Adtran and Juniper Networks: Unified Packet Optical Networking for Assured Performance

Transforming packet optical transport networks with efficient and assured IPoDWDM solutions

Discover how our joint packet optical transport solutions harness the full potential of open and disaggregated IPoDWDM architectures, while delivering end-to-end control, visibility and guaranteed performance

Learn more →

The challenge/opportunity

Multivendor IPoDWDM solutions with full control and optical performance

IPoDWDM architectures streamline network infrastructure and provide significant savings. However, they also introduce operational challenges. The loss of end-to-end optical ownership, visibility, and control can complicate optical performance assurance, optical service management, and fault isolation as well as responsibility assignment for troubleshooting and RMAs.

The Adtran and HPE Juniper Networking partnership addresses these challenges while preserving openness and disaggregation. We offer prevalidated IPoDWDM solutions with integrated data and management planes, ensuring end-to-end optical planning, performance guarantee, and coordinated support.

The capabilities you need

Assured interoperability, performance, and control for IPoDWDM

Achieve end-to-end visibility and guaranteed performance with validated platforms' interoperability and control collaboration.

- **IP routing platforms with coherent optical pluggable transceivers**
  Leverage coherent technology in HPE Juniper Networking ACX, MX, and PTX routers for IP aggregation, IP edge, and core
- **Open DWDM line systems (OLS)**
  Deploy future-proof and application-optimized router interconnects, metro, and core networks with Adtran FSP 3000 OLS innovation
- **Coherent pluggable transceivers**
  Meet any application needs with a broad range of 100G, 400G, and 800G ZR(+) coherent pluggables
- **End-to-end Layer 1 to Layer 3 control**
  Ensure streamlined operations through the seamless integration of Juniper® Routing Director and Adtran Mosaic Network Controller
- **Interoperability and performance assurance**
  Benefit from functional testing and performance validation of router-hosted pluggable transceivers over optical line systems, including optical performance planning

www.juniper.net **www.adtran.com**

The answer: HPE Juniper Networking and Adtran's packet optical transport solutions

Embrace the power of packet optical solutions with assured performance and operational simplicity

Through comprehensive testing and seamless integration of optical and IP domain control and planning tools, our solutions ensure IPoDWDM networks with guaranteed interoperability, assured optical performance, and outstanding end-to-end visibility and control—all powered by our state-of-the-art IP and optical networking technologies.

HPE Juniper Networking and Adtran jointly validate their IPoDWDM solutions in dedicated lab environments, ensuring proven interoperability across the optical layer, data plane, network management, and software-defined networking (SDN) layers. For example, Juniper has documented interoperability in the Juniper Validated Design "Data Center Interconnect over IPoDWDM" (JVD-OPTICS-BASE-01-01).

Moreover, Adtran's FSP Planner software includes detailed models for the coherent pluggables used in the solutions, enabling precise optical performance predictions and effective network planning.

Simplified management and control: Optical point-to-point networks can be managed directly and integrated into existing router automation frameworks. ROADM-based optical networks benefit from centralized control at the optical layer, facilitating effective optical bypass management. The optical controller provides end-to-end optical path visibility from the pluggables hosted in the router over the optical line system to the pluggable on the other side. Alarms are correlated to the IPoDWDM service that simplifies troubleshooting and fault isolation.

How it works

Efficient and streamlined packet optical networks

Our IPoDWDM solutions help operators create cost-effective, low-complexity packet optical transport networks, simplifying operations and troubleshooting while maintaining an open and disaggregated network architecture.

Packet optical core networks for service providers

Simplified optical connectivity between core IP nodes

Packet optical aggregation for optical and wireless access networks

Efficient optical transport across access, aggregation, and edge nodes

DCI for AI and cloud interconnect

Connect new data centers extending over larger distances

Packet optical enterprise interconnects

Effortless scaling beyond 100G between enterprise locations

Core features/capabilities

Lower CapEx, power, and space	**Pluggable transceivers in routers replace transponders** Coherent pluggables in routers save power consumption, footprint, and cost, no transponder cards and shelves are needed.
Lower maintenance cost	**Simplified network architecture through transponder elimination** Eliminating transponder platforms reduces operational complexity and lowers both maintenance and life cycle expenses.
Data plane integration	**Direct transport of router wavelengths over DWDM OLS** Coherent pluggable transceivers in Juniper routers are connected to the Adtran FSP 3000 OLS.
Optical planning simplicity and performance guarantee	**Plan IPoDWDM wavelengths just like traditional transponder wavelengths** Juniper coherent transceivers are integrated into the FSP 3000 planning tool, providing tested and guaranteed performance.
Management and control integration	**Comprehensive end-to-end management and control** Get management and control blueprints for simple and more complex optical architectures connecting IP routers.
End-to-end visibility	**IPoDWDM wavelengths monitoring simplifies troubleshooting and fault isolation** The MNC optical controller monitors IPoDWDM wavelengths from one router-hosted transceiver to another across the OLS.

Solution capabilities

Juniper delivers an AI-native routing portfolio designed to provide unparalleled uptime, agility, and power efficiency at enterprise scale. Built for the AI era, Juniper's routing solutions simplify WAN connectivity across data center, campus, branch, and multicloud environments. With automation and AIOps at the core, these solutions ensure high-speed, dependable connectivity while reducing operational complexity and improving sustainability outcomes.

Juniper's WAN solution combines the PTX Series, MX Series, and ACX Series routers with advanced automation and AI-driven operations to deliver a modern, experience-first network. These platforms address diverse use cases such as private WAN backbones, cloud interconnect, data center edge, and metro aggregation, enabling enterprises to scale seamlessly and future-proof their networks.

PTX Series Routers

High-performance core routing for WAN and data center

Deliver ultrahigh power efficiency, scale, and performance for 100G, 400G, and 800G architectures. Optimized for WAN core and data center use cases, PTX platforms provide a forward-looking architecture built for longevity and sustainability.

MX Series Universal Routing Platforms

Versatile, SDN-enabled routing for WAN edge and aggregation

Offer industry-leading system capacity, density, and security. With SDN capabilities and a robust feature set, they support a wide range of enterprise WAN use cases, including hybrid cloud connectivity and secure edge services.

ACX Series Routers

Metro access and aggregation with cloud-ready design

Deliver high-performance, energy-efficient connectivity for metro, aggregation, and edge deployments. With MEF 3.0 compliance, 5G timing support, and adaptive power innovations, ACX platforms enable sustainable and scalable WAN architectures.

Juniper Routing Assurance

AI-driven WAN operations and life cycle management

Juniper® Routing Assurance leverages AIOps to provide proactive insights, automated root cause analysis, and natural language troubleshooting. This reduces mean time to repair and simplifies operations from Day 0 to Day 2+.

Juniper Routing Director

Intent-based automation for WAN orchestration

Routing Director accelerates device onboarding, scenario planning, and network validation. It ensures service quality and compliance through continuous verification and automation.

Marvis® AI Assistant

Conversational AI for WAN troubleshooting and optimization

Marvis AI Assistant brings AI-native operations to the WAN. It lets IT teams resolve issues quickly using natural language queries and proactive recommendations for a self-driving network experience.

The solution builds upon two key Adtran technologies: the FSP 3000 open line system (OLS) and the Mosaic Network Controller (MNC) management and control.

Based on the application demands, users can choose between two optical network architectures:

1) Point-to-point router interconnects using an application-optimized FSP 3000 OLS configuration (FSP 3000 IP OLS) and direct control from the router environment via open APIs
2) Meshed router interconnects with optical bypass at intermediate nodes using an FSP 3000 OLS configuration (FSP 3000 Core OLS), leveraging flexgrid ROADMs and MNC optical layer control

Adtran FSP 3000
Modular, scalable, and open optical transport platform

Delivers application-optimized open line system (OLS) configurations, optical terminals, and coherent pluggable optics for flexible metro and core deployments, ensuring multi-vendor interoperability and future-proof scalability.

Adtran FSP 3000 IP OLS
Compact, easy-to-operate design for point-to-point interconnects

Provides IPoDWDM router interconnects without requiring deep optical expertise, enabling fast deployment and simplified operations.

Adtran FSP 3000 Core OLS
Flexgrid ROADM-based for scalable optical bypass

Enables efficient wavelength routing, network scalability, and remote programmability, reducing operational complexity and cost.

Adtran Mosaic Network Controller (MNC)
Comprehensive SDN-based optical control

Offers advanced multi-technology management with open, standardized interfaces for integration with higher-level orchestrators, delivering seamless Layer 1–3 control when paired with Juniper Routing Director.

Adtran FSP Planner
Integrated optical performance modeling

Ensures precise planning and guaranteed performance for coherent pluggables, reducing design risk and accelerating deployment.

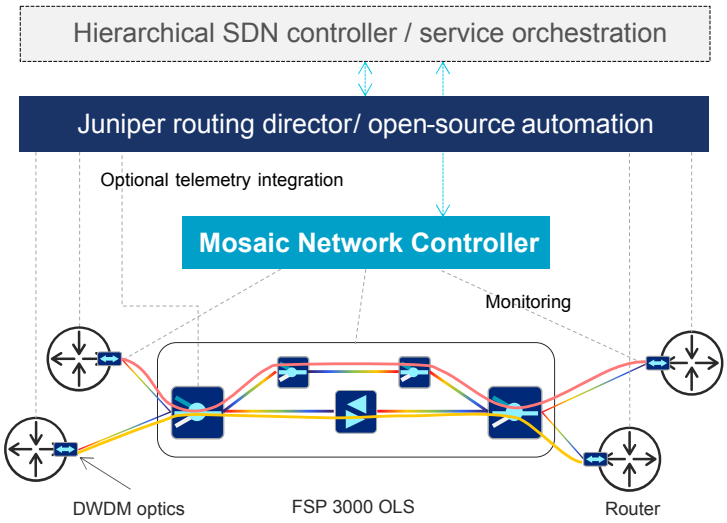

FIGURE 1 HPE Juniper Networking and Adtran Networking packet optical solution

Why Juniper and Adtran?

Our partnership advantage

At Juniper Networks, we are dedicated to dramatically simplifying network operations and believe that connectivity is not the same as experiencing a great connection. Mist™, Juniper's AI-native networking platform, is built from the ground up to leverage AI to deliver exceptional, highly secure, and sustainable user experiences from the edge to the data center and cloud. Additional information can be found at juniper.net or connect with Juniper on X (formerly Twitter), LinkedIn, and Facebook.

Adtran is a leading global provider of open, disaggregated networking and communications solutions that enable voice, data, video, and internet communications across any network infrastructure. From the cloud edge to the subscriber edge, Adtran empowers communications service providers around the world to manage and scale services that connect people, places, and things. Adtran solutions are used by multiple organizations and millions of individual users worldwide. Find more at Adtran, LinkedIn, and X.

Next steps

To learn more about the Juniper and Adtran solution, please contact your Adtran or Juniper representative, or visit www.adtran.com or www.juniper.net.

Take the next step

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See how we help unlock new growth, powered by AI.

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