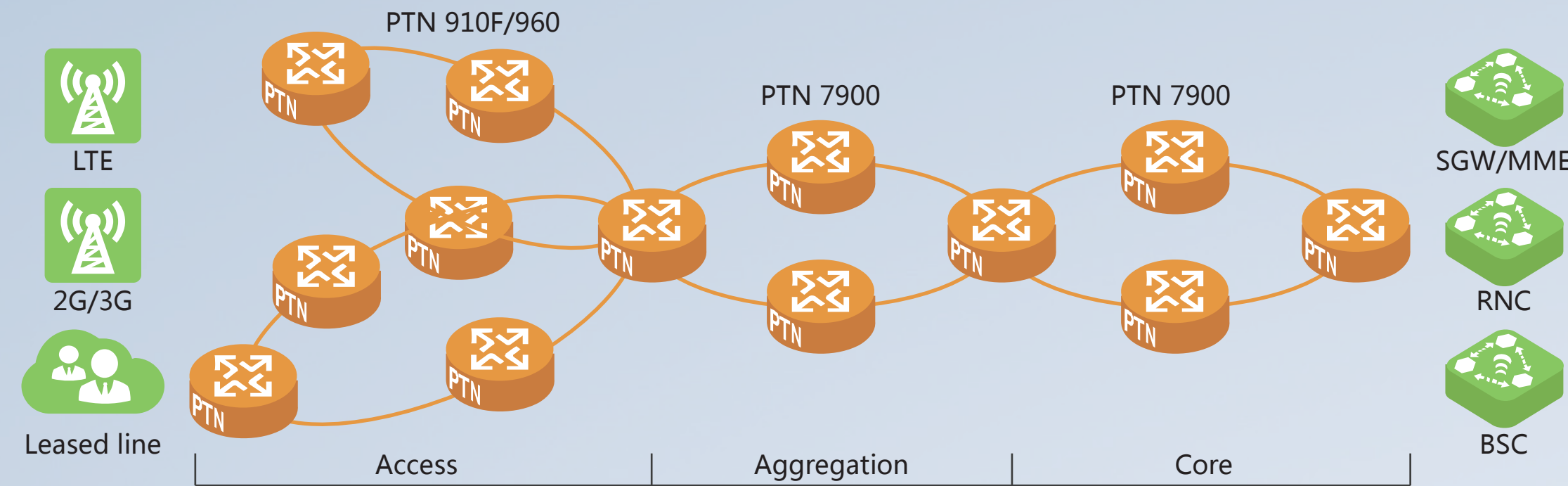


# PTN on the Way, SPTN Shifts Future



## 1. SPTN Fitting into LTE Development

**SPTN**  
Super Smart Soft



### Equipment Capacity

**Super**

- PTN960 10GE platform Access
- PTN3900 40GE platform Aggregation
- PTN7900 40/100GE platform Core

- 300 mm deep
- T bit/s-level, large capacity
- Dual-engine MPLS-TP & IP

### Service-oriented

**Smart**

- HQoS, Rigid & Flexible pipeline
- Intelligent O&M, visual network quality

Fine service operation

### Network Evolution

**Soft**

- Flexible programmable hardware core
- SDN architecture, separating control and forwarding

Current Network: Plan, Dispatch, Deploy, Monitor

SDN-based Soft Network: Monitor, APP, API

NMS-based network vs SDN architecture, simplify O&M to the extreme

## 2. All Series of PTN Equipment Available from Access to Core, with Enhanced Capabilities

Customized for VIP Leased Line Services

- PTN 905 (4G)
- PTN 910-F (9.23G max)
- PTN 910 (10.6G max)
- PTN 950 (12G max)

Double Capacity, Same Power Consumption

- PTN 960 (56G max)
- PTN 1900 (80G max)

Largest Tbit/s Capacity

- PTN 3900-8 (160G/320G)
- PTN 3900 (320G/640G)
- PTN 6900 (1.6T)
- PTN 7900-24 (2.88T)
- PTN 7900-32 (3.84T)

GE
10GE
40GE
100GE (SDN architecture)

## MPLS-TP&IP Dual-Engine, Smooth LTE Evolution

### SPTN Fitting into LTE Development

**MPLS-TP&IP dual-engine, smooth LTE evolution**

- PTN 7900 based on the VRP8 platform, and MPLS-TP & IP dual-engine.
- Inventory network smoothly evolving to LTE, 2G/3G carrier services not affected, and no network reconstruction required.

### Most complete MPLS-TP OAM

**SDN**

- SPTN supports the most complete MPLS-TP OAM capabilities.
- SPTN supports comprehensive ETH/TDM/ATM service protection and link protection mechanisms, and Provides carrier-class protection switching within 50ms.

## SPTN Solution

### 1. Super – SPTN Leading Product – PTN 7900



PTN 7900-24 (2.88T) Most compact in the industry

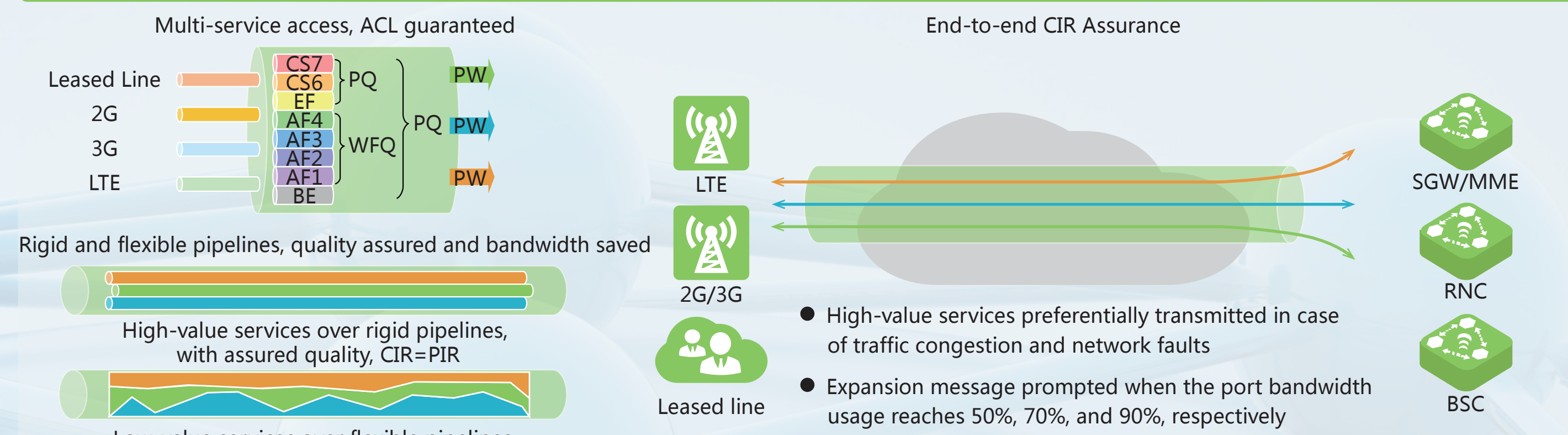
PTN 7900-32 (3.84T) Largest capacity in the industry

- Super-strong switching capacity, support for smooth upgrade to 12.8 Tbit/s**
  - Largest capacity of 3.84 Tbit/s in the industry
  - 40GE/100GE pipes, in support of long-distance transmission of 80 km
- Flexible power distribution, efficient heat dissipation**
  - 2+2 power supply, in support of a 2 Tbit/s switching capacity
  - Innovative π-shaped air ducts, with heat dissipation efficiency increased by 30%
- IP/MPLS-TP dual-engine design**
  - Powerful VRP8 kernel-based
  - IP/MPLS-TP dual-engine
  - Smooth evolution of inventory PTN to LTE
- First SDN-capable PTN in the industry**
  - SDN ready in software and hardware
  - Flexible and programmable hardware-based NP architecture
  - Smooth evolution of inventory PTN to SDN

Saved per device (annual) **40,000 KWH** = **40 tons** of carbon emission = **3 hectares** of forests

### 2. Smart – Rigid and Flexible Pipelines, with Visual Network Quality

Quality assurance for pipelines, enhancing customer experience



### Visual network traffic and assessable network quality, allowing for intelligent analysis of network performance



- Visual network-wide traffic, graphic display
- Assessable pipeline quality, customized report
- Predictable trend, proactive network expansion

### Enhance customer loyalty, proactive marketing and O&M

- Assessable and controllable service quality, with quality service experience for an enhanced customer loyalty.
  - Various types of network SLA reports, in support for service marketing and expansion.
  - Predictable trend and proactive O&M, with improved O&M efficiency.
- A week VS 2 hours
- Traditional mode vs HuaWei PTN

### 3. Soft – Future-oriented, smooth evolution to SDN

SPTN innovative collaborative layer, achieving smooth evolution to the SDN network.

**SPTN SDN Architecture**

- APP: OSS/BSS, APP
- Collaborative layer: Collaborative Device
- Control layer: EMS, Controller
- Forward layer: Traditional PTN, Mixed network, SDN PTN

Incremental Deployment Smooth Evolution to SDN

#### 1. MPLS-TP Network

Based on MPLS-TP 2G/3G/LTE unified multi-service bearer (currently implemented).

#### 2. Quasi-Soft Network

Based on Collaborative Device Separation of control and forwarding, collaborative device unifying the traditional networks and SDN network, smooth evolution to SDN.

#### 2. SDN-Soft Network

Based on SDN Architecture Implement standardization and virtualization of equipment and interfaces, and network resource sharing.

## Acronyms and Abbreviations

- SDN: Software-defined Networking
- EDD: Ethernet Demarcation Device
- LTE: Long Term Evolution
- MPLS-TP: MultiProtocol Label Switching Transport Profile
- MME: Mobility Management Entity
- SGW: Service Gateway
- FRR: Fast Reroute
- BFD: Bidirectional Forwarding Detection
- LAG: Link Aggregation Group
- PWE3: Pseudo Wire Emulation Edge-to-Edge

## 2015

January	February	March	April
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5
8 9 10 11 12 13 14	8 9 10 11 12 13 14	8 9 10 11 12 13 14	6 7 8 9 10 11 12
15 16 17 18 19 20 21	15 16 17 18 19 20 21	15 16 17 18 19 20 21	12 13 14 15 16 17 18
18 19 20 21 22 23 24	18 19 20 21 22 23 24	18 19 20 21 22 23 24	19 20 21 22 23 24 25
25 26 27 28 29 30 31	22 23 24 25 26 27 28	22 23 24 25 26 27 28	19 20 21 22 23 24 25
	29 30 31	29 30 31	26 27 28 29 30

May	June	July	August
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4	1
8 9 10 11 12 13 14	8 9 10 11 12 13	5 6 7 8 9 10 11	2 3 4 5 6 7 8
15 16 17 18 19 20 21	14 15 16 17 18 19 20	12 13 14 15 16 17 18	9 10 11 12 13 14 15
18 19 20 21 22 23 24	17 18 19 20 21 22 23	19 20 21 22 23 24 25	16 17 18 19 20 21 22
25 26 27 28 29 30 31	24 25 26 27 28 29 30	26 27 28 29 30 31	23 24 25 26 27 28 29
			30 31

September	October	November	December
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5 6 7	1 2 3 4 5
8 9 10 11 12 13 14	8 9 10 11 12 13	8 9 10 11 12 13 14	6 7 8 9 10 11 12
15 16 17 18 19 20 21	14 15 16 17 18 19 20	15 16 17 18 19 20 21	13 14 15 16 17 18 19
18 19 20 21 22 23 24	18 19 20 21 22 23 24	18 19 20 21 22 23 24	20 21 22 23 24 25 26
25 26 27 28 29 30 31	25 26 27 28 29 30 31	29 30	27 28 29 30 31

## 2016

January	February	March	April
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5
8 9 10 11 12 13 14	7 8 9 10 11 12 13	6 7 8 9 10 11 12	3 4 5 6 7 8 9
15 16 17 18 19 20 21	14 15 16 17 18 19 20	10 11 12 13 14 15 16	10 11 12 13 14 15 16
18 19 20 21 22 23 24	17 18 19 20 21 22 23	17 18 19 20 21 22 23	17 18 19 20 21 22 23
25 26 27 28 29 30 31	22 23 24 25 26 27 28	20 21 22 23 24 25 26	17 18 19 20 21 22 23
	28 29	27 28 29 30 31	24 25 26 27 28 29 30

May	June	July	August
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6	1 2	1 2 3 4 5 6
8 9 10 11 12 13 14	5 6 7 8 9 10 11	3 4 5 6 7 8 8	7 8 9 10 11 12 13
15 16 17 18 19 20 21	12 13 14 15 16 17 18	10 11 12 13 14 15 16	14 15 16 17 18 19 20
18 19 20 21 22 23 24	19 20 21 22 23 24 25	17 18 19 20 21 22 23	14 15 16 17 18 19 20
25 26 27 28 29 30 31	26 27 28 29 30	24 25 26 27 28 29 30	21 22 23 24 25 26 27
			28 29 30 31

September	October	November	December
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5	1 2 3 4 5	1 2 3 4
8 9 10 11 12 13 14	2 3 4 5 6 7 8	6 7 8 9 10 11 12	4 5 6 7 8 9 10
15 16 17 18 19 20 21	9 10 11 12 13 14 15	13 14 15 16 17 18 19	11 12 13 14 15 16 17
18 19 20 21 22 23 24	16 17 18 19 20 21 22	20 21 22 23 24 25 26	18 19 20 21 22 23 24
25 26 27 28 29 30 31	23 24 25 26 27 28 29	27 28 29 30	18 19 20 21 22 23 24
	30 31		25 26 27 28 29 30 31

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