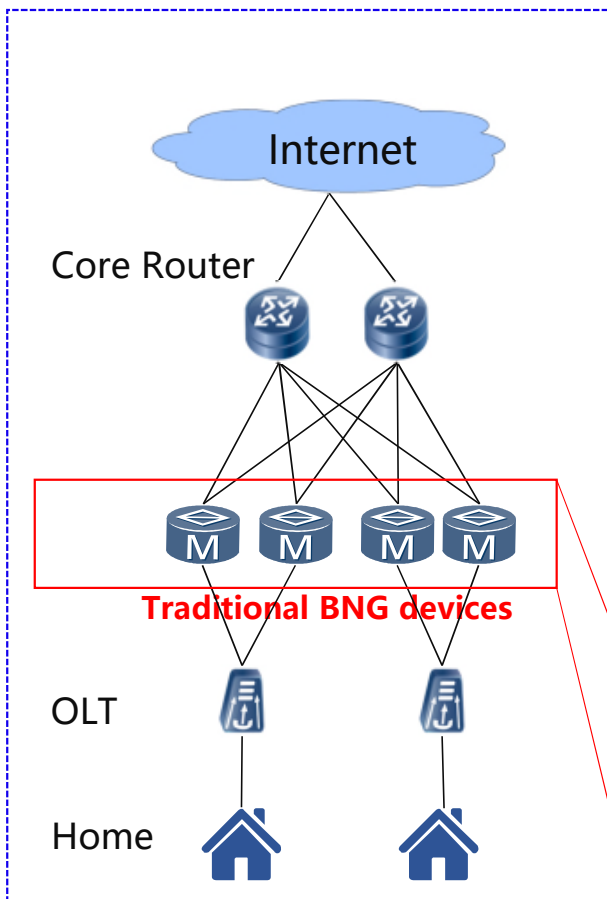


Information Model of Control-Plane and User-Plane separation BNG

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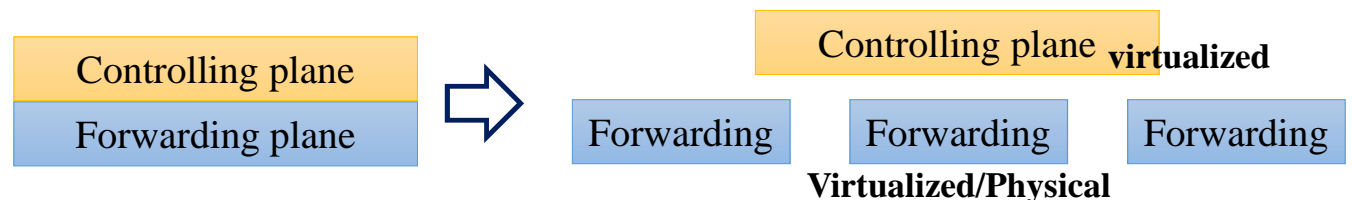
Background



BNG (Broadband Network Gateway) device is defined as an Ethernet-centric IP edge router, and the aggregation point for the user traffic. It performs **Ethernet aggregation, access protocols termination**, supports **user management, QoS and policy management, packets forwarding via IP/MPLS** and etc.

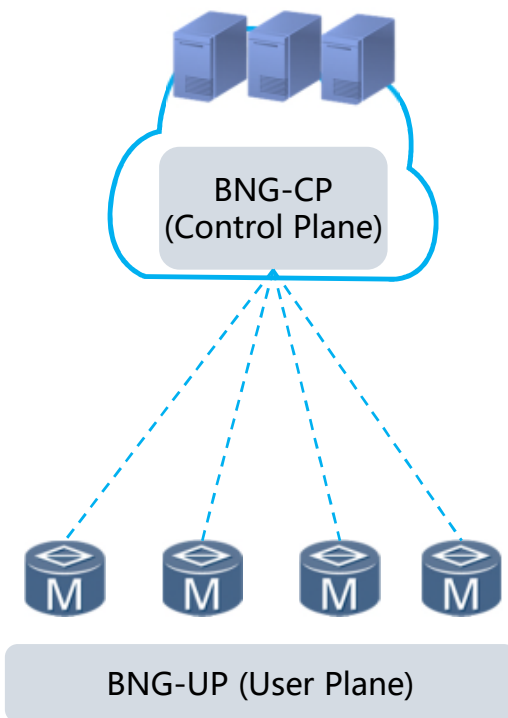
Some Concerns:

- (1) Services are **not well balanced** in different parts resulting to different utilization of resources such as sessions and IP addresses for example.
- (2) BNG is evaluated by indicators some related with forwarding resources and some related with controlling resources. Both can be the limitation of a BNG device .
- (3) BNGs are configured on each device. It's not convenient **on management**.



Background

New architecture brings big changes and brilliant advantages



Point1: Resources can be central controlled and balanced

Centralized control plane takes the responsibility of control and management. Thus it has the overall view of resources and can distribute the resources as required.

Point2: Device can be more efficient in extension

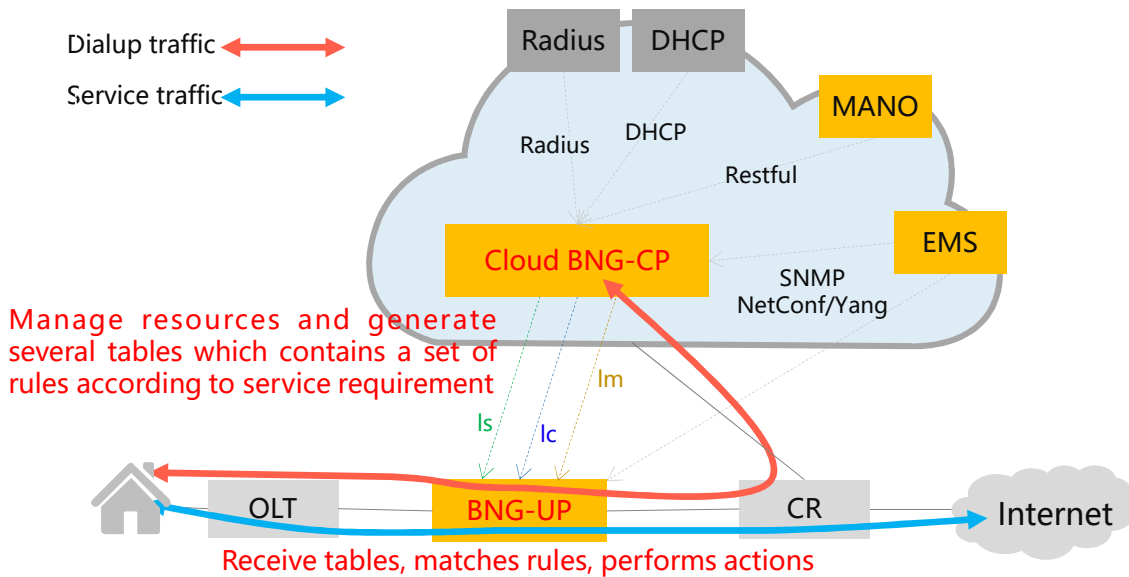
Control plane and user plane can be extended separately according to different situations such as the session overload and extremely high throughput.

Point3: Management can be easier as the BNG-CP is the only one facing to the outside system such as EMS, DHCP server, Radius and so on.

Point4: BNG-CP can be virtualized as a VNF with its management of MANO

Point5: BNG-UP can be a virtual machine or physical device as demand

Use case



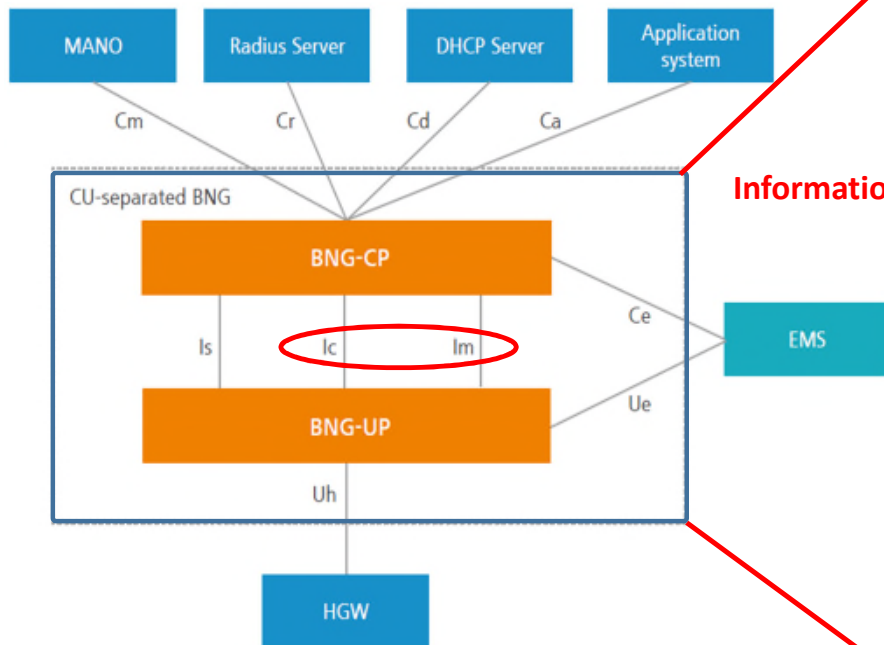
- Different from traditional process:**
- 1. Dialup:**
UP sends user dialup packets of PPPoE or IPoE to CP.
 - 2. Process dialup packet**
CP connects with outside service systems to do the dialup process
 - 3. Connection between CP and UP**
CP tells UP to do the corresponding forwarding actions with related policies.
 - 4. CP manages UP**

VXLAN: Service interface
Interface is used to establish VXLAN tunnels between CP and UP with PPPoE and IPoE packets transmitting over the VXLAN tunnels

Control interface
CP uses this interface to deliver service entries with IP, QoS, etc, and UP uses this interface to report service events to the CP including traffic statistics.

Management interface
CP uses this interface to deliver configurations to the UP with YANG models to be contributed.

Information model



Ic: Control interface

CP uses this interface to deliver service entries with IP, QoS, etc, and UP uses this interface to report service events to the CP including traffic statistics.

Im: Management interface

CP uses this interface to deliver configurations to the UP with YANG models to be contributed.

Information Model

```

+---CP: (generate Tables, which including several rules)
+---PORT information: rule 1, 2, 3 ...
+---User Infor: rule 1, 2, 3 ...
+---IPv4 Infor: rule 1, 2, 3 ...
+---IPv6 Infor: rule 1, 2, 3 ...
+---QoS: rule 1, 2, 3 ...
+---Address field distribute: rule 1, 2, 3 ...
+---UP
+---Case 1:(report resources and statistical information)
+---PORT RESOURCES of UP
+---Traffic statistics
+---Case 2:(match rules then perform corresponding actions)
+---PORT information: match rules than action
+---User Infor: match rules than action
+---IPv4 Infor: match rules than action
+---IPv6 Infor: match rules than action
+---QoS: match rules than action
+---Address field distribute: match rules than action
    
```

All are rules

Statistics

We need **an information model** for the **dynamic** management of users and UPs on BNG-CP.

Comments

- Is it a good direction to go?
- Work group chosen to do this work?
- Would you like to fulfil this work together?
- Any other comments are welcomed.

Thank you

Architecture

Neighboring policy and resource management systems

Radius Server

DHCP Server

EMS

MANO

Control plane

BNG-CP

PPP

Address
managementSubscriber
managementUP
management

AAA

Radius

DHCP

User plane

BNG-UP

Routing control

Forwarding
engine

BNG-UP

Routing control

Forwarding
engine

.....

BNG-UP

Routing control

Forwarding
engine

Stated in draft-gu-nfvrg-cloud-bng-architecture-00

Neighboring policy and resource management systems deploys different service systems such as RADIUS server, DHCP server and EMS. Besides, MANO is included.

CP is a user control and management component

- PPP focuses on user dialup packets of PPPoE / IPoE process
- Address, subscriber and up management are responsible for address pool, user entry and user policy, and UPs respectively.
- AAA, Radius and DHCP are used to connect with the neighboring systems

UP is a network edge and user policy implementation component

- Routing control focuses on the routing thing such as IGP/BGP/MPLS
- Forwarding engine focuses on traffic forwarding and user policy implementation such as QoS
- Other functions such as traffic statistics collection

New Architecture of BNG Devices