PTN 990

Highly Integrated, Large-Capacity Access, Low Power Consumption, Easy O&M, Future Proof

Device Overview

Appearance

- **Highly integrated**
- **Compact:** 5 U high, installed in either an ETSI standard cabinet or 19-in cabinet
- **Large capacity:** 160 Gbit/s packet switching capacity
- **Dense slots:** 14 service slots

Key Features

- **High access capability:** Supports 40GE ports, mobile communications services, home broadband, and enterprise group user access, all in a uniform bearer mode
- **Low power consumption:** Supports green software/hardware design, dynamic fine-grained energy conservation control, smart heat dissipation, and 230 W power consumption with typical configurations.
- **Easy O&M:** Supports PnP, remote commissioning, service-level E2E detection, and performance monitoring
- **Future-proof:** Smooth evolution to 640G/100G and to SDN network

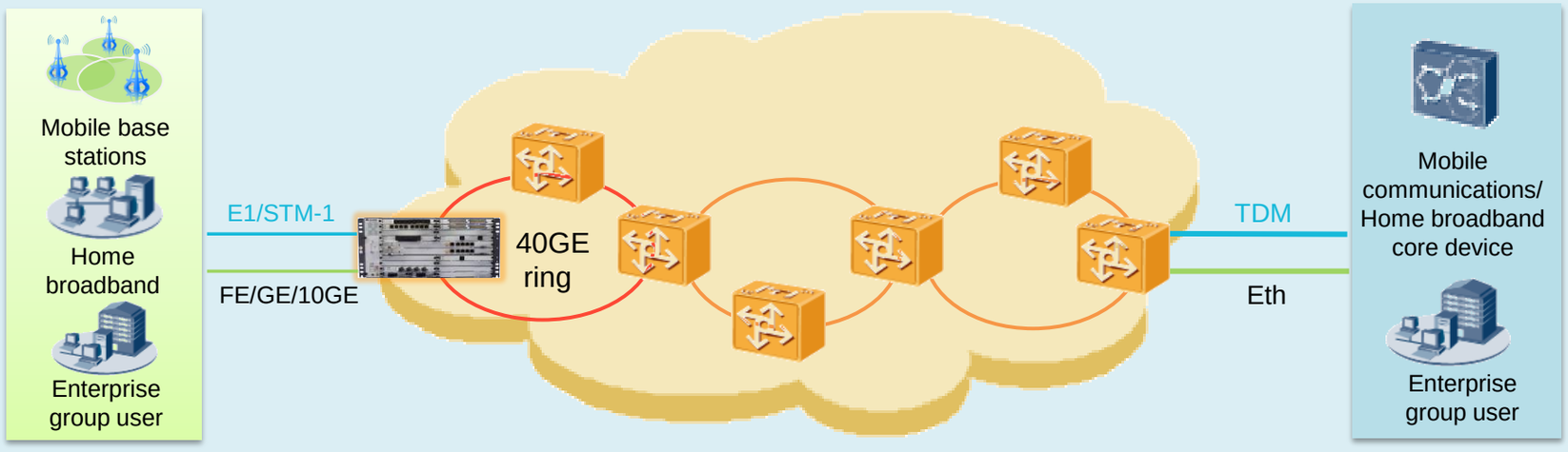
Software/Hardware Description

- **Star boards**

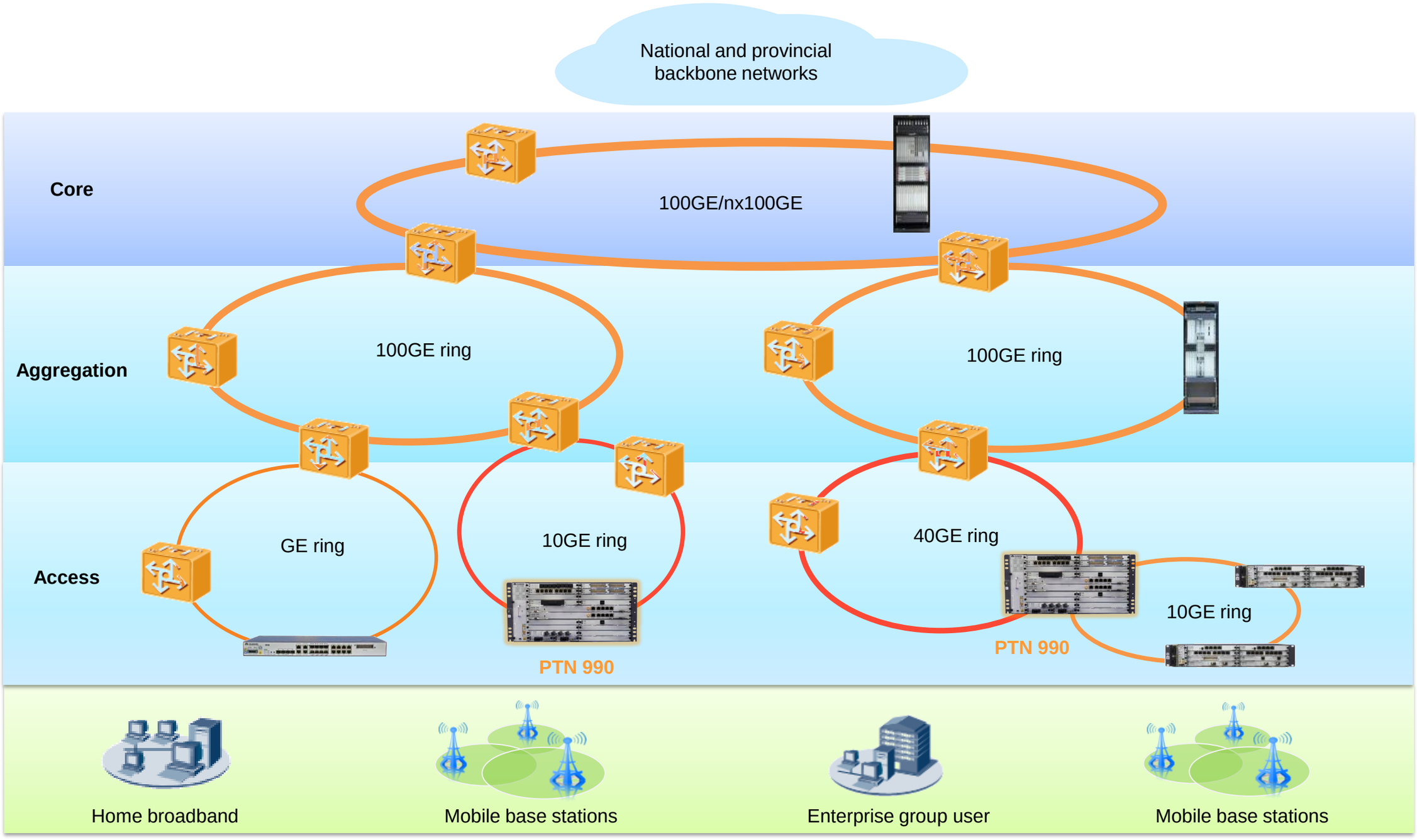
1x40GE: Highest access layer networking capability in the industry

- **Software features**
- **Service:** Multi-service access and uniform bearer, for efficient resource utilization
- **Protection HQoS:** Hierarchical E2E QoS management to provide exact service-type specific differentiated transport services
- **Protection:** Multi-level carrier-grade protection, which helps reliably transmit services
- **O&M:** An NMS runs DCN to manage PTN NEs. Multi-level OAM implements layered rapid fault detection and location.
- **Synchronization:** Precision clock/time synchronization, which helps lossless service transmission

Networking

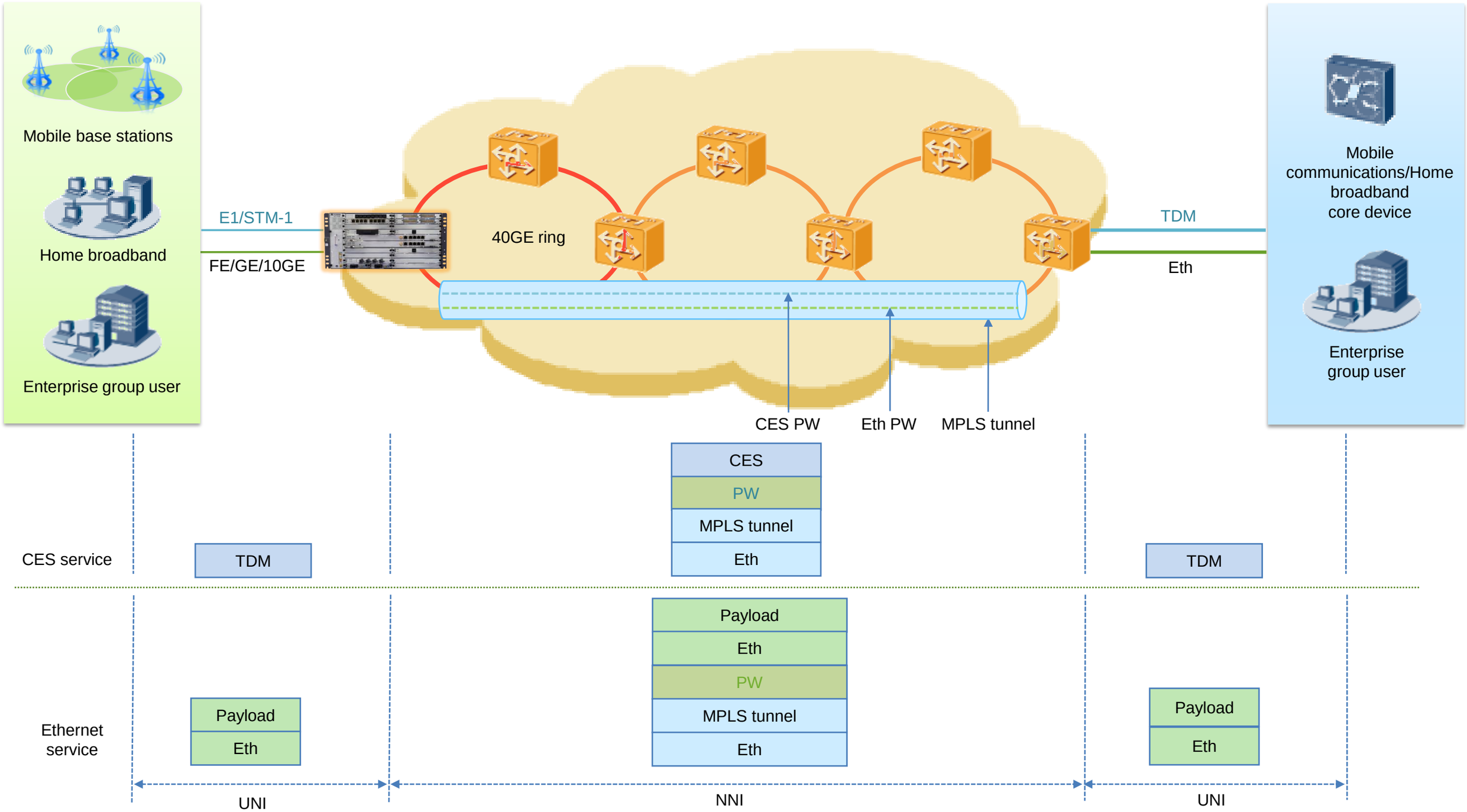


Usage Scenarios



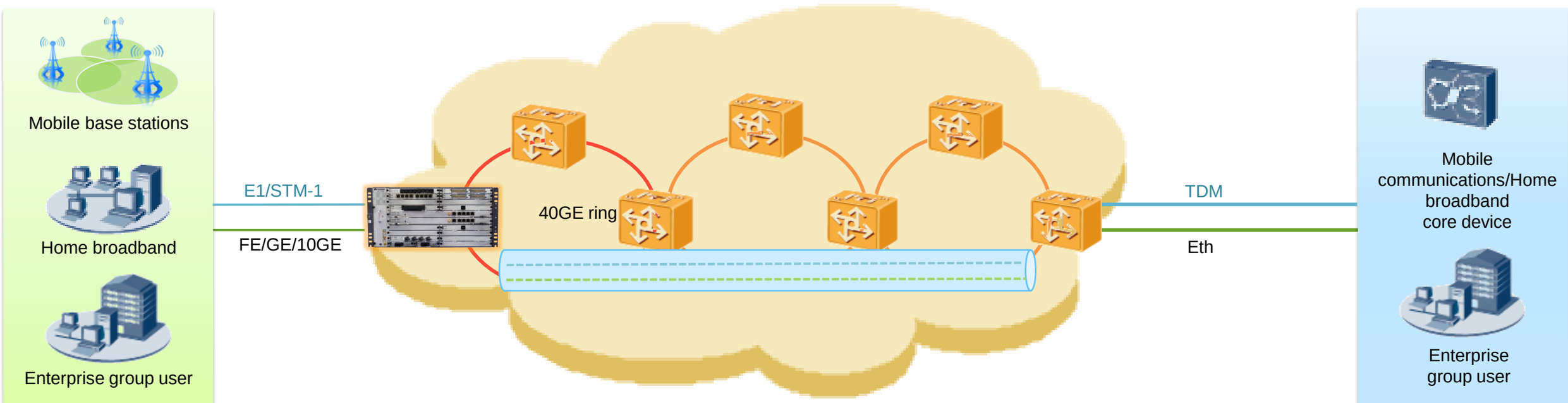
160G switching capacity/40G networking capability, Ethernet (GE/10GE/40GE) and TDM (E1/STM-1) port access, providing large-scale access for mobile bearer, enterprise group user, and home broadband services

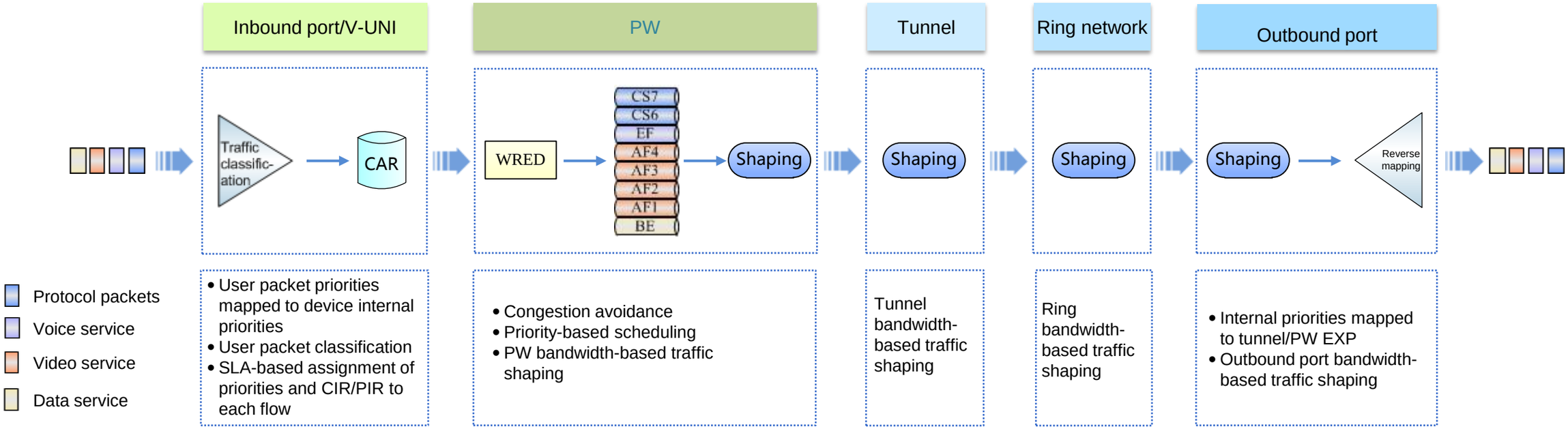
Software Features — Various Service Access and Uniform Network Bearering



User-side Ethernet (GE/10GE/40GE) and TDM (E1/STM-1) ports provide user access, and network-side E-Line/E-LAN and CES services are transmitted along MPLS tunnels/PWs, which efficiently uses resources.

Software Features — Hierarchical E2E QoS





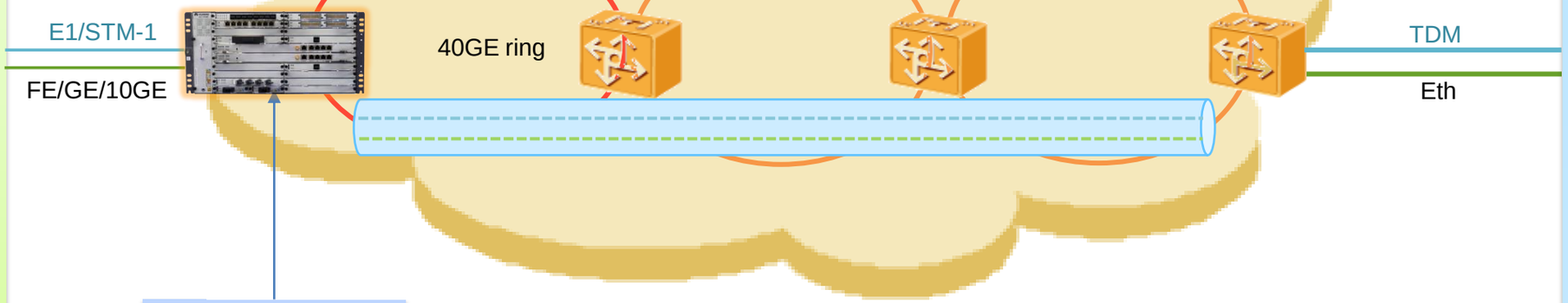
Supports hierarchical E2E QoS management and exactly provides service-specific differentiated transport services.

Software Features — Multi-level Carrier-Grade Protection

Mobile base stations

Home broadband

Enterprise group user



Mobile communications/Home broadband core device

Enterprise group user

Device-level protection (important boards 1+1 hot backup)

Bearer layer protection:
- MPLS tunnel APS: : Two PWs on disjoint paths protect each other.
- PW APS: Two PWs on disjoint paths protect each other.
- MPLS tunnel ring network protection: Dual-fiber bidirectional protection from multiple points of failure

Data link layer protection:
- LAG: Ethernet link protection
- LMSP: STM-1 link protection

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- LAG: Ethernet link protection
- LMSP: STM-1 /4 link protection

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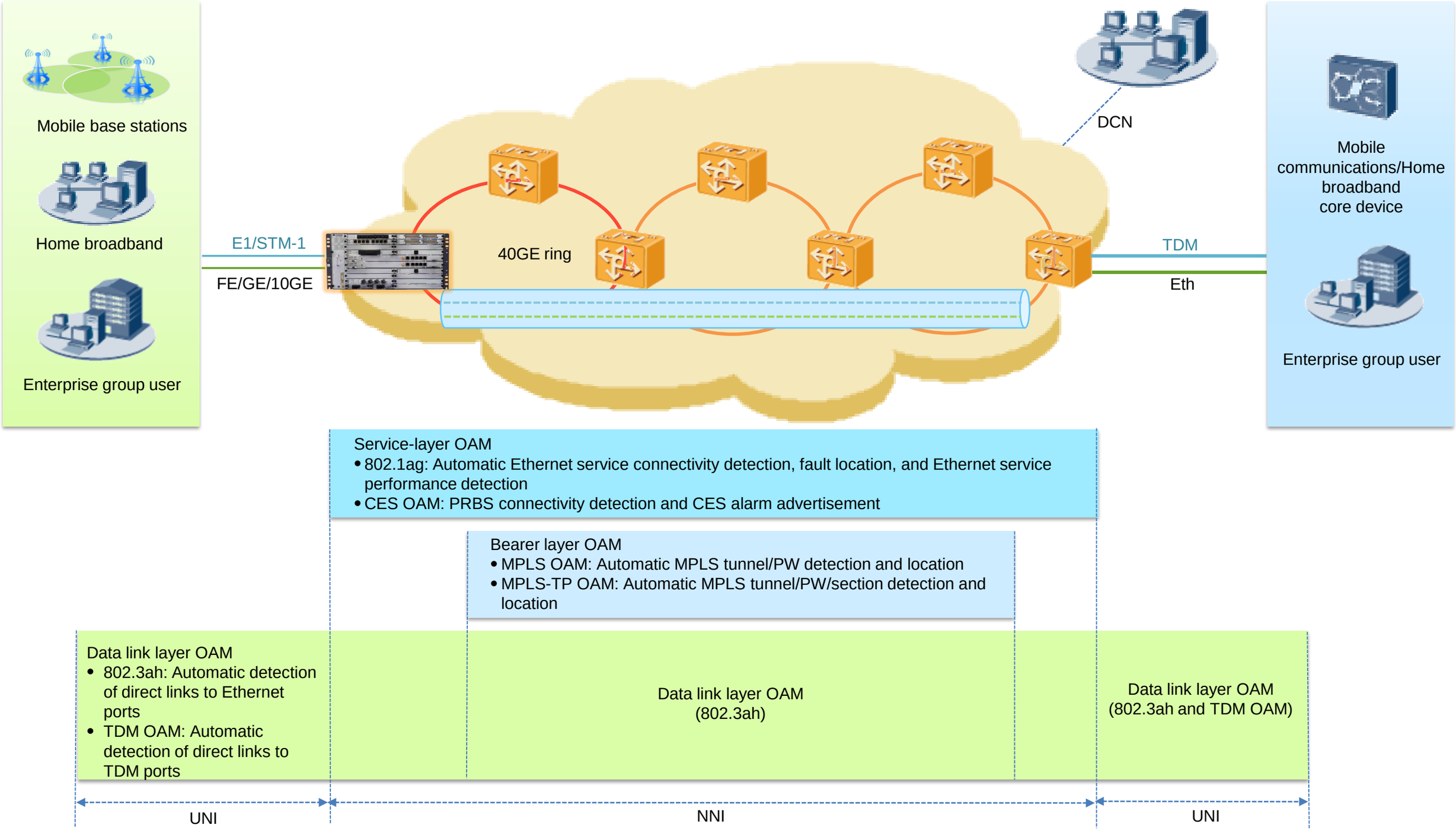
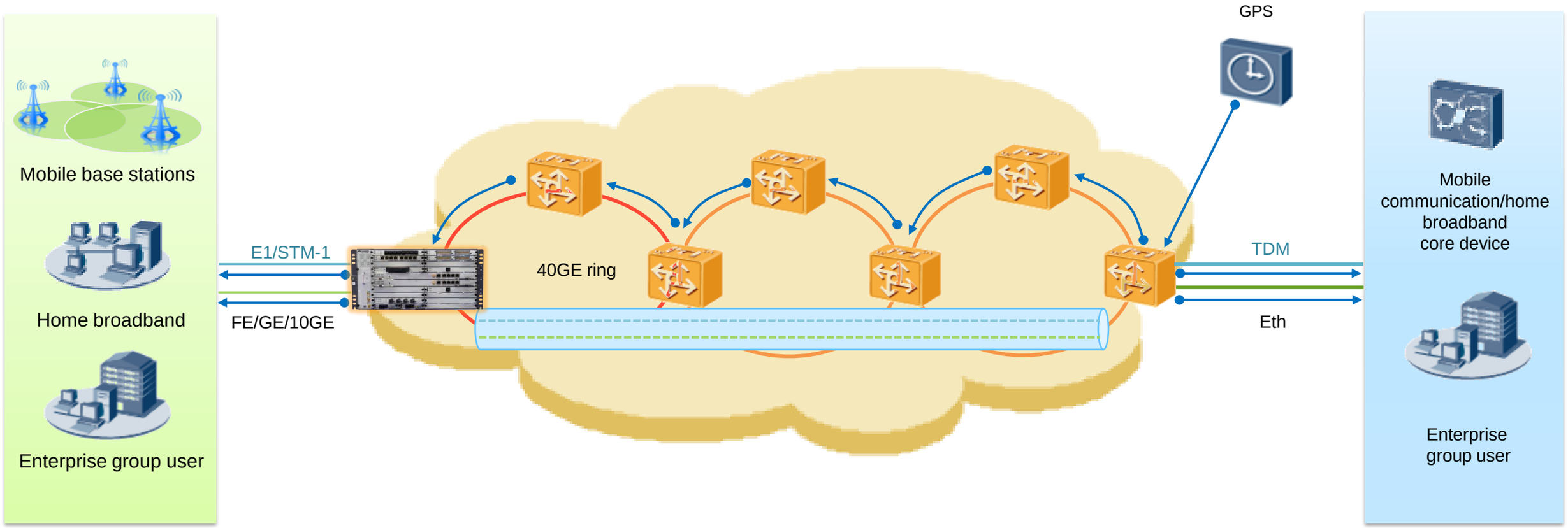
Supports device-level protection and data link/bearer layer carrier-grade protection, which helps reliably transmit services.

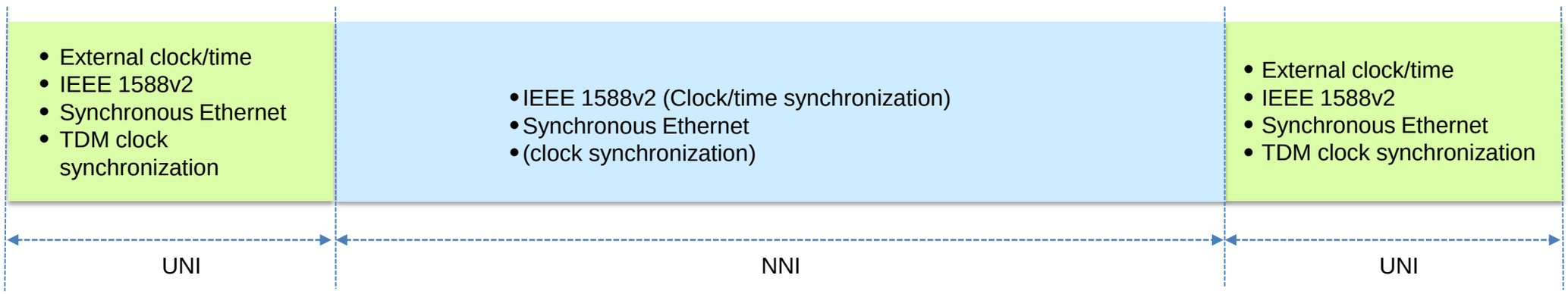
Software Features — O&M



- **Supports the NMS that runs DCN to manage PTN NEs.**
- **Supports data link layer OAM, bearer layer OAM, and service layer OAM, which implements hierarchical rapid detection and fault location.**

Software Features — Precision Clock and Time Synchronization





Supports various clock and time synchronization modes and provides precision clock and time synchronization for services, which helps implement lossless service transmission.

Device Configuration & Technical Specifications

Device Configuration

System control board	
TPJ1CXP	• Controls the system and schedules services. • Processes clock signals, and provides auxiliary interfaces • Supports 1+1 hot backup.
Service boards	
TPJ1EXL1	1-port 40GE Ethernet optical interface board
TPJ1EX1S	1-port 10GE Ethernet optical interface board (SFP+)
TPJ1EM8F	8-port GE/FE Ethernet optical interface board
TPJ1EM8T	8-port GE/FE Ethernet electrical interface board
TPJ1ML1A	16-port E1 interface board (75 ohm)
TPJ1ML1B	16-port E1 interface board (120 ohm)
TPJ1MD1A	32-port E1 interface board (75 ohm)
TPJ1MD1B	32-port E1 interface board (120 ohm)
TPJ1SQ1	4-port channelized STM-1 interface board
Power board	
TPJ1PIU	• Provides -48 V DC power ports • Supports 1+1 hot backup.
Fan board	
TPJ1FAN	Dissipates heat for a device, supports stepless speed adjustment, and provides fan redundancy.

Technical Specifications

Subrack parameters	
Cabinet	N63B, N63E, and 19-inch cabinets
Slots	System control boards: 1+1 Power boards: 1+1 Service boards: 14
HxWxD (mm)	220 x 442 x 222 (8.66 in. x 17.4 in. x 8.74 in.) 5 U high, 19 in. wide
Subrack weight	8 kg (17.64 bl.) (without boards)
Working voltage	–40 V to –72 V (DC)
Switching capacity	160 Gbit/s
Working temperature	0° C to 50° C (32° F to 122° F) (long term)

Maximum number of ports	
40GE	2
10GE	16
GE/FE optical	112
GE/FE electrical	112
10M electrical	112
STM-1 optical (VC3/VC4)	56
STM-1optical (VC12)	56
E1	448