

*Heavy Reading's View*

# **The Mobile Cloud Services Core for 4G and 5G Networks**

Prepared for Cisco Knowledge Network by  
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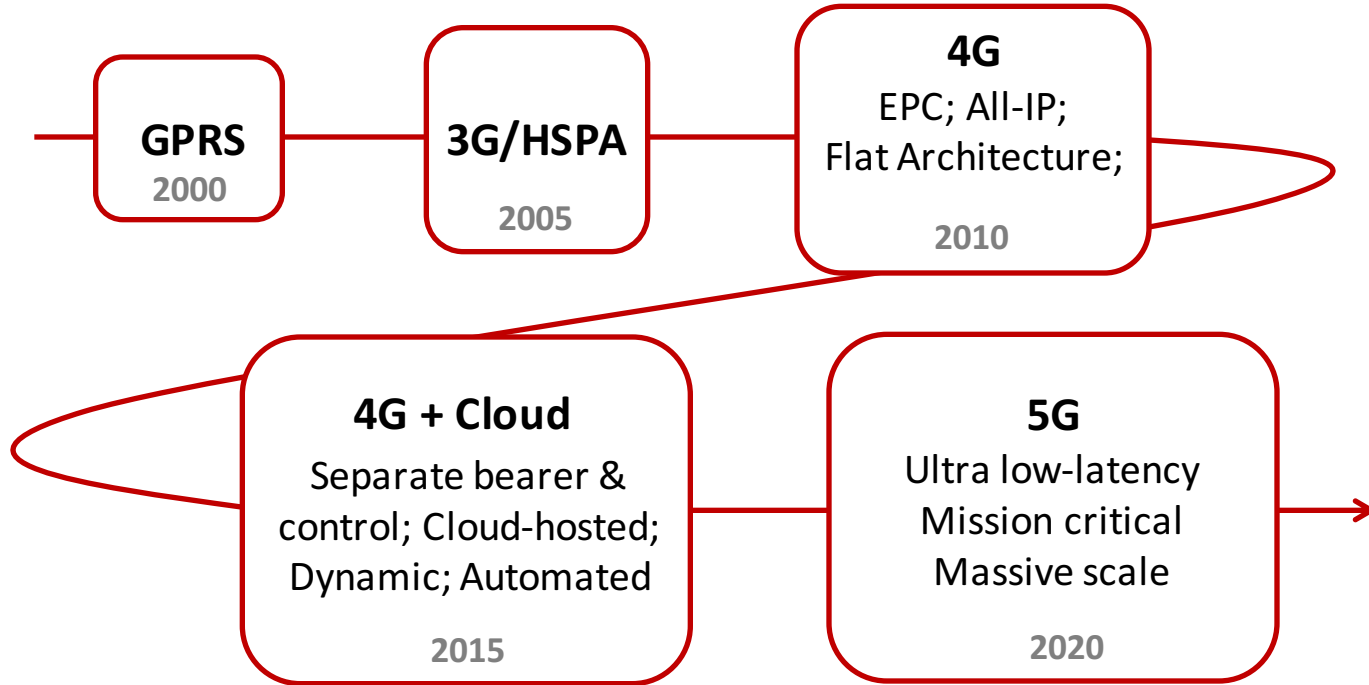
April 26, 2016



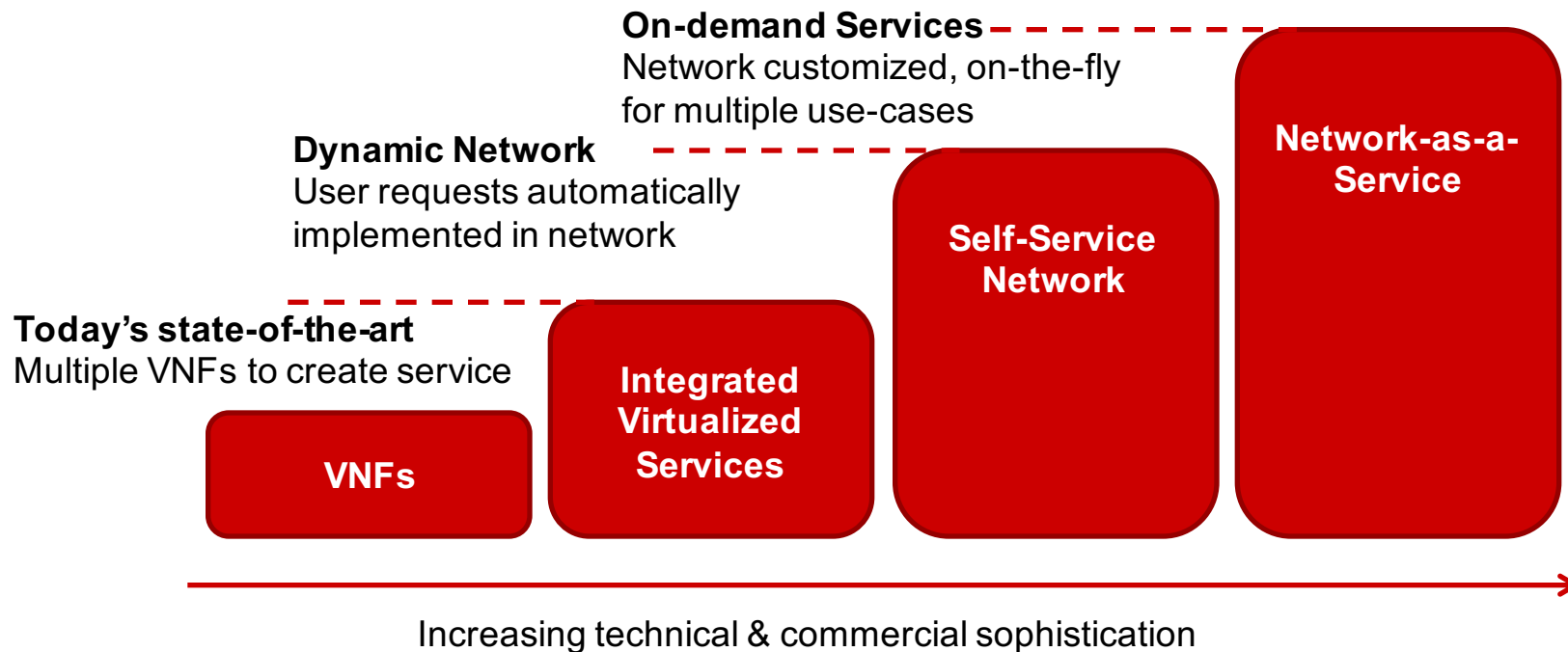
# Agenda

- Business Context
- Architecture Evolution
- Distributed Cloud and Distributed EPC
- Towards 5G

# Mobile Packet Core Technology Cycle



# Business Model Evolution



# Applying Cloud Principles to Mobile Core

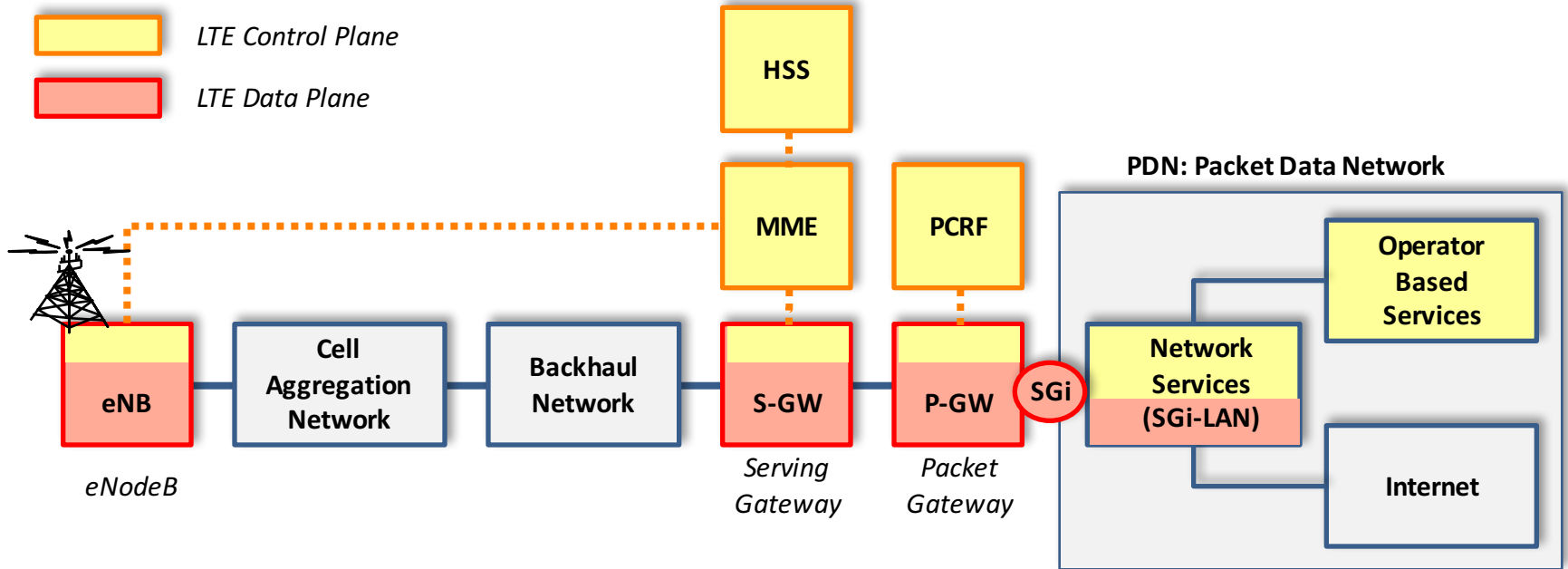
- Distributed processing, centralized control
- Services (VNFs in this case) abstracted from infrastructure
- User portals that allow customers to purchase and configure network services
- Make networking as easy to consume as cloud services

"If you look at the cellular core, you again find back offices full of exorbitantly expensive equipment that's typically quite brittle."

**Jennifer Rexford, Computer Scientist, Princeton (renowned for SDN research)**

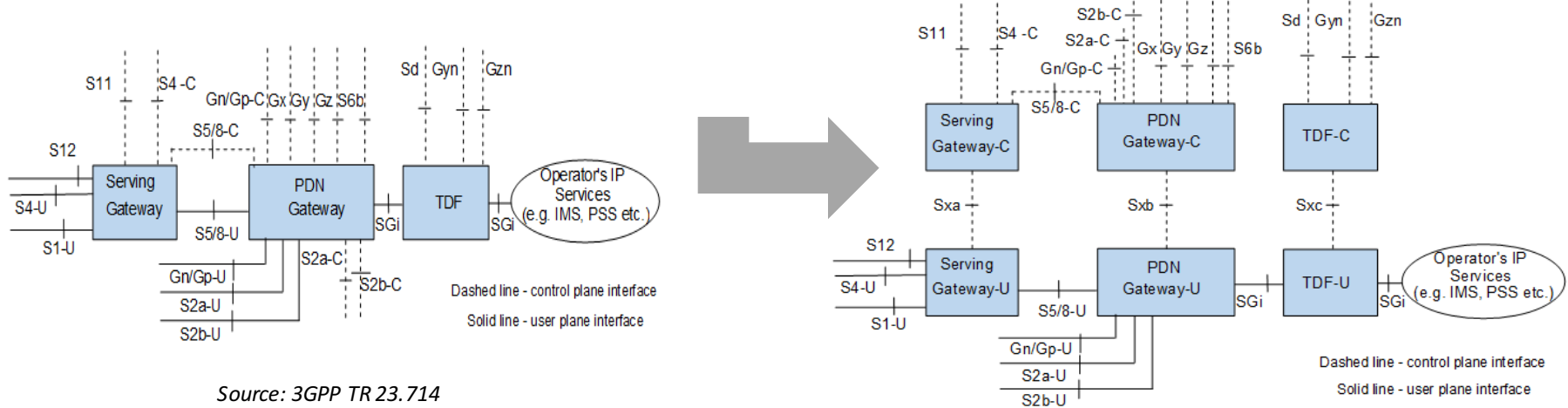
# Architecture Evolution

# Mobile Network is Control Plane Centric



- Opportunity to abstract & disaggregate functions

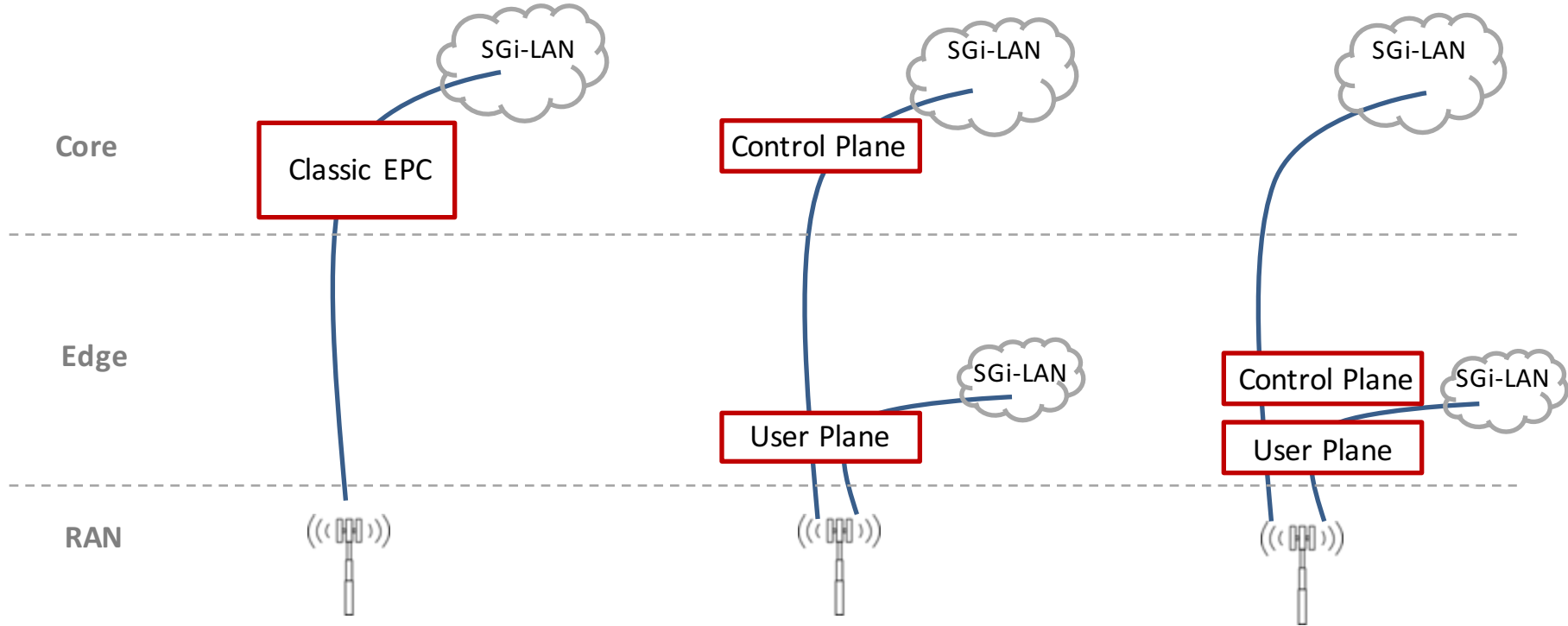
# 3GPP Control / User Plane Separation (“CUPS”)



- “Split Gateway” approach in 3GPP (TR 23.714)
- In real-world deployment, there is an opportunity to simplify
- Simple “User-Plane Nodes” and “Mobility Controllers” could emerge



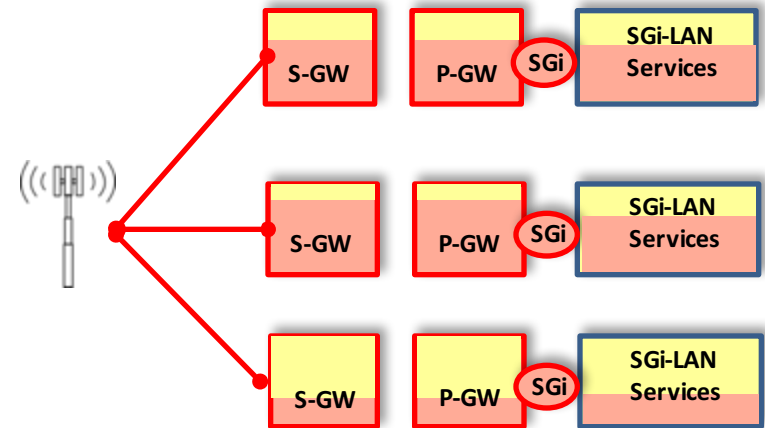
# Architecture & Deployment



# “Network Slicing” for EPC

## A.K.A. Packet Core Network Selection

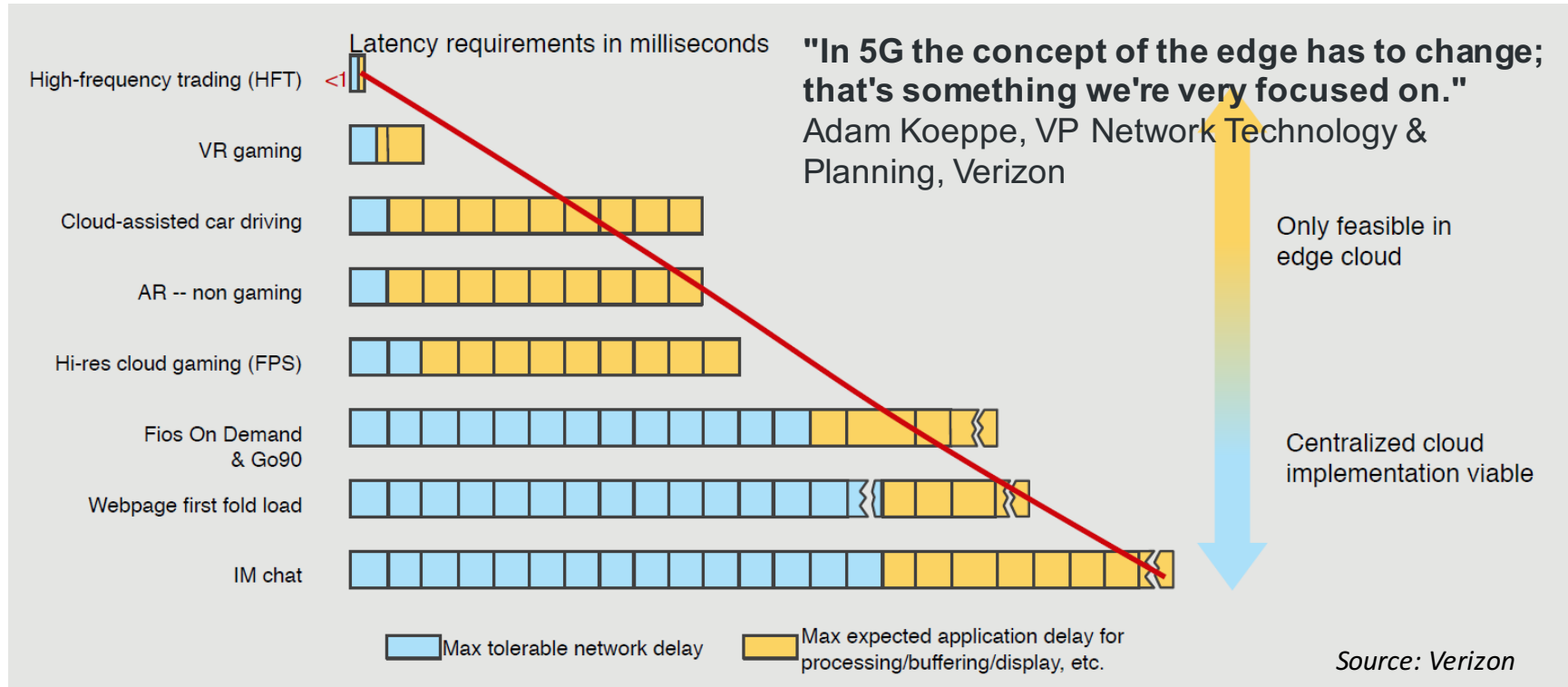
- Multiple options to steer user traffic into a core network processing path
  - **APNs** – Used for VoLTE and enterprises services today
  - **MoCN** – Used for networks sharing and MVNOs
  - **DECOR** – Ref TR 23.707; likely to be used initially for IoT
  - **Service Chaining** – Using packet headers; e.g. NSH



- Virtualization enables multi-tenant and single-tenant core networks
- “Slices” configured according to service type & traffic profile

# Distributed EPC Deployment

# Why Distribute?



# Distributed Cloud for MNOs

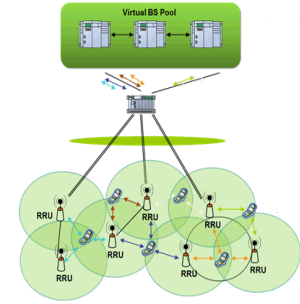
MEC



M-CORD

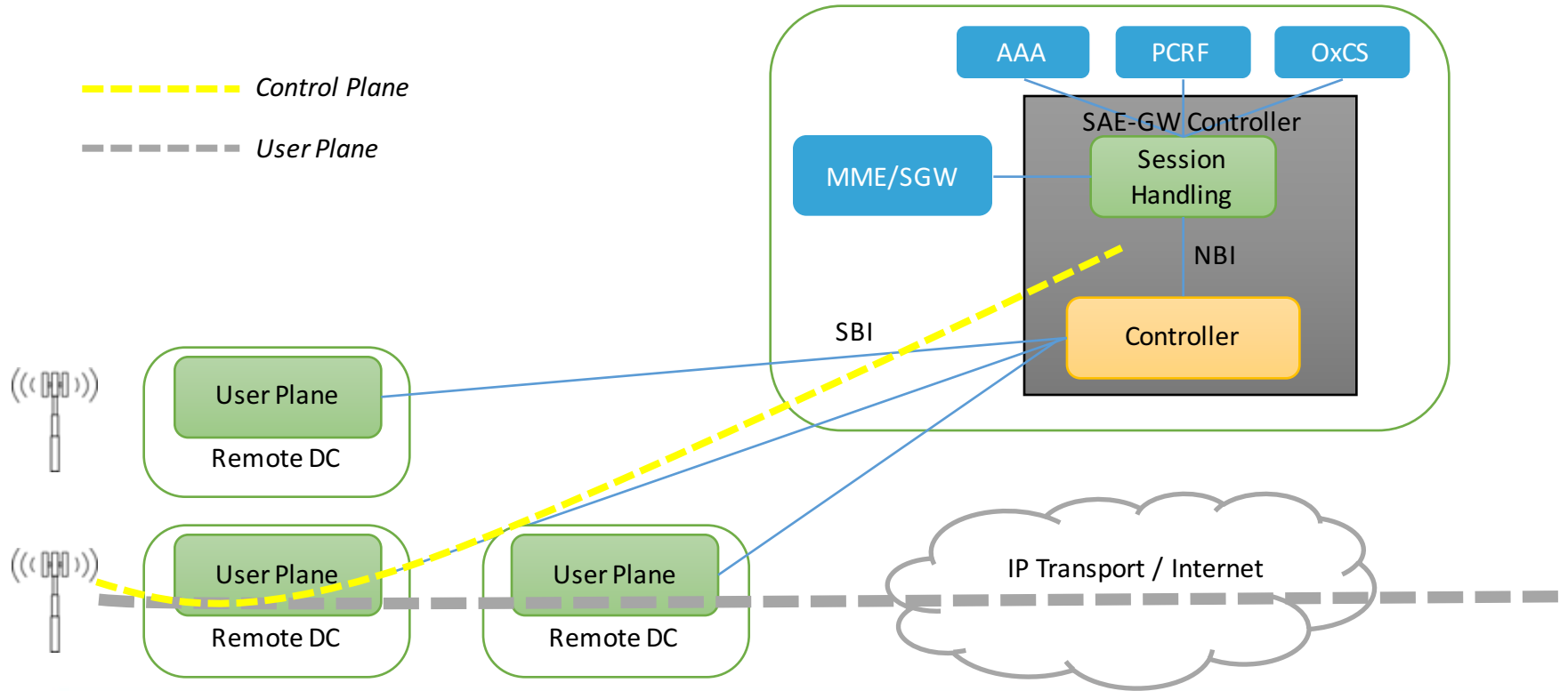
ON.LAB

C-RAN



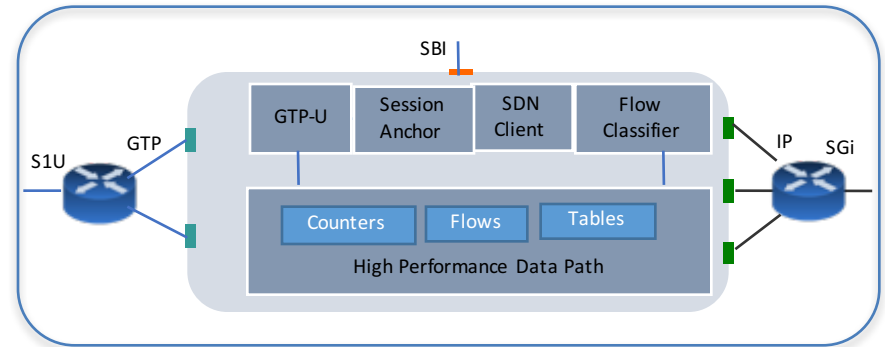
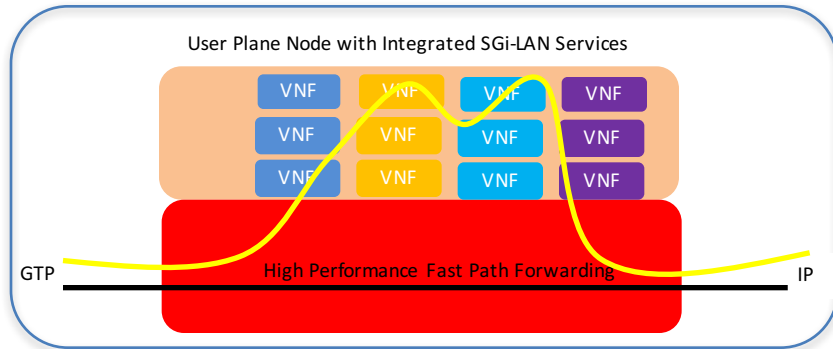
- Operators need one-hop access to the cloud
- Multiple efforts to define “edge cloud” environments
- Deployment at the aggregation layer, C-RAN hub, etc.

# Distributed Architecture



# Distributed User-Plane Node

- Virtualized on x86 servers
- Router termination of GTP
- GTP-enabled white-box switches

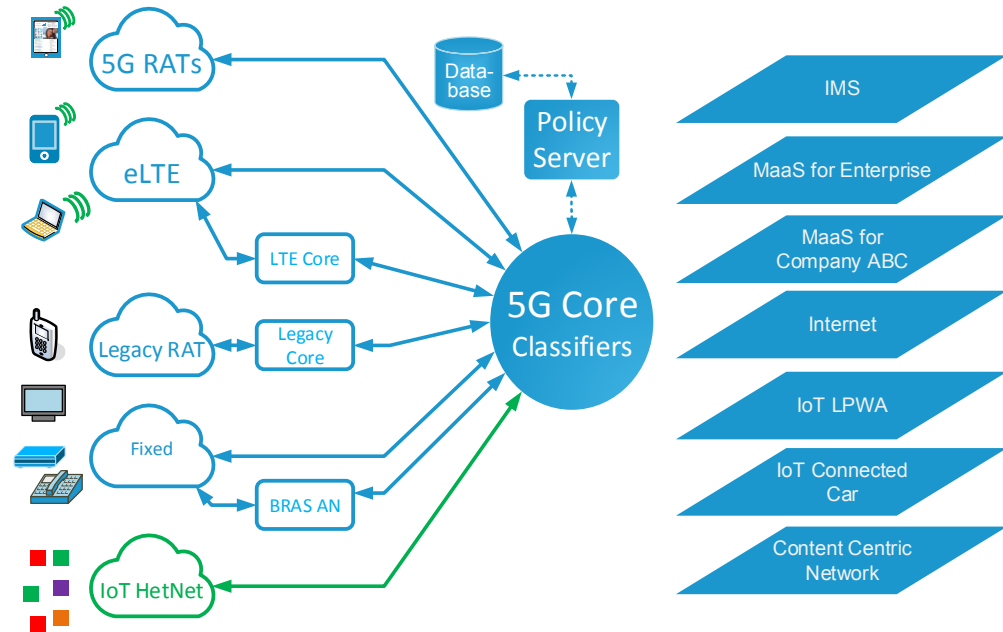


# Towards 5G



# 5G Core Development

- Network Slicing: Multiple logical networks as virtually independent business operations on common infrastructure
- All connections are steered into their correct slices based on policy layer
- Slices can be service chains equipped with service functions particular to the slice definition



- SA2 Architecture standards work underway in 3GPP

# Mobile Cloud Service Core White Paper



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[Big Communications Event](#)  
Austin, May 24-25

[http://www.lightreading.com/lg\\_redirect.asp?pid=lgid\\_docid=722051](http://www.lightreading.com/lg_redirect.asp?pid=lgid_docid=722051)

**Thank You!**

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