# 9802BF-2SFP+ PCI Express x8 Dual Port SFP+ 10 Gigabit Server Adapter (Intel 82599ES Based)

Dual-Port 10 Gigabit SFP+ Ethernet Server Adapters Provide Ultimate Flexibility and Scalability in Virtual and Unified Storage Environments

## Description:

9802BF-2SFP+10G Server Adapters with SFP+ connectivity are the most flexible and scalable Ethernet adapt- ers for today's demanding data center environments. Data center networks are being pushed to their limits. The escalating deployments of servers with multi-core processors and demanding applications such as High Performance Computing (HPC), database clusters, and video-on-demand are driving the need for 10 Gigabit connections. Customers require flexible and scalable I/O solutions to meet the rigorous requirements of running mission-critical
applications in virtualized and unified storage environments.

## Best Choice for Virtualization

The explosive growth in virtualization is leading to an increasing demand for network performance. With more Virtual Machines (VMs) running on each multi-core server, networking traffic is dramatically increased with each VM competing for available I/O bandwidth. Intel's family of 9802BF-2SFP+ 10G Server Adapters addresses networking bottlenecks in virtualized environments. These adapters enable network-intensive applications to achieve the performance expected in a virtualized environment.

The 10G LREC9802BF-2SFP+server adapter provides the best networking performance available in the industry, whether the physical port is configured in an emulation mode using the virtual switch in the Virtual Machine Monitor (VMM), or is directly assigned to a virtual machine. In the emulation mode, Intel's I/O technology, Virtual Machine Device queues1 (VMDq) optimizes network performance by offloading data sorting and copying from the software Virtual Switch in the VMM to the Intel Ethernet 82599 10 Gigabit Controller. This configuration is best suited for a large number of VMs running standard applica- tions that have limited bandwidth and latency requirements.

For mission-critical applications, where dedicated I/O is required for maximum network performance, users can assign a dedicated virtual adapter port to a VM. Using the PCI-SIG SR-IOV capability on an 9802BF-2SFP+ 10G server adapter provides direct VM connectivity and data protection across VMs. SR-IOV technology allows the data to bypass the software virtual switch and provides near-native performance. It assigns either physical or virtual I/O ports to individual VMs directly. This technology is best suited for applications that demand the highest I/O throughput and lowest latency performance such as database, storage, financial and other applications.

PCI-SIG SR-IOV is a mechanism for devices to advertise their ability to be directly assigned to multiple virtual machines. SR-IOV allows for the partitioning of a PCI function into many virtual interfaces for the purpose of sharing the resources of a PCI Express* (PCIe) device in a virtual environment. These virtual interfaces are called Virtual Functions. Each virtual function can support a unique and separate data path for I/O-related functions within the PCI Express hierarchy. Use of SR-IOV with a networking device, for example, allows the bandwidth of a single port (function) to be partitioned into smaller slices that may be allocated to specific VMs, or guests, via a standard interface.

The 9802BF-2SFP+ 10G server adapter delivers the same functionality and throughput as ten dual-port, one gigabit adapters, saving cost, power, and complexity.

## Unified Networking and Storage

The family of 9802BF-2SFP+ 10G server adapters lowers your data center total cost of ownership (TCO) by providing the ability to route LAN and SAN traffic over a single fabric.

## Support for Fiber Channel over Ethernet (FCoE)

FCoE encapsulates Fiber Channel frames over standard Ethernet networks, enabling Fiber Channel to take advantage of 10 GbE networks while preserving its native protocol. The LREC9802BF-2SFP+10G server adapter offer FCoE hardware acceleration to provide performance comparable to FC HBAs. The server adapters support Data Center Bridging, also known as Converged Enhanced Ethernet (CEE), which allows customers to configure traffic classes and priorities to deliver a lossless Ethernet fabric. An Intel Ethernet X520 server adapter reduces TCO by eliminating redundant fabrics and saves the cost of expensive FC HBAs and FC switch ports.

## Support for iSCSI

The server adapters provide complete support for proven native OS and VMM iSCSI initiators as well as iSCSI boot. Historically, CRC32C computation has degraded system performance, but now with the CRC instruction set included in the latest Intel® Xeon® processors, CRC validation is possible with minimal impact to network throughput while delivering superior data integrity.
The 9802BF-2SFP+ server adapters do it all 10 Gigabit LAN, FCoE, and iSCSI; truly delivering on the promise of unified

networking.

## Reliable Performance

The family of 9802BF-2SFP+ 10G server adapters include a number of advanced features that allow it to provide industry-leading performance and reliability.

## Security Optimizations

The adapters support IPsec offload for Microsoft's Network Access Protection (NAP), Active Directory,* and future security capabilities in Windows* 7. An 10G server adapter allows customers to run a secure network environment without sacrificing performance.

## PCIe v2.0 (5 GT/s)

PCIe v2.0(5GT/s) support enables customers to take full advan- tage of 10 GbE by providing a maximum of 20Gbps bi-directional throughput per port on a single dual port card.

## Designed For Multi-core Processors

Support for technologies such as multiple queues, receive-side scaling, multiple MSI-X vectors, and Low Latency Interrupts allow the LREC9802BF-2SFP+10G server adapter to provide high-performance, 10 Gigabit connectivity in multi-core server blades. These technolo- gies distribute network processing across multiple CPU cores, improving overall performance.

## Features

### General

Intel® 82599 10 Gigabit Ethernet Controller
SFP+ Connectivity
Low-profile
Load balancing on multiple CPUs
iSCSI remote boot support
Fibre Channel over Ethernet (FCoE) Support
Support for most network operating systems (NOS)
RoHS-compliant2
Intel® PROSet Utility for Windows* Device Manager
Time Sync (IEEE 1588, 802.1as)

### I/O Features for Multi-core Processor Servers

Intel® Direct Cache Access (DCA)
MSI-X support
Low Latency Interrupts
Header Splits and Replication in Receive
Multiple Queues: 128 Tx and Rx queues per port
Tx/Rx IP, SCTP, TCP, and UDP checksum offloading (IPv4, IPv6) capabilities
Tx TCP segmentation offload (IPv4, IPv6)
Receive and Transmit Side Scaling for Windows environment and Scalable I/O for Linux* environments (IPv4, IPv6, TCP/UDP)
IPsec Offload
MacSec

### Virtualization Features

VMDq
Next-Generation VMDq1 (64 queues per port)
PC-SIG SR-IOV Implementation (64 virtual functions per port)
Virtual Machine Load Balancing (VLMB)
Advanced Packet Filtering
VLAN support with VLAN tag insertion, stripping and packet filtering for up to 4096 VLAN tags

### Manageability Features

Preboot eXecution Environment (PXE) Support
Simple Network Management Protocol (SNMP) and Remote Network Monitoring (RMON) Statistic Counters
iSCSI Boot
Watchdog Timer

### Adapter Product Features

Intel® PROSet Utility
Plug and play specification support
Receive Side Scaling
Direct Cache Access (DCA)

## Advanced Software Feature

Adapter fault tolerance (AFT)
Switch fault tolerance (SFT)
Adaptive load balancing (ALB)
Teaming support
IEEE 802.3ad (link aggregation control protocol)
PCIe Hot Plug*/Active periphera; component interconnect (PCI)
IEEE 802.1Q* VLANs
IEEE 802.3 2005* flow control support
Tx/Rx IP, TCP, & UDP checksum offloading (IPv4, IPv6) capabilities (Transmission control protocol(TCP), user datagram protocol
(UDP), Internet protocol (IP)
IEEE 802.1p*
TCP segmentation large send offload
MSI-X supports Multiple Independent Queues
Interrupt moderation
IPv6 offloading — Checksum and segmentation capability extendedto new standard packet type

## Network Operating Systems (NOS) Software Support

Windows 7 32-bit(64-bit)
Windows 8 32-bit(64-bit)
Windows 8.1 32-bit(64-bit)
Windows Vista 32-bit(64-bit)
Windows Server 2003 32-bit(64-bit)
Windows Server 2008 32-bit(64-bit)
Windows Server 2008 R2 32-bit(64-bit)
Windows Server 2012 32-bit(64-bit)
Windows Server 2012 R2 32-bit(64-bit)
Linux kernel 2.6.30 or greater (x86_64) (w/ SR-IOV support)
FreeBSD 7.2 or laster
Linux RHEL 5.6
Linux RHEL 6.x
Linux SLES 11 SP1
Linux SLES 10 SP4
OS Independent
DOS NDIS 2
DOS ODI
EFI 1.1
UEFI 2.1
Vmware ESX 4.0[2]
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VMware Workstation