SUPERMICRO AND NOKIA DELIVER NEXT-GEN NETWORKING ARCHITECTURE SOLUTION

Supermicro Switches with Nokia Networking Software Enable Advanced, Scalable Infrastructures

Executive Summary

Supermicro, a global leader in high performance, high efficiency end-to-end green computing solutions, and Nokia, a global leader in telecommunications, are working together to deliver an advanced, AI-ready networking infrastructure solution for service providers, telecom operators, and enterprise organizations.

Nokia's Service Router Linux (SR Linux) and Event-Driven Automation (EDA) software combined with Supermicro's high-speed switching hardware creates a powerful platform that unlocks the capabilities of next-gen networking.

Solution Highlights

- A unified Supermicro hardware stack with Nokia's powerful network operating system (NOS)

- Integrated hardware and software for a powerful all-in-one networking solution

- High-performance, low-latency networking platform with 51.2Tb/s switch fabric capacity

- 64x 800G OSFP and 2x 25G SFP+ ports, ideal for 200/400/800G Spine-Leaf architecture

- Open, extensible, and resilient network operating system (NOS), built for scalability

- Microservices-based and model-driven software architecture

- Intent-based declarative Event-driven Automation (EDA)

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Target Markets

- Service Providers
- Telecom
- Enterprise

Use Cases:

- AI-enabled Networks
- AI Factories
- Network Automation

Figure 1: SSE-T8164S

Overview

Networking is the backbone of any data center, interconnecting countless servers, devices, and locations to ensure businesses and applications can operate seamlessly. A high-performance network is vital to the operation and safety of any IT infrastructure. Future-proof your data center network with Supermicro's high-speed switching platform and Nokia's innovative SR Linux operating system.

A full-stack data center hardware cluster brings all the benefits of a completely integrated, tested, and certified infrastructure solution. Supermicro supports an open ecosystem with full interoperability for a broad range of pre-qualified component suppliers. This gives users a free choice of components while benefiting from a proven high-performance switching platform and an industry-leading NOS.

Modern AI clusters involve hundreds, if not thousands, of GPU systems working together as one. The connectivity needed between these systems involves a tremendous number of links. Implementing and managing a network of this scale requires an automated platform that allows the network to adapt to changes as they happen. Nokia EDA helps achieve the speed and precision needed to efficiently deploy and operate a network of this scale.

Nokia SR Linux

Nokia SR Linux was developed in close collaboration with some of the world's largest network operators. It was designed to solve real-world challenges in IP and data center networks where the primary challenges are scalability, ease of operations, or both.

In addition to scalability, the overall network must provide high levels of programmability, openness, reliability, and extensibility to meet growing DevOps and agility requirements. Current industry solutions cannot meet these diverging requirements, and they were the genesis for the development of SR Linux.

Nokia SR Linux implements a unique architecture that delivers an open, extensible framework designed from the ground up for automation with advanced software features leveraging proven quality and resiliency. It provides openness, flexibility, robustness, and automation to make networks easier to scale, adapt, and operate.

Nokia SR Linux delivers:
- An open, extensible, and resilient NOS that is fully programmable and massively scalable

- A unique architecture that embraces cloud-native principles, featuring a microservices-based, state-efficient design

- A modular, model-driven architecture designed from the ground up for simplified operations, integrations, and ultimate visibility

- Field-hardened protocol stacks for enhanced IP routing and security features

- Extensive streaming telemetry, designed from the core out to support unprecedented granularity and volume

- A customizable, open-source command line interface (CLI) and on-demand, customized CLI plugins leveraging the flexibility of the Python programming language

- Unrivalled support for integrating community and customer-driven applications into the core of the system

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- Maximum portability with support for a "free to try" version of a container SR Linux image as well as a tool (Containerlab) to easily deploy networking lab topologies

- Flexible hardware integration and support for a wide range of hardware networking chipsets.

Nokia Event-Driven Automation

As data centers and AI clusters grow in scale, network infrastructure becomes increasingly complex. For instance, an AI cluster comprising 1,024 systems with 8 GPUs each result in 8,192 individual links that must be provisioned, configured, and maintained. Managing this without the proper tools is costly and risky. The challenge becomes even more complex in multi-tenant environments, such as service providers or GPU-as-a-service deployments. Nokia's EDA addresses these challenges by enhancing the reliability, scalability, and usability of data center network automation.
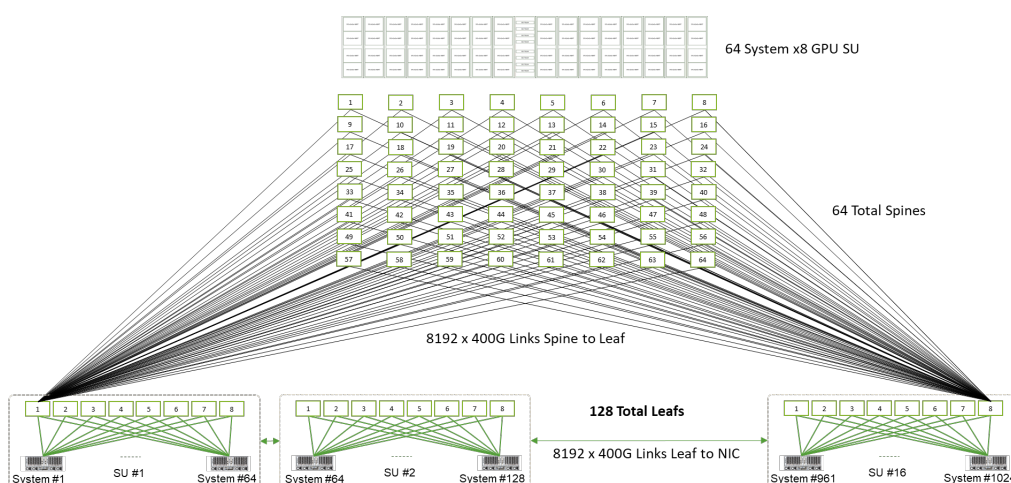

Figure 2: Network diagram for 1024 GPU systems (8192 GPUs)

EDA is an infrastructure automation platform that delivers reliable, simplified, and adaptable management to all phases of the data center fabric life cycle, including design, deployment, and ongoing operations. The platform abstracts the complexity of multivendor networks to facilitate their provisioning and monitoring in real time while making sure they always operate as expected:

- CI/CD methodology embodying DevOps principles applied to the network to ensure reliable operations

- Intent-based, declarative automation simplifies the entire operational life cycle from Day 0 design to Day 1 deployment and Day 2+ operations

- Event-driven, cloud-native microservice design built on a Kubernetes foundation that adapts to any data center environment
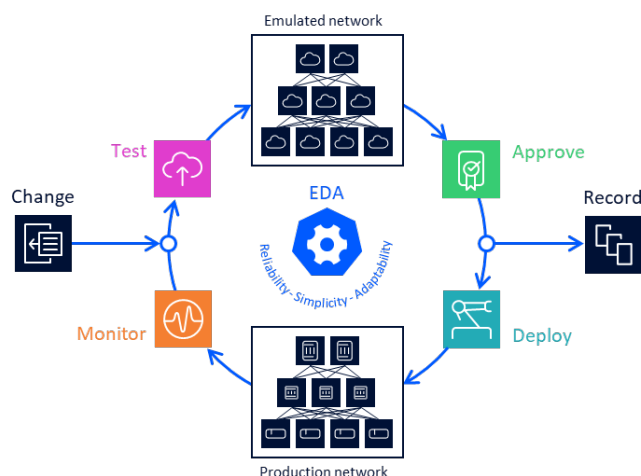
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Figure 3: EDA framework

Switching Platform

The Supermicro SSE-T8164 is a high-throughput, low-latency Ethernet switch featuring 64 800G OSFP ports and 2 25G SFP28 ports packed into a compact 2U form factor. With 51.2 Tbps of switching capacity, it delivers the highest density of 800G Ethernet ports, making it ideal for building large, flat scale-out network fabrics. Designed specifically for the demanding needs of AI data center networks, the SSE-T8164 leverages cutting-edge switch silicon and advanced software features to accelerate job completion times in large-scale AI training environments. It supports full interoperability with the latest AI accelerators and industry-standard fiber optic and copper cabling, making it a strong fit for a wide range of AI cluster designs.

The switch also supports Direct Attached Copper (DAC) cables up to 4 meters, enabling the construction of dense, low-power, cost-effective AI training clusters. Its 800G ports offer flexibility, supporting 400G, 200G, and 100G configurations via breakout cables. With port speeds ranging from 25G to 800G and robust software capabilities, the SSE-T8164 can serve in any network role — as a leaf, spine, or border leaf — within a multi-tier CLOS fabric. The SSE-T8164 is a versatile solution for building networks of all sizes, from smaller enterprise deployments to large-scale AI/ML training clusters and hyperscale cloud infrastructures.
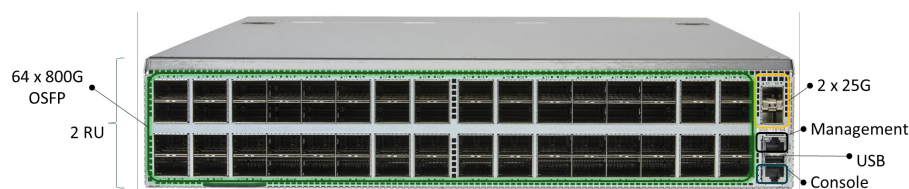

Figure 4: SSE-T8164 front view

Hardware Specifications

Model SKU	SSE-T8164S / SR
Form Factor	2U rackmount switch
Processor	Intel Xeon-D x86 CPU, 8C at 2.3GHz
Memory	32GB DDR4 RAM
I/O Interface	1x USB 2.0 Type A
Networking	64x 800G OSFP ports 2x 25G SFP+ ports 1x RJ45 OOB Management Port 1x RJ45 Console port
Cooling	Front-to-Back (S) and Back-to-Front (SR) cooling options are available 3+1 hot-swappable fan modules
Power Supply	Redundant 3200W AC power
Environmental	Operating Temperature: 0°C ~ 40°C (32°F ~ 104°F) Non-operating Temperature: -40°C to 70°C (-40°F to 158°F) RoHS, REACH and WEEE compliant

Conclusion

The integrated networking solution of Supermicro's switching platform with Nokia's SR Linux and EDA software enables service providers, telecom operators, and enterprise organizations to build a scalable, high-performance, AI-ready networking infrastructure.

For more information, visit www.supermicro.com

For more switch information, visit https://www.supermicro.com/en/products/accessories/Networking/SSE-T8164S.php

SUPERMICRO

As a global leader in high performance, high efficiency server technology and innovation, we develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, HPC, and embedded markets. Our Building Block Solutions® approach allows us to provide a broad range of SKUs, and enables us to build and deliver application-optimized solutions based upon your requirements.

NOKIA

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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