An introduction to Open Source MANO project (OSM)

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osm.etsi.org
Problem Statement

SPEED IS CRITICAL

INDUSTRY FRAGMENTATION IN MANO SPACE

SPEED IS CRITICAL
Why OSM?

3 reasons that make the difference
1) Open Source Initiative hosted by ETSI, easing alignment with NFV ISG...

...driven by service provider requirements

... and supported by key players of the virtualization space

... OPEN TO NEW FELLOW TRAVELLERS
2) It embraces the complexity required for deployments in field

1. EPA support

![Graph showing throughput (Mbps) with an x100 increase]

2. Multi-VIM

![Logos of OpenStack, ONOS, OpenDaylight, and OPNFV]

3. Multi-site

![Diagram showing multi-site setup]

4. SO and RO can be detached

![Diagram illustrating service orchestration and resource orchestration]
3) We are not starting from scratch

The project starts with running code from the beginning...

- OpenMANO (RO)
- Juju Charms (VNF Modelling & Config)
- Launchpad (SO/NS management)

Seed code represents an initial starting point, being all components pluggable/replaceable for OSM

... which helps to:

- Avoid over-engineering due to excess of abstraction
- Start getting traction at SP level
- Ecosystem steering
3) We are not starting from scratch

15th Oct 15
Dusseldorf
SDN NFV World Congress

28th Jan 16
1st F2F integration meeting towards MWC’16

22nd Feb 2016
MWC 16 Project presentation and press release

27th Oct 15
ETSI NFV #12 @Jersey City

18th Feb 16
ETSI NFV #13 @Dublin

4th Apr 16
Kick-off and 1ST Design meeting
Scope of OSM
Real operation is multi-layered by nature

<table>
<thead>
<tr>
<th>Level (L)</th>
<th>Function (L3)</th>
<th>Function (L2)</th>
<th>Function (L1)</th>
<th>Function (L0)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVICE OPERATION</strong></td>
<td><strong>SERVICE CREATION</strong></td>
<td><strong>FULFILLMENT</strong></td>
<td><strong>ASSURANCE</strong></td>
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<td>Tenant creation.</td>
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Current MANO approaches are partial

### Scope of Current MANO Approaches

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| (e.g. chaining of VAS & self-care portal) | • Add users to VPN  
• Add and chain VAS to VPN (self-care) | QoE monitoring |

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| Installation of switches & servers | Tenant creation.  
• Allocation of tenant quotes. | Monitoring of usage of resources by tenants.  
• Monitoring of NFVI infrastructure |
Current MANO approaches are partial

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Real operation is multi-layered by nature, so MANO needs to embrace it to have real operational impact.

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**SCOPE OF OSM**

**CLOUD OPERATION**
COMMUNITY-DRIVEN IMPLEMENTATION OF NFVO+VNFM+SO*

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2. DESCRIPTORS (VNFD & NSD)

3. INTEROP & EPA SUPPORT W/REFERENCE VIM(s)

(*) Note: Service Orchestrator (SO) is currently beyond ETSI scope for MANO
Mapping to ETSI NFV

G-VNFM = Generic VNFM
S-VNFM = Specific VNFM (external)
Information Model (IM) is key to enable an open ecosystem of VNF providers and build a coherent E2E service orchestration.
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Common and Standardized INFORMATION MODEL

- Delivering an open source MANO stack aligned to ETSI NFV Information Models
  - Capable of consuming published Information Models (IM) for NFV service and deployment (VNFD, NSD, etc.)
  - Extending the IM, and recommending back to ETSI NFV

- Assuring predictable behaviour of Virtualized Network Functions (VNF) and Network Services (NS) under said information models

- Enabling an eco-system of IM-compliant VNF vendors
  - Ready to be offered to cloud and service providers
  - No need of integration per- customer & MANO vendor basis
... providing a friendly environment for developers, minimizing entry barriers & paving the way for DevOps

**LOCAL DEVELOPMENT & TESTING**
- Open Development Env
- Functional tests
- Low cost
- Integration from the beginning

**TEST POOL FOR DEVELOPERS**
- Real servers and switches
- Performance tests (EPA can be enforced)
- Cost-effective shared infrastructure
- Move the value to VNF services

**SERVICE PROVIDER**
- Production/pre-production environment
- Real network scenarios
- Final service configuration
- Fast deployment
- Low final integration cost

SAME IMAGES AND DESCRIPTORS ACROSS ALL THE CHAIN!
... including the operational aspects and modelling of abstractions required for E2E service orchestration.

**HIGH-LEVEL PRIMITIVES**

E.g.:
- Add subscriber
- Add service profile
- Update subscriber profile
- Add service access to subscriber

**PARTICULARIZATION**

IP pools = x1
QoS1 definition = x2
QoS2 definition = x3

...
Demonstration: L3 VPN service with value added services

Putting OSM in practice
OBJECTIVE: Demonstrate the feasibility of the concepts, starting with existing code seeds

As realistic as possible, with commercial VNFs

Proof of main concepts of OSM:
  - E2E automation
  - EPA & underlay control - SLA can be guaranteed
  - Multi-Site
  - Multi-VIM
  - Combination of multi-tenant and single-tenant VNFs
  - Connection to external physical lines

Useful for next stages of the project
  - Enabler for further code development
  - Room for further evolution/complexity
MWC 2016 Demo - OSM integration

Launchpad (NSO) → OpenMANO (RO) → JUJU Server (CM) → OpenStack

OpenStack
- OpenStack Controller
- VNF
- Compute Node

OpenVIM
- OpenVIM Controller
- VNF
- Compute Node
MWC 2016 Use case

SSL VPN 1
Corp. A 10.0.1.0/24

SSL VPN 2
Corp. SP 10.0.2.0/24

VIM 1
Corp. A
10.0.1.0/24
VLAN 3000
VLAN X
mwc16data1

VIM 2
Corp. A
10.0.4.0/24

L2 connection for dataplane
L2 connection for low BW
MWC 2016 Demo - Videos

MWC16 demo

Demo infrastructure and interaction of OSM components
Lessons learnt

TEAM WORK
• Determination to solve any problem together

RESILIENCE
• Ability to withstand bumps along the way

NOT ALL IDEAS SURVIVE
• Strategy is quickly drop ‘NOT to do’ items
OSM community
COMMUNITY CHARACTERISTICS

• OPEN COMMUNITY-BASED MANO STACK, based on these principles:
  • Compliance and Feedback to ETSI ISG Architecture and Specs
  • Base implementation information model Evolution
  • Independent IOP labs to test & integrate in the community
  • With an open governance model based on technical meritocracy

• TYPES OF ENGAGEMENT
  • Developers (of course!)
  • Early adopters
  • Testers (modules & IOP)
  • Advisors

• END USER ADVISORY GROUP
  • Service providers and other end users of the technology (not integrators or resellers) will become members
  • Produce Feature requests to the technical groups
OSM code availability

Code will be available in OSM web page from the kick-off. Meanwhile:

- OpenMANO: [https://github.com/nfvlabs/openmano](https://github.com/nfvlabs/openmano)
- Juju charms and bundles: [https://jujucharms.com](https://jujucharms.com)
- RIFTware: [https://github.com/RIFTIO/RIFT.ware](https://github.com/RIFTIO/RIFT.ware)
Engage in OSM

osm.etsi.org

Get involved as an ETSI Member
To take part in the development of OSM and participate in the meetings, ETSI Members need to sign the OSM Membership Agreement and CCLA. In doing this, they agree to the OSM operating rules which in some cases are different from those in ETSI's Technical Working Procedures. Check if your company is an ETSI Member.

Get involved as an OSM Participant
Organizations who are not members of ETSI may also participate in OSM, attend meetings and help to develop OSM by making technical contributions. They are not applicable for leadership positions and must pay a participation fee to attend OSM meetings. To get involved as a Participant, please sign the OSM Participant Agreement and the CCLA.

In both cases, please follow the instructions on signing and returning your agreements. For any help please don’t hesitate to contact the OSM support team.

Developers and Users
Individual developers and end users are welcome to contribute code and feedback to OSM. If you want to get involved this way, just leave us your email below and we’ll be back to you soon.
Find out more at: osm.etsi.org
Example of sequence diagram

1. Instantiate NS
2. Instantiation Complete (resource information)
3. Deploy Proxy Charm
4. Apply Initial Config Primitives
5. Apply Configuration (Repeat for each VNF)

VNF Configuration (Repeat for each VNF)