BNG Solution for NG BB Architecture

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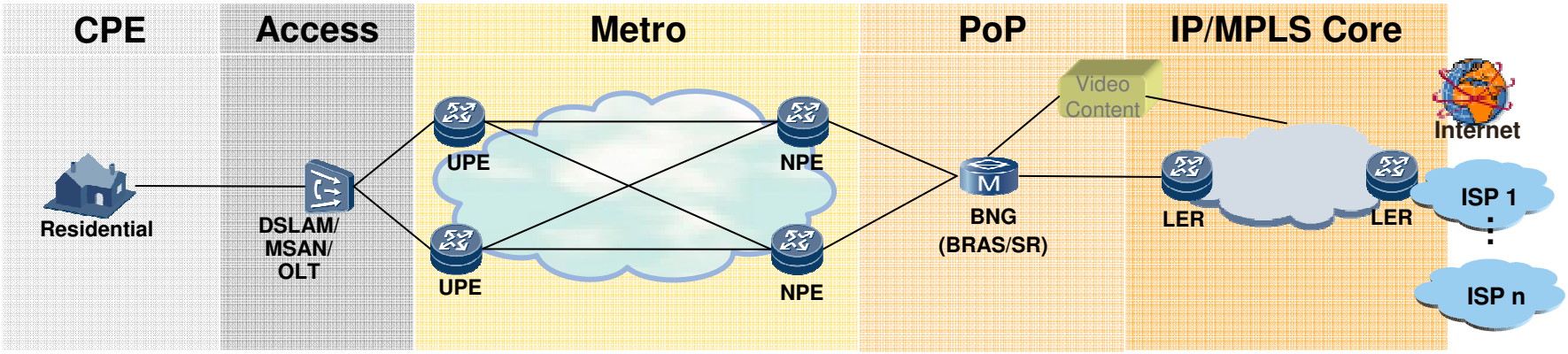
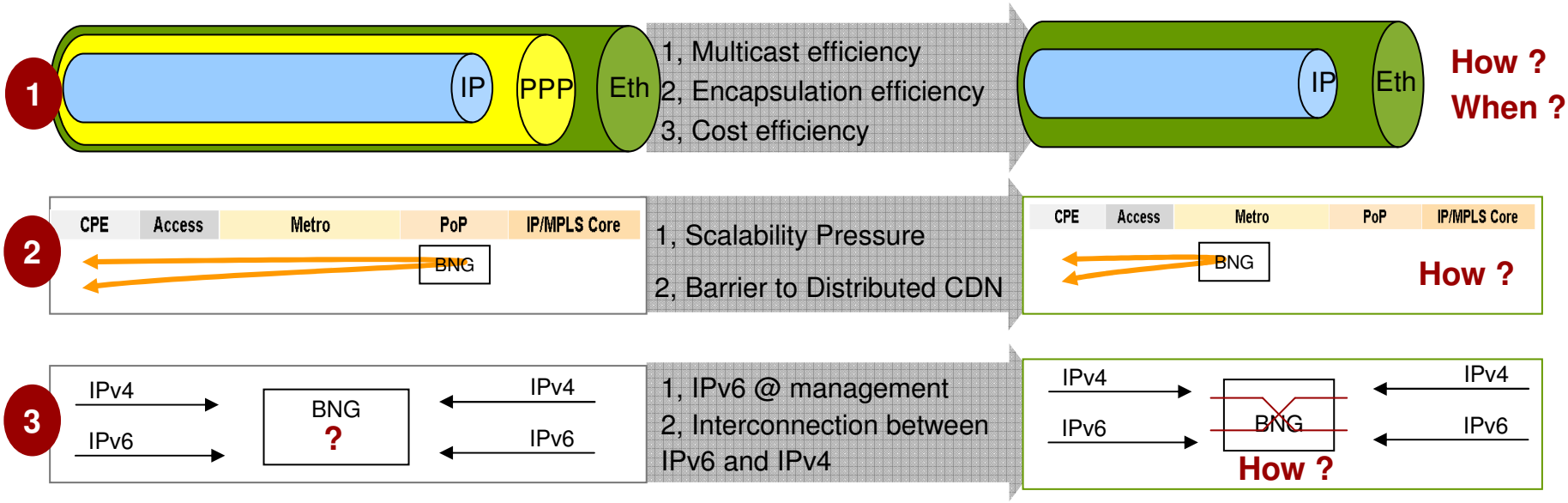
Challenges to BNG

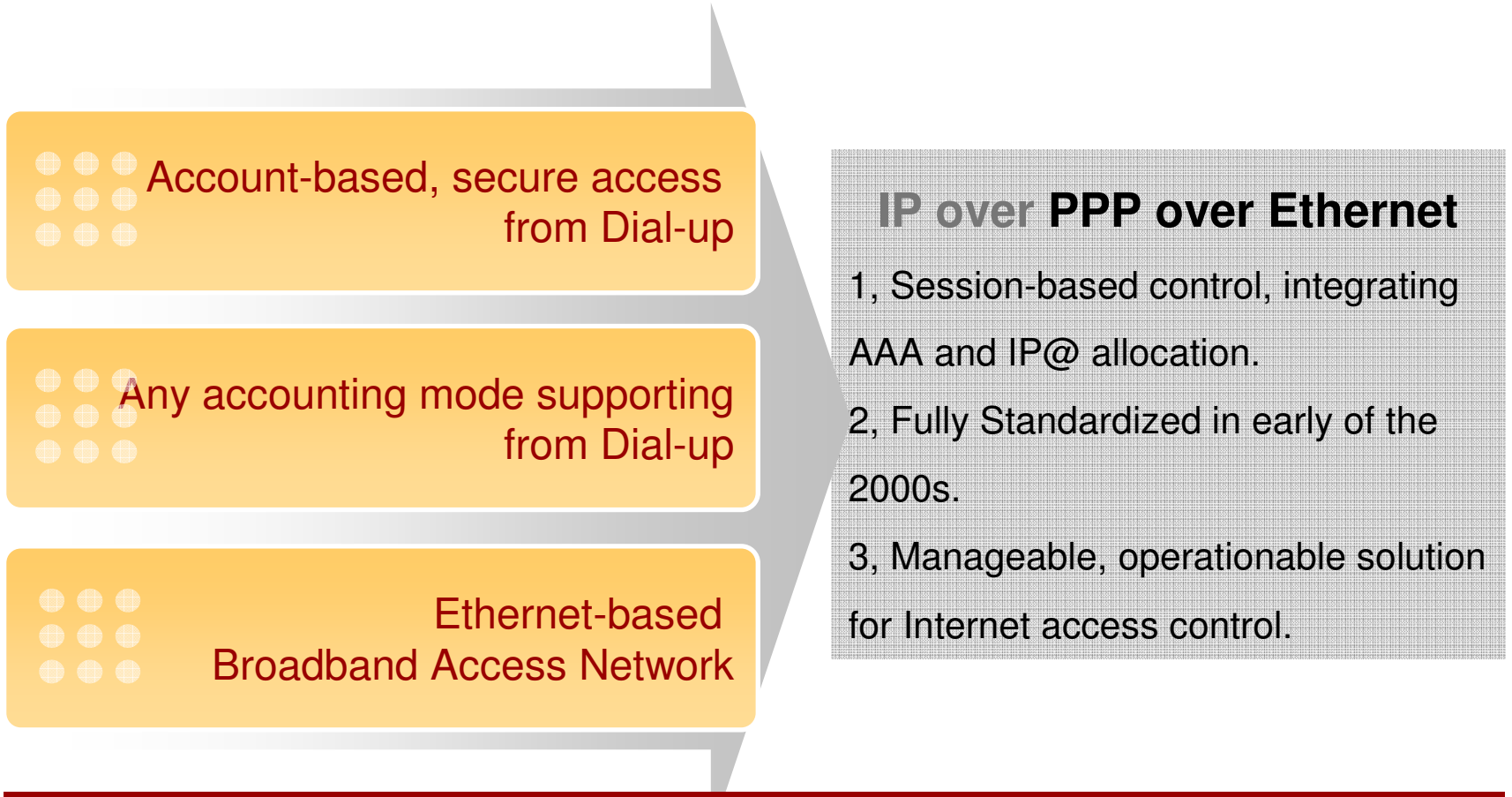




Agenda

- **DHCP-based Service Deployment**
- Multi-BNG Scenario
- IPv6 Migration

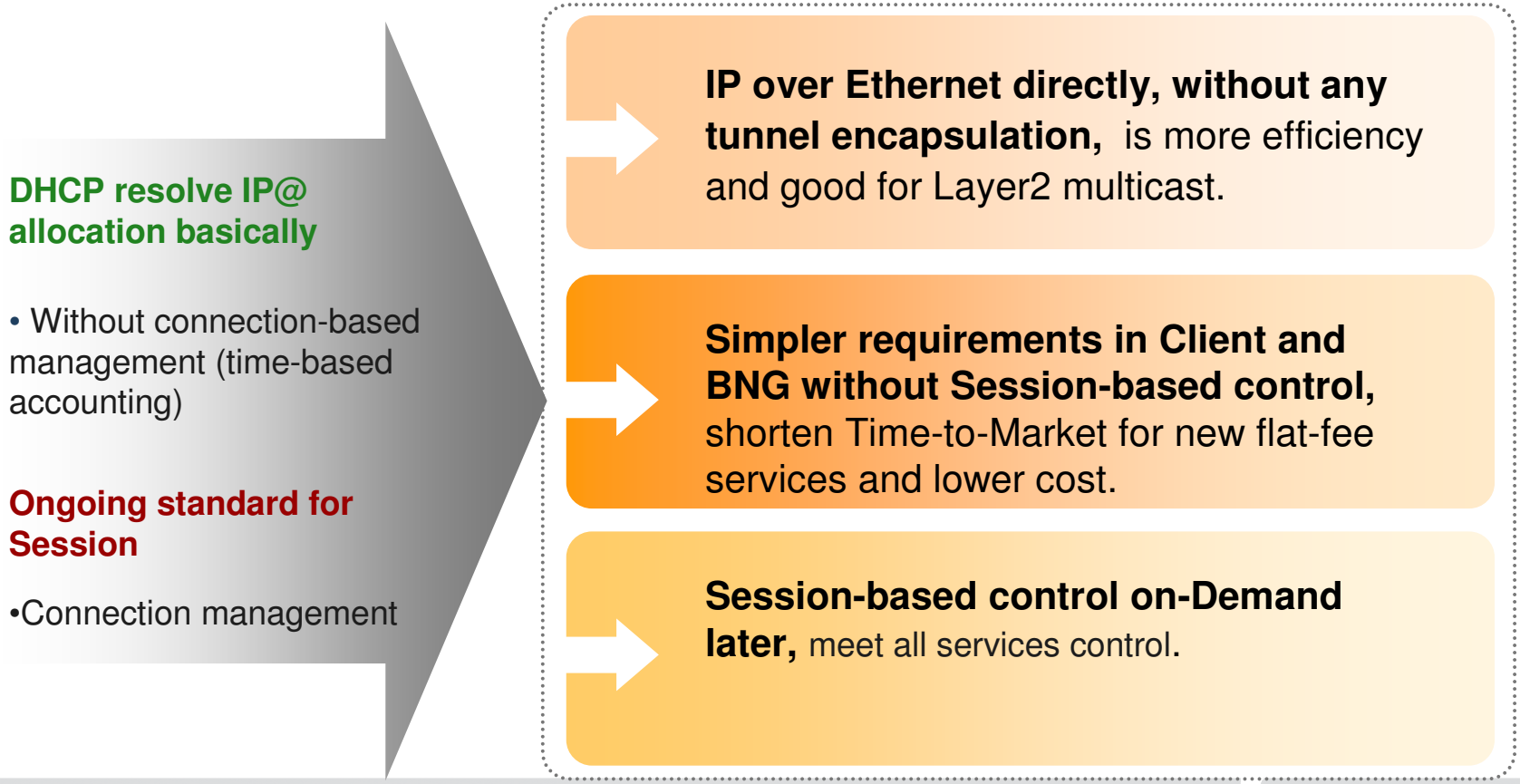
Why PPPOE previously ?



Management and Operation requirements

Why DHCP in future?

- **Multicast requirement, cost reducing requirement**



PPPOE vs IPOE/DHCP

AAA	PPP and PPPOE Session; Time-based, volume-based accounting	DHCP with Option60/82…; No Time-based accounting now
Connection mgmt.	PPPOE session, PPP echo	ARP detection, keep-alive msg
Efficiency	IP over PPP over Ethernet	IP over Ethernet (saving 16 bytes)
Multicast	Can not copy between PPPOE	Native Layer2 multicast
User isolation	Simple, PPPOE Session based	Depend on enhanced Ethernet, VLAN
Wholesale	PPPOE with L2TP, perfect	Static provision or DHCP relay
Standardized	Fully, already	Ongoing, especially in Session control

- PPPoE Replaced with IPoE/DHCP?
  - **Huawei's opinion: yes but dual-mode migration may be needed**
    - For Multicast-mode and always on-line services, use DHCP. New CPE must support DHCP.
    - For Time-based accounting and wholesale services, still use PPPOE if BRAS already deployed
    - IPOE/DHCP need improve Session-based control capability before replace PPPOE totally, that will increase equipment cost
  - **Industry opinion: AT&T did, FT doing**

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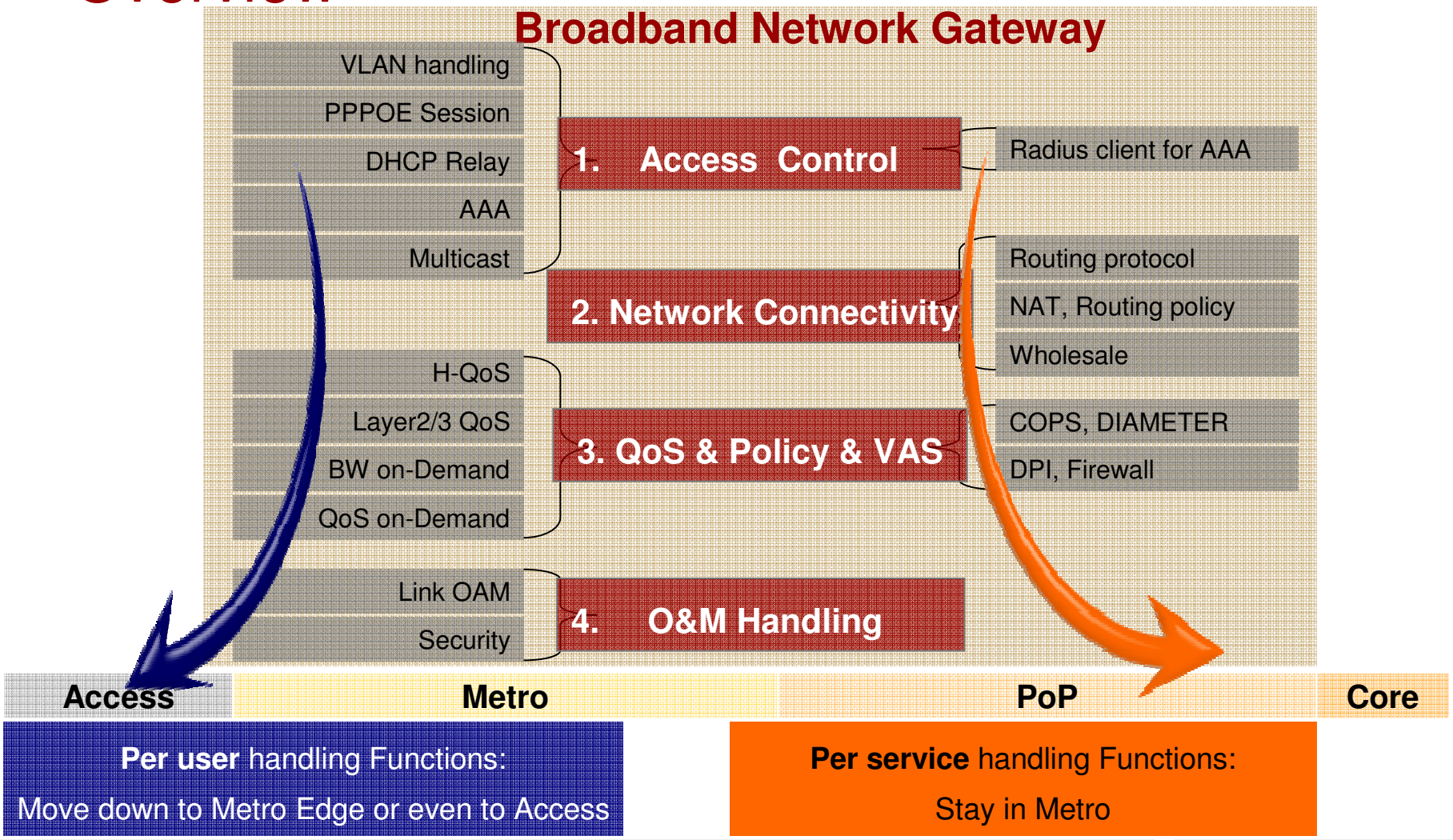
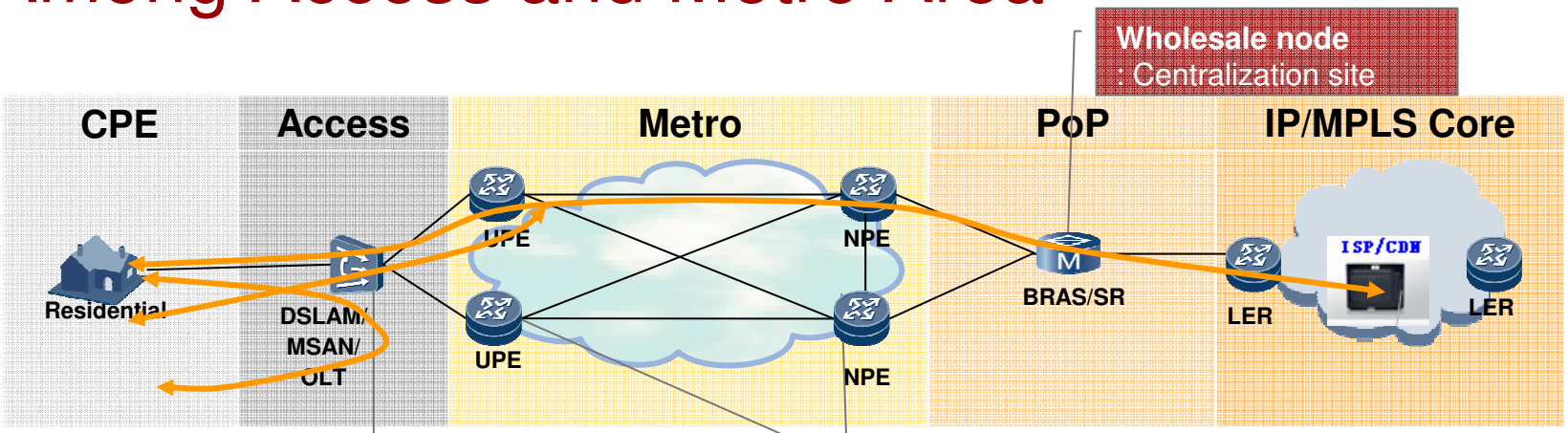
BNG Functions Scope and MultiBNG Overview



MultiBNG: Distributed BNG Functions Among Access and Metro Area



First IP Node
What support:
1) DHCP process, IP Session
2) PPPOE (? In Metro)
3) Multicast access control
4) Layer 2/3 QoS handling
5) AAA, *Radius Client (?)*

Metro IP Node
What support:
1) Deep service handling (DPI…)
2) IPv6 migration gateway
3) Radius snooping
4) Diameter / PCRF Proxy for First IP Node
5) PE/P for L3 VPN

Benefit:

1. Saving bandwidth in Metro and IP Core:

1) ISP/ICP can deploy CDN in any Metro site.

2) P2P traffic can be interconnected in Metro, close to users.

2. More revenue from ISP/ICP: bandwidth wholesale and room renting.

Strength and Weakness of MultiBNG

◆ MultiBNG

Strength: Distributing IP Intelligence capability in Access and Metro

1.1 Good for flow path optimizing

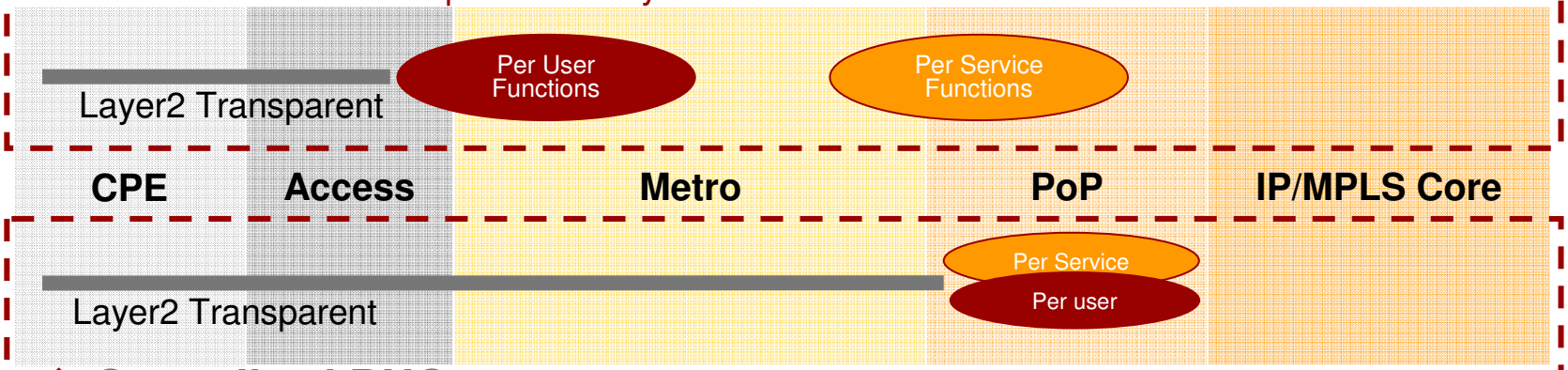
1.2 Increasing data transport efficiency

1.3 Increasing scalability for new users or new services

Weakness: More IP sites, how to avoid TCO upping?

2.1 Keep functions related to Per service in Metro/PoP

2.2 Metro Node provide Proxy function to OSS interface



◆ Centralized BNG

Strength: Centralized control mode, good for rapid provision

Weakness: Too long dumb pipe; Big challenge in scalability and redundancy

Agenda

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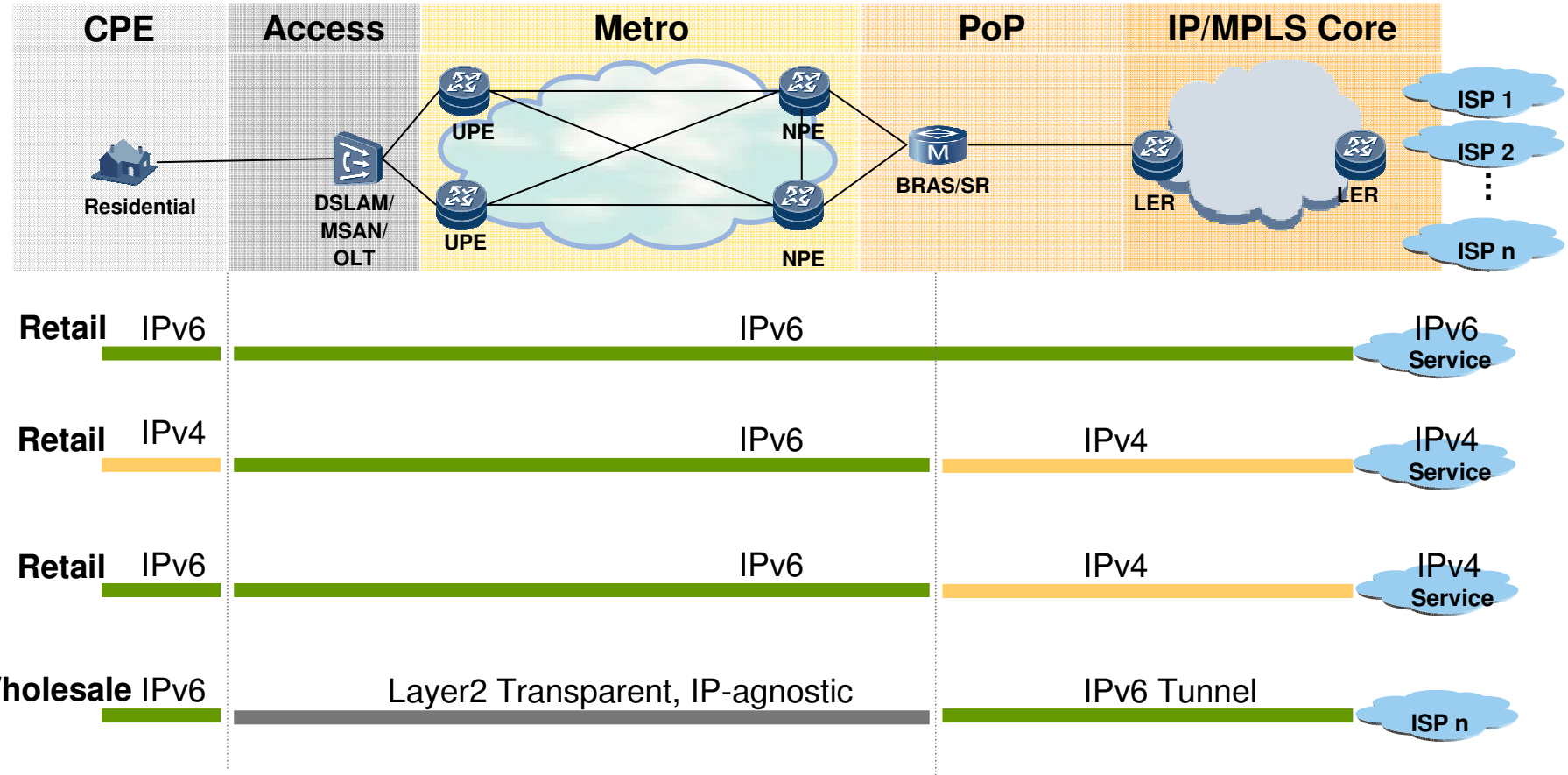
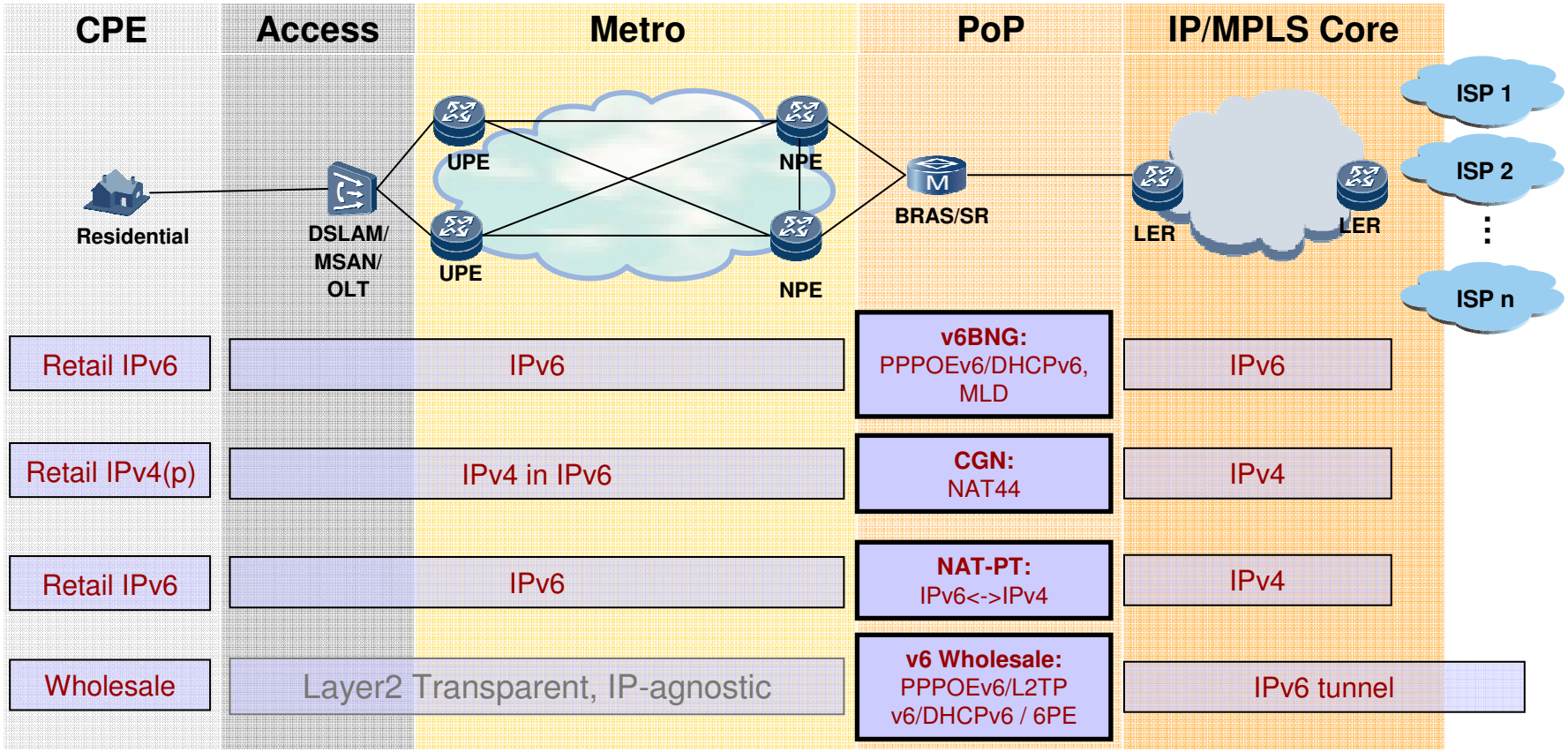
- **IPv6 Migration**

IPv6 Service Scenarios



IPv6 Migration Path in Service PoP



Summary of BNG Session

- IPOE/DHCP is a better choice for some certain scenarios, such as Multicast-mode or always on-line services. We should notice, removing PPPOE would cause barriers in wholesale and Time-based services.
- Improving session-based control capability on IPOE/DHCP, would increase equipment cost close to BRAS
- Distributed BNG functions is ideal for next generation network, per-user related functions moving to Access Node, per-service related functions staying in Metro
- BNG must prepare v6BNG/CGN/NAT-PT/v6L2TP/6PE for IPv6 migration

Thank you

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