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Stateless User-Plane for Virtualized EPC

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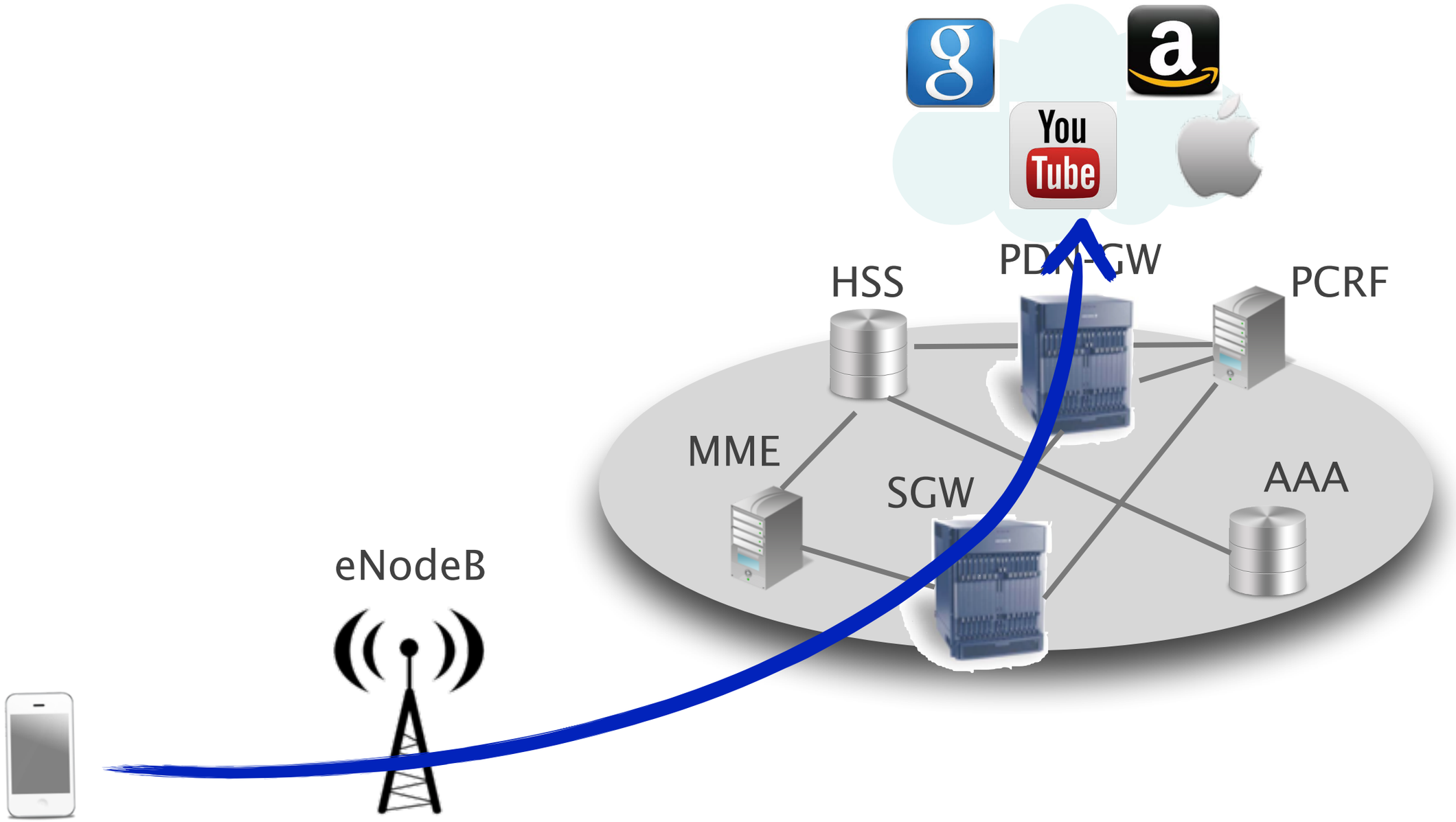
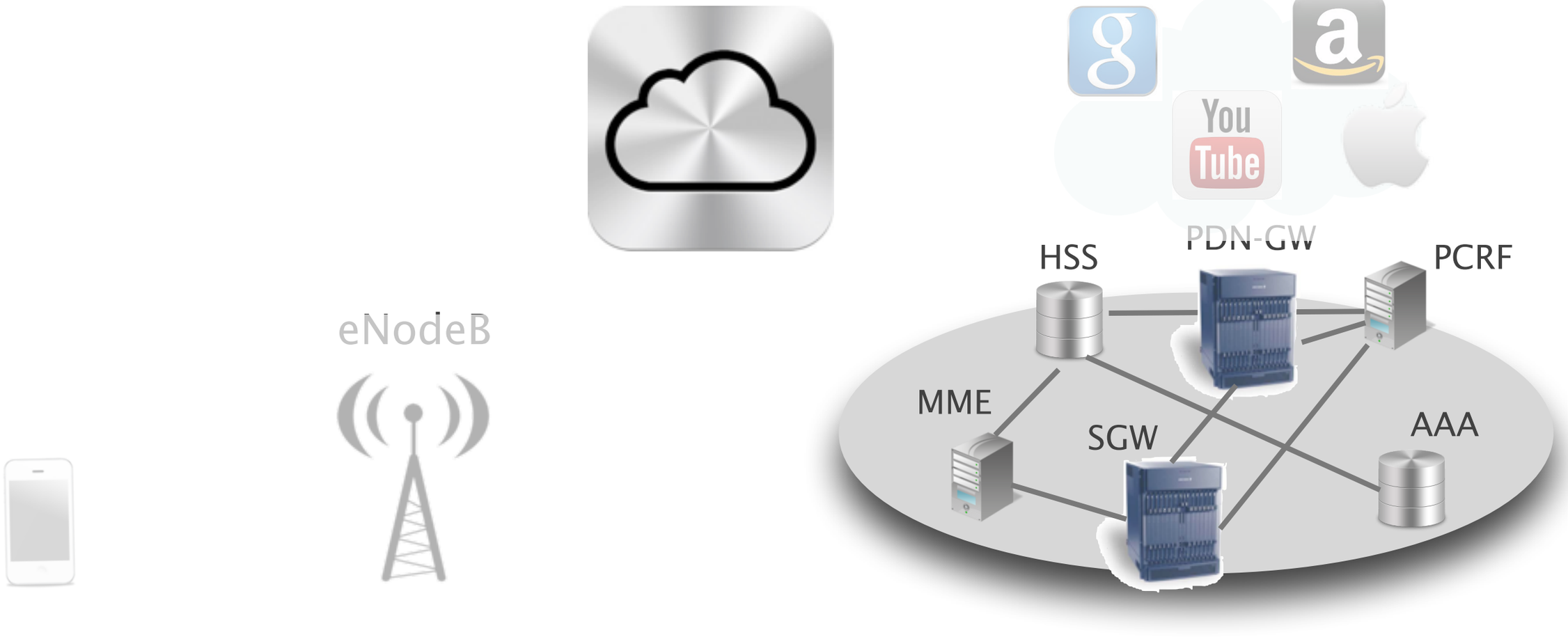
EPC
Evolved Packet Core



NFV

Network Function Virtualization

SoftBank



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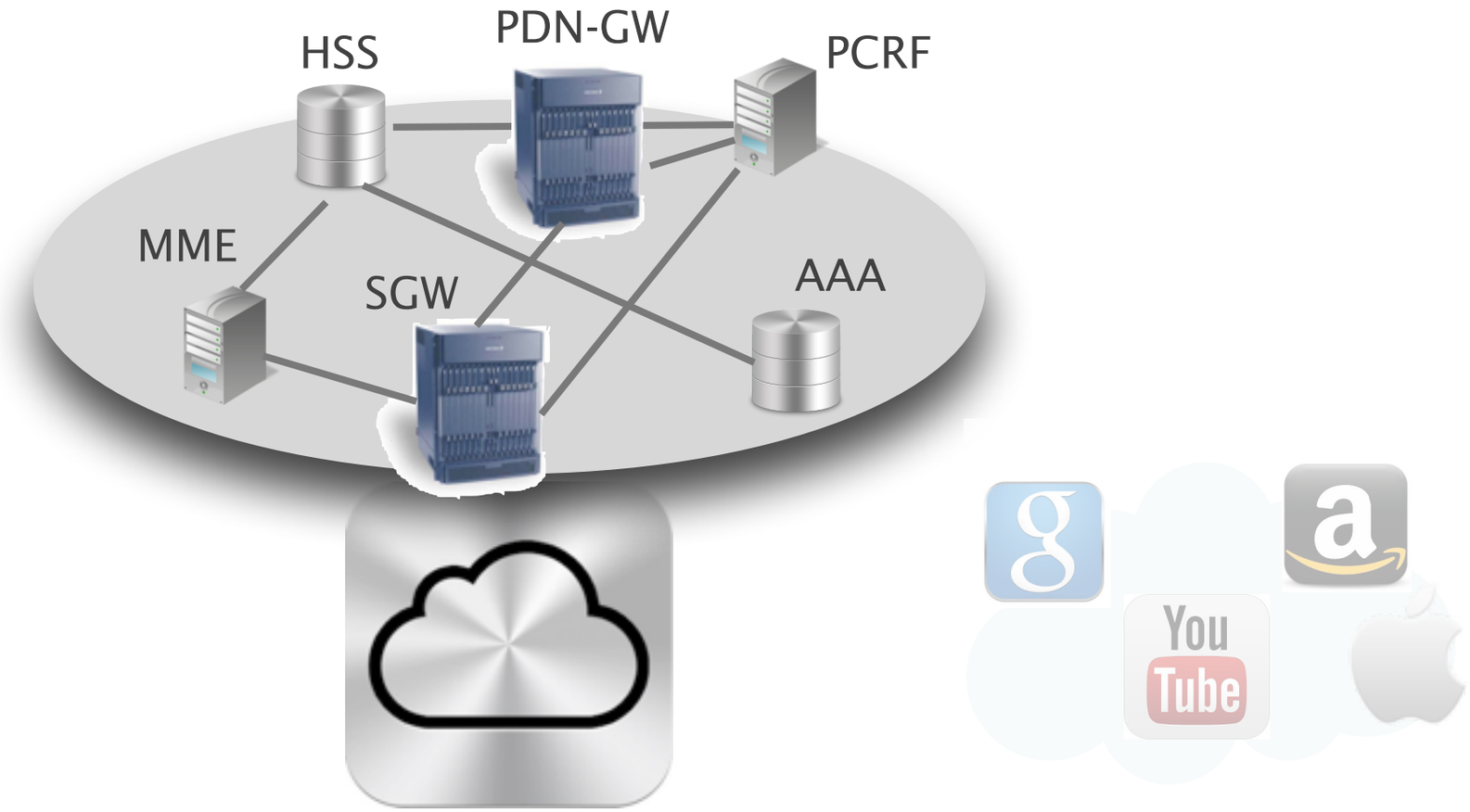
NFV

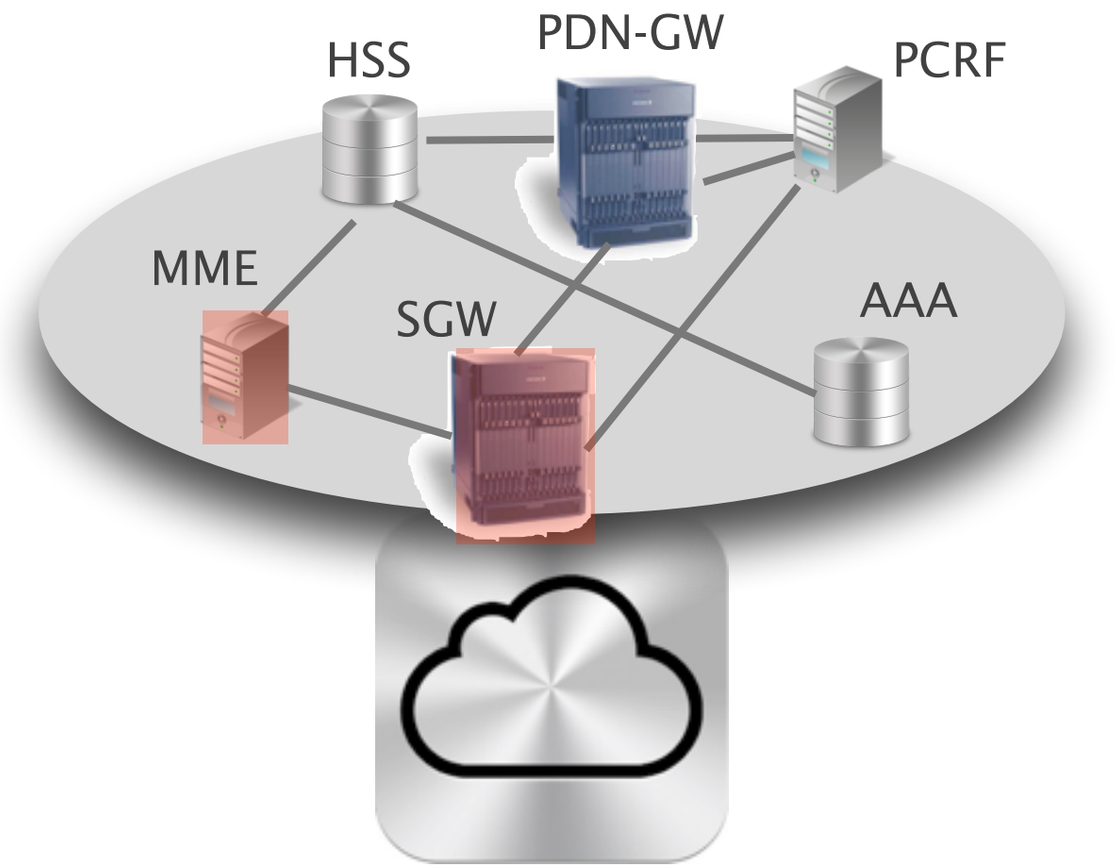
Network Function Virtualization



eNodeB

SoftBank

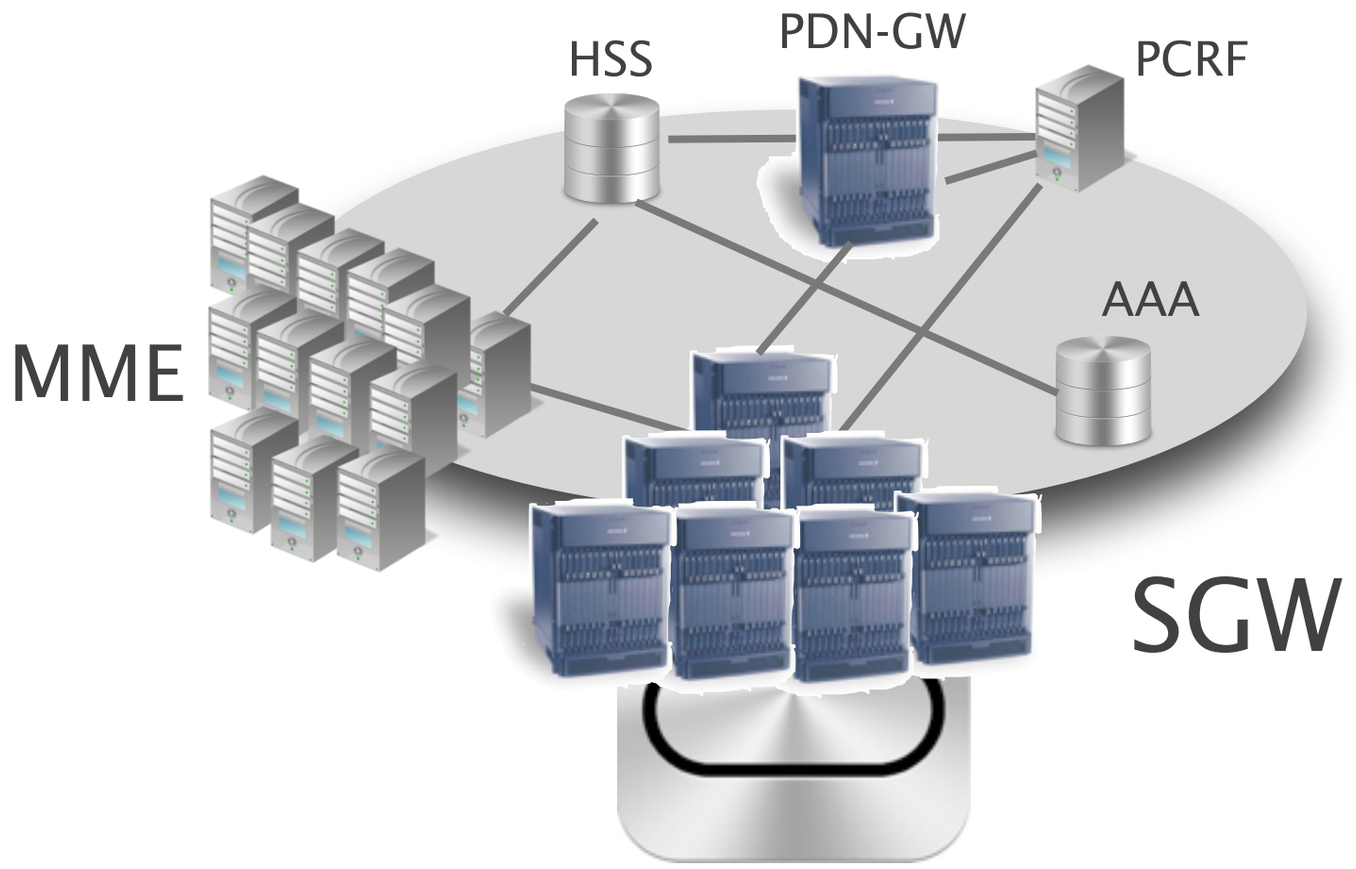
LTE *MATSURI*



eNodeB

SoftBank

Elastic Control-Plane with NFV



eNodeB

Flexible Control-plane
Weakened User-plane

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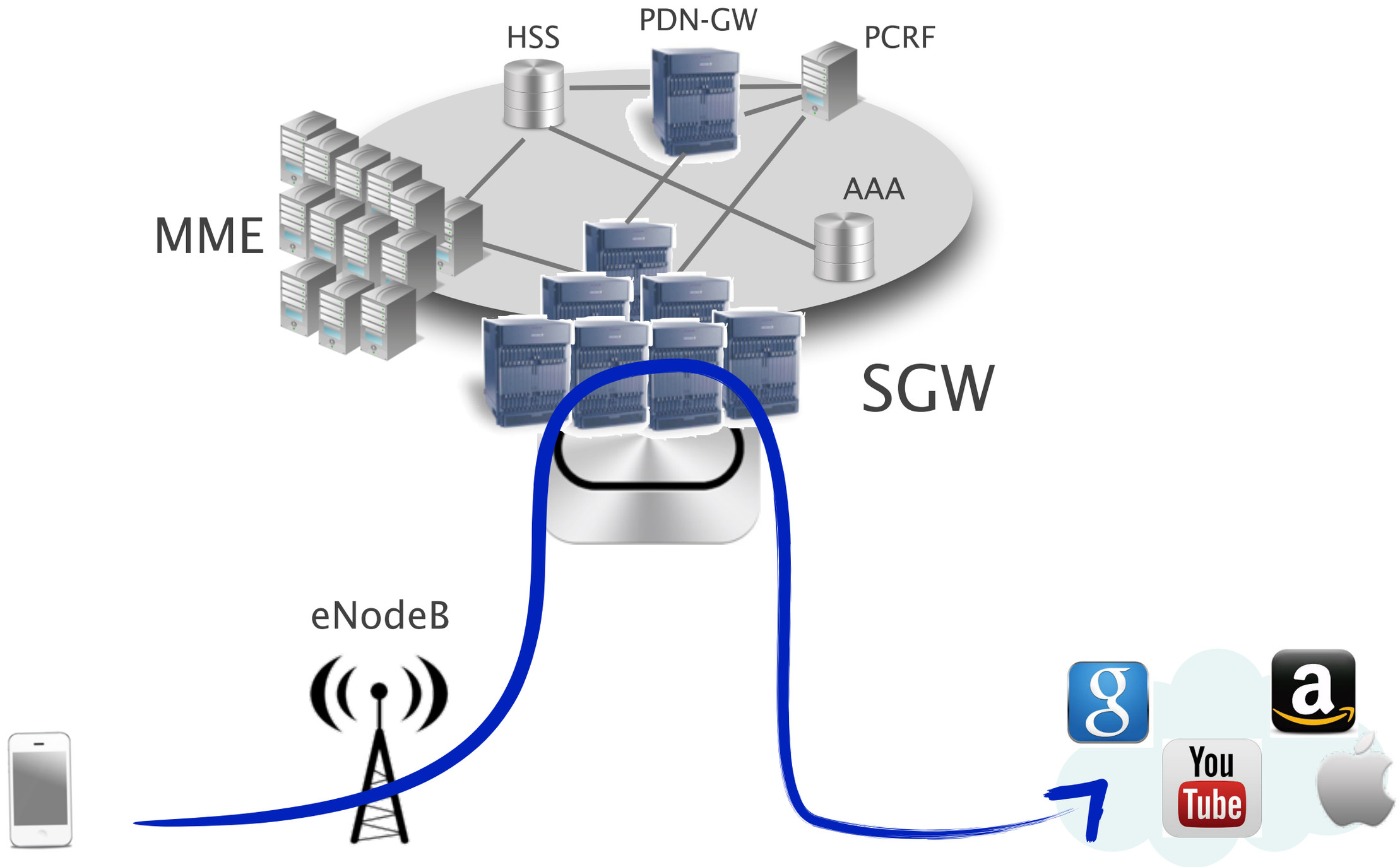

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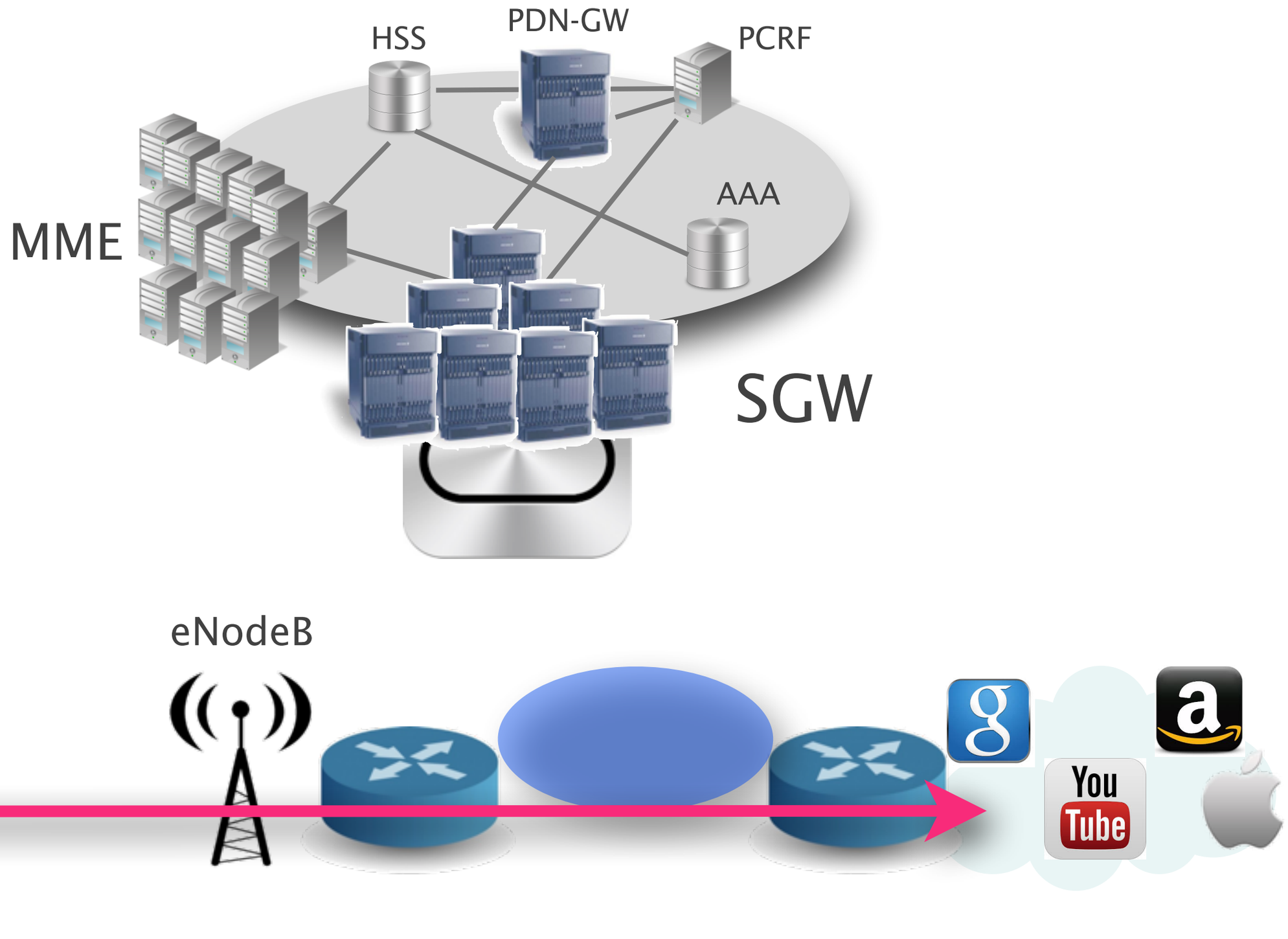
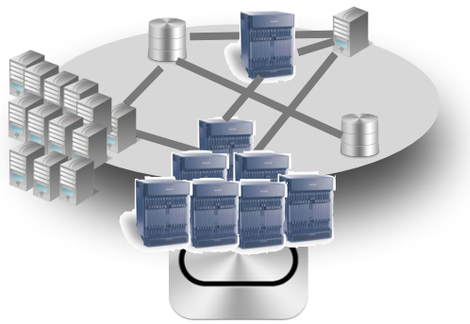
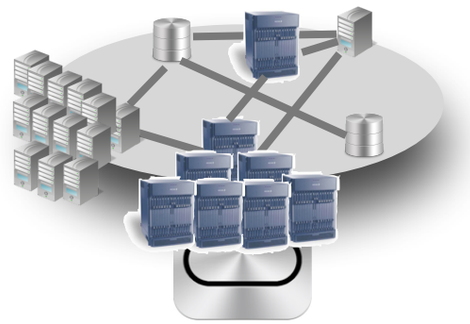
User-plane Requires Optimized Data-path for vEPC



Stateless User-Plane Architecture

SoftBank





EPC Edge Router

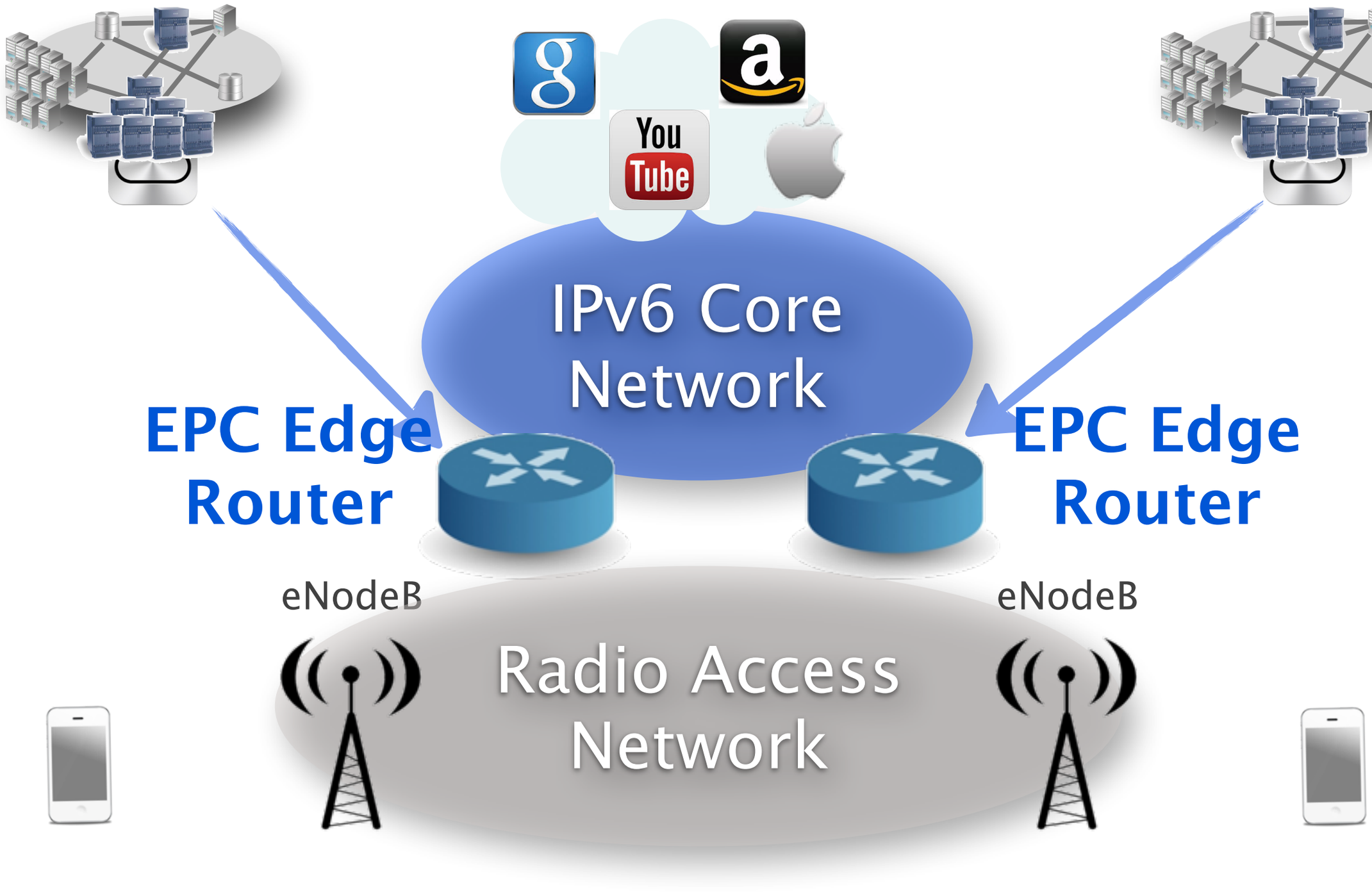
EPC Edge Router

eNodeB

eNodeB

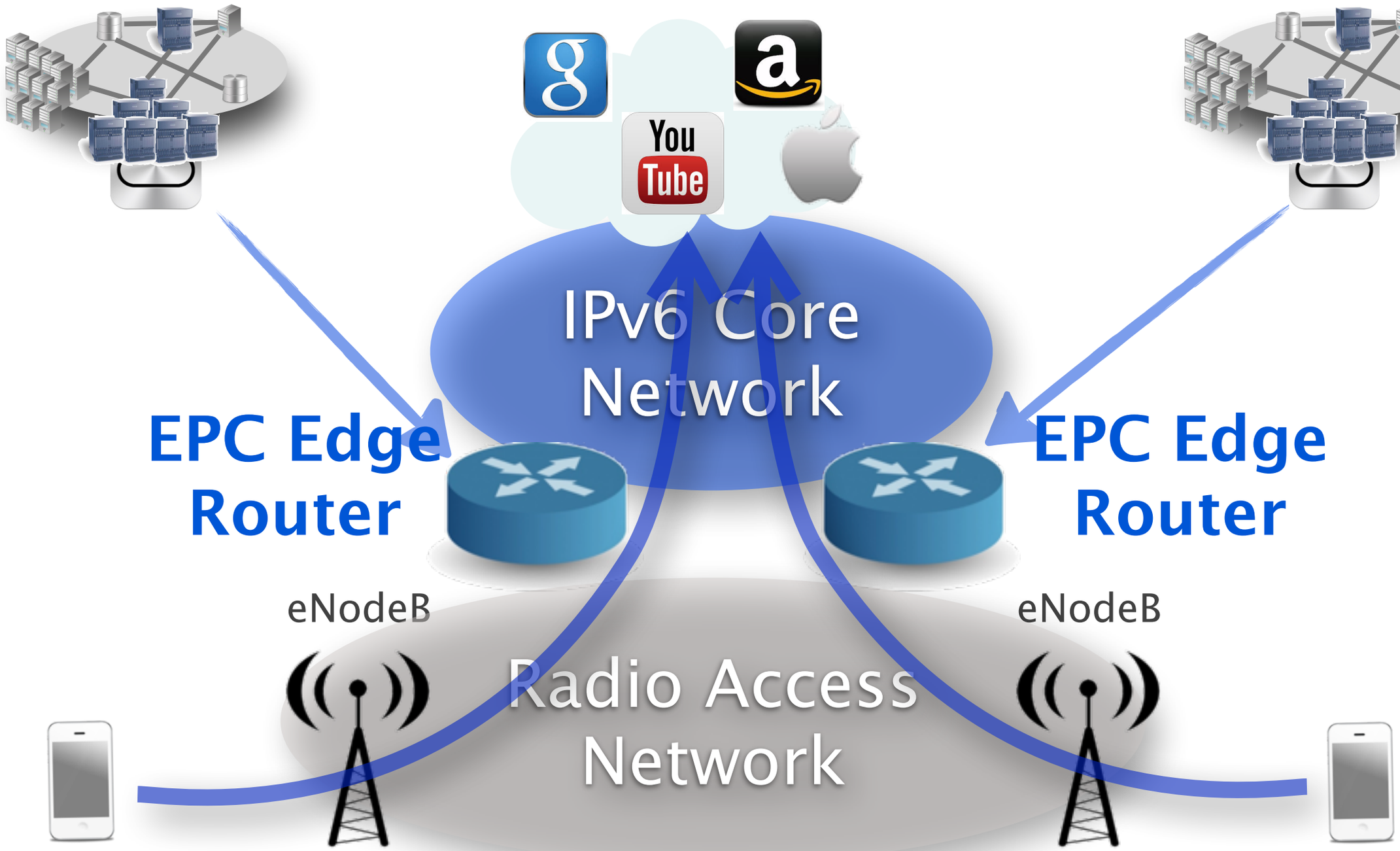
Stateless User-Plane Architecture

SoftBank



Stateless User-Plane Architecture

SoftBank



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Stateless User-Plane Architecture

Simple Configuration

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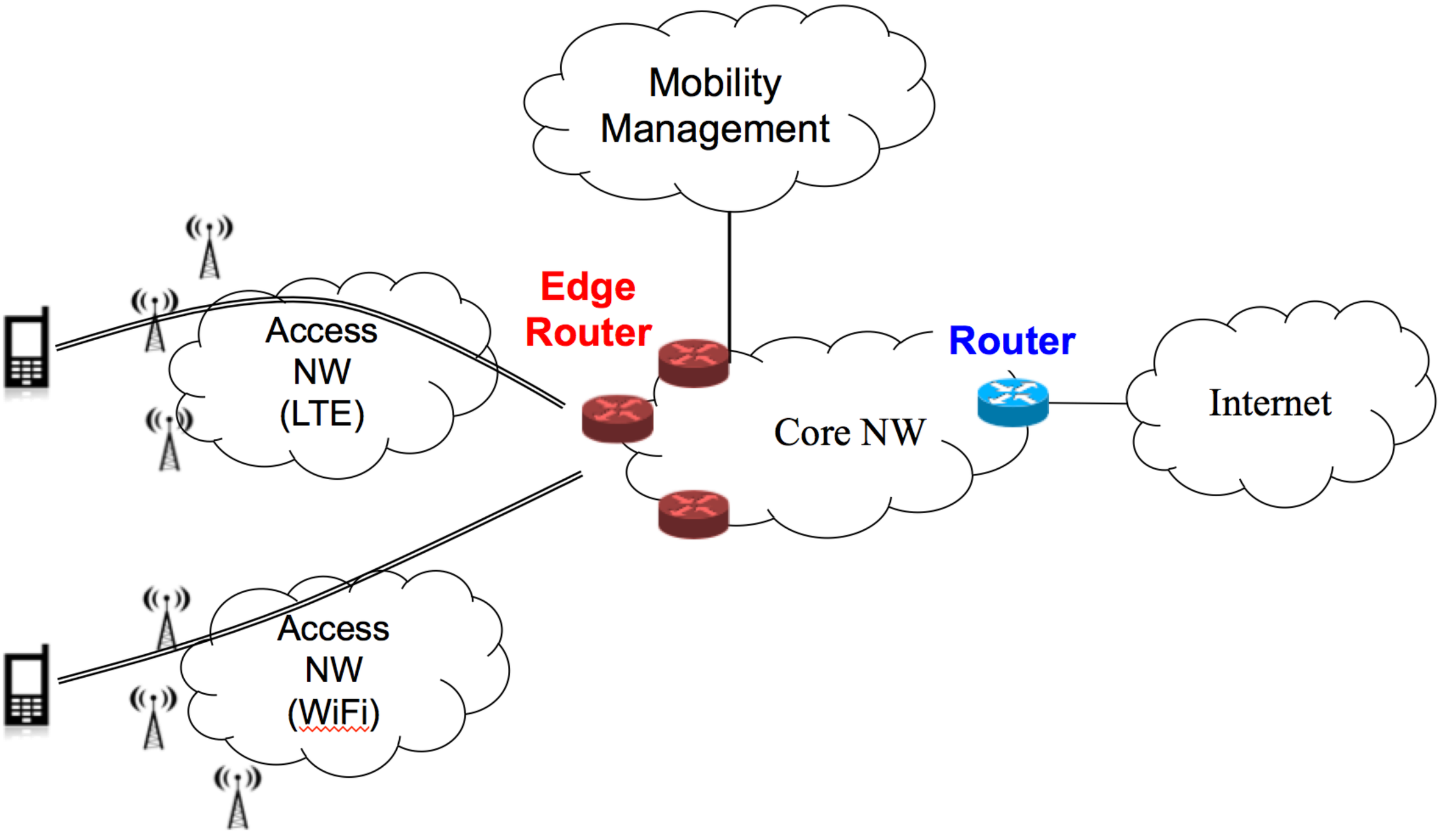
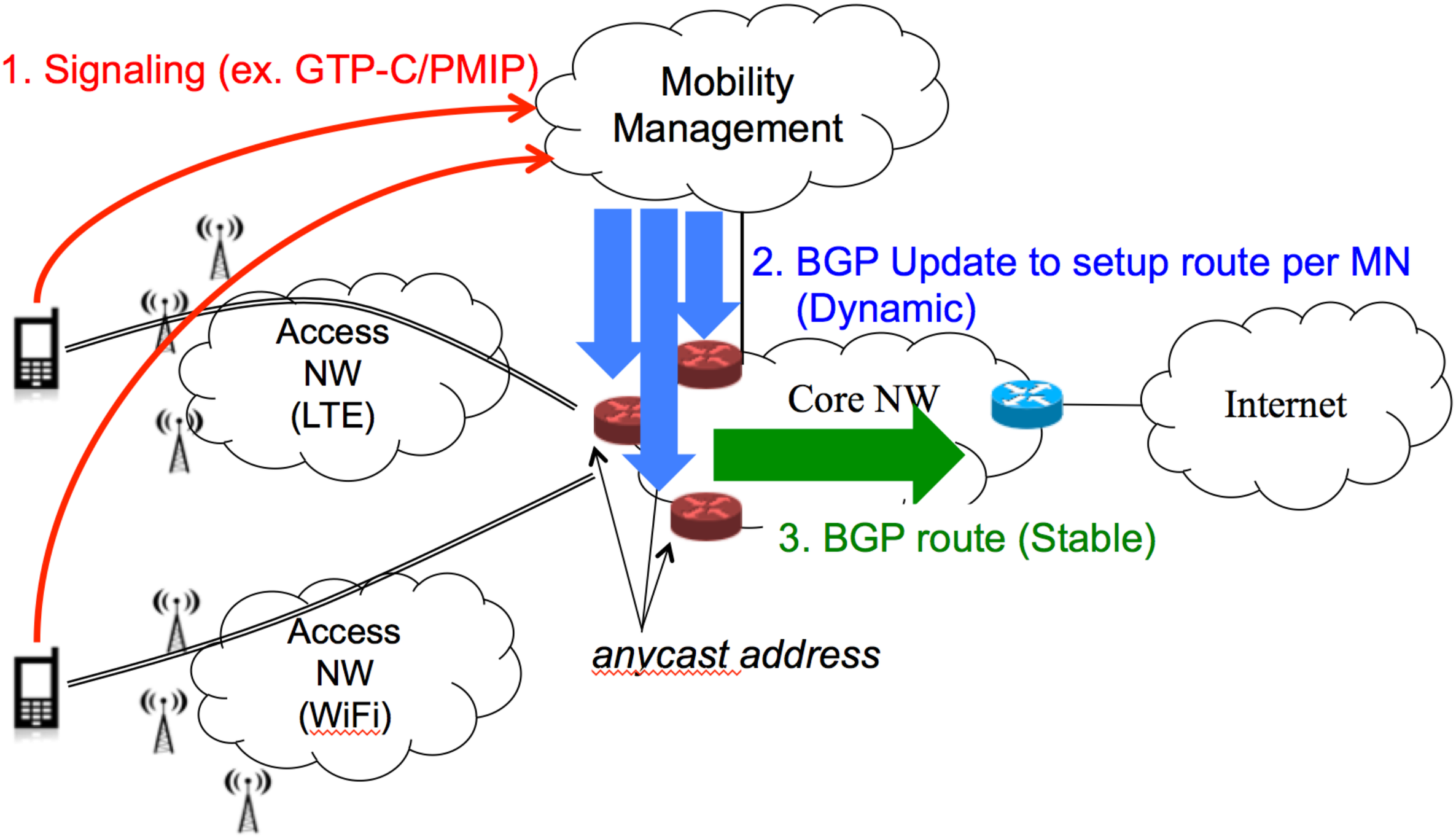


Stateless user-plane architecture for Mobile

SoftBank



Dynamic Route Update

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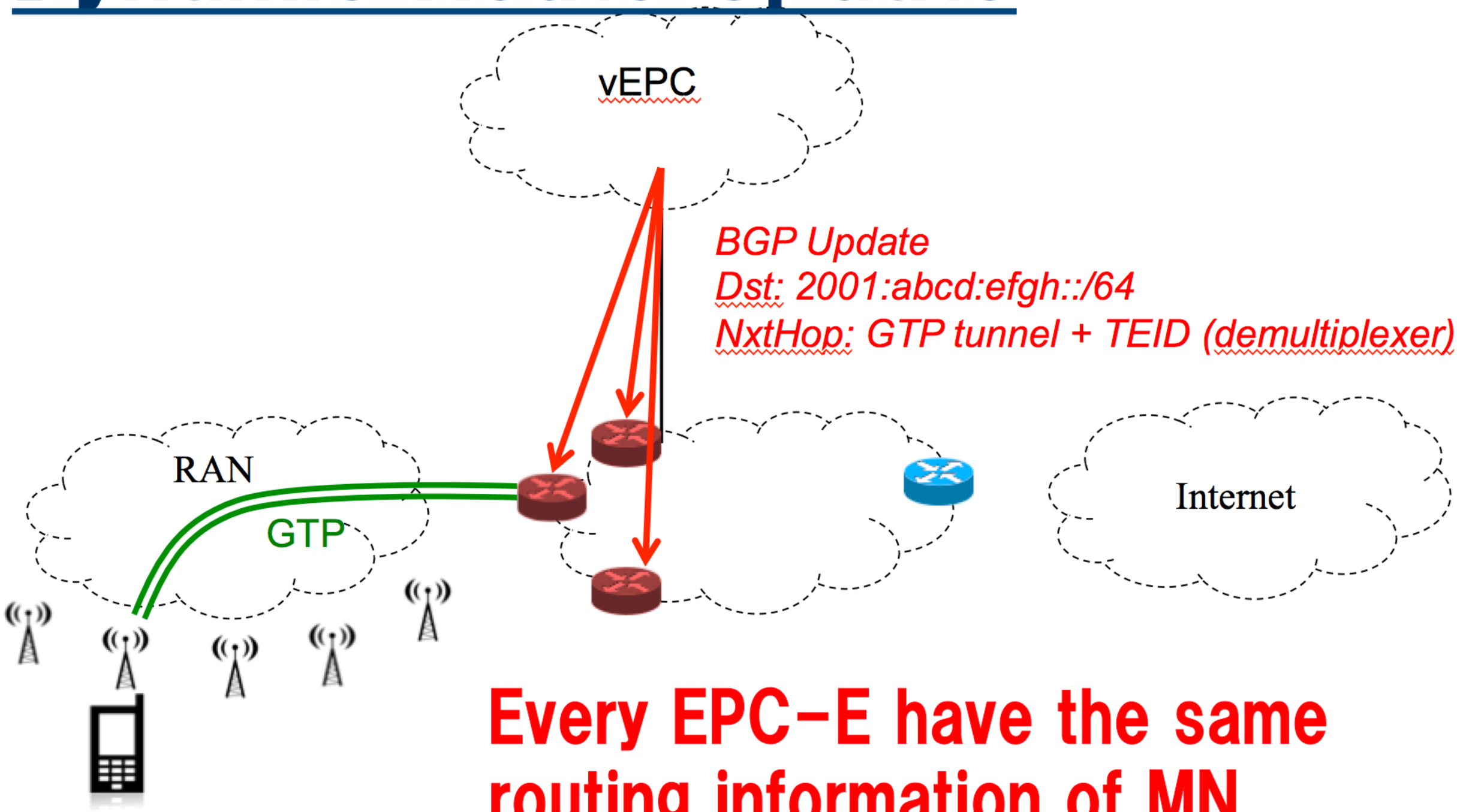

Every EPC-E have the same routing information of MN.

→ **Dynamic: BGP Update**

Remote Next Hop: *draft-vandevelde-idr-remote-next-hop*

Handover

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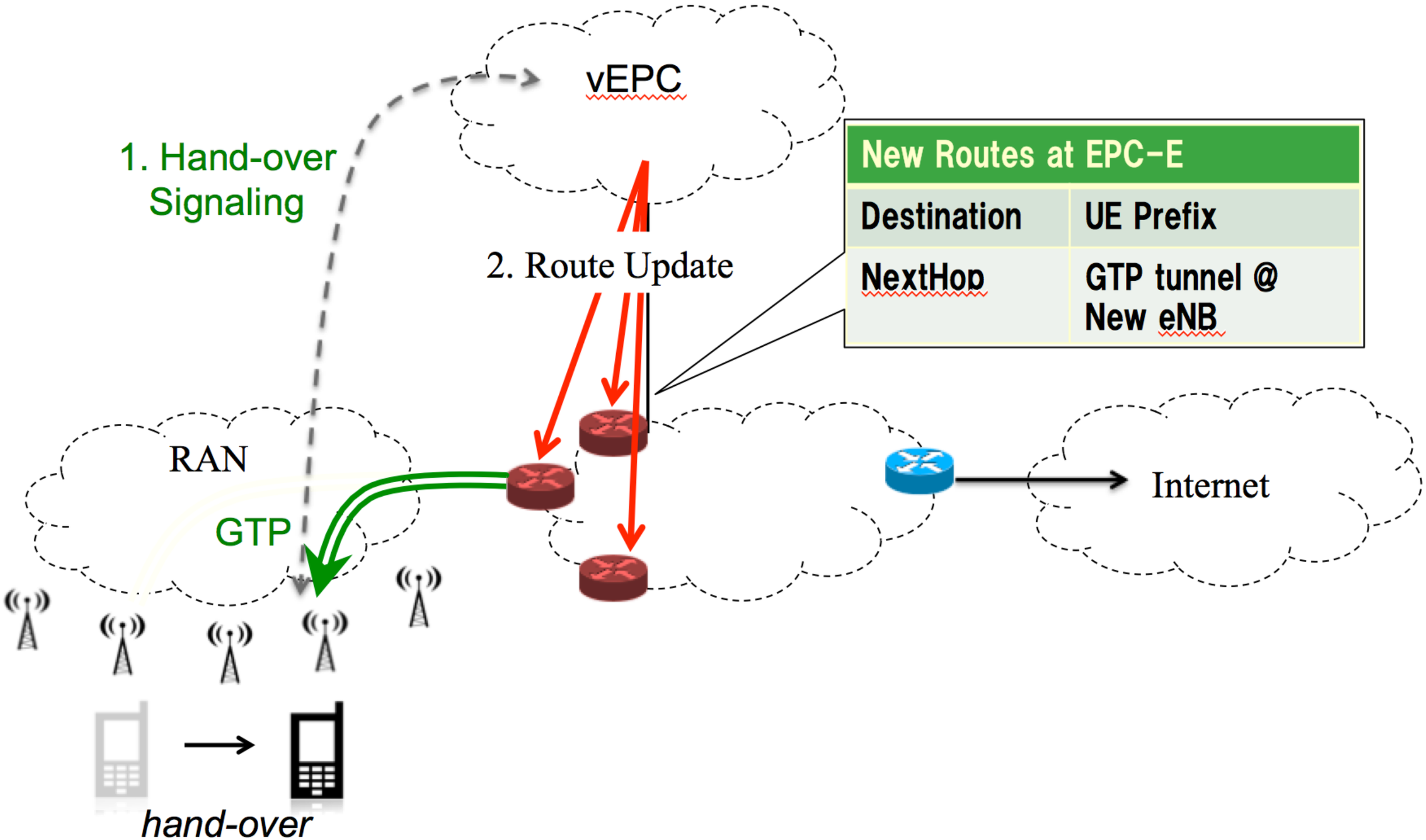

Stable Routes

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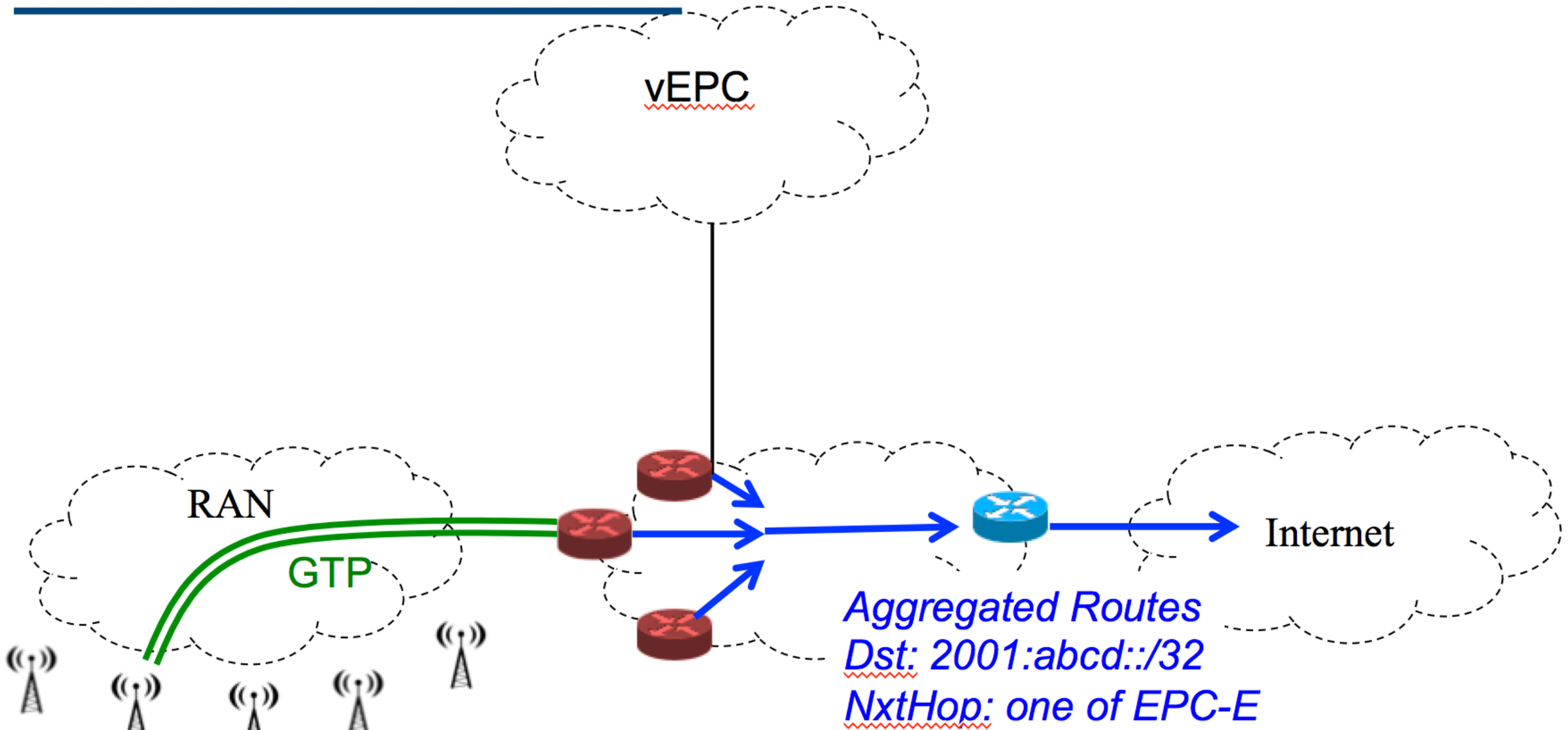

Every EPC-E advertise the aggregated prefix.

→ **Stable: BGP Update**

Address Delegation

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② Reverse Lookup

Destination	NextHop
…	…
2001:db8::/64	GTP Tunnel

vEPC

EPC-E has a route of every UE and uses that information to reply RS and DHCP REQ.

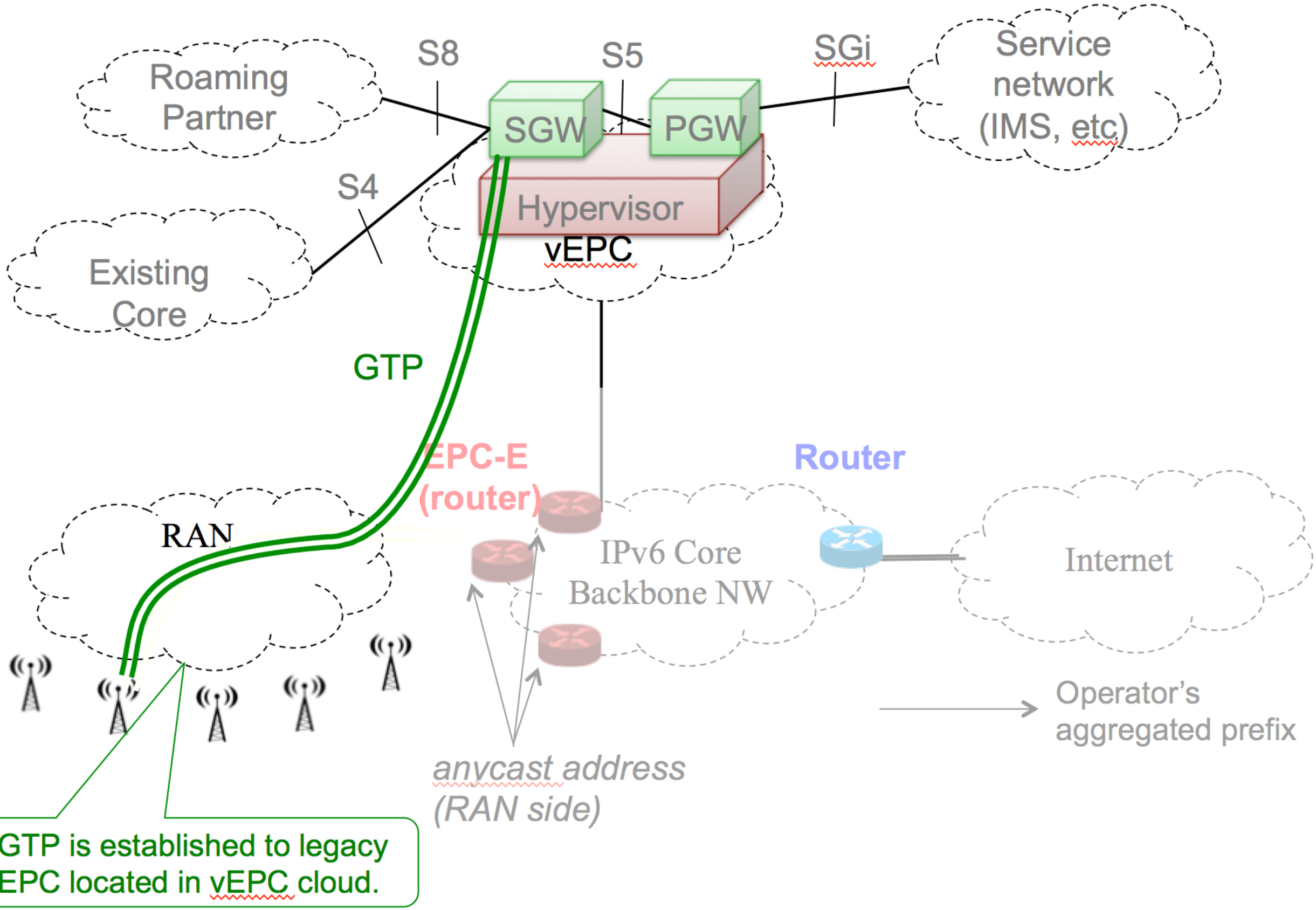
① RS or DHCPv6 Req

Internet

③ RA or DHCPv6 Res
(Delegate 2001:db8::/64)

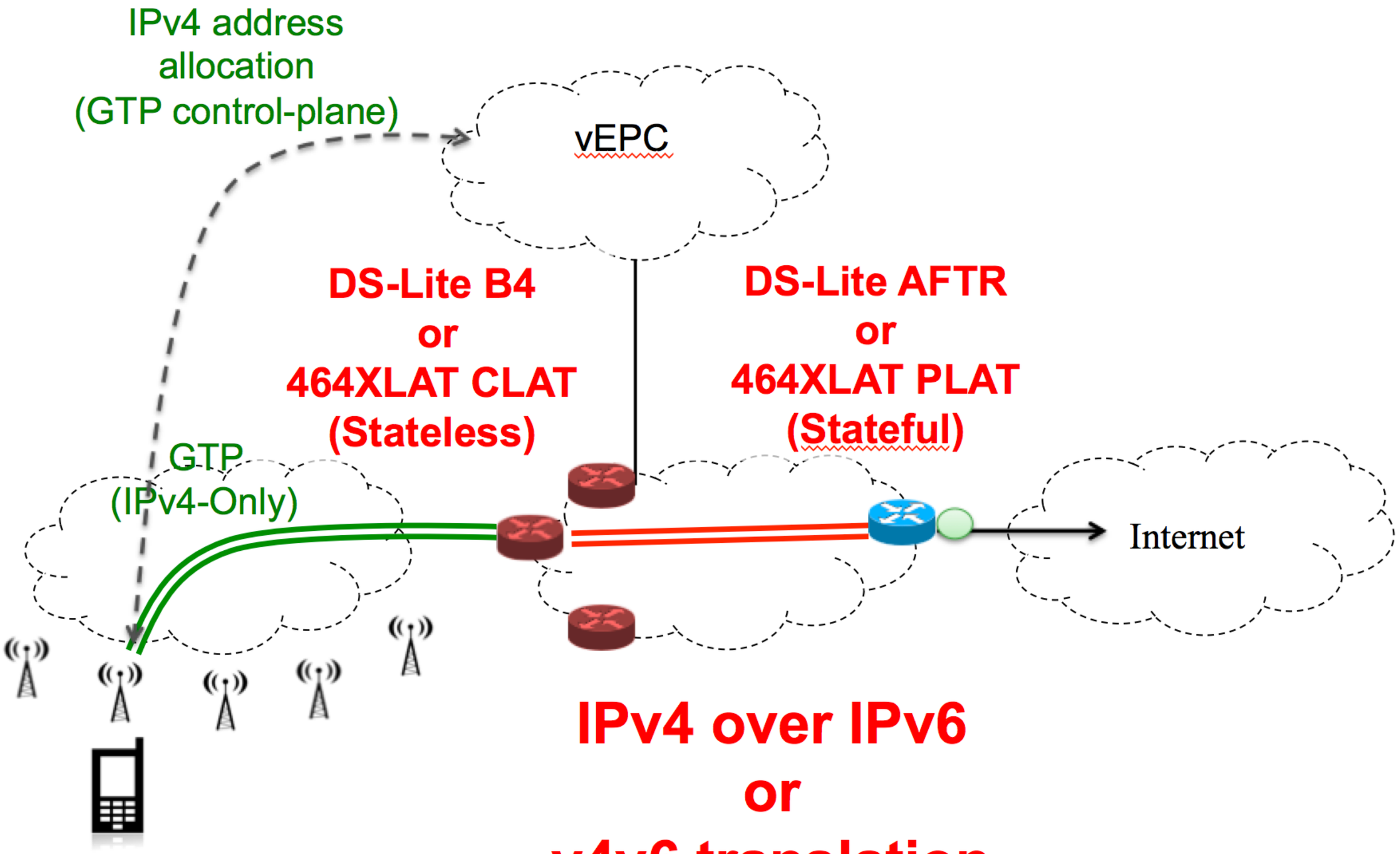
Backward compatibility

SoftBank



IPv4 Support

SoftBank



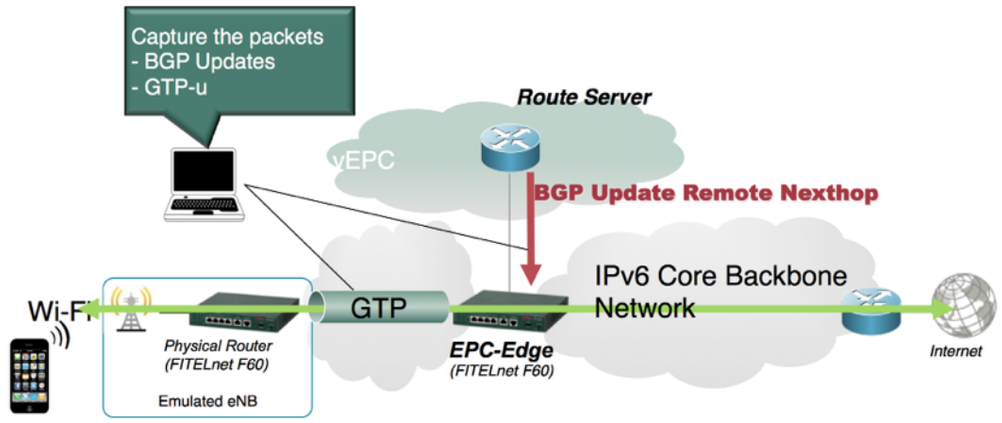
IPv4 over IPv6
or
v4v6 translation

Implementation and Performance Test

Stateless U-plane vEPC Demonstration

Wed, Mar.5 17:00- @Tower 3rd floor Meeting Room 1-4

BGP Remote Nexthop working on physical router in the vEPC system.

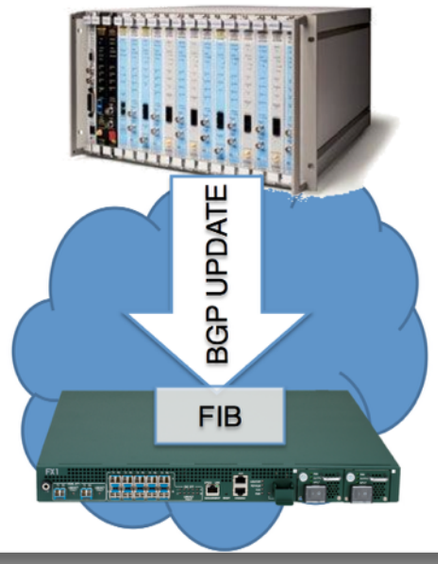


Question and more information

Furukawa Network Solution Corp.
Satoshi Usui : usui@fnsc.co.jp

Test environment

- DUT: FITELnet FX1
- BGP Update from Spirent AX/4000



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Result

Routes per single BGP UPDATE	Max FIB installation time (msec)	Max Routing Update Capability (routes/sec)
1	4.457	224
8	5.460	1465
16	7.092	2256
32	9.646	3317
64	14.596	4384
128	23.263	5502
256	39.673	6452

http://tools.ietf.org/agenda/89/slides/slides-89-dmm-4.pdf

Question?
Discussion?

http://tools.ietf.org/html/draft-matsushima-stateless-uplane-vepc