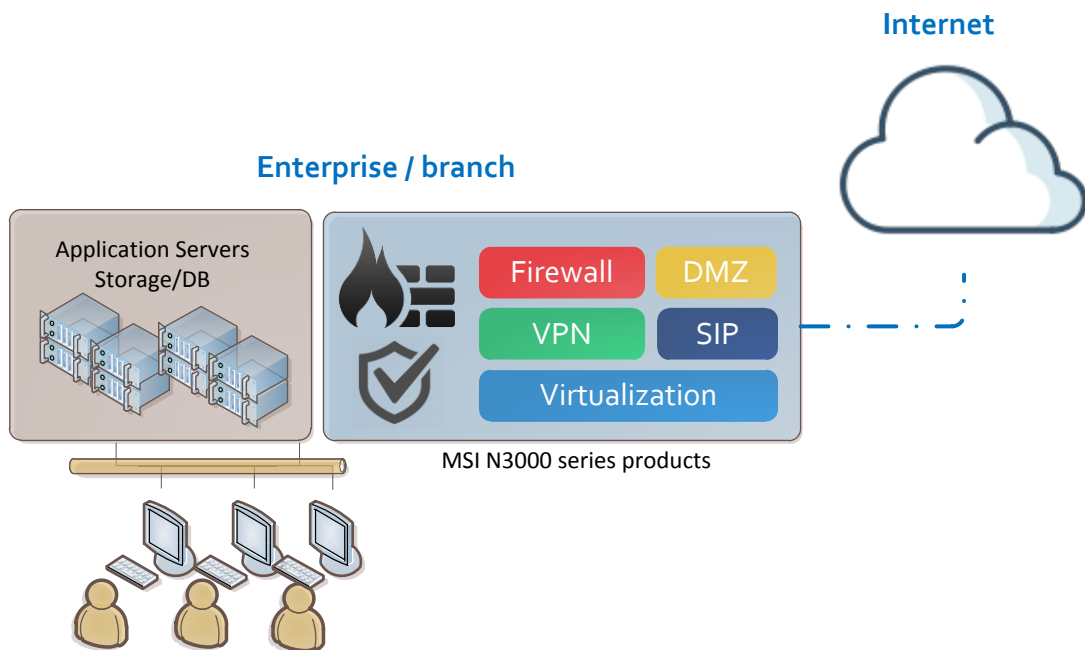# Data Plane Development Kit (DPDK)

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 N3000 series is able to be various security solution in campus/ enterprise / private cloud etc. In recent years, the rapid growth of new service of security tool and policy for networking is more important than ever. So establishing an efficiency network security device is necessary condition. MSI N3000 built with E3-1200v3/v4/v5 for general typical application to proceed firewall/ VPN/Crypto accelerator and SIP easily. Flexible NIC modules for N3000 series offer increased functionality that improves overall performance and networking efficiency. Base on those powerful and diversity NIC modules, N3000 series is able to be realized an enterprise router through NFV infrastructure. Especially improving data plan performance through OVS with DPDK application with high cores D-1500 CPU platform (integrated Ethernet 10GbE dual ports). MSI N3000 series is medium level for campus/ enterprise by whose computing ability and flexible NIC modules.

Figure 2. N3000 series typical application