



# Solutions for Data Center Interconnect (DCI)

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# About PacketLight

- Established in 2000
- Develop state-of-the-art optical transport systems
  - DWDM/CWDM
  - OTN layer
  - Layer-1 encryption (FIPS 140-2 certified, CCEAL2 certified), QKD
- Solutions for data, storage, voice and video transport applications
- Compliant with international standards
- Green products
- Design & manufacturing in Israel
- Member of the RAD group



Certificate 4582

# The RAD Group

Coordinated Strategy | Shared Sales Channels | Joint Development & Technology



5,310  
employees



\$1.8B  
revenue in 2022



More than 100  
startups in 40 years

Your Network's Edge®

The Service Assured  
Solutions Company  
Established: 1981

DWDM and OTN  
Solutions  
Established: 2000

Sub-6GHz Wireless  
Backhaul  
Established: 1997

Network Test  
Solutions  
Established: 1991\*

Integrated Application  
Delivery  
Established: 1997\*

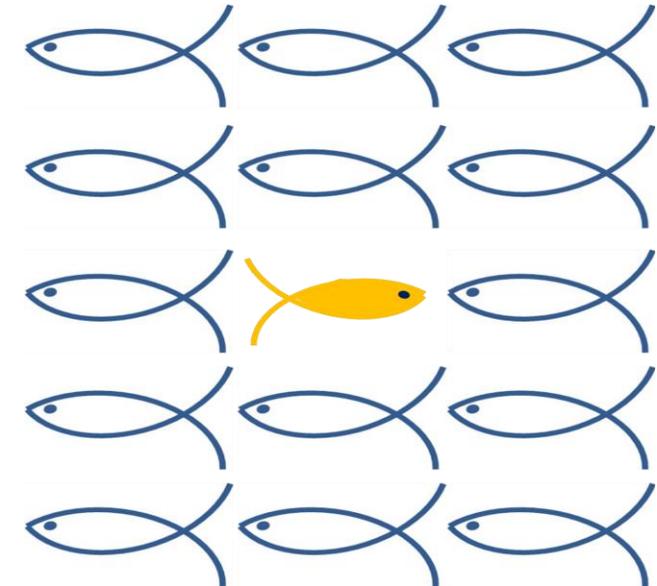
Wireless Mobile  
Backhaul  
Established: 1996\*

Group Distributor in  
Israel and Worldwide  
System Integrator  
Established: 1975

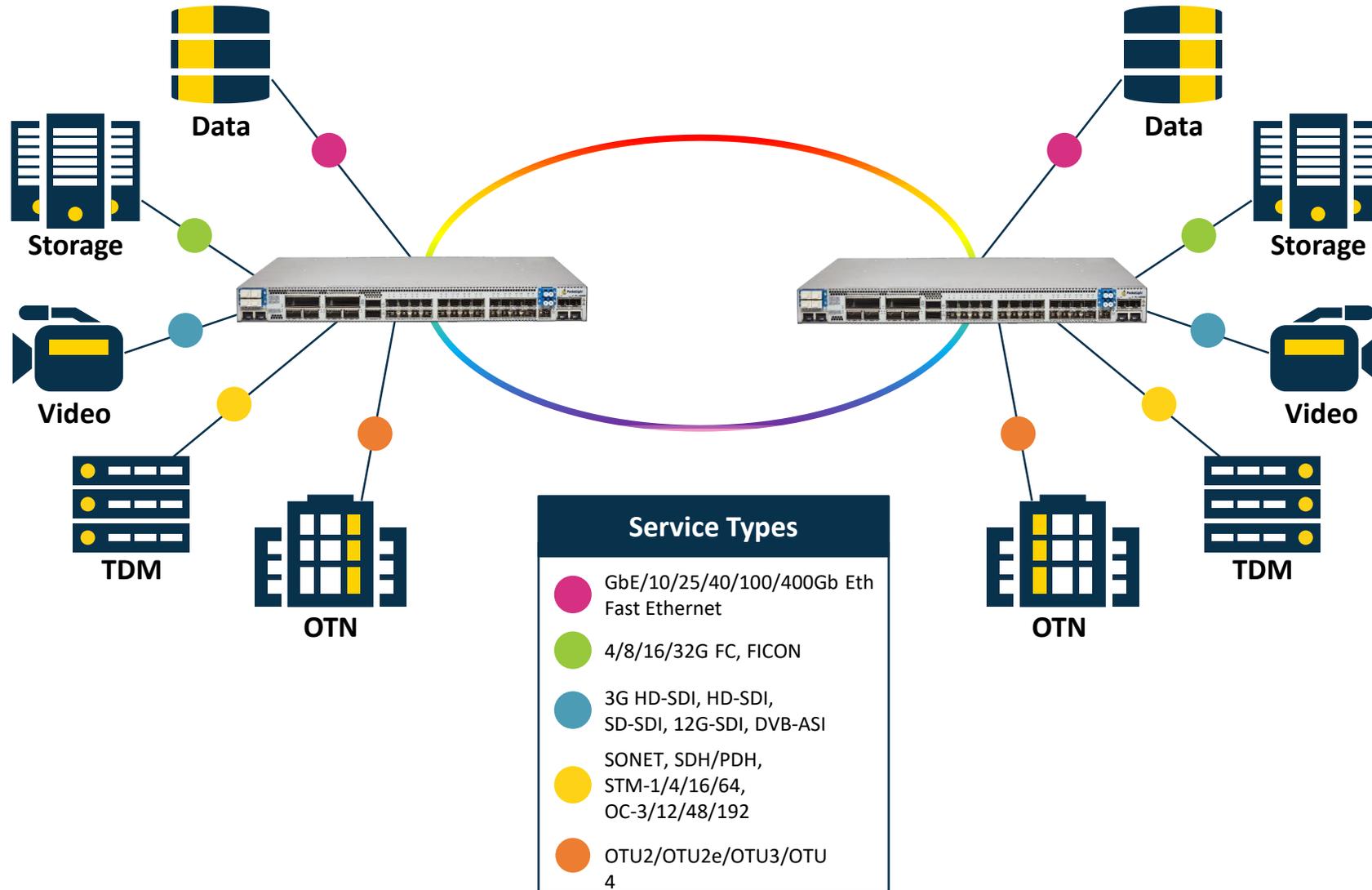
\*Publicly Traded Company

# PacketLight Differentiators

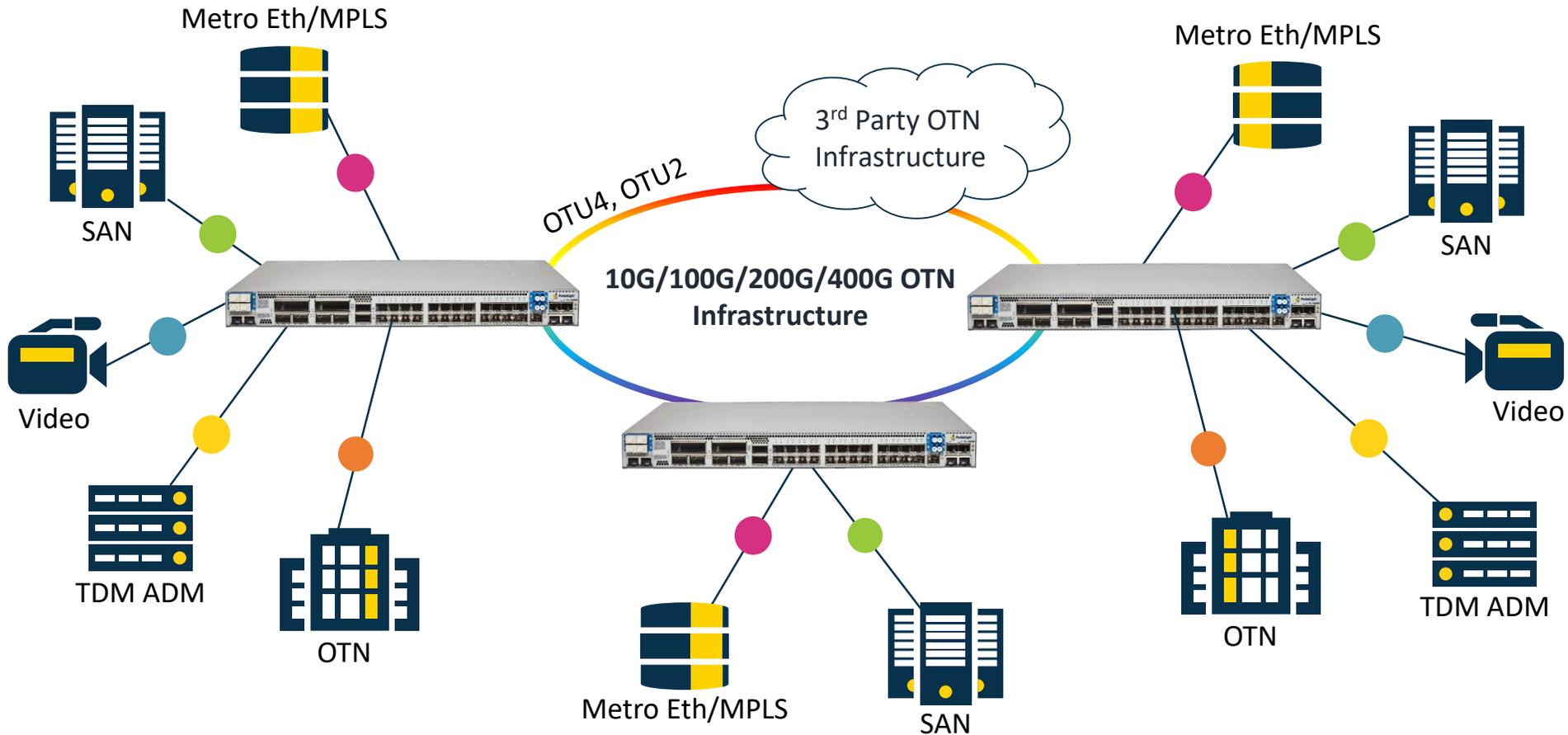
-  Compact, low power 1U solutions
-  Carrier-class feature set
-  Flexible mix of services
-  No port licensing
-  Simple deployment and configuration
-  Cost-effective stackable solution
-  Transports up to 400G per wavelength



# Building Agile DWDM, CWDM Infrastructure



# Building OTN + DWDM Metro/Access Networks



| Service Types |   |
|---------------|---|
|               | GbE/10/25/40/100/400Gb Eth Fast Ethernet      |
|               | 4/8/16/32G FC, FICON                          |
|               | 3G HD-SDI, HD-SDI, SD-SDI, 12G-SDI, DVB-ASI   |
|               | SONET, SDH/PDH, STM-1/4/16/64, OC-3/12/48/192 |
|               | OTU2/OTU2e/OTU3/OTU4                          |

# Product Portfolio

## Transponders

PL-4000T: 4 x 400G Transponder/Muxponder



PL-4000G 4.8T Transponder



PL-2000T: 800G Transponder



PL-1000TN: 6 x 8G/10G OTN Services



PL-1000TE: 8 x 1G-16G services



PL-8000T: 3.2T Transponder/ADM



## Muxponders

PL-4000M: 600G Muxponder



PL-2000GM: 2x100G Long Haul ADM



PL-2000ADS: 200G ADM Short Haul



PL-2000M: 200G Muxponder/Transponder



PL-2000: 20G ADM



PL-8000M: 2x800G Muxponder



## Infrastructure

PL-1000D: Diagnostics



PL-1000RO: WSS ROADM



PL-1000IL: Optical Amplifiers



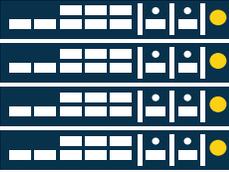
PL-1000R: Raman Amplifier



PL-300: Passive Solutions



# Comprehensive Feature Set



Disaggregated  
Stackable Chassis



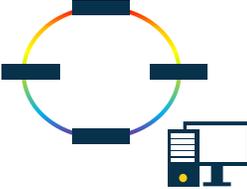
OTN Layer



Up to 96 WL  
Mux/Demux



EDFA,  
Raman



Remote  
Management  
OSC/GCC



Layer-1  
Encryption  
QKD



FlexGrid WL



Network  
Diagnostics



Muxponders  
Family



Optical  
Protection



Single or  
Dual Fiber



MNG Firewall



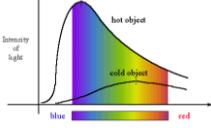
800G per  $\lambda$



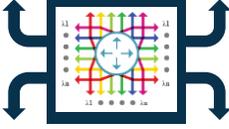
LightWatch NMS  
SNMP MIB  
REST / NETCONF



Performance  
Monitoring



CWDM/DWDM



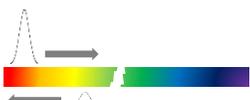
ROADM



Network  
Protocols



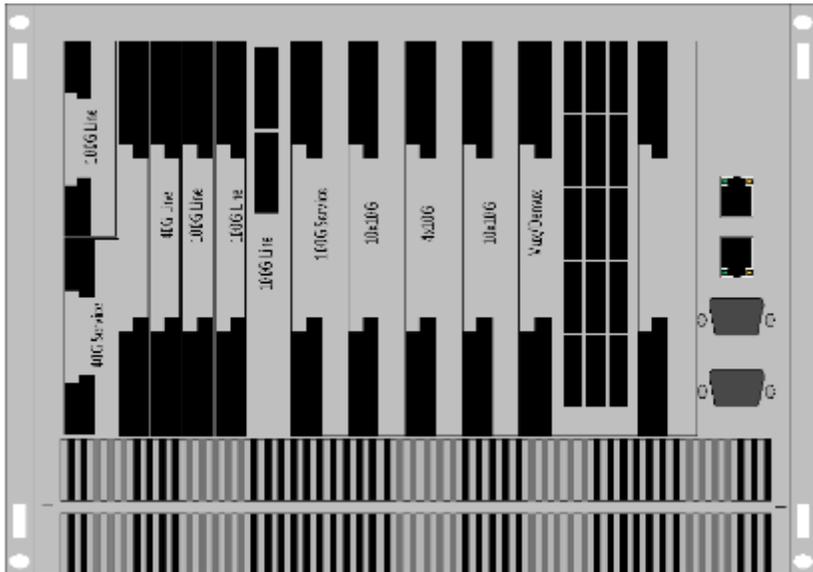
OSA



OTDR  
OSC OTDR

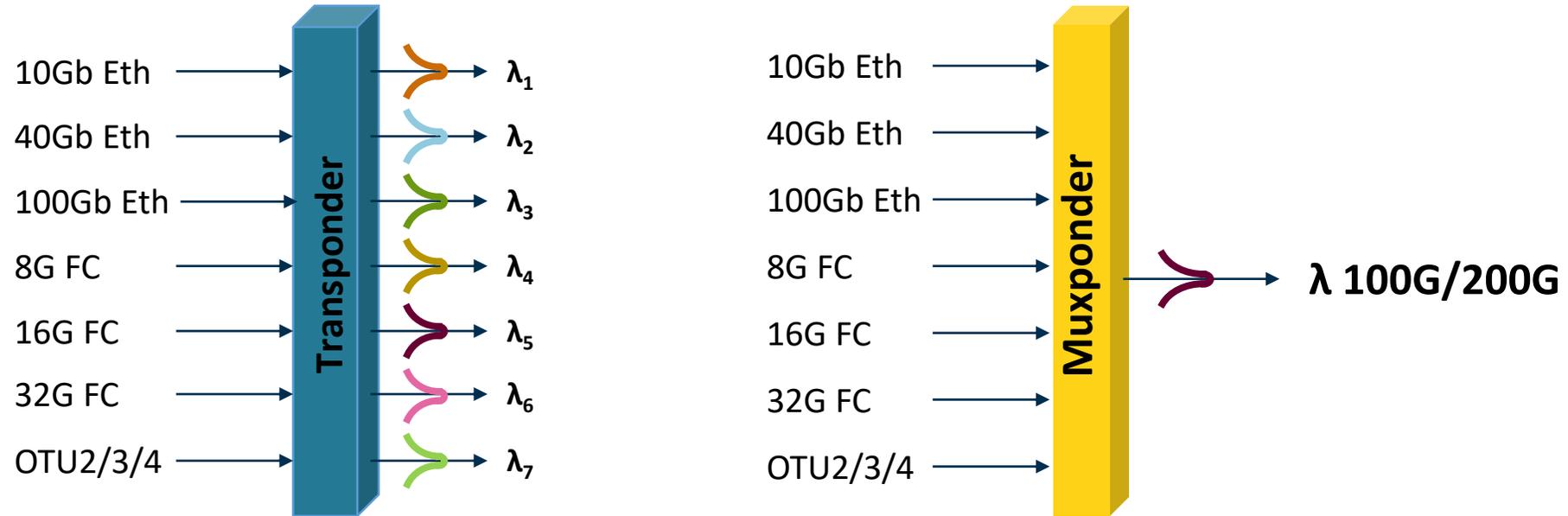
# Chassis vs Stackable

- Consumes space and high energy
  - Cannot adapt to previously existing rates
  - Needs to be replaced to adapt to newer, higher capacity services
- Easily supports existing infrastructure
  - Quickly add higher capacity services
  - Easy to adapt new WDM technologies
  - Unlimited growing path



**Stackable approach provides more flexibility for future growth and faster ROI**

# Spectral Efficiency Of Wavelength 100G/200G



**Muxponders increase fiber capacity by a factor of up to 20**

# Applications for Service Providers

- High capacity, metro/long-haul backbone
- Alien wavelength solutions - relieve bottlenecks
- Extend existing backbone
- Managed services for enterprises
- Offer encryption services
- Last mile aggregation solution
- Layer-1 Encryption services



Carriers



ISPs



Utilities/Rails



Mobile  
Operators



Content  
Providers



Dark Fiber  
Providers

# Applications for Enterprise

- Data center interconnect (DCI)
- Connectivity between office branches
- Layer-1 encryption for data protection
- Mix of services - Ethernet, FC, STM, Video
- Build easy to manage backbones
- Campus / ring connectivity



Data Centers



Defense



Finance



Education



Hospital



Government



Broadcast

# Challenges for Data Centers

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- Build high capacity, low latency network
- Ability to support unique mix of services
- High level data security and compliance with encryption regulations
- Data and storage (FC) synchronous replication
- High network availability with full hardware redundancy
- Low OPEX backbone that is easy to maintain and grow

# Benefits of WDM Solutions for Data Centers

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- High capacity backbone of up to 1.6T services
- Flexible mix of services GbE/10/40/100Gb Ethernet, and 8/16/32G FC
- Layer-1 encryption to ensure secure connectivity for all data
- Ultra-low latency for redundant, transparent data transport
- Low power consumption & low form factor guarantee low OPEX
- Pay-as-you-grow scalable architecture that enables quick and easy growth
- Easy to deploy and operate
- EMS/NMS - for easy configuration, management, and monitoring

# Benefits of PacketLight Encryption Solution

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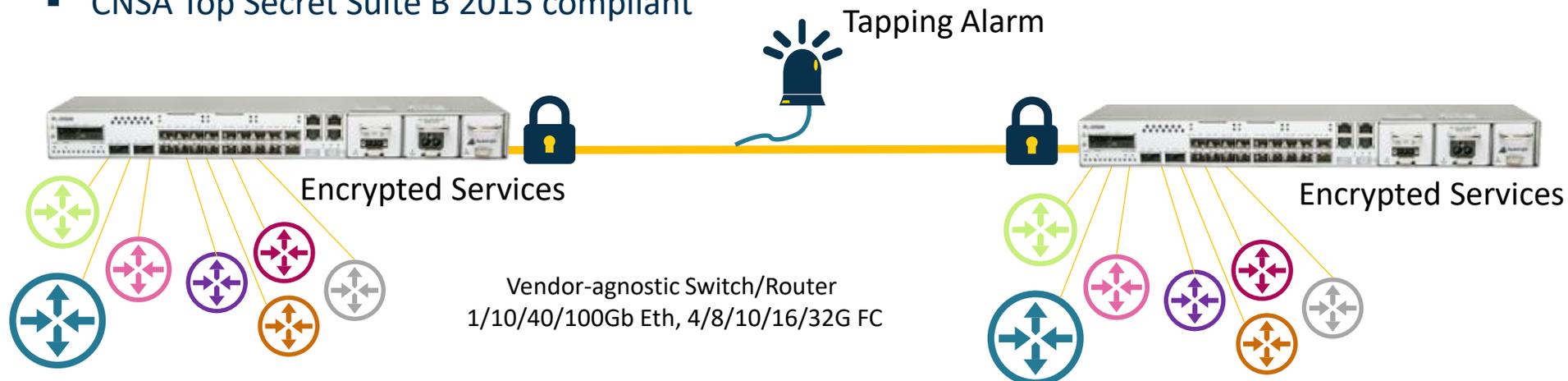
- Encryption ensures:
  - Confidentiality
  - Data integrity
  - Authentication
- Secures all data transmitted over fiber
- Ideal for low latency applications
- Interfaces with existing DWDM infrastructure and Telco OTN networks
- No need to change or upgrade Layer-2/3 switch/routers
- Transparent, maintaining full bandwidth of all traffic

# PacketLight Layer-1 Encryption Solution

- Software-based activated by license
- No additional license cost after initial investment
- No additional hardware or software required
- Configured per uplink or individual service ports
- Easy set up and configuration
- Complete control in the hand of the user
- Automatic fiber tapping detection and alarm
- FIPS 140-2 Level 2 certified
- Common Criteria EAL2 certified
- CNSA Top Secret Suite B 2015 compliant



Certificate #3529



# Layer-1 Fiber Security

## Physical Layer

- Optical power monitoring per service
- Automatic detection of fiber tapping

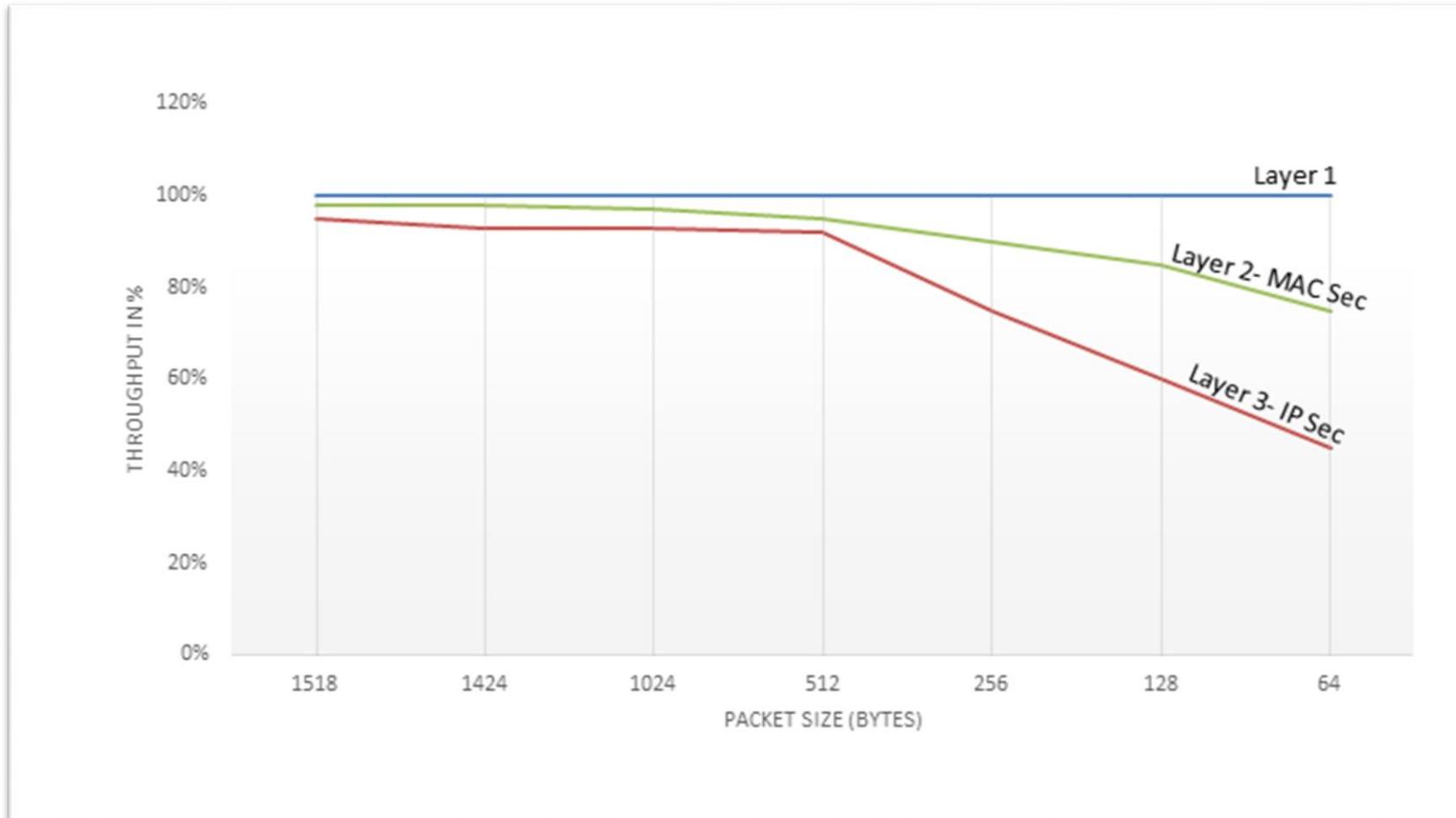
## Data Plane

- Layer-1 transparent full bandwidth encryption
- GCM-AES-256 (advanced encryption standard)
- Diffie-Hellman Key Exchange
- Authentication using SHA-384

## Management Plane

- SNMPv3
- Radius
- Management firewall
- HTTPS
- Secure shell

# Layer-1 Full Throughput Performance

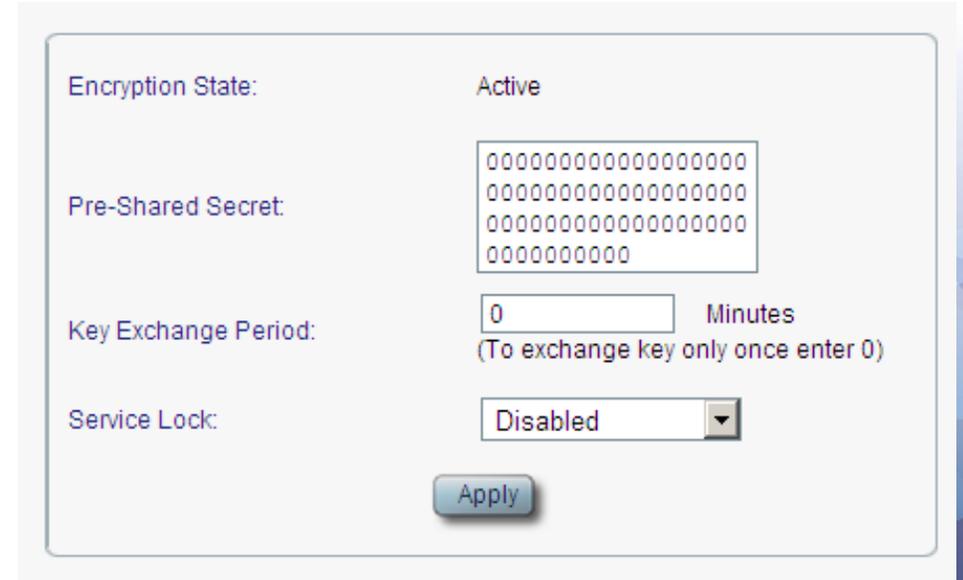


# Encryption Functionality

| Requirement                       | Function                              | Algorithm   | FIPS 140-2             | CNSA |
|-----------------------------------|---------------------------------------|---|------------------------|------|
| <b>Crypto Algorithm</b>           | Encryption algorithm                  | GCM-AES-256   | FIPS 197 and SP800-38D | Yes  |
| <b>Key Management</b>             | Key establishment                     | Elliptic Curve Cryptography Cofactor Diffie-Hellman (ECC CDH)   | SP 800-56A             | Yes  |
| <b>Key Message Authentication</b> | Message digest with pre-shared secret | Secure Hash Algorithm 2 (SHA-384 )  | FIPS 180-4             | Yes  |
| <b>Self Tests</b>                 | Integrity tests                       | On power up check digestion for software encryption modules and run test vectors with known answers (KAT) | Yes                    | N/A  |
| <b>Random Number Generator</b>    | Used for keys generation              | True Random (TRNG) with FDK-100, and Deterministic random bit generator (DRBG)                            | SP800-90               | N/A  |
| <b>Access Control</b>             | Authentication                        | Role based, user/password authentication  | Yes                    | N/A  |
|                                   | Physical security                     | Tamper evidence   | Yes                    |      |
| <b>EMI/EMC</b>                    | FCC Part 15 Class A                   | N/A   | Yes                    | N/A  |
| <b>Services</b>                   | Supported services                    | 10G/40G/100GbE, 8G/10G/16G/32G FC, OC192/STM64, OTU2/OTU2e/OTU4   | N/A                    | N/A  |

# Crypto Officer Functionality

- Roll based separation of crypto officer and network administrator
- Crypto officer per client service
- The only user allowed to change his own password
- The only user with access to the Encryption tab with
  - Pre-Shared Secret information
  - Key Exchange Period
- In all other terms the behavior of the crypto officer user is like a read-only user for the GUI and CLI
- Remote login via the web GUI over HTTP/HTTPS.
- Service Lock – prevents the admin from changing the service type from encrypted to non-encrypted
- For locked encrypted service, no change of service type
- Any locked services, prevent restore-to-factory-defaults, load a previously saved configuration file or switch between SW loads



The screenshot shows a configuration window for encryption settings. It includes the following fields and controls:

- Encryption State:** Active
- Pre-Shared Secret:** A text box containing 24 characters of 0s.
- Key Exchange Period:** A text box containing '0' followed by 'Minutes' and a note '(To exchange key only once enter 0)'. There is also a 'Minutes' label to the right of the text box.
- Service Lock:** A dropdown menu currently set to 'Disabled'.
- Apply:** A button at the bottom right.



# Selected Case Studies



# Case Study: Managed Services

## Challenges

- Encrypt 2 data centers
- Full hardware redundancy with 2 fiber paths
- Scalable to 32G FC and 100GbE

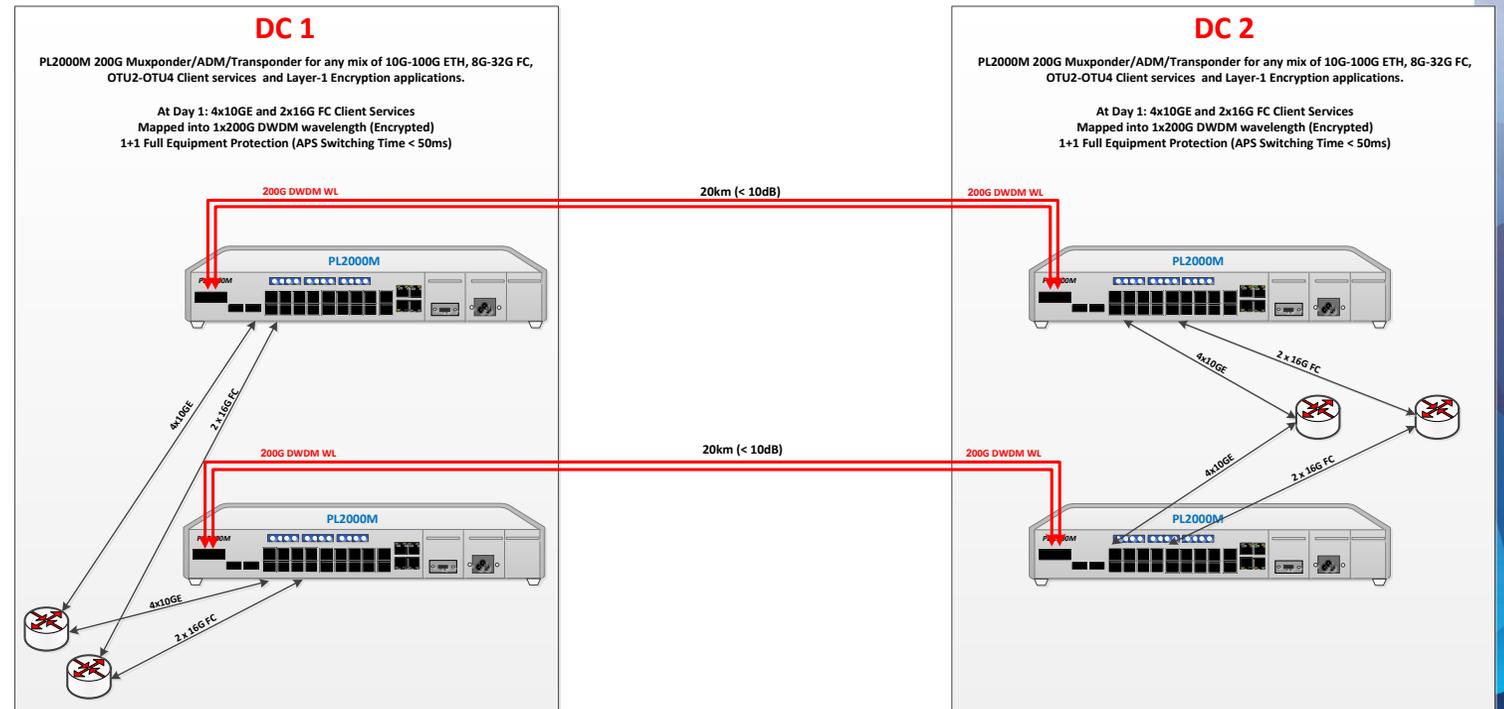
**Where:** Netherlands  
**What:** Multi-tenant Data Center  
**Services:** 2x16G FC, 4x10GbE  
**Distance:** 20 km

## Solution

- Dual muxponder solution (PL-2000M)
- Quick upgrade to 32G FC
- Additional 10 x mix of services available
- Encryption per service port or uplink

## Success!

- Fast turn up of new services
- Low CAPEX and OPEX
- Scalable
- Simple maintenance and support



# Case Study: Managed Services

## Challenges

- Encrypt 2 DCs, and provide full hardware redundancy with 2 fiber paths
- Easy and cost-effective upgrade to 32G FC and 100GbE

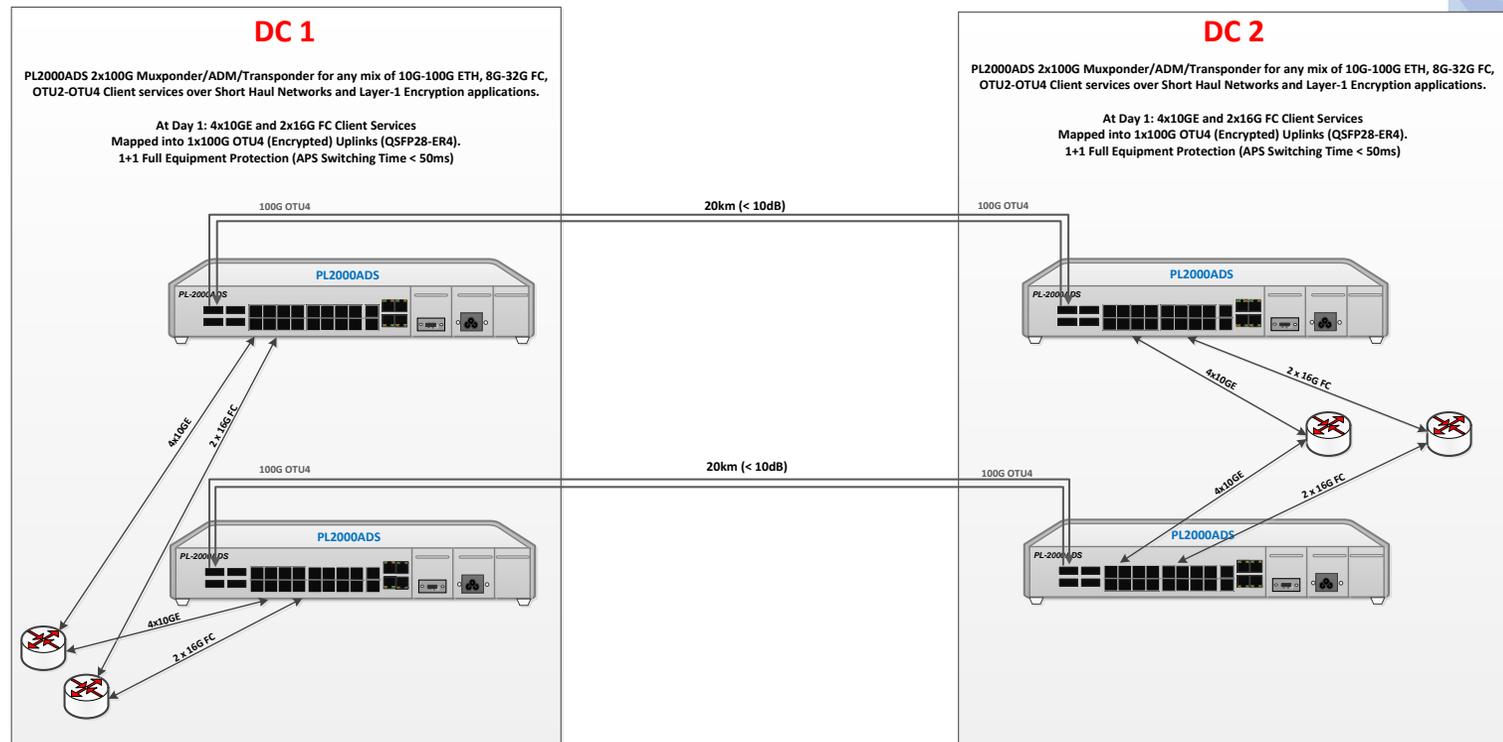
**Where:** Netherlands  
**What:** Multi-tenant Data Center  
**Services:** 2x16G FC, 4x10GbE  
**Distance:** 20 km

## Solution

- Dual PL-2000ADS non-coherent muxponder
- Quick upgrade to 32G FC w/o additional cost
- Encryption per service port or uplink
- Low cost solution

## Success!

- Fast turn up of new services
- Low initial CAPEX
- Simple maintenance and support



# Case Study: Data Center Connectivity

## Challenges

- Encrypt 2 data centers
- Full hardware redundancy with 2 fiber paths
- Scalable to additional 100GbE

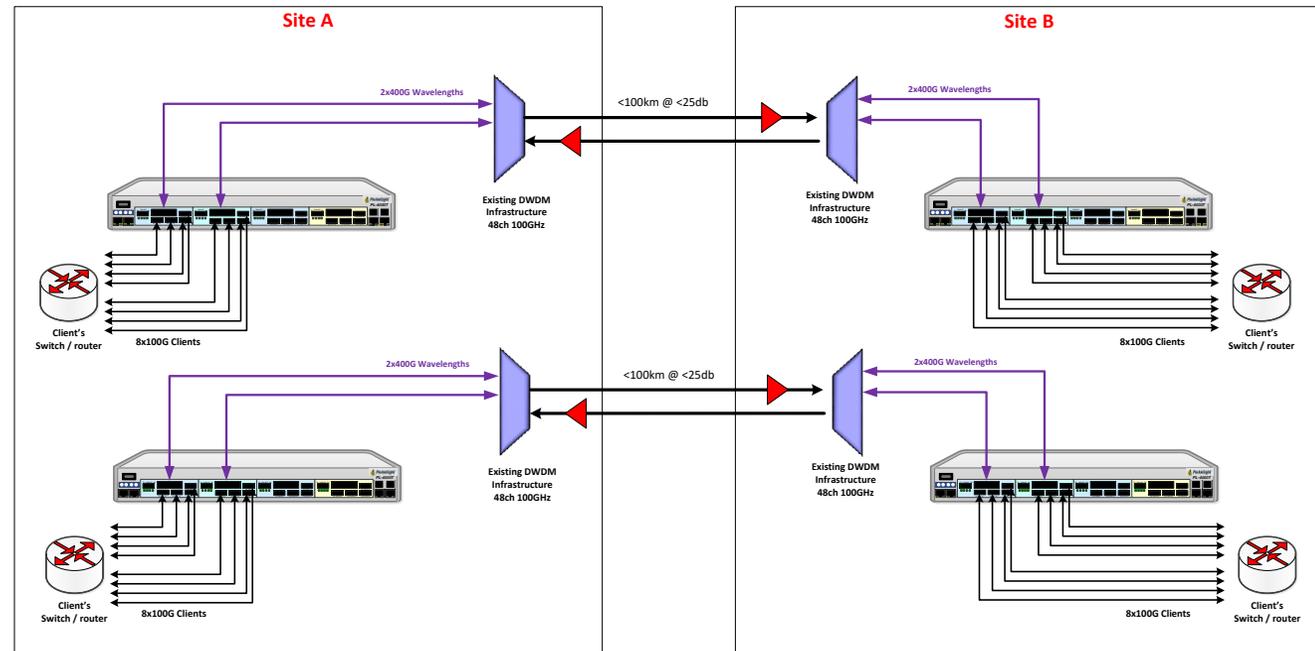
**Where:** Netherlands  
**What:** Single-tenant Data Center  
**Services:** 8x100GbE  
**Distance:** 20 km

## Solution

- Dual transponder solution (PL-4000T)
- Fully redundant
- Encryption per service port or uplink

## Success!

- Fast turn up of new services
- Low CAPEX and OPEX
- Scalable
- Simple maintenance and support



# Case Study: Redundant/Secured connectivity

## Challenges

- Connect 2 DCI's, while protecting fiber paths through 2 fiber paths
- Easy and cost-effective upgrade to 32G FC and 100GbE

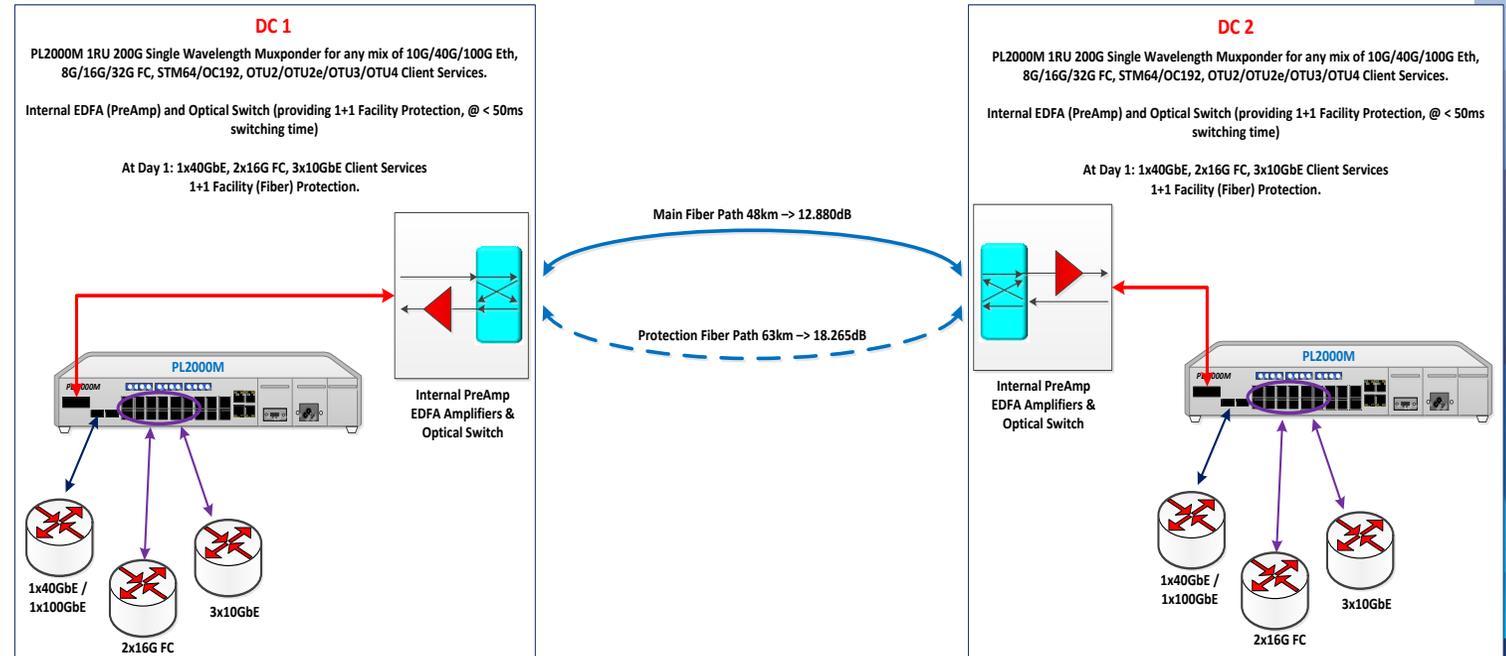
## Solution

- Single PL-2000M muxponder at each site
- Quick upgrade to 32G FC, & 100GbE
- Embedded optical switch for fiber protection

## Success!

Fast turn up of new services  
Low initial CAPEX  
Low OPEX  
Scalable per customer needs  
Simple maintenance and support

**Where:** Belgium  
**What:** Single-tenant Data Center  
**Services:** 1x40GbE, 1x100GbE, 2x16G FC, 3x10GbE  
**Distance:** 40 km

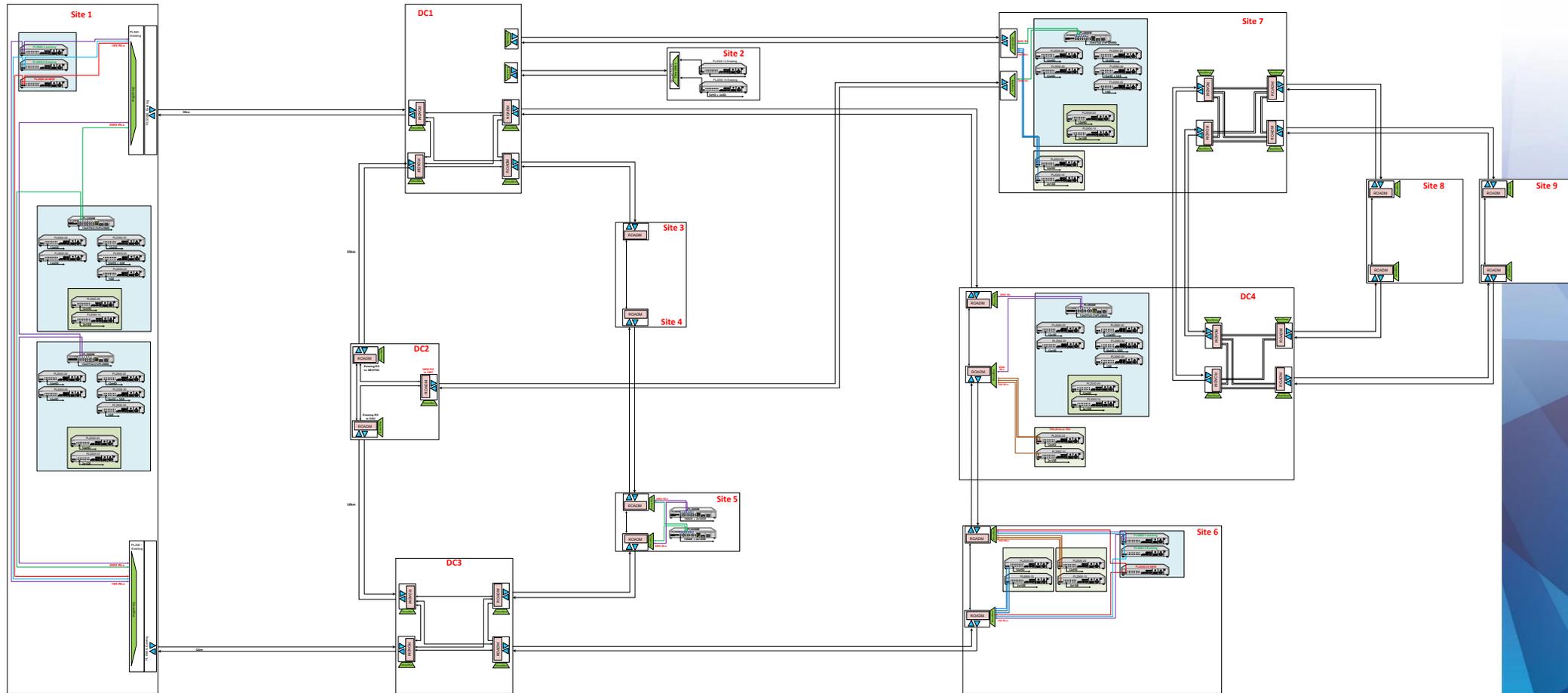


# MediaHub Australia DWDM OTN 48x200G Backbone



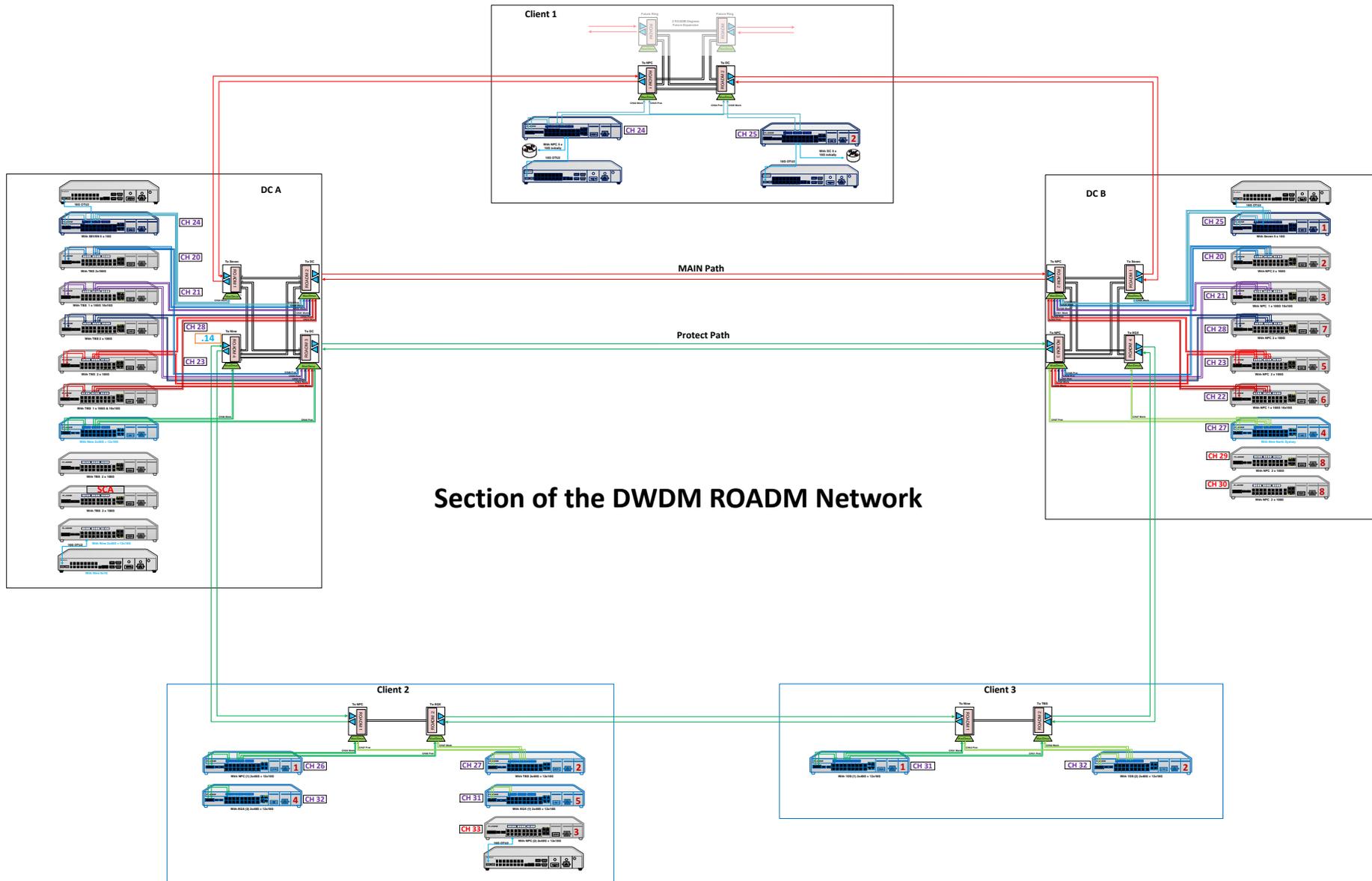
DWDM ROADM OTN backbone across NSW, connecting over 20 sites and transferring over 400 metro and regional TV and Radio channels, live Video feeds, voice, 100G/40G/10G/1G data and 32G/16G/8G storage services over 200G and 10G DWDM wavelengths.

The network is built with PacketLight's PL1000RO, PL1000IL, PL1000TN, PL2000, PL2000M, PL300 devices.



Section of the DWDM ROADM Network

# Nine & Seven Networks DWDM OTN 48x200G Backbone



Section of the DWDM ROADM Network

DWDM ROADM OTN backbone across Sydney Metro, connecting Seven's, Nine's Network studios, Playout Centers and Data Centers, transferring live IP Video, 100G/40G/10G data and 32G/16G/8G storage services, and streaming services over 200G DWDM wavelengths.

The network is built with PacketLight's PL1000RO, PL2000, PL2000M, PL2000T, and PL300 devices.

# Case Study: Connecting offices to DC

## Challenges

- Connect 2 offices to central data center
- Transmit 1 x GbE
- Add more services easily
- CPE equipment – easy to deploy & maintain

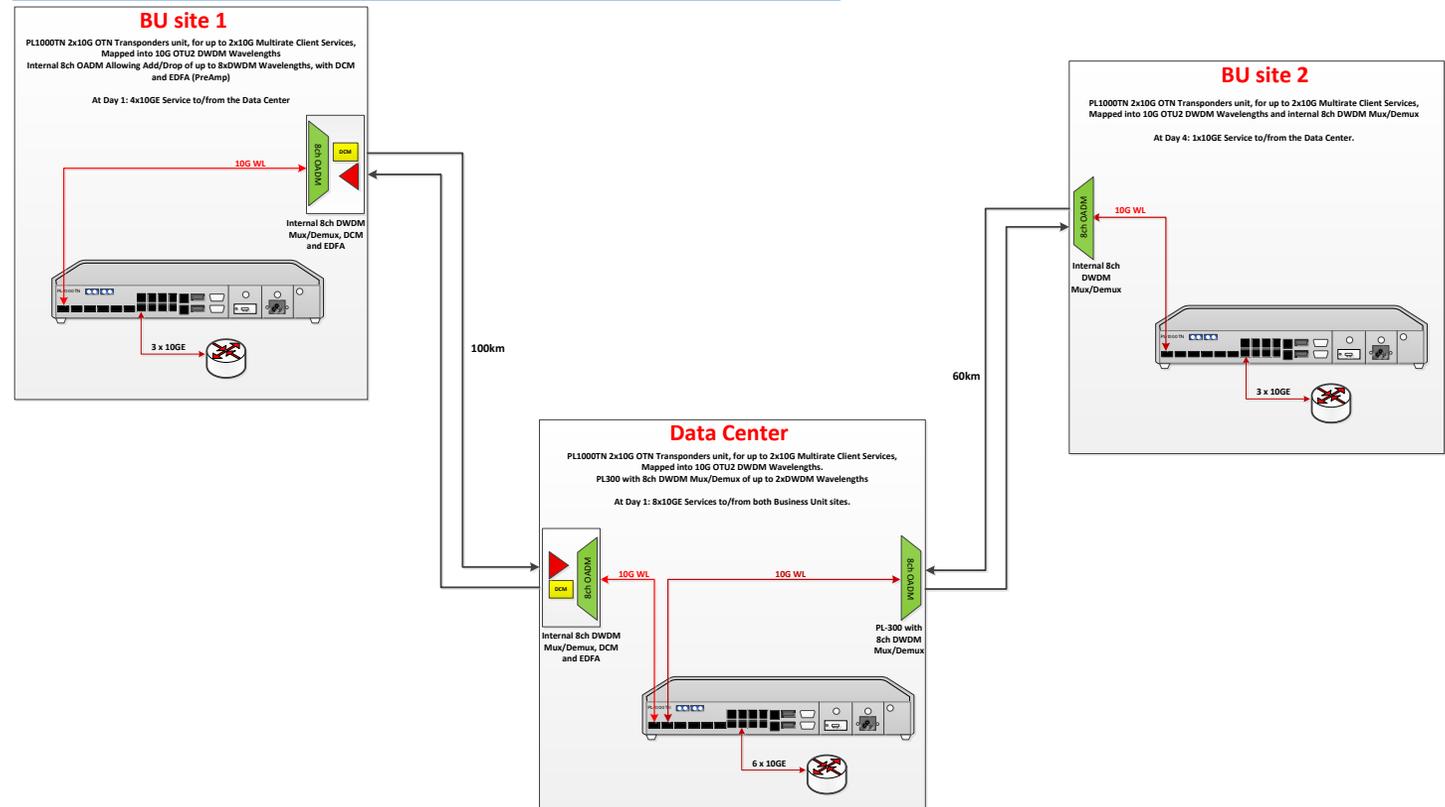
## Solution

- Transponder at each site (1 x PL-1000TN)
- Integrated solution - mux/demux & EDFA
- Ready to transmit 1 x 10GbE
- Scalable by adding 2 x 10GbE

## Success!

- Low CAPEX and OPEX
- Scalable
- Simple maintenance and support

**Where:** Belgium  
**What:** Connecting Offices to DC  
**Services:** 3x10GbE  
**Distance:** 100km, 60km



# Case Study: Extending Existing DWDM

## Challenges

- 32G FC over Existing 3<sup>rd</sup> party DWDM
- Remote management
- CPE equipment – easy to deploy & maintain
- Full redundancy & encryption

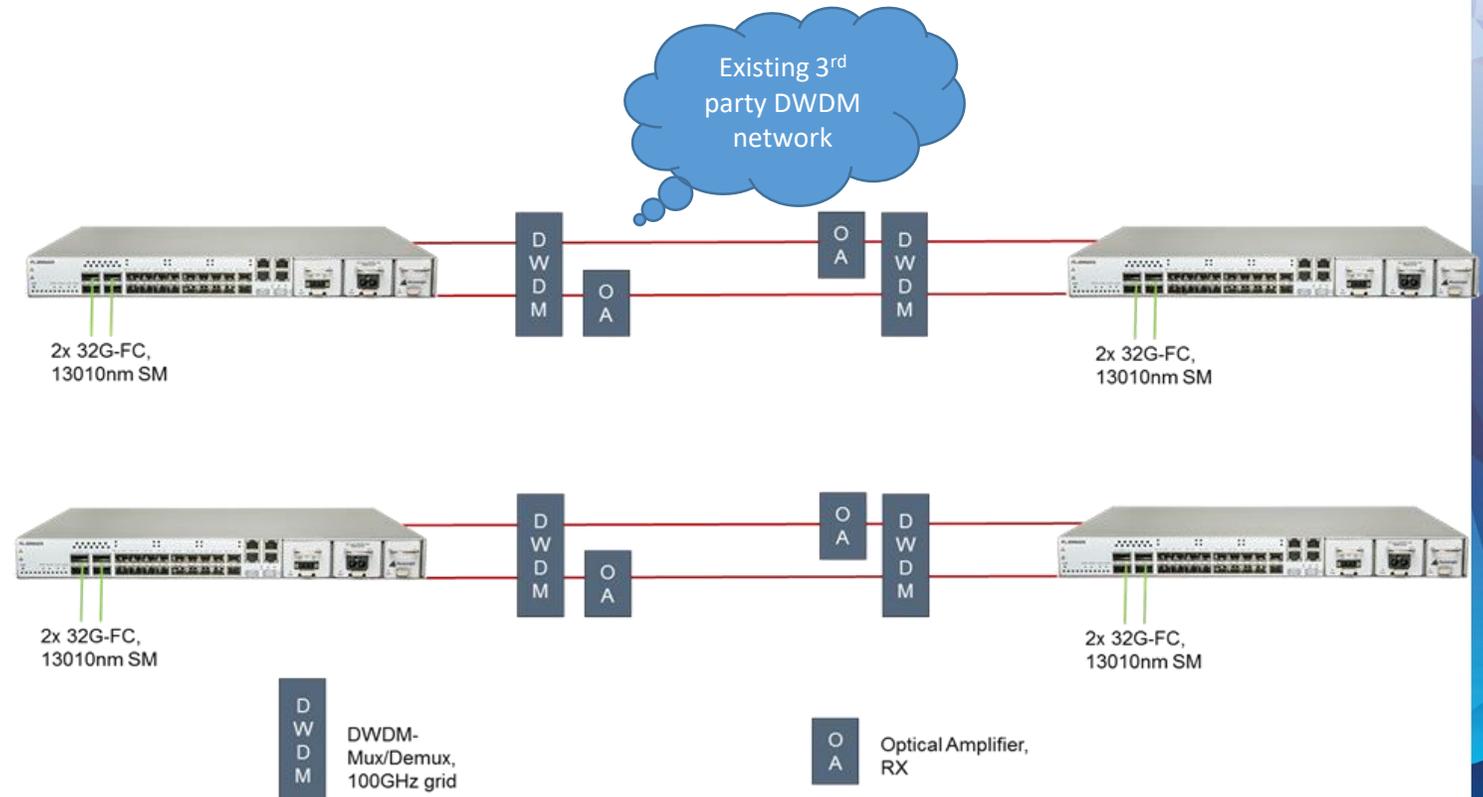
## Solution

- Alien wavelength solution (2 x PL-2000ADS)
- 2 x 32G FC, fully redundant
- Use existing 3<sup>rd</sup> party mux/demux and amps
- Encryption on each FC service

## Success!

- Fast turn up of new services
- Low CAPEX and OPEX
- Scalable
- Simple maintenance and support

**Where:** Germany  
**What:** Multi-tenant DC  
**Services:** 4x16G FC, Encrypted  
**Distance:** 40 km



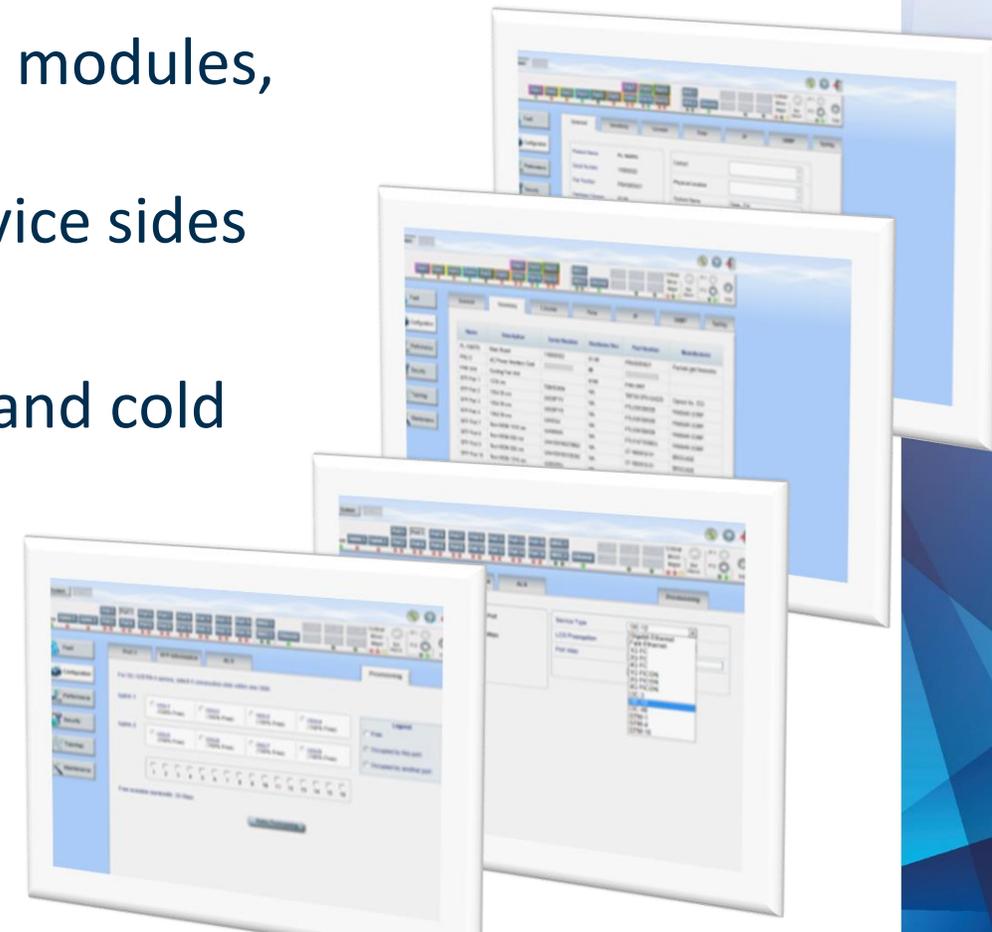


# EMS/NMS and GUI



# Web-based Management System

- Web-based management system
- Simple common configuration process for all product families
- Provides performance monitoring for all optical modules, Client (service) types and Line (uplink)
- Built-in troubleshooting tools both link and service sides
- Network topology view
- Maintenance services with, SW download, hot and cold restart
- Full alarm and event history, and activities log
- No extra licensing or server cost



# PL-2000M Uplink Configuration

The screenshot displays the PacketLight PL-2000M web interface. At the top, the system name is "PL-2000M" and the IP address is "10.0.1.155". A navigation bar includes "System" and "ALL" tabs, and a status bar shows various port and service indicators like "Uplink", "Port 1-16", "MNG 1-2", "ETH 1-2", "COM", "MUX", "EDFA", "Critical", "Minor", "Major", "Ext Alarm", "P 1", "P 2", and "FAN".

The main configuration area is titled "Uplink" and includes sub-tabs for "CFP2", "ALS", and "OTN". The "Uplink" sub-tab is active, showing the following configuration details:

- Port Type: OTUC2 Uplink Port
- Port Rate: 264.536 Gbps
- Maximal Distance: 100 km
- Admin Status: Up
- Operational Status: Down

On the right side of the configuration area, there are dropdown menus for "Service Type" (set to OTUC2) and "Transponder Direction" (set to Tx+Rx), and a text input field for "Port Alias". An "Apply" button is located below these fields.

At the bottom of the configuration area, there are two status indicators: "Admin Up" (green circle) and "Admin Down" (red circle).

A left-hand navigation menu contains icons and labels for: Fault, Configuration, Performance, Security, Topology, and Maintenance.

# PL-2000M Uplink CFP2 Configuration

PacketLight™ PL-2000M System Name: IP: 10.0.1.155

System ALL

Uplink Port 1 Port 3 Port 5 Port 7 Port 9 Port 11 Port 13 Port 15 MNG 1 ETH 1 COM COM 1 COM 2 Critical Minor Major Ext Alarm P 1 P 2 FAN

PWR Port 21 Port 25 Port 2 Port 4 Port 6 Port 8 Port 10 Port 12 Port 14 Port 16 MNG 2 ETH 2 MUX EDFA 1 EDFA 2

Fault Configuration Performance Security Topology Maintenance

Uplink CFP2 ALS OTN

Vendor Name: PLN  
WDM Class: DWDM  
Lanes Num: 1  
Lanes Spacing: 50 GHz  
TX Nominal WL: 1549.32 nm  
RX Nominal WL: 1554.94 nm  
Max Bit Rate: 256 Gbps  
Part Number: CFP2-ACO-D-1101  
Serial Number: T29W4741  
Connector Type: LC

100GBE  
LR4 ER4 SR10 CR10 DWDM  
MM SM

OTU4  
LR4 ER4 SR10 LR10 DWDM  
MM SM

Tx Pwr: -5.0 dBm  
Rx Pwr: NA  
Current CD: 0 ps/nm  
SNR: NA  
Pre-FEC BER: 2E-4  
Temperature: 48 °C

High Receive Power Threshold: 3.0 dBm  
Low Receive Power Threshold: -18.0 dBm  
TX WL 1 Channel: 35  
RX WL 1 Channel: 28  
Spacing: 50GHz  
Tx Output Power: -5 dBm  
Nyquist Filtering: Disabled

Apply

# PL-2000M Port Configuration

The screenshot displays the PacketLight PL-2000M web interface. At the top, the system name is "PL-2000M" and the IP address is "10.0.1.155". A navigation bar includes "System" and "ALL" tabs, along with status icons for power, help, and alarm. Below this is a row of port selection buttons from "Uplink" to "FAN".

The main configuration area is for "Port 1". It features tabs for "SFP+", "ALS", "APS", and "Provisioning". The "Provisioning" tab is active, showing a configuration table:

|                     |              |
|---------------------|--------------|
| Port Type:          | Service Port |
| Port Rate:          | 10.3125 Gbps |
| Admin Status:       | Down         |
| Operational Status: | Down         |

Below the table are two status indicators: "Admin Up" (green circle) and "Admin Down" (red circle).

To the right, a "Service Type" dropdown menu is open, showing a list of options:

- 10GbE-LAN (selected)
- 10GbE-LAN NO PM
- 16G FC
- 16G FC NO PM
- 8G FC
- OC-192
- STM-64
- OTU2
- OTU2e
- Encrypted 10GbE-LAN
- Encrypted 10GbE-LAN NO PM
- Encrypted 16G FC
- Encrypted 16G FC NO PM
- Encrypted 8G FC
- Encrypted OC-192
- Encrypted STM-64
- Encrypted OTU2
- Encrypted OTU2e

A left-hand sidebar contains navigation buttons for "Fault", "Configuration", "Performance", "Security", "Topology", and "Maintenance".

# PL-2000M Uplink Performance Monitoring

PL-2000M
System Name:  
IP: 10.0.1.155

System

ALL

Uplink

Port 1

Port 3

Port 5

Port 7

Port 9

Port 11

Port 13

Port 15

MNG 1

ETH 1

COM

COM 1

COM 2

Critical

Minor

Major

Ext Alarm

P 1

P 2

FAN

PWR

Port 21

Port 25

Port 2

Port 4

Port 6

Port 8

Port 10

Port 12

Port 14

Port 16

MNG 2

ETH 2

MUX

EDFA 1

EDFA 2

Fault

Configuration

Performance

Security

Topology

Maintenance

### Uplink Port Performance Monitoring

PM Period:  Type:

| Interval                  | Rx Level dBm | Tx Level dBm | SNR dB | Chromatic Dispersion | Pre-FEC BER |
|---------------------------|--------------|--------------|--------|----------------------|-------------|
| Current 10/06/19;11:00:00 | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 1 10/06/19;10:45:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 2 10/06/19;10:30:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 3 10/06/19;10:15:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 4 10/06/19;10:00:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 5 10/06/19;09:45:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 6 10/06/19;09:30:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 7 10/06/19;09:15:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 8 10/06/19;09:00:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |
| 9 10/06/19;08:45:00       | NA           | -5.0 dBm     | NA     | NA                   | NA          |

Export to File

Refresh every:  seconds

# Encryption Configuration

The screenshot displays the PacketLight PL-1000TE Crypto web interface. At the top, the system name is "PL-1000TE Crypto" and the IP address is "10.0.1.85". A navigation bar includes "System" and "ALL" tabs, along with status icons for power, help, and alarm. Below this is a row of status indicators for various components: PWR, Port 1-16, MNG 1-2, Ethernet, MUX 1-2, COM, COM 1-2, EDFA 1-2, Critical/Minor/Major alarms, Ext Alarm, P 1-2, and FAN. A left sidebar contains menu items: Fault, Configuration, Performance, Security, Topology, and Maintenance. The main content area shows the "Encryption" configuration for "Port 11".

System Name: IP: 10.0.1.85

System ALL

Port 1 Port 3 Port 5 Port 7 Port 9 Port 11 Port 13 Port 15 MNG 1 DCM MUX 1 COM COM 1 COM 2 Critical Minor Major Ext Alarm P 1 P 2 FAN

PWR Port 2 Port 4 Port 6 Port 8 Port 10 Port 12 Port 14 Port 16 MNG 2 Ethernet MUX 2 EDFA 1 EDFA 2

Fault Configuration Performance Security Topology Maintenance

Port 11 SFP/+ ALS Encryption

Encryption State: Init

Pre-Shared Secret: 0000000000000000  
0000000000000000  
0000000000000000  
0000000000000000

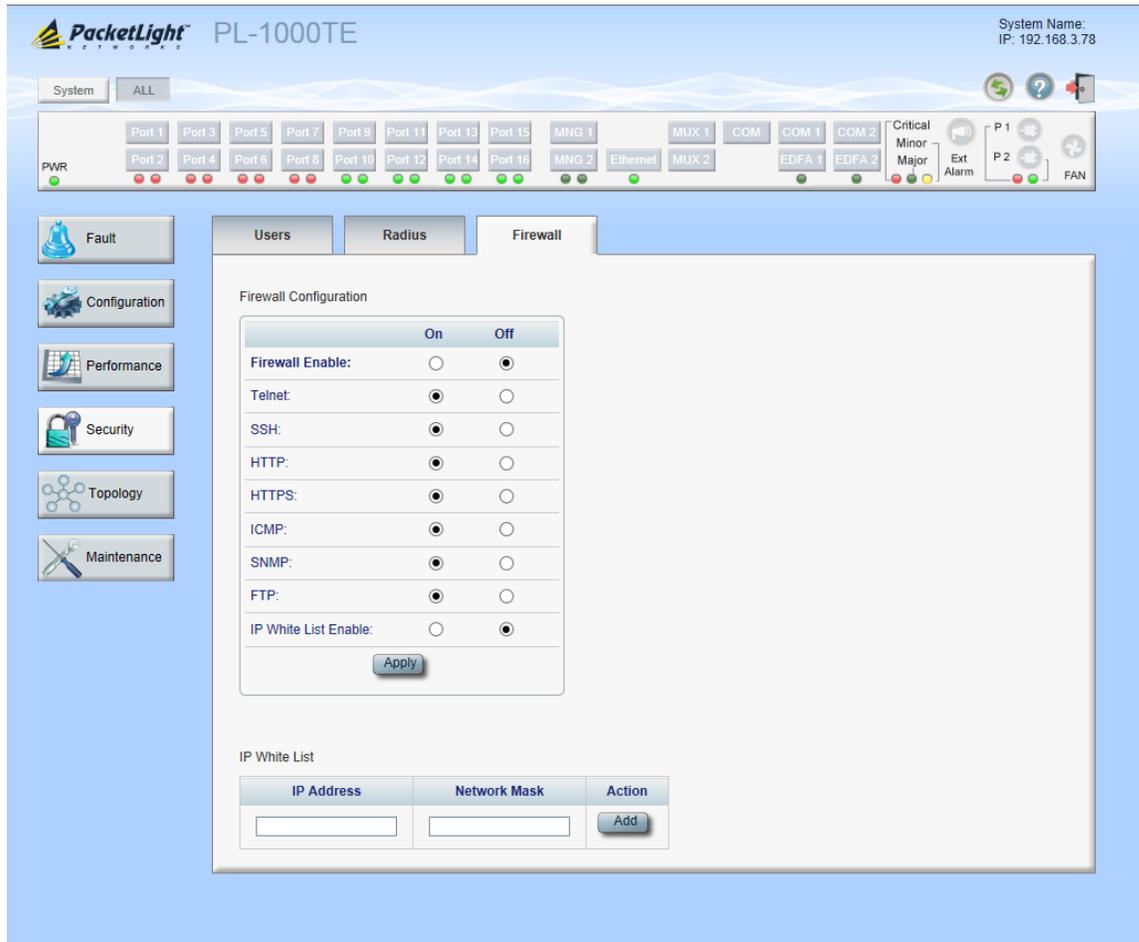
Key Exchange Period: 0 Minutes  
(To exchange key only once enter 0)

Service Lock: Enabled Disabled

Apply

# Firewall

- Built-in firewall allows blocking of any selected IP address or protocols.

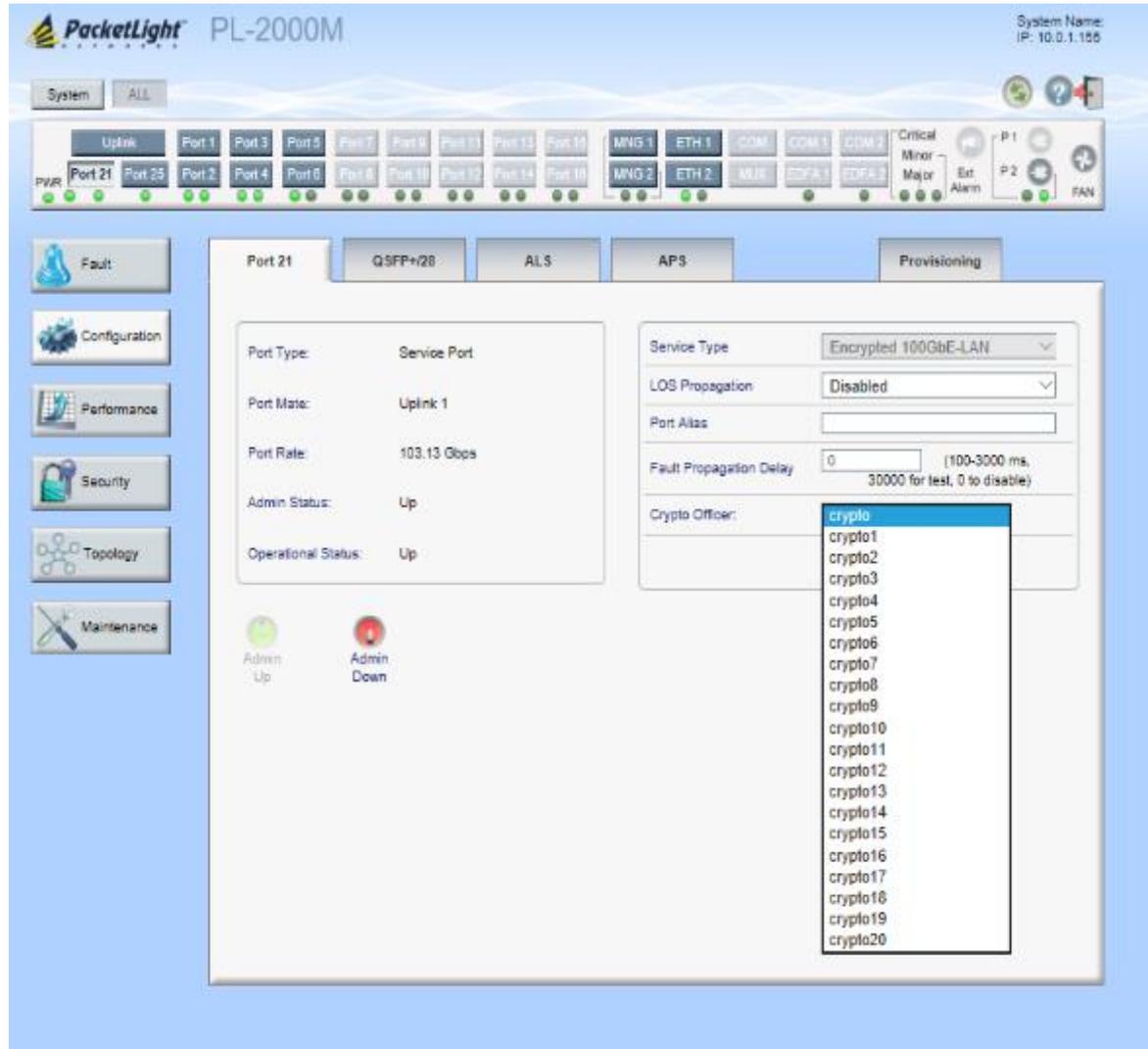


The screenshot displays the PacketLight PL-1000TE web interface. At the top, the system name is PL-1000TE and the IP address is 192.168.3.78. The interface includes a navigation menu on the left with options like Fault, Configuration, Performance, Security, Topology, and Maintenance. The main content area is divided into tabs for Users, Radius, and Firewall. The Firewall tab is active, showing the Firewall Configuration section. This section includes a table for enabling or disabling various protocols and an IP White List section.

|                       | On                               | Off                              |
|-----------------------|----------------------------------|----------------------------------|
| Firewall Enable:      | <input type="radio"/>            | <input checked="" type="radio"/> |
| Telnet:               | <input checked="" type="radio"/> | <input type="radio"/>            |
| SSH:                  | <input checked="" type="radio"/> | <input type="radio"/>            |
| HTTP:                 | <input checked="" type="radio"/> | <input type="radio"/>            |
| HTTPS:                | <input checked="" type="radio"/> | <input type="radio"/>            |
| ICMP:                 | <input checked="" type="radio"/> | <input type="radio"/>            |
| SNMP:                 | <input checked="" type="radio"/> | <input type="radio"/>            |
| FTP:                  | <input checked="" type="radio"/> | <input type="radio"/>            |
| IP White List Enable: | <input type="radio"/>            | <input checked="" type="radio"/> |

Below the configuration table is an 'Apply' button. The IP White List section features a table with columns for IP Address, Network Mask, and Action, and an 'Add' button.

# Multiple Crypto Officers



The screenshot displays the PacketLight PL-2000M web interface. At the top, the system name is "PL-2000M" and the IP address is "10.0.1.156". A navigation bar includes "System" and "ALL" tabs, along with various port and module status indicators (Port 1-16, MING 1-2, ETH 1-2, COM, COM 1-2, EDFA 1-2, P1, P2, FAN). A left sidebar contains menu items: Fault, Configuration, Performance, Security, Topology, and Maintenance. The main content area shows the configuration for "Port 21".

Port 21 configuration details:

- Port Type: Service Port
- Port Rate: 103.13 Gbps
- Admin Status: Up
- Operational Status: Up
- Service Type: Encrypted 100GbE-LAN
- LOS Propagation: Disabled
- Port Alias: (empty field)
- Fault Propagation Delay: 0 (100-3000 ms, 30000 for test, 0 to disable)
- Crypto Officer: (dropdown menu)

The "Crypto Officer" dropdown menu is open, showing a list of options from "crypto" to "crypto20". The "crypto" option is currently selected.

# Management Security

- HTTPS – Secured HTTP
- Support SNMPv3
- SSH - Secured Shell (telnet)

The interface shows the configuration for SNMP. On the left is a navigation menu with icons for Fault, Configuration, Performance, Security, Topology, and Maintenance. The main area has tabs for General, Inventory, License, Time, IP, and SNMP. The 'SNMP' tab is active, showing 'SNMP Configuration' and 'SNMP Traps'.

**SNMP Configuration**

|                                |                  |
|--------------------------------|------------------|
| Read-Only Community String     | read-only1       |
| Read-Write Community String    | read-write       |
| Admin Community String         | admin            |
| v1/v2c Trap Community String   | public           |
| SNMP Trap Compatibility Format | Full Iindex Mode |
| SNMP Protocol Version          | v1, v2c, v3      |

**SNMP Traps**

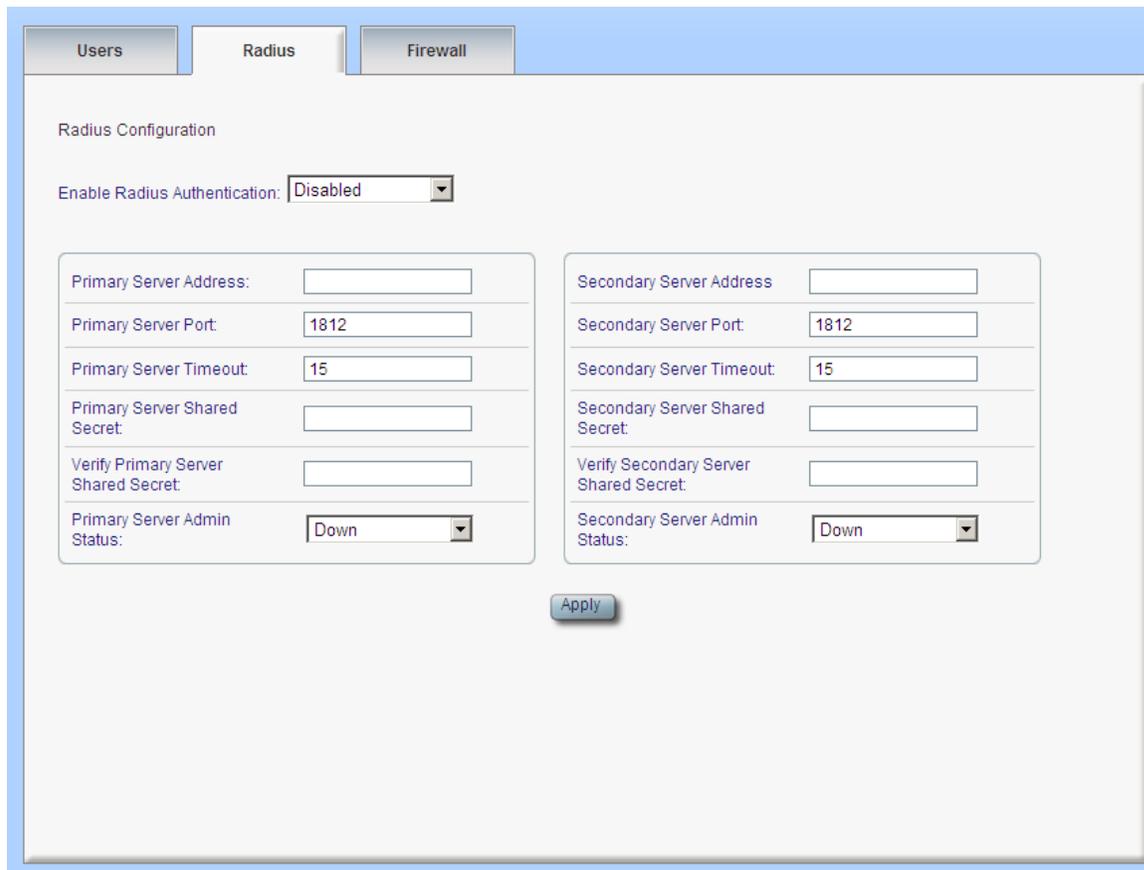
| Manager Address | SNMP Version | v3 User | Trap Port | Action |
|-----------------|--------------|---------|-----------|--------|
| 192.168.1.31    | SNMP v3      | trap    | 162       | Delete |
| 192.168.1.56    | SNMP v3      | aaa     | 162       | Delete |
|                 | SNMP v2c     | aaa     | 162       | Add    |

The interface shows 'Local User Management' with tabs for Users, Radius, and Firewall. The 'Users' tab is active, displaying a table of users with their permissions, passwords, and authentication methods.

| User Name | Permission      | Password    | SNMPv3 Auth | SNMPv3 Priv | Edit User        |
|-----------|-----------------|-------------|-------------|-------------|------------------|
| aaa       | Read/Write User | Verify: [ ] | No Auth     | No Priv     | Modify<br>Delete |
|           | Read Only User  | Verify: [ ] | MD5         | No Priv     | Modify<br>Delete |
|           |                 | Verify: [ ] | MD5         | No Priv     | Modify<br>Delete |
|           | Administrator   | Verify: [ ] | No Auth     | No Priv     | Modify           |
| obbb      | Read/Write User | Verify: [ ] | MD5         | AES         | Modify<br>Delete |
|           | Read Only User  | Verify: [ ] | No Access   | No Access   | Add              |

# Radius

- Radius for centralized user management is supported
- Up to two Radius servers are supported for protection



The screenshot shows a web interface for configuring Radius servers. It features three tabs: 'Users', 'Radius', and 'Firewall'. The 'Radius' tab is active, displaying the 'Radius Configuration' section. At the top, there is a dropdown menu for 'Enable Radius Authentication' set to 'Disabled'. Below this, there are two columns of configuration fields for a primary and secondary server. Each column includes fields for 'Server Address', 'Server Port' (both set to 1812), 'Server Timeout' (both set to 15), 'Server Shared Secret', 'Verify Server Shared Secret', and 'Server Admin Status' (both set to 'Down'). An 'Apply' button is located at the bottom center of the configuration area.

| Field                                 | Primary Server | Secondary Server |
|---------------------------------------|----------------|------------------|
| Enable Radius Authentication          | Disabled       |                  |
| Primary Server Address                |                |                  |
| Primary Server Port                   | 1812           | 1812             |
| Primary Server Timeout                | 15             | 15               |
| Primary Server Shared Secret          |                |                  |
| Verify Primary Server Shared Secret   |                |                  |
| Primary Server Admin Status           | Down           |                  |
| Secondary Server Address              |                |                  |
| Secondary Server Port                 |                | 1812             |
| Secondary Server Timeout              |                | 15               |
| Secondary Server Shared Secret        |                |                  |
| Verify Secondary Server Shared Secret |                |                  |
| Secondary Server Admin Status         |                | Down             |

# PacketLight Advantages

## The Technology

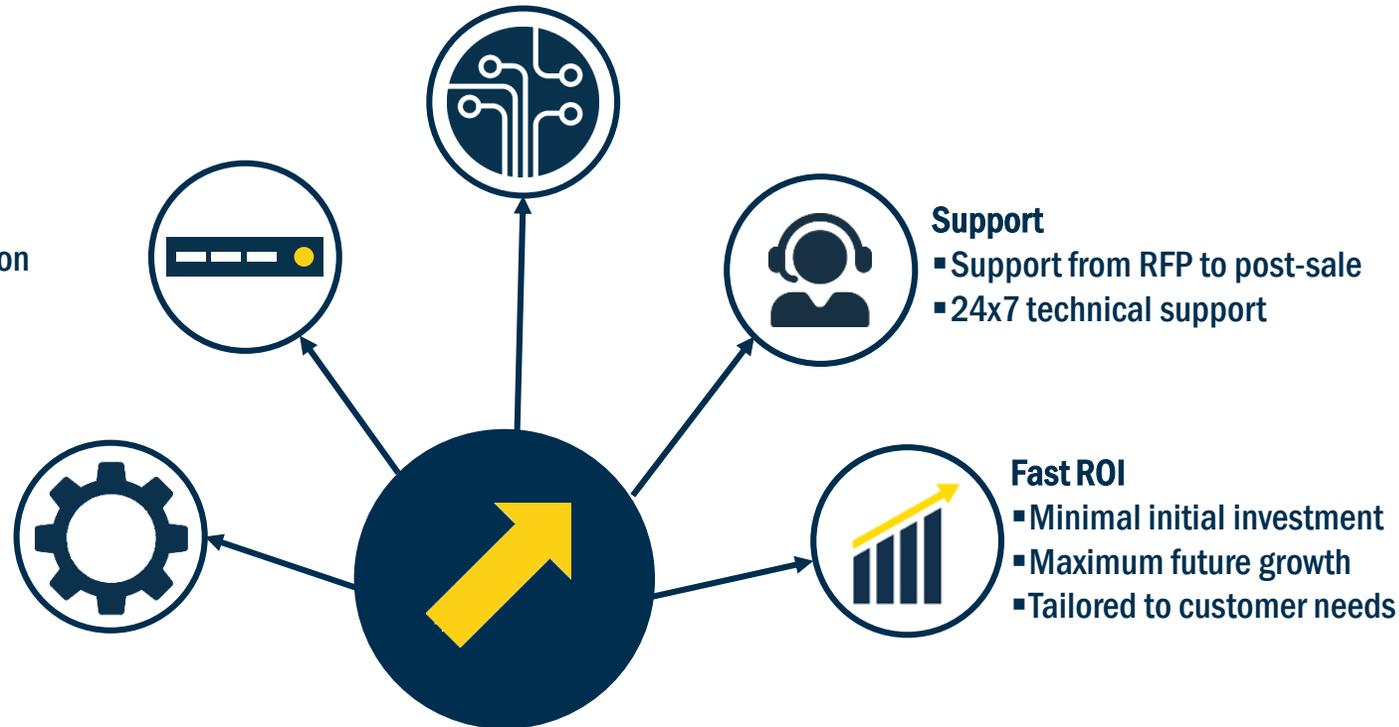
- State-of-the-art WDM technology
- Carrier grade features
- All building blocks for any WDM solution
- Advanced security and encryption
- Adding features per customer needs
- Flexible mix of services
- Low latency

## Size

- Saves rack space
- Lower power consumption

## Ease of Use

- No need for a WDM expert
- Easy to Install, maintain and configure





# 20 Years of Technology Excellence

