

Network Composability for Communication Service Providers (CSPs)

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Presenters



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Agenda

- Introduction : Extreme's 9920 NPB solution with Tofino 2
- Networking Challenges
- Data Center of the Future (DCoF)
- Intel® Intelligent Fabric vision
- Intel® Intelligent Fabric Processors
- Intel® Tofino Product Family

Extreme 9920 – “A Revolution in Network Visibility”

- Cloud Native Visibility solution with Network Packet Broker application
- Extreme Networks is one of the first customers to deploy Intel® Tofino™ 2 Programmable Ethernet Switch ASICs
- The Extreme 9920 NPB solution is deployed in large 5G mobile networks
- Extreme projects large opportunities for this solution over the next 3-5 years



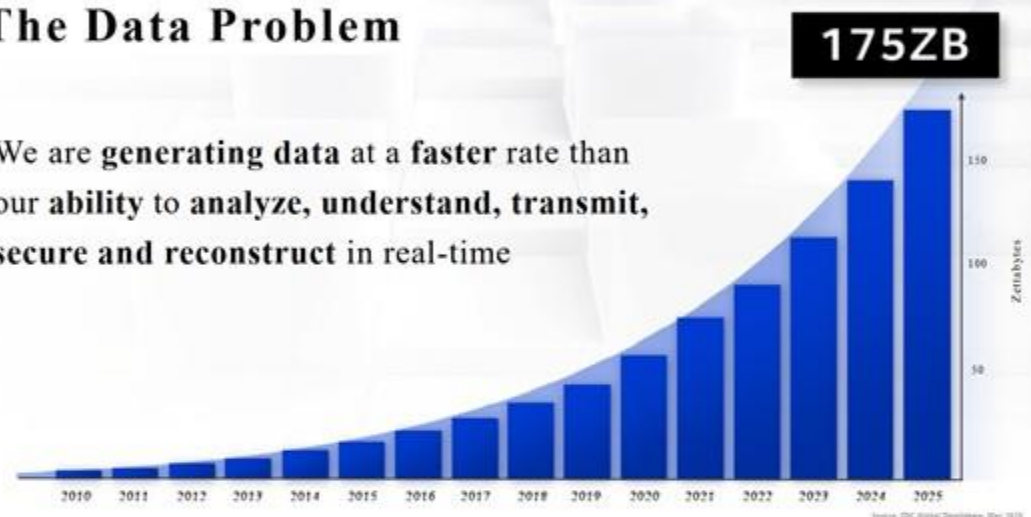
Extreme 9920

Cloud-Native Network Visibility Platform

Networking Challenges

The Data Problem

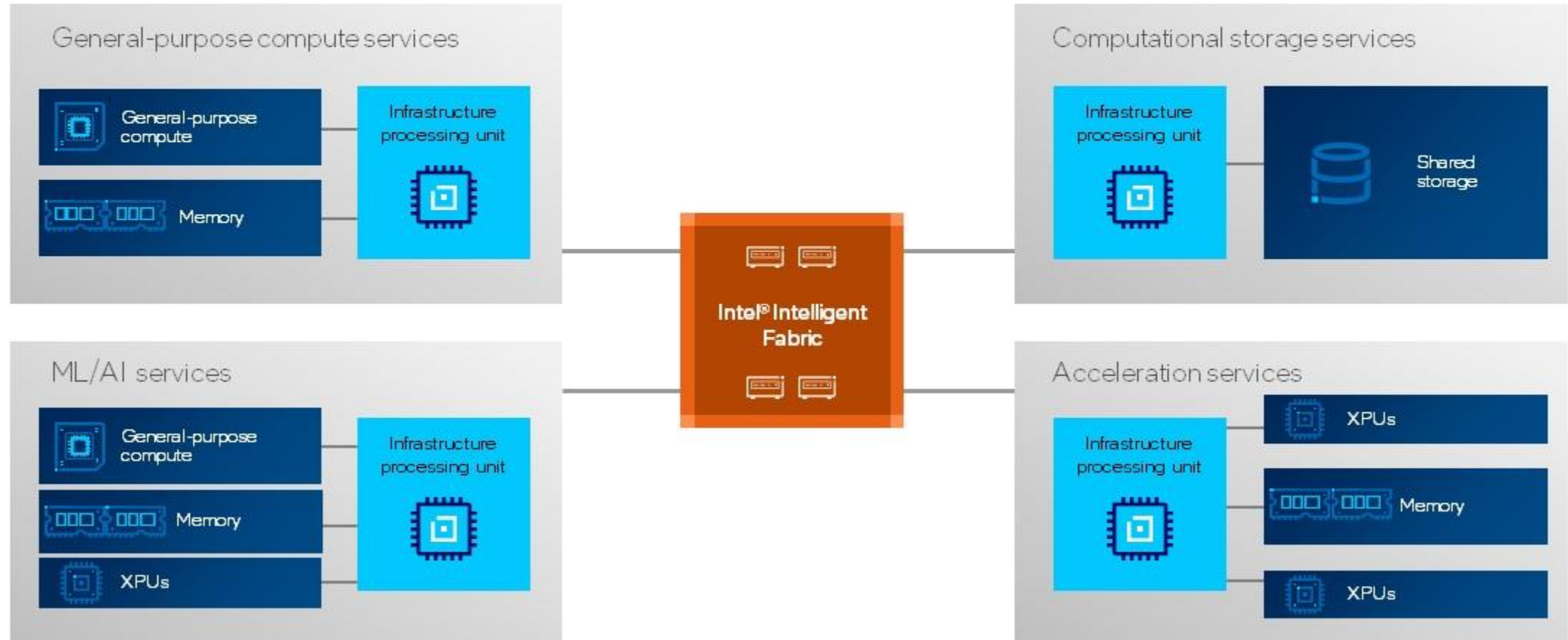
We are **generating data** at a **faster rate** than our **ability to analyze, understand, transmit, secure and reconstruct** in real-time



- Move to Cloud-native architecture with container-based processing, orchestration and automation
- Distributed, scale-out world is changing architecture
- AI and changing workloads spawn need for growing network optimizations
- Operational challenges of root causing network slowdowns
- End-to-end Security
- Increasing network CAPEX and OPEX investment for service providers

Network needs to get smarter while increasing bandwidth

Data Center of the Future: Intel® Intelligent Fabric



VISION: Intel® Intelligent Fabric

End-to-End Co-Optimizations

Photonics Integration

OPTICAL MODULES

High-bandwidth connectivity at 100G, 400G and beyond

ETHERNET SWITCH

P4-programmable scale-out fabric with uncompromising performance

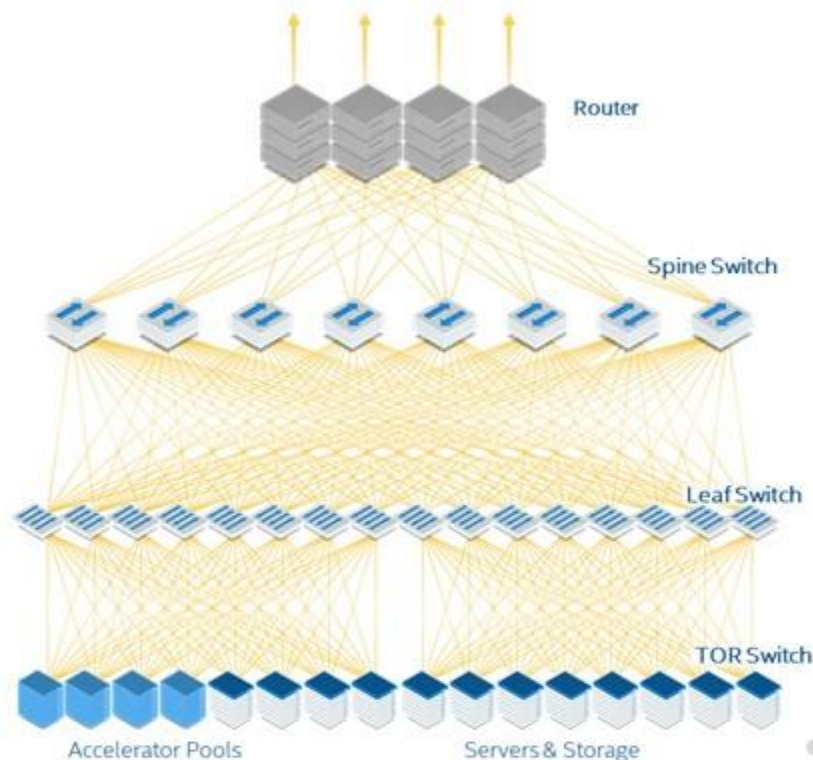
ETHERNET IPU's and NETWORK ADAPTERS

Programmable infrastructure acceleration for demanding data movement

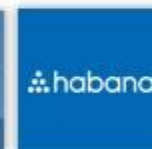
CPUs & xPUs

Fabric-enabled endpoints aligned to accelerators & software pipelines

- Ease of Use
- Massive Bandwidth
- AI-driven Self-monitoring / Self-analyzing / Self-healing
- Enhanced Security
- Enable End-to-end Optimization w/ Fabric Telemetry
- Improved Density / Power / Cost



Intel Portfolio



Industry Standards

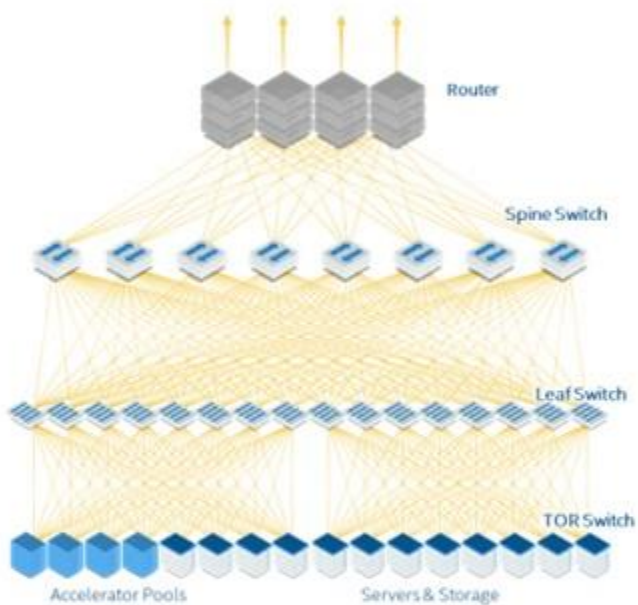


eBPF



At the Heart of Intel® Intelligent Fabric Intel® Tofino™ 3 Intelligent Fabric Processor

New! Announced
at Intel Innovation
in Oct '21



Challenge: Explosion in 5G and IoT data, distributed workloads; requires AI and cloud-to-edge visibility

Solution:
Intel® Tofino™ 3 Intelligent Fabric Processor (IFP)



Intelligence



Performance – up to 25.6 Tbps



Visibility & Control

Optimized for:
Cloud and Edge Data Centers
HPC
Comms moving to Cloud technologies



Switch to Intelligence with Intel Tofino 3 IFP

Intel® Intelligent Fabric Key Benefit Vectors



INTELLIGENCE

- Fully Customizable P4-Programmable Pipeline
- Intelligent Packet Processing for Accelerating AI/ML Workloads
- Expandable Table and Buffer Sizes with Intel® FPGAs
- Enhanced Security with Intel® Software Guard Extensions (Intel® SGX) and Intel® Trust Domain Extensions (Intel® TDX)



PERFORMANCE

- 6.4/12.8/25.6 Tbps Total Throughput
- 112G/56G SerDes for high speed and easy migration
- High speed Intel® Silicon Photonics
- Power-optimized Hyperscaler Use Cases for Intel® Tofino™ Intelligent Fabric Processors



VISIBILITY & CONTROL

- Enhanced Congestion Control
- Identify delays or hotspots with real-time In-band Network Telemetry (INT)
- Analyze packet flows with Deep Insight Network Analytics Software
- Remedy using AI or Deep Insight reports
- Traffic monitoring and steering for enhanced security and reliable transport
- Increase INT data available with Intel® IPU and Ethernet Network Adapters

Intel® Tofino™ Product Family

Tofino (16nm)



- 1.8 to 6.4 Tbps
- 25G SerDes

Tofino 2 (7nm)



- 4.8 to 12.8 Tbps
- Modular Chip Design
- 56G SerDes

Tofino 3 (7nm)



- 6.4 to 25.6 Tbps
- Modular Chip Design
- 112G/56G SerDes

Intelligence

- P4 Programmable
- AI/ML Acceleration
- Highly-Secure

Performance

- Up to 25.6 Tbps throughput
- 112G/56G SerDes
- Power-Optimized Use-Cases

Visibility and Control

- Edge-to-cloud real-time telemetry
- Enhanced congestion control
- Self-healing network capabilities

Status: Production now

Production now

Future

EXTREME NETWORKS

NETWORK COMPOSABILITY FOR CSPs

Tim Harrison Dec-8, 2021





Service Providers need to move faster than their customers.



Composability

composable (*adj.*): to make or form by combination.







HOW EXTREME HELPS YOU TO KNOW YOUR NETWORK



Deliver industry-leading flexibility to compose the visibility data pipeline for different packet processing use cases

Enable CSPs to scale anywhere through automation and simplified management

Power visibility across highly distributed physical or virtual environments



EXTREME NETWORKS – NETWORK VISIBILITY SOLUTION

Cloud-Native Experience with the Reliability of a Carrier-Grade Solution



- **Extreme Visibility Manager**

- Centralized Management of all Extreme Visibility Solutions
- Massively Scalable to Grow and Adapt



- **Composable Network Operating System**

- Microservices Architecture
- Built for Customization and Rapid Service Delivery



- **Extreme Network Visibility Platform**

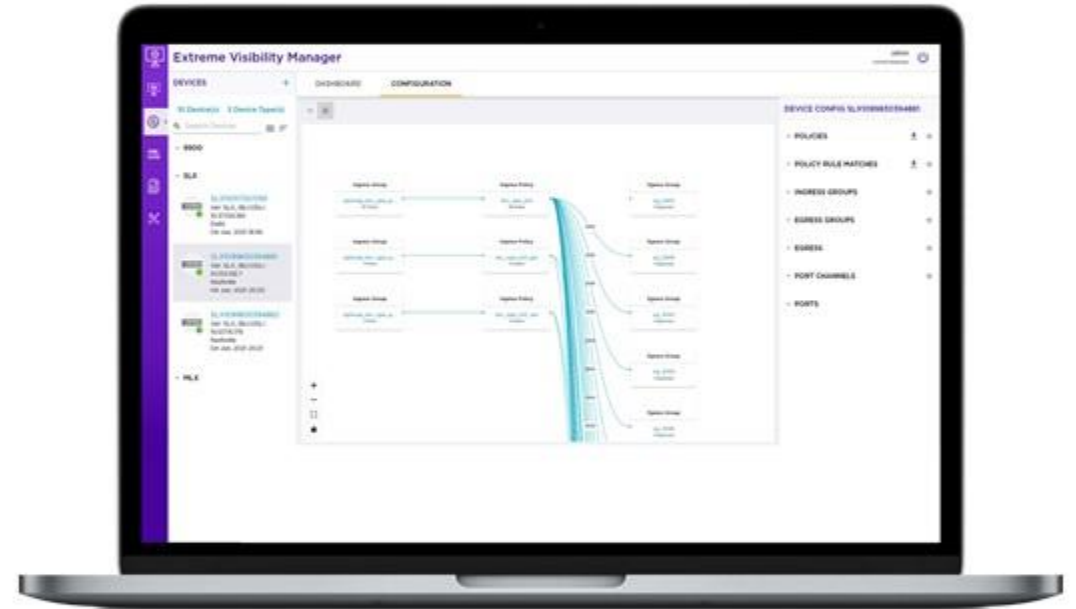
- Build for a cloud-native world
- Network Packet Broker application for the most demanding SPs
- **Featuring the Intel Tofino 2 Ethernet Switch ASIC**

PRODUCT HIGHLIGHTS EXTREME VISIBILITY MANAGER

Centralized Management of all Extreme Visibility Solutions



- Designed for a User-Centric Graphical Experience
- Streaming Platform Telemetry for Powerful Management
- Improves Productivity and Reduces Operating Costs



<https://www.extremenetworks.com/product/visibility-manager/>



Extreme 9920

Know Your Network.

Fully Composable Platform

Based on the Intel Tofino2 Ethernet Switch ASIC

Cloud-Native Technologies

Reduces risk and accelerates service delivery

Powerful Packet Visibility

Delivers the deep visibility of Extreme's NPB application

Incredible Performance

Wire speed aggregation, regeneration, and optimization



Security
Analytics



Compliance
Analytics



Service
Analytics



Performance
Analytics





Cloud-Native Visibility

Know Your Network.

Carrier Grade Composable Platform

Increases flexibility with cloud-native programmability

Scalable Traffic Aggregation

Helps ensure the best network performance anywhere

Clearer Subscriber Visibility

Generates revenue by identifying new traffic trends

Powerful Packet Filtering

Delivers key data for security and performance visibility



Extreme
Visibility Manager



Extreme 9920
Visibility Platform



Extreme
Session Director



SLX 9140
Collector



Extreme Virtual
Packet Broker



SLX 9240
Collector/Aggregation



BGP-EVPN



Edge Infrastructure



Automation

IP Fabric



Extreme 8720

Trusted Spine/Leaf Switch



Extreme 8520

Trusted Leaf Switches

Border Routing



SLX 9640

Deep Buffer Router



SLX 9740

Core Router / Border Leaf



SLX 9540

Core Router / Border Leaf

Cloud Native Visibility



Extreme Visibility Manager



Extreme 9920

Visibility Platform



SLX 9140

Collector



SLX 9240

Collector/Aggregation

IP Transport Services



SLX 9640

Deep Buffer Router



SLX 9740-40C / SLX 9740-80C

Core Router / Border Leaf




New Extreme Intelligent Cloud-Native Network Visibility Solution

www.extremenetworks.com/solution/visibility

Extreme Visibility Manager

Hierarchical Management Framework




Available | New 9920 | CONTACT SALES

- BETTER USER-CENTRIC EXPERIENCE**
Reaching the pain-point interface for an administrator is not an easy task. Solution Architect can reduce complexity and to increase the opportunity for an operator.
- STREAMING TELEMETRY FOR PLATFORM MANAGEMENT**
Reducing the amount of data transmitted, updates and patches can be applied quickly and safely to reduce operational risk.
- IMPROVE PRODUCTIVITY AND REDUCE OPERATING COSTS**
Integration with existing Extreme visibility solution supports the multi-service based. Extreme visibility Manager enables provisioning, management, and maintenance of the continuous service delivery cycle.

Extreme - 9920

Cloud-Native Network Visibility Platform



Available | New 9920

- COMPOSABLE DATA PIPELINE**
The Extreme 9920 is based on the new open data pipeline for multi-vendor, multi-tenant, multi-geography and multi-service delivery, allowing for a common interface for managing a large volume of data through 5G 4G LTE.
- CLOUD-NATIVE OPERATING SYSTEM**
The managed network visibility solution is a multi-tenant based operating system for customization and new service delivery, allowing for a common interface for managing a large volume of data through 5G 4G LTE.
- MASSIVELY SCALABLE MANAGEMENT ARCHITECTURE**
Management of the visibility platform is designed to be highly scalable and to support a large number of users, allowing for a common interface for managing a large volume of data through 5G 4G LTE.

Unprecedented Clarity into Network Utilization with Extreme Cloud-Native Network Visibility Solution



5G is the 1st generation of cellular technologies built on cloud-native principles.

The COVID-19 pandemic has transformed the mobile network. Technology has moved into the era of the Infinite Edge, where distributed network access, scalable cloud services, and consumer-centricity are driving new use cases, such as AR/VR.

5G use cases at the mobile and enterprise edge are driving massive amounts of data and requiring more and more bandwidth. Service Providers need to make sense out of that data to provide the best, most reliable service possible and the way Service Providers think about visibility must be transformed. If they are not building a composable network to support 5G network visibility, they will be left behind.

Most traditional network visibility tools cannot be easily adapted for future use cases like autonomous vehicles or industrial IoT. Because many 5G use cases are still undefined, Service Providers need a composable solution that provides visibility into highly distributed environments and is flexible enough to be adjusted for specific purposes at the edge without requiring extensive IT/re-engineering infrastructure upgrades.

The explosion of greater and more flexible visibility into data on the network is driving distributed data visibility requirements. Service Providers need to have the value of a cloud-native experience with the benefits of a managed platform for their automation and visibility. Cloud-native systems are designed to embrace rapid change at a large scale with

Head of Sales
Senior Manager, Product Marketing
Available in 2020



ADVANCE
WITH US™

Questions?

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