OSM Release SEVEN webinar
Part 1: Overview of OSM Release SEVEN
15 January 2020
OSM Introduction and Release SEVEN Highlights

Francisco-Javier Ramón Salguero (ETSI OSM Chairman, Telefónica)
Understanding what OSM provides
OSM provides Network as a Service (NaaS) in the form of NS and Slices that can span across different domains and technologies...

**Abstraction through Layering**
- Simplification
- Reusability
- Agility

**E2E Service Orchestration**

**OSM Scope**
- Simplification
- Reusability
- Agility

**HIGH-LEVEL PRIMITIVES**

**OSM Scope**

**Simplification**
- Add subscriber
- Add service profile
- Update subscriber profile
- Add service access to subscriber

**Abstraction through Layering**
- Simplification
- Reusability
- Agility
... so that a single OSM NS/Slice can span across different types of VIM+NFVI, Transports, and Physical Functions.

E2E Service Orchestration

OSS/BSS

- SOL005 + NS LCM calls

PNFs & HNFs

TRANSPORT DOMAIN

VIRTUAL DOMAIN

IM integrated

T-SDN (TAPI, MEF...)

Or-Vi
The IM feeds OSM behaviour, independently of the specific technologies southbound...
... while the northbound view for **Day-2 operations** for the NS/Slice remains as high level actions.
OSM is Model-centric. Modelling is key to hide internal complexity and simplify/automate daily operations.

OSM modelling is complete, self-contained and agnostic to technology infrastructure.

OSM allows modelling three different types of entities:

- NF Packages (VNF, PNF, HNF)
  - Mgmt Procedures
  - Resource Description

- NS Package
  - Mgmt Procedures
  - Topology

- Network Slice Package
  - Mgmt Procedures
  - Topology

All the life-cycle management aspects can be modeled: creation, initial configuration and further operations (reconfiguration, scaling, maintenance, etc.)
OSM is Model-centric. Modelling is key to hide internal complexity and simplify/automate daily operations.

OSM modelling is complete, self-contained and agnostic to technology infrastructure.

OSM allows modelling three different types of entities:

All the life-cycle management aspects can be modeled: creation, initial configuration and further operations (reconfiguration, scaling, maintenance, etc.)

NF Packages are preserved across all the chain and all the customers.
VNF Packages are also a **key advantage of OSM** to minimize the need of reverse engineering.
VNF Packages are also a key advantage of OSM to minimize the need of reverse engineering.

After ecosystem enablement, these activities are no longer needed.
... becoming a powerful vehicle for VNF developers to reach quickly a huge number of customers

Hardcoded values in the package are a recurrent error that prevents scaling.
“In theory, there is no difference between theory and practice. But, in practice, there is”

(Benjamin Brewster)
OSM community is really LARGE AND DIVERSE, with 137 members today

- 15 Global Service Providers
- Leading IT/Cloud players
- VNF providers

(*) Names & brands may be claimed as the property of others
OSM Ecosystem (as of today)

https://osm.etsi.org/wikipub/index.php/OSM_Ecosystem

Companies listing their products and offers related to OSM (like “OSM Yellow pages”)
- Searchable by potential customers looking for OSM-related products
- Only with demonstrable OSM-related products/offers
- Opt-in process, continuously open

© ETSI 2020
Release SEVEN gives decisive steps towards cloud-native apps and versatility

**Improved lifecycle and feedback**
- Improved VNF configuration interface
- Real-time feedback upon request

**Fault Management & Performance Management**
- Fault and performance management of OSM modules
- Automated dashboards for enhanced usability

**VNF Onboarding**
- Improved validation of OSM packages

**100% Python 3**
- RO migration to Python 3
- OSM client migration to Python 3

**Kubernetes and cloud-native apps**
- Support of K8s-based NFs
- Creation of K8s clusters on demand (as VNFs)
- Deployment of OSM in K8s clusters

**Planning & optimization**
- Placement optimization

**Multi-VIM and multi-SDN support**
- Enhanced SDN Assist, with high level calls
- Migration of SDN assist and WIM connectors to Python plugin model
- Azure plugin

Available at: osm.etsi.org
Kubernetes support enables OSM for all 5G and Edge use cases

Full K8s app lifecycle operations:
- init
- install
- upgrade
- delete
- status
- inspect
- ...

>20,000 K8s applications now compatible with OSM

Hybrid scenarios with K8s, VMs, PDUs and SDN are 100% supported
Overview of the webinar

DAY #1:
Overview of OSM Release SEVEN

1. OSM introduction and Release SEVEN highlights
   (Francisco-Javier Ramón, Telefónica) [10 minutes]

2. Running real Network Services with OSM
   (Gianpietro Lavado, WhiteStack) [40 minutes]

3. Monitoring the Open Source MANO components
   (Francisco Rodríguez, Indra) [15 minutes]

DAY #2:
Running cloud-native Network Services with OSM

1. Deploying on Kubernetes with OSM
   (Gerardo García, Telefónica) [20 minutes]

2. Deploying on Kubernetes with OSM and Juju bundles
   (Tytus Kurek, Canonical) [20 minutes]

3. Automatic placement of Network Services
   (Mats Eriksson, Arctos Labs) [20 minutes]
and, if you want to learn even more...

... you can join us to our upcoming OSM Hackfest!
Thanks!

osm.etsi.org
osm.etsi.org/wikipub
Open Source MANO

OSM Webinar - Day #1: Overview of OSM Release SEVEN
Running real Network Services with OSM

Gianpietro Lavado
(Whitestack)
Introduction

OSM has become the **MANO solution of choice** for operators that are deploying horizontal NFV environments, thus **achieving full automation of the complete lifecycle** of their virtualized Network Services.

In this slot, through an interactive walkthrough, the audience will get a strong understanding of the main features and value what OSM brings to operators for orchestrating real Network Services with OSM.
Fast & Easy Installation

Open Source MANO installs in Docker Swarm or Kubernetes with a single, unattended script.
Starting Release 7, OSM includes system monitoring through a Grafana dashboard.
Role-Based Access Control

OSM is a multi-tenant platform, where projects, roles, users and policies are supported.
Integration with the VIM layer is very simple through API credentials, and also extendable to support advanced features like availability zones, PCI-passthrough and multi-site deployments.
Comprehensive VNF onboarding

OSM’s information model and automation engine allows for a complete VNF onboarding, including Day-0 to Day-2 operations, and easy package uploading.
Hybrid Network Services support

Physical Network Functions (PNF) can be easily included as part of an “Hybrid” Network Service, so that PDUs can be configured from OSM through Day-1/2 operations.
Instantiation in OSM is straightforward, and allows for including additional parameters to further customize the way the Network Service is being deployed over a given infrastructure.
Initialization, configuration and ongoing operations over the VNFs are supported through cloud-init (Day-0) and the VNF Configuration and Abstraction module (Day-1 and 2 through charms)
Once instantiated, Network Services status is automatically monitored, as well as the key metrics included in the VNFD.
Metric-based Auto-Scaling

Automatic per-VDU scaling is supported, triggered by any monitored metric in the system.
We will launch a real-world VNF, an LTE Packet Core based on Facebook’s Magma project.
**Live OSM demo!**

**Functional, distributed LTE Packet Cores in minutes!** Multiple Access Gateway VNFs are deployed, monitored, automatically initialized and self-registered into the Orchestrator using Day-1 operations.
Open Source MANO

Find us at:

osm.etsi.org
osm.etsi.org/wikipub
Monitoring Open Source MANO in Kubernetes

Francisco Rodríguez (Indra)
TL;DR:

`.install_osm.sh -c k8s --k8s_monitor`

Access dashboard: `http://<osm-host>:3000`

Kubernetes health

OSM component status

OSM component resource consumption
Monitoring the OSM infrastructure

- Available in the k8s deployment of OSM. From version 7.1
- There is a similar feature for the docker swarm (classic) deployment of OSM (not to be discussed here)
- Aimed at monitoring OSM infrastructure, NOT the VNF/NS deployed
- Implementation based on Prometheus operator (Helm chart), plus some Prometheus exporters (node, Kafka, mysql, mongodb), in “monitoring” namespace
Kubernetes deployment of upstream OSM

- 5 Statefulsets with one replica, for persistence modules.
- 7 deployments with one replica.
- VCA is deployed as an Lxd container in the same host

```
<table>
<thead>
<tr>
<th>light-ui</th>
<th>mon</th>
<th>pol</th>
<th>prometheus</th>
</tr>
</thead>
<tbody>
<tr>
<td>keystone</td>
<td>nbi</td>
<td>ro</td>
<td>lcm</td>
</tr>
<tr>
<td>mysql</td>
<td>mongo</td>
<td>kafka</td>
<td>zookeeper</td>
</tr>
</tbody>
</table>
```

“osm” namespace
Implementation

Resources monitored

- Kubernetes core
- "osm" namespace
- OSM pods
- Host

Monitoring components

- "monitoring" namespace
- Prometheus Operator & exporters
- Dashboards
Available dashboards

- **Kubernetes cluster**
  upstream dashboards in Prometheus operator helm chart

- **Open Source MANO**
  Specific dashboards for OSM
  - OSM Status summary
  - Hosts
  - Kafka, mongodb, mysql
<table>
<thead>
<tr>
<th>Failed pods / Failed nodes (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K8s resources requested</td>
</tr>
<tr>
<td>OSM components status (up/down)</td>
</tr>
<tr>
<td>CPU/Memory per OSM component</td>
</tr>
</tbody>
</table>
Hosts status

Summary (uptime, used memory, CPU, disk)

- CPU usage
- Disk usage
- Memory usage
- Network usage
Mongo, mysql and Kafka dashboards

Kafka
- Messages produced/consumed
- Lag by consumer group
- Partitions per topic

Mongodb
- Connections
- Document operation stats
- Network operations

Mysql
- Connections
- Disk occupation (indexes, tables)
- Network operations
Gory details for the brave

Resources monitored

Adapters to Prometheus

Monitoring pods

Configuration

Kubernetes pods

OSM pods

Host OS

Prometheus operator

Prometheus CR

Prometheus pod

Grafana pod

Mongodb adapter

Mysql adapter

Kafka adapter

Node adapter

ServiceMonitor CR

Dashboards

ConfigMaps

Change here to customize the dashboards
REMEMBER:
If you want to learn even more...

... you can join us to our upcoming OSM Hackfest!