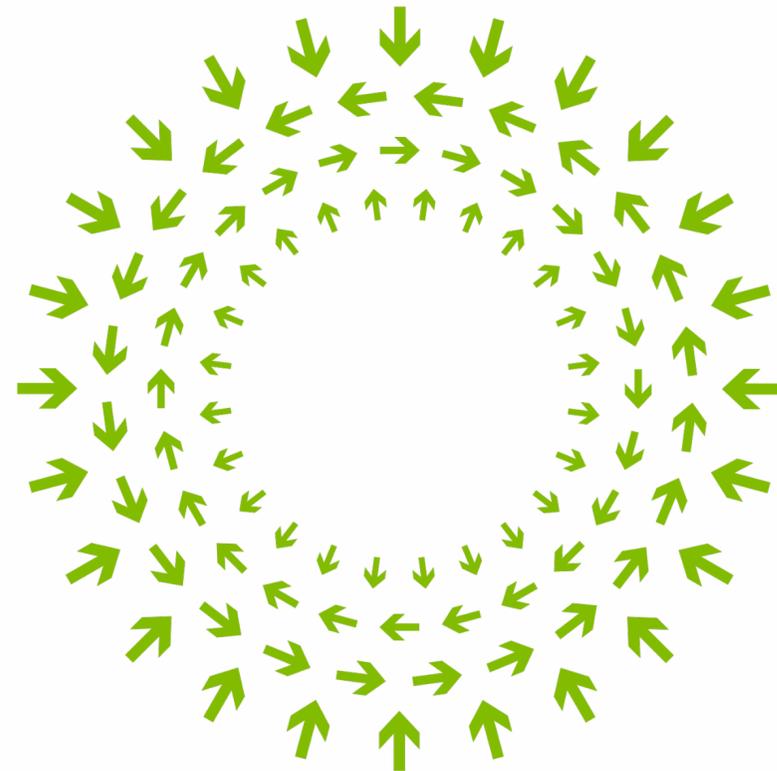


Derivations on XGS-PON spec

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Let's talk PON!

GPON

GPON is a well-established and understood PON standard based on Gigabit speeds (2.5 x 1.25).

Used for AT&T GigaPower, Google Fiber, and Verizon FiOS, as well as many other Fiber to the X deployments around the world.

XGS-PON

A new ITU standard for PON networks.

10Gbps – Symmetric – Passive – Optical – Network.

Uses different wavelengths for upstream and downstream traffic than GPON, so can co-exist on the same passive optical network.

Higher speeds and symmetric bandwidth better supports emerging 5G small cell backhaul, as well as high-speed Internet access service.

NG-PON2

An emerging ITU standard for PON networks.

1 to 4 wavelengths both upstream and downstream, so up to 40Gx40G bandwidth.

Also coexists with existing GPON wavelengths.

Provides even more bandwidth than XGS-PON.

GPON

It's not dead yet!

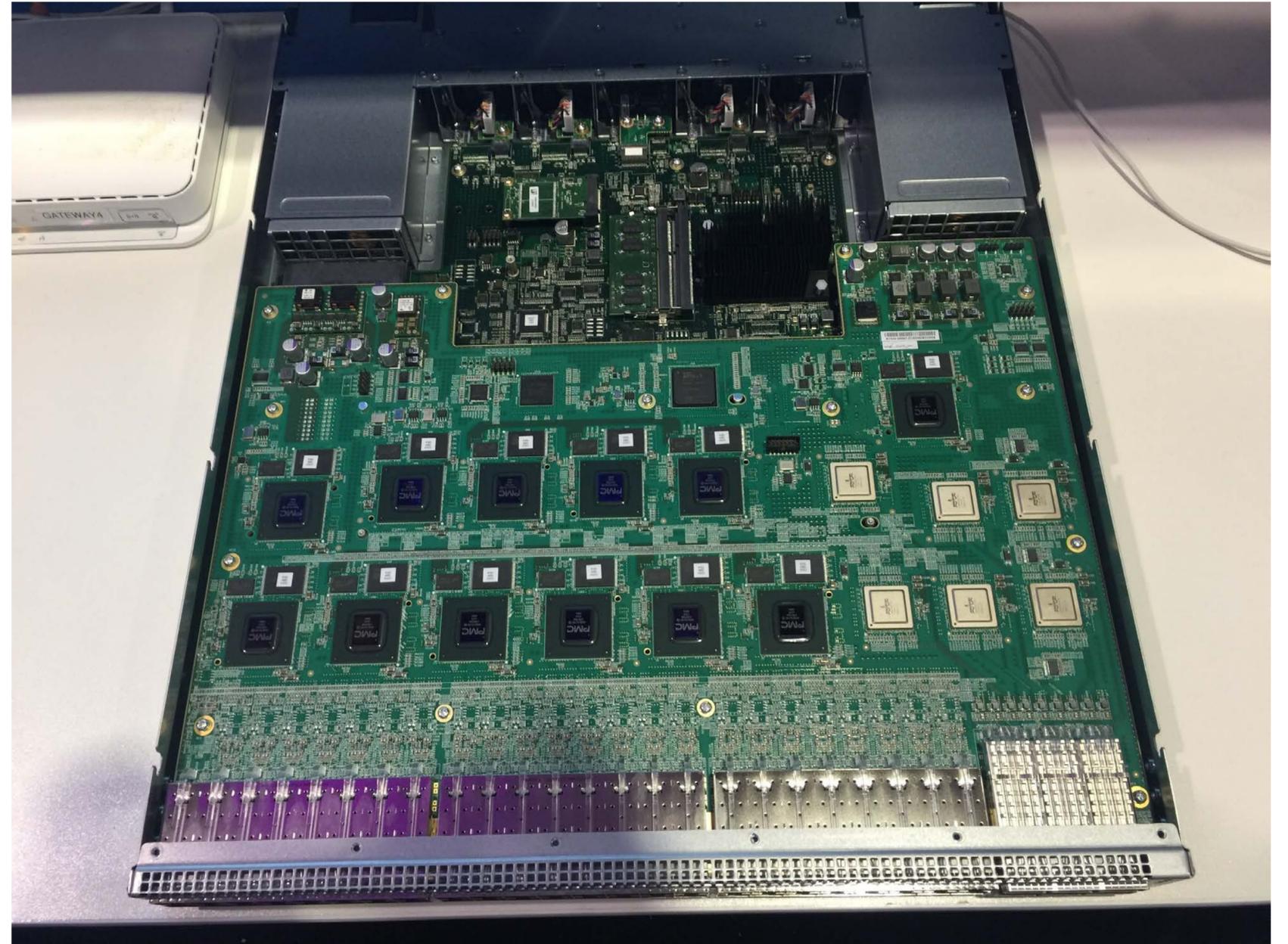
Many carriers are still deploying GPON and plan to continue for many years.

AT&T Open GPON Spec

Is being deployed in Europe

Some carriers were interested in using the design as a stand-alone box.

- And we added the optional CPU for that application
- But later feedback expressed an interest in having aggregation inside the box rather than outside.



NG-PON2

It's what's next for some carriers

Some carriers are interested in going directly from GPON to NG-PON2

NG-PON2 will offer 1 to 4 wavelengths up stream and another 1 to 4 downstream.

Each downstream wavelength is similar to XGS-PON in that it supports 10Gbps.

Upstream wavelengths can be 10G or 2.5G.

Wavelengths can be combined or used separately – think network slicing.

Wavelengths can be distributed so that different OLT electronics serve the same PON – higher availability.

So Let's have a closer look at the Open XGS PON NFV 1RU Design

PON PHY SoC

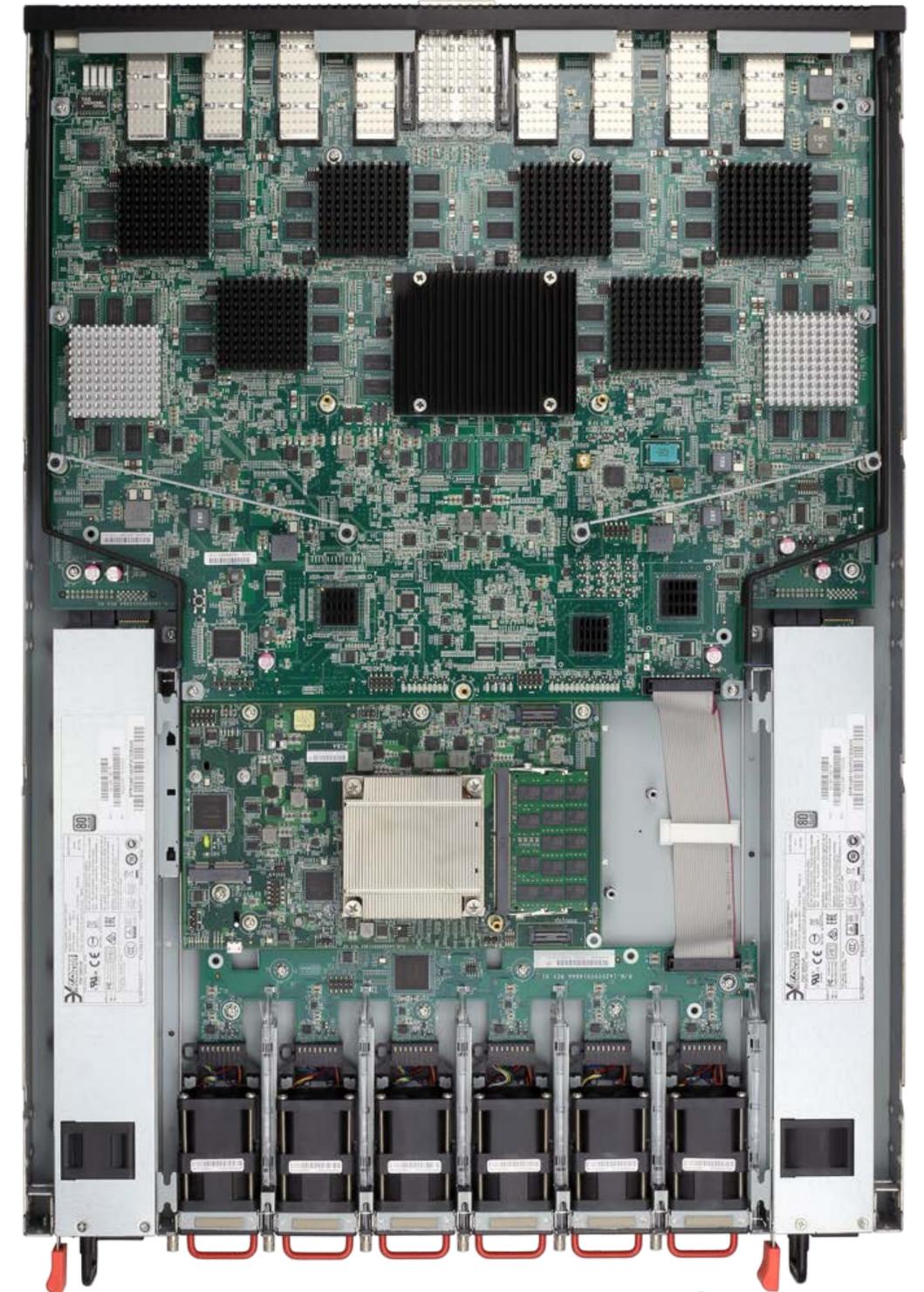
BCM68620 "Universal OLT PON MAC"

- GPON ITU-T G.984 MAC
- EPON IEEE 802.3ah EPON MAC
- XGPON ITU-T G.987 MAC
- 10G-EPON IEEE 802.3av MAC
- NGPON2 (10/2.5) ITU-T G.989 MAC
- NGPON2 (10/10[x4]) ITU-T G.989 MAC
- XGS-PON (10/10) ITU-T G.9807.1 MAC
- Integrated burst mode PON SerDes
- Integrated NNI SerDes supporting 2.5G HSGMII and 10G XFI

PON Aggregation

BCM88470 "Qumran-AX"

- 300G Full duplex switching
- 1, 2.5, 10, 40, 100G interfaces
- Mix/match Eth and OTN
- Deep buffers
- Programmable H-QoS
- MPLS, VPLS, L2VPN, L3VPN, OAM
- VXLAN, NV-GRE



So What Else Could the Spec Do?

GPON or EPON OLT

128 Ports – 3RU just to fit optics. Depopulate to create 1RU 48 port, or 2RU 96 port OLT.

XGPON1 or 10G-EPON

64 Ports

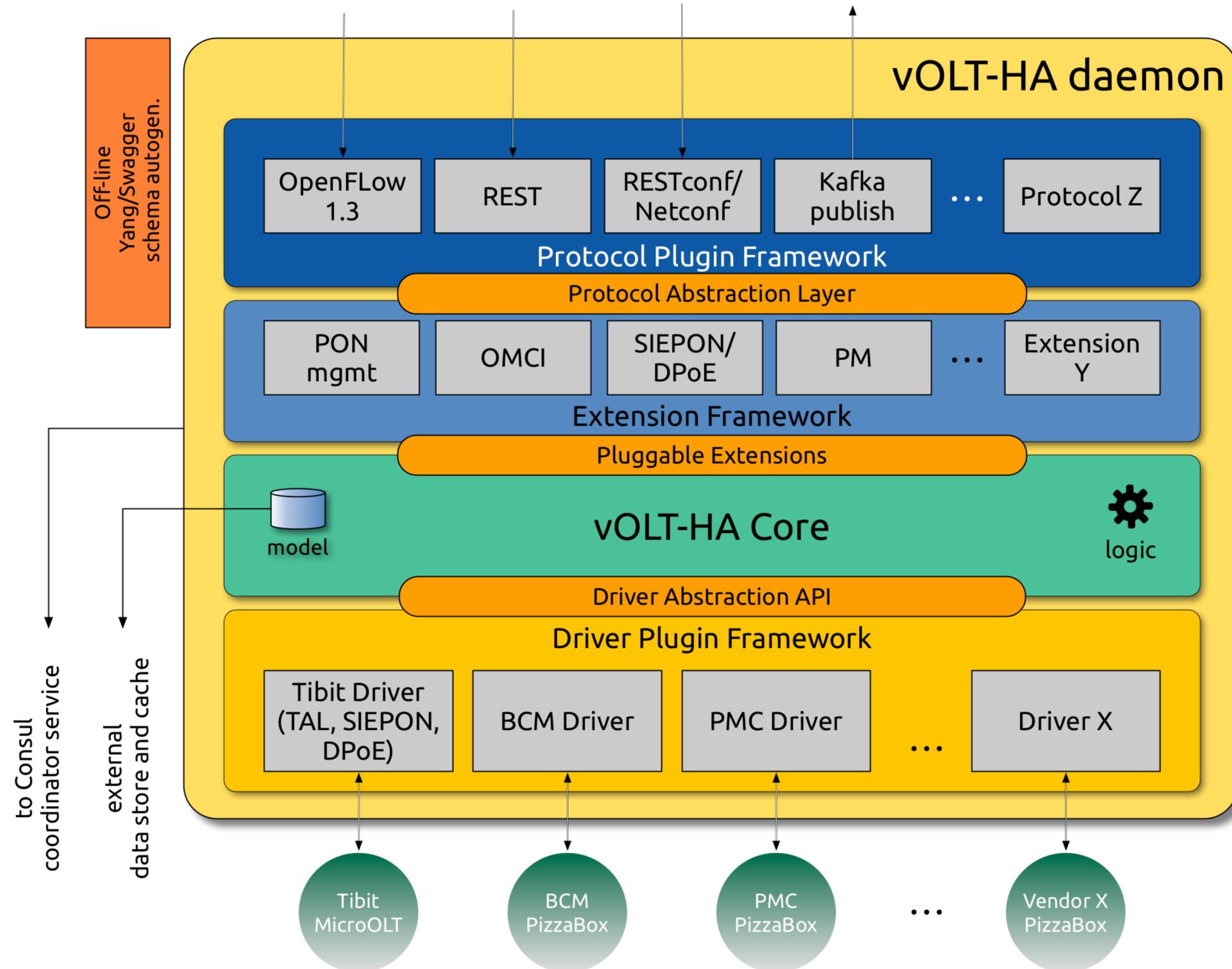
XGS-PON OLT

16 Ports

NG-PON2 OLT

4 Ports of 40x40G

Software Stack





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