

HOGYAN TARTSUK ÉLETBEN MEGLÉVŐ HÁLÓZATAINKAT

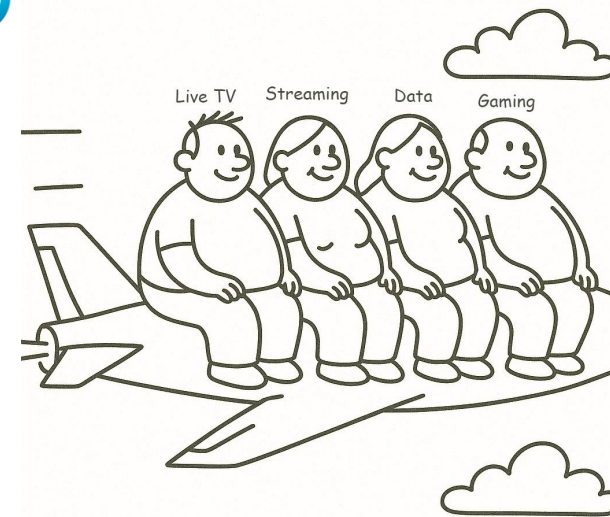
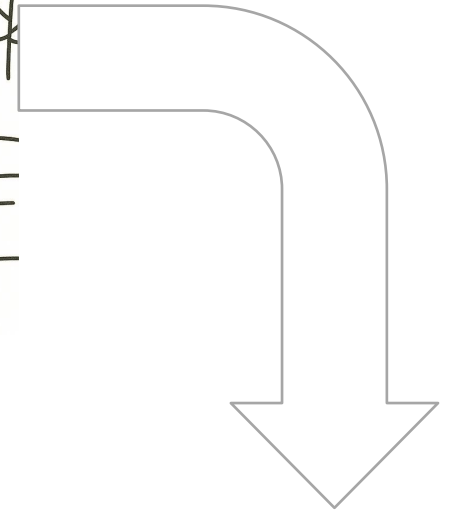
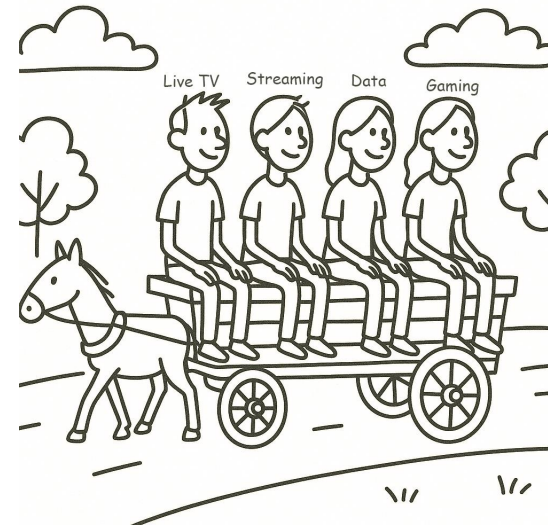
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HTE INFOKOM 2025

Schäfer Zoltán





KEY VALUES TO WIN BROADBAND IS ESSENTIAL



**High
Speed**



Reliable



**Growth
and
Expandability**



**Reputation
and
Track Record**

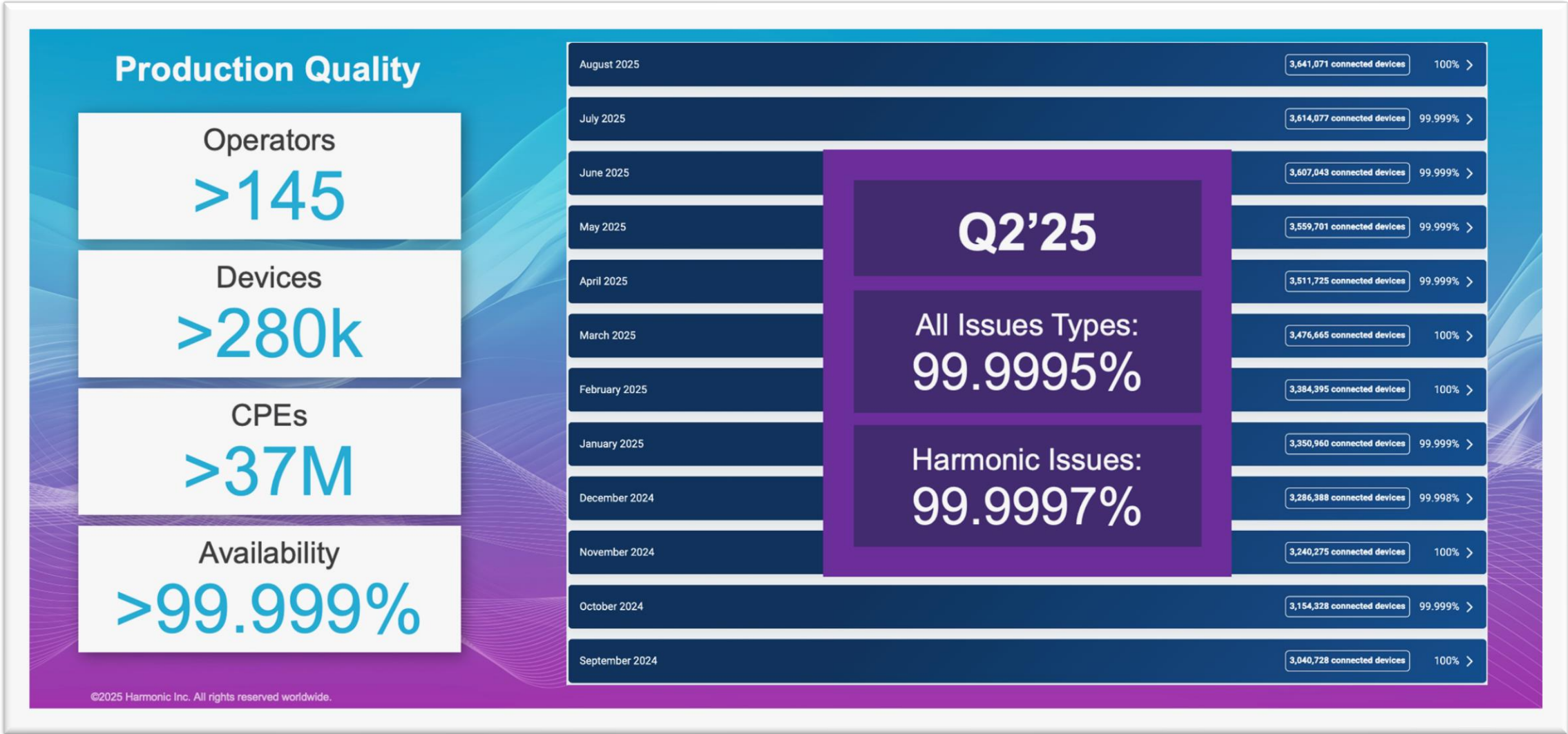


**Reduced
Environmental
Impact**



**Future
Ready**

ALL CUSTOMER SERVICE AVAILABILITY Q2 2025



SOFTWARE TRANSFORMS THE FUTURE TODAY





Mission Critical Reliability
Software detects and protects with > 99.999% uptime



Speed
Symmetric multi-gigabit broadband



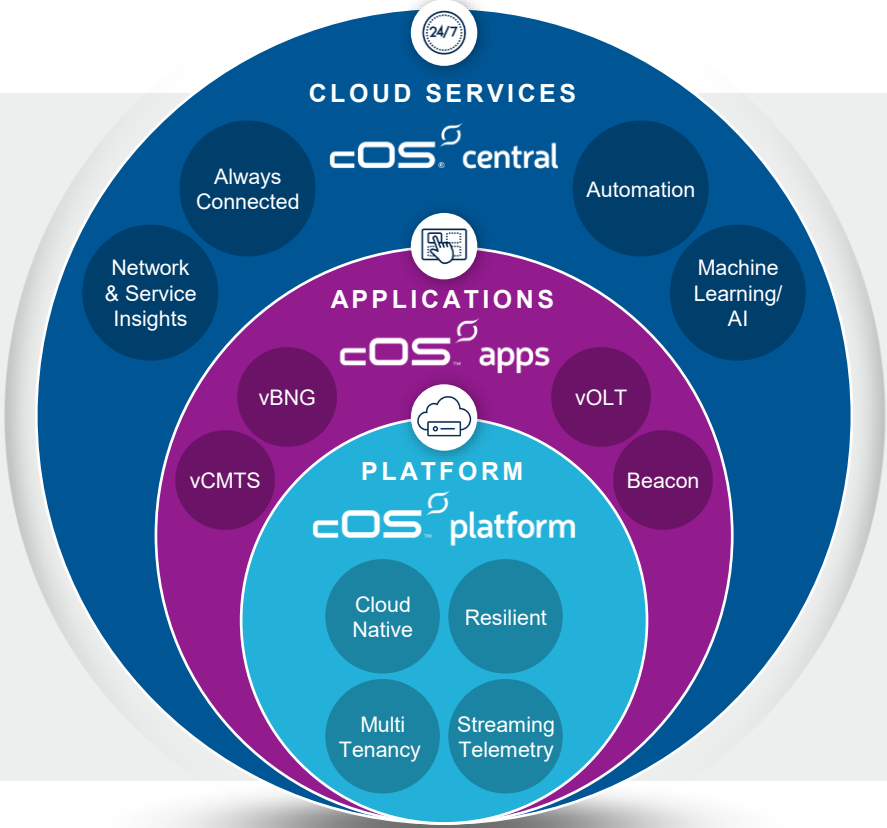
Quality of Experience
Enhance subscriber satisfaction with performance and low lag



Platform Longevity
Future readiness with software expandability and upgradeability



Fiber Optionality
Adapt to shifts in broadband infrastructure with DOCSIS + Fiber



DEVICES

Reef, Wave



RPD SHELVES

Oyster Ripple



OUTDOOR NODES

Pebble



RPD MODULES

Pier



R-OLT SHELF

Wharf



Jetty **REMOTE SWITCHES**

Fin Pearl

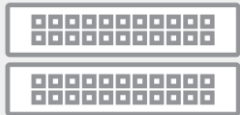


R-OLT

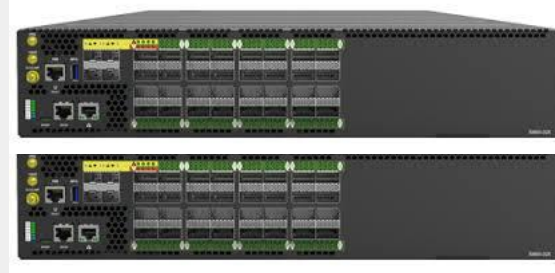
cOS Core Cloud Native Redundant Solution Scale



vCore



CRE



Video Engine



Linkv2



PTP GM
(optional)



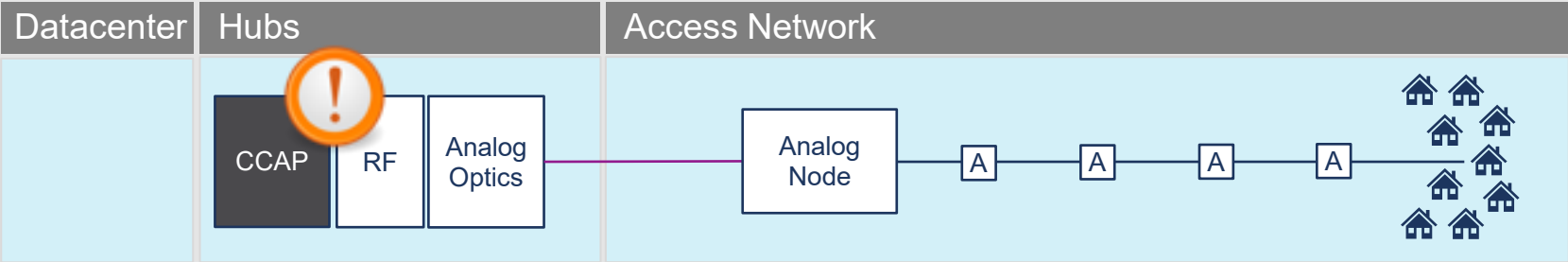
- High Scale FCP Server-Cluster (3 servers)
 - 320Gbps DS / 100Gbps US DOCSIS Throughput
 - Up to 25000 CM
 - Up to 160 DOCSIS MAC Domains
 - Up to 2560 PON Ports
- High Scale CRE (IPI shown)
 - 32 x 100G for Server and NSI/DSI CIN connection
 - Other CRE Arista, Juniper, Nokia or Cisco
- Prostream X – Video Engine
 - Up to 8 Gbps Streaming capacity, 1+1 Redundant
 - Geo-Redundancy Option

Other

- Data Aggregation Server for cOS & Sonar
 - Up to >100K CM's
- Dual PTP Grandmaster
 - Up to >1000 clients

SMART CABLE BROADBAND STRATEGY

EXISTING NETWORK ARCHITECTURE



Upstream

Downstream

SPECTRUM / UPSTREAM BANDWIDTH

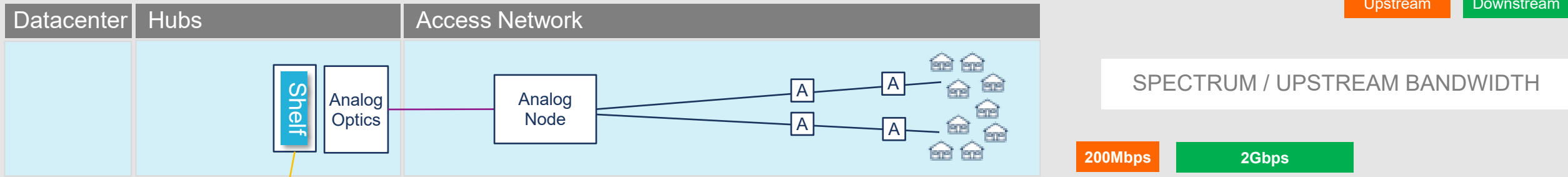
200Mbps

2Gbps



SMART CABLE BROADBAND STRATEGY

A PORTFOLIO OF FLEXIBLE OPTIONS



BROADBAND CONVERGED PLATFORM

vOLT/vBNG

Video core

Edge router

vCMTS

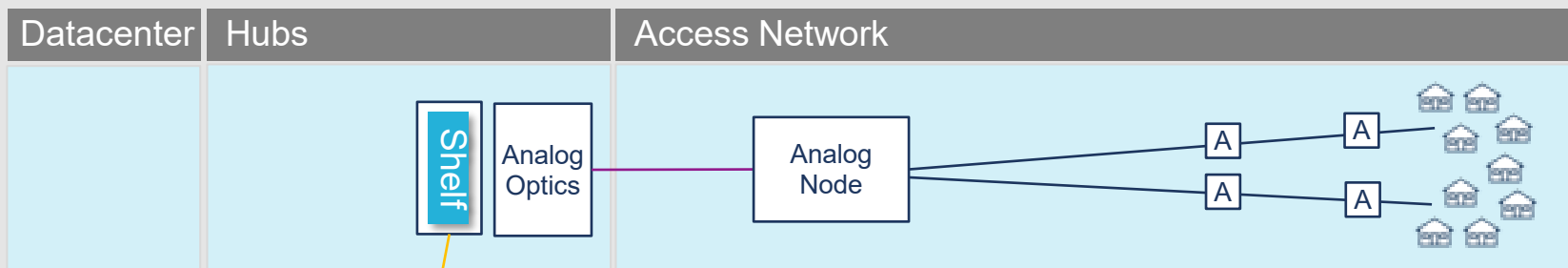
vCMTS

Ethernet Switch (DAAS)

- Replacement of iCCAP with R-PHY Shelf
- No Replacement of Analog Optics
- Consolidation of Video, Data to one RF Port removes RF Splitting and Combining
- No Spectrum Licensing constraints
- Experience shows immediate 40% Power Saving from iCCAP Replacement in Headend and Hub sites is possible
- Further movement towards Remote-PHY and Digital Optics can take the overall Power Saving over 70%

CABLE BROADBAND STRATEGY

A PORTFOLIO OF FLEXIBLE OPTIONS



Upstream

Downstream

SPECTRUM / UPSTREAM BANDWIDTH

200Mbps

2Gbps

BROADBAND CONVERGED PLATFORM

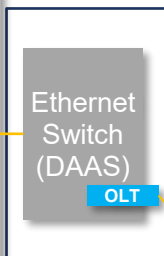
vOLT/vBNG

Video core

Edge router

vCMTS

vCMTS



Outdoor Node Platform

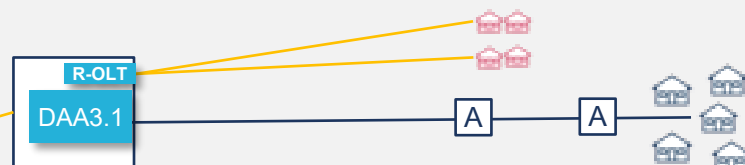


DIGITAL NODE = EXPANDED UPSTREAM

1.7Gbps

8Gbps

1



SIMILAR TO (1) + FTTH/PON ON R-OLT

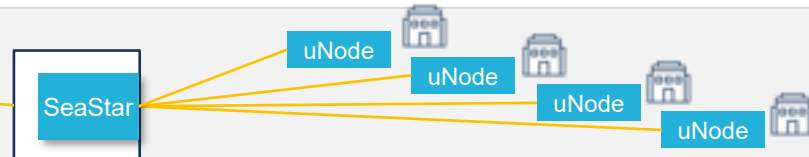
For heavy users and MDUs

1.7Gbps

8Gbps

2

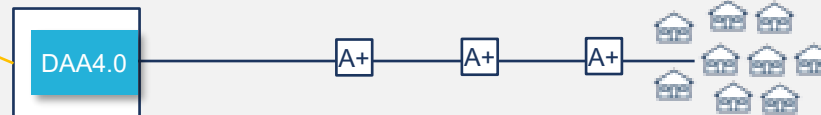
10G Symmetric



FIBER DEEP | FIBER TO MDU

Reuse of Coax in Building with DOCSIS 3.1 BoostD

3



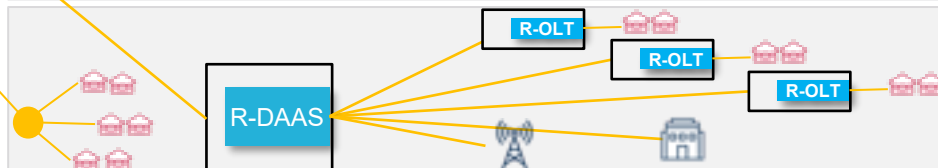
NEW DOCSIS 4.0 (UNIFIED - ESD OR FDX)

For expanded bandwidth.

7 Gbps

13 Gbps

4



FTTH/PON

Network construction and new CPEs

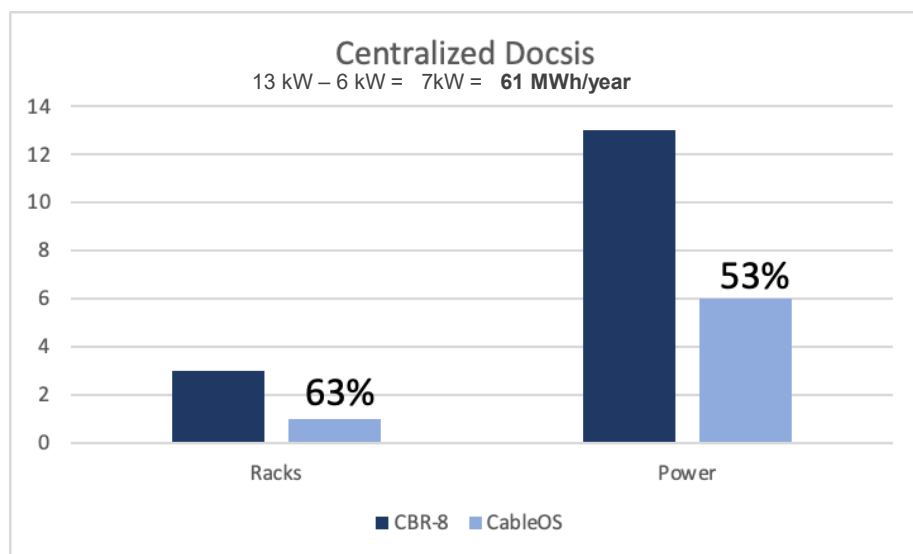
10G Symmetric

5

Power and Space Analysis

Existing HUB

- ✓ 27000 CM
- ✓ 3 pcs of CBR8 (13kW)
- ✓ 12 Racks
- ✓ 5kW – Headend optics, 5kW- Outdoor plant and nodes

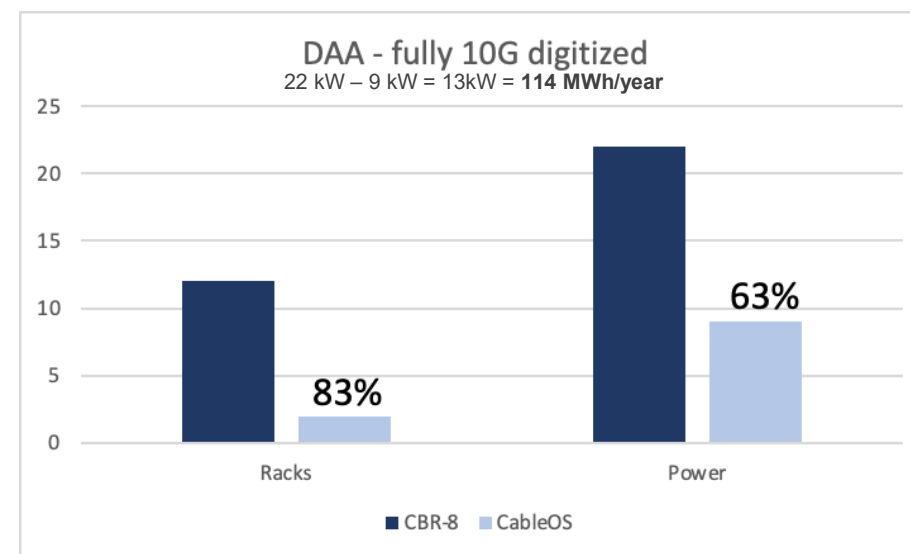


Power Efficiency

- ✓ Reduced cost of Headend Powering
- ✓ Reduced cost of cooling, batteries and UPS powering

DAA- fully 10G digitized

- ✓ 27000 CM
- ✓ vCMTS (3kW)
- ✓ 2 Racks
- ✓ 0kW – Headend optics, 6kW – Outdoor plant and nodes



Space Efficiency

- ✓ No need for expensive new facility/rack space
- ✓ Double or triple the capacity at no additional space requirements
- ✓ Simplified cabling / IP infrastructure reduces maintenance cost and single points of failure count

High RF Power

57dBmV/ch for 1x1x1
53dBmV/ch for 1x2x2

No
Internal
Cables

Strand and
Wall Mounting

Small Form Factor
230 x 310 x 140 mm
9 x 12.2 x 5.5 inch

V-bias Control
for Power Saving

Oyster

Node for DOCSIS and PON



Modular
Power Supply with
>1 sec Hold Up Time

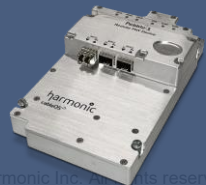
Universal Power Supply

AC MAINS: 85 -260VAC
AC CABLE: 35 -95VAC

IP67
-40 .. +60C

Compatible with

Pebble-1



Jetty



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cos sonar
cos analytics

Up to
5xPON ports
With Jetty
max 34W



USE CASE

Lower-density MDU's which only have coax cabling

CHALLENGES ADDRESSED

Slow and costly

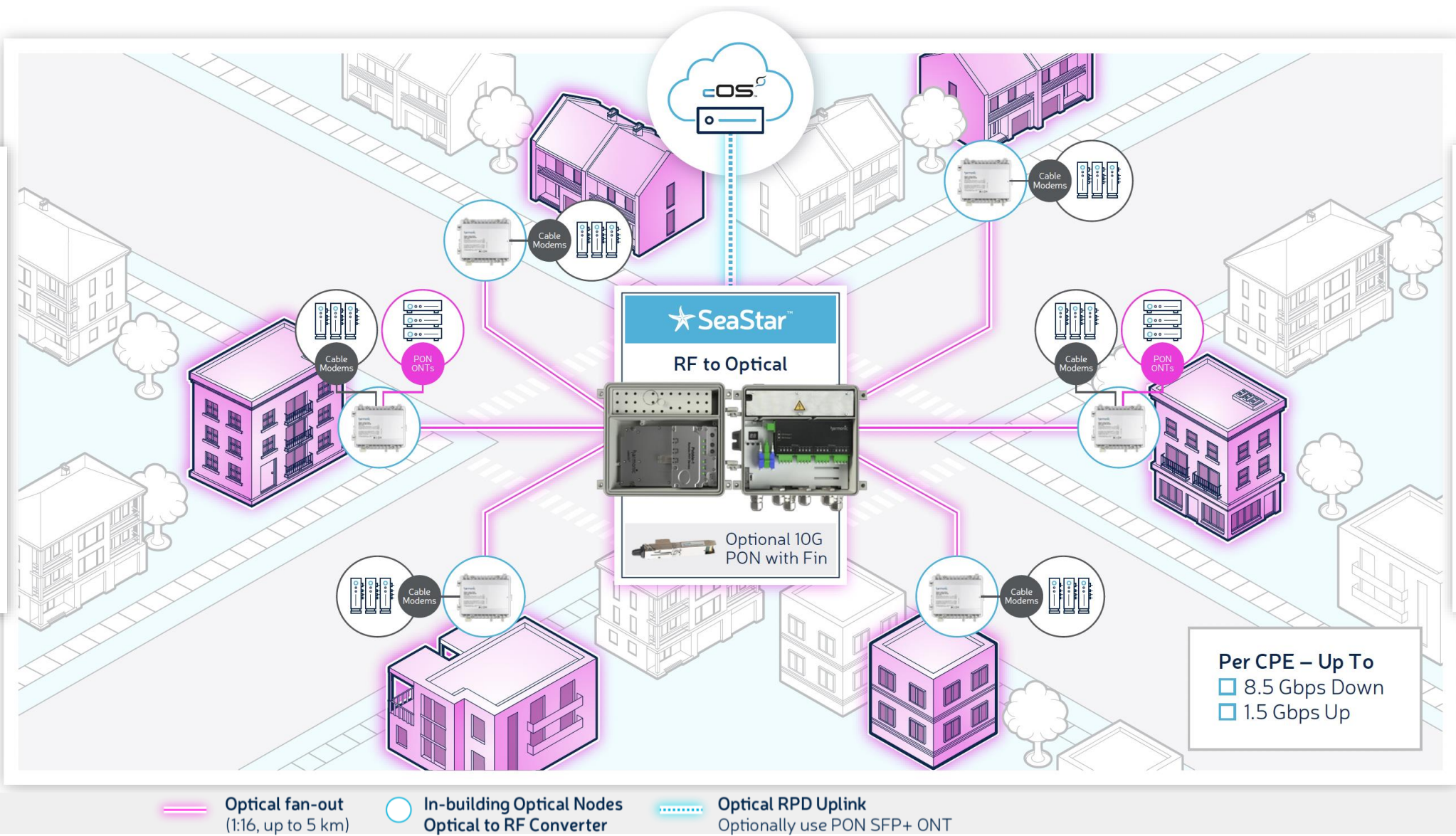
To rewire fiber,
or not an option

Not cost-effective

Existing solutions
at low densities

Operationally taxing
requires managing and
supporting separate
solutions

SEASTAR THE SOLUTION'S VALUE PROP



CABLE

Avoid the cost of RPD per MDU

Multi-gig speeds with DAA & vCMTS

Eliminate HFC

Enable transition to fiber

TELCO

Tap into MDU coax (no re-wire)

Fiber speeds

Cost effective & fast TTM to convert MDU

Coexist with existing fiber services

Per CPE – Up To
8.5 Gbps Down
1.5 Gbps Up

SEASTAR SOLUTION OVERVIEW



SEASTAR NODE:

Single RPD in semi-central location, feeding multiple (max 16) MDU's

DS is converted to Optical signal, split to 16, and transmitted to MDU's

Optical US on same fiber, different lambda. Two US SG's of 8 links, connected to Pebble US ports

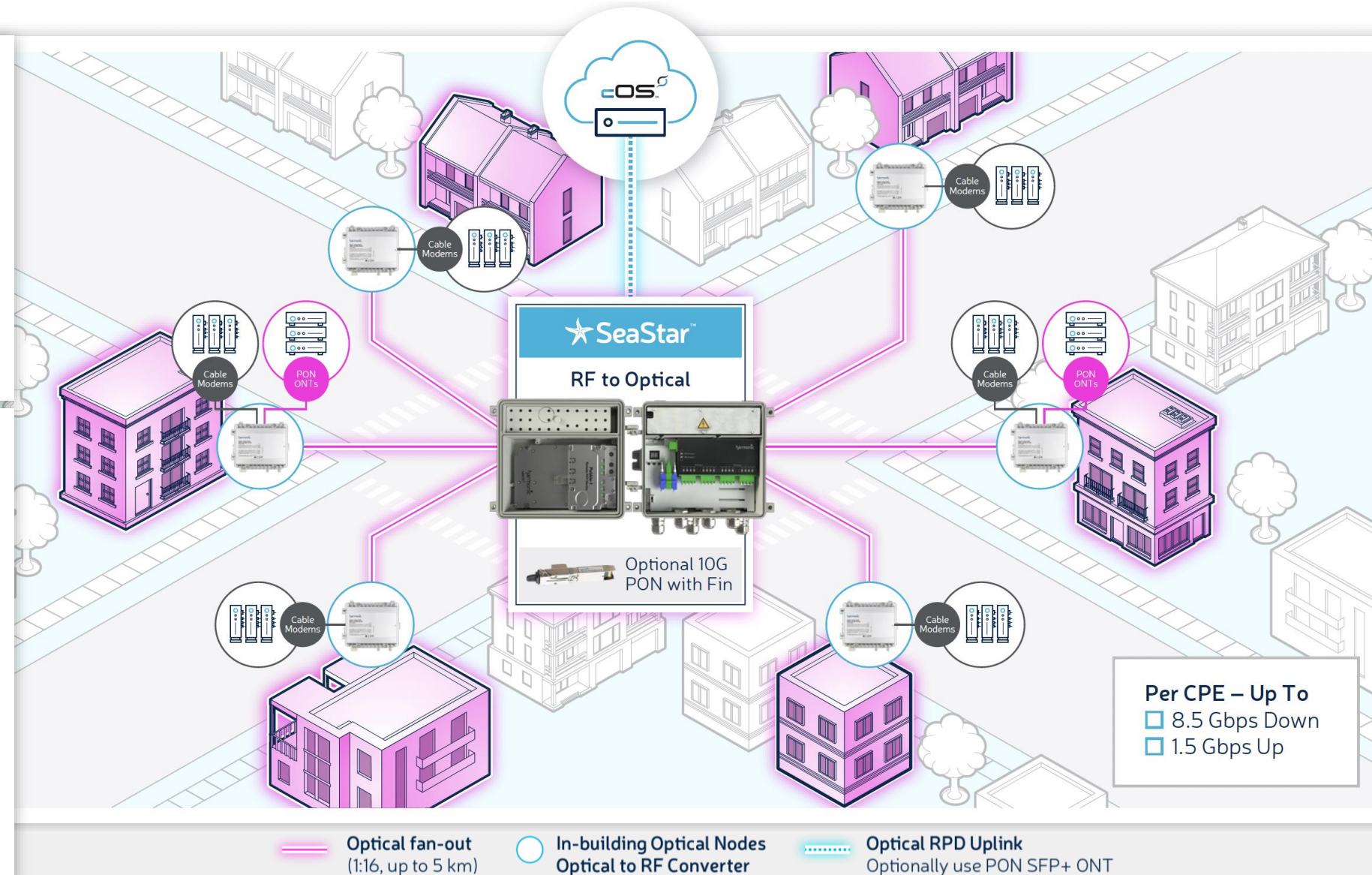
MINI ANALOG OPTICAL NODES ON MDU SIDE:

Legacy off-the-shelf analog nodes, located in MDU

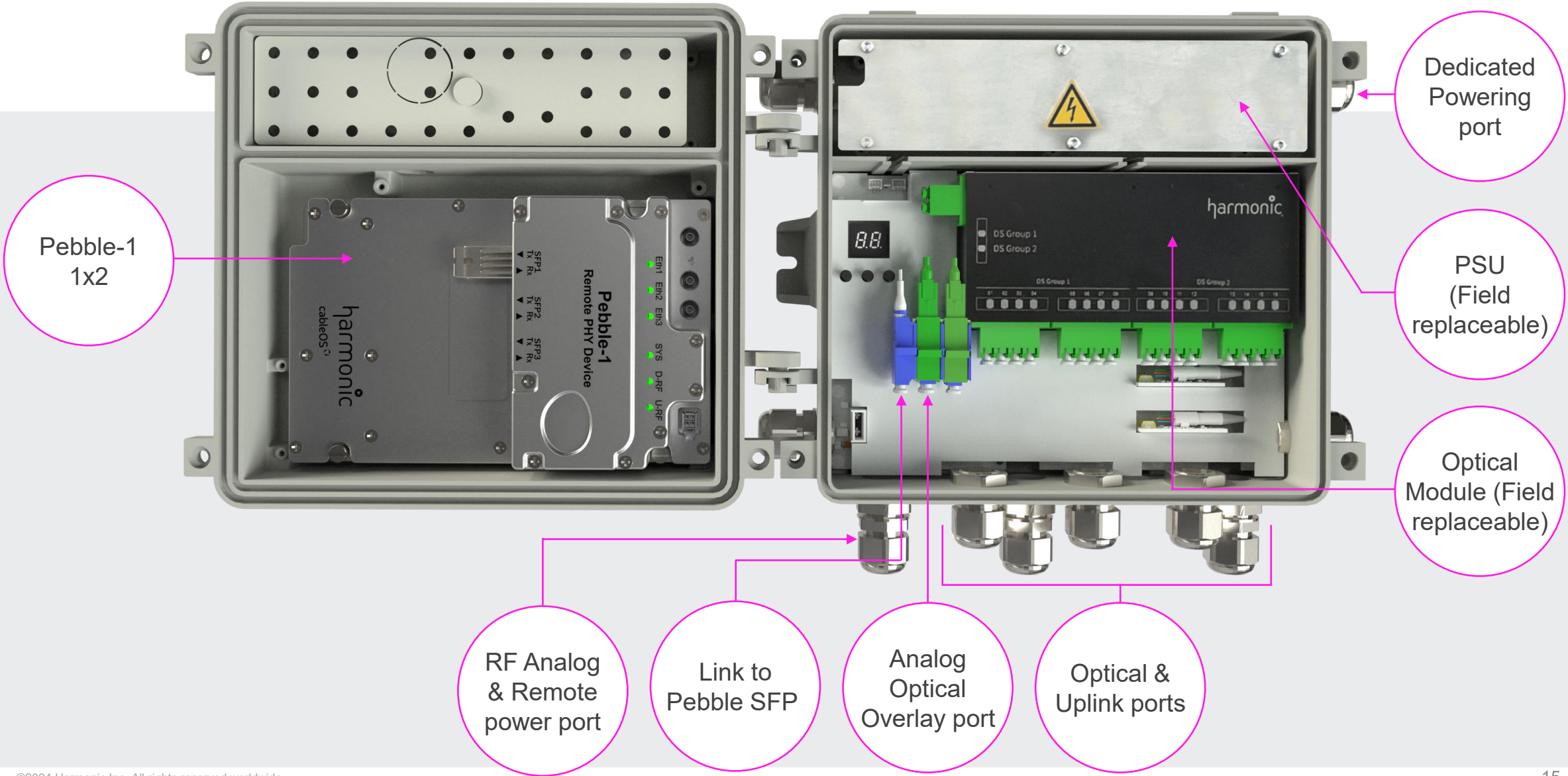
DS/US RF duplexing done inside the analog node

Scale: Max homes per MDU: 32 *
Max homes per SeaStar: ~200 *

PON co-existence w/Fin: Max 8 ONU's per MDU, 128 per SeaStar *



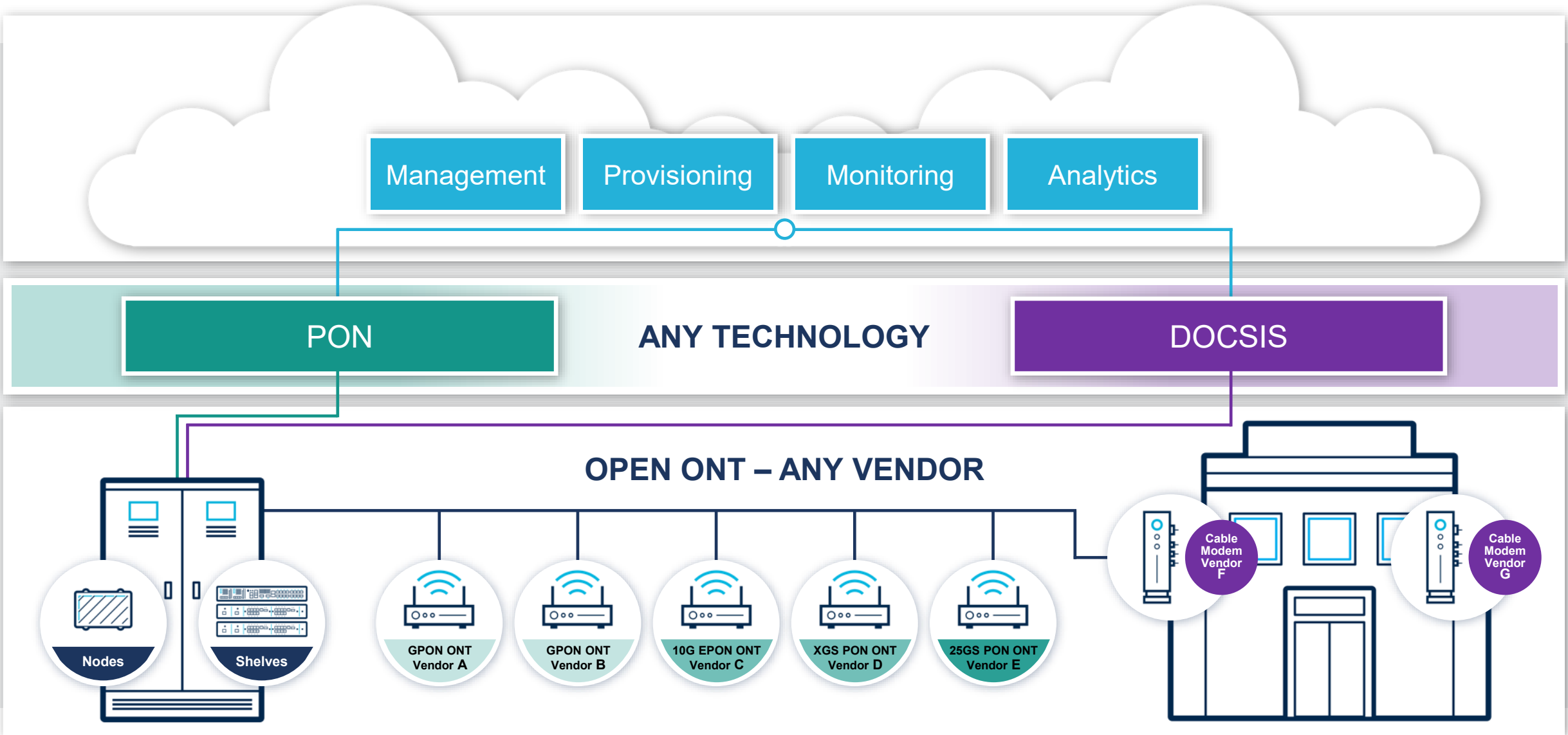
SEASTAR NODE INTERNALS





FIBER OPTIONALITY

ANY TECHNOLOGY, ANY PROVISIONING, ONE VIEW SUPPORTING AN OPEN ONT ECOSYSTEM



OPEN ONT APPROACH BRING ANY VENDOR

Open ONT Advantages

- Bring your own ONT
- Avoid CPE vendor lock
- Get competitive pricing
- Adopt New Technologies

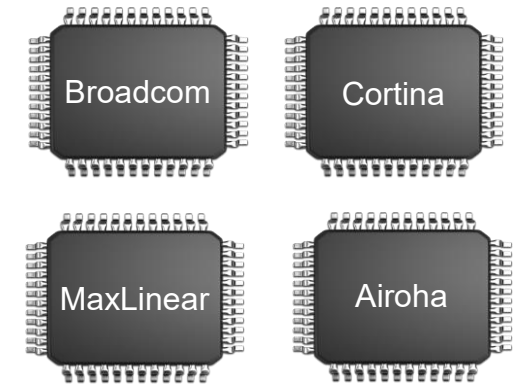
Open ONT Ecosystem

- Internal Interop Facilities
- Industry & Partner Labs
- Detailed Validation Cases
- Automated IOP Testing Suite

Open ONT



Any ONT Chip



THE FULL POTENTIAL OF DOCSIS AND FIBER

BROADBAND PLATFORM



vCMTS

vCMTS

vOLT/vBNG

Video core

Edge router

DAAS

DEVICES



Remote Nodes



Outdoor Cabinets

CPE

BoostD 3.1
CM

ONU

Unified
DOCSIS 4.0
CM

ONU

Unified
DOCSIS 4.0
CM

ONU

ONU

SPECTRUM

1.5 Gbps

8.0 Gbps



Unified DOCSIS 4.0

5.5 Gbps

8.0 Gbps



5.5 Gbps

8.0 Gbps



8.0 Gbps

8.0 Gbps

GPON/XGS/10G EPON Symmetric

THANK YOU.