Collaboration proposal with O-RAN SC and OpenStack Tacker

Dec. 2021

OpenStack Tacker project
(NTT DOCOMO, NTT, NEC, Fujitsu)

Background

✓ Motivation: Tacker would like to contribute Tacker code to O-RAN SC as a part of SMO.

✓ Today's topic:
  – Introduction of Tacker
  – Tacker contributions

The SMO project would welcome a contribution towards the O2 interface from your colleague. It would help if they could give a presentation of what exactly is being contributed, the timeline of the contributions, and if there are specific VNFs and PNFs that are being targeted with this contribution. I can then work with TOC to setup the repos we will need to make the contribution.
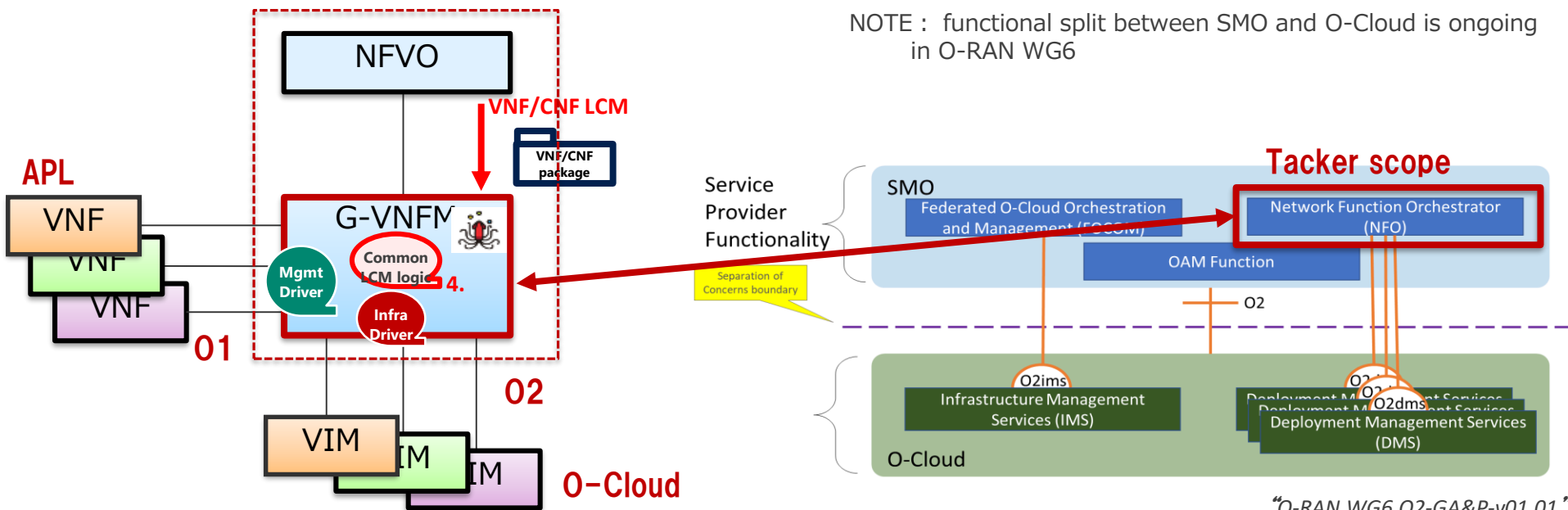
What is Tacker

✓ OpenStack Tacker is an official OpenStack project to manage virtual resource since 2016.

- One of main component in OpenStack
- Generic VNF Manager (VNFM) and an NFV Orchestrator (NFVO)
- deploy and operate Network Services (NSs) and Virtual Network Functions (VNFs) on an NFV infrastructure platform

- follow specification based on ETSI NFV-MANO Architectural Framework.
- See more detail as https://wiki.openstack.org/wiki/Tacker
- implemented an NFV MANO framework with requirements for Generic-VNFM from operators in commercial level.
- published user guide documentation and samples in official site that anyone can try out immediately.
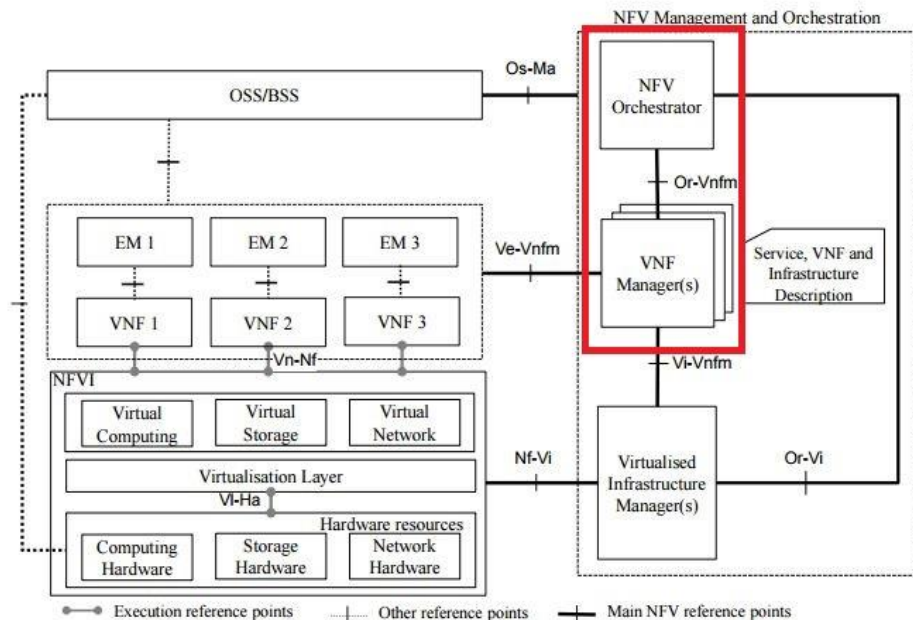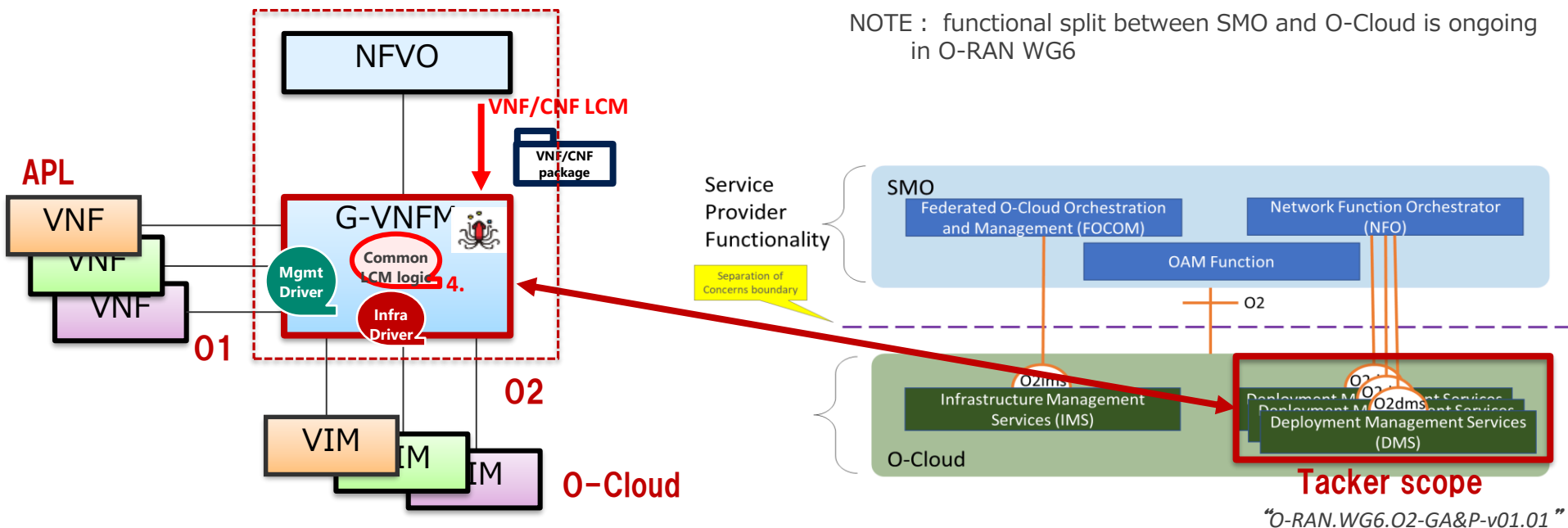
Tacker capability

✓ Tacker can manage NF Deployment via O2dms.
- – Tacker can support both SOL014 and Kubernetes API as O2dms.
- – Tacker support SOL001 VNFD for VM and Kubernetes Manifest for container.
- – Tacker has capability to configure VNF using Ansible as O1.

NOTE : functional split between SMO and O-Cloud is ongoing in O-RAN WG6

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✓ Tacker can manage NF Deployment as a part of DMS.
  - Tacker can support SOL003 as O2dms.
  - Tacker support SOL001 VNFD for VM and Kubernetes Manifest for container.
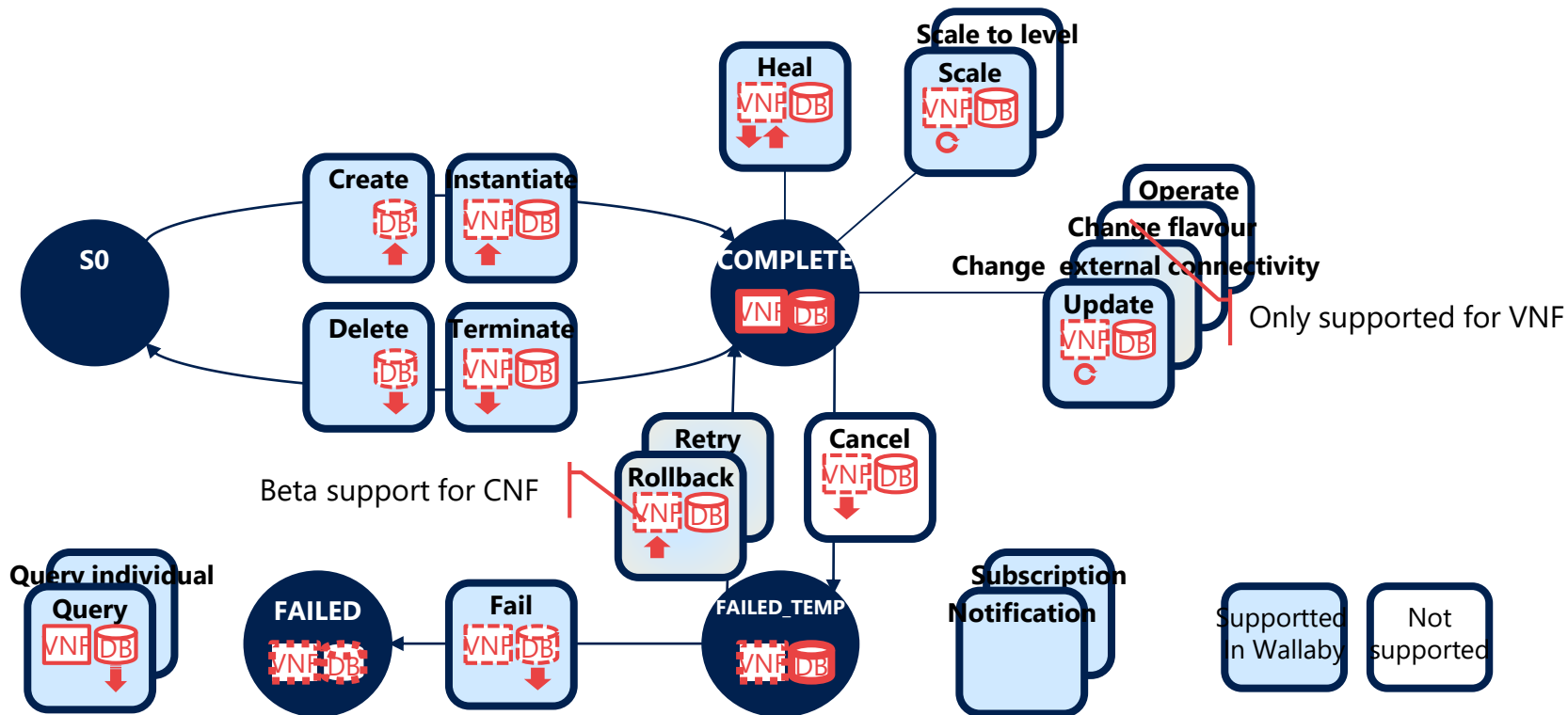 - Tacker has capability to configure VNF as DMS.

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Tacker capability

✓ Tacker can support almost LCM API specified by ETSI NFV.
  – Tacker support Instantiate, Terminate, Heal, Scale, error-handling.

(Annex) Implementation example

✓ Many operators and vendors already use Tacker as NFV-MANO in core network.

– **free5GC** //https://www.free5gc.org/

– KDDI (Japanese operator) manages Core Network VNF in commercial
  - (Production) NNI-SBC (Session Boarder Controller)
  - (Production) IMS (IP Multimedia Subsystem)

  Note: The system have 10+ million subscribers

– BIGLOBE (Japanese MVNO operator) Core Network VNF in commercial
  - (Production) P-GW (PDN Gateway)
  - (Production) TMS（Traffic Management Solution）

Contribution plan

✓ Tacker can contribute NFO functionality to manage VM based VNF and container based VNF as a part of SMO.
  – Tacker can connect to 3rd party component in SMO which supports SOL003, e.g. ONAP.
  – Tacker can connect to OpenStack and Kubernetes.

✓ Tacker can provide Tacker source code and technical documentation in OpenStack to O-RAN SC, and keep following ETSI NFV spec and O-RAN spec.
  – Tacker can provide knowledge and experience with code to develop MANO functionality.

Future plan

✓ Roadmap

release by every six months

2019	2020	2021	2022

Ussuri → **Victoria** → **Wallaby** → **Xena** → **Yoga** → **Z Release**

- Start SOL-based implementation
- Release of demo video

OpenStack VIM
- **Support Day0/1 VNF lifecycle**
- **Support Day2 VNF lifecycle**
- **Support K8s cluster management**
- **Multi API version (ETSI API v1 & v2 ※)**
- **Support SOL014**
- **Support update operation**

Support additional functions for vRAN application (starting to be studied)

Kubernetes VIM
- **Support Day0/1 CNF lifecycle**
- **Support Day2 CNF lifecycle**
- **Support additional functions for CNF management**

- **Tacker is developed and released around 6-month cycles.**
- **Tacker will implement features that have been requested and agreed upon by the community for each release.**

※ **Definition of SOL and API Version**

ETSI SOL document version	API version	Support
2.6.1	1.3.0	Already be supported
3.3.1	2.1.0	Day0/1: Already be supported Day2: Will be supported

Considerations for Tacker integration

✓ Should Tacker support Kafka?
  – Kafka is used for the interconnection between all components inside SMO (FOCOM, OAM Function, and NFO).
  – Tracker as G-VNFM is connected to the back of NFVO (e.g. ONAP) with SOL003 inside the NFO.
  – If Kafka communication as NFO can be covered by NFVO alone, then Tacker does not need to support Kafka.

✓ Information provided by O-RAN SC is needed for judgment.
  – At what level of component granularity is Kafka messaging implemented?
  – What is the concrete information exchanged by Kafka messaging?

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