

<b>Purpose:</b>	<b>Pre-sales Training for Enterprise Business Products and Solutions</b>
<b>Product/Solution:</b>	<b>Access WDM</b>
<b>Trainee:</b>	Regional enterprise business and channel/partner product and solution managers
<b>Introduction:</b>	Market Summarize & Position, highlights, Product Correspondence, Roadmap, Success Case, Quota Introduction, Configuration Introduction
<b>Organizer:</b>	Enterprise Business Solution Sales Competence Improvement Center

## Maintenance

<b>records:</b>	<b>New/Update</b>	<b>Author/Owner(Name/ID)</b>	<b>Date(YYYY-MM-DD)</b>
V1.0		Youqiankun 152301	2011-10
V2.0		Meng Wenjun 62791	2012-01

# Access WDM OSN 1800

[www.huawei.com](http://www.huawei.com)

Pre-sales Training Material for Enterprise Business Products and Solutions

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Version: V1.0(20120123)

HUAWEI TECHNOLOGIES CO.,  
LTD.



# Contents

**1**

**Market Summarize & Position**

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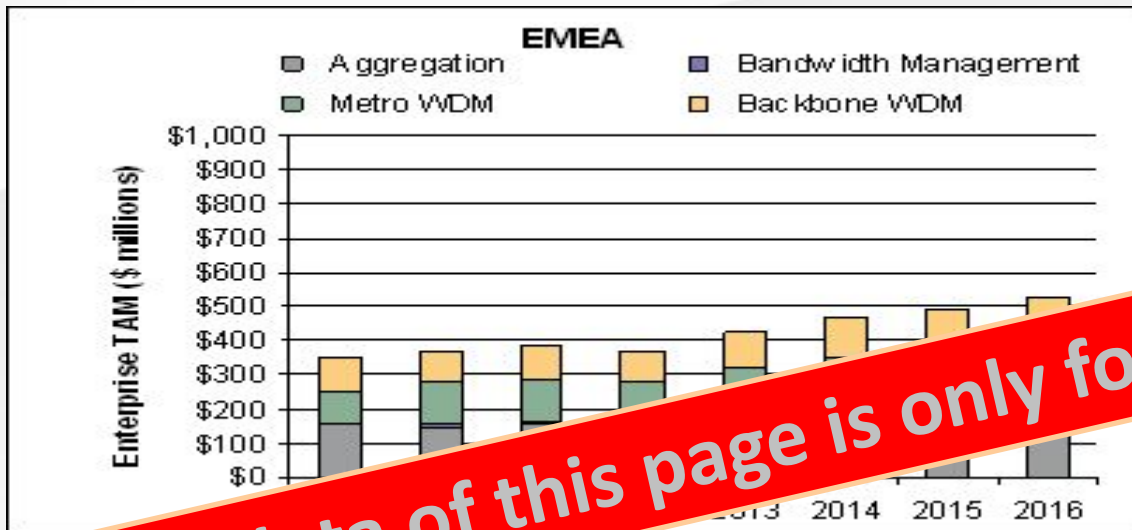
**Successful Stories**

**4**

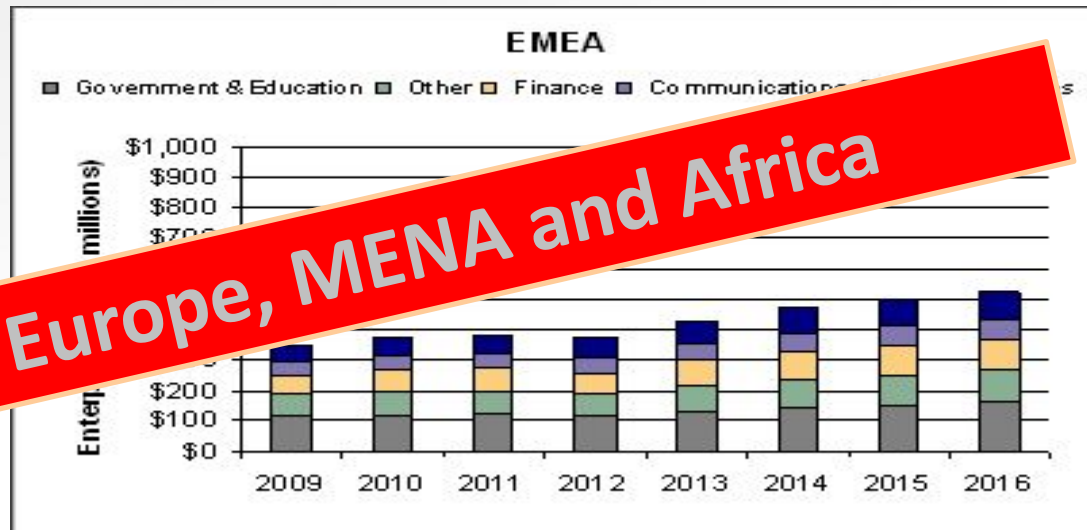
**Configuration**

# Metro WDM Market Share

Forecast by region by product

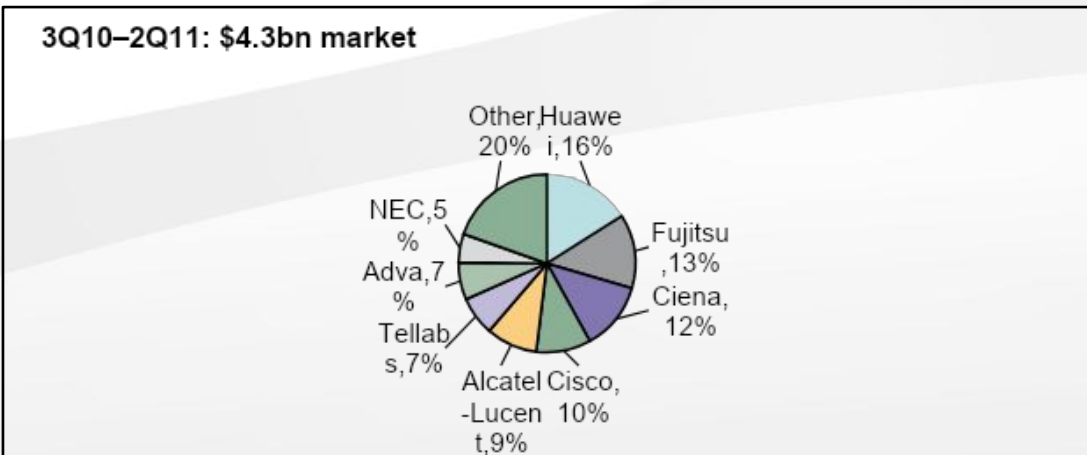
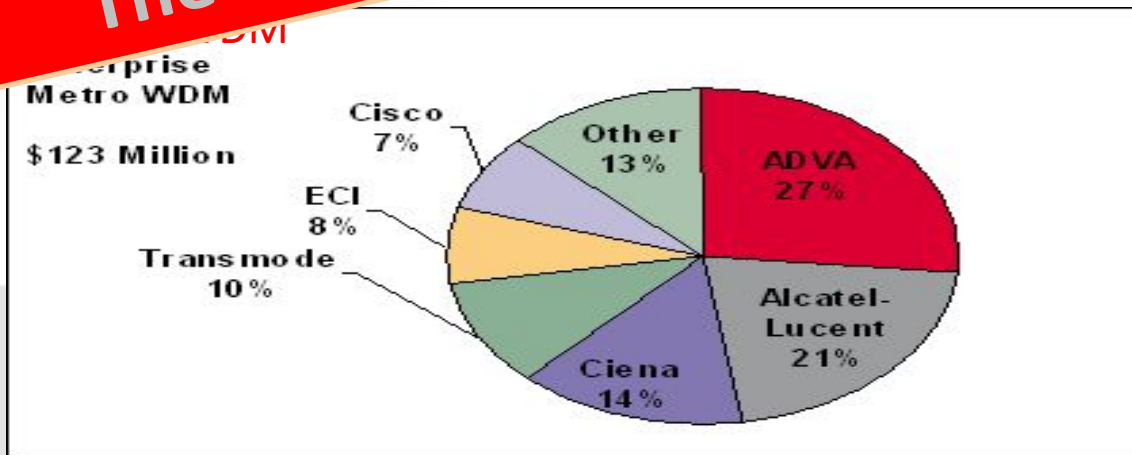


Forecast by region by vertical

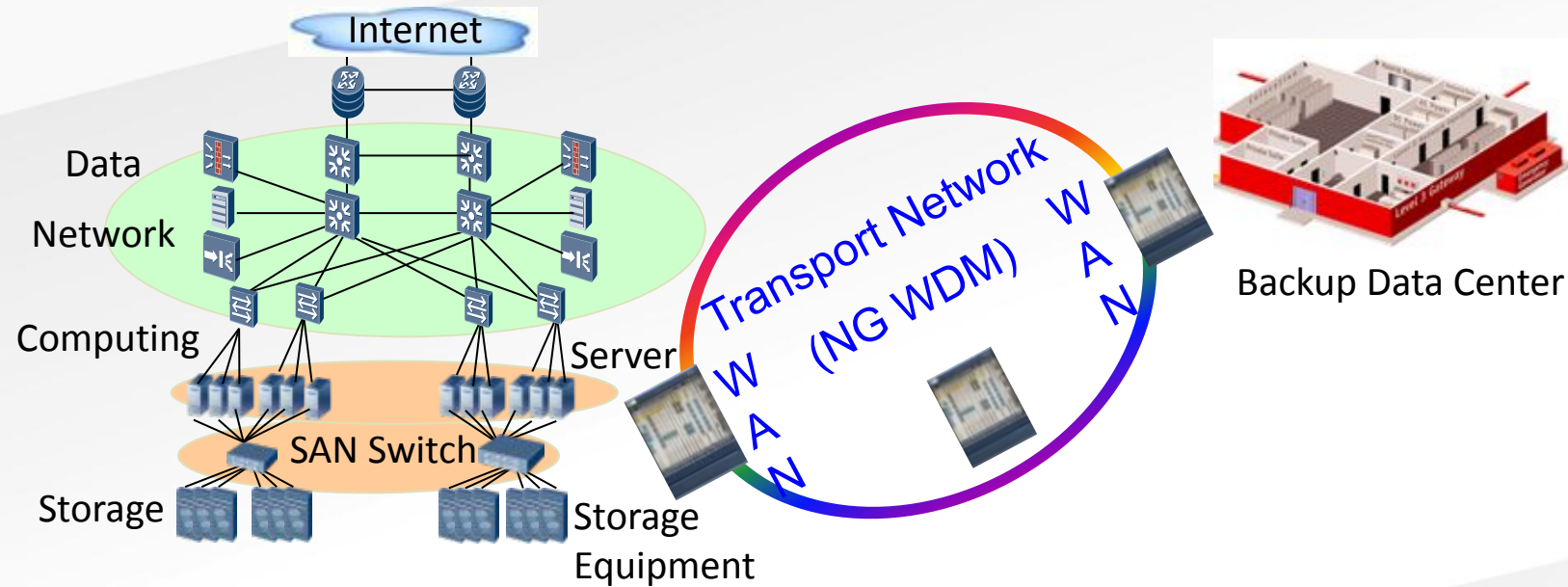


**The data of this page is only for Europe, MENA and Africa**

Global Market for Metro WDM

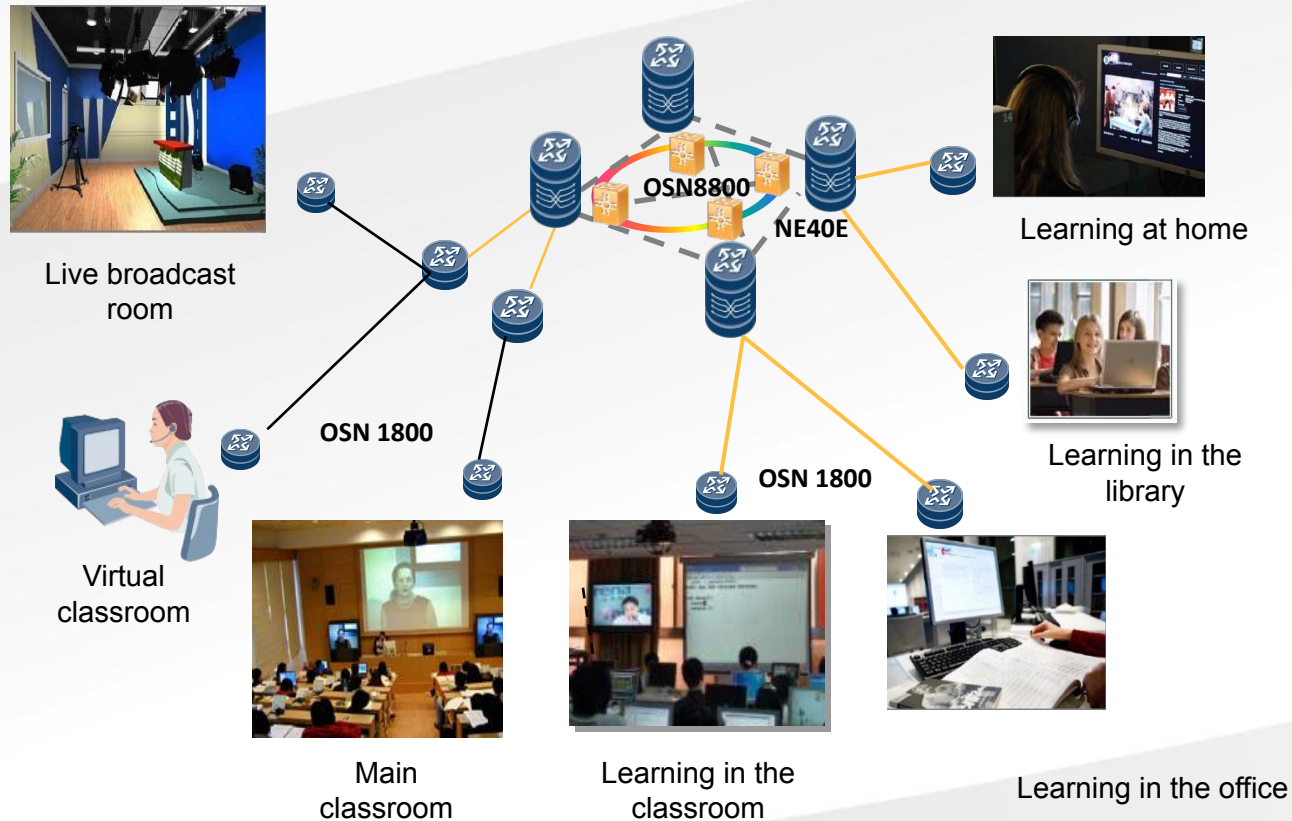


# Scenario 1: Data Center Disaster & Recovery



- SAN interfaces: ESCON、FICON、FC、IP、ATM
- Large Bandwidth, Low Latency, High Reliability
- Easy management and simple upgrade to get more capacity
- Professional Certificated: Fully Certificated by top authority including EMC、HP、IBM、SUN、McDATA、Brocade, meanwhile deeply corporate with IBM to meet all SAN application scenarios.

# Scenario 2: Distance Teaching



- ✓ Distance teaching for students
- ✓ Distance training for teachers
- ✓ Faculty communication
- ✓ High-end training and meetings

## OSN1800 as a WDM solution applied in access layer which is a cost-efficient and high broadband solution

1. 2M~10G full service access ;
2. Smoothly expanse to 80G by plugging service card
3. 1+1 protection supported by client side, OUT, line side and equipment level;
4. Both single fiber and pair fiber transmission are supported;
5. Remote in-band management by G.709

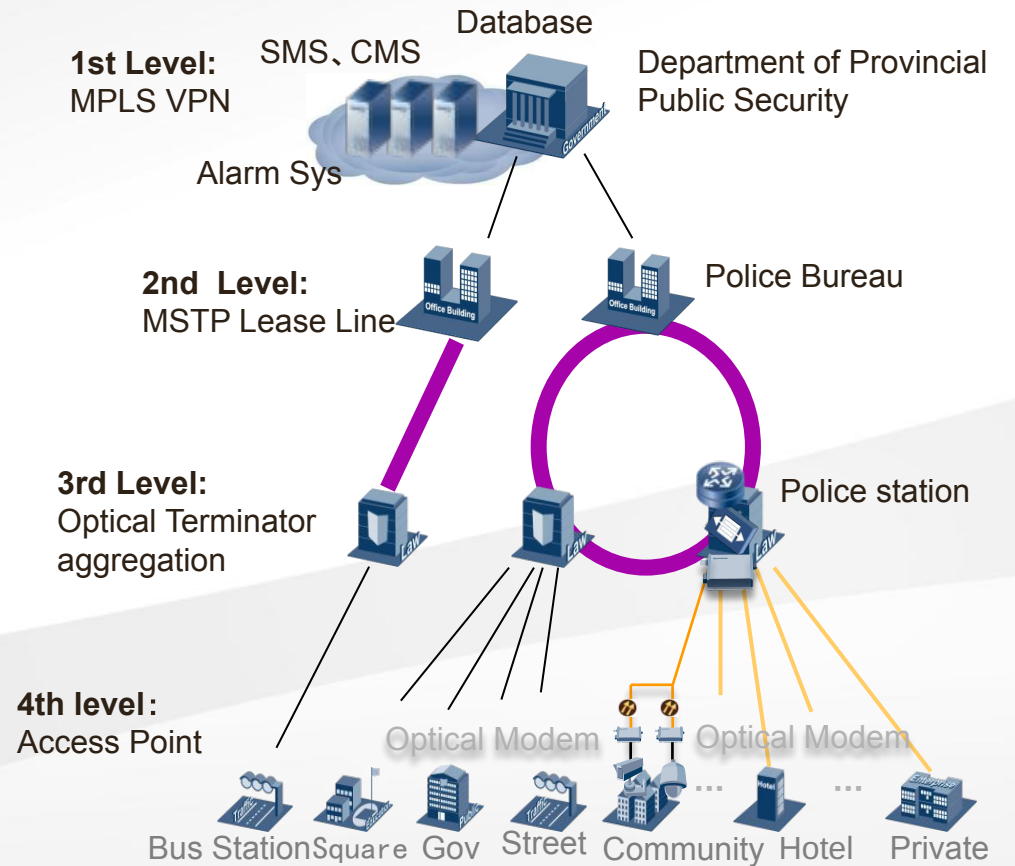
# Scenario 3: Restful City-Efficient Video Transmission

Restful City go to large-scale expansion

Initial Phase	Developing phase	Peak Phase
Make trail at Peking, Hangzhou, Jinan and Suzhou.	At Aug of 2005, Peking, Shanghai and other 20 cities are listed in "3111 Trail Cities" Project.	After 2007, totally 400 County Towns and Cities enter the building to the climax of Restful City.

With development of "Restful City, to satisfy the high capacity requirement of monitoring video transmission and the increasing requirement of video shared by government. **OSN1800 as a WDM solution applied in access layer which is a cost-efficient and high broadband solution for customers could resolve the tension of fiber recourse.**

## OTN: Video Transmission Solution for Police Bureau





# Scenario 4: High-speed Railway Coverage



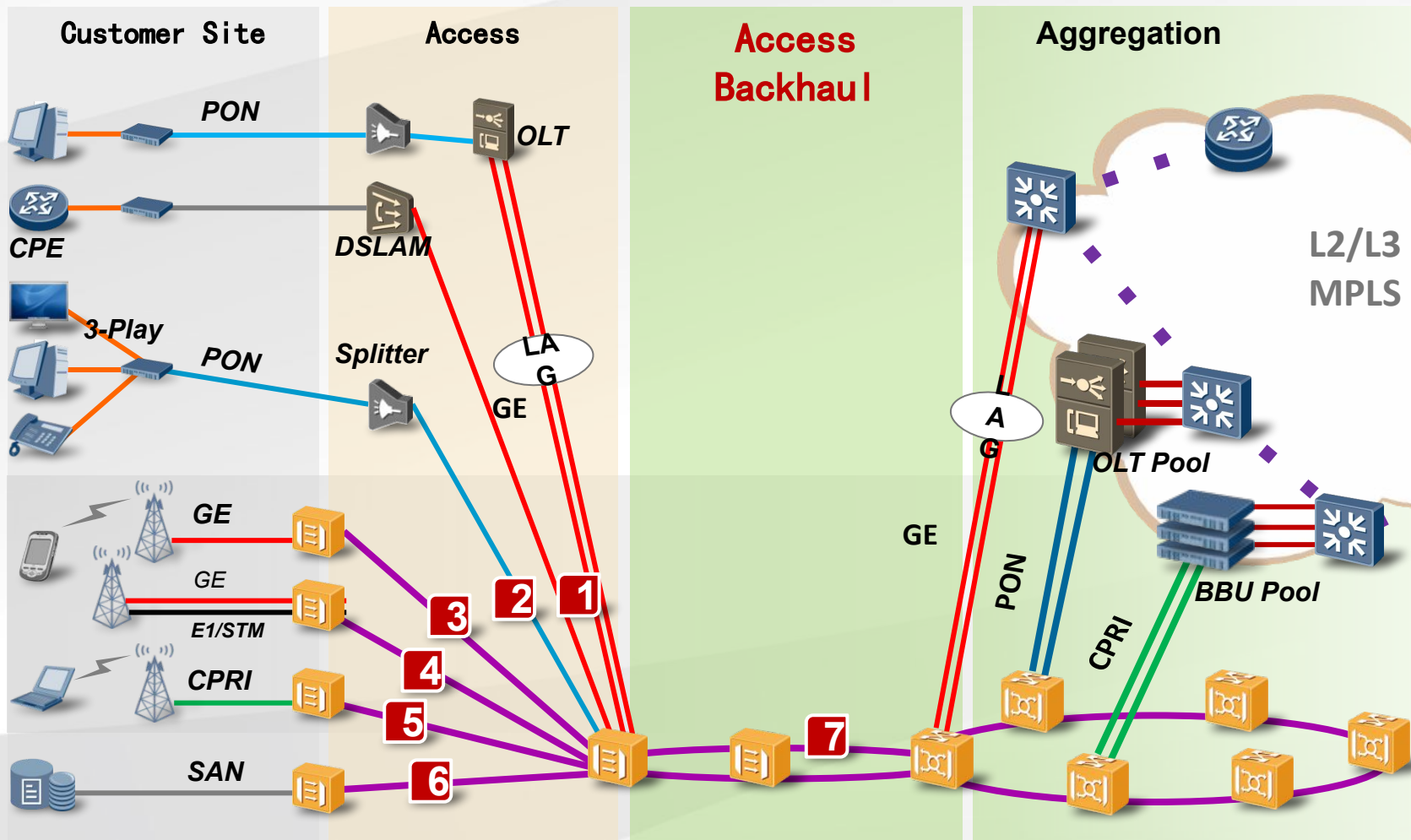
**Better Performance:** BTS handoff delay approximate to 0.

**Less Site:** 1 BBU hotel site every 37km (can share existing 2G/3G site).

**Higher Reliability:** switch time < 50ms in case of fiber failure.



# Scenario 5: 2M~10G in Single Access Backhaul



Fixed

- 1 GE to DSLAM/OLT
- 2 PON over OTN

Mobile

- 3 GE to Node B
- 4 2G & 3G backhaul in single fiber
- 5 CPRI over OTN

Leased Line

- 6 SAN over OTN
- 7 L2 in WDM

# Contents

**1** Market Summarize & Position

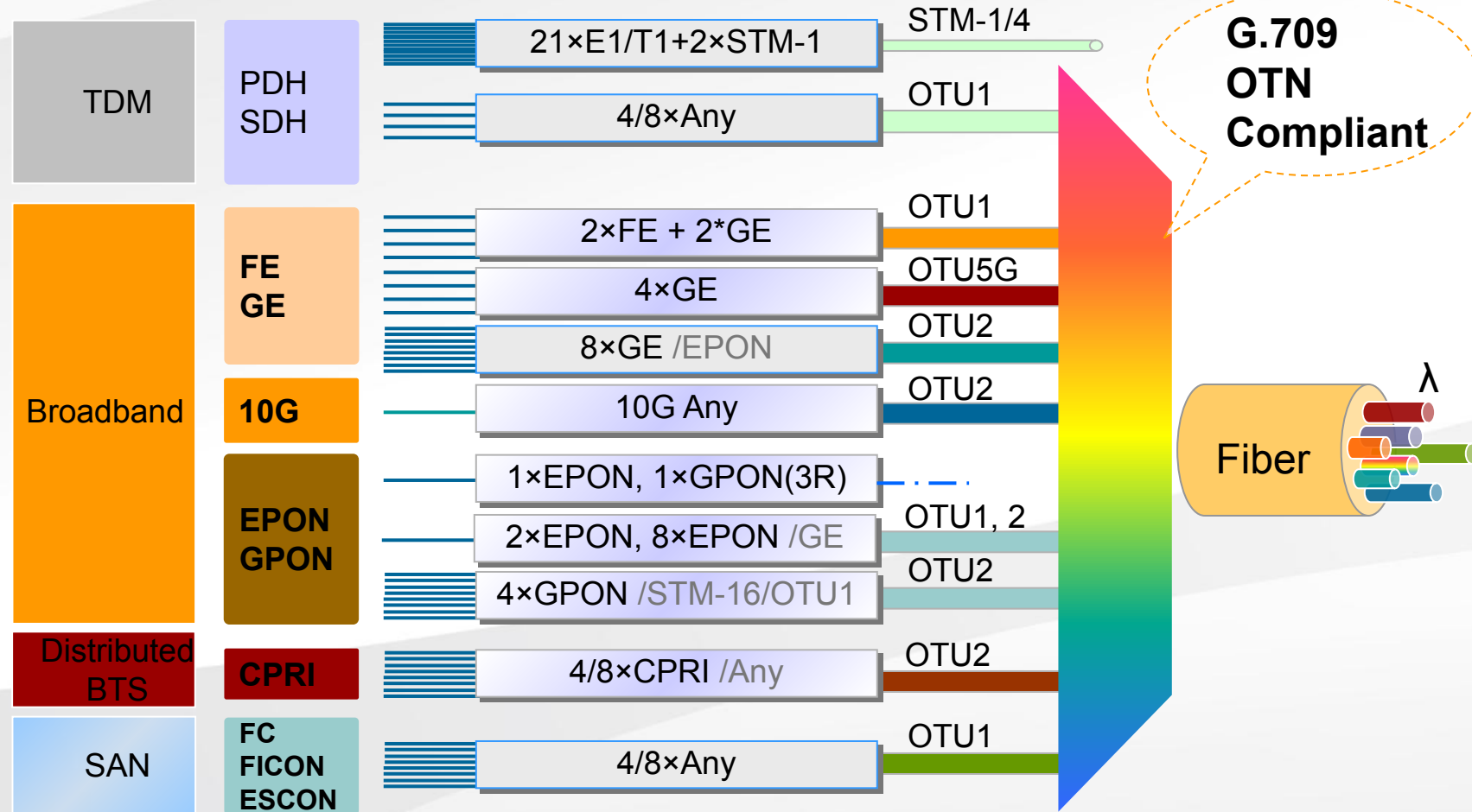
**2** Product Highlights

**3** Successful Stories

**4** Configuration

# Full-Service Access

2Mbps-10Gbps in 1 System



# Fits Anywhere



**Rack-, outside cabinet-, wall-, pole-mount. And AC power supply**



In 19"/23" Rack



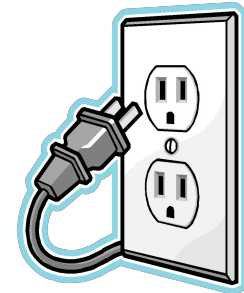
In Outdoor Cabinet



Wall Mount



Pole Mount



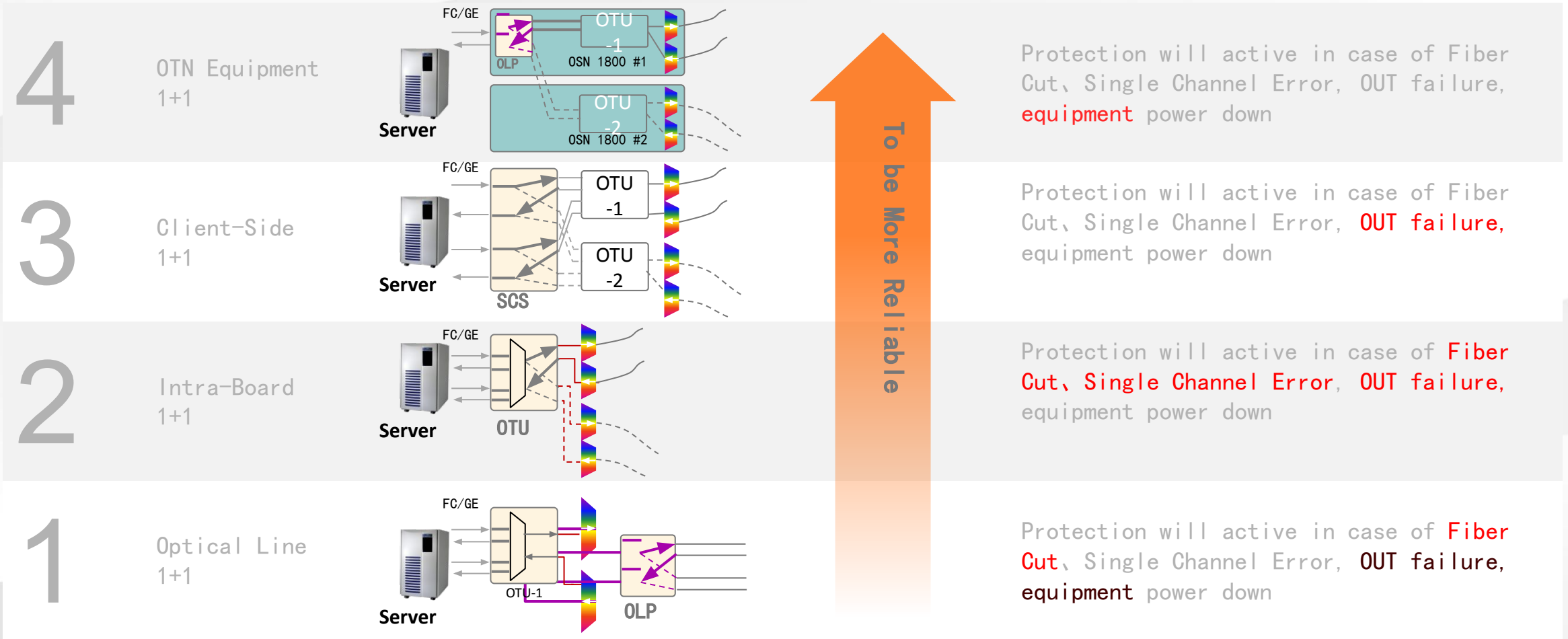
AC Power Supply



**Temperature hardened ( -40°C ~ +65°C / -40°F ~ 149°F )**

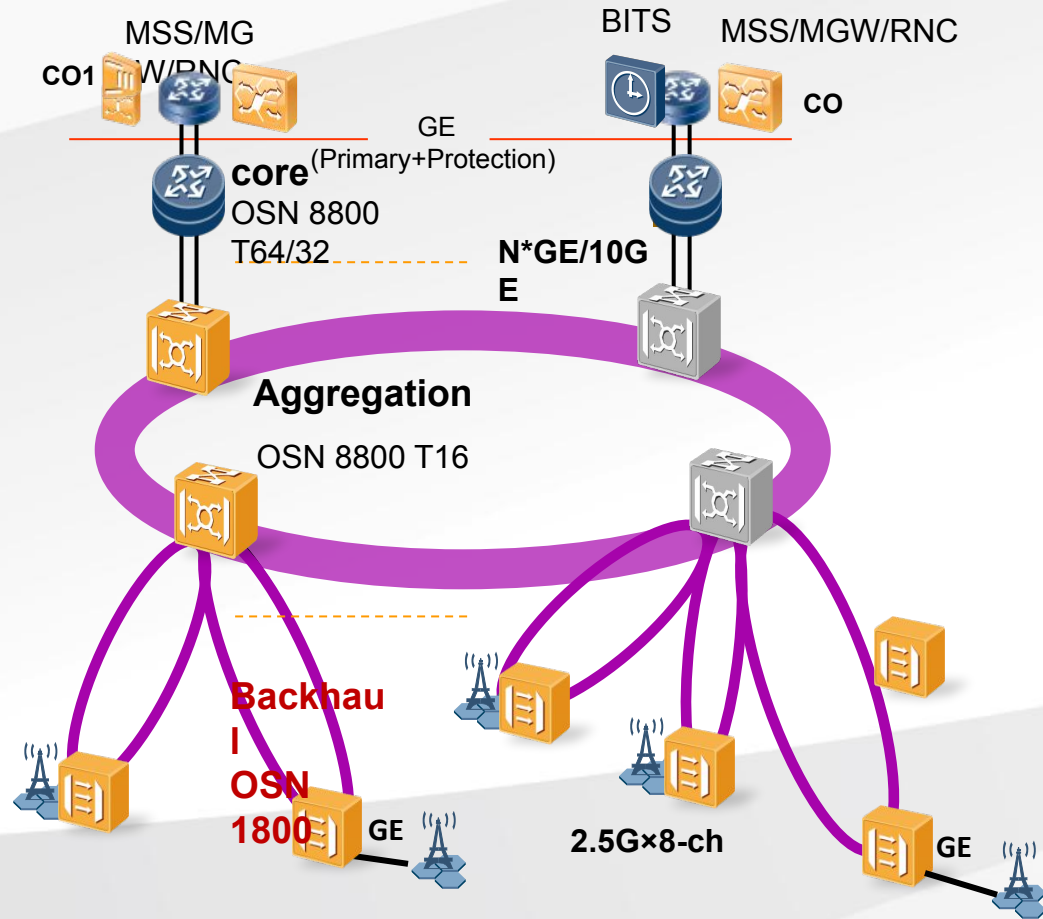
**Only for some specific configurations.**

# Redundancy System with full “1+1” Protection



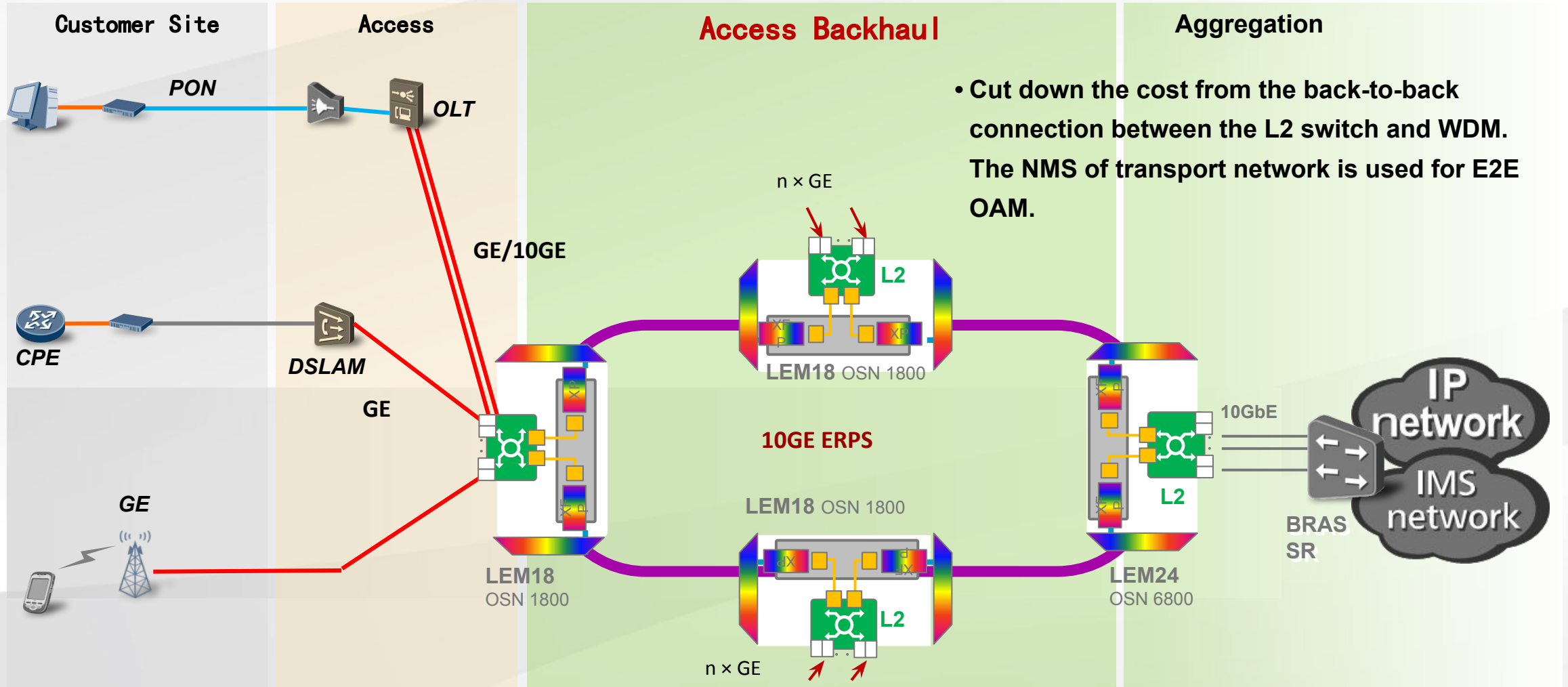


# E2E 1588V2



- ❖ **Simple** engineering without measurement
- ❖ **Easy** Operation by NMS
- ❖ **High** clock reliability with protection;
- ❖ 1588v2 over **ESC** without FIU board.

# L2 Switch in WDM : Simpler Networking, Larger Capacity



# Certification



**ServerNet:** compatibility between the HP ServerNet protocol, the HP 6780 Cluster Switch and Huawei DWDM solutions



**SAN:** FC100, FC200 SAN Service



Safety: EN60950-1:20001 +A11:2004  
 EN60825-1:1994+A2:2001+A1:2002, EN60825-2 :2004  
 EMC : EN55022:1998+A1:2000+A2:2003  
 EN55024:1998+A1:2001+A2:2003  
 EN 300 386 V1.3.3:2005



UL 60950-1, 1st Edition, 2007-10-31 (Information Technology Equipment - Safety - Part 1: General Requirements)  
 CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07 (Information Technology Equipment - Safety - Part 1: General Requirements)



**conforms to the specific sections 4.2.2, 4.2.3, 4.4.1 and 4.5.2.1 of Telcordia GR-63-CORE, Section 10 of GR-1089-CORE**

**conforms to the specific sections 4.1.1.1, 4.1.1.2, 4.1.1.3, 4.1.2, 4.1.3, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 4.4.3,4.6 and 4.7.2 of Telcordia GR-63-CORE, Section 2, 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.2.2, 3.2.3.1,3.3.1.1, 3.3.1.2, 3.3.2, 3.3.3.1,3.3.3.2,4.6.9.1, 7 and 9 of GR-1089-CORE**

# Contents

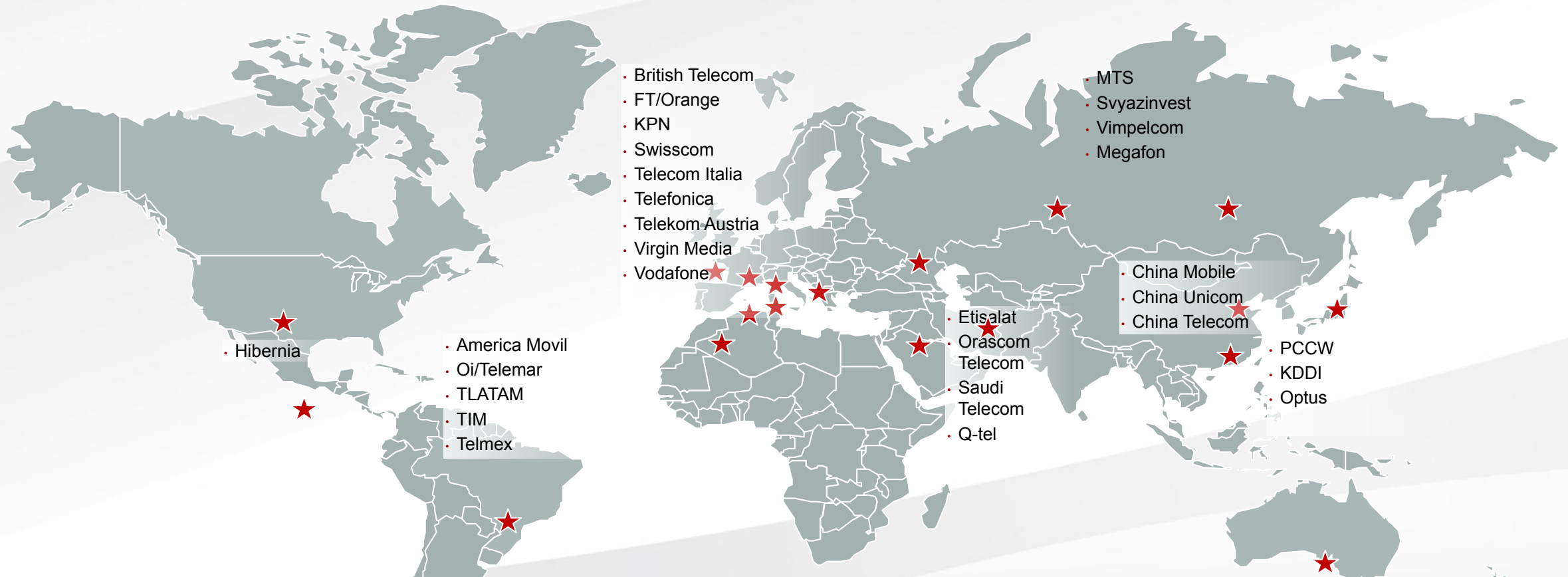
**1** Market Summarize & Position

**2** Product Highlights

**3** **Successful Stories**

**4** Configuration

# OSN 1800 Applied 10,000+ Sets



- Over **80%** market share in China and mutually deployed in Restful Cities, Enterprises, Data Centers, Universities and so on.
- Over **10,000 sets** commercially available in global market. Cooperate with KDDI, PCCW, TA, FT, Vodafone, Telefonica, and private network customers from Government/Finance/Education/Enterprise.



# Belgium Syntigo Railway Project

## Background & Needs

- Syntigo was set up in 1998 as a subsidiary of SNCB-Holding, hold the second largest optical network in Belgium and cover 150000km, It provide service with involved Transport & Mobility, Enterprise & Public sector, and Telecom operator & Integrators. It is aimed to be the most reliable supplier of ICT solutions for mobility and communication.

## Huawei Solution

- Huawei series products OSN 1800/ OSN 6800/ OSN 8800.
- Multi-degree WSS ROADM and integrated OTN switching.
- OSN 1800 for small granularity services access.
- 80×40G provide enough capacity for extend.

## Benefits

- Safety & Reliability: end to end fixed fiber, real-time, high-speed solution, elevate dispatch efficiency, enhance transportation safety.
- Multi-Service access: support various applications (SCADA, Passenger-ticket Management Information System, etc.)
- Easy maintenance: unified network deployment and management reduce operating expense



# Spain ADIF Railway Transmission Project

## Background & Needs

**Adif**, the administrator of railway infrastructures, is the world leader with 99.6% of train arrived with less than 3'. Up to 2010, Adif has 2,200Km high speed rail and 11,096Km conventional railway in service.

Traditional SDH network is in use along the 1200km-long railway around Madrid. Adif wants to rebuild the network, which has two fibers and fifty sites, for higher capacity and unified TDM&IP access.

## Huawei Solution

- 108 OSN 1800 equipments for unified TDM&IP access.
- C+DWDM: CWDM cost effective initial deployment + DWDM scalability (>1Tb/s).
- Optical line protection for each fiber between two adjacent stations.

## Benefits

- Multi-service access: E1, STM-1/4/16, FE, GE, 10GE.. etc.
- High capacity: 8\*10G(CWDM), and easy expansion to 16\*10G(DWDM).
- High reliability: switchover time < 50ms.

## High Capacity, Unified TDM&IP Access



# Alibaba DC Disaster Recovery Project

## Background & Needs

Alibaba is the largest e-business company in china and the second one in the world .  
 Founded in 1999 in Hangzhou , China . Alibaba contains Taobao Marketplace , Alibaba cloud Computing , Alipay and Koubei.com . There are six DataCenters in Alibaba HQ to support global service.

## Huawei Solution

- OSN6800 for each node which support 80\*40G, OSN1500B for E1 and FE service access
- Tributary side support FC400 , 10GE , GE , FE and E1 port
- In first phase , offer 42\*10G bandwidth (42 wavelength, 10G each wavelength )
- The protection is ODUk SNCP .

## Benefits

- High reliability: equipment-level protection(1+1 hot backup for key boards) and network-level protection(SNCP) , switchover time <50ms.
- Easy bandwidth upgrade (42\*10G to 80\*40G)
- U2000 unified network management to reduce operating expense

Flexible Access, High Bandwidth



# EVN NPC DWDM Project

## Background & Needs

Vietnam Electricity (EVN) is the largest power company in Vietnam having an installed electricity generation capacity of 8,860 MW and a distribution network of 19,396 kilometers . North Power Corporation (NPC) is one of the EVN's seven subsidiaries .The DWDM network is used for twenty-four UHV substations connection , the longest distance among substations is 120 kilometers ..

## Huawei Solution

- OSN6800 for each node which support 80\*40G, OSN1500B for E1 and FE service access
- Tributary side support FC400 , 10GE , GE , FE and E1 port
- In first phase , offer 42\*10G bandwidth (42 wavelength, 10G each wavelength )
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## Benefits

- High reliability: equipment-level protection(1+1 hot backup for key boards) and network-level protection(SNCP) , switchover time <50ms.
- Easy bandwidth upgrade (42\*10G to 80\*40G)
- U2000 unified network management to reduce operating expense

## Flexible Access, Smooth Evolution



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# OSN 1800 Major Components List

Component	Description
<b>TNF-Case-II</b>	Case-II(2U,Fan)
<b>TNF-SCC</b>	System Control & Communication Board with OSC,Wind Cooling Mode
<b>TNF1FIU01</b>	Fiber Interface Unit,(CWDM&DWDM)
<b>TNF1MR410</b>	4-ch Add/Drop Multiplexer,100GHz(192.1/192.2/192.3/192.4THz)
<b>TNF1OPU</b>	Optical Pre-Amplifier Unit (-19dBm/1dBm,20dB Gain,C-BAND) ,Wind Cooling Mode
<b>eSFP-1310nm-L-4.1</b>	Optical Transceiver,eSFP,1310nm,STM4,-3~2dBm,-30dBm,LC,SM,40km
<b>TNF-ELOM</b>	Enhanced 8 x Multi-rate-Service ports Multiplexing Optical Wavelength Conversion Board(OTU2)(1*193.60-10.71G-40km,8*eSFP-1310nm-10km-GE/FC100/FICON)
<b>SS-OP-LC-FC-S-20,G.657B</b>	Patch Cord,LC/PC-FC/PC,Single mode,G.657A2,2mm,20m,LSZH
<b>SS-OP-ATN-LC-5</b>	Fixed Optical Attenuator,1310/1550nm-5dB-LC/PC->45dB
<b>SSC-DCM-CAGE-D</b>	Double-DCM CAGE(ETSI Rack)
<b>SSE-DCM(A)-C-652(20km)</b>	Dispersion Compensation Module

# OTU cards: Unique & Better features

	Cards	Specification	Advantage than others
2.5G	LDGF	2 GE + 2 FE => OTU1, 1 protected line port	More 2*FE
	LDGF2	2*(2*GE=>OTU1), 2 protected line port	Double capacity
	LQG	4*GE=> OTU5G, 1 protected line port	Unique 5G line rate
	LQM	4*Any(100M~2.7G) , 1 protected line port	Single λ supports 2*GE+2*STM-1
	LQM2	8*Any(100M~2.7G) => OTU1, 1 protected line port or 2*(4*Any)=> 2 OTU1, no protected line port	2 times common 4*Any
10G	LSX	10G Any (STM64/OC192, 10GE LAN/10GE WAN) => OTU2	Unique for metro edge WDM
	ELOM	8*Any (100M~10G) => OTU2	Unique for metro edge WDM
	LEM18	16*10GE+2*10GE/GE=> OTU2/10GE	High density of ETH service access
	EPON	2 EPON/GE => OTU1 , 1 protected line port	Unique EPON over WDM/OTN solution. GE□ODU0□(×2)□ODU1 also supported.
		8 EPON/GE => OTU2	LOE card also support 8*GE => OTU2
	GPON	1 GPON => OTU1, 1 protected line port	Unique GPON over WDM/OTN solution
		4 GPON/STM-16/OTU-1 => OTU2	
	E1/T1 feature	21 E1/T1 + 2 STM-1 => 2 STM-1/4	E1/T1

\*Card labeled by Green is newly added at R3

# OSN 1800 I:

## 4 channels + 1310nm in single 1U box



- 443mm×44mm×220mm (W×H×D)
- 3 slots for OTU card
- OTM: 4 C/DWDM channels + 1310nm
- OADM: 2 protected C/DWDM channels + 1310nm

### Unique Features

- 2 protected  $\lambda$  in single card (LWX2, LDGF2)
- 2×GE + 2×STM-1 in single 2.5G  $\lambda$ (LQM, LQM2), or
- 2×GE + 2×FE in single 2.5G  $\lambda$  (LDGF), or **2×10GE/GE+2×GE (LEM18)** ,  
**8×Any(ELOM)**
- **PON、CPRI over OTN** for Central office consolidation

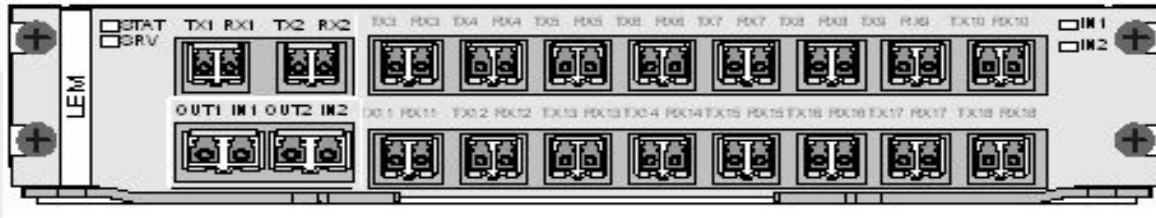
# OSN 1800 II:

## 8 protected ch + 1310nm in single 2U box



- 2U device: 442mm×88mm×220mm(W×H×D)
- **6 slots** for OTU card
- OTM: 8 C/DWDM channels + 1310nm
- OADM: **8 Protected C/DWDM channels** + 1310nm (e.g. 4×LDGF2/LWX2 + 2×MD8/MR8 + SCC )
- Capacity: **20G** for single device in CWDM (4×LDGF2/LQM2/LQG); **60G** for single device in DWDM (6×LSX)

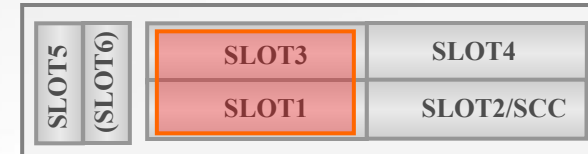
# LEM18: L2 card with high density GE/10GE



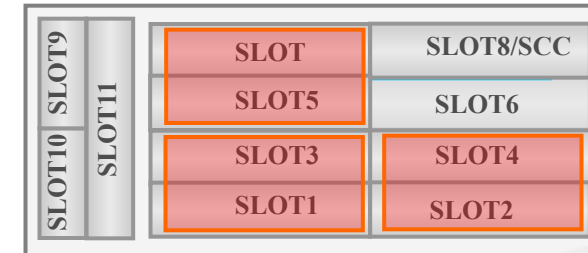
## Card Feature:

- **High Density Ethernet Service Access:**
  - Client side: **16×GE/FE+2×10GE/GE**. GE/FE service support electrical and optical module.
  - WDM line side: OTN mode and ETH mode. 2×OTU2 in OTN mode, 2×10GE in ETH mode.
  - Pluggable SFP/SFP+/XFP/TXFP
- **Rich L2 feature, including** EPL/EVPL/EPLAN/EVPLAN, QinQ, QoS, etc.
- Protection:
  - Client side: LAG.
  - **WDM side: ERPS in OTN/ETH mode.**
- Management: G.709 in-band (ESC) (Notes: under OTN mode)

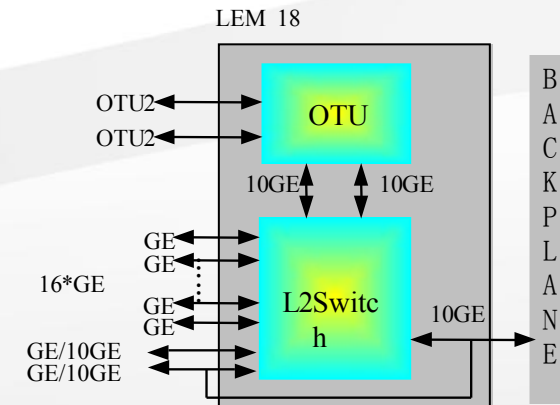
## One card with 2 slots:



## OSN1800-I

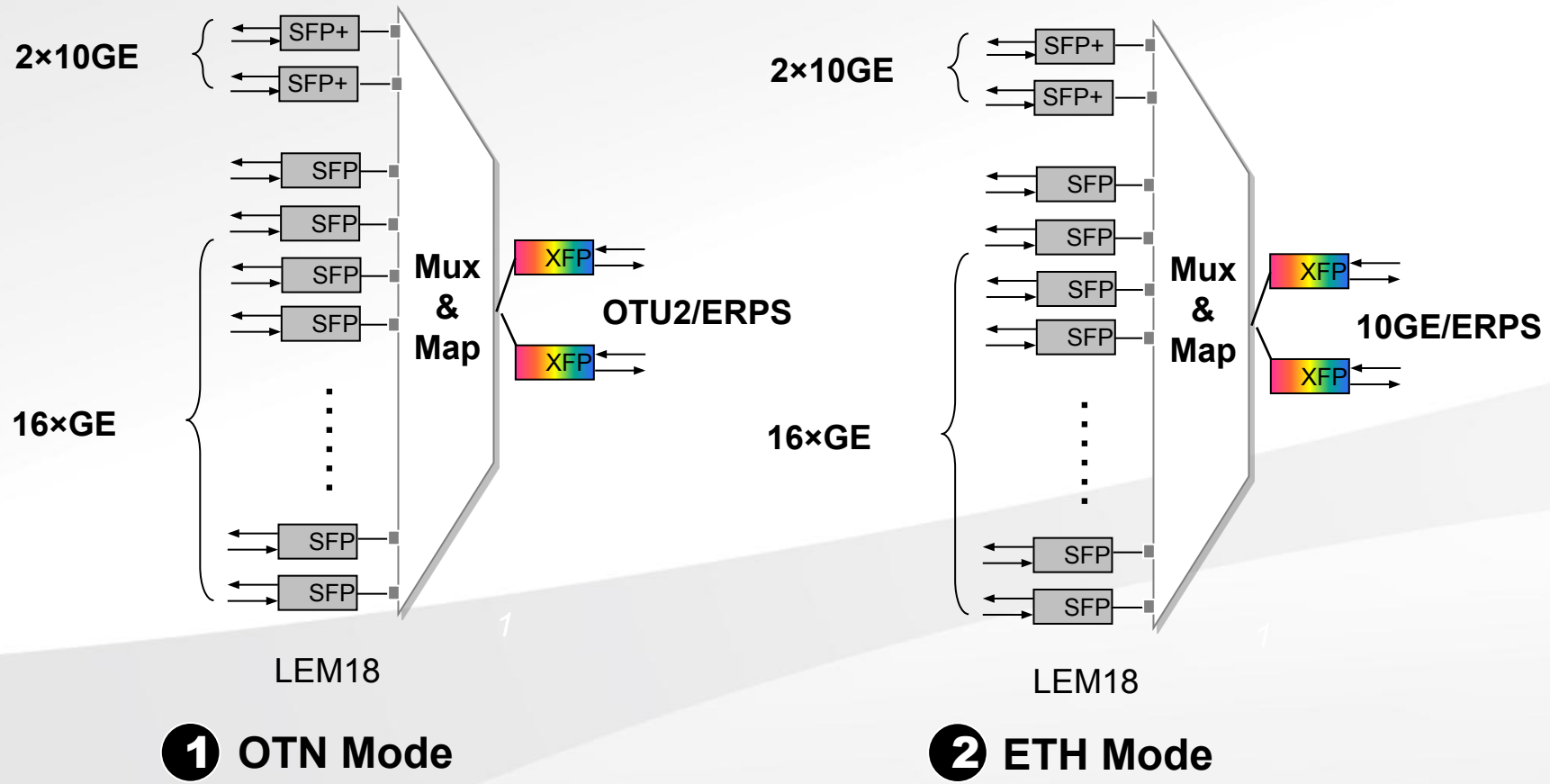


## OSN1800-II Note: Slot4/6 & Slot3/5 is available



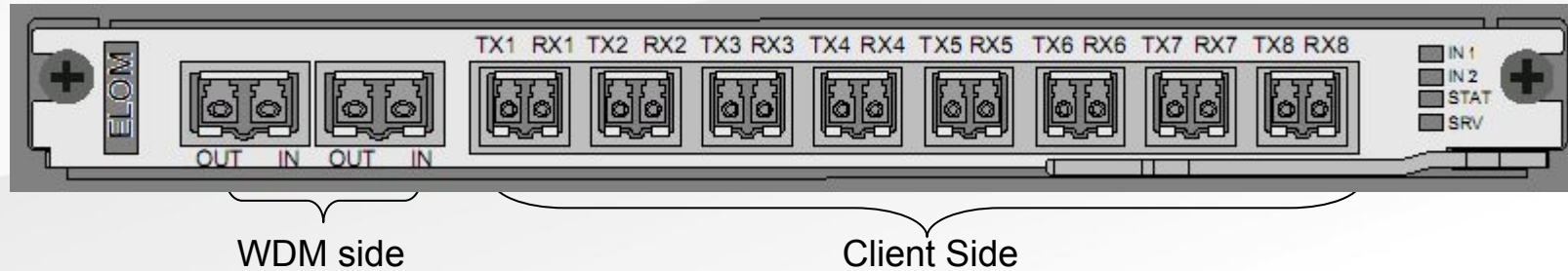
# LEM18: OTN Mode & ETH Mode

Dual Mode in One Card



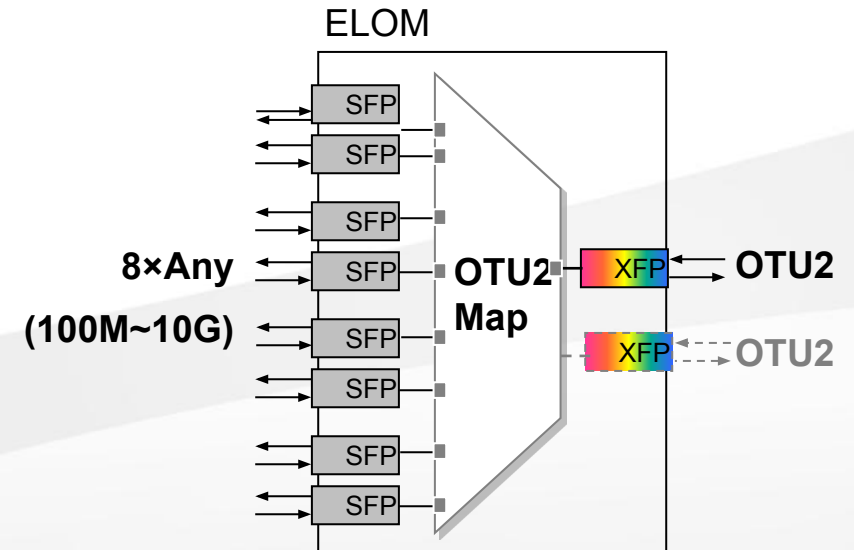


# ELOM: 8×Any (100M~10G) □ OTU2

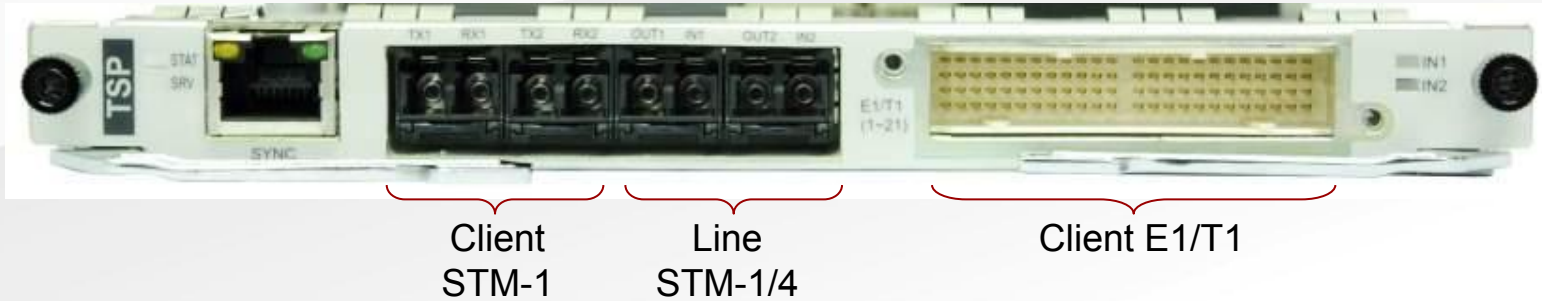


## Card Feature:

- **Client Side: 8×Any(100M~10G) including:**
  - FE, GE, 10GE LAN, STM-1/4/16, OTU1
  - FC 1G/2G/4G/8G, FICON, FICON Express, ESCON
  - InfiniBand 2.5G/ 5G
  - DVB-ASI, HDTV, HD-SDI, SDI
  - CPRI: 1.2288Gbit/s, 2.4576Gbit/s, 6.1440Gbit/s
- Pluggable SFP/SFP+/XFP/TXFP
- **ODU0/1/2 Mapping**
- Protection:
  - **WDM side: 1+1 line side**
  - Client side: Client side 1+1 (working with another ELOM)
- Management: G.709 in-band management (ESC)

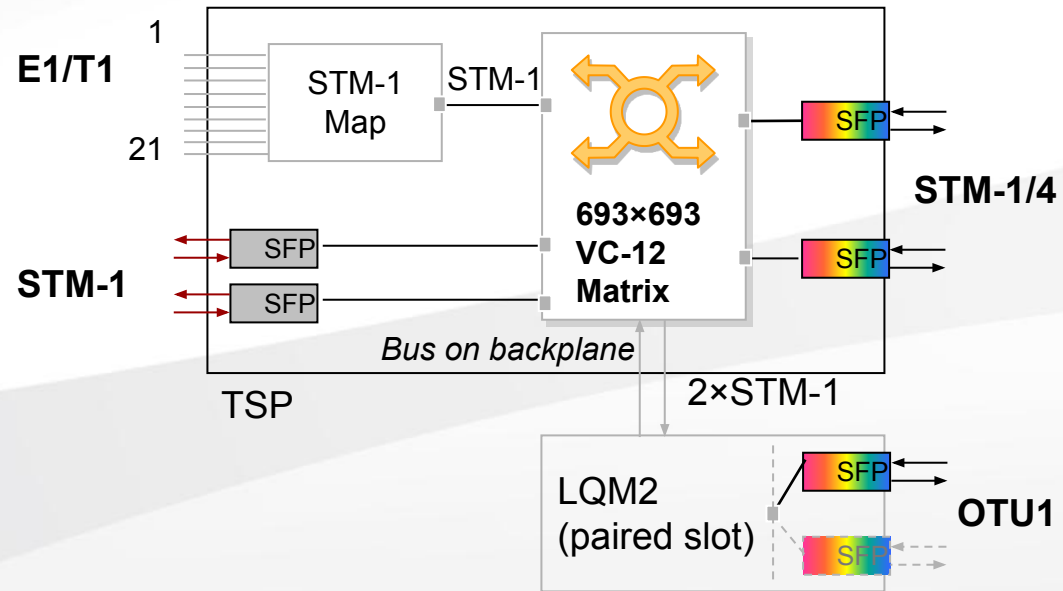


# TSP: 21 E1/T1 + 2 STM-1/4



• **Features:**

- **Access 21 E1 or T1 (electrical port), and 2 STM-1(optical port)**
- All optical port support SFP
- Data exchange with LQM2 card in paired slot

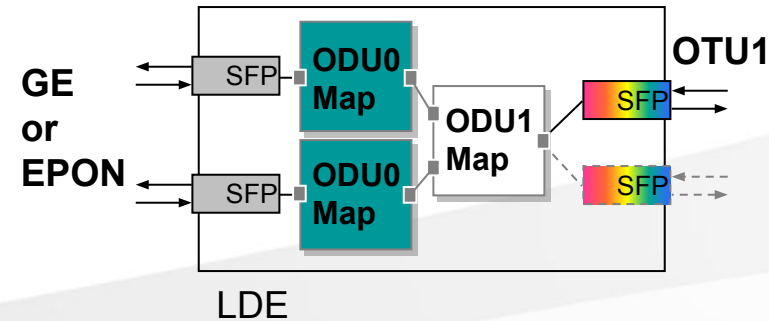


# LDE: 2 EPON/GE □ OTU1

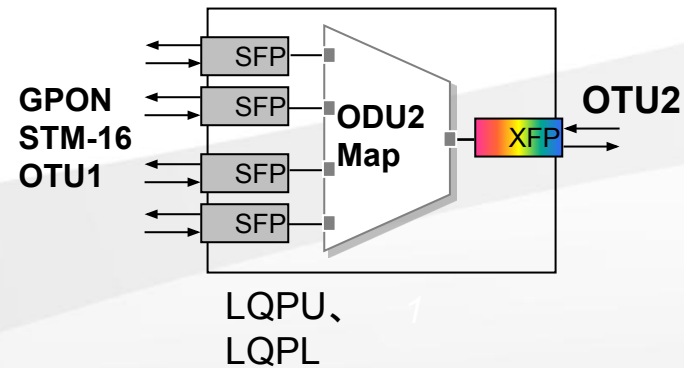


## • Features:

- **2 EPON or GE optical input**
- Client & Line SFP
- Protection (Optional):
  - OTU 1+1 (With external OLP)
  - Embedded WDM channel 1+1
- LPT (Link-state Pass Through)
- Jumbo frame
- **ODU0 Mapping supported**
- G.709 In-band Management (ESC)

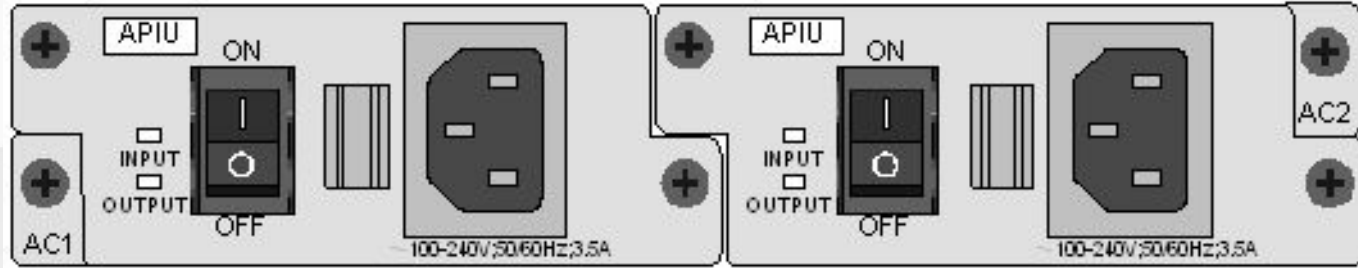


# LQPU & LQPL: 4 GPON/STM-16/OTU1 □ OTU2



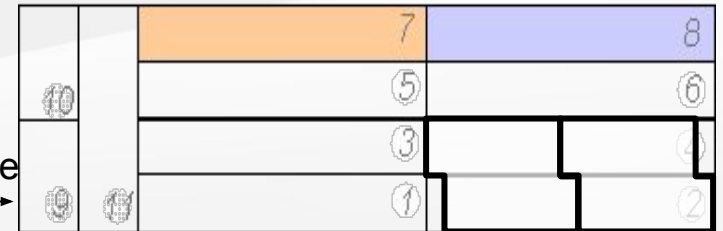
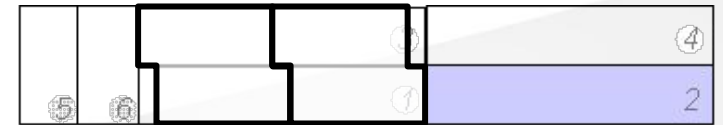
**Notes: different cards used in OLT side and ONU side.**

# APIU: AC Power Input



- **Features:**

- **AC Power (100 ~ 240 VAC, 47 - 63 Hz) Input**
- Occupy 2 vertical card-slots
- Protection:
  - Card 1+1 (Default)



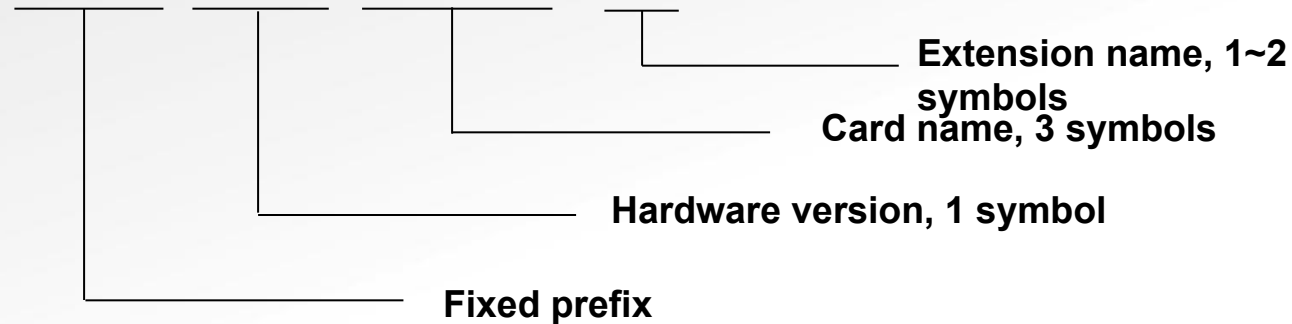
## Appendix

# Cards Naming Rule



# Appendix: Naming Rule of Cards (1/4)

- Total naming rule



# Appendix: Naming Rule of Cards (2/4)

- Naming rule of **system** card



Extension name, A or B for different card

Card name, 3 symbols

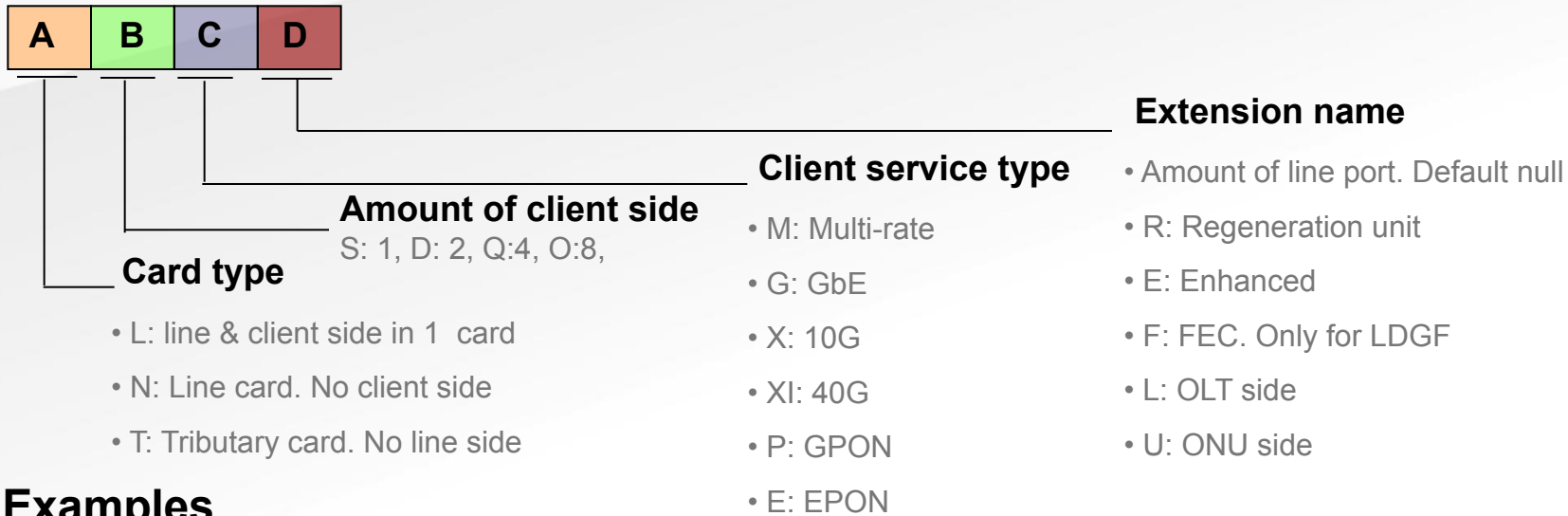
- SCC: Controller card
- FAN: Fan tray unit
- PIU: Power supply unit

- Examples

No.	Card name	Card description	Shortened form
1	TNF1PIUA	Power supply unit for OSN 1800 1U device	PIUA
2	TNF1PIUB	Power supply unit for OSN 1800 2U device	PIUB
3	TNF1FANA	Fan tray unit for OSN 1800 1U device	FANA
4	TNF1FANB	Fan tray unit for OSN 1800 2U device	FANB

# Appendix: Naming Rule of Cards (3/4)

## • Naming rule of OTU card



## • Examples

No.	Card name	Card description	Shortened form
1	TNF1LQM2	Double 4 x Multi-rate ports wavelength conversion card	LQM2
2	TNF1LSPU	ONU Side Single Port GPON Access wavelength conversion card	LSPU
3	TNF1LSPR	Single Port GPON 3R extension card	LSPR

- **Exception: LWX2/LWXR2:** Double Arbitrary Bit Rate (42Mb/s~2.67Gb/s) transparent transport/regeneration card.

# Appendix: Naming Rule of Cards (4/4)

## • Naming rule of OADM card



**Default null.**

- S: Single fiber work
- D: double OADM in 1

**Default null. S means it includes 1310nm OSC**

**Amount of  $\lambda$ . Value is 1/2/4/8**

**Card type**

- M: multiplexing card
- D: De-multiplexing card
- MD: MUX & DeMUX in 1
- MR: OADM core card
- MB: band-filter

## • Examples

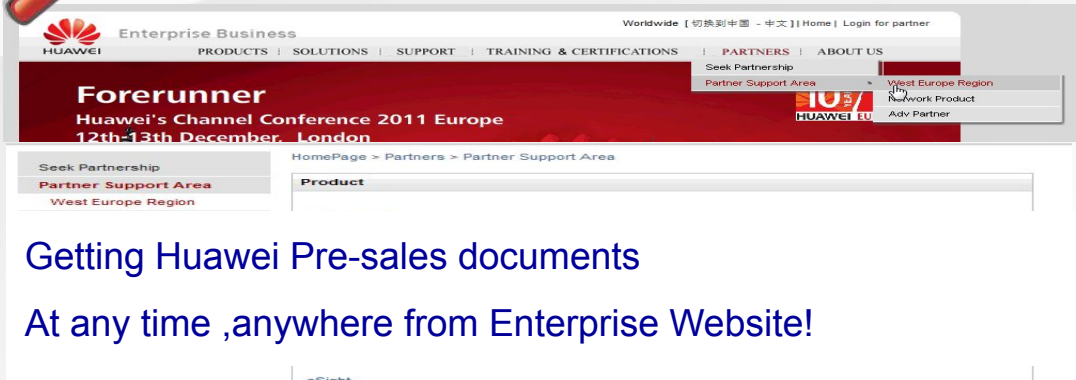
No.	Card name	Card description	Shortened form
1	TNF1MR1	Single Channel OADM card	MR1
2	TNF1MR1S	single Channel OADM card With 1310nm OSC	MR1S
3	TNF1SBM1	Single Fiber Bidirectional single channel OADM card	SBM1
4	TNF1MD8	8 Channels Multiplexing and De-multiplexing card	MD8

# Huawei Kung Fu Document - Weapons for you

## Weapon1: Enterprise Website



<http://enterprise.huawei.com>



Getting Huawei Pre-sales documents  
At any time ,anywhere from Enterprise Website!

## Weapon 2: Bookshelf

Sorts	Doc Types	Document Name	Product Type	Version	Path of Website	Link of Website
Customer Communications	Main Slide	Professional Quality, Simplicity Network Series LAN Switch Main Slide V3.2	ALL	V1R6	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Customer Communications	<a href="#">Web</a>
Customer Communications	Brochure (Simple Edition)	Brochures(Simple Edition)	S1700/2700/3700/5700/6700/7700/S9300	V1R6	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Customer Communications	<a href="#">Web</a>
Customer Communications	Brochure (Detail Edition)	Brochures(Detail Edition)	S1700/2700/3700/5700/6700/7700/S9300	V1R6	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Customer Communications	<a href="#">Web</a>
Bidding	Brief Ordering Guide	Guide	S1700/2700/3700/5700/6700/7700/S9300	V1R6	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Bidding	<a href="#">Web</a>
Sales Guide	Brief Sales Guide	IP Product Brief Sales Guide	ALL	V1R6	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Sales Guide	<a href="#">Web</a>
Bidding	Product Models Comparison with Competitor	Oversea Switches Models Comparison	ALL	/	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Bidding	<a href="#">Web</a>
Training	Pre-sale Training Slides	Huawei Quidway SX7 Series Switch Introduction V1.2	ALL	/	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Training	<a href="#">Web</a>
Brand	Case Study	Huawei Datacom Product Cases on Industry Networks	ALL	/	HomePage > Partners > Partner Support Area > West Europe Region > Product > LAN Switch > Brand	<a href="#">Web</a>

- Rich information
- Quick access and search
- Convenient navigation

## Weapon3: Document Email



Where can I find it and feedback?



[WEUdoc@huawei.com](mailto:WEUdoc@huawei.com)

## Weapon4: Powerful Material



# How to Get Presales Help



Partners

[WEUpresales@huawei.com](mailto:WEUpresales@huawei.com)



Call Center

*Country		*Company Name	
*Product		Project Name	
*Contact Person		*Phone	
*Email Address			
*Question Description			

Huawei Experts



Partners

00800-33888888



- 5\*8 hours presales email and telephone support
- Products and solutions consulting



**Open  
Discussion  
Any Question?**



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