Open Network Automation Platform (ONAP) Architecture Overview

Vimal Begwani – AT&T
Lingli Deng – China Mobile
Outline

- Motivation and Background
- Meta Data Driven Strategy
- ONAP Architecture Overview
- Illustrative Flow: Design, Deploy and Operate
Key Imperatives and Drivers for ONAP:

- As We Move Towards Software Defined Networks and Virtualized Network Functions, We Need a New Approach for Operational Management Framework to Realize the Following Objectives:

  - Increase Value of the Network:
    - Rapidly on-board new services
    - Facilitate new business & revenue models
    - Make Network Programmable in real-time

  - Reduce Capex:
    - Reduce / Eliminate dependency on development cycles
    - Dynamically adjust capacity & Allocate Resource When / Where Needed
    - Lower aggregated spare capacity

  - Reduce OpEx:
    - Automated service delivery and activation with Zero Touch Flow Through
    - Policy & Analytics-driven closed loop optimization
Linux Foundation Framework, Governance, Control
Bringing the best of both worlds together

+ 2+ years of Deployment Maturity at AT&T
+ Comprehensive: Design +Orchestration + Control + Policy + Analytics
+ Model-based design enabling self-serve capabilities for instantiation and closed loop automation

+ Open TOSCA model
+ Most Advanced Open Source Process & tool chain
+ Architected for ease of VNF insertion (SDK)

The Linux Foundation is creating the greatest shared technology investment in history by enabling open source collaboration across companies, developers, and users.

We are the organization of choice to build ecosystems that accelerate open technology development and commercial adoption.
**ONAP Design Time Framework**

- Catalog-driven Graphical design studio to:
  - Define Recipes for instantiating & Configuring VNFs & Services
  - Design Monitoring & Managing VNFs & Services
- Test & Validate artifacts
- Distribute meta-data to Execution Environment

**ONAP Execution Time Framework**

- Meta-data driven execution modules to:
  - Instantiate VNFs, Configure VNFs & E2E Services
  - Track Active & Available Inventory
  - Monitor and Take Automatic Corrective Action
- Operational Dashboard
Proposed ONAP Merged Architecture

Dashboard
- OA&M
  - Operation Administration & Maintenance
- Active & Available
  - Inventory
- Service Orchesturator

Operational Functions
- Data Collection & Analytics
- Common Services, Data Movement, Access Control & APIs
- Controllers
  - SDN Agent
  - Infra. Cont
  - network Cont
  - App. Cont
  - VF Cont

Design Functions
- Service Design & Creation
- Policy Creation
- Analytic Application Design
- Recipe/Engineering Rules & Policy Distribution

VNF SDK
- ONAP Portal
- ONAP Controller

E – Services
BSS / OSS
Big Data
Proposed ONAP Merged Architecture

Service Or orchestrator (SO)
- Orchestrates and manages the delivery, modification or removal of networks & services
- Provides cross domain orchestration and coordination
- Integrate TOSCA end-to-end orchestration

Active & Available Inventory (A&AI)
- Real-time topology map with context views of virtual networks, services and applications
- Uses the network resources as the database of record due to their dynamic nature

Data Collection, Analytics & Events (DCAE)
- Collects Telemetry Data from VNFs and other sources
- Analytic Applications Detect Anomalous conditions
- Publishes Actionable conditions

Service Design & Creation
• Service Design: environment to define service and resource, constraints, instantiation & modification recipes.
• Policy Creation: Associate anomalous and actionable conditions with automated remedy actions
• Provides SDK to onboard and certify Vendor VNFs

Data Collection & Analytics

Design Platform

© 2017 AT&T Intellectual Property. All rights reserved. AT&T, Globe logo, Mobilizing Your World and DIRECTV are registered trademarks and service marks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks are the property of their respective owners.
ONAP Illustrative Flow: Design, Deploy and Operate

Vendor Domain

1. VF Design
2. VF Package

Operator Domain

Design Time Framework

3. VF Onboarding (Verification, LCM testing, Benchmarking, Certification)
4. Service Design
4. Policy Design
4. Analysis Design

Run Time Framework

External APIs

5. Catalog
7. A&AI
6. SO E2E Service Orchestration & Mgmt

Common Service

8. DCAE: Data Collection, Analysis & Event
6. SDN Agent
6. Infra Cont
6. Net Cont
6. App Cont
6. VF Cont

Distribute

6. 3rd party Cont
6. 3rd party VNFM/EMS
Thank you

Questions?