

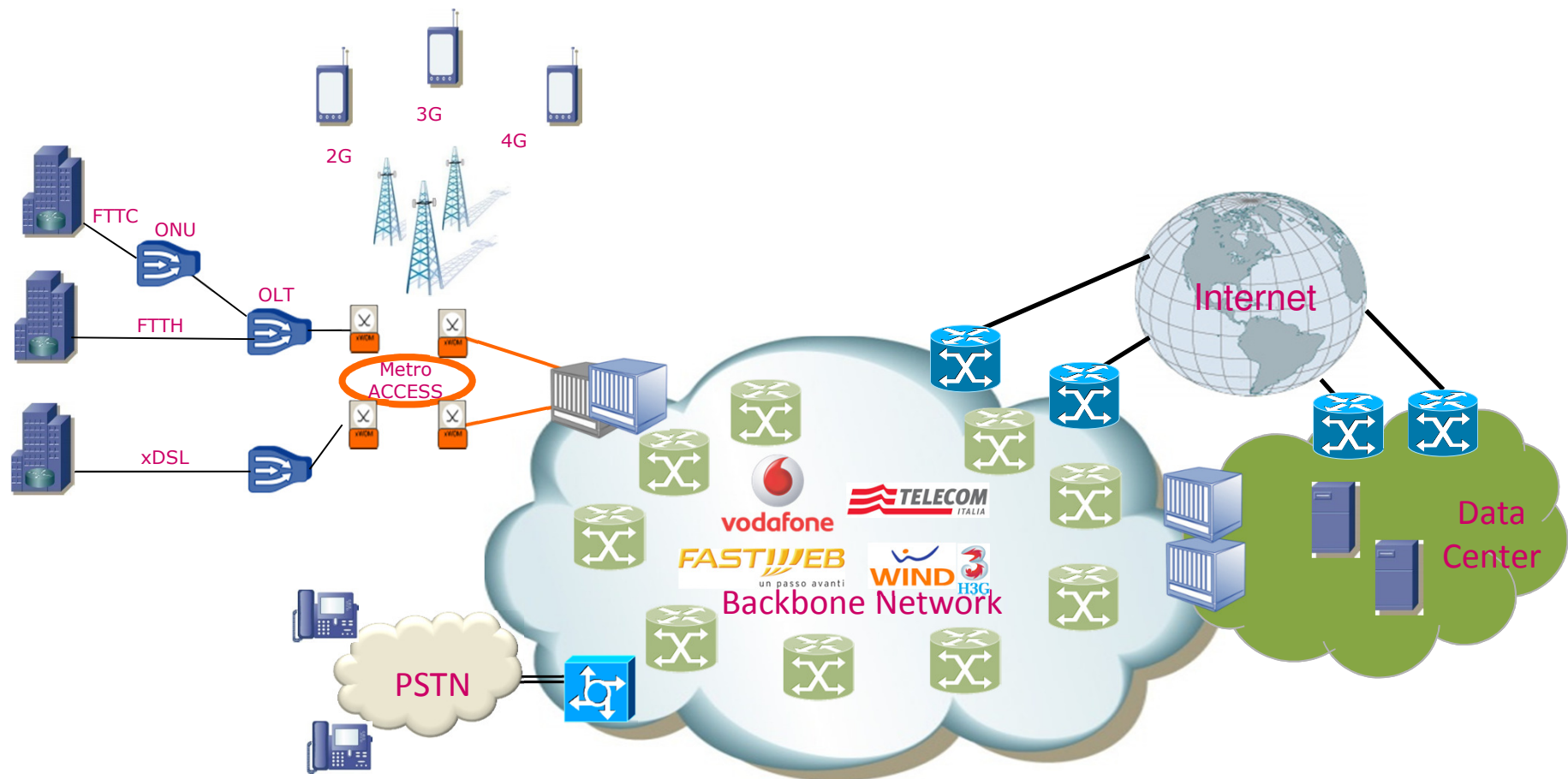
State of the art Routers Architecture (Juniper, Cisco, Huawei)

Relatore: Ing. Maurizio Ipsale (K Labs Trainer and Professional Services Engineer)

www.klabs.it



- Telco Network Architecture
- Metro/Core Routers **Evolution**
- **SDN/NFV** Evolution
- FTTH/FTTC Access Network
- **K Labs** Job opportunities
- K Labs **Internship**



Worldwide Top Router Vendors

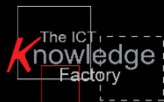


HUAWEI

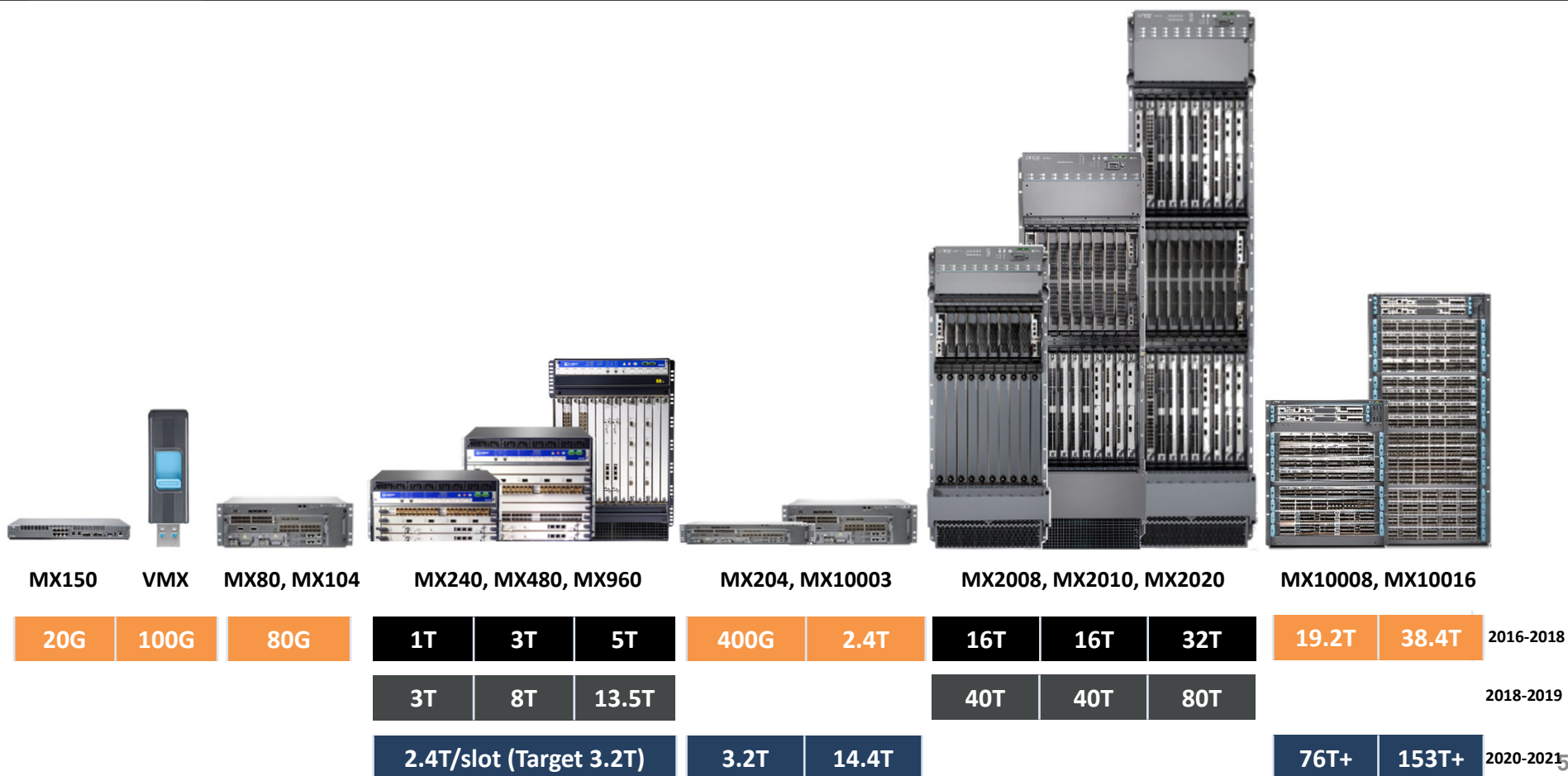


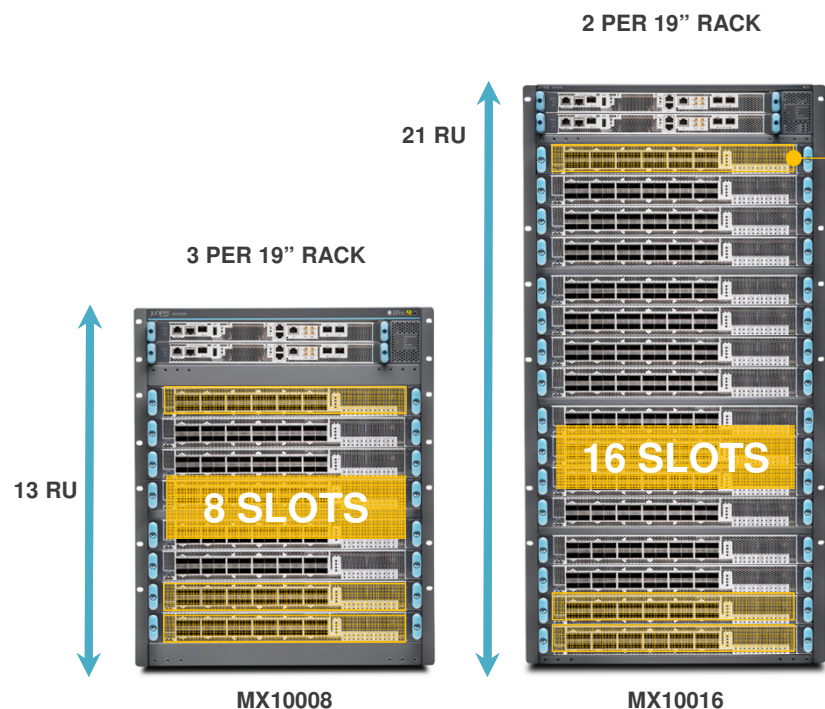
CISCO™

JUNIPER
NETWORKS®



Metro and Core Routers





Universal chassis across all product families

Dense 10GE, 40GE and 100GE

Optimal power and cooling design for DC / COLO

Scalable card/fabric interconnect, capacity increase

2.4T Line Card supported @ FRS

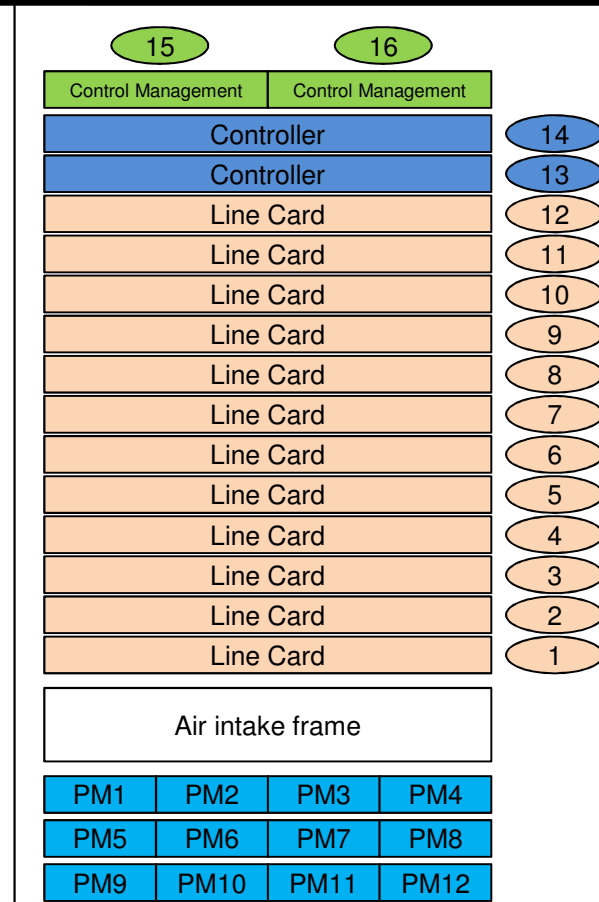
MAIN FEATURES

COMPACT, OPTIMIZED FOR DC AND COLO

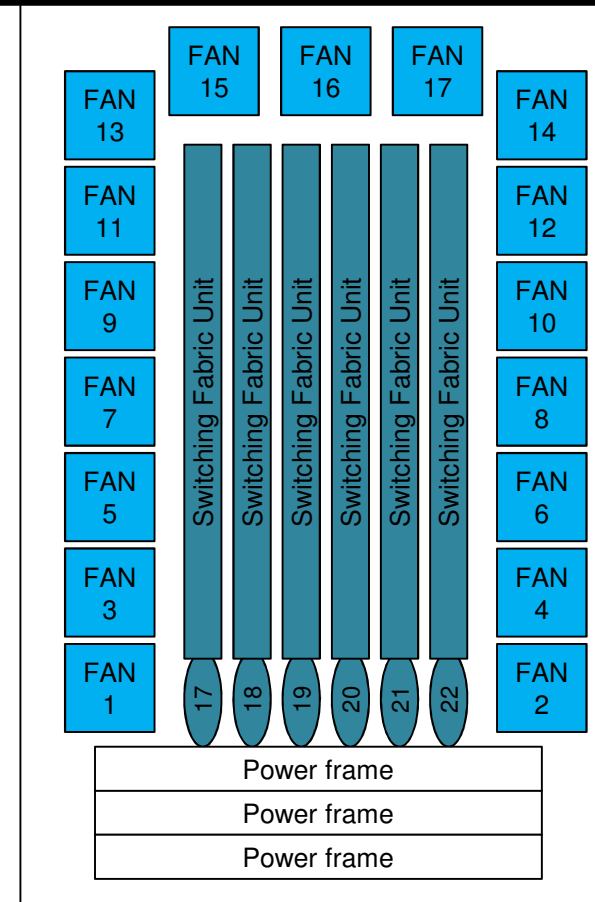
DC-NEBS (GR-3160) COMPLIANT

10GE / 40GE / 100GE

Slot Distribution Diagram example



front view



rear view



ASIC

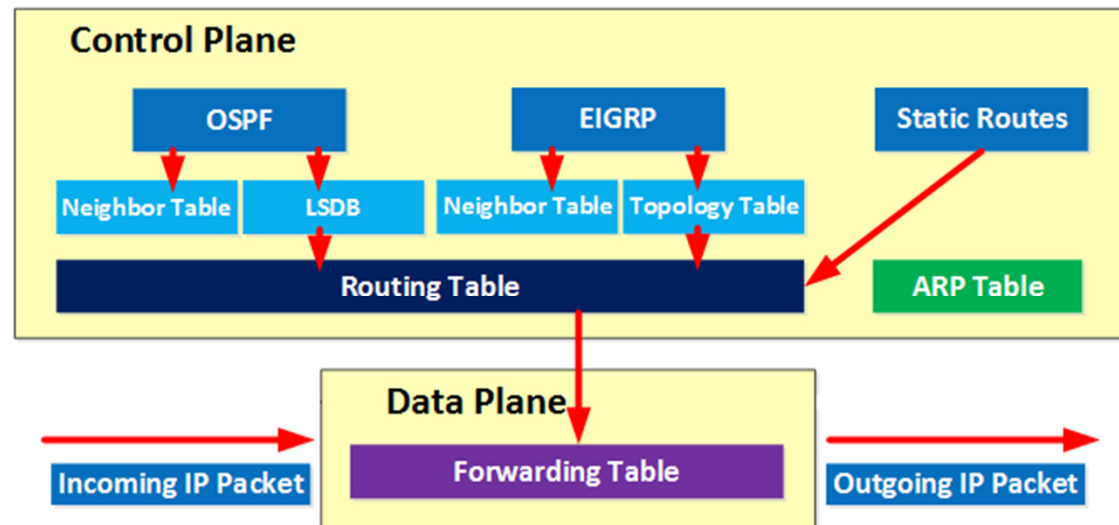
- 28nm process
- 23.44mm x 23.15 mm die size
- More than 60% power consumption reduction
- 400 Gb/s Network Processor

VS



General Purpose CPU

Control Plane and Data Plane Separation 2/2



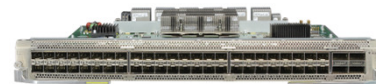
High Density Line Cards 1/2



36*100GE QSFP28



36*40GE QSFP+



48*10GE SPF+ +
2*40GE+2*100GE

10GE Flex Port



SFP-T: RJ45,
GE electrical



100m

SFP: GE optical
port connection



500m,
10Km, 40km,
80km, 100km

10GE AOC:

Short-distance, low-
cost connection



3m, 10m, 20m

10GEcopper cable:
Low-cost connection
within 5m



1m, 3m, 5m,
7m, 10m

SFP+: 10GE optical
port connection



100m, 220m, 300m,
1.4km, 10km,
40km, 80km

40GE Flex Port



QSFP+ connection



100m, 150m, 300m,
400m, 1.4km, 10km,
40km

40GE copper cable:
Low-cost connection
within 5m



1m, 3m, 5m

40GE AOC:
Short-distance, low-
cost connection



10m

One 40GE splits into 4*10GE

Fiber
connection



300m, 1.4km, 10km

Copper cable
connection



1m, 3m, 5m

AOC connection



10m

100GE Flex Port



CFP 100G fiber connection



100m,
10km, 20km,
40km, 80km



CXP 100G fiber connection



100m



CFP2 100G fiber connection



100m, 10km



QSFP28 100G fiber connection



100m, 500m
2km, 10km

100GE split into 2/3*40GE



100m

Cable connection



10m

100GE split into 8/10/12*10GE



100m

100GE split into 4*25GE

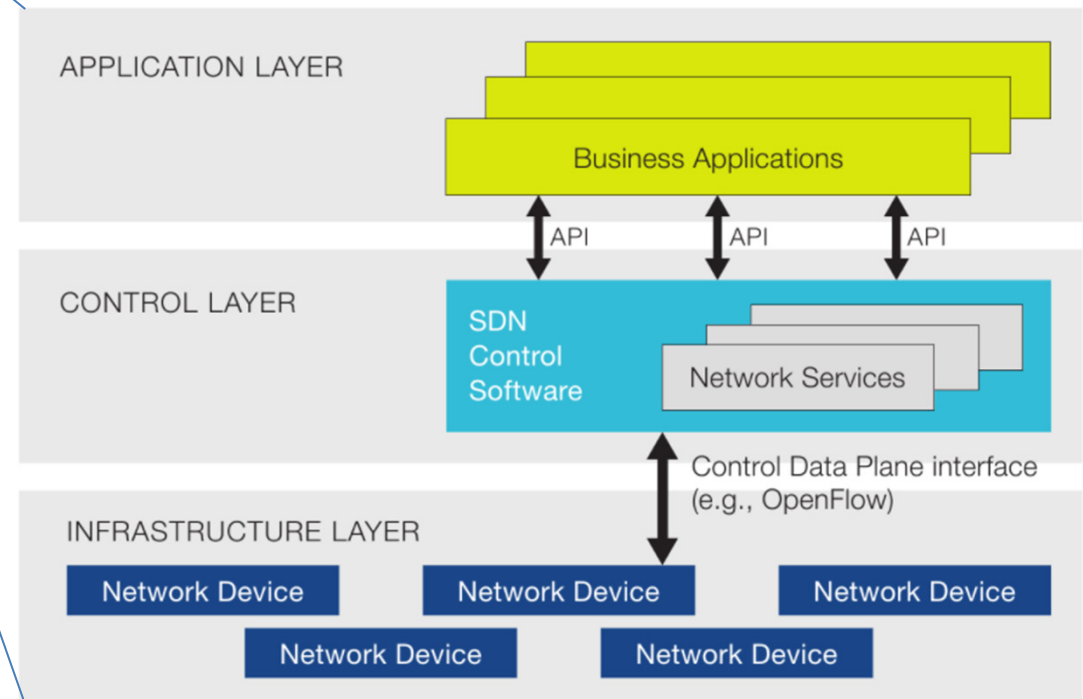
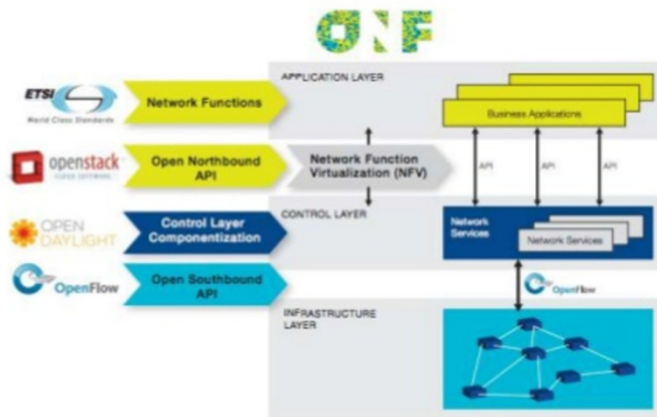


100m, 500m

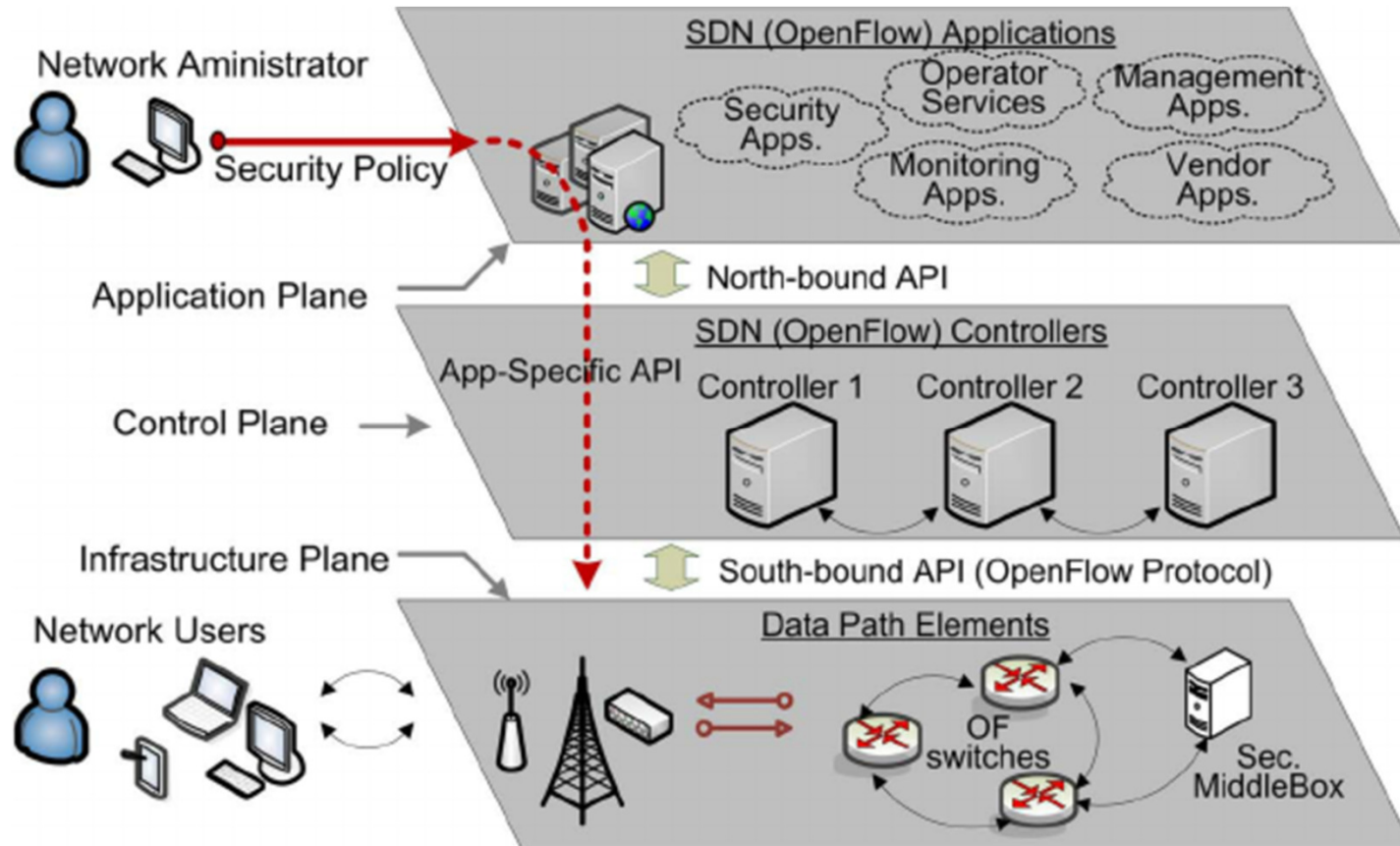


1m,
3m, 5m

Software Defined Networking (SDN)

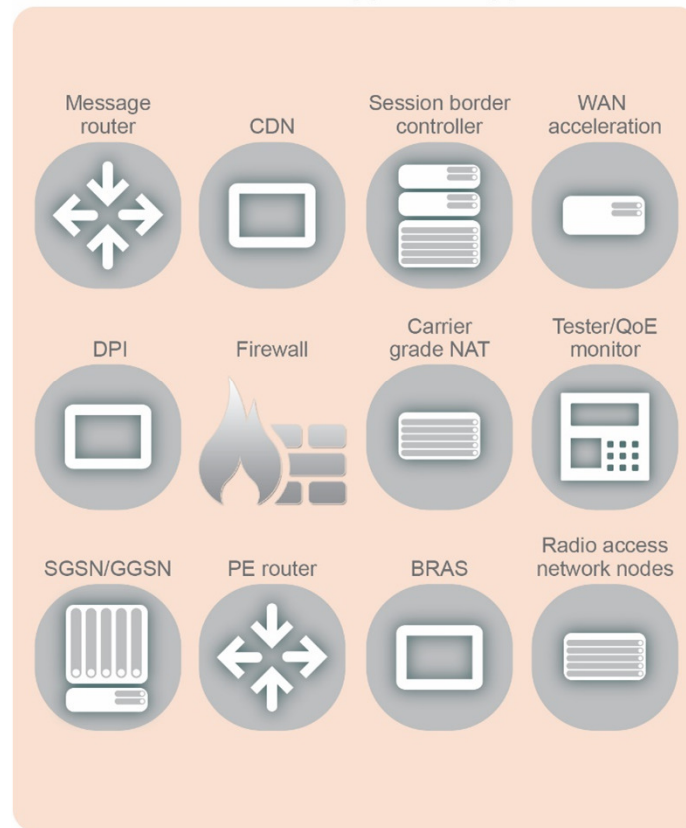


Network Processor for SDN Scenario

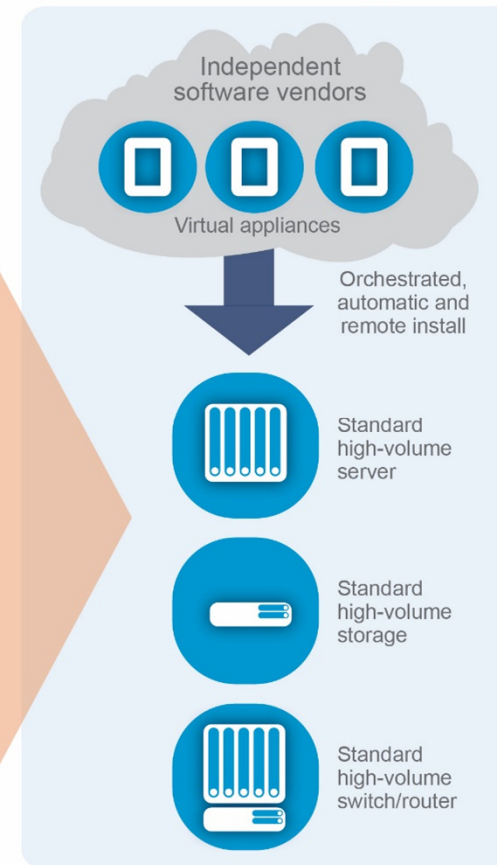


Network Function Virtualization (NFV)

Classic Network Appliance Approach



Network Virtualization Approach





Worldwide Top FTTH/FTTC Vendors



Alcatel-Lucent

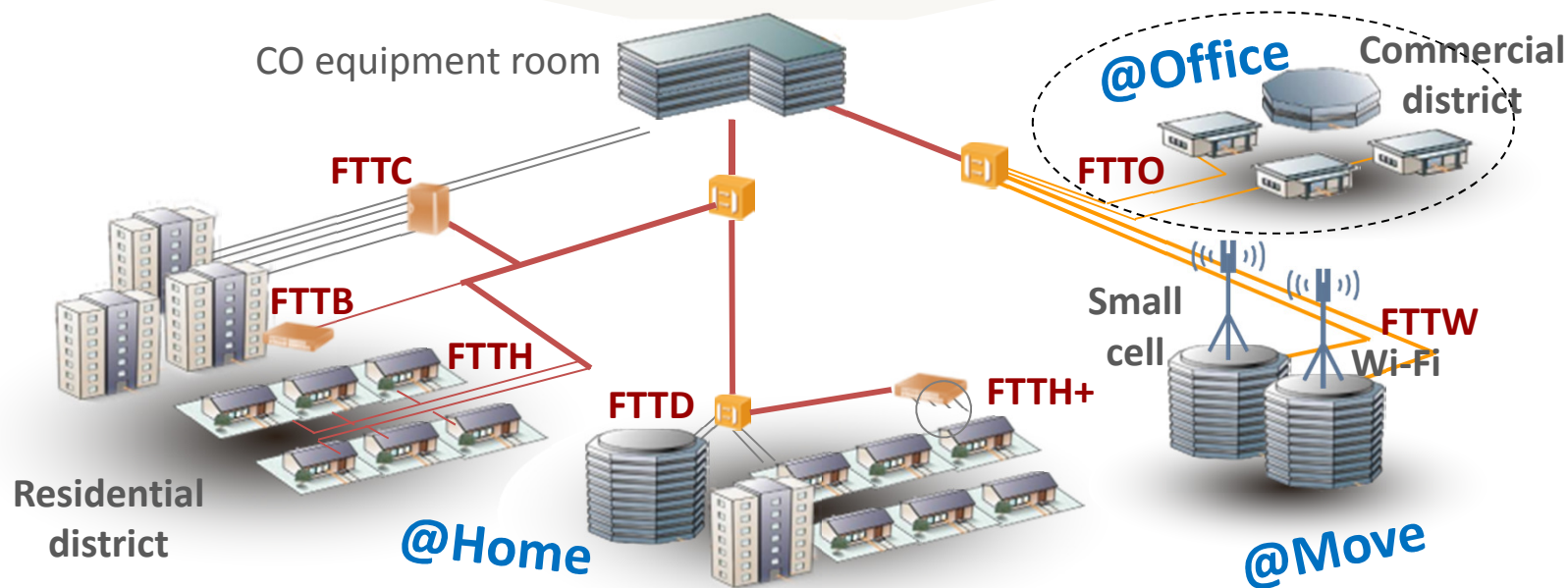


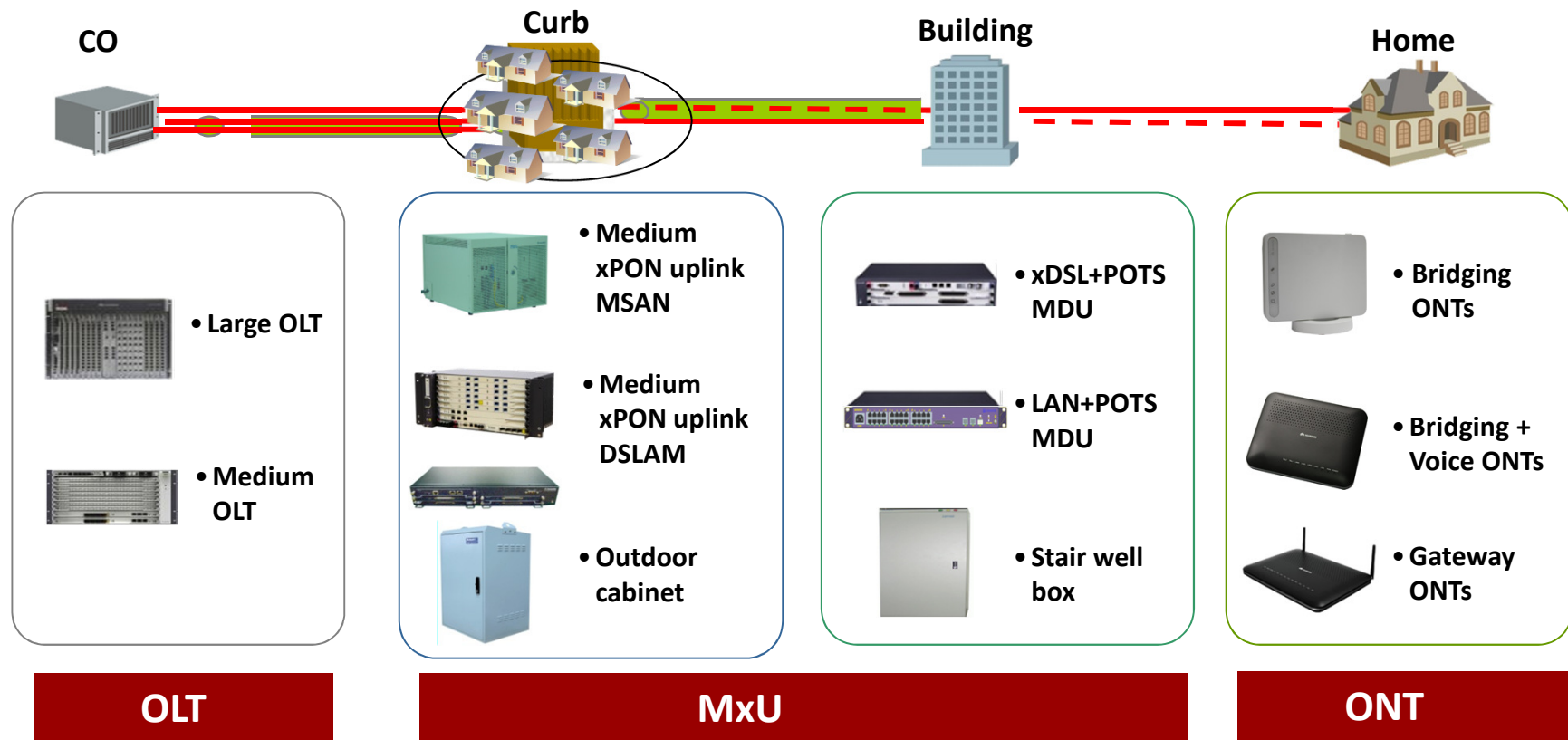
Enterprise

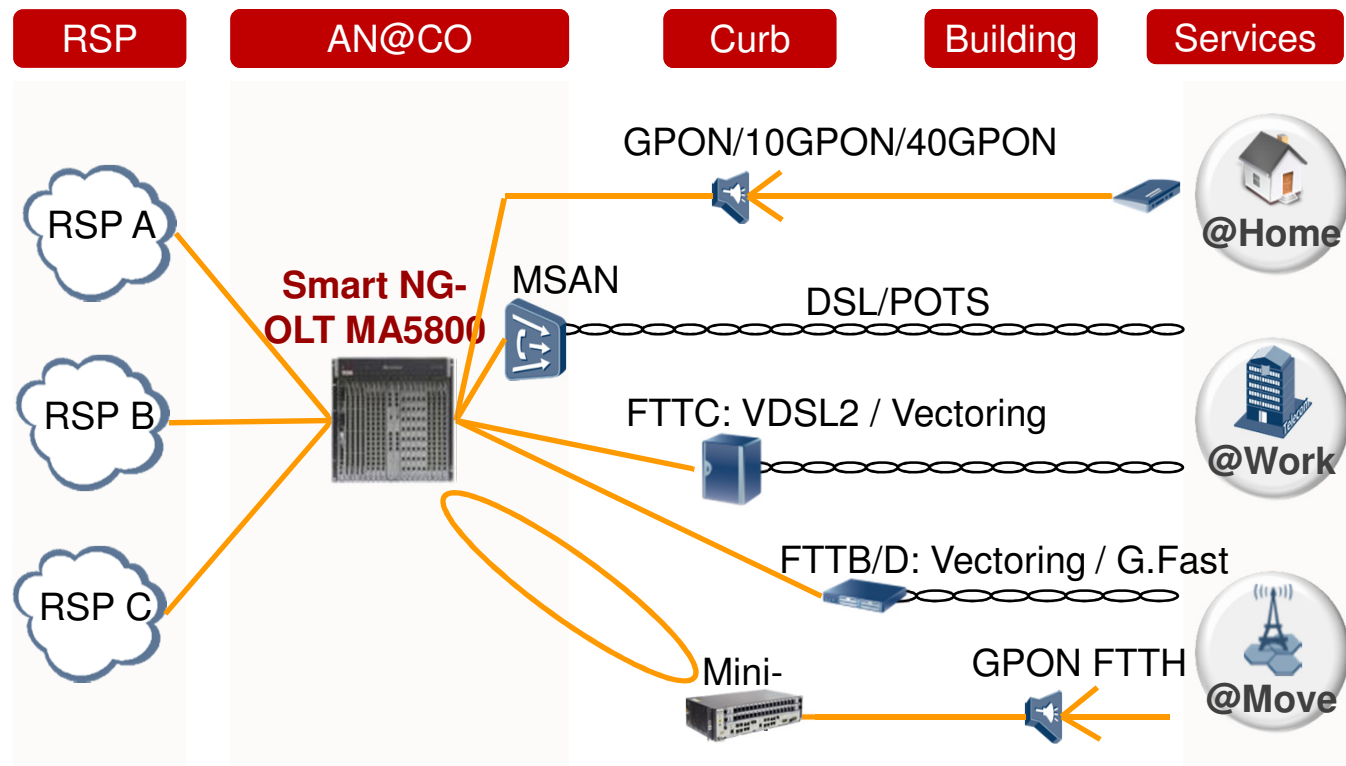
Accredited Training Partner

JUNIPER[®]
NETWORKS

An **integrated full-service network** is required
for full-service operation







Bridging



HG8010
1 LAN

Bridging + Voice



HG8110
1 LAN + 1 POTS

Gateway



HG8240R
4 LAN + 2 POTS



HG8240
4 LAN + 2 POTS



HG8245/HG8245T
4 LAN + 2 POTS
1 USB
Wi-Fi



