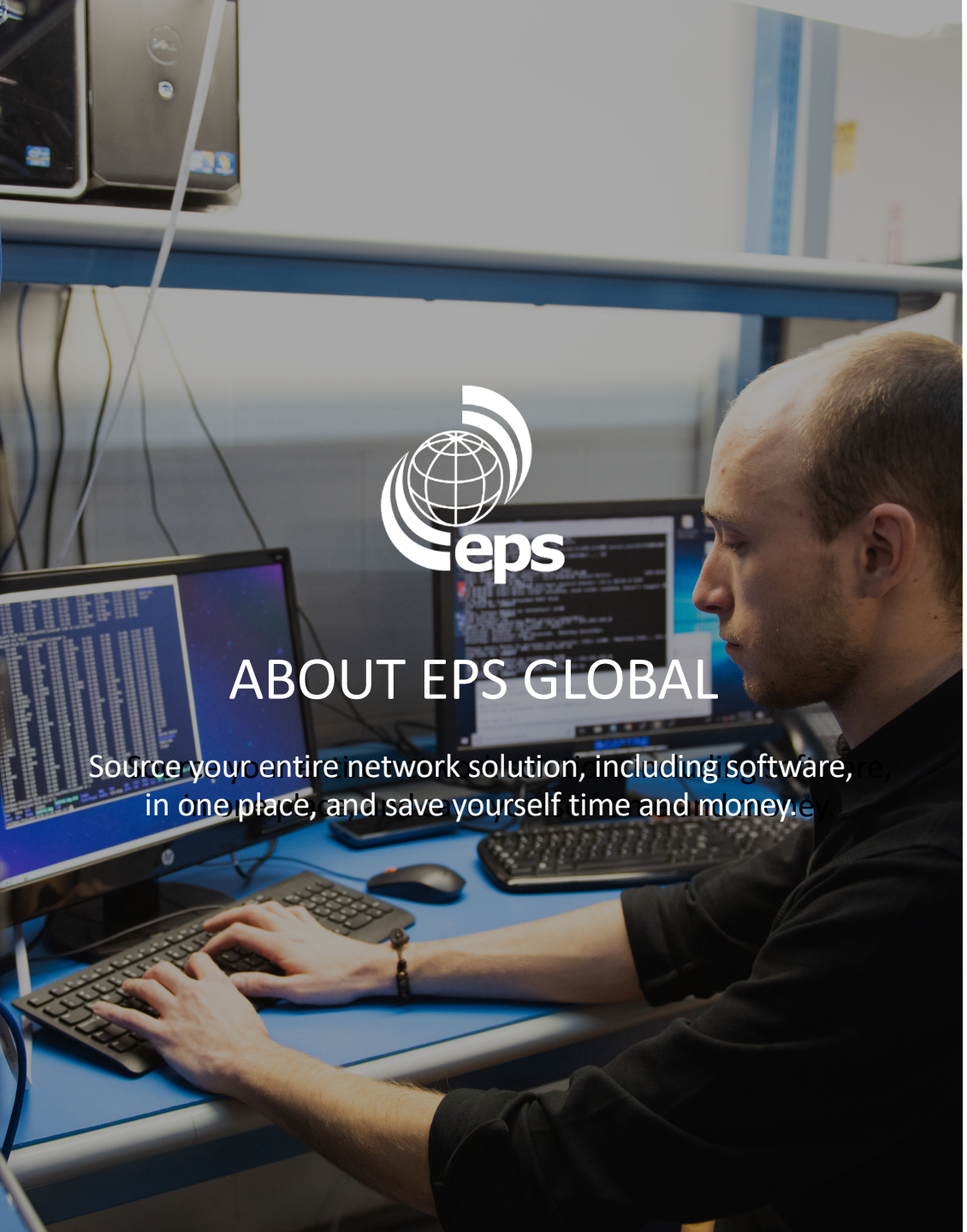
Unboxing Open Networking

The Hardware Within

28th April 2020



ABOUT EPS GLOBAL

Source your entire network solution, including software, in one place, and save yourself time and money.

01

GLOBAL REACH. LOCAL PRESENCE

We have offices in 28 cities in 16 countries - giving you access to a global supply supported by a local team. Local language & currency support in each region.

STOCK AVAILABILITY & SOURCING

EPS Global stocks and can source all the hardware you need: switches, optics, and cables in our regional distribution hubs worldwide, allowing us to minimize lead and transit times for our customers.

02

03

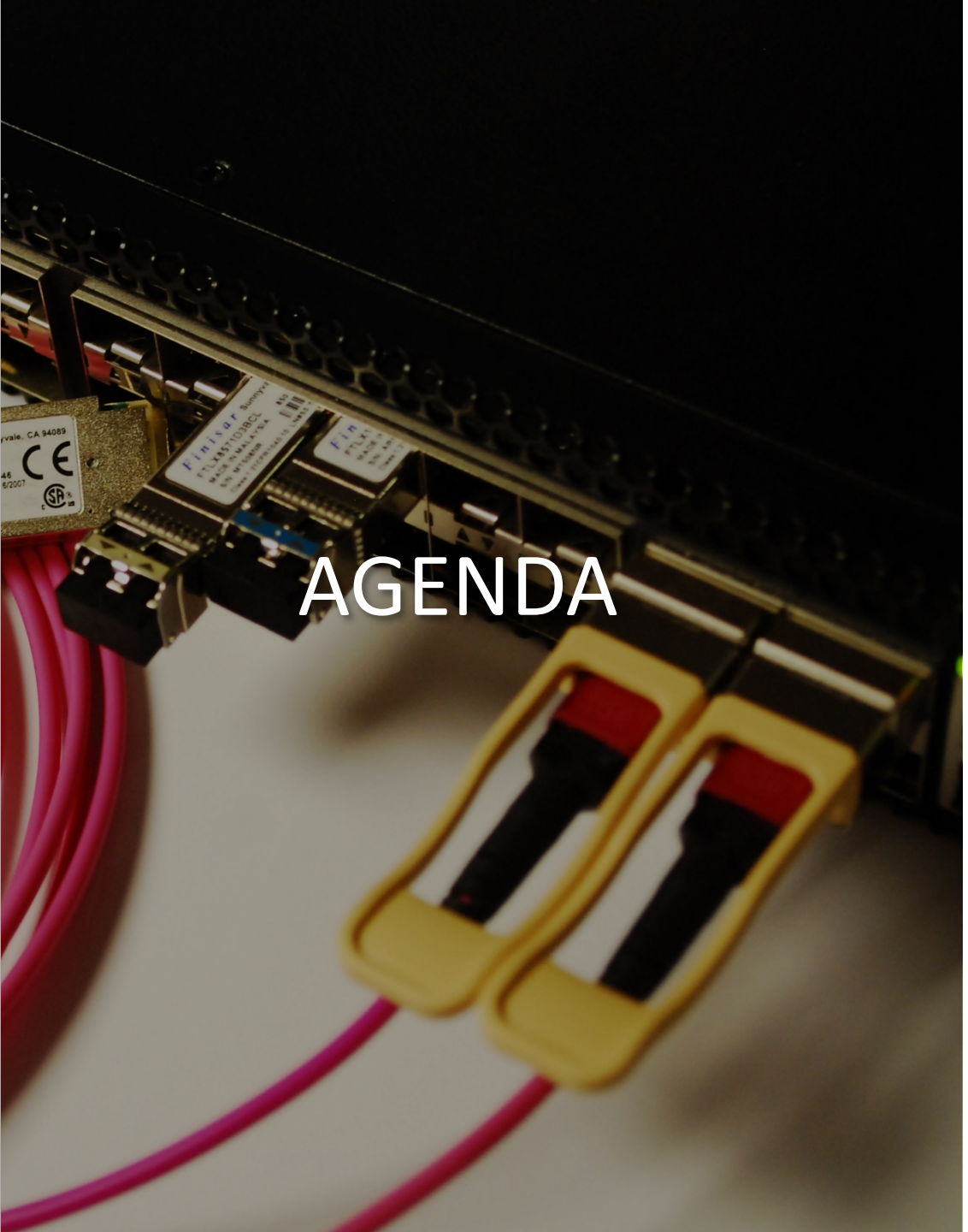
PRESALES SUPPORT TEAM

Our engineers offer pre-sales technical advice, connecting you with the right software vendor for your application, and will configure the hardware, supporting you through your implementation to ensure it is a success.

AUTHORIZED DISTRIBUTION

Peace of mind. EPS Global has franchised distribution agreements with its suppliers, ensuring traceability, genuine products, and the best tech support. Need something else? We can source products for you.

04



AGENDA

- Who are Edgecore Networks?
- Evolution of the Hardware & Use Cases
- Contributions to the OCP
- The Edgecore Lab
- Open NOSs & Cross Pollination
- Direction & Momentum of Open Hardware & the OCP

SPEAKERS

Łukasz Łukowski

Vice President Sales & Channel EMEA

Edgecore Networks

Barry McGinley

Systems Engineer

EPS Global

Steve Helvie

VP of Channel Development

Open Compute Project

Accton Technology and Edgecore Networks

Accton Technology

- The Leading Network ODM - Servicing Tier-1 Customers
- Founded 1988, IPO Taiwan 1995 (TWSE: 2345)
- $1.8B USD Revenue 2019, 5,145 Employees Worldwide
- 9 R&D Locations with more than 1,000 Engineers
- State-Of-The-Art High-Volume Manufacturing in Taiwan and China
- One Stop Shop!

Edgecore Networks

- Brand launched in 2004, wholly owned subsidiary of Accton
- Go-to-market business to network operators - DC, Telecom, and Enterprise
- Manages customer, partner and open community relationships
- Leading contributor of network designs to OCP, TIP participant, ONF – Charter Partner
- **More than 10M Ethernet Ports shipped in 2019!**

Accton
Making Partnership Work

Open Networking Evolution

Edgecore Leadership Evolution in each Market

OPEN Compute Project

10G Leaf
40G Spine

10G/25G Leaf
100G Spine

DCI

100G Leaf
400G Spine

Next Gen
Switch-Optical
Integration

Photonics
Switching

Data Center

ONF Open Networking Foundation

TELECOM INFRA PROJECT

Monitoring,
Packet
Broker

CORD
&
Access

Internet
Exchange

Aggregation
&
Core

Cell Site
Gateways
& Backhaul

Mobile
Fronthaul

Telecom / MSO

OPEN Compute Project

PoE & Access
Switches

Open
Wi-Fi

Distribution
Centers

Corporate Networks

MDU Services

Hotspot

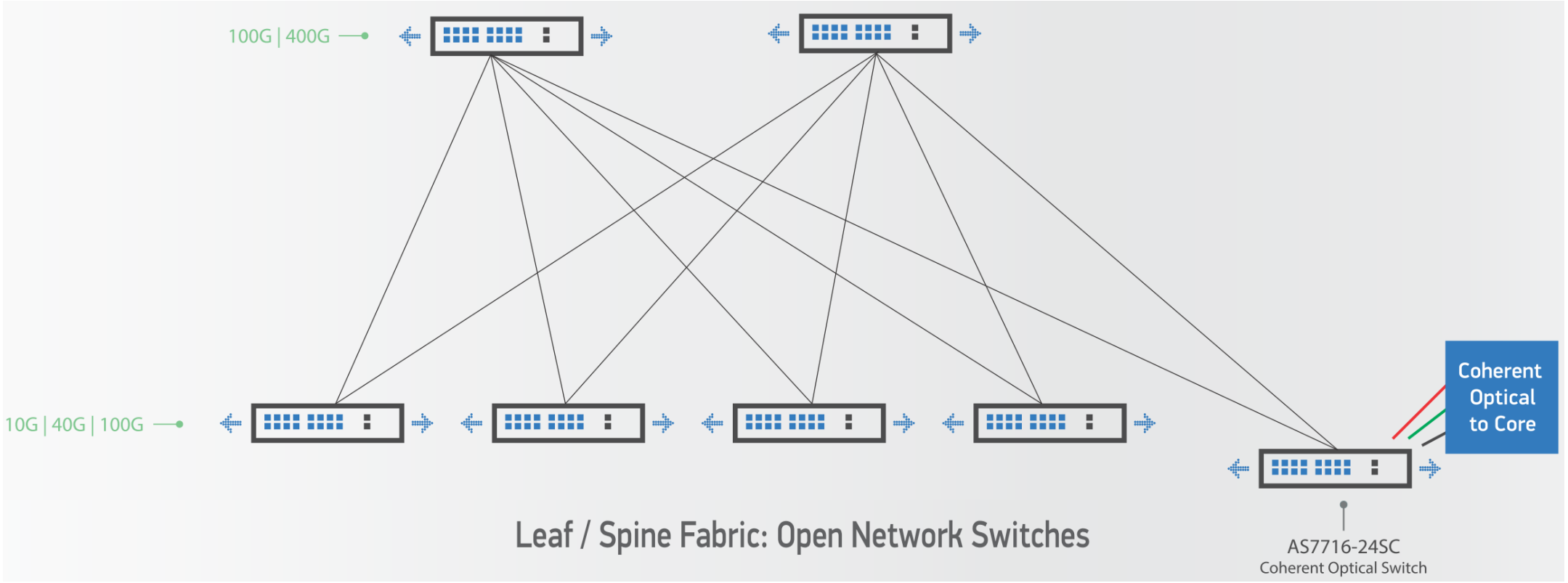
Retail Stores

uCPE

Enterprise / Campus

Data center

Evolution



Data center

Edgecore cooperation with Hyperscale Datacenter (40G / 100G)

Wedge-16X

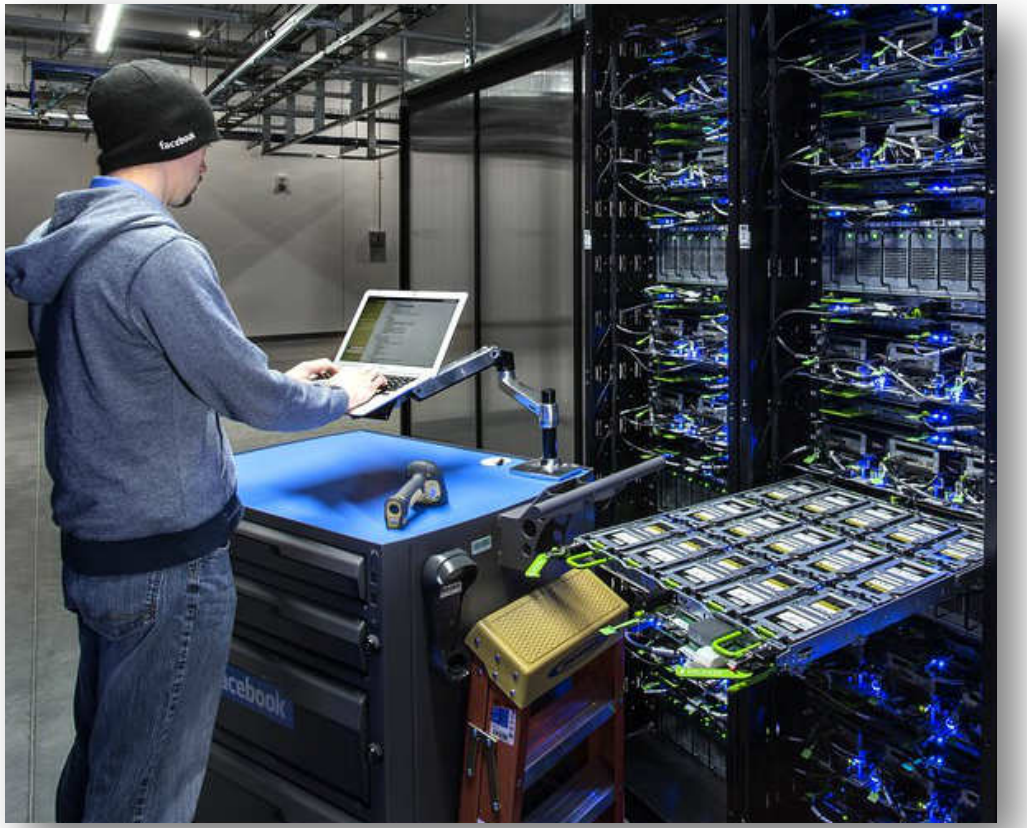
16x40G, Broadcom Trident II

Wedge100S-32X

32x100G, Broadcom Tomahawk+

OCP ACCEPTED

Facebook Design



Data center

Edgecore cooperation with Hyperscale Datacenter (100G / 400G)

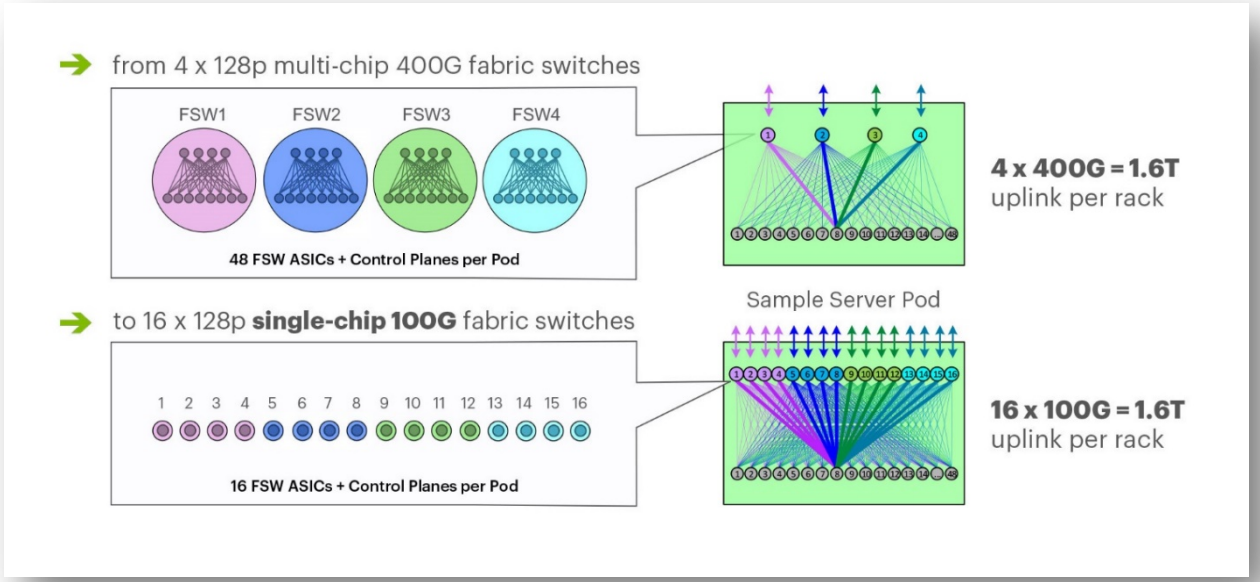
MINIPACK AS8000

- Broadcom Tomahawk 3, Intel® Xeon® D-1527 CPU
- 8 Line Card Options (PIMs)
  - 16 x 100G QSFP28 / up to 128 x 100G
  - 4 x 400G QSFP-DD / up to 32 x 400G

MINIPACK

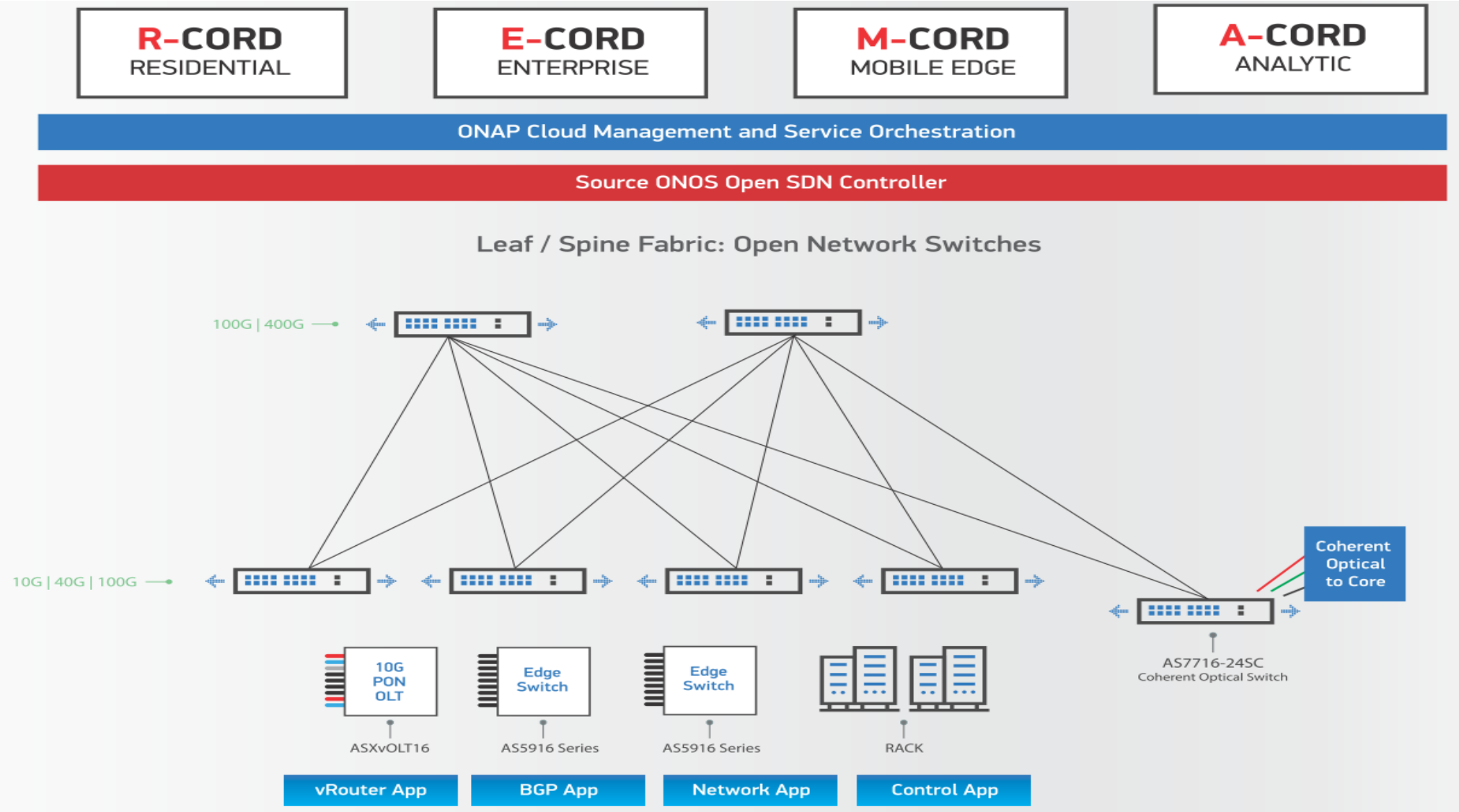
OCP ACCEPTED

Facebook Design



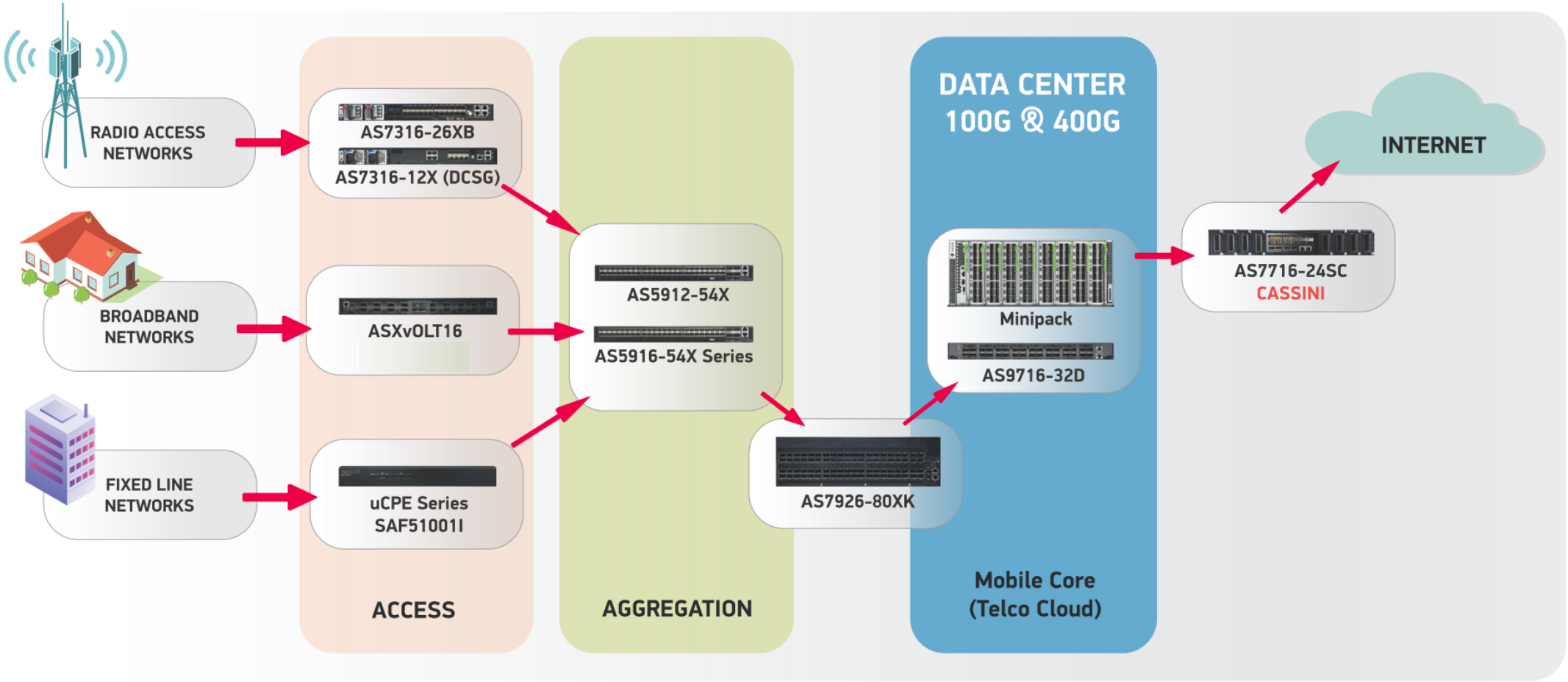
Telecom / MSO

Migration & evolution



Telecom / MSO

The Logical Architecture for Edgecore Open Networking CSP Portfolio



Telecom / MSO

Edgecore cooperation with Telecoms (DCSG)

AS7316-26XB Cell Site Gateway

16 x 10G SFP+, 8 x 25G SFP28 + 2 x 100G QSFP28

AS5915-18X TIP DCSG Disaggregated Cell Site Router

4 x 1G RJ45, 8 x 1G/2.5G SFP + 6 x 10G SFP+

AS7315-27X Cell Site Gateway

16 x 10G SFP+, 8 x 25G SFP28 + 1 x 100G QSFP28 + 2 x 100G Stacking Ports

TELECOM INFRA PROJECT

OCP ACCEPTED

Telecom / MSO

Edgecore cooperation with Telecoms (Open 10G PON OLT)

10G PON ASXvOLT16

16 x 10G XGS-PON XFP + 4 x 100G QSFP28

Telecom / MSO

Edgecore cooperation with Telecoms (Aggregation and Core Routers)

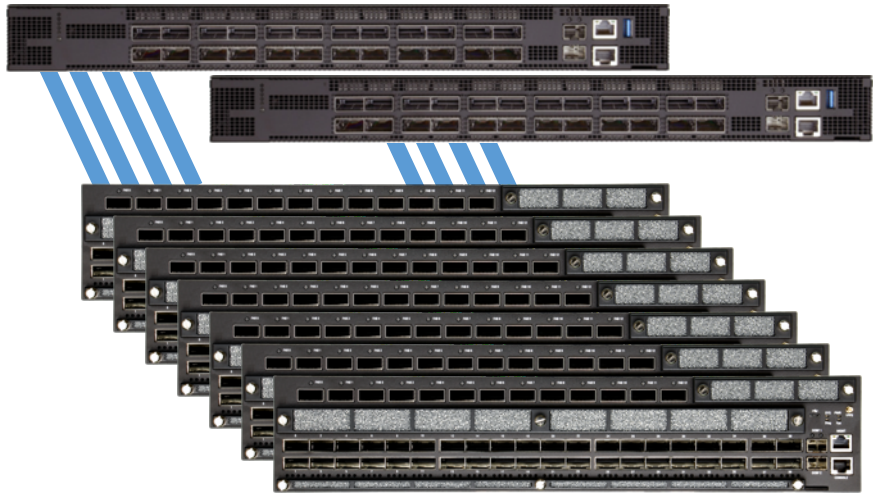
Standalone

- Single CPU
- Single Control/Management Plane
- Non-Redundant

Stacked/Clustered

- Multiple CPU
- Single Control/Management Plane
- Redundant

Distributed Virtual Chassis

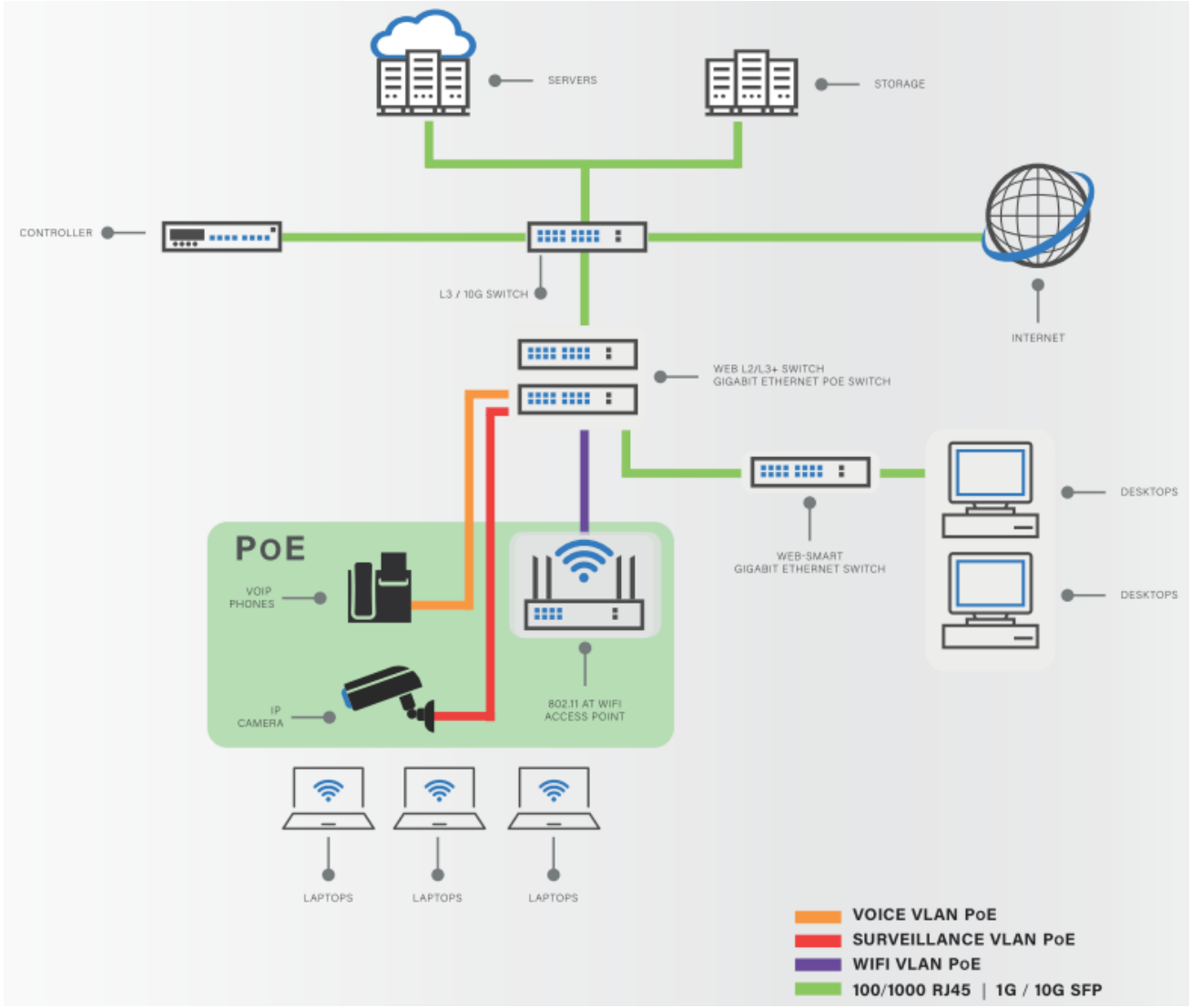


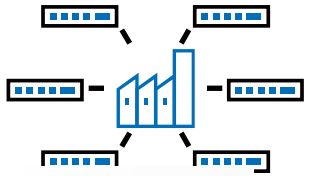
- Multiple CPU
- Single Control/Management Plane
- Redundant
- Scales to 1000s of Ports

OCP ACCEPTED

Enterprise / Campus

Evolution





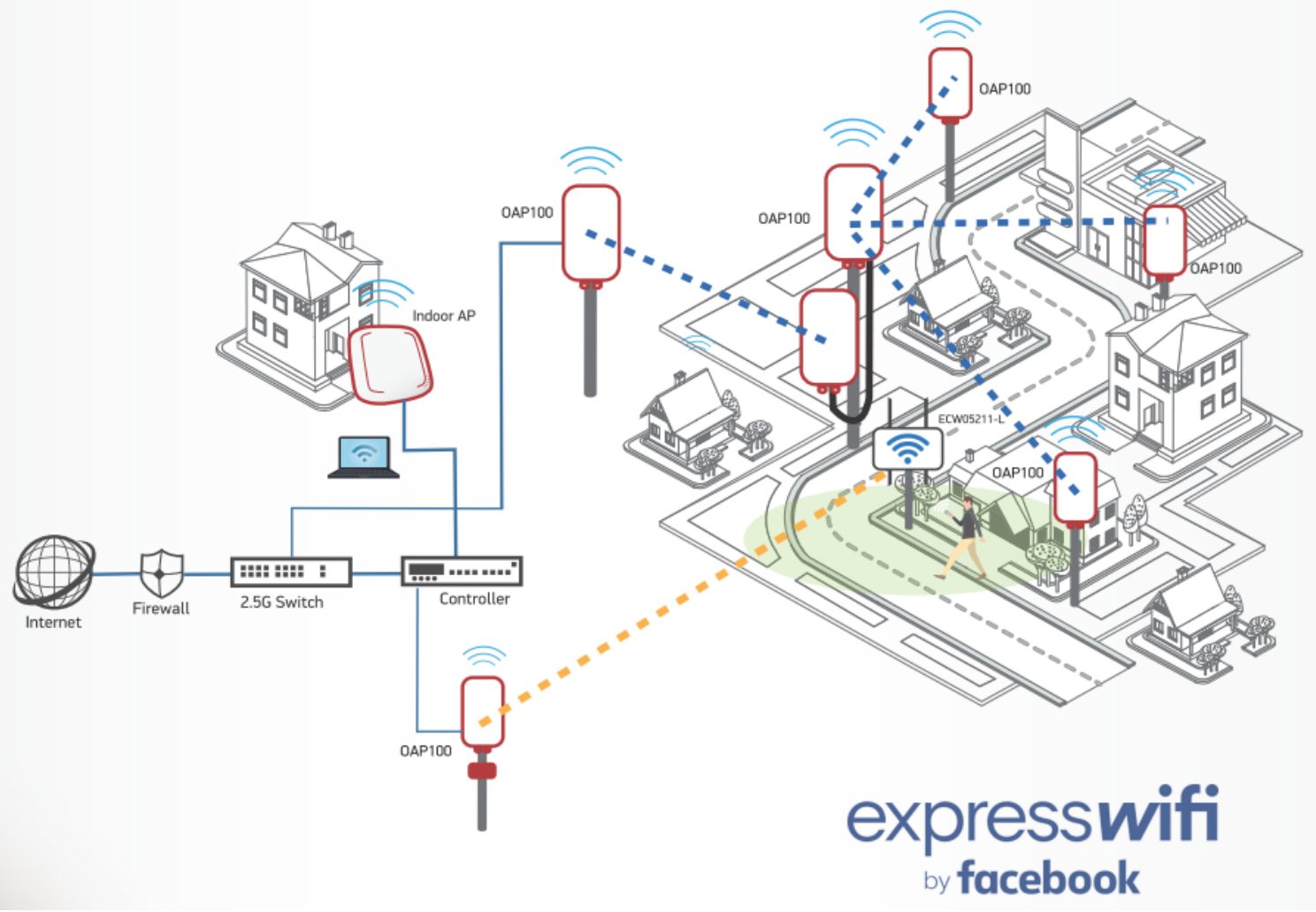
AS4610 SERIES
Access switch
24 or 48 Port 1G, 4x10G, 2x20G Stack Ports
Broadcom® XGS Helix 4
Embedded ARM CPU
POE and non-POE Options

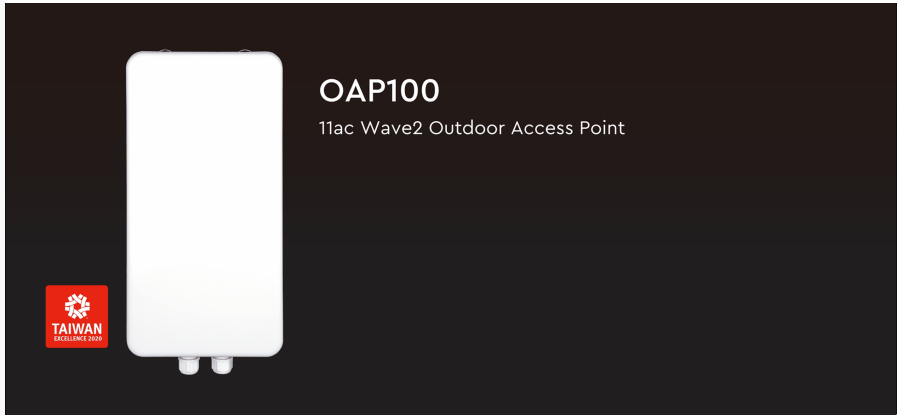
AS4630 SERIES
Access Switch
48x 1G or Multi-Rate, 4x25G, 2x100G
Broadcom® XGS
Intel Xeon Denverton CPU
Optional MACSEC
IEEE 802.3bt (90W) POE Support

SAF51001I, SAF51003I, SAF51015I
SAF4100I, SAF4101I
Universal CPE (uCPE) Platform
Integrates WAN, LAN, and VNFs
Intel Atom Intel Processor
DDR4 Memory
HDD / SSD options
1G RJ45, 1G SFP / 10G SFP+

Enterprise / Campus

Evolution





Most Network Design Contributions to Open Source

Industry Firsts: 10G to 400G DC switches, New Telco /MSO Use Cases

OCP-Accepted™ Designs & Products

• 1G Leaf Mgmt Switch	Helix4
• 10G TOR Switch	Trident II
• 40G Spine Switch	Trident II
• 100G TOR & Spine Switch	Tomahawk
• 100G TOR & Spine Switches	Trident3
• 64 x 100G Spine Switch	Tomahawk II
• 32 x 400G	Tomahawk III
• 10G/100G Edge Switch	Qumran
• Open Leaf Switch Adapter	

OCP-Accepted™ Access Products

• 1G PoE Switch	Helix4
• 802.11ac Wave1 Wi-Fi APs	BCM
• 802.11ac Wave2 Wi-Fi APs	QCA

Most Network Design Contributions to Open Source

Industry Firsts: 10G to 400G DC switches, New Telco /MSO Use Cases

Edge-corE NETWORKS

OPEN Compute Project SOLUTION PROVIDER

OPEN PLATINUM

Partner Designs, Edgecore OCP-Inspired™ Product

• Wedge40-16X	Facebook
• Wedge100-32X	Facebook
• Wedge100BF-32X	Barefoot
• Wedge100BF-65X	Barefoot

Design Contributions in OCP Review

• 100G OMP800 Chassis	Tomahawk
• 100G OMP1600 Chassis	Tomahawk
• 25G TOR Switch	Tomahawk
• MiniPack AS8000	Tomahawk III

TELECOM INFRA PROJECT

Accepted Design Contribution

- Cassini Packet Transponder

Designs in Process

- DCSG Cell Site Gateway

OCP Telco Working Group

• ASXvOLT16 10G OLT	BCM Qumran & Maple
• AS7316-26XB Cell Site Gateway	Qumran-AX
• AS7926-40XK and -80XK Aggregation Routers	Jericho2 in OCP Review

Want to try?

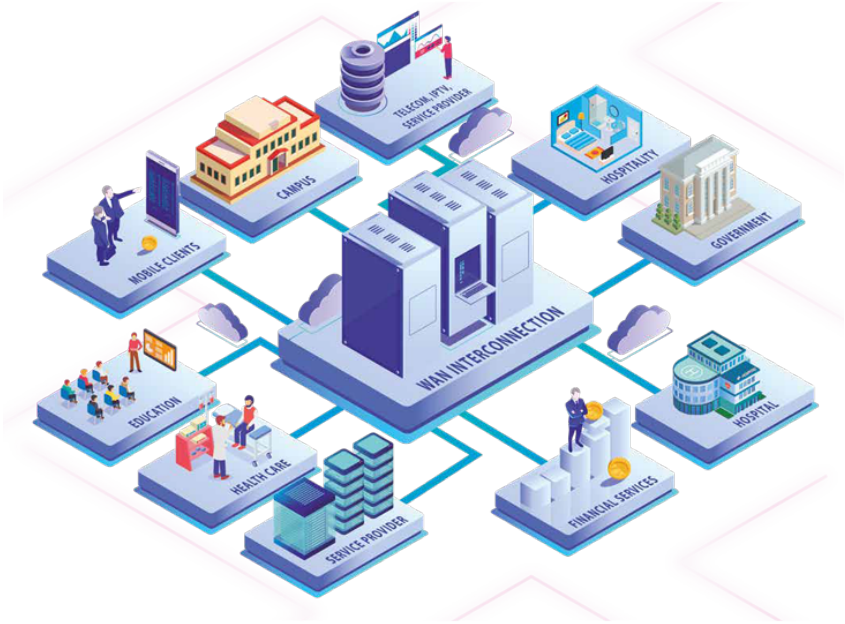
Edgecore EMEA LAB in Poland

SEBA 10G PON Mobile LAB

Leaf & Spine Mobile LAB

OPEN NETWORKING SOLUTIONS

EPS Global has partnerships with all the leading hardware and software vendors in the open networking ecosystem, and our engineers can advise you on the best product set to suit your business needs, offering software configuration and bundling of hardware solutions for hassle-free, consolidated shipments.



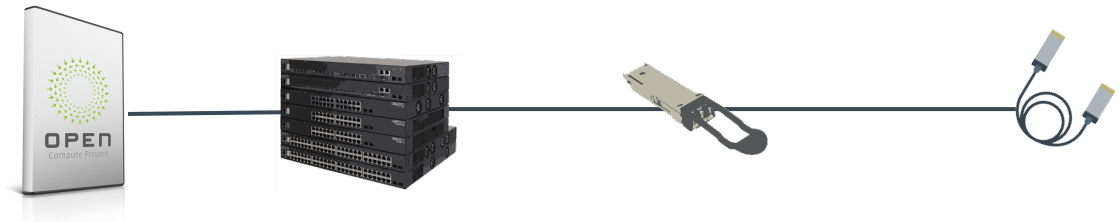
NETWORK OPERATING SYSTEMS

CUMULUS · big switch networks · PICA8 WHITE BOX SDN · Pluribus NETWORKS · ip infusion

ARRCUS · XCLOUD NETWORKS · kaloom · THE LINUX FOUNDATION · rtbrick

SONiC · ONL · ONF OPEN NETWORKING FOUNDATION · V · apstra

TURNKEY SOLUTIONS FROM A SINGLE SOURCE



Software + Switch · Transceivers · Cables

GLOBAL TECH SUPPORT

COMMERCIAL SOFTWARE

Data Center

- BIG SWITCH NETWORKS
- CUMULUS NETWORKS
- IP INFUSION
- PLURIBUS NETWORKS
- BROADCOM ICOS

CSP

- RTBRICK
- DRIVENETS
- IP INFUSION
- ARRCUS
- RADISYS
- VOLTA NETWORKS

Enterprise

- PICA8
- PLURIBUS NETWORKS
- CUMULUS NETWORKS

Disaggregated

- APSTRA
- NETRIS (FORMALLY XCLOUD)

OPEN SOURCE SOFTWARE

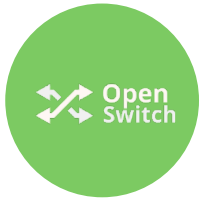
SONiC from Microsoft

Stratum from ONF

Broadcom’s ICOS

ONF ONOS

Open Networking Linux (ONL) from OCP



OpenSwitch from the Linux Foundation

ONOS from ONF

DANOS from the Linux Foundation

DATA CENTER & ENTERPRISE SOLUTION

Spine & Super Spine
400G/100G

Leaf
25G/10G

Edge - 1G

Compatible Software

CUMULUS

big switch networks

snaproute

Pluribus NETWORKS

PICA8

ip infusion™

ixia

SONiC

NETSCOUT

END-TO-END SERVICE PROVIDER SOLUTIONS

Service Provider
Core & Edge

OLT

Metro
Aggregation

Cell Site Router
Gateway

vBNG

Compatible Software

ADVA™ STL

ARRCUS NETWORK DIFFERENT™ VOLTA Networks

ipinfusion™ rtbrick

Infinera DRIVENETS

VOLTHA VIRTUAL OLT HARDWARE ABSTRACTION

Thoughts on the direction and momentum of open hardware & the Open Compute Project (OCP)

Steve Helvie
Open Compute Project (OCP)

steve@opencompute.org

OPEN Compute Project ®

FierceTelecom

AI TELECOM TECH PLATFORMS

Telecom

Open Compute Project switches rule the data center bare metal roost - report

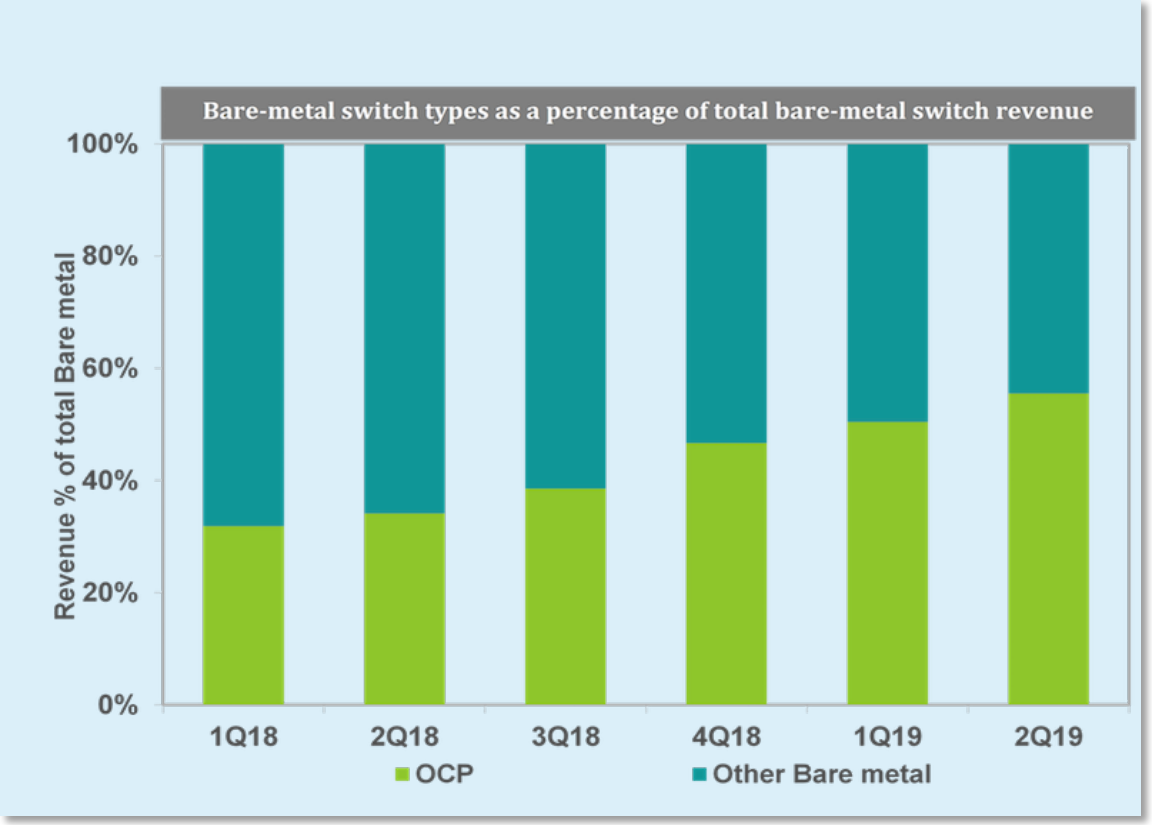
by Mike Robuck | Oct 24, 2019 11:33am

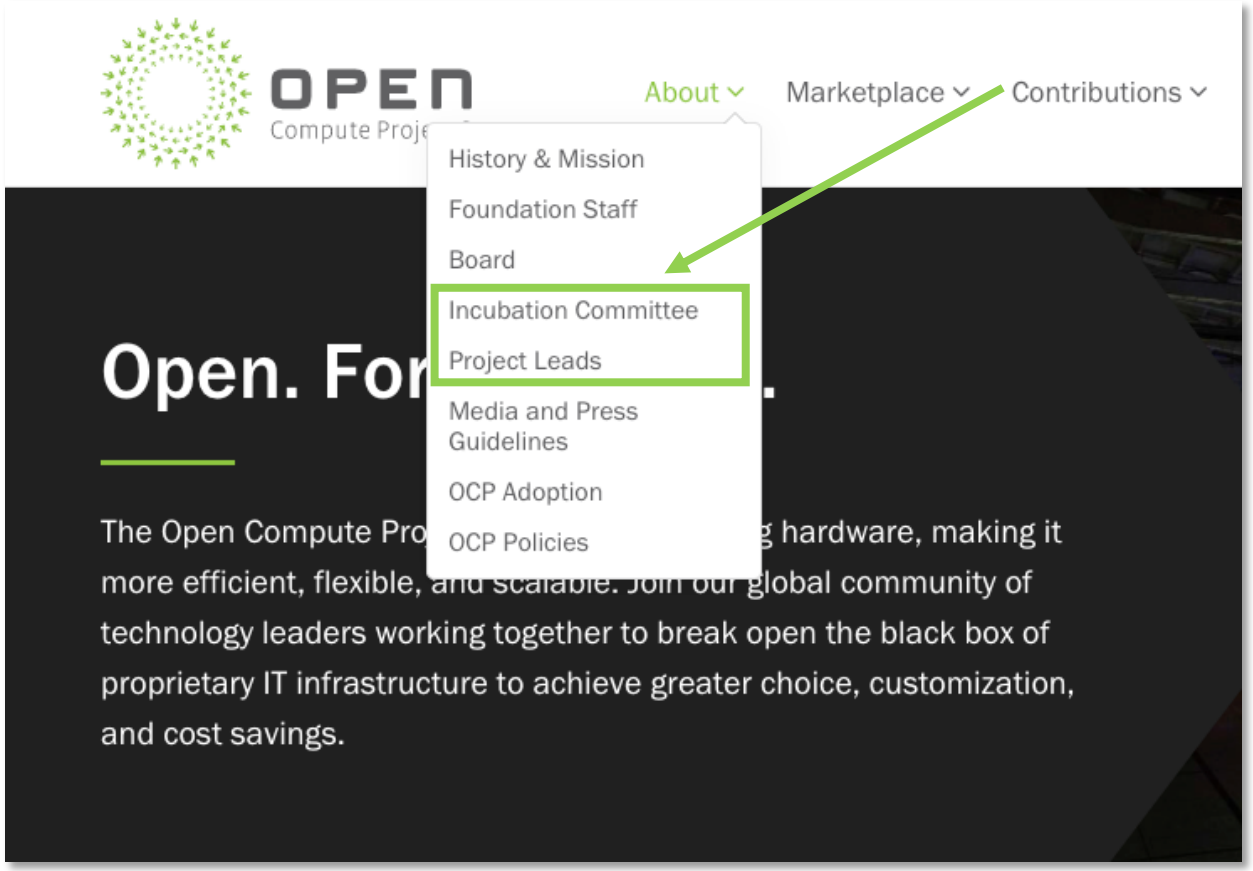
https://www.fiercetelecom.com/telecom/open-compute-project-switches-rule-bare-metal-roost-report

"OCP-certified switches have moved past the trial and wait-and-see phases"

Devan Adams, principal analyst at IHS Markit

1. Data Center CAPEX Reduction Initiatives
2. Increase in SDN offerings
3. Rise in merchant-based silicon





Jeff Catlin

Co-Chair

Open Compute Project

George Tchaparian

Edgecore Networks

Regional Project Community - Taiwan

Lukasz Lukowski

Open Compute Project

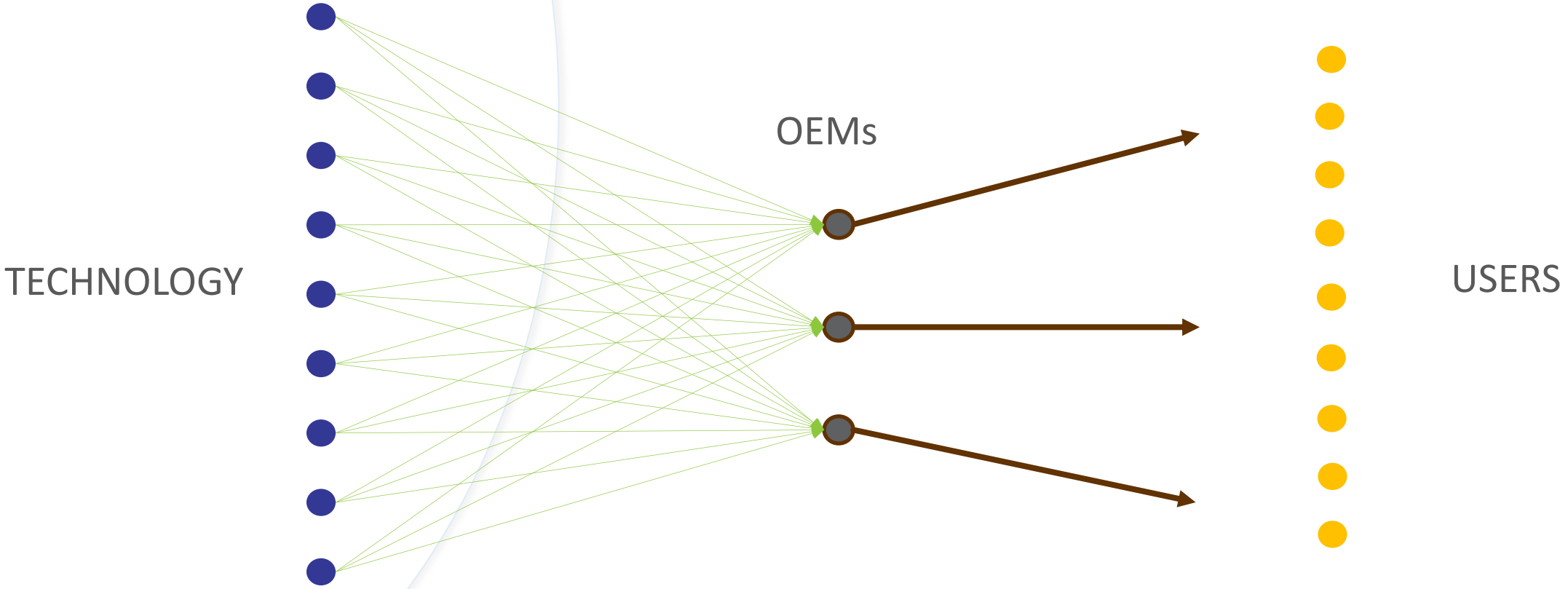
Regional Project Community - Europe

OPEN PLATINUM™

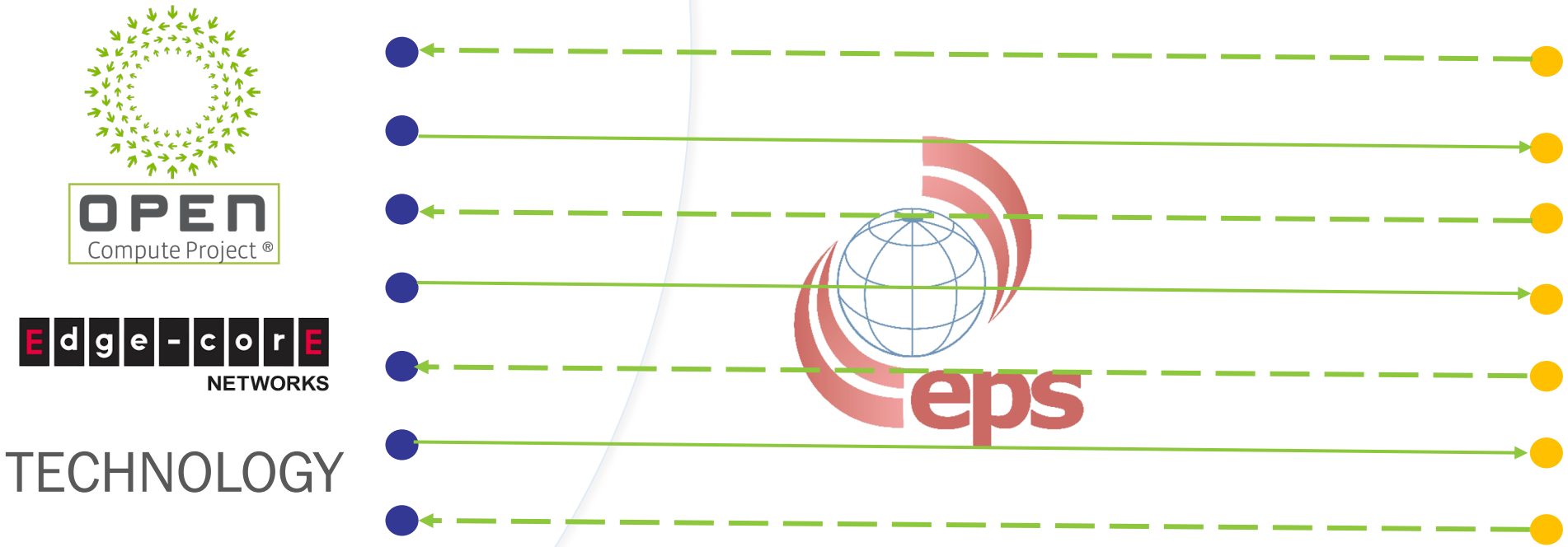
OPEN Compute Project SOLUTION PROVIDER®

OPEN Compute Project

The Old Innovation Pipeline



Better Together



Whatever market *open source* enters… It eventually dominates.

OPEN
Compute Project

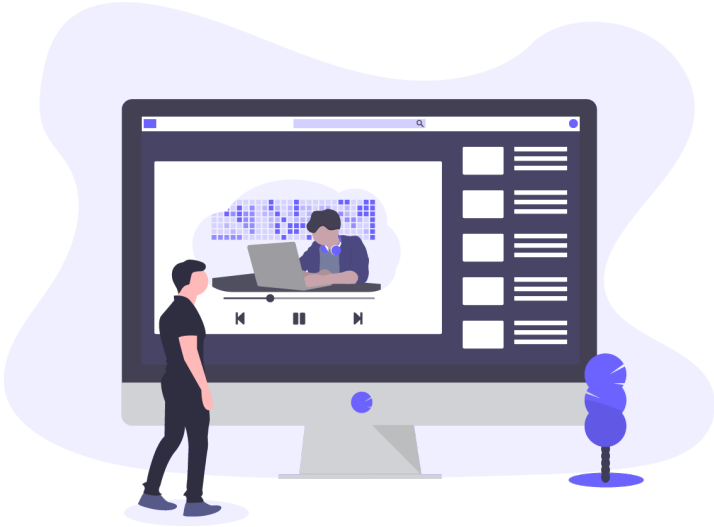
UPCOMING WEBINARS

OCP Virtual Global Summit
May 12th – 15th

Public to Private Cloud Network Deployment
May 26th

DC & Service Provider Solutions
June

Networking Simplified
July



GET IN TOUCH

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OPEN COMMUNITY

CIOSDN 20 MOST PROMISING Review SOLUTION PROVIDERS 2017

ISO 9001

SR2018 50 BEST COMPANIES TO WATCH

ISO TS 16949

apstra