CMCC’s Consideration on Disaggregated BNG

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BNG In CMCC’s Network

BNG=Broadband Network Gateway

- Gateway for residential access with necessary management functions (PPPoE, AAA, etc.).
- First hop for fixed line Internet service
- 10,000+ Deployed in CMCC
- >150 million subscribers
- 95% FTTH GPON
Challenges of Legacy BNG

✓ Inefficient address management
  • Inadequate IP address + Hard to predict user base
  • Advance planning results in inefficiency of address allocation
✓ Bucket effect cased by integrated CP and UP
  ✓ Unbalanced Session management (CP) vs Capacity (UP) load
  ✓ Whichever reaches the limit causes performance degradation of the other
✓ Complicated interfaces with neighboring systems
  ✓ Each BNG interconnects with Radius/DHCP/EMS etc.
✓ Inflexible software upgrade for BNG
Desired DBNG Architecture

- Fixed-Access BNG is our major requirement, should support
  - PPPoE, IPoE, L2TP, CGN, ...
  - High Reliability
  - Multi-vendor interoperation
  - ...
- BNG-CP (Control Plane)
  - Subscriber/Session management
  - Address management
  - AAA, QoS, Policy...
- BNG-UP (User Plane)
  - Forwarding (PPPoE/IPoE, IP, MPLS, NAT...)
  - Routing Control

Beijing: 200+ BNG-UPs (multi-vendor)  
Managed by 2 BNG-CPs (Geo-redundancy)
CMCC DBNG Practices

Investigation was carried out since 2017 with PoC and field trial practices

- CP (VNF) + UP (VNF or PNF) deployment
  - CP deployed in the centralized cloud;
  - VNF UP for session-greedy services, PNF UP for traffic-greedy services;
- Better performance achieved
  - IP address utilization increases 40%;
  - Session capacity from 512K to 20million
  - Subscriber activation rate increase from 1000/s to 10k/s
- Service provisioning substantially simplified

Supporting Partners: Huawei, ZTE, H3C, CertusNet, Nokia;
Next Steps

• Wide DBNG deployment in 2019 and 50% legacy BNG (150 million subscribers) will be upgraded to DBNG in the coming years.
• Interoperation is required between DBNG-CP and DBNG-UP (year 2020)
• Progress in IETF
  • Discussion in RTGWG since 2017
  • Consensus on requirements and use cases
  • Consensus on proposing a new WG
Thanks