VOLTHA Project: Release 1.3 and 2.0

ONF & AT&T

CORD Build 2017, San Jose
January 14, 2018

VOLTHA 1.3 Feature Set

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

- **Support of AT&T OpenOMCI Specification**
  - AT&T OpenOMCI - ATT_OMCI_Specification_v2.0_20170331 (003).pdf

VOLTHA 2.0 Feature Set (I)

- **Containerized Adapters**
- PON & ONU Management (Continue from 1.x)
- PON Configuration (Continue from 1.x)
- Finalize Whitebox OLT Adapter (*ASFVOLT16*)
- Traffic Management/QoS (upstream & downstream)
- Alarms/Event Management
- Performance Monitoring Support
- VOLTHA PON Scalability > 2 OLTs; 64 ONU/OLT
- **G.Fast Support** (DPU Driver/Adapter)
- **NETCONF Support (NBI) (RFC 6241)**
  - SSH and TLS support

VOLTHA 2.0 Feature Set (II)

- Standards-based Yang Model Support (BBF & IETF) Phase I
- VOLTHA Software Component Upgrade
- VOLTHA Stability Enhancements

Exploratory/Foundational Work:

- Deployment Automation
- Examine all the existing GPBs in order to map to standard YANG models
- YANG aware transactional database support
- IEEE 802.3 PON Support

VOLTHA v2.0

Infrastructure & process improvements

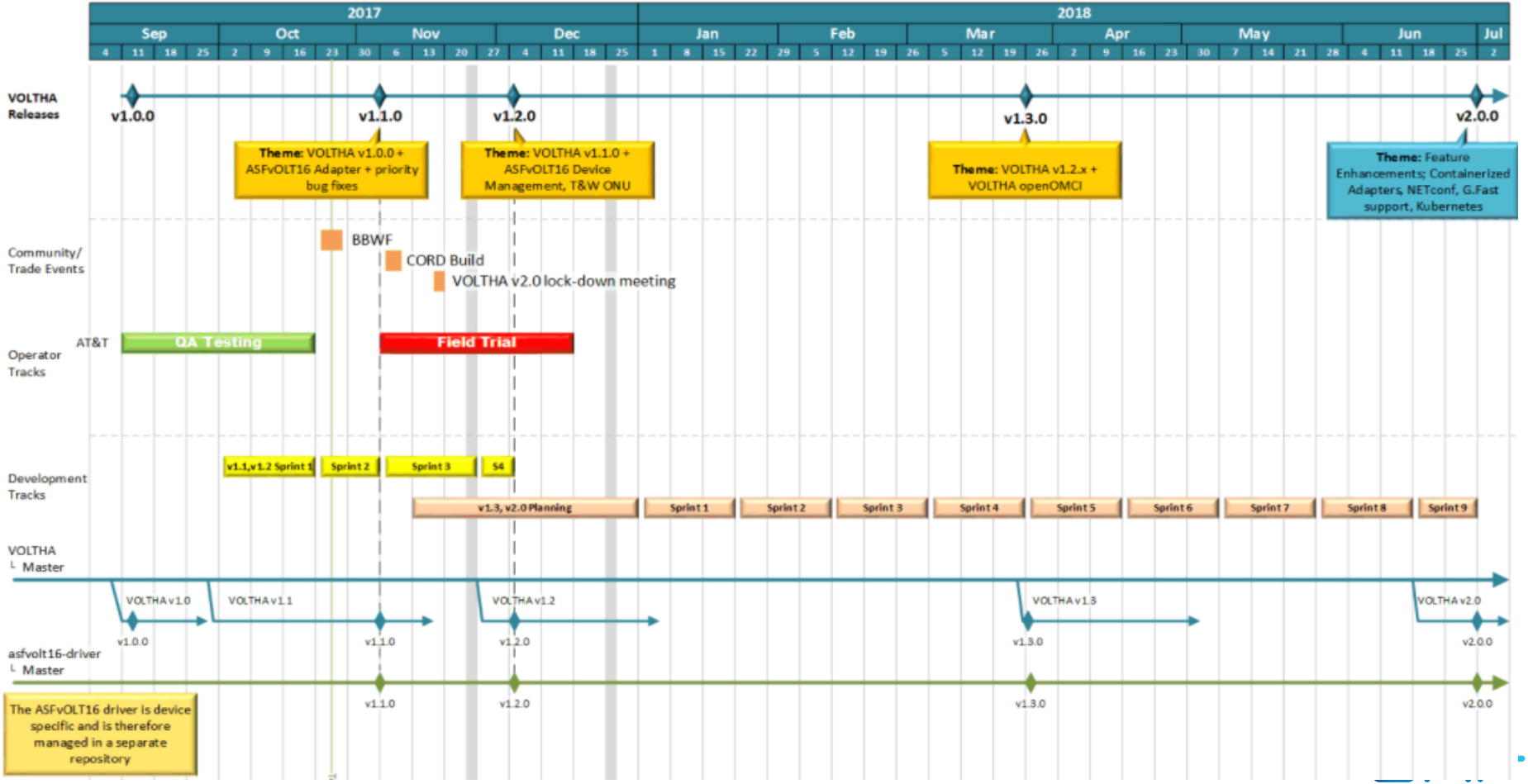
- CI/CD with reference implementation of VOLTHA and HW setup
- Separation of VOLTHA and Adapters into separate repos to enable independent releases
- Establish common mini-milestones for integration testing based on common high-level integration test plan
  - Plug-fest to work through features and interop issues (TBD)

Feature planning: End of November, 2017 for Q2 2018 Release

- Feature list

Grow the community with more service providers and vendors engagement

VOLTHA v1.x & v2.0 Release Milestones



Externally Visible Deliverables and Activities

- VOLTHA v1.3 March 2018
- VOLTHA v2.0, June 2018
- ASFvOLT16 v2.0 release, June 2018

- **Activity**
  - VOLTHA 1.3 for AT&T ATO Demo (Dallas)
  - Open Networking Summit (2018)
  - VOLTHA Plug Fest
  - Service Providers Trials

Check out Useful Information

- VOLTHA Wiki Page: https://wiki.opencord.org/display/CORD/VOLTHA
  - VOLTHA 1.0 features and Release note can be found in VOLTHA Wiki
- Join VOLTHA meetings - see CORD calendar for VOLTHA TST Meetings
  - A separate meeting schedule for ASFVOLT16 OLT adapter work
- Welcome to join our effort to create an vendor & technology agnostic Access Network Architecture
  - More Questions: Contact Shawn Ying at sying1562@gmail.com

Backup

What is VOLTHA?

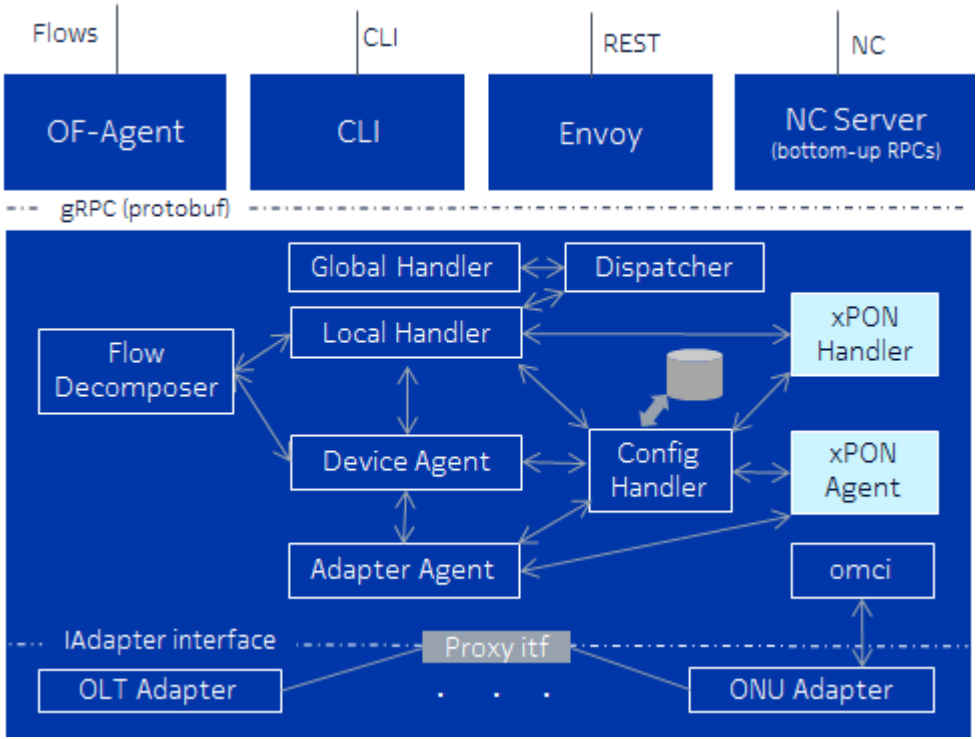
- **V**irtual **O**ptical **L**ine **T**ermination - **H**ardware **A**bstraction
- Layer of abstraction atop legacy and next generation network equipment
  - **Initially** – PON (G-PON, E-PON, XGS-PON)
  - Ultimately –G.Fast, NG-PON2 DOCSIS, Ethernet
- Key Value add of VOLTHA:
  - **Network as a Switch**: Making an access network look like an abstract programmable switch
  - **Evolution to virtualization**: works with legacy as well as virtualized devices. VOLTHA can also run on the device, on general purpose servers or in a DC
  - **Unified OAM abstraction:** provides unified, vendor/technology agnostic management interface such as device lifecycle, system monitoring, alarms, troubleshooting, etc.
  - **DevOps bridge to modernization:** bring the latest development techniques to telecommunications

Why VOLTHA?

- **Service Providers' Nightmare**
  - Control and management of legacy access devices is a mess
  - Each access technology brings its own protocols and concepts
    - Worse: Each vendor has his own interpretation of the same standards, yielding vastly diverging set of solutions, for example OMCI messages
- **What Service Provides want**
  - all vendors for a given access technology would provide an identical control and management interface
    - **This is NOT happening!**
- **VOLTHA provides a first step to address the issues**
  - Confines the differences of access technology to the locality of access and hiding from the upper layers of the OSS stack

VOLTHA High Level Architecture

- VOLTHA Containers communicate over gRPC
- Main container publishes events to **Kafka**; and persists data in **Consul**
- Use **consul** for service discovery
- Southbound OLT/ONU adapters will be their own containers as well - *Targeted for VOLTHA 2.0*
- **Split adapters**; i.e. OLT adapter and ONU adapter -> enables OLT-ONU interoperability



VOLTHA Roadmap

VOLTHA v1.0 (9/13/2017)

Theme:
Basic Management and Operations of vendor OLT solutions (XGS-PON)

Features

VOLTHA High Availability
- w/ Docker Swarm
- Database redundancy with Consul

VOLTHA Remove Internet network access dependency for Install, Deploy and Runtime

PON Management & Configuration
- BBF WT-385 implementation
- AutoDetect ONU
- ONU Registration
- Control Plane

VOLTHA Backup /Restore

VOLTHA Security
- Local Access Control Least Privilege Access (Install, Instantiate, Maint)
- No Open Ports

VOLTHA Software Maintenance (patching documentation)

Exploratory/Foundational Work:
YANG Common Data Model - NETCONF/YANG
G.Fast (DPU Driver)
Harmonizing PM KPI's
K8s Container Management

VOLTHA v2.0 (Q2 2018)

Theme:
Feature Enhancements

Features

Containerized Adapters
NETCONF Support (NBI) (RFC 6241)
- SSH and TLS support

Standards-based Yang Model Support (BBF & IETF)
PON & ONU Management Part II
PON Config Part II
G.Fast Support (DPU Driver/Adapter)
Finalize Whitebox OLT Adapter (OCP)
Alarms & PM Support
VOLTHA Software Component Upgrade
VOLTHA Stability Enhancements
Migrating from Docker Swarm to **Kubernetes**
Reference implementation of VOLTHA - CI/CD
Traffic Management/QoS (upstream & downstream)
VOLTHA PON Scalability 2 OLT; 64 ONU/OLT*

Exploratory/Foundational Work:
Deployment Automation
OpenOMCI Stack
IEEE 802.3 PON
Examine all the existing GPBs in order to map to standard YANG models
YANG aware transactional database support

VOLTHA v3.0 (Q4 2018)

Theme:
Productization

Features

Netconf Call Home (RFC 8071) support
YANG aware transactional database support

VOLTHA Security
- Encrypted Messaging
- Global Access Control (e.g. CORD Platform)
- Audit Logging

Harmonizing Alarms and Events (YANG model?)
Implementation of PM KPIs (based on harmonized work)

OLT / ONT Interoperability
OpenOMCI Stack
ONT Adapter (OpenOMCI common adapter)

Rogue ONU mitigation
VANILLA Architecture Refactor
TOSCA Support
Ethernet PON Support

Exploratory/Foundational Work (TBD):