OLT Disaggregation

GPON OLT

This is what we (the CORD community) accomplished as part of the R-CORD POCs

vOLT	AAA	Mcast	DHCP

ONOS

OpenFlow	NetConf

vOLT Agent

OpenFlow Agent	NetConf
OLT API	OMCI Stack

L2/OMCI

GPON OLT MAC (MicroSemi)

ONF

Virtual OLT Hardware Abstraction (VOLTHA)

VOLTHA hides PON-level details (T-CONT, GEM ports, OMCI etc.) from the SDN controller,
and abstracts each PON as a pseudo-Ethernet switch easily programmed by the SDN controller
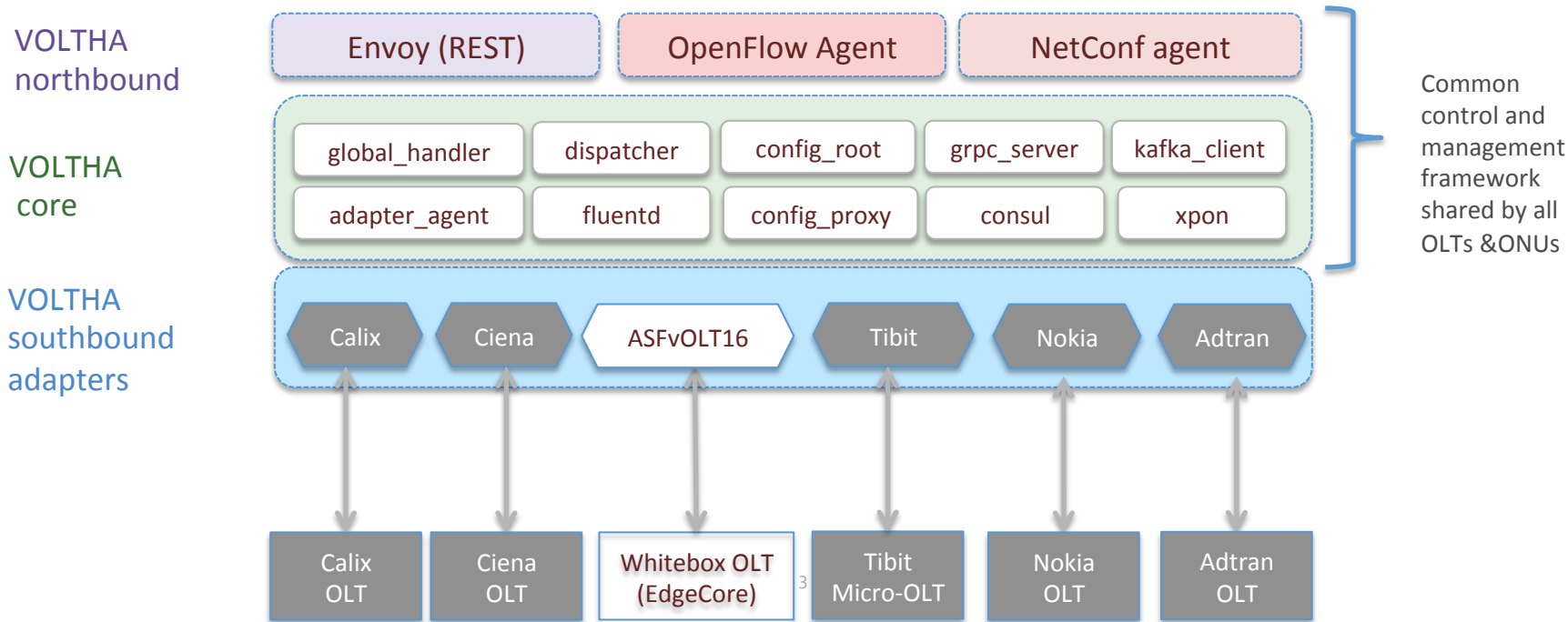
Industry's First White-Box XGS-PON OLT

White-Box = Open-Hardware Specs + Open-source software
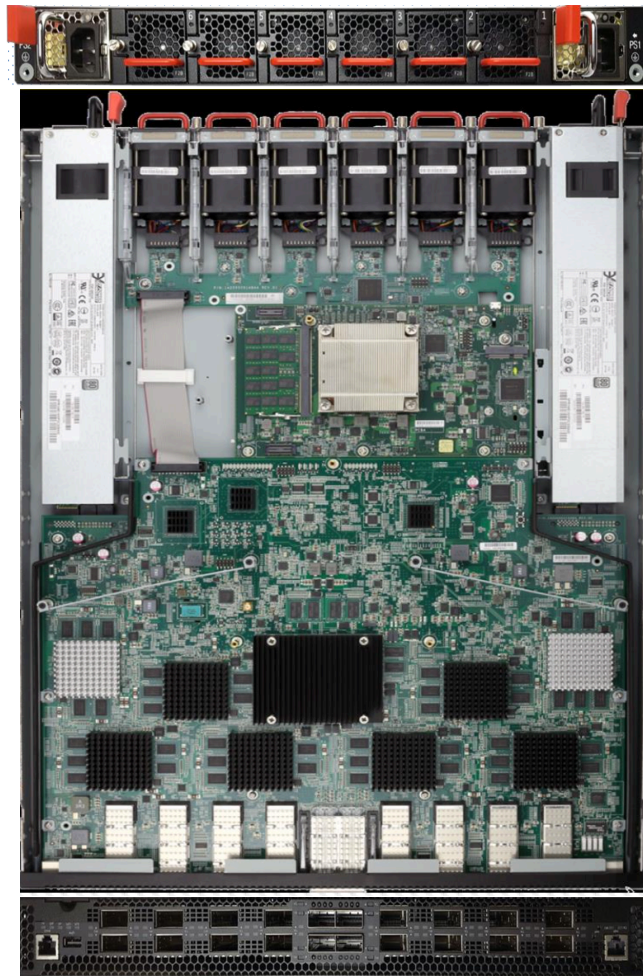
Contributors:

- Accton/Edgecore
- ALTEN Calsoft Labs
- AT&T
- Broadcom
- Ciena
- ONF
- Radisys

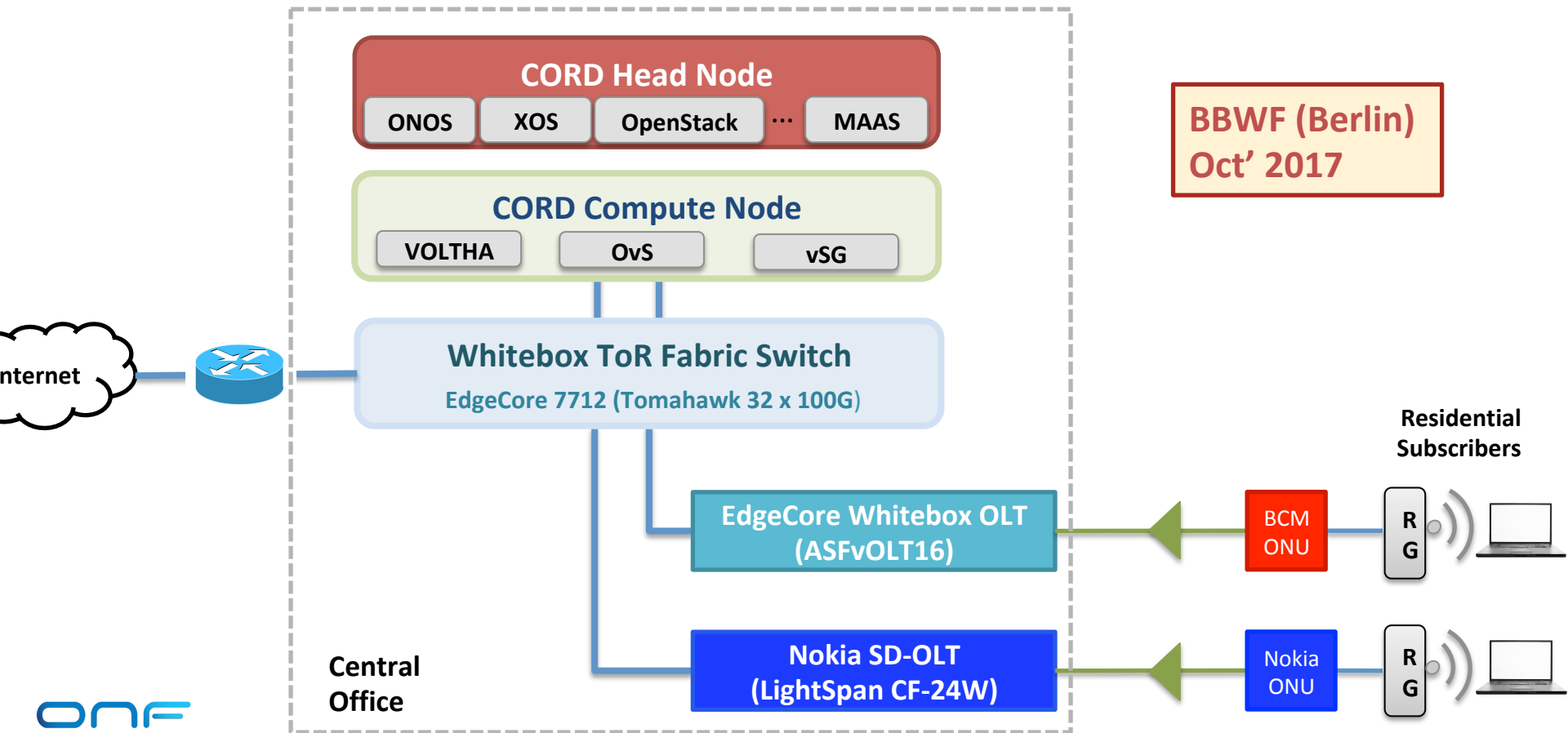Edgecore ASFvOLT16

Whitebox OLT

Hardware available July 2017

Software release with CORD 5.0 Feb 2018

VOLTHA in R-CORD

Broadband World Forum R-CORD & VOLTHA Demo

VOLTHA roadmap

VOLTHA Roadmap - 1.3 Release (April 30 2018)

- VOLTHA High Availability
  - Migrating from Docker Swarm to **Kubernetes**
  - Explore other database redundancy framework

- Supports AT&T OpenOMCI Specification
  - Interoperability of ONUs and OLTs

- Release public docker images so can run without building code

ONF

VOLTHA – current state

- PON is abstracted as OpenFlow device that allows SDN controller to program service flows

- However, underneath configuring the PON (tconts, GEM ports, etc) relies heavily on top-down configuration

  - Several config commands/calls to bring up an subscriber's ONU in the simplest configuration

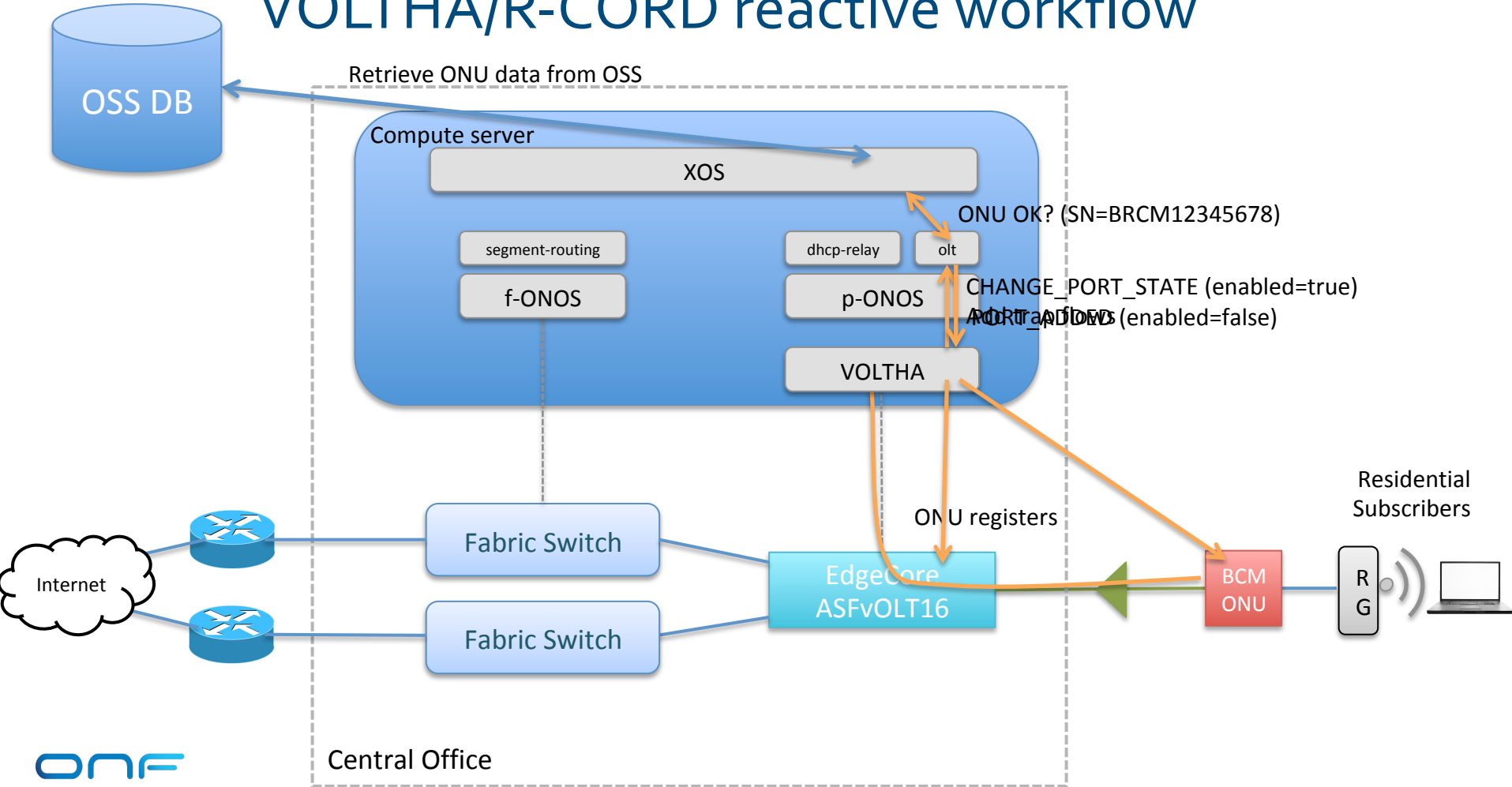 - Breaks the simple management abstraction, exposes PON details

```
channel_group create –n "Manhattan" –d "Channel Group for Manhattan" –a up –p 100 –s 000000 –r
raman_none
channel_partition create –n "WTC" –d "Channel Partition for World Trade Center in Manhattan" –a up –r
20 –o 0 –f false –m false –u serial_number –c "Manhattan"
channel_pair create –n "PON port" –d "Channel Pair for Freedom Tower in WTC" –a up –r down_10_up_10 –t
channelpair –g "Manhattan" –p "WTC" –i 0 –o class_a
traffic_descriptor_profile create –n "TDP 1" –f 100000 –a 500000 –m 1000000 –p 1 –w 1 –e
additional_bw_eligibility_indicator_none
channel_termination create –i 0001bb590711de28 –n "PON port" –d "Channel Termination for Freedom
Tower" –a up –r "PON port" –c "AT&T WTC OLT"

vont_ani create –n "ATT Golden User" –d "ATT Golden User in Freedom Tower" –a up –p "WTC" –s
"BRCM12345678" –r "PON port" –o 1
ont_ani create –n "ATT Golden User" –d "ATT Golden User in Freedom Tower" –a up –u true –m false
tcont create –n "TCont 1" –r "ATT Golden User" –t "TDP 1"
v_enet create –n "Enet UNI 1" –d "Ethernet port – 1" –a up –r "ATT Golden User"
gem_port create –n "Gemport 1" –r "Enet UNI 1" –c 2 –a true –t "TCont 1"
```

ONF

VOLTHA 2.0 and beyond – Towards SDN

- Reduce dependency on top-down configuration (xPON)
  - Automatically bring up PON ports on device boot
  - Automatically detect and configure ONUs on registration
    - Allows for validation of ONUs with OSS
  - 'Service Profile' mechanism allows configuration of QoS parameters
- Separation of VOLTHA and Adapters into separate repos to enable independent releases
- New OpenOLT adapter and OLT software for whitebox OLTs

ONF

VOLTHA/R-CORD reactive workflow

OSS DB

Retrieve ONU data from OSS

Compute server

XOS

ONU OK? (SN=BRCM12345678)

segment-routing

dhcp-relay

olt

f-ONOS

p-ONOS

CHANGE_PORT_STATE (enabled=true)
PORT_ADDED (enabled=false)

VOLTHA

Internet

Fabric Switch

Fabric Switch

EdgeCore
ASFvOLT16

ONU registers

BCM
ONU

Residential
Subscribers

R
G

Central Office

ONF

Thanks!