

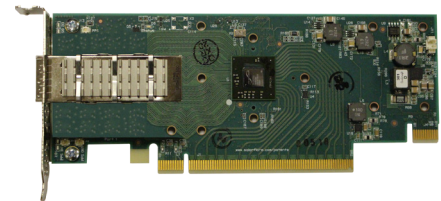
# XtremeScale™ X2542

## Dual Port 50Gb Ethernet PCIe NIC



For IT architects building modern data centers, the XtremeScale X2542 is a full-featured and powerful 50GbE NIC designed specifically for scale-out applications such as distributed databases, machine learning and cloud hosting.

X2542 lays a new foundation for NIC-based server and network virtualization. This enables highly distributed applications with thousands of inter-connected web hosting, machine learning and big data workloads. X2542 is the first and only NIC platform that provides ultra-scale connectivity for thousands of server nodes in today’s virtual networks, simultaneously providing real-time packet and flow analytics. This combination of ultra-high bandwidth, ultra-low latency, ultra-scale connectivity and packet telemetry, allows X2542 NICs to serve as the industry’s first commercial platform for micro-segmented NIC fabric services that scale with each server, virtual machine or container.



### Features and Benefits

**A powerful 50GbE NIC**—With two 50Gbps ports, X2542 delivers ultra-high throughput and latency as low as 500ns. The base NIC includes ScaleOut Onload kernel bypass, combined with DPDK, to provide both TCP and packet-based APIs for application acceleration. The X2542 also supports optional precision timing protocol (PTP) software for apps that require synchronized time stamping of packets with single-digit nanosecond accuracy.

**A Programmable NIC that Performs Packet Inspection and Classification**—Inside the ASIC of every X2542 NIC is an XtremePacket™ Engine which provides this general-purpose NIC the unique ability to inspect every packet at line-speed. Network engineers can then use Solarflare APIs to control the visibility, security and performance of network traffic.

**A Platform for a Micro-Segmented NIC Fabric**—Cloud service providers are deploying Smart NIC fabrics to achieve micro-segmentation of their network services that scale linearly. The X2542 from Solarflare is a platform for the industry’s first commercially available NIC Fabric, including shrink-wrapped applications for micro-segmented acceleration, telemetry, and security.

### Solarflare Advantage

- Ultra-high throughput
- Up to 400% acceleration of caching databases, software load balancers and distributed web applications
- High performance TCP-based NVMe storage
- Packet parsing and switching with programmable control plane
- Latency as low as 500ns
  - Used by 9 of top 10 exchanges worldwide
- Hardware-based filtering and micro-segmentation
- Telemetry and packet capture
- Hardware and software PTP solution

## Specifications

### **Acceleration**

Universal Kernel Bypass  
 DPDK Poll Mode Driver - Packet (Cloud, Telco)  
 ScaleOut Onload - TCP (Cloud, Telco, Enterprise)  
 Onload - TCP/UDP (Fintech)  
 TCP Direct - TCP/UDP (Fintech)

MSI-X Support  
 Interrupt Coalescing

### **Security**

ServerLock™ Local Hardware Filtering - Monitor, report, analyze, filter and enforce policies  
 Tamper resistant adapter – Digitally signed firmware and secured private keys

### **Time Synchronization and Hardware Timestamping**

Hardware timestamping for all packets, sent and received including PTP.  
 On-board Stratum 3 compliant oscillator  
 Solarflare Software PTP Daemon delivers enhanced stability and clock synchronization accuracy and can be used to synchronize the adapter clock to external time source

### **Stateless Offloads**

TCP/UDP Checksum Offload (CSO)  
 TCP Segmentation Offload (TSO)  
 Giant Send Offload (GSO)  
 Large Send Offload (LSO)  
 Large Receive Offload (LRO)  
 Receive Side Scaling (RSS)  
 Receive Segment Coalescing (RSC)

### **Manageability and Remote Boot**

PXE and UEFI  
 Solarflare Secure Boot  
 Tamper resistant Secure Firmware Upgrade  
 NC-SI over MCTP SMBus  
 PLDM over MCTP SMBus  
 MCTP PCIe VDM

### **Management and Utilities**

Ethtool Support  
 vCenter Plug-in  
 Solarflare Boot Manager

### **Adapter Hardware**

PCIe Gen 3.1 x16  
 50G QSFP28 direct attach copper or optical transceiver  
 XtremeScale™ SFC9250 Ethernet Controller

### **Hardware Certifications**

FCC, UL, CE  
 RoHS - Complies with EU directive 2011/65/EU

### **Traffic Engineering**

XtremePacket™ Engine for dedicated parsing, filtering, and flow steering  
 TCP/UDP/IP, MAC, VLAN, RSS filtering  
 Accelerated Receive Flow Steering (ARFS)  
 Transmit Packet Steering

### **Storage**

NVMe-TCP Plug-in for low latency, high performance storage networking on standard Ethernet fabric

### **Virtualization**

Linux Multiqueue  
 VMware NetQueue  
 Microsoft Hyper-V Virtual Machine Queue (VMQ)  
 SR-IOV: 16 physical functions; 240 virtual functions  
 2048 Guest OS protected vNICs  
 Full hardware switch fabric in silicon capable of steering any flow based on Layer 2 to Layer 4 protocols, between physical and virtual interfaces.  
 VXLAN, NVGRE, and GENEVE tunneling offloads; adaptable to custom overlays.

VLAN and VLAN Q-in-Q Insertion/Stripping

### **Ethernet Standards**

IEEE802.3-2012 Ethernet Base Standard, including 802.3bx  
 IEEE 802.3ad, 802.1AX Link Aggregation  
 IEEE 802.1Q, 802.1P VLAN Tags and Priority  
 IEEE 1588-2008 PTPv2  
 Jumbo Frame support (9000 bytes)

### **OS Support**

Red Hat RHEL, SUSE SLES, Debian, Ubuntu  
 Windows Server  
 VMware ESXi

For complete list of supported OS versions visit:  
<http://support.solarflare.com>

### **Physical Dimensions**

L: 16.75 cm (6.6 in)  
 W: 6.9 cm (2.7 in)  
 End bracket height: PCI Express standard, 12.0 cm (4.725 in)  
 PCI Express low-profile: 7.92 cm (3.12 in)

### **Environmental Requirements**

Temperature:  
 Operating: 0°C to 55°C (32°F to 131°F)  
 Storage: -40°C to 65°C (-40°F to 149°F)  
 Humidity:  
 Operating: 10% to 80%  
 Storage: 5% to 90%

### **Ordering Information**

X2542, X2542-PLUS

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 X2542 Product Brief 031918

Note: Feature availability is dependent on software release support. Please contact Solarflare support for details.