Taking SEBA into Production
Requirement Analysis & Design

- Requirement preparation
- Business and Technical
- ONF’s VOLTHA and SEBA study
- GAP Analysis
- Design
Things to Do

- **New Features**
  - Service related features (TT Workflow)
  - Northbound APIs
  - UI
  - FCAPS

- **Network Integration**
  - Provisioning
  - PM
  - Alarm

- **Hardening**
  - Scaling services for n ONUs bringup scenario
  - compute nodes/micro-services restarts
  - add/remove, reboot, enable/disable devices
  - Backup/Restore

NETSIA
Decided Architecture
Development Activities

- **Voltha 1.x**
  - Technology profile Voltha 1.6
  - Multi t-cont, VLAN translation
  - Multicast and BAL brigades

- **Voltha 2.x**
  - Performance & Scalability tests
  - Containerization brigade
  - Stabilization brigade
  - BBSIM

- **Netsia Components**
  - Service Control
  - O&M Modules
  - APIs
  - User Interface
Test Activities

- Test Case Documentation
- Automated tests started by Jenkins
  - Functionality
- Scalability and performance tests with BBSIM (South-to-north)
  - OMCI Initialization
    - `rw_core` performance
    - onu-adapter performance
    - olt-adapter performance
  - DHCP and authentication
    - DHCP traffic tests with `tcpreplay` (South-to-north)
    - ONOS performance on Rest APIs (North-to-south)
    - Failover tests
CI/CD Activities

- For CI operations in our development environment
  - Periodic Jenkins Jobs are used

- For CD operations
  - Jenkins
  - Test automation frameworks (JUnit, Robot Framework)
  - Binary repository manager (Nexus 3)
  - Docker, Kubernetes
  - Custom developed tools/scripts

- Additional tools
  - Bitbucket for source code management
  - Jira issue tracking system
  - SonarQube for code quality
Process

- Created a mirror of all upstream projects under Bitbucket
- Periodic (three times a day) sync with Jenkins jobs
- Netsia repos:
  - Netsia specific components
- Forks from mirror for upstream projects
- Mid-day sync from fork to development branches.
- Maintain a GitLab for 3rd party dependencies.
- Build code and upload the artifacts to Nexus 3 by Jenkins jobs.
- Use artifacts in Nexus 3 during deployments.
Multi T-CONT

- TT workflow requires each service has different T-CONTs
- High complexity
  - For each subscriber service BW limitation might be different
    - e.g. Gold/Bronze HSI service
    - pbit marking, VLAN translation, MAC learning
- It was too difficult to debug
  - No clue to understand what is NOT working
  - No way to debug at the HW level
  - Logs are not very informative
IPTV Service

Video On Demand & Multicast

• Both uses the same T-CONT thus same Technology ID
• Changes required on SADIS, ONOS vOLT
• TP has two GEMs
• Need VOD, IGMP Trap and IPTV DHCP flows to be defined
  • VOD flow is not required in case of MAC learning
Multicast

- Multicast brigade
  - Netsia ONF Sterlite Infosys

- Implementation has been completed on Voltha 1.7. Community reviews are ongoing.
  - Jira Epic is “Enabling multicast functionality in VOLTHA”

- Multicast has been implemented along with the Multi T-Cont
  - Design was dependent on the Multi T-Cont and BAL traffic model and it’s limitations.
  - No support for destination IP address - IP to MAC conversion on adapter

- IGMPv2 done, but TT requires also v2 and v3 as hybrid.
Multicast

- ONOS apps has been updated to work with the ONOS 1.13.x
- New Multicast Store usage
- OLT’s to manage by mcast and fabric to manage by segment routing
VLAN Translation

- TT workflow requires VLAN translation at the ONU level
  - SADIS, vOLT, OpenOMCI adaptor
  - Extended VLAN Tagging Operation at OMCI
  - OF worked well as NB API

- Not open-sourced yet
  - It’s hard to implement this without affecting other workflows
BAL 3.x provides the flexibility changing packet pbits
• mapping to queues by pbits - not tested yet!

BAL 2.6 multicast limitations
• same V-LAN for different multicast groups - supported by BAL 3.1(patch) & BAL 3.2

BAL 2.6 is re-architected, must use BAL 3.x for production
• 3.0 is an early release, 3.1 and later stable releases
Thank You

Follow Up Links:
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