NEXT-352SFP-1G PCI Express x4 Dual Port SFP Gigabit Server Adapter (Intel I350 Based)

Dual-port Gigabit Ethernet server adapters designed with performance enhancing features and new power management technologies

Key Features

Halogen-free dual-port Gigabit Ethernet adapters with fiber interface options

Innovative power management features including Energy Efficient Ethernet (EEE) and DMA Coalescing for increased efficiency and reduced power consumption

Flexible I/O virtualization for port partitioning and quality of service (QoS) of up to 32 virtual ports

Scalable iSCSI performance delivering cost-effective SAN connectivity

High-performing bridgeless design supporting PCI Express* Gen 2.1 5GT/s

Reliable and proven Gigabit Ethernet technology from Intel Corporation

Overview

The new NEXT-352SFP-1G builds on Intel's history of excellence in Ethernet products. Intel continues its market leadership with this new generation of PCIe* GbE network adapters. Built with the bridgeless Intel® Ethernet Controller I350, these adapters represent the next step in the Gigabit Ethernet (GbE) networking evolution for the enterprise and data center by introducing new levels of performance through industry-leading enhancements for both virtualized and iSCSI Unified Networking environments. This new family of adapters also includes new power management technologies such as Energy Efficient Ethernet (EEE) and DMA Coalescing (DMAC).

Flexible I/O Virtualization

The NEXT-352SFP-1G includes Intel® Virtualization Technology for connectivity (Intel® VT-c) to deliver I/O virtualization and Quality of Service (QoS) features designed directly into the controller on the adapter. I/O virtualization advances network connectivity models used in today's servers to more efficient models by providing Flexible Port Partitioning (FPP), multiple Rx/Tx queues, and on- controller QoS functionality that can be used in both virtual and non-virtual server deployments.

By taking advantage of the PCI-SIG SR-IOV specification, Intel® Ethernet products enable Flexible Port Partitioning (FPP). With FPP, virtual controllers can be used by the Linux* host directly and/or assigned to virtual machines. With this port partitioning, administrators can create up to eight dedicated connections on a single Ethernet port for use in bare-metal and virtualized server deployments.

In a bare-metal Linux server, host processes can be assigned to dedicated network resources to provide traffic isolation and balanced bandwidth allocation.

In a virtualized environment, a VM can be assigned to a virtual controller to reduce the CPU overhead seen when using a software-based network bridge by offloading network traffic management to the controller.

Scalable iSCSI Performance

An NEXT-352SFP-1G with native iSCSI initiators built into Microsoft* Windows*, Linux*, and VMware* ESX platforms provides a simple, dependable, cost-effective way to connect to iSCSI SANs. These native initiators are broadly tested using multiple generations of operating systems, storage systems, and OS tools to help ensure reliability and ease of use. Standardizing on Intel® Ethernet Adapters for iSCSI enables administrators to use a single initiator, TCP/IP stack, and a common set of management tools and IT policies. In addition, Intel® Ethernet Server Adapters include a number of hardware features designed to accelerate iSCSI traffic and enhance data processing.

For example, TCP segmentation offload and checksum offload capabilities help reduce processor usage, increase throughput, and deliver exceptional iSCSI performance. Finally, using native OS initiators, an NEXT-352SFP-1G supports the CRC-32 digest instruction set included with Intel® Xeon® processor products, which improves transmission reliability and delivers an enterprise-class iSCSI solution.

Power Management Technologies

Today, companies everywhere are looking for ways to decrease energy consumption across the enterprise to reduce costs and environmental impact, while at the same time solving increasingly important power density challenges. That's why Intel has introduced new, advanced Power Management Technologies (PMTs)with the NEXT-352SFP-1G that enable enterprises to configure power options on the adapter and more effectively manage their power consumption.

Energy Efficient Ethernet (EEE)

The NEXT-352SFP-1G supports the IEEE802.3az Energy Efficient Ethernet (EEE) standard so that, during periods of

low network activity, EEE reduces the power consumption of an Ethernet connection by negotiating with a compliant EEE switch port to transition to a low power idle (LPI) state. This reduces the controller power to approximately 50% of its normal operating power, saving power on the network port and the switch port. As soon as increased network traffic is detected, the controller and the switch quickly come back to full power to handle the increased network traffic. EEE is supported for both 1000BASE-T and100BASE-TX.

DMA Coalescing

Another power management technology that can reduce power on the server platform is DMA Coalescing (DMAC). Typically, when a packet arrives at a server, DMA calls are made to transfer the packet within the server. These calls wake up the processor, memory and other system components from a lower power state in order to perform the tasks required to handle the incoming packet.

Based on the configurable DMAC settings, incoming packets are buffered momentarily before any DMA calls are made. This enables the controller to intelligently identify opportunities to batch multiple packets together so that when components are wakened from lower power states they can efficiently handle the batched packets at the same time. This enables platform components to remain in lower power states longer, which can dramatically reduce platform energy consumption. DMAC synchronizes DMA calls across all controller ports to ensure maximum power savings.

Software Tools and Management

Intel® Advanced Network Services (Intel® ANS) include new teaming technologies and techniques such as Virtual Machine Load-Balancing (VMLB) for Hyper-V environments. Today, Intel ANS includes a variety of teaming configurations for up to eight adapters, support for mixed vendors server adapters teaming and includes support for 802.1q VLANs, making Intel ANS one of the most capable and comprehensive tools for supporting server adapter teaming.

Additionally, Intel® PROSet for Windows* Device Manager and PROset CL extends driver functionality to provide additional reliability and Quality of Service features and configuration.

General Features

Intel® Ethernet Controller I350

With PCI Express* V2.1 (5 GT/s) Support

Low-Profile and Standard height full

Ethernet Features

IEEE* 802.3 auto-negotiation

1Gb/s Ethernet IEEE 802.3, 802.3u, 802.3ab PHY specifications Compliant

Integrated PHY for 10/100/1000 Mb/s for multispeed, full, and half-duplex

IEEE 802.3x and 802.3z compliant flow control support with software-controllable Rx thresholds and Tx pause frames

Automatic cross-over detection function (MDI/MDI-X)

IEEE 1588 protocol and 802.1AS implementation

Power Management and Efficiency

<1W S0-Max (state) 1000BASE-T Active 90oC (mode)

<400mW S0-Typ (state) 100BASE-T Active (mode)

IEEE802.3az - Energy Efficient Ethernet (EEE)

DMA Coalescing

Smart Power Down (SPD) at S0 no link / Sx no link

Active State Power Management (ASPM) Support

LAN disable function

Full wake up support

Advanced Power Management (APM) Support (formerly Wake on LAN)

Advanced Configuration and Power Interface (ACPI) specification v2.0c

Magic Packet* wake-up enable with unique MAC address

ACPI register set and power down functionality supporting D0 and D3 states

MAC Power Management controls

Low Power Link Up - Link Speed Control

Power Management Protocol Offload (Proxying)

Latency Tolerance Reporting (LTR)

I/O Virtualization Features

Eight transmit (Tx) and receive (Rx) queue pairs per port

Flexible Port Partitioning:

32 Virtual Functions on Quad-port or 16 Virtual Functions on Dual-port

Support for PCI-SIG SR-IOV specification

Rx/Tx Round-Robin Scheduling

Traffic Isolation

Traffic Steering

VM to VM Packet forwarding (Packet Loopback)

MAC and VLAN anti-spoofing

Malicious driver detection

Storm control

Per-pool statistics, offloads, and jumbo frames support

Independent Function Level Reset (FLR) for Physical and Virtual Functions

IEEE 802.1q Virtual Local Area Network (VLAN) support with VLAN tag insertion, stripping and packet filtering for up to 4096 VLAN tags

IEEE 802.1q advanced packet filtering

Mirroring rules

Support for Simple VEPA

VF Promiscuous modes

Stateless Offloads/Performance Features

TCP/UDP, IPv4 checksum offloads (Rx/ Tx/Large-send); Extended Tx descriptors for more offload capabilities

IPv6 support for IP/TCP and IP/UDP receive checksum offload

Tx TCP segmentation offload (IPv4, IPv6)

Transmit Segmentation Offloading (TSO)

Interrupt throttling control

Legacy and Message Signal Interrupt (MSI) Modes

Message Signal Interrupt Extension (MSI-X)

Intelligent interrupt generation

Receive Side Scaling (RSS) for Windows environment

Scalable I/O for Linux environments (IPv4, IPv6, TCP/UDP

Support for packets up to 9.5K Bytes (Jumbo Frames)

Low Latency Interrupts

Header/packet data split in receive

PCIe v2.1 TLP Processing Hint Requester

Descriptor ring management hardware for Transmit and Receive

Remote Boot Options

Preboot eXecution Environment (PXE) flash interface support

Intel® Ethernet iSCSI Remote Boot for Windows, Linux, and VMware

Intel Boot Agent software:

Linux boot via PXE or BOOTP, Windows* Deployment Services, or UEFI

Manageability Features

Management Component Transport Protocol (MCTP)

Firmware Based Thermal Management

IEEE 802.3 MII Management Interface

MAC/PHY Control and Status

Watchdog timer

Extended error reporting

Controller Memory Protection

Vital Product Data (VPD) Support

Adapter Product Features

Plug and play specification support

Intel® I/O Acceleration Technology (Intel® I/OAT)

Ships with full-height bracket installed; low-profile bracket included in package

Technical Features

Data rate supported per port: 1000 Mbps

Bus type: PCI Express* 2.1 (5 GT/s))

Bus width: 4-lane PCI Express; operable in x4, x8 and x16 slots

Interrupt levels: INTA, INTB, INTC, INTD, MSI, MSI-X

Controller-processor: Intel Ethernet Controller I350

Power consumption (typical): 6.0 W

Storage temperature: -40 °C to 70 °C (-40 °F to 158 °F)

Operating temperature: 0 °C to 55 °C (32 °F to 131 °F)

Storage humidity: 90% non-condensing relative humidity at 35 °C

Network Operating Systems (NOS) Software Support

DOS, Novell ODI

Windows XP 32-bit(64-bit)

Windows Server 2003 32-bit(64-bit)

Windows Vista 32-bit(64-bit)

Windows 7 32-bit(64-bit)

Windows 8 32-bit(64-bit)

Windows 8.1 32-bit(64-bit)

Windows Server 2008 32-bit(64-bit)

Windows Server 2008 R2 32-bit(64-bit)

Windows Server 2012

Windows Server 2012 R2

Linux 2.4 series kernel、2.6.x、3.x

FreeBSD 7.x or most of FreeBSD

UnixWare / Open Unix 8

Sun Solaris x86

VMware

Xen4

Ordering Information:

M/N	Description	Noted
NEXT-352SFP-1G	PCI Express x4 Dual Port SFP Gigabit Server Adapter (Intel I350 Based)	Not including module