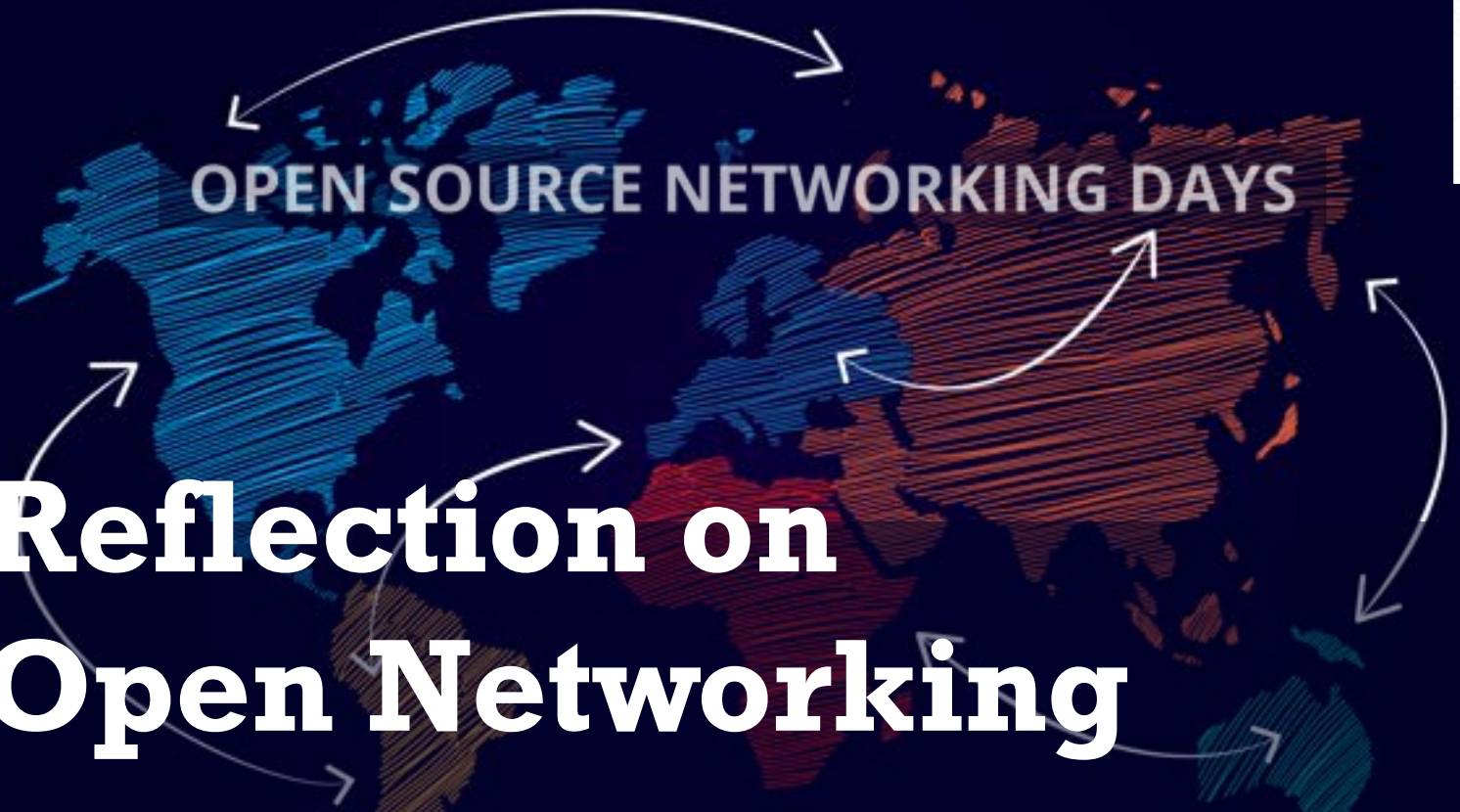

Live Q&A

Reflection on Open Networking

Chun-Ming Ou <jimmy_ou@edge-core.com>

Edgecore Networks

@OSN_DAYS_TAIWAN

Live Q&A and polls

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Scan me to
join live Q&A

You can also use following link:
https://app.sli.do/event/6cqlagtg

Or

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Who am I

Chun-Ming Ou

「Freedom, Control and Innovation」

Ambassador

Pre-sale

Senior Engineer

Software
is
eating
the world

What is open networking?

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NFVs / Applications

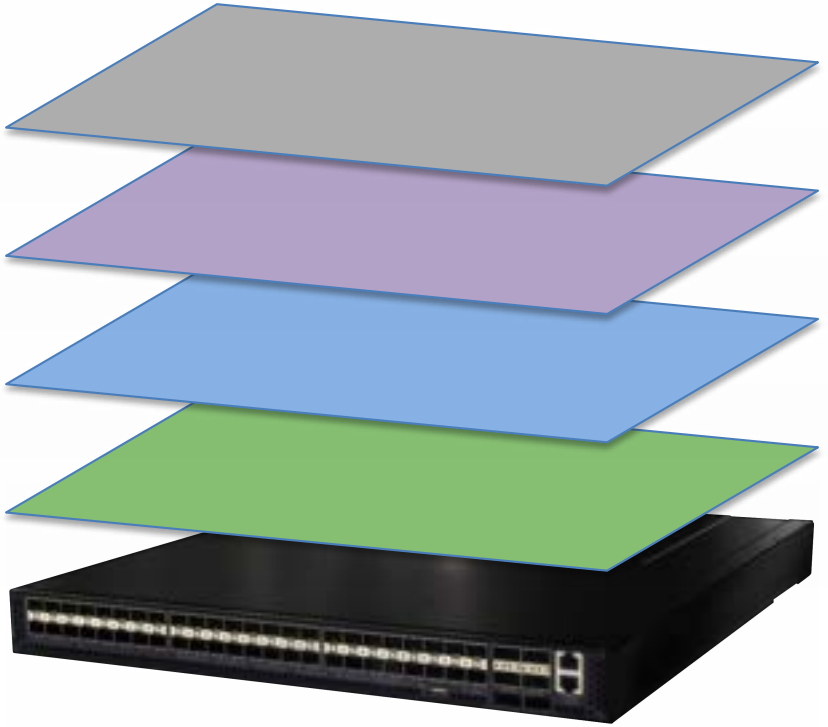
NFVs/Applications provide different network functions

Network Operating System (NOS)

NOS is a specialized operating system for a network device such as a router, switch or firewall

White box

white box is a network switch that is assembled from standardized commodity parts. White box switches run on off-the-shelf chips



SDN Controller / Control Plane

SDN controller or control plane manages flow control for network management and application performance

Open Network Install Environment (ONIE)

ONIE enables a bare metal network switch ecosystem where end users have a choice among different network operation system

Open networking use case

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- Datacenter
- Telecom
- Campus
- Enterprise

amazon

Tencent 腾讯

Google

Alibaba Group 阿里巴巴集团

Microsoft

T

AT&T

China unicom 中国联通

NTT Communications

Türk Telekom
Değerli Hissettirir

Programmable device

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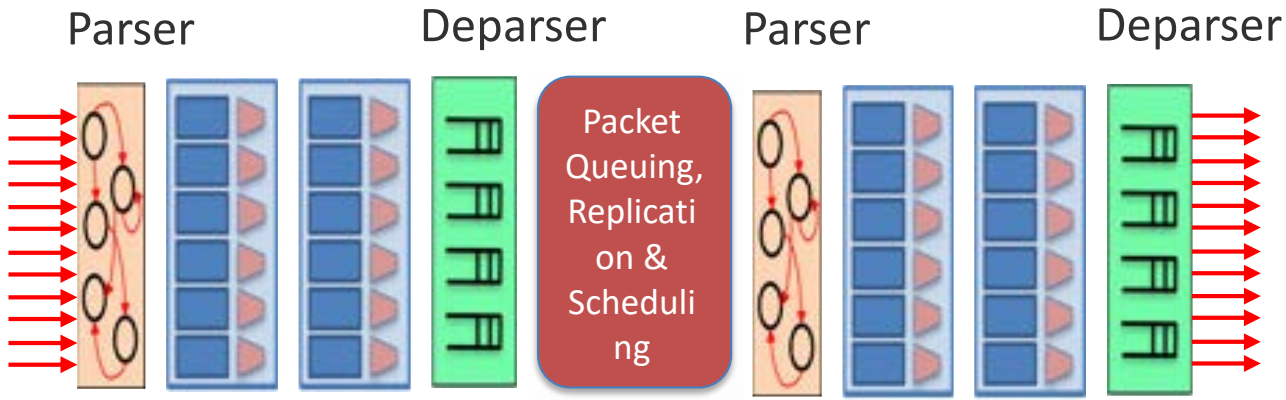
- Wedge100BF-32X/65X/32QS
  - 32/64 x 100G QSFP28
- AS9516-32D
  - 32 x 400G
- XLT
  - Server switch with 4 x FPGA

	Tofino	Tofino 2
Max Throughput	6.5 Tbps	12.9 Tbps
Match Action Pipelines	Quad	Quad
MAU Stages per Pipe	12	20
Total SRAM per Pipe		67% increase
Total TCAM per Pipe		67% increase
Packet Buffer		190% increase
SerDes Line Rate	10/25G NRZ	10/25G NRZ 50G PAM4
Ethernet Port Speed	10/25/40/ 50/100 GbE	10/25/40/ 50/100/ 200/400 GbE



5G architecture

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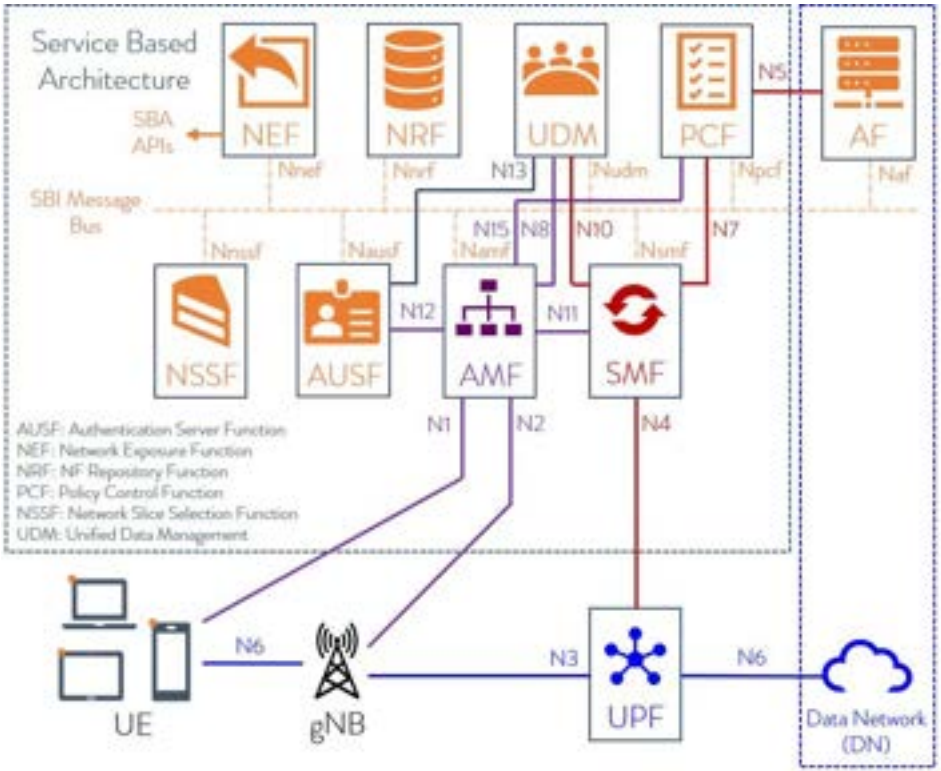

- Service Based Architecture
- SDN/NFV is the fundamental concept
- UPF represents the data plane evolution of a Control and User Plane Separation(CUPS) strategy.

- How about offloading UPF to white box?

Diagram reference from metaswitch

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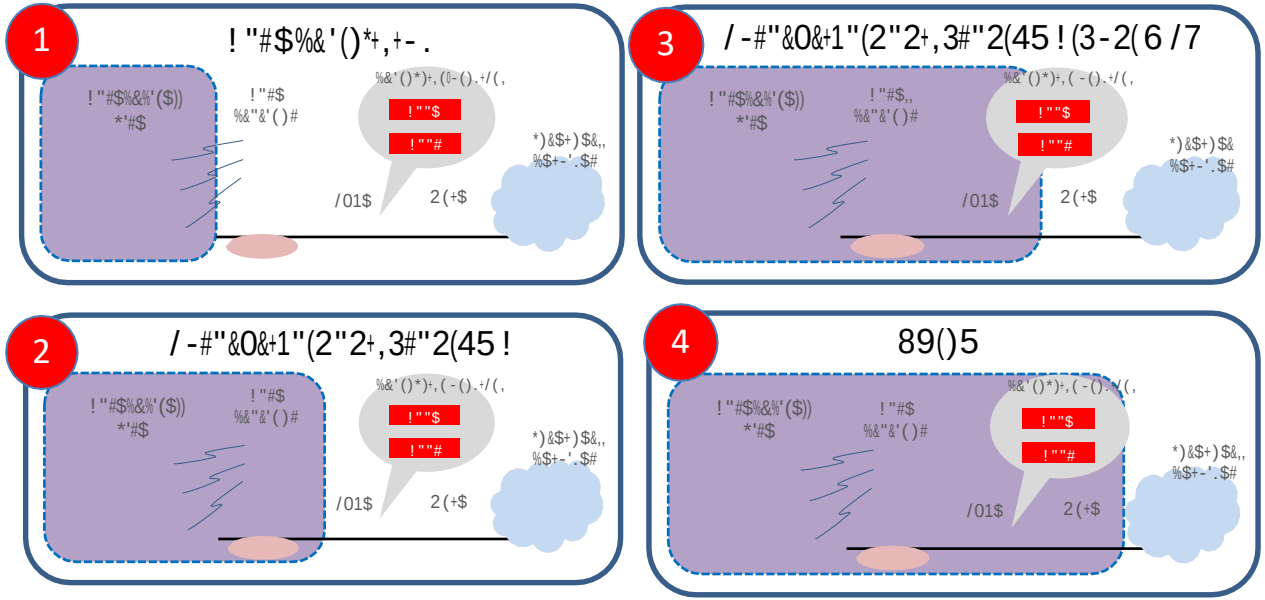

Enterprise 5G SA

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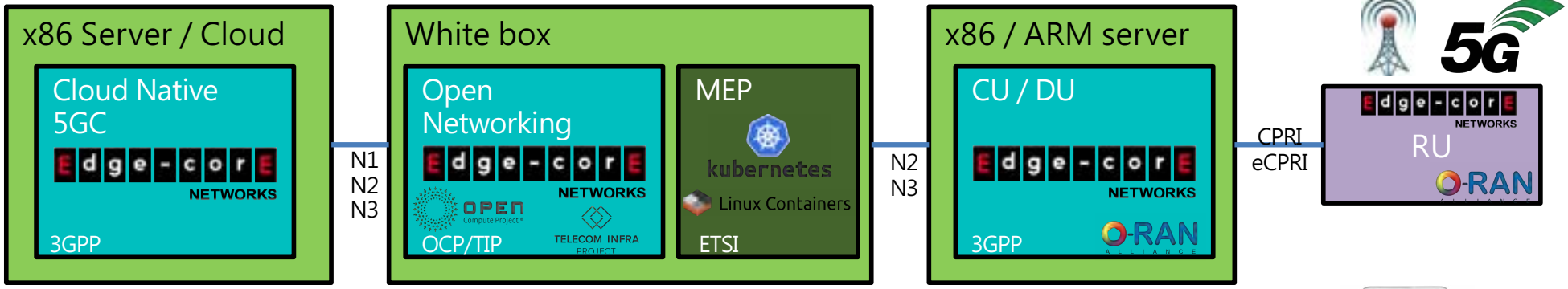

5G fundamentals: Functional Split

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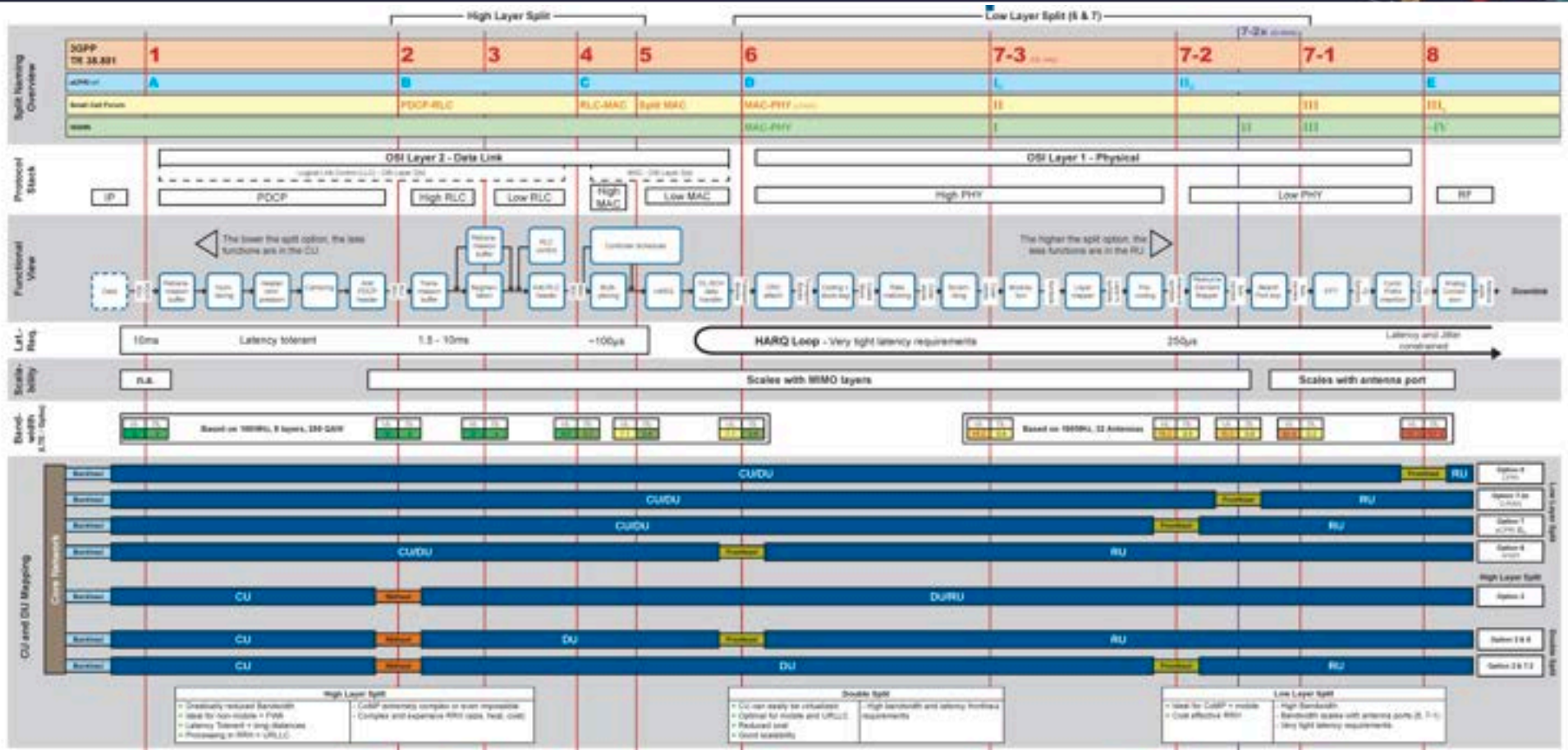

Reference from cubeoptics

Split	1	2	3	4	5	6	7-3	7-2	7-2x	7-1	8

5G RU

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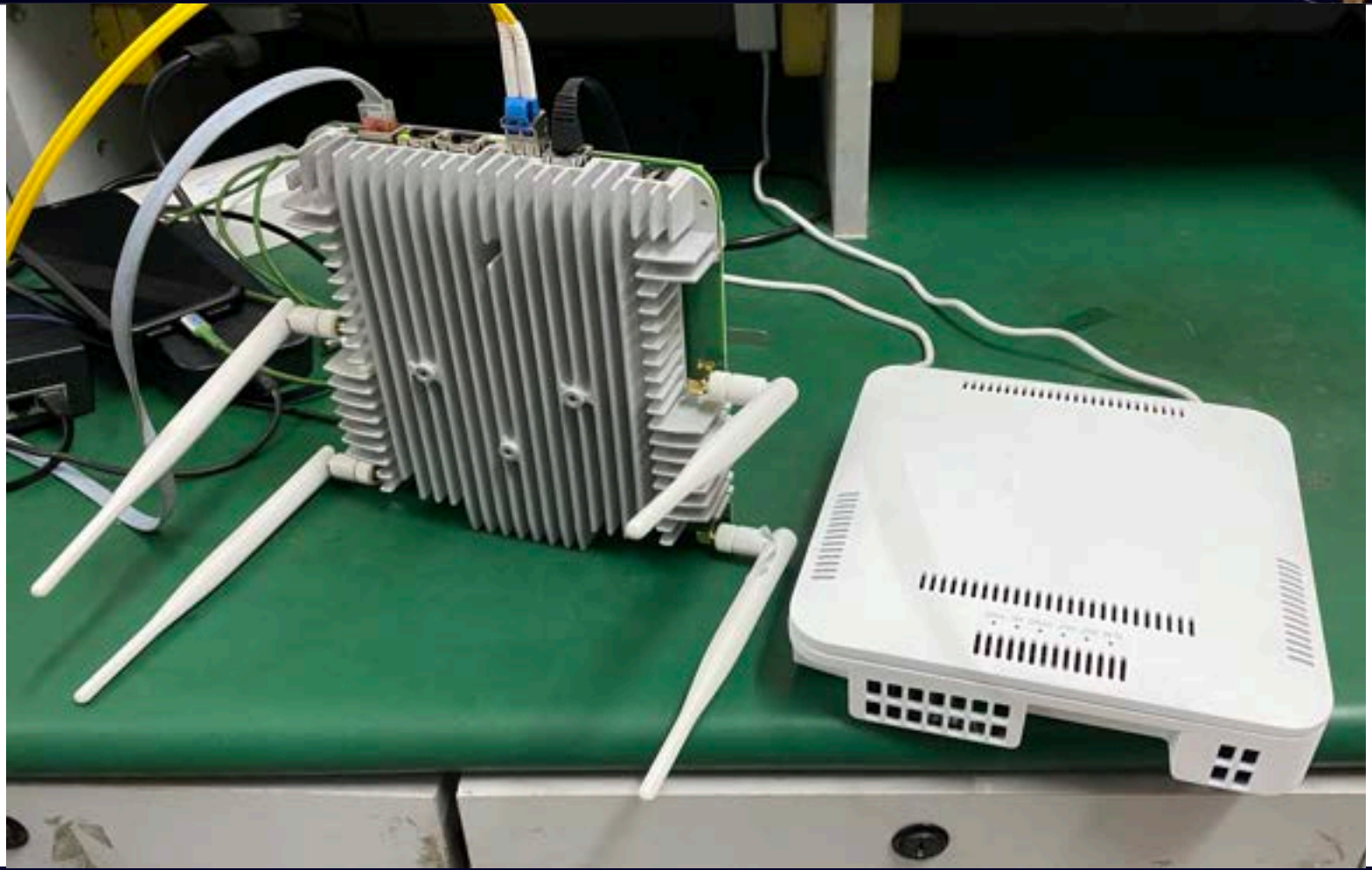

Only 5G? 60GHz wireless

802.11ay

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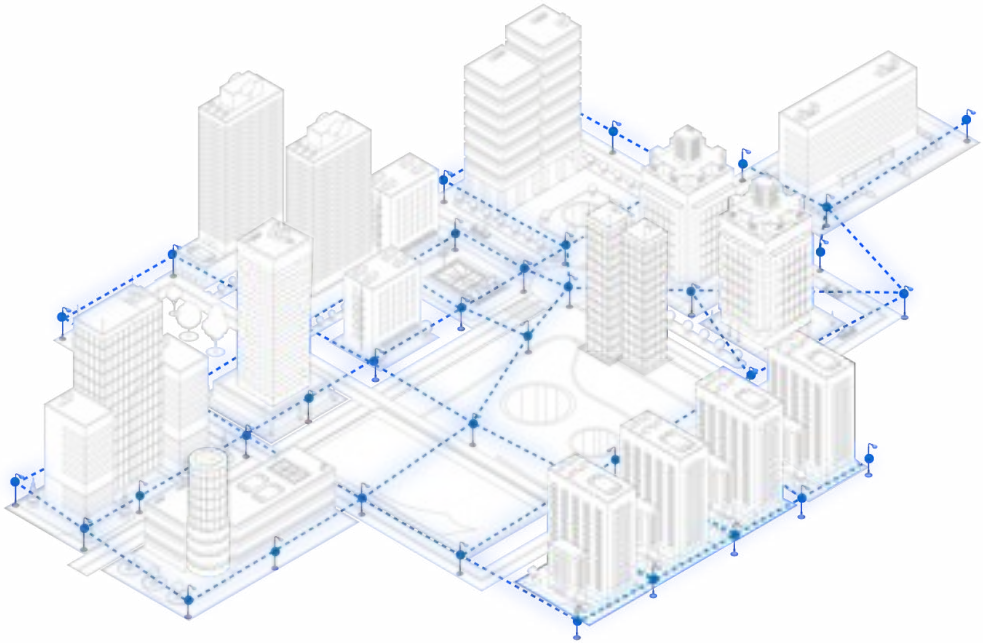

- Facebook Terragraph certificated
- Noise & License-free 60 GHz
- Resilient Mesh Network
- Time-division Multiple Access
- Beamforming Technology with Phased Array Antenna

facebook connectivity

Terragraph - MetroLinq

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Fixed Wireless Access

Outdoor Wi-Fi Backhaul

Small Cell Backhaul

Smart City

MLTG-360

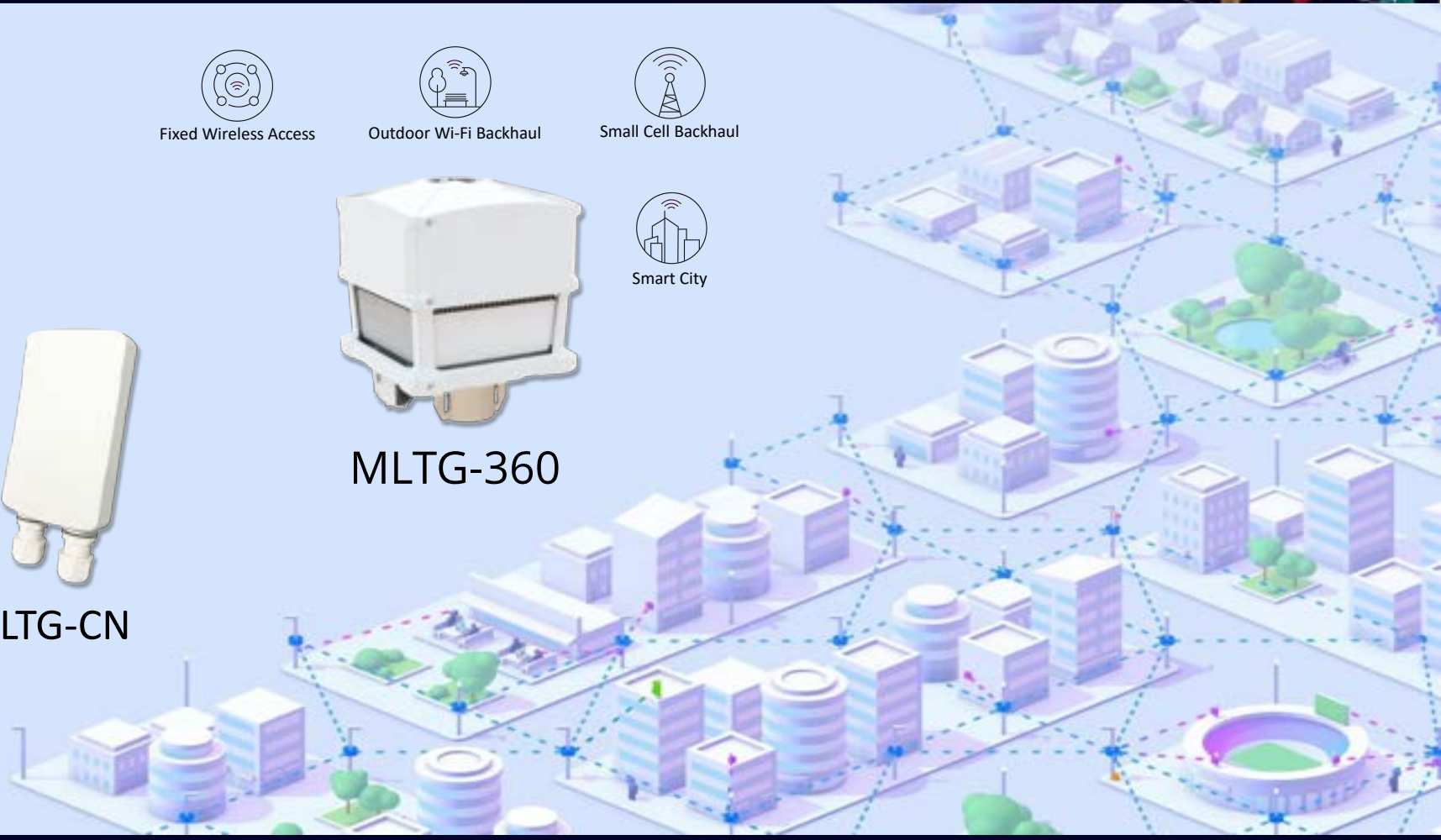
IoT Backhaul

Smart City

Fixed Wireless Access

Outdoor Wi-Fi Backhaul

MLTG-CN



MetroLinq performance

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Network Results

Terragraph leverages 60 GHz unlicensed spectrum to deliver fast reliable internet

3.6 Gbps
peak bi-directional aggregate data rate

1 Gbps
Per user downlink data throughput

<1ms
latency per hop

150m
link distance for peak rates

GSMA 5G SA option 2 type 2

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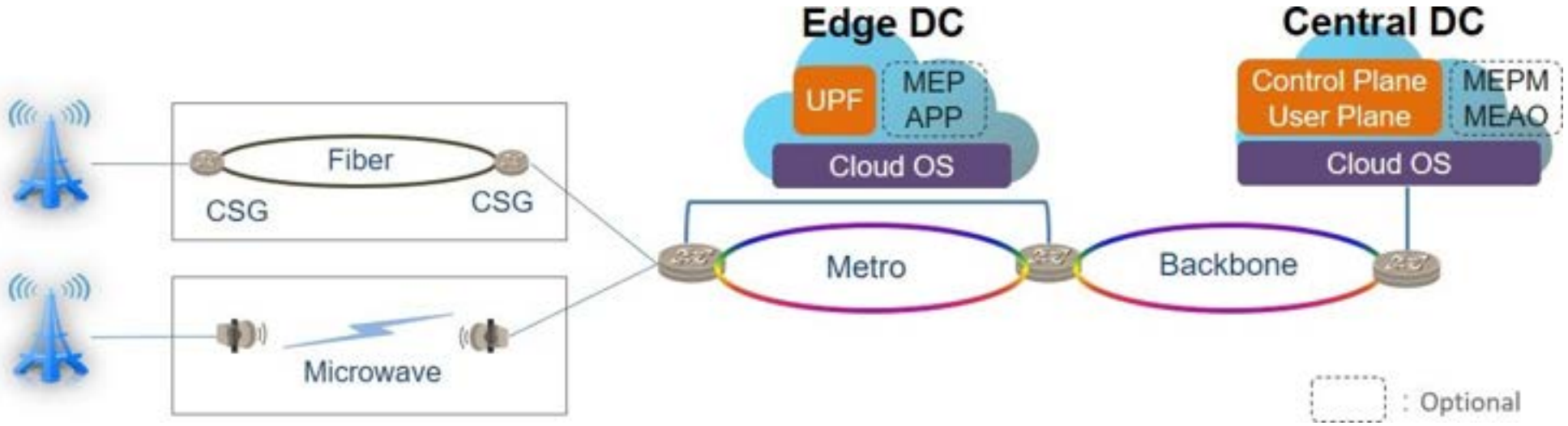

Summary

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- Internet company
  - Rapid innovation and always provide new service
- Telecom
  - Stable, as well as affordable
- Cloud service provider
  - New service, low cost and tolerance for unstability
- Campus
  - Stable
- Enterprise
  - Stable and cheap

Without purchasing order, it is meaning less.

Enterprise use open networking

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- Consider the scale of the enterprise, use open networking solution may not be a cost-effective solution
  - Most open networking device is more expensive than legacy
- The operate teams familiar with the use of legacy network device
  - Familiar with CLI
  - Stability of functions
  - Responsibility when service is down

Where to get SDE to compile p4?

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- Get Intel P4 Studio SDE by sign NDA with Intel
- Join the P4 training which holds by Intel
- Edgecore provide P4 platform to help

Gap between software and hardware

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- The code which works for software does not compatible to be use in the hardware
- The software that is essential for operating some of the special functions that are only provided by hardware is missing.

v1model to TNA

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v1model Architecture

TNA Architecture

How many telecom use open network

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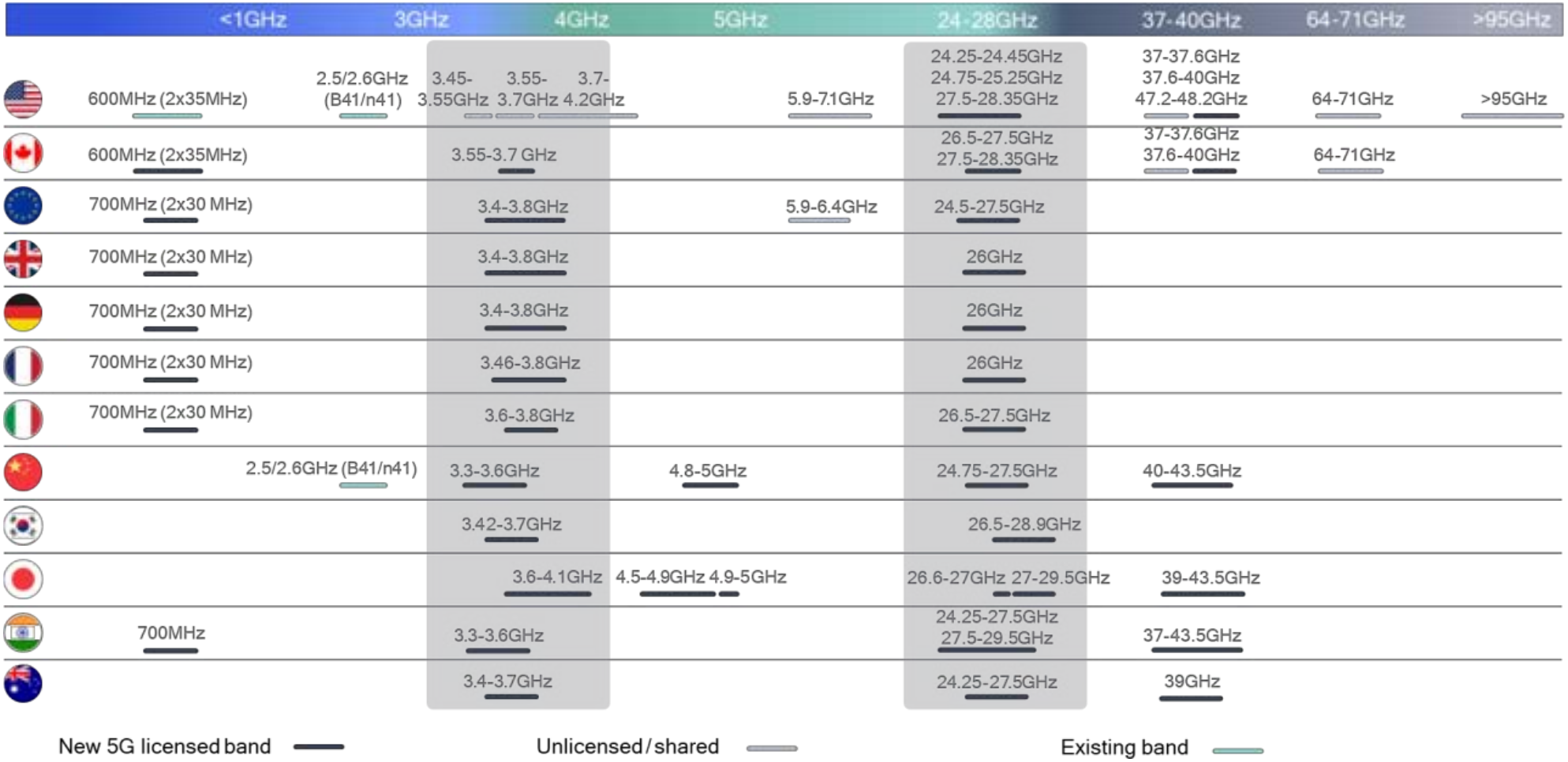

MetroLinq is able to deliver **fiber-like speeds** at a fraction of the cost of deploying new fiber infrastructure.

Thank You

Scan me to join
live Q&A

jimmy_ou
@
edge-core.com

#Intel #Barefoot #Tofino #Tofino2 #P4 #P4lang #OpenNetworking