

## PLUSOPTIC NIC-10GB-1RJ45-V2-PLU

### PCIe 3.0 x8 Single Copper Port 10 Gigabit Server Adapter (Intel X550 Based)

#### Overview

NIC-10GB-1RJ45-V2-PLU is PLUSOPTIC a new generation of high-performance PCIe 3.0 x8 Lane 10 Gigabit server adapter, based on the Intel X550AT controller. The Server Adapter Simplifies Migration to 10 Gigabit Ethernet (GbE), Provides iSCSI FCoE Virtualization and Flexible Port Partitioning (FPP).



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#### Key Features

- Low cost, low power, 10 GbE performance for the entire datacenter.
- New generation single-port 10GBASE-T controller with integrated MAC and PHY
- Standard CAT 6a cabling with RJ45 connectors.
- Supports NBASE-T\* technology (2.5 and 5.0 GbE over CAT 5e)
- Backward compatibility with existing 1000BASE-T networks simplifies the transition to 10GbE.
- PCI Express\* (PCIe\*) v 3.0 with up to 8.0 GT/s
- Unified networking delivering LAN iSCSI and FCoE in one low-cost CNA.
- Flexible 1/0 virtualization for port partitioning and Quality of Service (QoS) of up to 64 virtual ports
- Reliable, proven 10GbE technology from Intel Corporation.

#### Simplify the Transition to 10 GbE

With 10GBASE-T migration to 10 GbE is dramatically simplified with backward compatibility for your existing GbE network infrastructure. Install an X550 adapter into a server and the auto-negotiation between 1 GbE and 10 GbE provides the necessary backwards compatibility that most customers require for a smooth transition and easy migration to 10 GbE. When time and budget allows 10GBASE-T switches can be added any time to experience the full benefits of 10 GbE.

10GBASE-T uses the copper twisted-pair cables that are very familiar to IT professionals today. It is all you know and love about 1000BASE-T. The knowledge training and investment in BASE-T are preserved. 10GBASE-T is the easiest and most versatile 10GbE interface that can be deployed anywhere in your data center. Its flexible reach from 1 meter to 100 meters supports the latest network architectures including Top of Rack (ToR) Middle of Row (MoR) and End of Row (EoR).

## 10 GbE Performance at Low Cost and Low Power

The new NIC-10GB-1RJ45-V2-PLU is the lowest cost way to deploy 10 GbE in your data center today, using low cost CAT 6 and CAT 6a cabling. Chances are this cabling already exists in the data center.

A way for Intel to reduce cost and power is to integrate components into a single-chip solution. Why is integration important? First, integration translates to lower power. This means no active heat sink and reduces the per-port power consumption. Second, integration also means a lower cost per port because two separate components are not needed. When cabling is accounted for cost efficiencies realized from a single part mean 10GBASE-T is the lowest cost media to deploy.

With lower cost and power 10GBASE-T is ideal for broad deployment. 10GBASE-T is an option for every rack and tower server in the data center. The PLUSOPTIC new 10GBASE-T NIC-10GB-1RJ45-V2-PLU NIC provides bandwidth-intensive applications with highly affordable 10 GbE network performance and cost-effective RJ45 connectivity for distances up to 100 meters.

## A Complete Unified Network Solution

Converging data and storage onto one fabric eliminates the need for multiple adapters and cables per server. Furthermore 10 GbE provides the bandwidth to converge these multiple fabrics into a single wire. A key capability that makes all this possible is traffic class separation provided by Data Center Bridging (DCB). DCB provides a collection of standards for additional QoS functionality such as lossless delivery congestion notification priority-based flow control and priority groups. This enables NIC-10GB-1RJ45-V2-PLU to provide a one-wire solution with virtual pipes for the different classes of traffic:

- Data: best effort delivery of standard LAN traffic.
- Storage: NAS or SAN including lossless FCoE and iSCSI.
- Management: Guaranteed connectivity of data center IP management.

## Unified Networking Principles

Intel's unified networking solutions are built on the principles that have made us successful in Ethernet:

- Open architecture integrates networking with the server enabling IT managers to reduce complexity and overhead while enabling a flexible and scalable data center network.
- Intelligent offloads lower cost and power while delivering the application performance that customers expect.
- Proven unified networking is built on trusted Intel Ethernet technology enabling customers to deploy FCoE or iSCSI with the same quality used in their traditional Ethernet network.

Intel's unified networking solutions are enabled through a combination of Intel Ethernet products along with network and storage protocols integrated in the operating systems. This combination provides proven reliability with the performance that data center administrators around the world have come to expect from Intel.

### **Best Choice for Server Virtualization**

Virtualization changes server resource deployment and management by running multiple applications and operating systems on a single physical server. With Intel® Virtualization Technology for connectivity (VT-c) NIC-10GB-1RJ45-V2-PLU delivers outstanding I/O performance and QoS in virtualized data centers and cloud environments. I/O virtualization advances network connectivity used in today's servers to more efficient models by providing FPP multiple Tx/Rx queues, Tx queue rate-limiting and on-controller QoS functionality that is useful for both virtual and non-virtual server deployments.

NIC-10GB-1RJ45-V2-PLU reduces I/O bottlenecks by providing intelligent offload of networking traffic per VM, enabling near-native performance and VM scalability. The host-based virtualization technologies include:

- VMDq for emulated path: NIC-based VM queue sorting enabling efficient hypervisor-based switching.
- SR-IOV for direct assignment: NIC-based isolation and switching for various virtual station instances enabling optimal CPU usage in virtualized environment.

Additionally, the NIC-10GB-1RJ45-V2-PLU NICs provides virtual bridging support that delivers both host-side and switch-side control and management of virtualized I/O as well as the following modes of virtualized operation:

- VEPA: IEEE 802.1Qbg support for Virtual Ethernet Port Aggregator.
- VEB: Virtual Ethernet Bridge support with Intel VT.

### **Networking Virtualization**

Network virtualization is the next big trend in creating an agile data center. The NIC-10GB-1RJ45-V2-PLU NICs are ready to help take you to the next level.

- VX LAN and NVGRE offloads: These stateless offloads preserve application performance for over lay networks. With these offloads it is possible to distribute network traffic across a CPU core.
- Preserves application performance in network virtualized environment.

### **Flexible Port Partitioning (FPP)**

By taking advantage of the PCI-SIG\*SR-IOV specification FPP enables virtual Ethernet controllers that can be used by a Linux\* host directly and/or assigned directly to virtual machines for hypervisor virtual switch bypass. FPP enables the assignment of up to 64 Linux host processes or virtual machines per port to virtual functions. An

administrator can use FPP to control the partitioning of the bandwidth across multiple virtual functions. FPP can also provide balanced QoS by giving each assigned virtual function equal access to 10 Gb/s of bandwidth. The combination of 10 GbE and unified networking helps organizations overcome connectivity challenges and simplify the data center infrastructure.

10 GbE provides a simple well-understood fabric for virtualized data centers one that helps reduce cost and complexity as the number of Virtual Machines (VMs) continue to grow.

Specifications	
Controller	Intel Ethernet Controller X550AT(NIC-10GB-1RJ45-V2-PLU)
Baffle Height	Full height and half height
Power Consumption	Typical Power 11.2W; Maximum Power 13.0W
System Support	Windows Server* 2012 R2; Windows Server 2012 R2 Core; Windows Server 2012; Windows Server 2012 Core; Windows Server 2008 R2; Windows Server 2008 R2 Core; Linux* Stable Kernel version 2.6.32/3x; Linux* RHEL 6.5 and RHEL 7.0; Linux* SLES 11 SP3 and SLES 12; FreeBSD* 9 and FreeBSD* 10; UEFI* 2.1; UEFI* 2.3; VMware ESXi 5.1 (Limited Functionality); VMware ESXi 5.5
Ports	Single 10GBASE-T RJ45 Port
Bus type	PCIe v3.0 (8.0GT/s) (2.0 and 1.1 compatible)
Bus Width	X8 lane PCIe operable in x8 and x16 slots
Data rate supported per port	10 GbE/1 GbE/100MbE
LED Indicators	Link ( green/orange bright ) and ACTIVITY (green flashing) Link Rate(green=10Gbps ; orange=1Gbps/100Mbps)
Virtual Machine Device Queues (VMDq)	Offloads data sorting from the hypervisor to silicon, improving data throughput and CPU usage <ul style="list-style-type: none"> <li>• QoS feature for Tx data by providing round-robin servicing and preventing head-of- line blocking</li> <li>• Sorting based on MAC addresses and VLAN tags</li> </ul>
Support for PCI-SIG SR-IOV	Up to 64 VFs per port
IEEE 802.1Q VLAN Support with VLAN Tag	Ability to create multiple VLAN segments
VXLAN Stateless Offloads	A framework for overlaying virtualized layer 2 networks over layer 3 networks. VXLAN enables users to create a logical network for VMs across different networks
NVGRE Stateless Offloads	Network Virtualization using Generic Routing Encapsulation. The encapsulation of an Ethernet Layer 2 Frame in IP that enables the creation of virtualized Layer 2 subnets that can span physical Layer 3 IP networks
Intel® Flow Director	Yes

MSI-X	Yes
FPP - 64 VFs Per Port	Yes
Tx/Rx IP SCTP TCP and UDP Checksum Offloading (IPv4IPv6) Capabilities	Yes
Tx TCP Segmentation Offload	Yes
SNMP and RMON	Yes
Protocol Support	IEEE 802.1Q* VLANs IEEE 802.3 2005* flow control support compatible 10 GbE and 1 GbE Ethernet/ 802.3ap (KX/KX4) Specification compatible the 10 GbE 802.3ap (KR) Specification compatible 1000BASE-BX Specification
PXE	Yes
WoL	No
Jumbo frames	15.5 KB
Ethernet power management	Yes
Storage	iSCSI, NFS,FCoE,SMB
Operating temperature	0 °C to 55 °C (32 °F to 131 °F)
Storage temperature	-40 °C to 70 °C (-40 °F to 158 °F)
Storage humidity	Maximum: 90% non-condensing relative humidity at 35 °C
Air Flow	Minimum of 1.50 LFM required
Certifications	FCC CE RoHS
Size ( LxWxH ) mm	137*69*1.6 mm