LightRiver

ALIEN AWARE NETWORKING®

netFLEX®

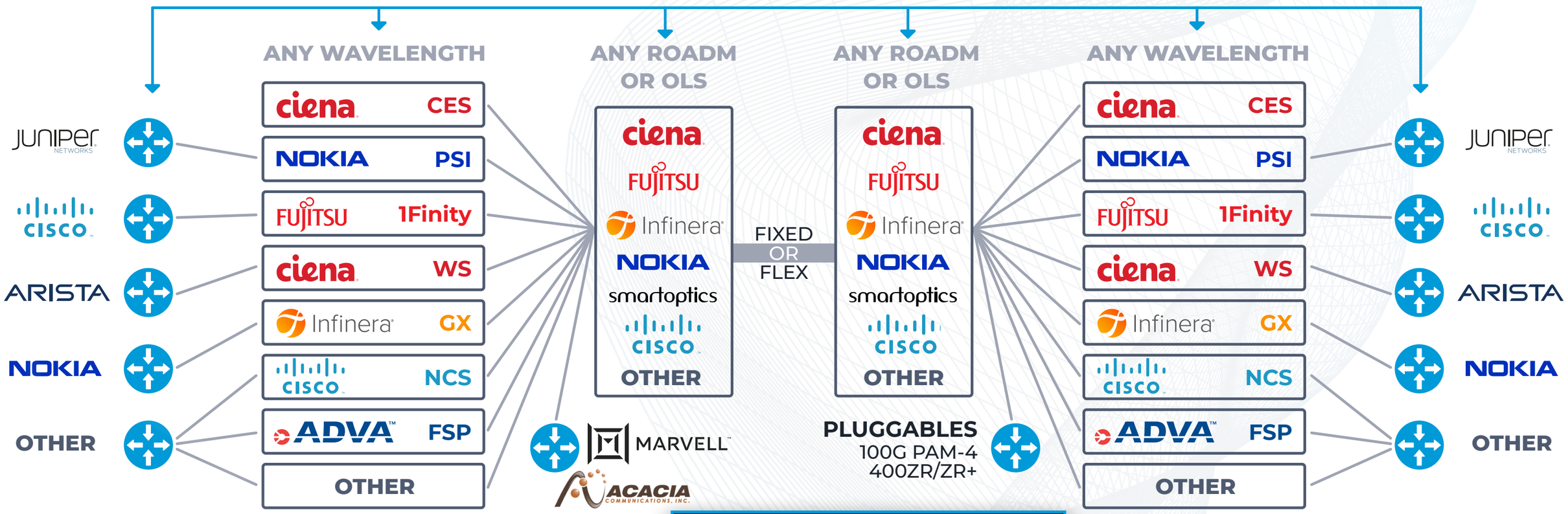
ALIEN AWARE NETWORKING®

ALIEN WAVELENGTH INDUSTRY DEFINITION

In a DWDM system, an 'alien wavelength' is a colored optical signal that originates on networking equipment that is different or 'alien' from the optical line system. Alien waves can originate via transponders from a different manufacturer or from dissimilar technology such as a router with colored optics. Alien waves are transparent to the optical line systems and not under the management or control of the line system's NMS.

LIGHTRIVER'S ALIEN AWARE NETWORKING®

Our solution embraces alien wavelengths allowing them to be readily monitored, analyzed, and managed end-to-end, no matter what suppliers or technologies are leveraged within a single network operator, or across multiple interconnected operator networks. This is possible via Multi-Vendor, Multi-Technology, Open Optical network automation enabled by netFLEX. LightRiver services and software allow network operators to now embrace the benefits of alien waves without the shortcomings that exist currently.

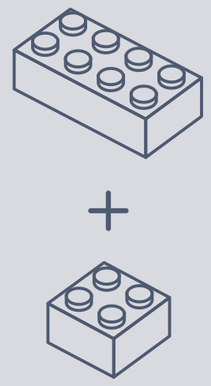


AREA 51
OPTICAL DISAGG LAB

In addition to the automation of disaggregated networks supporting Alien Wavelength Services, LightRiver can also help you design, test, build and deploy your Open Optical network at scale.

PLUG-AND-PLAY

As the transport network is quickly evolving toward Open, Disaggregated, Plug-and-Play architectures, end-to-end network management is more critical than ever. The netFLEX optical domain controller provides support for DWDM Open Line, Open ROADM, NextGen DCI/Waves platforms, and the latest Packet Edge and Pluggables/ 400G-ZR/ZR+, all of which support realtime inventory, programmable analytics, and control automation.
The end objective is comprehensive management of the underlying wavelength services.



EMBRACE THE ALIEN

netFLEX.lightriver.com

ALIEN AWARE NETWORKING®

PRODUCT OFFERING

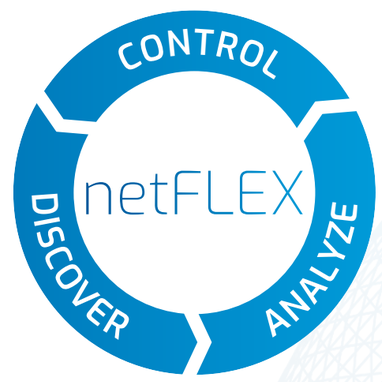
Available individually or bundled

Technology Labs

Design & Test

Factory Built Network (FBN)

Build & Deploy



Optical Domain Control

Automation

LightRiver

ENGINEERING, DESIGN & LAB VALIDATION SERVICES

LightRiver's Open Optical expertise supports comprehensive design and engineering services to include lab test and validation. Based on our diverse supplier relationships for multi-vendor and multi-technology solutions with the leading OEM's and next generation of Open Optical suppliers, LightRiver has industry leading access to expertise and the technologies within our interop-labs.

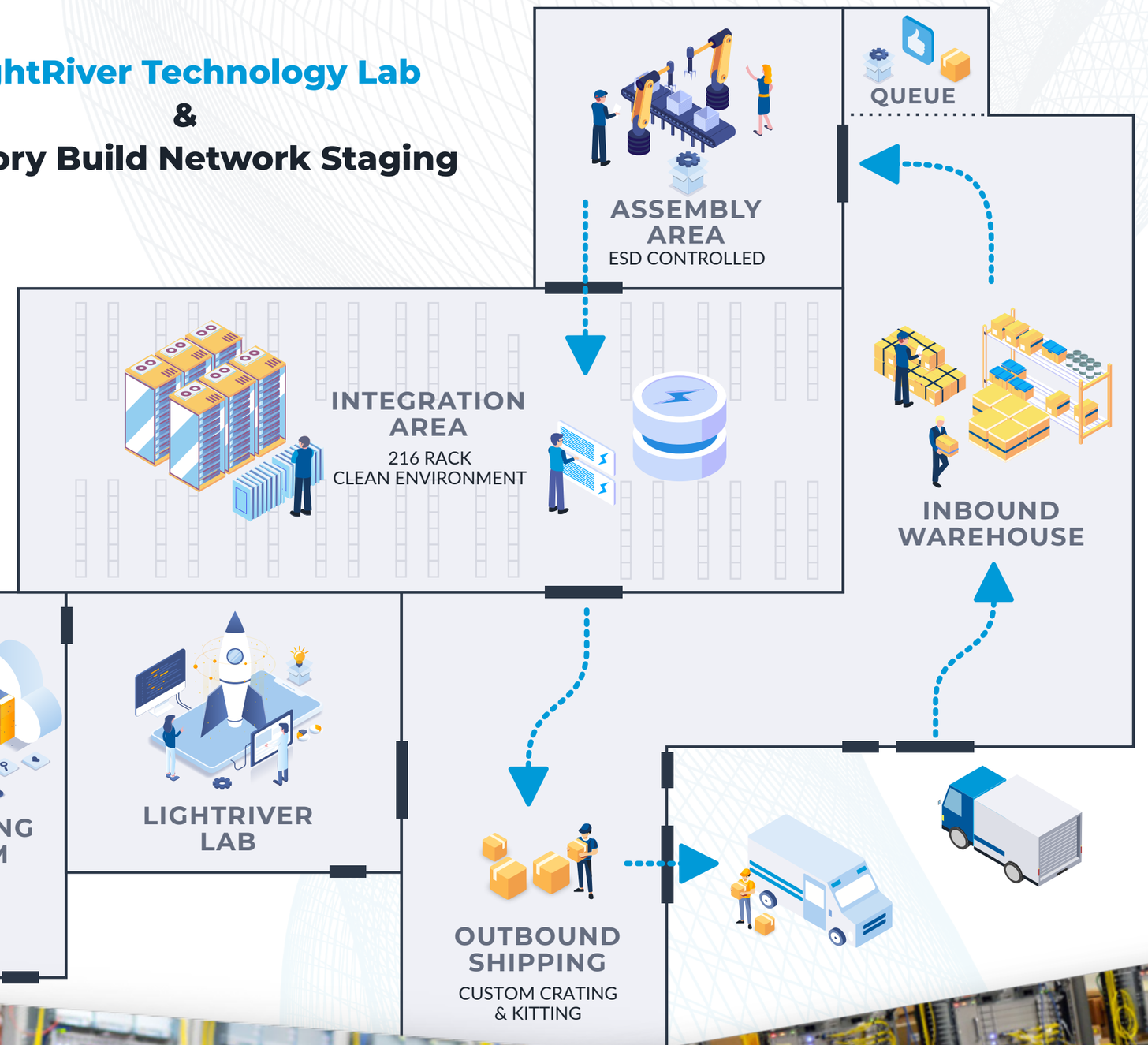
NETWORK ENGINEERING

- Network architecture consulting
- System design & detailed engineering
- Engineering Design Packages (EDPs)
- Methods-of-Procedure (MOPs)

DISAGG-NETWORKING TECHNOLOGY LABS

- Multi-Vendor, Multi-Technology, Proving Ground
- $50M of IP/MPLS, Carrier Ethernet, DWDM, Packet Optical, and broader Open Optical
- Full Multi-Media Remote Access: online meetings/training, VPN access, shared desktops, remote demos

LightRiver Technology Lab
&
Factory Build Network Staging



LightRiver

BUILD & DEPLOY SERVICES

LightRiver's intelligent Factory Built Network® (iFBN®) allows you to pre-build your Open Optical, Alien Aware Network, within our factory-labs to ensure that the network is delivered faster, at less cost, with higher quality.

intelligent FACTORY BUILT NETWORK® (iFBN®)

- Accelerated Time to Market: Project timelines are reduced by 50% allowing for new business sooner.
- Better Network Performance: Rigorous testing leads to higher quality and better performing networks.
- Less Business Disruption: 60% less onsite installation time reduces disruption to on-going business.
- Lower Internal Costs: Internal resource requirements are drastically lowering costs.

TURN-KEY INNOVATION

ARCHITECT, BUILD, INTEGRATE, TEST AND ASSURE YOUR ALIEN AWARE NETWORK

Project Manage End to End

Architect & Design

Architect
- Multilayer

Proof of Concept
- Vendor A
- Vendor B
- Vendor C

Design
- BoMs & Cost

LightRiver Labs

Pre-Deploy

Fiber Testing
- Full FOC

Survey
- Sites

Onsite

Site & Fiber Remediations
- PMed by LR

Engineering
- EDP

Factory Network Build
Receive, Install, & Integrate
- Performed in Factory

Customer Training in Factory
On Pre-staged Network
- Customer Tailored

Intelligent Factory
Testing & Baseline
- netFLEX®

Final Install & Test

Validation
- OTDR

Onsite Install
- Carrier Grade

Circuit Test
- Y.1564

Onsite

Documentation
- As-Built

Intelligent Field Testing
Baseline, Active Intelligence
- netFLEX®

Less Time on Customer Sites + Faster Deployment + More Reliable Networks + Customer Cost Savings = SCALE FAST!

netFLEX®

Simplify, Standardize, Personalize

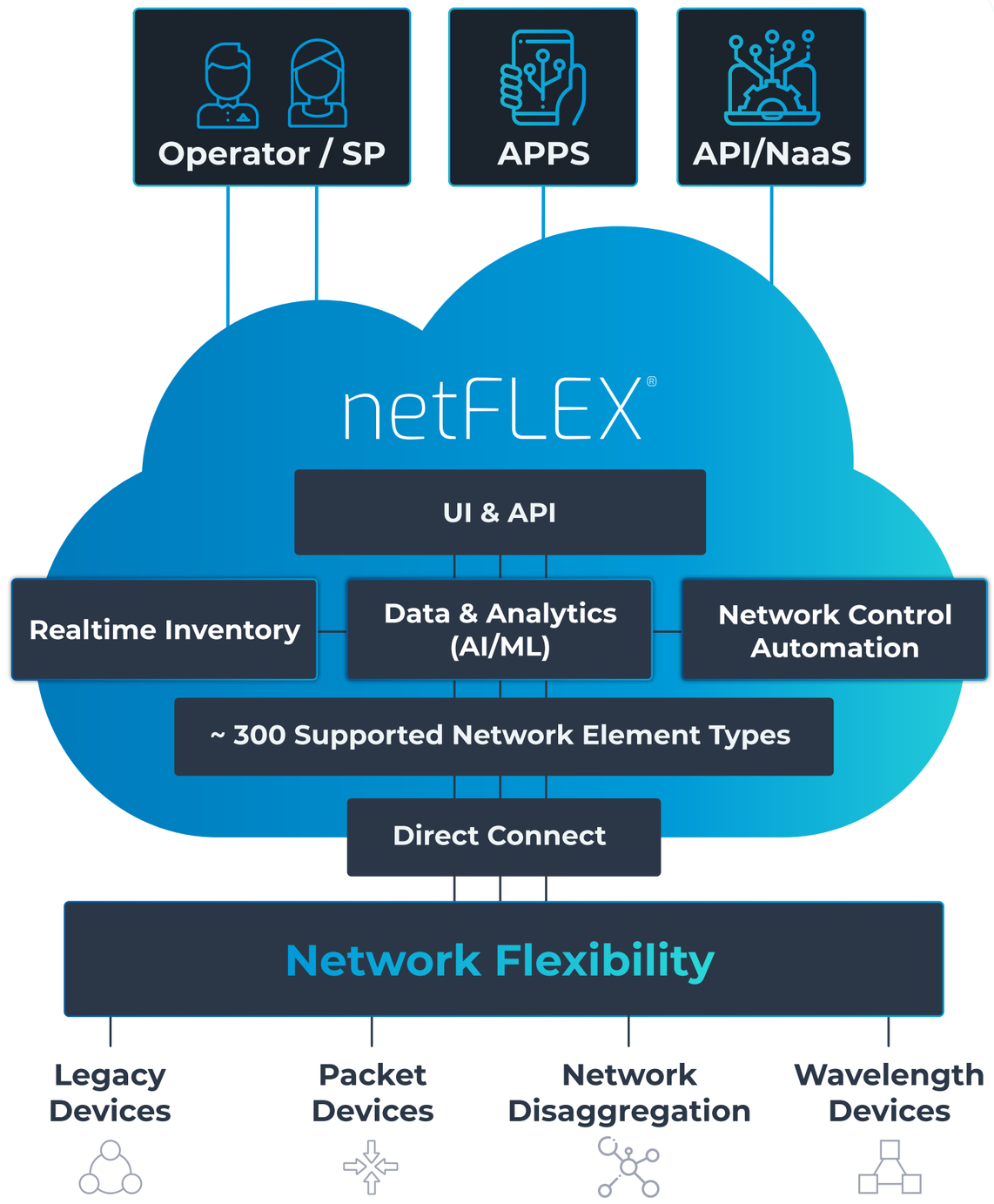
OPEN OPTICAL NETWORK AUTOMATION

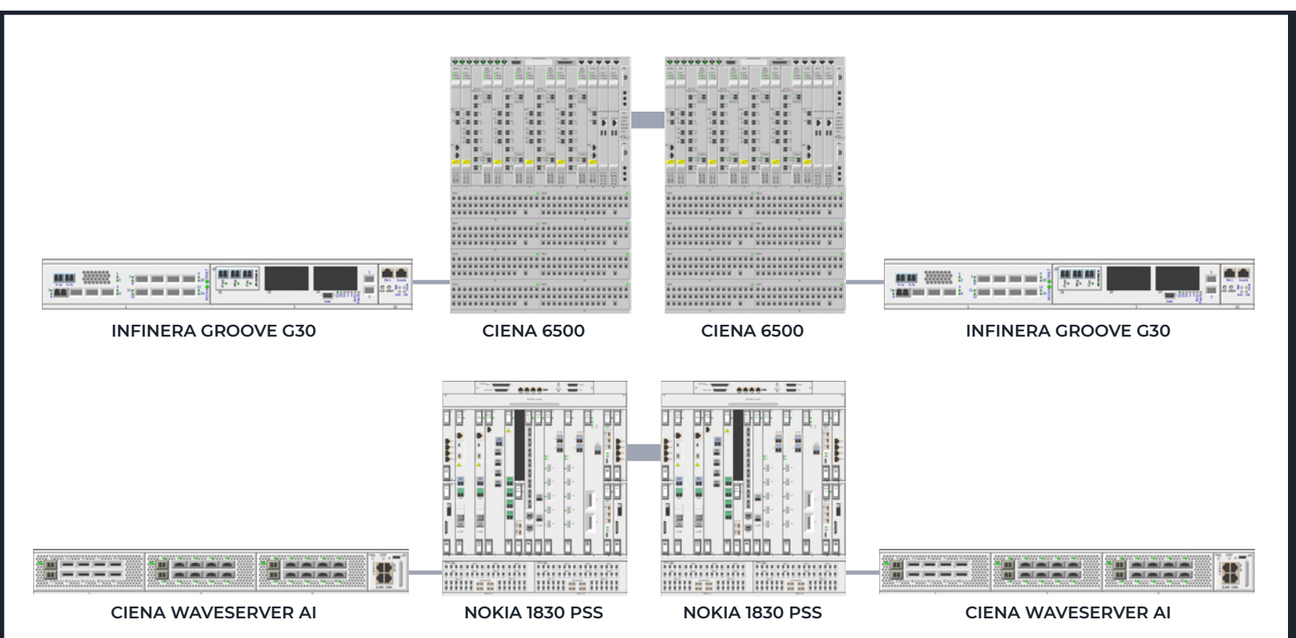
End-2-End automation of disaggregated network solutions, supporting Alien Wavelength Services. netFLEX provides industry leading support of the suppliers and technologies that are becoming the plug-and-play solutions for Open Optical.

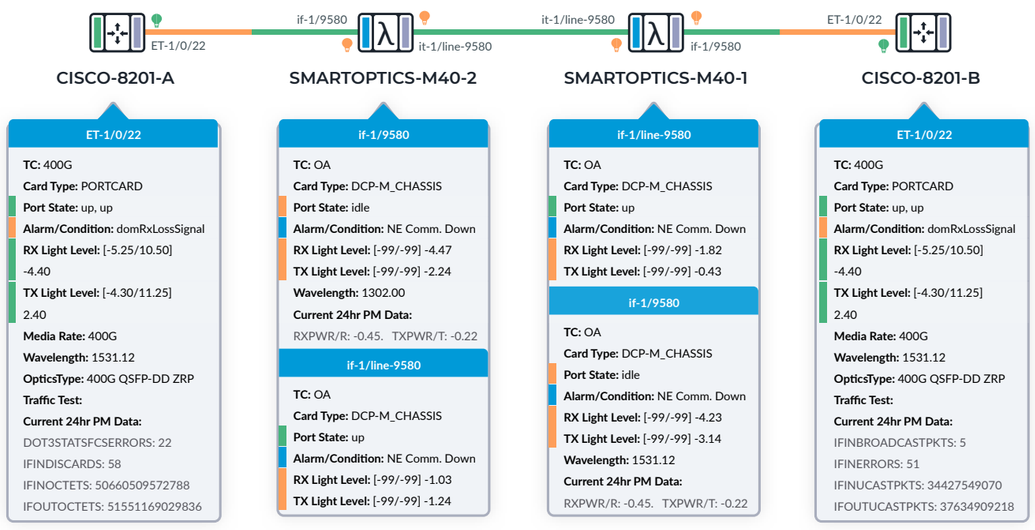
Realize True Network ***Flexibility***

netFLEX was architected for end-to-end network and service automation where realtime (discovered) inventory, actionable analytics, and control automation were built for SDN abstraction to allow for uniform management of multi-vendor and multi-technology to make it 'all look the same.' This comprehensive Optical Domain Controller Framework supports full life-cycle service automation of legacy and nextgen transport networks. netFLEX supports a full complement of network-health-automation leveraging data/analytics to baseline performance and make it all 'actionable.'

- SDN: end-2-end network abstraction
- Multi-Vendor Solution
- Network FLEXibility across every functional area
- Programmability as defined by operator & customer
- Enablement of UI & API for seamless digital experience







netFLEX®

END-TO-END VISIBILITY AND CONTROL OF OPEN OPTICAL NETWORKS.

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