SOLARFLARE®

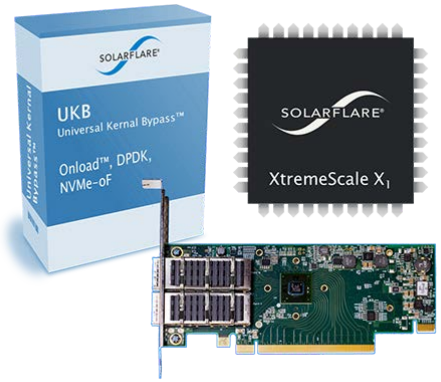
Neural-Class Networks Made Simple

The Evolving requirements of the Modern Datacentre

Robert Clark, EMEA Channel Manager
Silverstone September 2017

Who are Solarflare?

Software Defined NICs



XtremeScale™ Technology Universal Kernel Bypass Applications

- Storage
- NVMEoF
- Financial Trading
- Telco
- Web
- Databases

Network Analytics

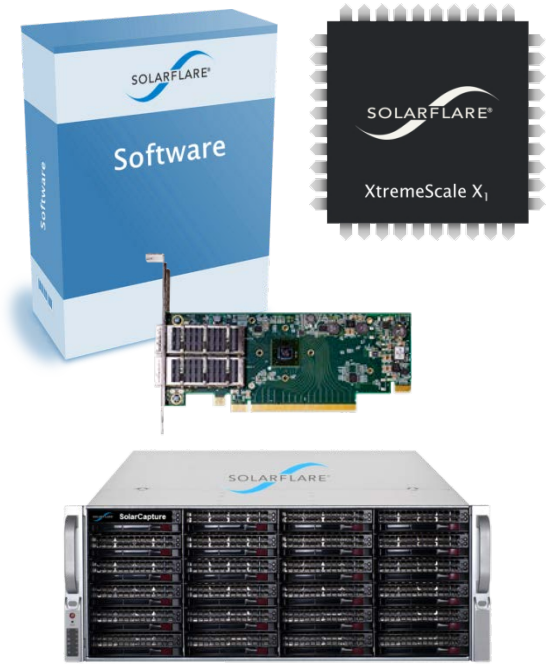
SolarCapture® appliances for packet capture and network analytics provide visibility into network traffic for compliance and security

Security

SolarSecure® Domain Fortress™ controller appliances, and NIC-based ServerLock™ software, secure traffic inside data centers by creating and managing server firewalls

Solarflare Communications

We design ultra high performance chips, adapters cards, software and turnkey systems



Deployed in enterprise, telco and cloud data centers

For the world's most demanding customers

NASDAQ

上海證券交易所 SHANGHAI STOCK EXCHANGE

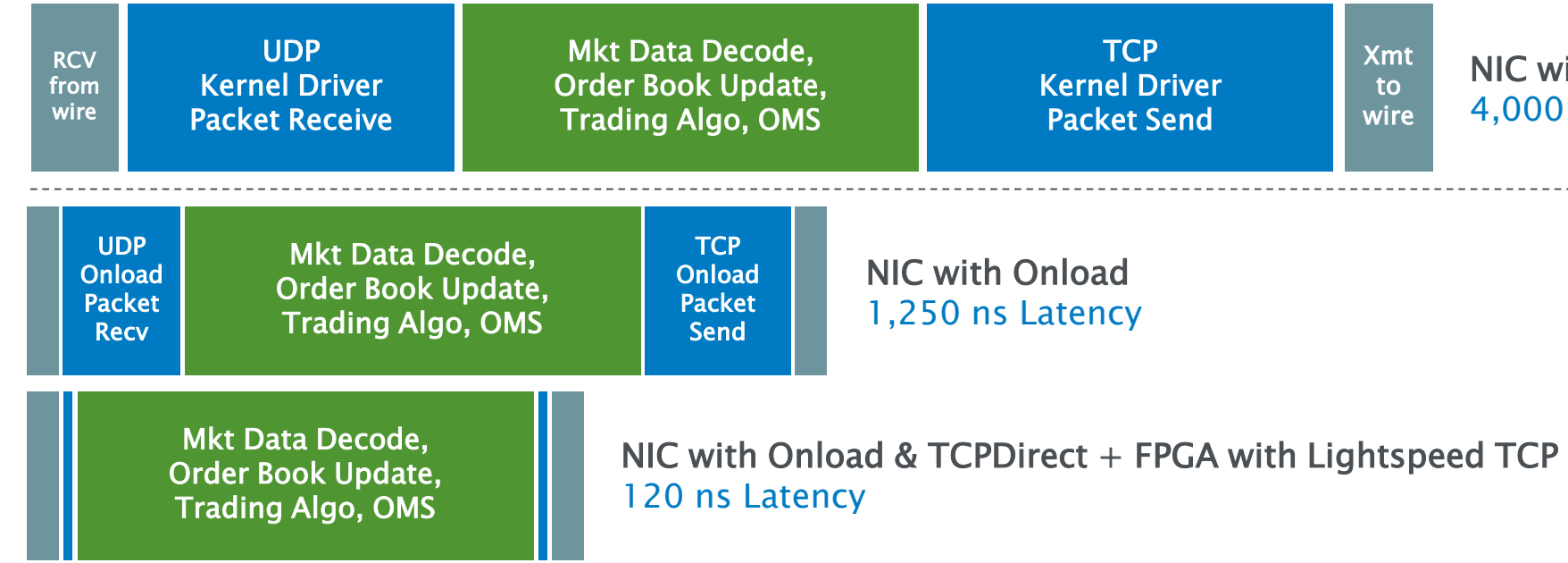
NYSE EURONEXT

CLOUDFLARE.

Market Leader in Networking for Electronic Trading

Delivering Lowest Tick-to-Trade Latency

HFT Server Farm



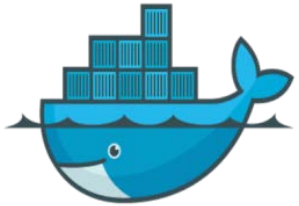
- Onload™ kernel bypass software and ASIC hardware is compatible with standard Ethernet and dramatically reduces latency vs. NIC driver
- Physical partitioning eliminates jitter and support many concurrent HFT apps
- Value to one customer: $60,000/year/µs/Ethernet port ($24m/100 ports)

Selected Customers

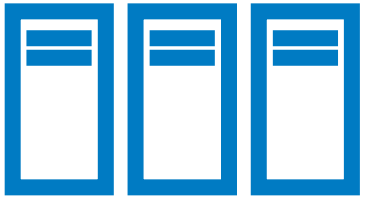
The Modern Data Center

Designed for Neural-Class Networks

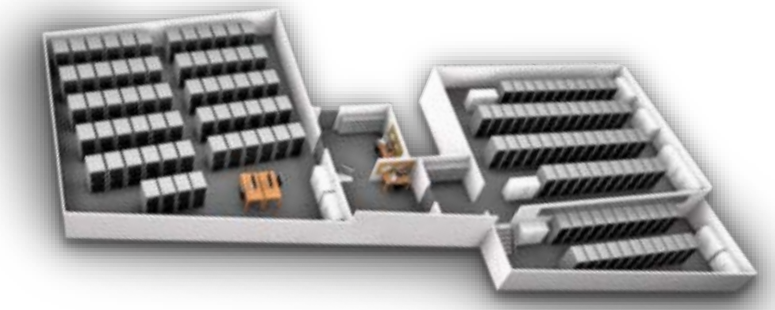
Software Defined Everything



Containerized

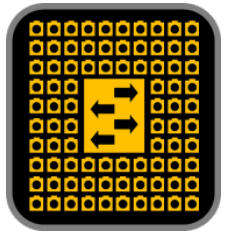


Scale Out



NVMe Flash Storage

Servers Secured with Hardware



Ultra Scale Connectivity

Instrumented for Telemetry

Two Megatrends Leading to Neural-Class Networks

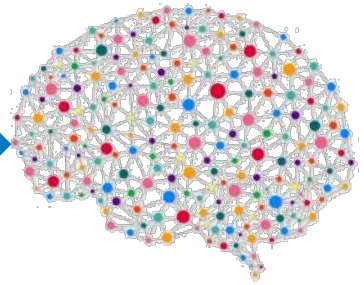
Cloud data centers

Software defined everything

Data Center Infrastructure

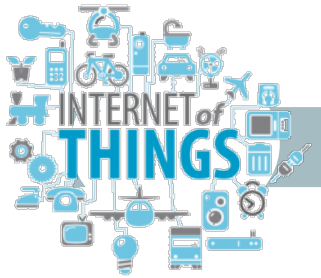
New Class of Network: High Bandwidth ● Ultra Low Latency ● Software Defined ● Instrumented for Telemetry ● Secure with HW Firewall ● Ultra Scale Connectivity

Big data analytics



"Neural-class networks" for AI and non-AI

Business Applications



IoT

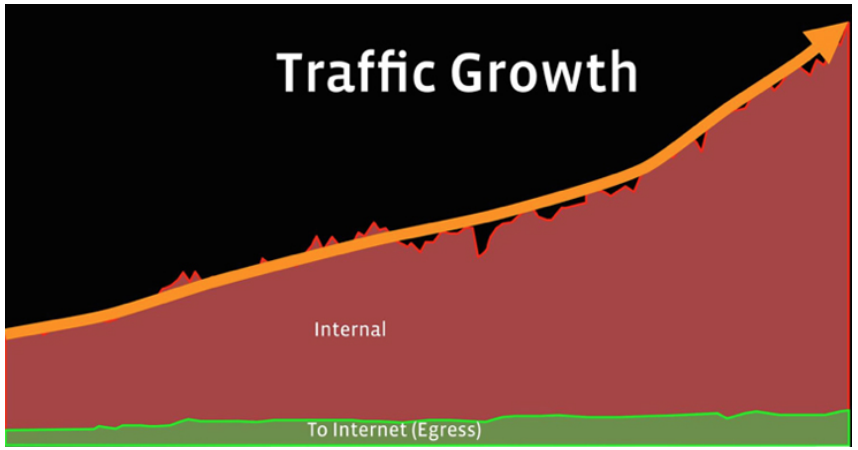
Mountains of data

“Neural-Class” Networks for AI and Non-AI

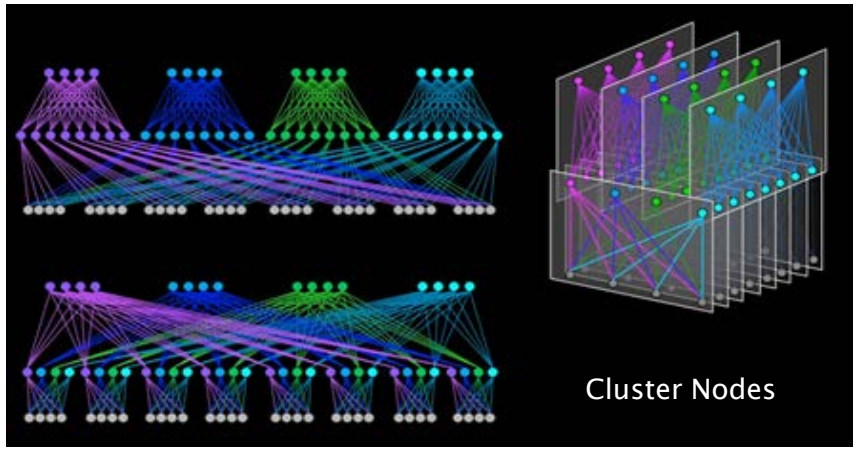
1.35 Billion Users

facebook

Huge Growth in Internal (server to server) Traffic

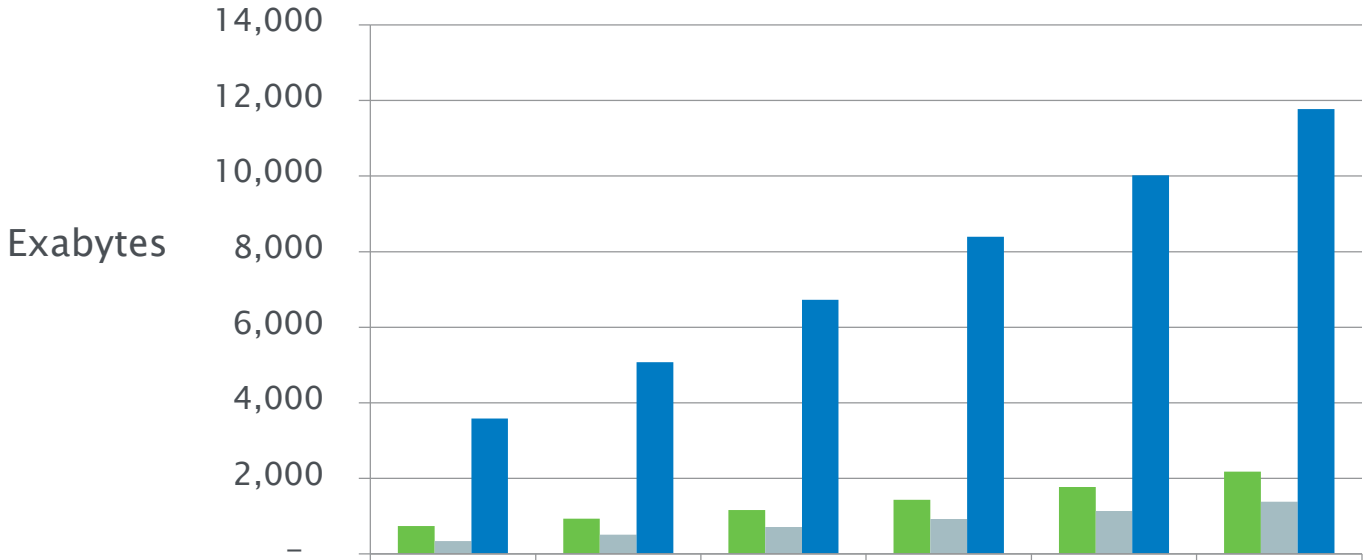


Ultra Scale Connectivity



Growing Inter-Data Center Traffic and Threats

77% of IP Traffic is Within Data Center, 90% if Rack-Local Traffic is Included.



	2015	2016	2017	2018	2019	2020
Data Center to User	744	933	1,164	1,438	1,772	2,183
Data Center to Data Center	346	515	713	924	1,141	1,381
Within Data Center	3,587	5,074	6,728	8,391	10,016	11,770

http://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/global-cloud-index-gci/white-paper-c11-738085.pdf

As internal traffic grows, so does:

- The importance of protecting servers from internal threats
- The number of virtual connections between cores, VMs and containers
- The need for scalable ultra low latency connections between cores, VMs and containers

Solarflare XtremeScale™ Architecture

For Neural-Class Networks

SOLARFLARE®

Ultra High Bandwidth

10 25 40 50 100

Speeds up to 100Gbps and cut-through technology to improve CPU efficiency

Ultra Low Latency

<1µ

Universal Kernel Bypass accelerates performance of distributed environments

Ultra Scale Connectivity

Thousands of virtual NICs and network flows for fine-grain network connectivity

Tailor networks to the specific needs of your applications

API

Software Defined

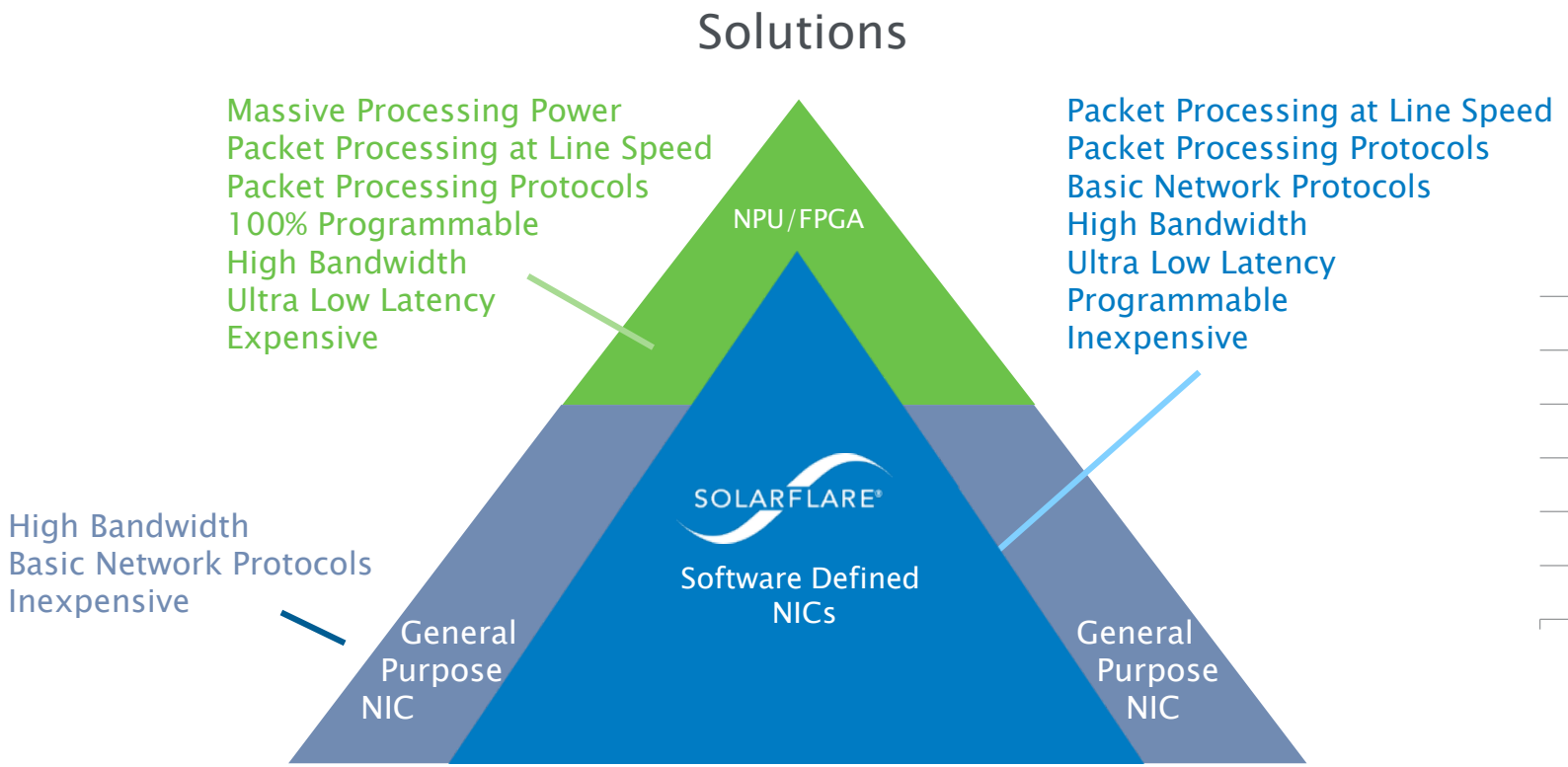
Server-level security enforced in the NIC a safeguard for heavy inter-data center traffic

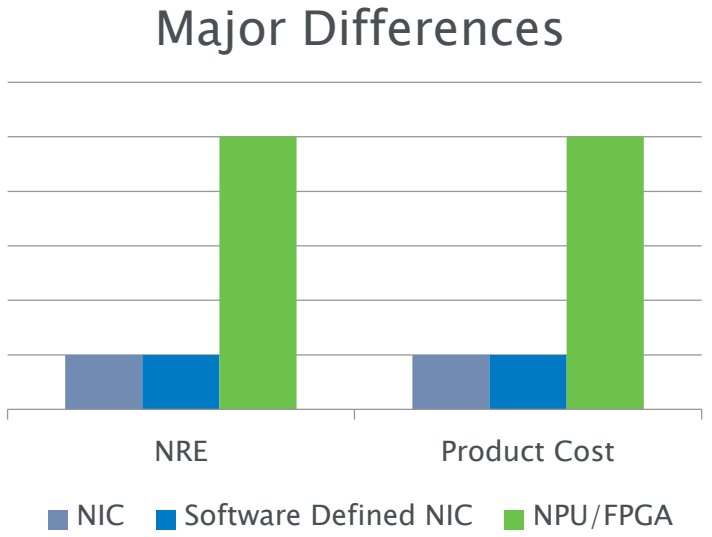
Hardware Security

Monitor, capture and analyze your network traffic to improve compliance, performance and security

Instrumented for Telemetry

Pioneering a New Class of Packet Processing NIC





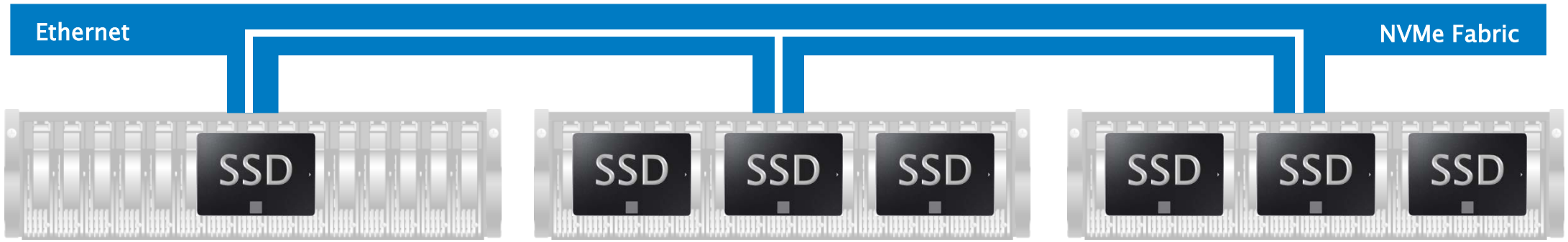
NVMe over Fabrics Changing Flash Storage

NVMe SSD 

PCIe interface instead of SAS/SATA

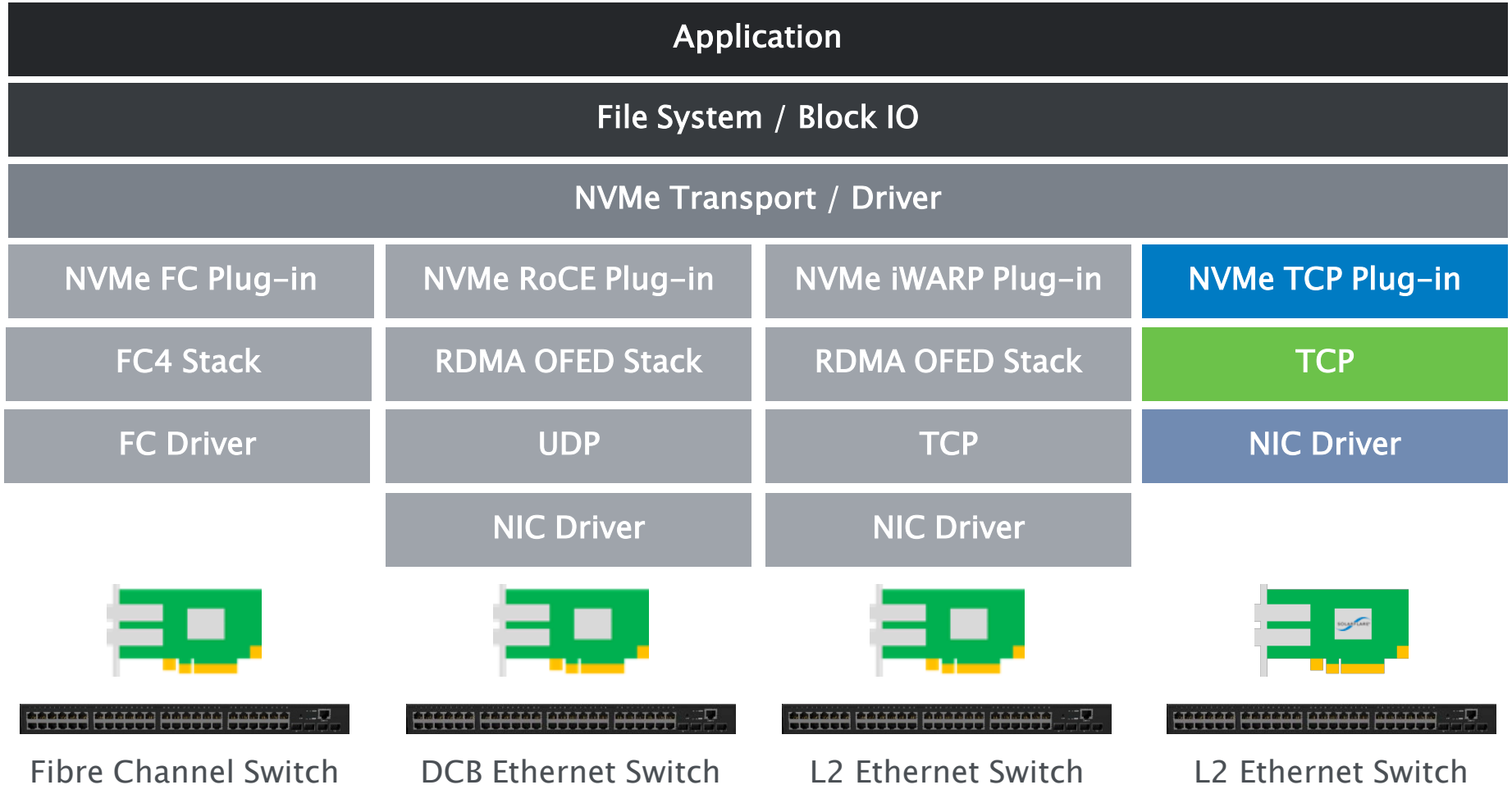
NVMe over Fabrics = Extension of PCI bus protocol over a network

Flash Storage can now be placed anywhere and accessed with local storage performance



App Server with NVMe SSD | JBOF (Just a Bunch of Flash) | AFA with NVMe SSDs

Solarflare Pioneering NVMe-oF Using TCP

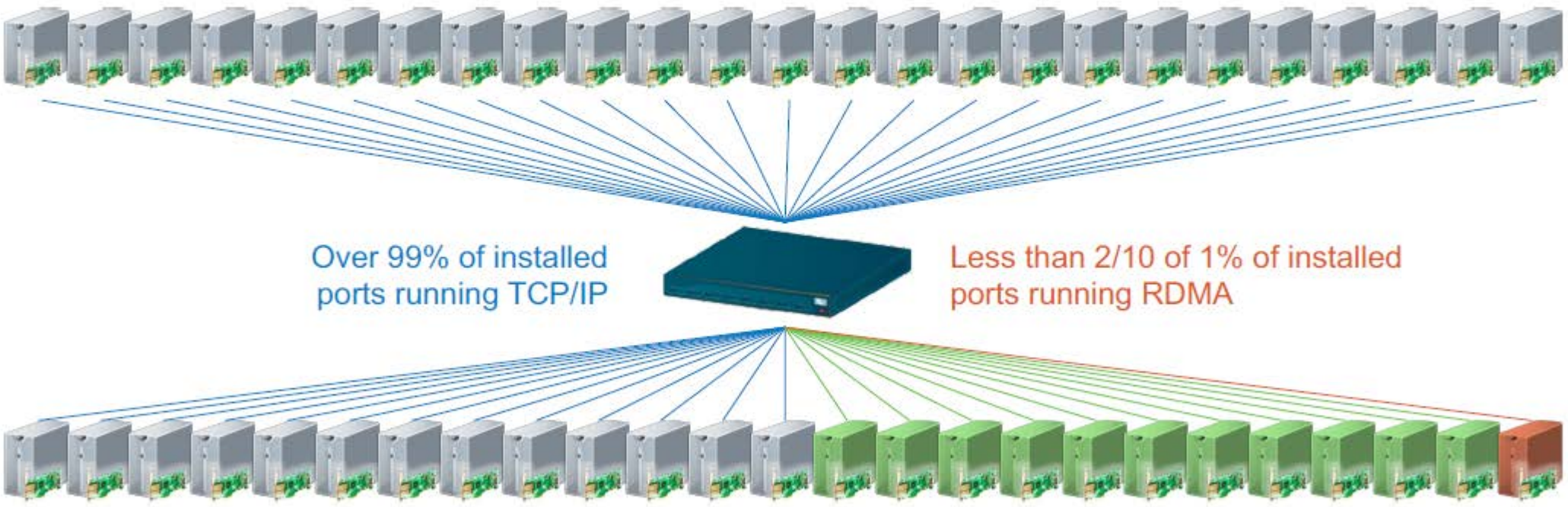


- Low latencies of NVMe local flash storage over POSIX compliant TCP/IP networks.
- Scales to large numbers of connections across the data center
- Out-performs RDMA
- Least expensive switching infrastructure

NVMe oF

Market Adoption Faster with NVMe over TCP/IP

100% of Servers in Data Center Connected to Ethernet
(2016 Ethernet Server Ports: ~500,000M installed, ~50M shipped)



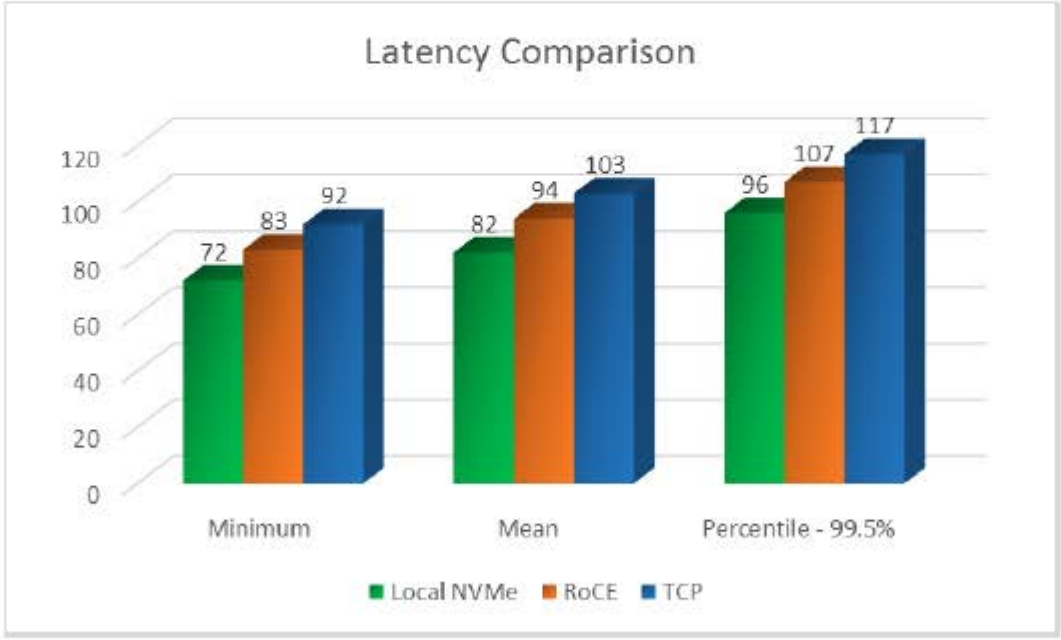
Less than 25% of installed ports support DCB required for RoCE-based RDMA

Source: IT Brand Pulse

SOLARFLARE®

Latency Data

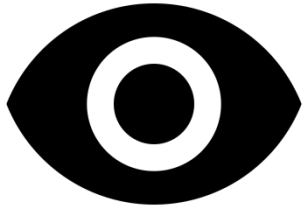
- Test conducted with 4KB reads with a single queue and queue depth of 1



Latency represented in µs

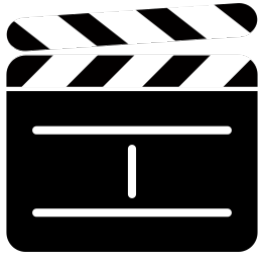
Mean and 99.5%ile latency within 10% of RoCE without optimization

Pervasive Need for High-Performance Packet Capture & Network Analytics Which are Cost Effective



Providing visibility of live streams

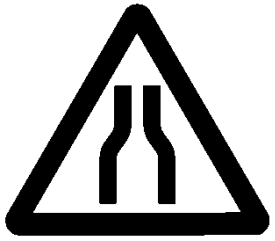
Providing lossless capture



Time stamping packets

Reducing Mean-time-to-detect

Feeding NPM, security and business analytics

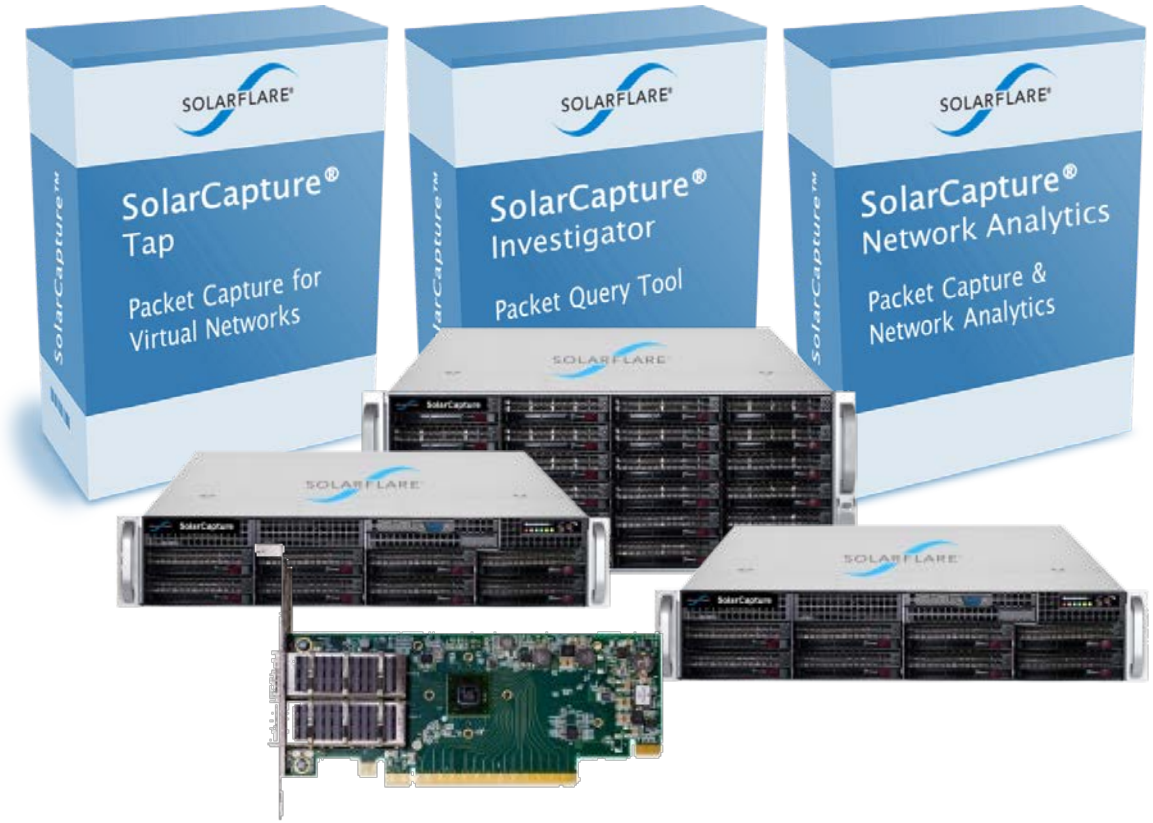


Identifying performance bottlenecks

Solarflare Pioneering High-Performance, Cost-Effective Packet Capture & Network Analytics

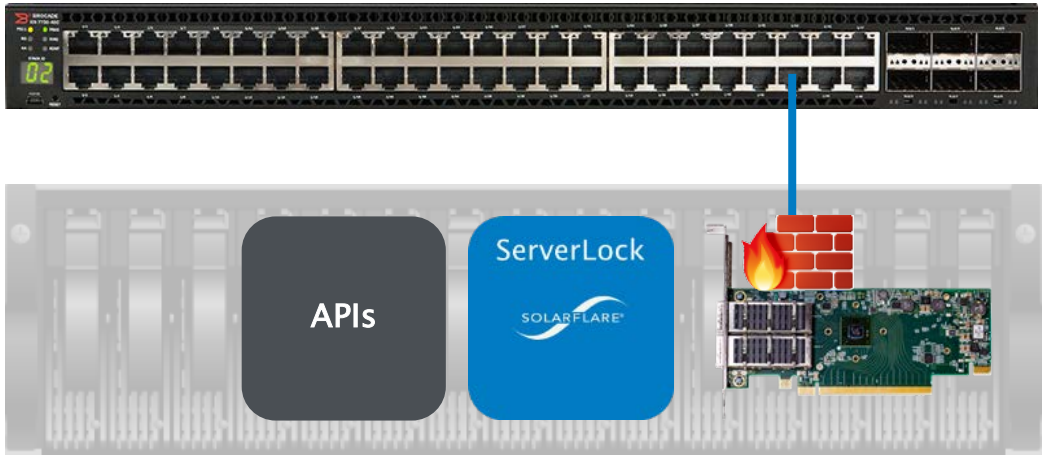
SolarCapture Appliances & Systems

100% Lossless Packet Capture to 40Gbps



Solarflare Pioneering Security Inside the Data Center

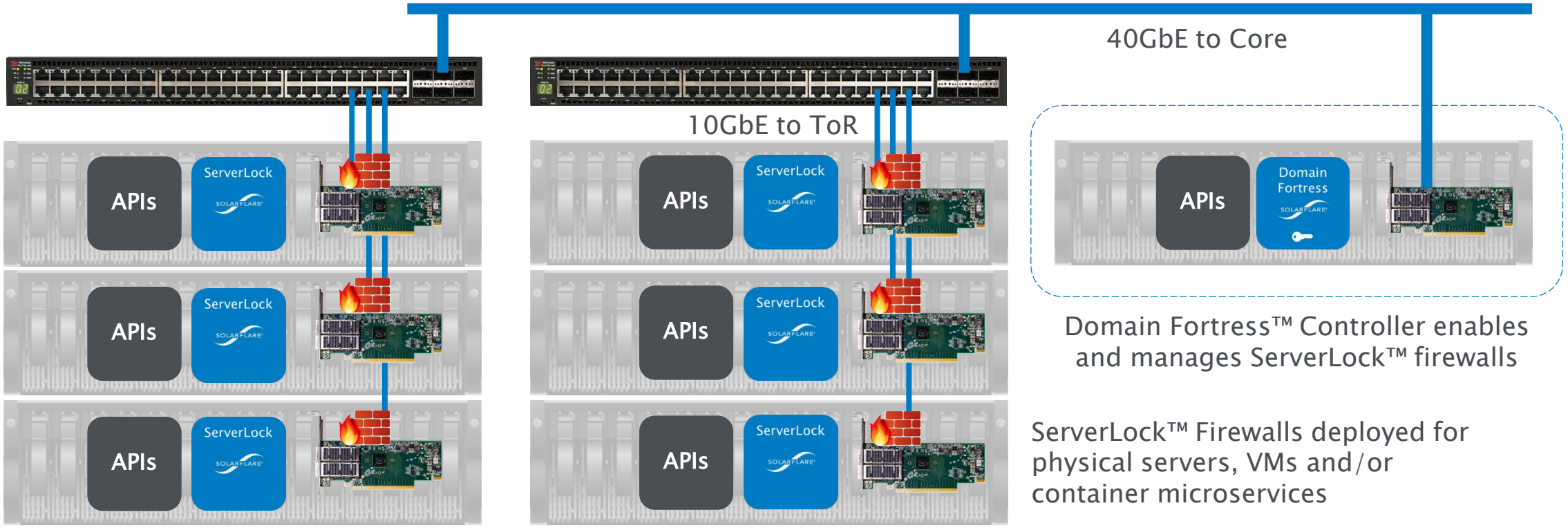
SolarSecure NIC-Based Firewalls



ServerLock™ firewalls deployed for physical servers, VMs and/or container microservices

Solving Inter-Data Center Access Security

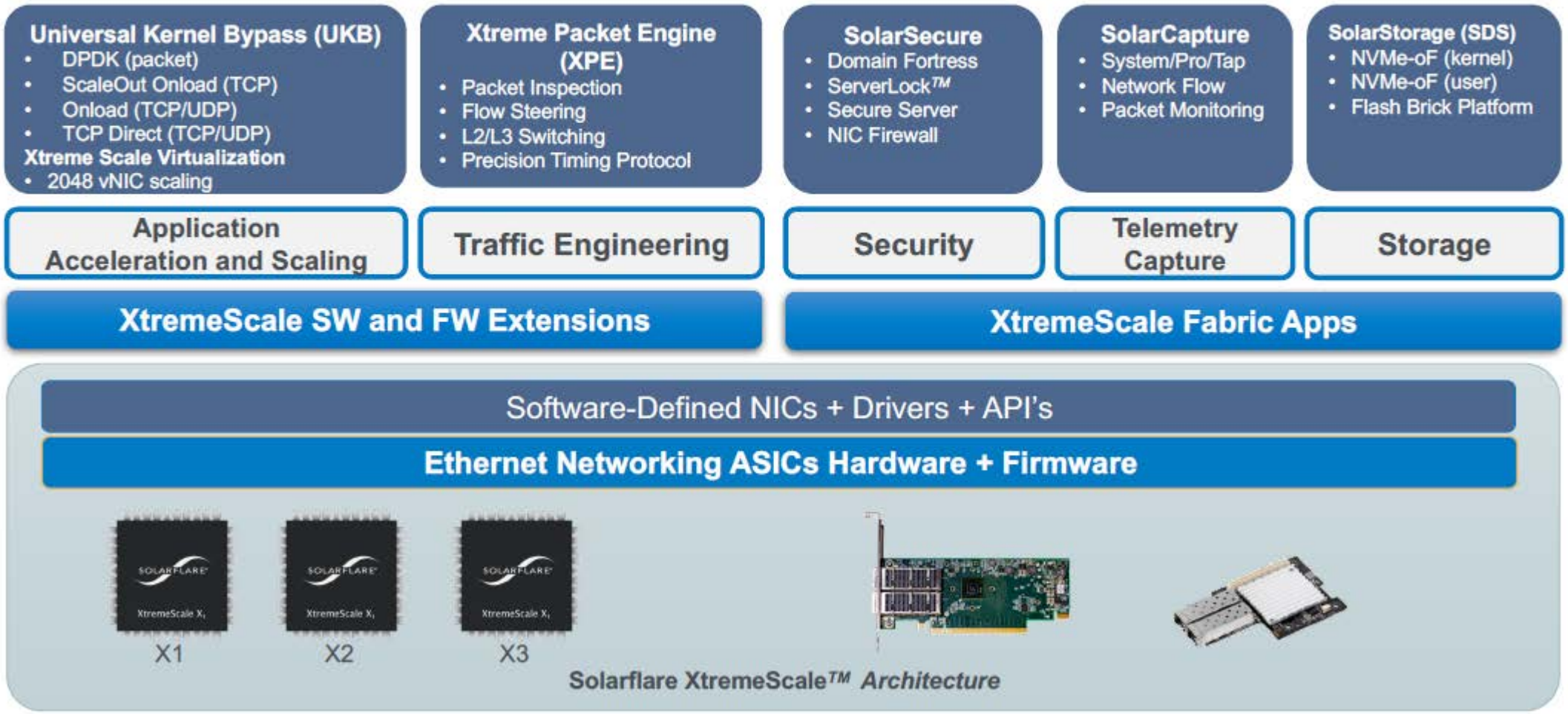
HW-Based Server Firewalls can Block Application Traffic Without a Valid Reason to Communicate



Domain Fortress™ Controller enables and manages ServerLock™ firewalls

ServerLock™ Firewalls deployed for physical servers, VMs and/or container microservices

Solarflare XTremeScale Portfolio



Solarflare Expansion Beyond NICs and HFT

Neural-Class Networks Made Simple