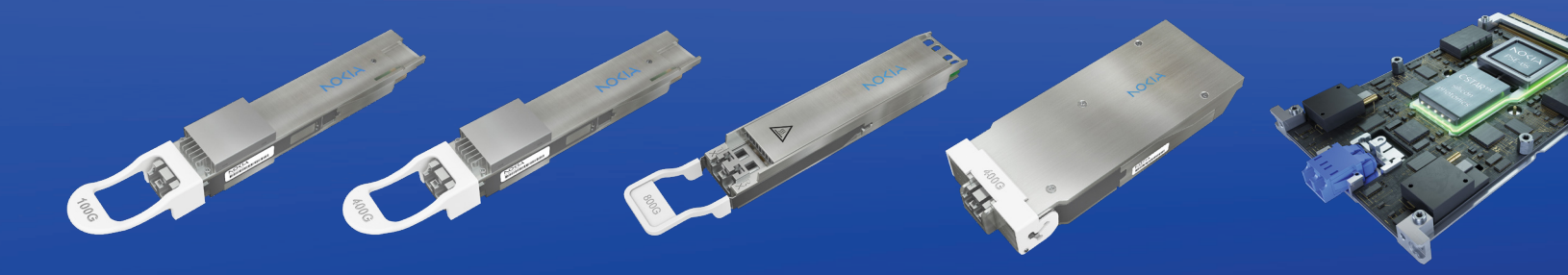


# Optical Networking Portfolio

Photonic Service Engine (PSE) and Infinite Capacity Engine (ICE) coherent optics



- Photonic Service Engine and Infinite Capacity Engine Coherent DCO transceivers
- Tightly integrated multi-chip module with DSP and vertically integrated optics
- Embedded solutions deliver up to 1.2Tb/s capacity and extended reach for metro DCI, long-haul, and subsea applications
- InP and SiPh compact coherent pluggables solutions from 100G to 800G for campus, DCI, metro & regional applications

## 1830 Global Express (GX) compact modular transport

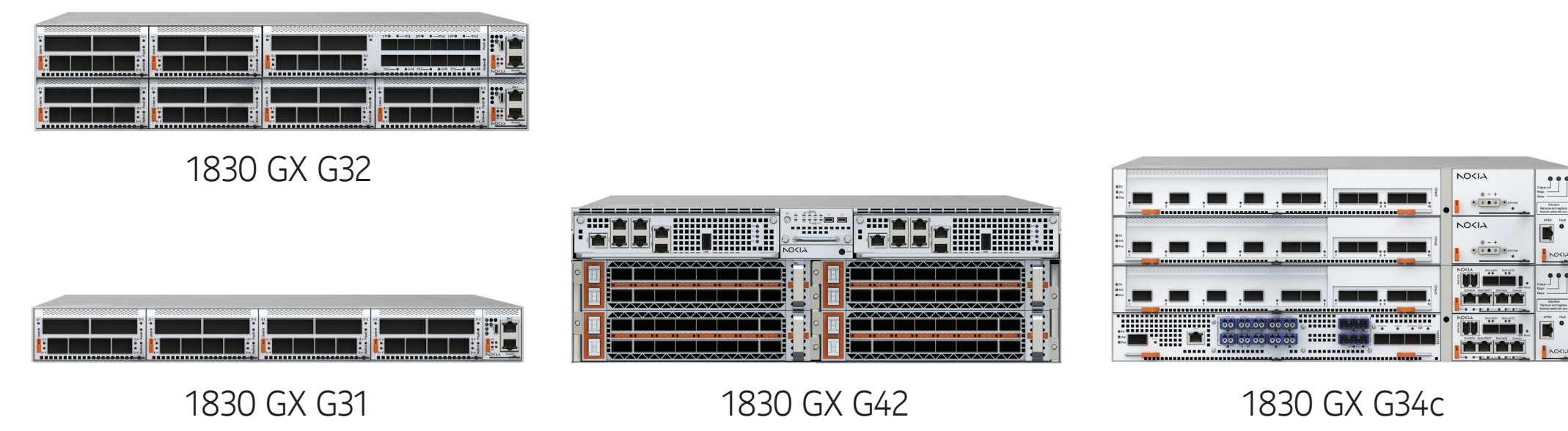
Flexible, scalable, modular platform supporting multi-haul open optical line systems (OLS), embedded & pluggables transponder, and aggregation capabilities on a single compact platform with 300mm and 600mm options

### Transponder functionality

- From 100G to 1.2T per wavelength
- Up to 9.6T line capacity per shelf
- Super C and Super L options
- Lowest power per bit transport
- Open APIs and streaming telemetry
- Embedded and pluggables

### OLS functionality

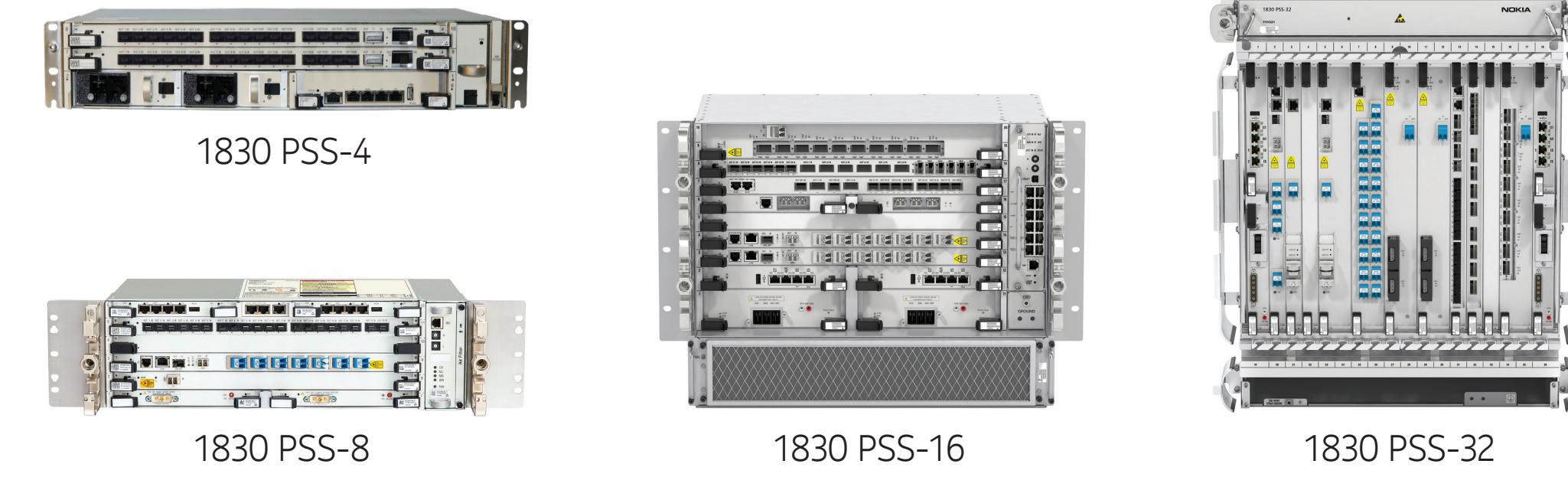
- From FOADM to ROADM
- Metro, core, long-haul, and subsea
- C+L and Super C/L band options
- Up to 11.6 THz of fiber spectrum
- Layer 0 restoration
- Open APIs and streaming telemetry



## 1830 Photonic Service Switch (PSS)

Scalable solutions for DCI, metro, regional & long-haul networks

- Integrated P-OTN transport and WDM
- PSE-based super-coherent and compact WDM coherent optics
- Full-featured WDM line system with ROADM and C+L options
- Single card C-F and CDC-F iROADM options covering 2 to 32-degrees
- Options for C-band, modular C+L and integrated C+L iROADM
- Full range of sub-1G to 400G client ports with high density
- Multi-layer, multi-service scale and efficiency
- Highly reliable telco design with 2RU/3RU/8RU/14RU chassis options



## 1830 Photonic Service Switch (PSS-x)

P-OTN switching for business & wholesale services

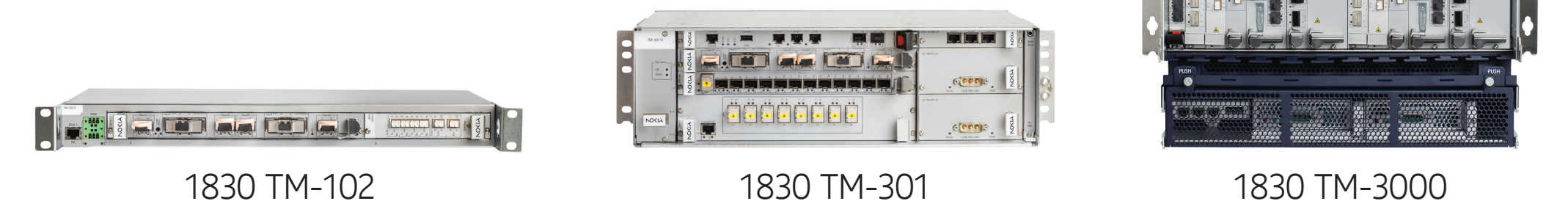
- Centralized P-OTN switching with ODUk granularity up to 4/12/48 Tb/s per chassis
- Integrated PSE-based super-coherent and compact WDM coherent optics
- High-density sub-1G to 100G client ports
- Multi-layer and multi-service scale, efficiency and protection/restoration
- Reliable, compact 10RU/21RU/21RU chassis options



## 1830 Express Transport Metro (XTM) series metro transport

Application optimized packet optical connectivity

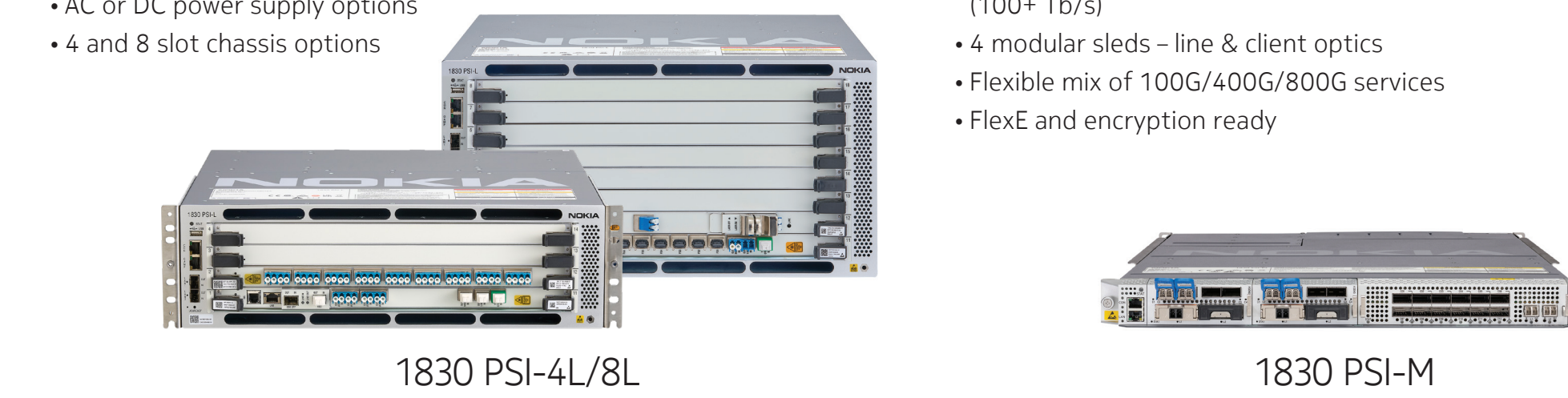
- Industry-leading key metro capabilities
- From customer premises to 400G+ core
- Enables revolutionary point-to-multipoint optical architectures
- Superior low-latency and synchronization capabilities
- Cost-optimized for diverse applications



## 1830 Photonic Service Interconnect (PSI)

Compact, modular photonic line system

- Supports full range of 1830 PSS line system hardware including iROADM, amplifiers, C-F, CDC-F and C+L features
- Front to back airflow design
- AC or DC power supply options
- 4 and 8 slot chassis options



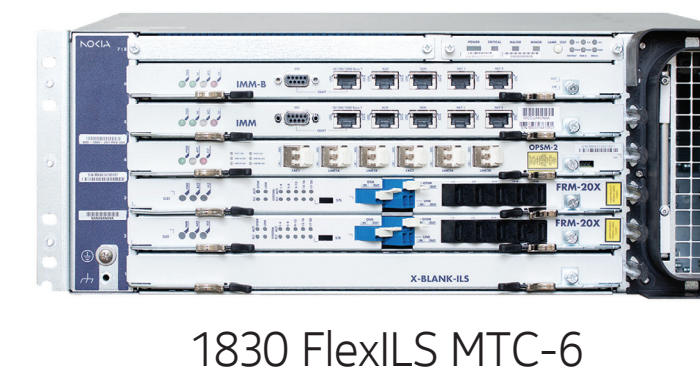
Flexible, high-capacity transport

- PSE-based super-coherent and compact WDM coherent optics
- Reliable, compact 1RU design for data center environment
- Up to 2.4 Tbps per RU and up to 44 chassis per rack (100+ Tb/s)
- 4 modular sleds – line & client optics
- Flexible mix of 100G/400G/800G services
- FlexE and encryption ready

## 1830 Flexible Intelligent Line System (FlexILS)

High-performance flexible-grid open optical line system

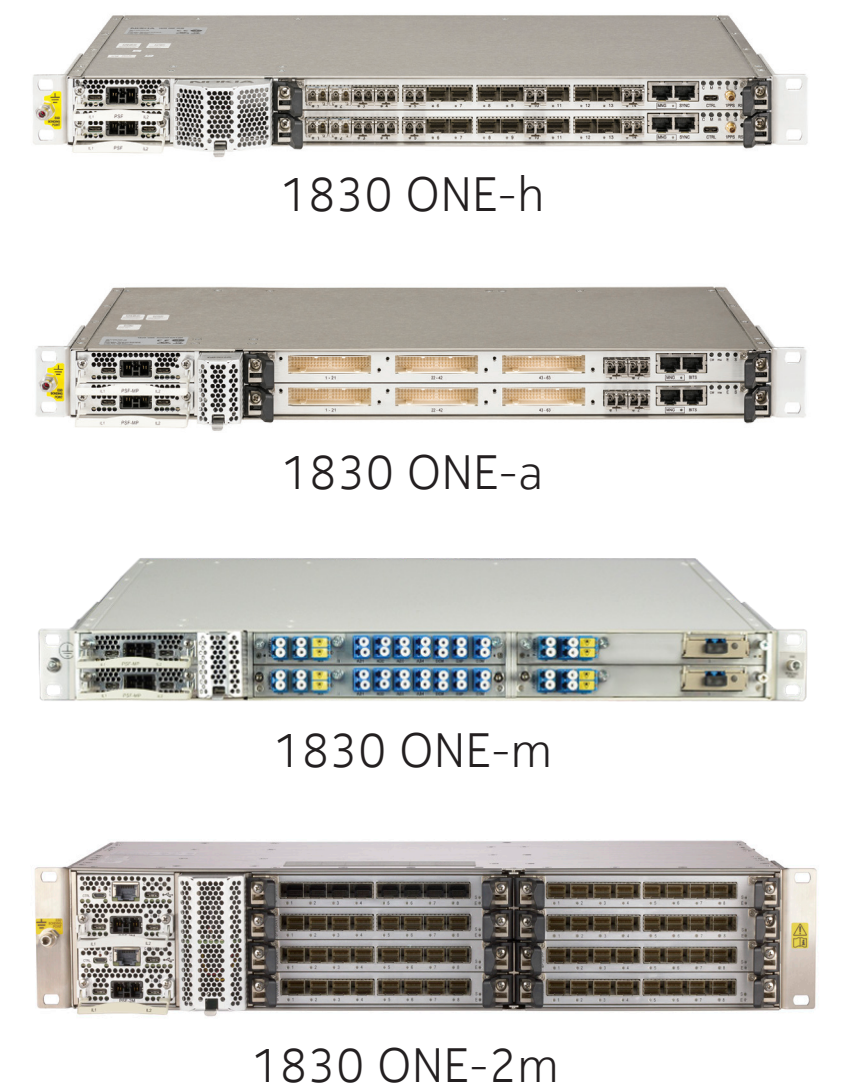
- Seamless support for virtually any transponder
- C+L band support with hitless upgrade
- GMPLS-based optical restoration
- Subsea optimized Intelligent Power Management (IPM)
- Highly automated with Nokia ADAPT software
- Support for spectrum-switched optical network (SSON)
- Open APIs and streaming telemetry



## 1830 Optical Network Extender (ONE)

Multi-service P-OTN, transport and ROADM optimized for metro and access

- Integrated packet-OTN transport
- OTN aggregation and switching
- DWDM muxing
- Wavelength routing
- Multiservice, pay-as-you-grow design
- Up to 200G access rates and up to 400G switch capacity
- Complements 1830 PSS portfolio



## 1830 Photonic Service Demarcation (PSD)

Carrier Ethernet and wave services

- Carrier-class 10G demarcation device
- Compact and low power suited for customer premise sites
- Rapidly deployable with automated installation
- Optional link protection
- Dual AC or DC power supply options



## 1830 Time-sensitive Packet Switch (TPS)

Time-sensitive packet transport

- TSN fronthaul (802.1CM) compliant
- Ultra-low latency TSN switching
- Converged multi-service transport (CPRI, RoE, eCPRI and Ethernet)
- High-precision synchronization distribution



## 1830 Link Extender (LX)

- Extended reach amplification & ROPA enabling unrepeated subsea or terrestrial spans up to 400km
- Tight integration with 1830 PSS family (common management)
- High power booster amps, Raman amps, ROPA (remotely optically pumped amplifiers)



## 1830 Security Management Server (SMS)

Quantum-safe optical transport

- Secure, scalable, centralized key management
- Synchronized key rotation and distribution
- Strong hardware-generated keys
- Independent certifications: CCEA, FIPS, ANSSI, NIST



## Network automation software



Grow revenue and reduce TCO by using automation to harness the intelligence, responsiveness, programmability, and scalability of optical networks to enable new business models and support network and service lifecycles



**WaveSuite Network Operations Center**  
• Enhances the Nokia optical network management software with more openness and functionality



**WaveSuite Resource Controller**  
• Performs multi-domain & multi-vendor SDN controller functions, & computes paths across optical domains



**WaveSuite Synchronizer**  
• Provides intuitive tools that let you take control of your entire network synchronization infrastructure



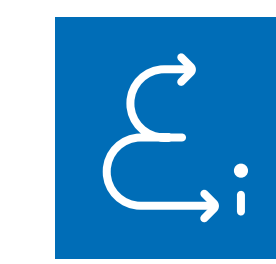
**WaveSuite Service Enablement**  
• Helps virtualize and monetize the optical network using innovative services and B2B2X business models to reach more customers



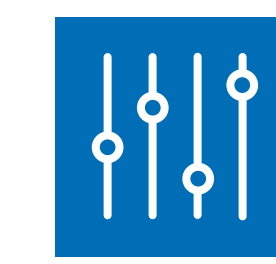
**Transcend Network Management System**  
• Supports network management functions



**Transcend Controller**  
• Performs multi-domain & multi-vendor SDN controller functions



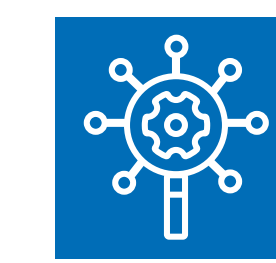
**WaveSuite Advanced Diagnostics**  
• Delivers a powerful troubleshooting automation engine enhancing the diagnostic tools provided by WS-NOC



**WaveSuite Optimizer**  
• Uses automation to extract more capacity and value from the optical network



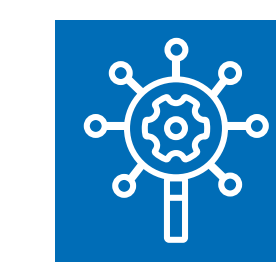
**WaveSuite Planner**  
• Simplifies network designing and planning with tools that can analyze the optical network for maximum efficiency



**WaveSuite Health and Analytics**  
• Provides real-time network intelligence helping to make smarter business, operational and infrastructure decisions

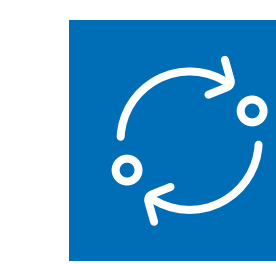


**Transcend Network Planning System**  
• Simplifies network design and service planning



**Transcend Network Insight**  
• Provides real-time bandwidth metering and licensing

## Network Services Platform (NSP)



- Delivers a programmable, network automation framework for large scale IP/MPLS, Ethernet, optical, IP/optical and microwave networks
- Improves network availability with powerful assurance analytics capabilities to troubleshoot the network and fix issues quickly
- Enables network control and traffic optimization in real-time to maintain stringent SLAs

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# NOKIA

The Nokia Optical Networking portfolio enables new frontiers in scale, sustainability, and performance to cost effectively and securely connect users, things and clouds.



Explore the Nokia Optical Networking portfolio

