Industry Harmonization for Shaping a Management Ecosystem and Promote Innovation

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New Market Realities

New use cases

Ultra coverage and bandwidth
Ultra reliable
Ultra low cost

Massive network complexity
Network slices
Distributed cloud
Heterogenous networks
RAN densification
Why 5G need Cloud Native Applications

**Speed**
- Fast, low-cost introduction of new services in small scale

**Scale**
- Scale fast at low cost from hundreds of users to millions

**Efficient operations**
- Automation, no-touch operations
- Legacy and new services
- Life-cycle independence (services/infrastructure)

**Performance and capacity**
- Optimized capacity throughput and resource utilization

**Rapid Innovation**
Software development in fast-moving, independent and empowered teams
Technologies Enabling Business Transformation

Cloudification
Model based Management
Automation, AI/ML
Open Source
In Ericsson ‘Productification’ generally means:

...but open source can reduce cost and harmonize...at volume.
Open Source Enables 5G cloud native applications and infrastructure
Combining the best of two worlds

Open Collaboration + Industry Standards = Base for Innovation

Let’s enable the next generation of advanced automation
ONAP Architecture
Version 4.0.9
Date: May 8th, 2019

Legend
Design
Orchestration & Management
Operations

ONAP Dublin Architecture

OSS / BSS / Other

Run-Time

Manage ONAP

ONAP Operations Manager (OOM)

Design-Time

Service Design & Creation (SDC)

- VNF Validation
- VVP
- VNF SDK
- Portal
- O&M Dashboard (VID)
- Use-Case UI
- External APIs
- CLI
- Interfaces

Service Design & Creation (SDC)

- Service/xNF Design
- xNF Onboarding
- Workflow Designer
- Controller Design Studio
- DCAE Design Studio
- Catalog

Closed Loop Automation (CLAMP)

Policy Framework

Service Orchestration (SO)

Active & Available Inventory (AAI)

External System Register (ESR)

AuthN/AuthZ (AAF)
Optimization (OOF)
Logging
Audit (POMBA)
Multi-Site State (MUSIC)
& Others...

Virtual Function Controller (VFC)

Microservice Bus (MSB) / Message & Data Routers (DMaP)

Correlation Engine (Holmes)

Infrastructure Adaptation (Multi-VIM/Cloud)

SDN Controller (SDNC)

Application Controller (APPC)

Active & Available Inventory (AAI)

External System Register (ESR)

External Systems

Third Party Controllers

sVNFM
EMS

Network Function Layer

VNFs

PNFs

Managed Environment

Hypervisor / OS Layer

ONAP Shared Utilities

- CCSDK
- Model Utilities
- TOSCA Parser

OpenStack
Commercial VIM
Kubernetes
Public Cloud

Private Cloud
MPLS
Private
DC Cloud
IP
Public
Cloud

Cloud

Managed
Environment

Private
Edge Cloud
ONAP Overview – Three Aspects

Functional Architecture
Overall Automation Platform architecture
A common industry view on Operational Support Systems

Component and Interface Definitions
Defines the components in terms of interfaces and capabilities

Technology Source/Realization
Open source technology to use:
1. directly - community version
2. from a distributor - in the future

Open source technology to use:
1. directly - community version
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... but there is need for more

The Secret Sauce

Functional Architecture

Component and Interface Definitions

Technology Source/Realization
Who does what?

Innovation & Differentiation

Application logic

Common assets

Middle-tier & Platform

Basic Components

- Visualization
- Business logic/orchestration scripts
- Analytics applications
- Policies
- Orchestration models
- Optimization models
- Mediation models
- SON
- Network health monitor
- Topology explorer
- Cell provisioning
- …

Tight Coupling

- Information model
- Generic API layer
- …

- Database
- GUI SDK
- …

typically sourced from 3PP, open source (e.g. Cassandra, Camunda)
As part of aligning ONAP to ETSI MANO, ONAP will support ETSI standards for packaging, operations, security and monitoring for managing VNF, PNF and NS.

- For packaging, the SOL004 standard is used for the VNF and PNF package, and the SOL007 standard will be used for the NS package.
- VNF, PNF and NS will be described by SOL001 standard.
- For VNF LCM, Package Management, LCM operations and Monitoring, SOL003 standard is used.
- For NS LCM and Package Management, LCM operations and Monitoring, SOL005 standard is used.
- For EM triggered scenarios (LCM, Fault, Performance, Configuration), SOL002 standard is used.
- ETSI Package and communication security will be supported.

ONAP components realization of ETSI MANO

- SDC will realize SOL004 and SOL007 package onboarding, design and distribution functionalities.
- External NFVO and VFC will realize the NFVO functionalities.
- SOL003 Adapter will realize the Or-Vnfm (SOL003) interface.
- SOL005 Adapter will realize the Os-Ma (SOL005) interface.
- SOL002 Adapter will realize the Ve-Vnfm (SOL002) interface.
Closed Loop assurance helps an operator to continuously deliver the expected level of communication service quality, by automatically reconfiguring the mobile network resources when a performance degradation impacts the communication service SLS (Service Level Specification).

Management data analytics is an enabler of closed loop assurance of communication service.
Control Loop

Model driven Control Loop Design
Skapad av Gervais-Martal N'guyen, senast ändrad av Marco Platania den apr 15, 2019

Overview
This functional requirement is intended to further advance the ease and ability of creating control loops in Dublin by addressing the following:

PNF support in Control Loops
Skapad av Liam Fallon, senast ändrad den aug 16, 2019

Overview
Currently, control loops are VNF-oriented, more specifically on VNF orchestration use cases. Here, we are examining how the control loop concept and implementation might be expanded so that it could be used to support PNF use cases.

Metadata Driven Control Loops
Skapad av Liam Fallon, senast ändrad den jun 12, 2019

Overview
Currently, control loops are triggered by DCAE (Analytics) microservices, trigger a policy, which in turn triggers an action on a controller (actor). The trigger could be any component, not necessarily a DCAE microservice.
External APIs

- Open Digital Architecture (ODA) Project
- TMF641 – Service Ordering