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OSM Release ELEVEN

Release Notes

Open Source MANO
Technical Steering Committee
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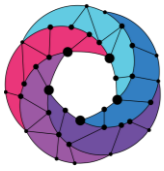


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Introduction

The ETSI Open Source MANO community is happy to announce OSM Release ELEVEN, keeping up our schedule of two releases per year since 2016.

Committed since its foundation to the alignment with ETSI standardization work, OSM Release ELEVEN completes the adoption of two new ETSI NFV specifications, SOL004 and SOL007 for package formats. In addition, Release ELEVEN also includes significant functional extensions in areas such as:

- interoperability with public clouds, now also supporting deployments over Google Cloud;
- interaction with cloud-native environments, now enhanced with fine-grained operations for CNFs and Kubernetes cluster monitoring,
- integration of network functions of different natures, now improved with inter-application relations across physical, virtual, and containerized network functions.

We reached Release ELEVEN with a community that has grown to 150 organizations and many individual contributors who bring the expertise to enable OSM functionality and adoption. Many thanks to all these organizations, OSM developers, and users, for participating directly or indirectly in making OSM awesome!

New Features in Release ELEVEN

Release ELEVEN brings a set of new features:

- **Support of standardized VNF and NS package formats**
Adopting the most recent ETSI NFV standards for VNF and NS packaging, increasing interoperability between OSM and different products on the market.
- **Additional public cloud support: VIM plugin for Google Cloud**
Completing the infrastructure support for the three largest public cloud providers, i.e., Microsoft Azure, Amazon Web Services, and now Google Cloud Platform
- **Fine-grained operations in CNFs**
Advanced fine-grained operations for Cloud-native Network Functions.
- **Better integration across PNF, VNF, and CNFs**
Enhanced data exchange mechanisms to allow advanced hybrid deployments with Physical, Virtual, and Cloud-native Network Functions.
- **CNF monitoring from Kubernetes metrics**
Expansion of monitoring in OSM to collect metrics from Kubernetes clusters in a centralized Grafana dashboard.
- **Enhanced installation process**
Supporting the latest Ubuntu LTS release, and better tracking of the installation process.

The following sections describe these features in further detail.

Support of standardized VNF and NS package formats

Standards allow us to make software that can interoperate with other products on the market, fostering a healthy and diverse ecosystem. In previous releases, we saw the positive impact of ETSI NFV-SOL006 adoption on OSM, allowing our users to deploy standard VNF and NS descriptors.

Starting with Release ELEVEN, OSM can onboard VNF Packages based on the NFV-SOL004 specification and NS Packages based on NFV-SOL007. Package structures with and without TOSCA metadata are supported, and ZIP file format is used to compress and store the package contents.

In order to allow a smooth transition to these new standardized packages, OSM continues to support the original package format supported in previous releases.

Additional public cloud support: VIM plugin for Google Cloud

Release ELEVEN brings the support of the Google Cloud Platform (GCP) as a VIM. The feature includes the use of GCP service accounts and the creation of resources such as virtual machines and networks.

This important addition to OSM completes the suite of already supported public cloud IaaS connectors, expanding the ability to orchestrate Network Services to Amazon Web Services, Microsoft Azure, and Google Cloud. This new feature consolidates OSM's position as the first choice for multi-cloud orchestration.

Fine-grained operations in CNFs

OSM Release ELEVEN brings advanced fine-grained operations for Cloud-native Network Functions, thanks to the upgrade to Juju 2.9 and the use of [Pebble](#).

Pebble is a lightweight piece of software that allows the Python [Charm Operators](#) to communicate with the workload containers to perform fine-grained operations. Charms that use Pebble are called “*sidecar charms*”, because the charm and the workload containers both run in the same [Kubernetes Pod](#).

Charms are the most powerful and consistent way to execute day-to-day operations across Network Functions of different natures: physical, virtual, containerized. In this release we have taken a step further by enabling advanced fine-grained operations with Pebble, such as:



- **Start and stop services:** Pebble allows you to start, stop, and restart as many services as the charm needs.
- **Run one-shot commands:** Pebble includes an API for executing arbitrary commands on the workload container.
- **Files API:** It offers a clean and tasteful API to push/pull files from the Charm Operator to the workload containers, which is really useful for configuration files.

With this new feature, OSM leverages the Kubernetes Operator Pattern, which is becoming more prevalent in containerized network functions.

Better integration across PNF, VNF, and CNFs

One of the key aspects of OSM is the ability to orchestrate Network Functions of different natures: physical, virtual, and containerized. In this release, charms have been enhanced with new mechanisms, such as relations, which allow for better integration across network functions in complex scenarios.

[Relations](#) are used by Charm Operators to exchange information with each other. Let's imagine a simple example: an IMS VoIP service and Home Subscriber Service (HSS). The VoIP service needs to know how to find the HSS, and the HSS must be informed of the VoIP service. In this context, creating a relation offers a simple mechanism to allow for integration between these applications. For example, the VoIP service needs to know the DIAMETER address of the HSS, and the HSS DIAMETER stack must be configured to allow for connections from the VoIP service.

In OSM release ELEVEN we are enabling this advanced integration among all Network Functions deployed as part of the same Network Service, even if they are of different natures. This means that we can now fully integrate physical appliances (PNF) with virtual functions (VNFs) and Kubernetes-based workloads (CNFs).

This feature enables advanced hybrid deployments with legacy, virtual, and cloud-native applications.

CNF monitoring based on Kubernetes metrics

This feature extends the existing VNF monitoring capabilities to CNFs deployed on a Kubernetes cluster.

As part of the service assurance functionality, OSM is able to collect the infrastructure metrics of the VDUs of VNFs deployed as part of the network service.

Starting with OSM release ELEVEN, it is now possible to monitor CNF metrics too, in a centralized operational dashboard. This dashboard in Grafana gets the data from a Prometheus operator distributed in each Kubernetes cluster, and displays the CNF performance metrics.

Enhanced installation process

The OSM Release ELEVEN community installer has been updated to include support of Ubuntu 20.04 LTS, in addition to the existing support of Ubuntu 18.04 LTS. Additional changes include new mechanisms to track installation progress, assisting the OSM community with understanding installation usage, identifying conditions of installation failures, and improving collection of troubleshooting information.

Conclusions

Release ELEVEN continues the adoption of the relevant ETSI NFV standards, by adding SOL004 and SOL007 to the already supported SOL005 and SOL006. Standards adoption is part of the OSM vision to enable interoperability and a large and healthy NFV ecosystem.

In addition, OSM is also aligning with the most recent market needs, by implementing the latest technologies for managing Containerized Network Functions (CNFs). This is a huge differentiator in the orchestration space, and a strong requirement for deploying 5G and beyond network functions.

ETSI OSM is a comprehensive open source management and orchestration solution for physical, virtual and containerized Network Functions over private and public clouds, with three robust commercial distributions, and multiple commercial deployments by network operators.

The OSM community is still growing with ambitious plans. If you want to join us, please visit [How to get involved in OSM](#)

To go further

For more information, please visit the following links:

- [Open Source MANO's user documentation](#)
- [Open Source MANO's developer's guide](#)
- [Open Source MANO's VNF onboarding guide](#)
- [OSM ecosystem](#)
- [OSM members and participants](#)