OSM Release NINE
Achieving the ETSI NFV vision

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Understanding what OSM provides
OSM provides a platform to create **Networks as a Service** and to manage them conveniently later.

**Abstraction through Layering**
- Simplification
- Reusability
- Agility
... on different types of infrastructure and across different locations...

MULTI-VIM & MULTI-SDN

MULTI-SITE

... with VNFs composed of VMs, containers and/or physical elements...

a) All VMs

b) All Containers

c) All Physical

d) Hybrid cases
... and ready for network-specific workloads whenever needed

Huge Pages

NUMA Topology Awareness

CPU Pinning

Data Plane assignment

Line rate with all frame sizes

x100

x100
All in OSM is model-driven to make VNFs and scenarios as portable and reusable as possible

NS PACKAGES / SLICE PACKAGES:

DEPLOYED INSTANCES:

Upon instantiation, you just need to decide:
- The target VIM (or VIMs)
- Values for the parameters (IP addresses, keys, etc.)
All these OSM packages are oriented to maximize reusability for multiple scenarios

Can be easily customized upon instantiation

Parametrized

OSM Package

Parameter #1
Parameter #2
Parameter #3
Parameter #n

Multi-VIM Multi-SDN
VNF vendor does not need to know the details of our infrastructure upfront

Model agnostic to infrastructure

Models include full lifecycle

Day-2 can by run from OSM
Recurrent operations are greatly simplified

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Space travel requires a leap of faith... ...but a lot of good engineering!
Which spaceship would you choose?

Enterprise (NCC-1701)

• Designed in the 60’s...
• Faster than x8 light speed
• Much bigger than a football pitch, comfortable for 10s crew members
• Public was interested for decades
• You can wear comfortable clothes
• Never flew for real

Apollo XI

• Designed in the 60’s...
• Much slower than light speed (0.0037%)
• Maybe bigger than an open kitchen, terribly uncomfortable for 3 people
• Public was interested just a few days
• Need to wear awkward outfits
• Can bring you to the Moon and return safely!
SO... WE MADE IT!
Release NINE has brought new features supporting the journey to production readiness

Modelling extension
- SOL006 alignment.
- Full integration of declarative RO (NG RO).
- Simple strategy to allow address pairs for virtual IP

VNF lifecycle management
- Distributed Proxy charms.
- Support of Helm version 3.
- Kubernetes VCA in K8s installation.
- Centralized VCA for KNFs.

Smoother integration with external systems
- RBAC external integrations readiness & testing.
- Subscription API for OSS/BSS management systems.

User Interface improvements
- Multi-tenancy in Grafana.
- Various UI Improvements.

Soon available at: osm.etsi.org
Catalog of VNF packages ready for quick & easy consumption from OSM

All packages produced by OSM are collected in OSM’s GitLab

- Packages used for release testing
- Hackfest contents
- Leveraging on the new capabilities of OSM client to ease development and testing workflows

Feature of OSM repos to ease consumption from the own OSM platform

- Allows anyone to distribute their own OSM packages from their own servers.
- Easy search in catalog(s)
- Avoidance of manual downloads from remote locations (automatic retrieval and consumption)
- Addition of multiple sources (i.e. multiple repos)

https://osm.etsi.org/gitlab/vnf-onboarding/
Fully operational EPC in minutes!
OSM features seen in practice

- Docker and VM-based virtualization lifecycle management
- Complex KNF deployment in minutes
- Physical Network Function automation
- Automatic Horizontal Scaling
- High performance techniques activation
- Underlay network automation
- Network Function Day-0, Day-1 and Day-2 operations
- Network Slicing with shared services

https://osm.etsi.org/gitlab/vnf-onboarding/osm-packages/tree/master/magma
OSM community is really **LARGE AND DIVERSE**, with **142** members today, but always **OPEN** to new participants

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

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

https://osm.etsi.org/wikipub/index.php/OSM_Ecosystem
OSM Ecosystem
(as of today)

https://osm.etsi.org/wikipub/index.php/OSM_Ecosystem
Telefónica Movistar Chile announced the Commercial Deployment of ETSI OSM

Overview of the webinar

• **Improved NF Operations**
  • David García, Canonical – OSM N2VC MDG Lead

• **Integration of Grafana with OSM’s RBAC**
  • Subhankar Pal, Altran – OSM SA MDG Lead

• **Adoption of ETSI NFV SOL006 and OSM feedback**
  • Alejandro García, Whitestack – OSM Committer
and, if you want to learn even more...

... you can join us to our upcoming OSM Hackfest!
Improved Network Function Operations
Day-1 and day-2 operations

Deploy → Configure → Operate
Different Network Functions (NF)

NF of different vendors

nature

Challenge at the operations level

Containerized NF (5G Core)

Virtual NF (Virtual Router)

Physical NF (Physical Firewall)
OSM solution is to use Operators → Charms
Human Operators

Install, configure, upgrade, backup, restore, get logs, ...

Human operator
(The Expert)

A particular Network Function
Operator Pattern

Software that drives software

Install, configure, upgrade, backup, restore, get logs, ...

Operator code (The Expert)

A particular Network Function
Operators are managed by the VCA → Juju
Operators

Install, configure, upgrade, backup, restore, get logs,

A particular Network Function

Operator code

VCA
Integration

Operator code

Install, configure, upgrade, backup, restore, get logs,

A particular Network Function
Integration

Operator code
Install, configure, upgrade, backup, restore, get logs,

A particular Network Function

Operator code
Install, configure, upgrade, backup, restore, get logs,

A particular Network Function
Integration

A particular Network Function

Operator code

Install, configure, upgrade, backup, restore, get logs,

Operator code

Install, configure, upgrade, backup, restore, get logs,

A particular Network Function
Integration

A particular Network Function

Operator code
Install, configure, upgrade, backup, restore, get logs, integrate, ...

Operator code
Install, configure, upgrade, backup, restore, get logs, integrate, ...

A particular Network Function
Universal Operators

- Containerized NF (5g Core)
- Virtual NF (Virtual Router)
- Physical NF (Physical Firewall)
New: Distributed Proxy Charms

Before:

- VCA
  - Proxy Operator instance: Install, configure, upgrade, backup, restore, get logs, ...
  - Proxy Operator instance: Install, configure, upgrade, backup, restore, get logs, ...
  - Network Function
  - Network Function
New: Distributed Proxy Charms

Before:

VCA

Proxy Operator instance
- Install, configure, upgrade, backup, restore, get logs, ...

Proxy Operator instance
- Install, configure, upgrade, backup, restore, get logs, ...

Network Function

Network Function
New: Distributed Proxy Charms

Release NINE:

Proxy Operator instance

Install, configure, upgrade, backup, restore, get logs, ...

Network Function

Proxy Operator instance

Install, configure, upgrade, backup, restore, get logs, ...

Network Function
New: Better experience with K8s operators

• Kubernetes clusters are available since Release SEVEN
• In Release NINE:

Centralized management of K8s clusters with VCA

- Less resources needed
- Improve efficiency
- Scalable design
DEMO!
Multi-tenancy in OSM metric’s dashboard
Role-Based Access Control (RBAC) in OSM provides different users and projects a controlled access to different resources. For achieving this, different backends are available.

Option 1 (Internal)

Option 2 (Keystone)

Option 1 (LDAP)
Multi Tenant Grafana

Grafana multi-tenancy extends the RBAC feature to OSM’s Grafana and provides OSM users with controlled access to OSM dashboards. With multi-tenancy, users can now login to Grafana with their OSM credentials instead of a common username as was the case in previous releases.

Feature Description: https://osm.etsi.org/gerrit/#/c/osm/Features/+/9177/
How it was before Release 9?

User 1

Project 1

User 2

Project 2

Open Source MANO

admin (default)

Grafana

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How it is in Release 9?

Open Source MANO

User 1

Project 1

User 2

Project 2

Grafana

User 1

Project 1

User 2

Project 2

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Use Case Example Create User

1. Kafka Producer
   - osm user-create
   - Push user details (user-name, password)
   - New user created in OSM

2. Kafka Bus
   - Kafka Consumer
   - Pull user details (user-name, password)

3. MON Tenant Manager
   - User = user name
   - New user created in OSM

4. MON
   - New user created in OSM

5. MON Dashboarder
   - User create API
   - New user created in Grafana

6. Grafana Adapter
   - User create API

7. Grafana
   - New user created in Grafana

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OSM RBAC & Grafana Mapping

- User
- Project
- Role
- NFV/VNF

- User
- Team
- Team Permissions
- Dashboards

- Grafana
- OSM RBAC
OSM RBAC & Grafana Mapping

OSM RBAC

User 1

Project 1

VNF 1

User 2

Project 2

VNF 2

User 3

Project 3

VNF 3

Grafana

User 1

Team 1

Dashboard 1

User 2

Team 2

Dashboard 2

User 3

Team 3

Dashboard 3
DEMO!
Adoption of ETSI NFV SOL006 and OSM feedback
Purpose of alignment
Purpose of alignment
Benefits

- Establishes quality and consistency for development and maintenance of VNF packages.
- Enhances interoperability.
- Improves management and design.
- Boosts OSM’s ecosystem growth.
- Provides valuable feedback from a practical perspective.
SOL006: A standard for NFV descriptors

```json
vnfd:
  id: hackfest_eapasriov-vnf
  product-name: hackfest_eapasriov-vnf
  description: A VNF consisting of 2 VDUs with EPA capabilities
  version: '1.0'
  mgmt-cp: vnf-mgmt-ext

ext-cpd:
  - id: vnf-mgmt-ext
    int-cpd:
      cpd: mgmtVM-eth0-int
      vdu-id: mgmtVM
  - id: vnf-data-ext
    int-cpd:
      cpd: xe0-int
      vdu-id: dataVM

int-virtual-link-desc:
  - id: internal
df:
```
SOL006: A standard for NFV descriptors

```json
- id: vnf-mgmt-ext
  int-cpd:
    cpd: mgmtVM-eth0-int
    vdu-id: mgmtVM
- id: vnf-data-ext
  int-cpd:
    cpd: xe0-int
    vdu-id: dataVM
  int-virtual-link-desc:
    - id: internal

vdun:
  - cloud-init-file: cloud-config.txt
    id: mgmtVM
    int-cpd:
      - id: mgmtVM-eth0-int
        virtual-network-interface-requirement:
          - name: mgmtVM-eth0
            position: 1
```

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SOL006: A standard for NFV descriptors

```json
vau:
  - id: mgmtVM
    name: mgmtVM
    int-cpd:
      - id: mgmtVM-eth0-int
        virtual-network-interface-requirement:
          - name: mgmtVM-eth0
            position: 1
            virtual-interface:
              type: PARAVIRT
        int-virtual-link-desc: internal
      - id: mgmtVM-eth1-int
        virtual-network-interface-requirement:
          - name: mgmtVM-eth1
            position: 2
            virtual-interface:
              type: PARAVIRT
        cloud-init-file: cloud-config.txt
        sw-image-desc: ubuntu18.04
```
Portability from older descriptors

- A translator CLI tool is available as part of osmclient.
- All available descriptors at OSM VNF Onboarding repo have already been adapted.
- Tool currently being used by vendors during Plugtest.
Takeaways from IM alignment

To wrap it up...

• Standards alignment is at the heart of the OSM project vision
• The relationship between OSM and ETSI NFV ISG ensures standards and software maturity
• Packages and tools developed already available and being validated on ETSI NFV&MEC Plugtests
Find us at:

osm.etsi.org
osm.etsi.org/docs
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