ONAP
Open Source Community for Orchestrator

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2017-11
• Orchestrator with Open Source
• ONAP Introduction
• ONAP in China Mobile
• Summary
Orchestrator is the Re-Constructed OSS for NFV/SDN networks (1/2)

3/4/5G

VNF
VNF
PNF
VNF

Slicing, micro-service

Infrastructure

Cloud OS
compute
network
storage

Orchestrator

Service and Network Orchestration
Resource Management
Automatic and Intelligent Operation

Re-constructed OSS
Orchestrator is the Re-Constructed OSS for NFV/SDN networks (2/2)

3rd party Apps  Self-service Portal  OPS Portal

Re-Constructed OSS

End to End Orchestrator Network Service Lifecycle Management

VNF Lifecycle Management  Resource Management

Traditional OSS

Fault Management  Configuration Management  Alerting Management  Performance Management

Unified Capability Exposure

End-to-End Orchestration

Distributed Resource Mgmt.

Traditional FCAPS Mgmt.

Orchestrator could be the core of next generation OSS.
Network Management and Orchestration System (O) is a Operating and Supporting System, used by a new type of network which brings in SDN/NFV.

Orchestrator is the “Brain” for the future network.

Network Management and Orchestration System functions as the architect who builds telecommunication “Lego”, orchestrates telecommunication functions and capabilities into services for the needs of different industries. And manage the whole life-cycle of resources, networks and services to achieve agile onboarding and effective network operation.
It is necessary to develop a NFV/SDN fusion network management and orchestration system using open source software:

- With traditional international standardization industry operation mode, the innovation progress is slow (in years), with potential compatibility issues between vendor solutions, and potential risks from lack of control of the software system.
- Open source software is key to enable operators quickly introduce technology to achieve business innovations.
- At the same time, being de facto standards, open source community helps multi-manufacturers communicate with each other and promote industrial maturity.

"Open source" is a new R & D model achieving Self-development for Carriers.

Traditional international standardization industry operation mode:
- Operators’ Requirements
- Architecture Discussion
- Protocol Design
- Product Implementation
- IoT Test
- Long Iteration circle (yrs)

Open source community industry operation mode:
- seed code
- Requirements Analysis
- Iterative implementation
- Product Implementation
- Code driven
- Short iterative circle (months)
• Orchestrator with Open Source

• ONAP Introduction
  – ONAP Scope
  – ONAP release plan
  – ONAP architecture

• ONAP in China Mobile

• Summary
ONAP Vision: The Top, Global Automation platform for Network, Infrastructure & Services across Service Providers, Cloud Providers and Enterprises in a Software-Defined, Virtualized Era

- ONAP (Open Network Automation Platform) is an open source software platform that delivers capabilities for the design, creation, orchestration, monitoring, and life cycle management of VNFs/SDNs and high-level services that combine the above.

- ONAP provides for automatic, policy-driven interaction of these functions and services in a dynamic, real-time cloud environment.

- ONAP uses cloud technologies and network virtualization to offer services, achieving both faster development and greater operational automation. It lets service providers quickly add features and reduces operations costs. It gives service providers and businesses with their own network clouds more control of their network services, and enables developers to create new services.
ONAP: the marriage between OPEN-O and openECOMP

Linux Foundation Framework, Governance, Control
Bringing the best of both worlds together

ECOMP

- 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)

ONAP
OPEN NETWORK AUTOMATION PLATFORM
## ONAP TOP 10 Requirements

### The Technology

1. **Merge, Re-architect & Optimize** ECOMP & OPEN-O code bases into a single, flexible platform
2. **Modularity** enhancements for maximum flexibility
3. **Enhance** Model driven design eg HEAT, YANG, TOSCA
4. **Add NEW features/functionality** making ONAP a de-facto platform for automation
5. **Global Requirements** inclusion for maximum end users value creation

### The Ecosystem

1. **Participation** Global (end users at at least 50% subscribers, top vendors/integrators)
2. **Open Code**, collaborative processes, sustainable ecosystem
3. **Collaboration** with Upstream projects, users
4. **CI/CD** Best practice - Deliver in incremental chunks
5. **Harmonize** ONAP with standards frameworks eg ETSI, MEF....
ONAP Members

Platinum Members (18)

- AT&T
- 中国移动
- China Mobile
- orange
- Tech Mahindra
- VMware
- Vodafone
- ZTE
- Nokia
- Intel
- IBM
- Huawei
- Ericsson
- Cloudify
- Cisco
- China Telecom
- Bell
- Amdocs
- Jio

Silver Members (32+)

- Accenture
- ARM
- 亿阳信通
- GDOO Inter-Tsenn
- Canonical
- 赛特斯 CertusNet
- China UNICOM
- 中国通
- Ciena
- CloudBase
- Comcast
- Coriant
- Equinix
- FiberHome
- Fujitsu
- H3C
- Infosys
- Juniper
- Kaloom
- Mavénir
- Metaswitch
- Microsoft
- MIRANTIS
- NEC
- Netcracker
- Netsia
- Openet
- PCCW Global
- RAISECOM
- Redhat
- Samsung
- V Em
- Wind
- Windstream
- ZTEsoft
ONAP Members covers 55% Global Subscribers

Global Subscribers
- 55%
- 28% Untapped, for now
- 17%

Additional Wireless Subscribers (in Pipeline)

Service Providers
- AT&T
- Bell Canada
- China Mobile
- Comcast
- China Telecom
- Orange
- Reliance Jio
- Vodafone
- China Unicom
- PCCW
- Veon (VimpelCom)
- Windstream

Ecosystem Vendors, Integrators
- Amdocs
- Cisco
- Ericsson
- Gigaspaces
- Huawei
- IBM
- Intel
- Nokia
- Tech Mahindra
- VMware
- ZTE
- Accenture
- ARM
- BOCO Inter-Telecom
- Canonical
- CertusNet
- Ciena
- Cloudbase Solutions
- Coriant
- Fujitsu
- H3C
- Infosys
- Juniper
- Mavenir
- Metaswitch
- Microsoft
- Mirantis
- NetSIA
- Netcracker
- ONF
- Raisecom
- Redhat
- Samsung
- Wind
ONAP Governance & Organization

- **Governing Board**
  - Responsible for budget, trademark/legal, marketing, compliance & overall direction

- **Technical Steering Committee**
  - Fair Technical Board starting with commitment to project success and transitioning to merit based over time

- **Marketing Committee**
  - PR, event, blog, tutorial and summit

- **Officer Position in ONAP Governing Board**
  - Chair: Chris Rice (AT&T)
  - President: Yachen Wang (China Mobile)
  - Treasurer: Vincent Danno (Orange)
1. May 2017, ONAP Amsterdam Release officially launched.
2. August 2017 (M3), API Freeze for R1, 50% of Functional Test Case are completed.
3. September 2017 (M4), Code Freeze for R1, 100% of Functional Test Case and E2E Test Cased are completed.
ONAP R1  “Amsterdam”  by the Numbers

57 members
10/10 top NW vendors
55% of world’s subscribers

8 months
Inception to release

1380
Wiki Community

538
Contributors
46 member orgs

15 mins
Avg time to new service delivery
ONAP Architectural Principles

- **Model Driven**: Automated without hard-coding
- **Cloud Native**: Built for the cloud and to manage cloud native VNF
- **DevOps CI/CD**: Built using CI/CD Manage VNFs using CI/CD Break/Fix → Plan/Build
ONAP R1 “Amsterdam” Architecture

**Design Time**
- SDC
  - Model Designer
- CLAMP
- VNF SDK

**Run Time**
- VID
- OOM
  - Portal Framework
- Service Orchestration
- ONAP CLI
- A&AI
  - ESR
- Common Services
  - DMaaS
  - CCSDK
  - Logging
  - AAF
  - Microservice Bus
- Policy Frmwk
  - SDN-C
  - Controller driver
  - VIM driver
- Multi-VIM/Cloud
- Holmes
- DCAE
- APP-C
- VF-C
  - sVNFM/EM S driver

From openECOMP
From OPEN-O
Convergence from both sides
New
3rd party

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From OPEN-O
Convergence from both sides
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VF-C: Virtual Function Controller (ETSI-aligned) Incorporates commercial VNFMIs to create and manage underlying VNFs
A Day in the Life of an ONAP Service

VNF

1. Vendor provided VNF (cloud-hosted, optimized or native)
2. Vendor packages VNF as per ONAP requirements; can use VNF SDK

Design

3. Design/test teams onboard VNFs
4. Designers create products, services, recipes

Run-Time

5. OSS/BSS system triggers service deployment
6. Service lifecycle management
7. Constant data collection, analytics, event monitoring; S3P

Closed Loop
VoLTE: Model-driven, Real-time, Closed-loop Automation Blueprint

- Incorporates commercial VNFs & VNFMs to create and manage underlying vEPC and vIMS
- Improves HW utilization, (multitenancy)
- Improves speed to revenue
- New voice services: months reduced to minutes

Lowers CapEx by extending infra investments
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CMCC ONAP draft Roadmap
Be ready for deployment by 2018

- NovoNet Trail for vEPC, vIMS
- NB-IoT vEPC, vIMS commercial
- 5G commercial trial

- ONAP R1 Amsterdam
- ONAP R2 Beijing
- CMCC R1 development
- CMCC R1
- CMCC R2
- ONAP CMCC R1 Trial
- ONAP CMCC R1 Deployment
- ONAP CMCC Scale Deployment
ONAP Integration Lab for VoLTE scenario
ONAP Verification in China Mobile NovoNet trail Network

1. Establish 2 layers of new type of DCs with TIC
   - Deploying control plane vNF on Core Tic nodes
   - Deploying Media plane and access layer vNF on Edge Tic nodes

2. Achieve a unified orchestration and scheduling via ONAP
   - Achieving a unified orchestration system by establishing 2 lays systems: domain and cross-domain network management and orchestration systems.

3. Unified Resource Pool supports multi-service environment
   - TIC new DC to form a unified resource pool, support multi-service environment, to achieve multi-service resource sharing.
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ONAP 2018 Guidance

• ONAP R2 Beijing Release – Summer 2018
  - Expand platform maturity to enable support for 5G, cloud, Enterprise and IoT services.
    – Inter Cloud connectivity
    – Enterprise Packaging

• Continuing Global Adoption & Harmonization with SDO/other open source projects
  – Aligning API/Information Models and OSS/BSS integration
Collaborate and Join in ONAP

Collaborate between ONAP and ITU-T

IMT 2020 network slicing, network capability exposure use cases, architecture and APIs

Input to ONAP:

functional requirements, architectural considerations & deployment use cases
5G end-to-end slicing management UC

ONAP output:

code evaluation, integration testing, application demonstration
centralized orchestration, distributed control federation
Etc.