



5Gtango

5GTANGO and OSM




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Automation in the NFV Environment

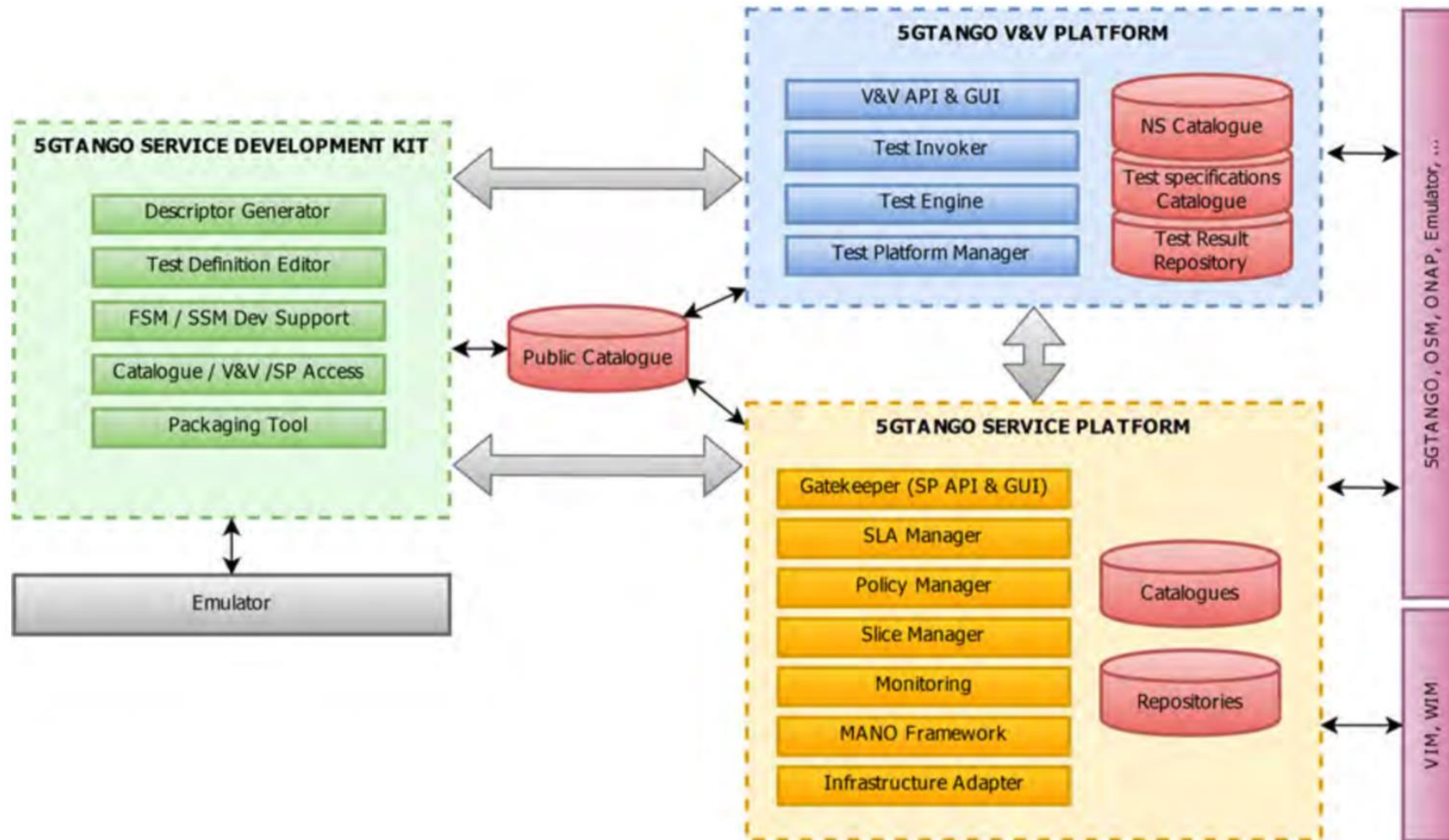
- Service view
 - As the unit for development, deployment, management...
- Integrated lifecycle
 - Development, validation, operation
 - Model-based consistency
- DevOps for critical services
 - Automated verification and validation
 - Mediated lifecycle management
- Provide run-time support
 - Policy enforcement
 - SLA verifiability



Service-Oriented Lifecycle

- A holistic, E2E view of the elements to be considered
- Three phases in the service lifecycle
 - Coordinated by a shared catalogue
- Development  Service Developer
 - Supported by a SDK
 - Service is initially published at the catalogue
- Validation and verification  VaV Provider
 - Automated VaV platform
 - Results published on the catalogue
- Deployment and operation  Operator
 - Selected from the catalogue
 - Mediated platform
 - Policy and SLA enforcement

The 5GTANGO Architecture



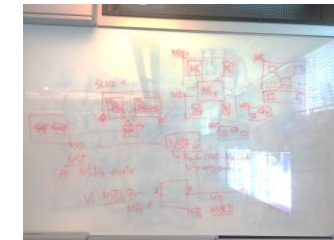
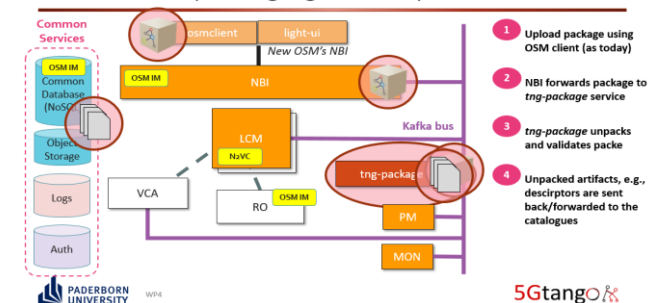
sonata 
powered by **5Gtango** 

Contribution to OSS communities

- 5GTANGO is NOT creating a new open source community.
- Collaboration with other OSS communities requires focused effort:
 - Architecture alignment, additional peer-review, code conventions, ...
 - Upstream collaboration → real impact
- The consortium will encourage collaboration with other **open source communities** key to the project:
 - OSM
 - VIM-emu
 - 5GTANGO's advanced NFV package format and tools
 - V&V plugin
 - Network Slicing
 - ONAP
 - V&V plugin

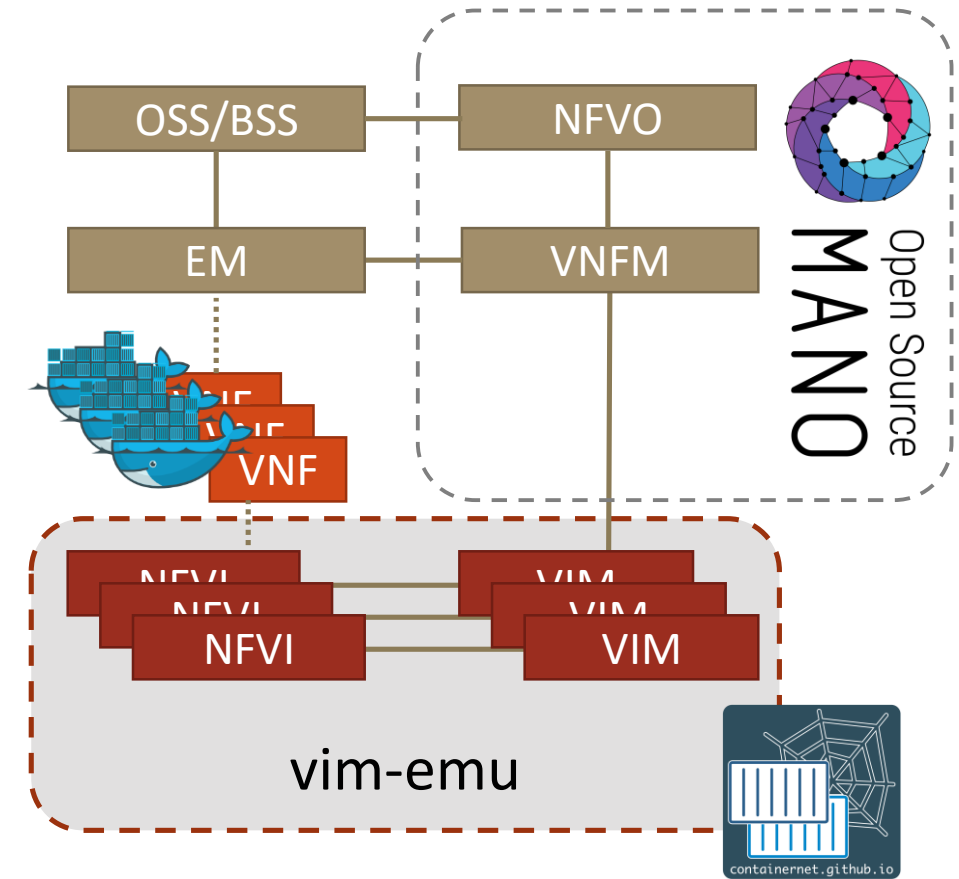


5GTANGO's packaging tool as part of OSM



VIM Emulator (vim-emu)

- Vision: Create an easy-to-use and easy-to-deploy **NFV prototyping platform**
- Main feature: Emulate large **multi-PoP NFVI** scenarios
- Rel. 5: **Improved integration** with OSM
- Single command installation
 - `$./install_osm.sh --vimemu`



Scope of the Emulation Platform in a simplified ETSI framework

VIM Emulator - Outlook

1. Full support of networking features when using OSM with vim-emu
 - Service chaining based on NSH
 - Full support for floating IPs and different subnets
2. Support for Charm-based VNF configurations
 - Allow users to test custom Charms on our lightweight emulated platform
3. Advanced support for large-scale multi-PoP experiments
 - Easily set up hundreds of emulated NFVI PoPs for MANO scalability experiments

5GTANGO's advanced NFV package format

- **Compatible to ETSI SOL004**
- Extends SOL004 where needed
 - **NS packages, VNF packages**, test packages
 - Artifact tagging
 - Check summing and signatures
- Concept: Allow to **package almost everything**
 - (packages are just containers, we don't care about semantics of their contents)
- Tooling: Provide **tools and services** to create, unpack, and validate packages
- Open source, **Apache 2.0**

Package Format Spec.



<https://goo.gl/xHeztH>

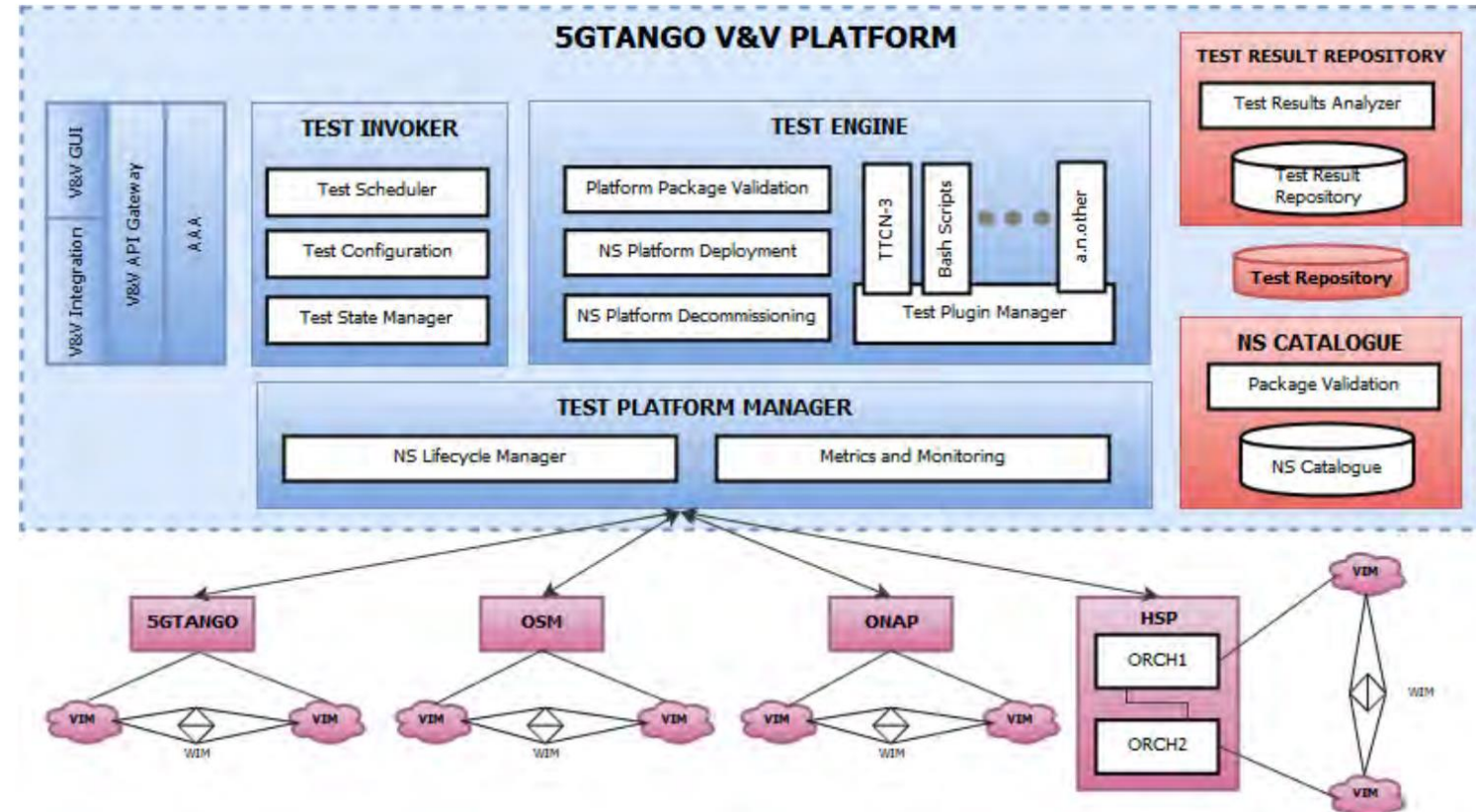
Package/Un-pack. Tool



<https://github.com/sonata-nfv/tng-sdk-package>

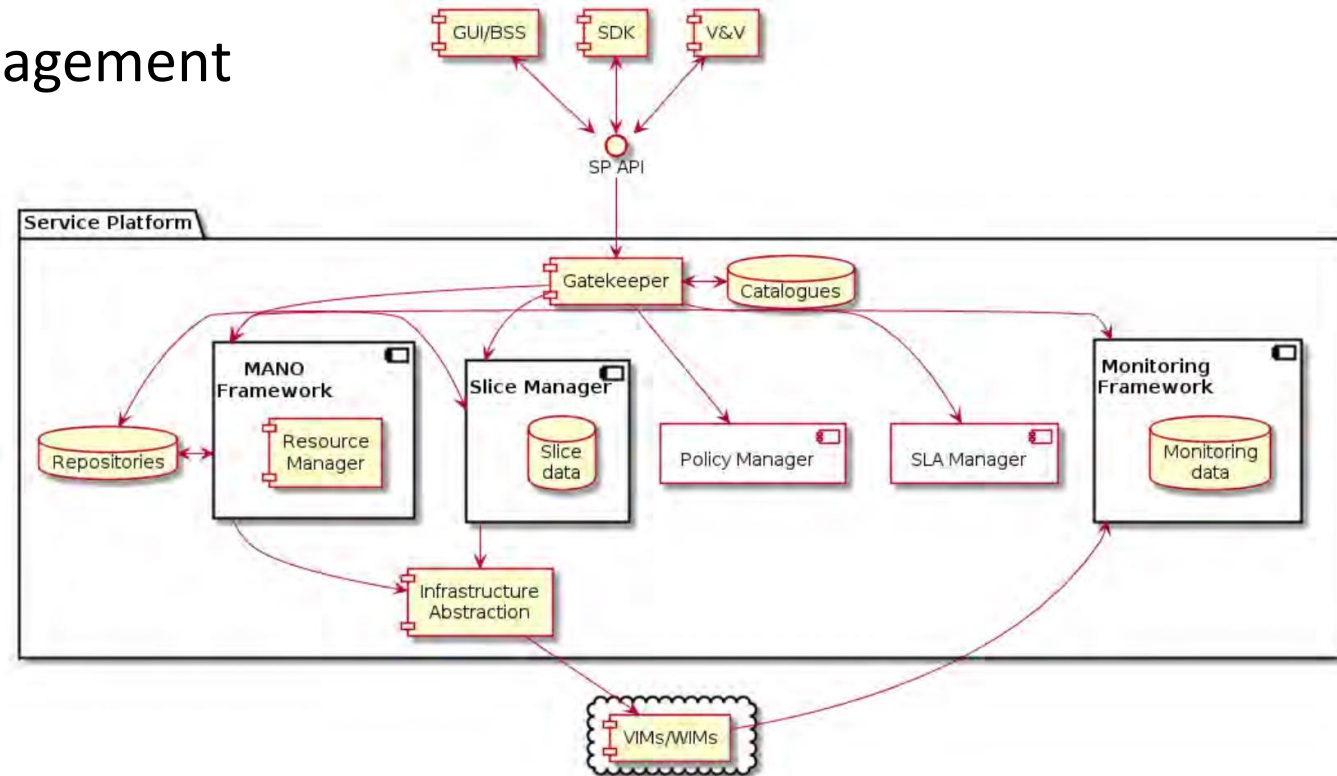
Verifying and Validating

- Support for
 - Different test specification sources
 - Automated test execution
 - Linked test results
- Enabling Continuous Testing
 - Model-based
 - As an essential part of the automation loop



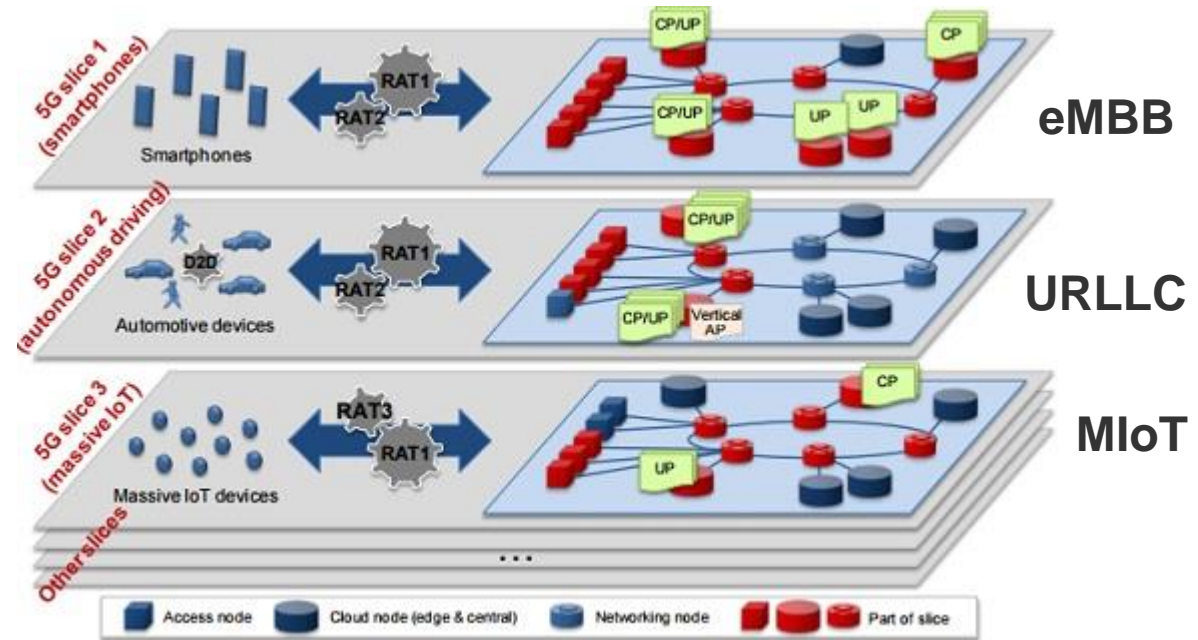
Closing the Loop

- The service platform addresses operational support
 - MANO
 - Policy enforcement and SLA management
 - Monitoring
 - And, for sure, **slice support**
- Usable in two *flavors*
 - Test platform for VaV
 - Production service
- Mediated by the Gatekeeper
 - Access enforcement
 - Sanity checks
 - Service platform orchestration



Network Slicing

- Different network slices addressing different types of usage requiring different levels of functionality, performance and reliability.
- For each type of usage there can be different:
 - The radio access technologies (RAT)
 - The list of activated core network features in the control plane and the user plane
 - Resource dimensioning and the location where they are deployed



Source: NGMN

Network Slicing is... like teenage sex

Every one talks about it

Nobody knows how to do it

Everyone thinks everyone else is doing it

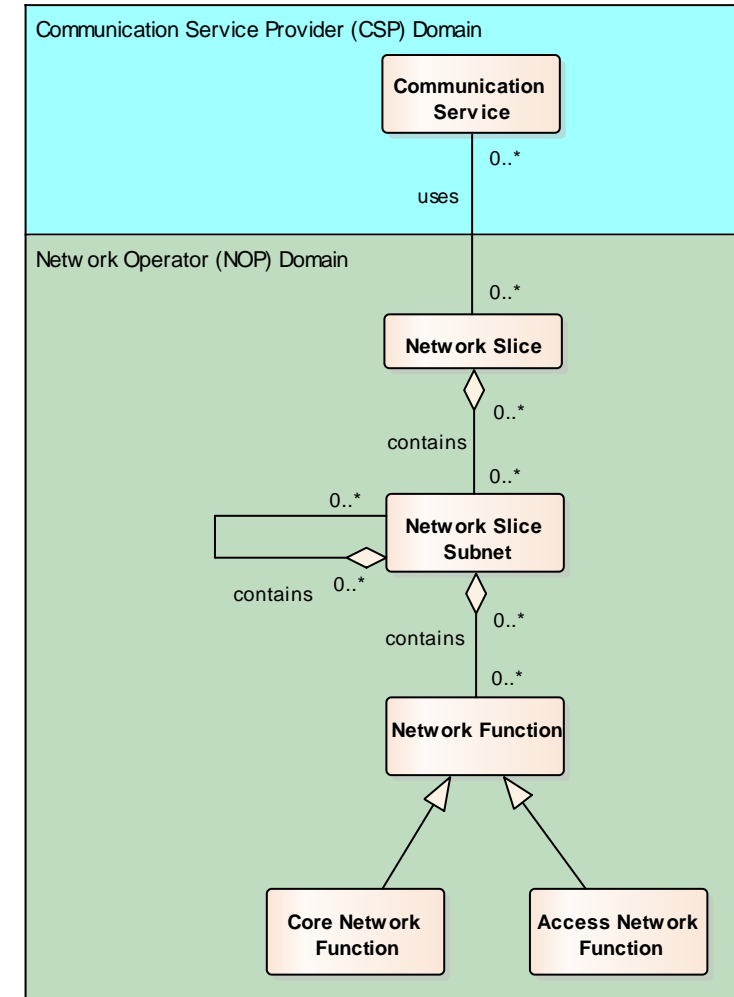
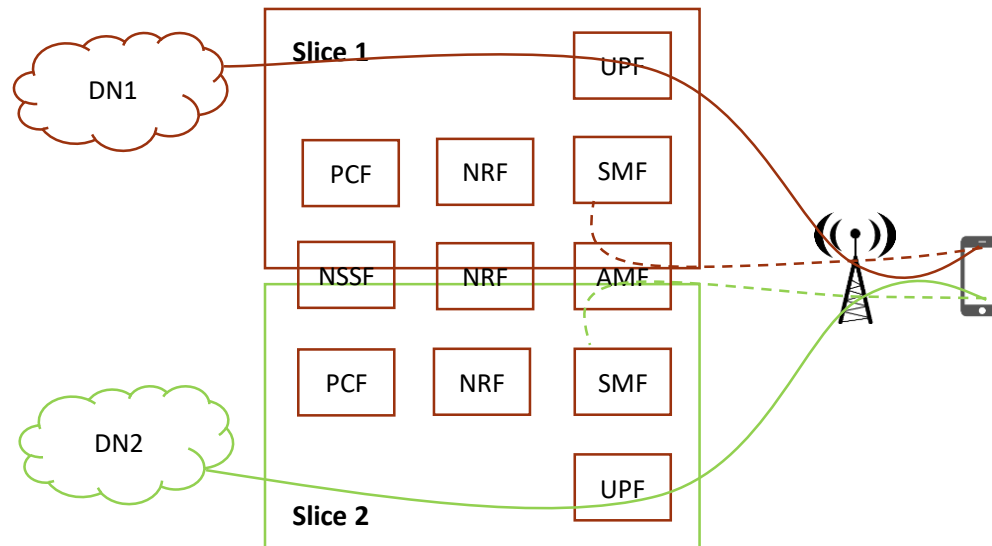
Everyone claims they are doing it



Disclaimer: My apologies in case of offence, I could not avoid to use this comparison ☺

3GPP Network Slicing

- Slice Information Model (3GPP TS 28.531)
- Clear distinction on Access Network Functions and Core Network Functions.
- Shared Network Functions.

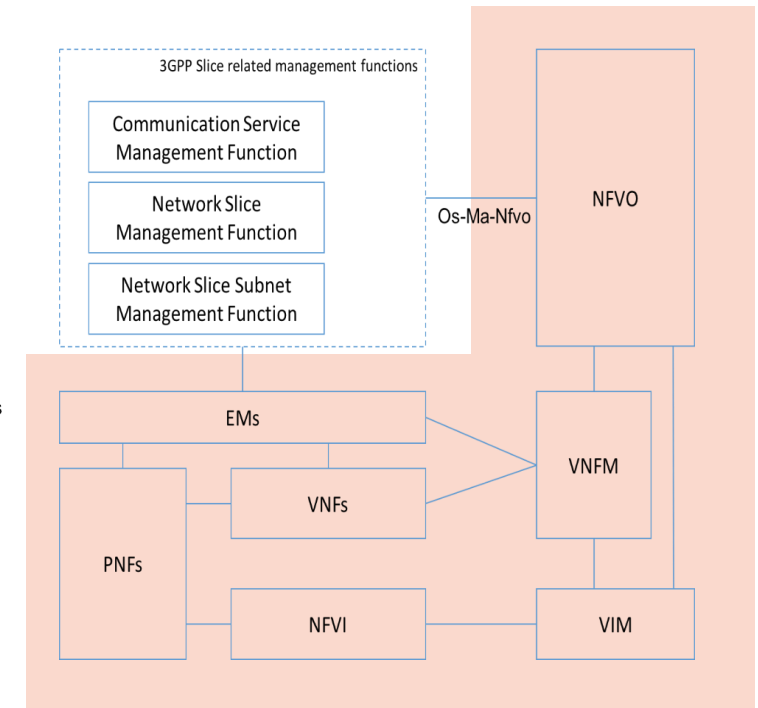
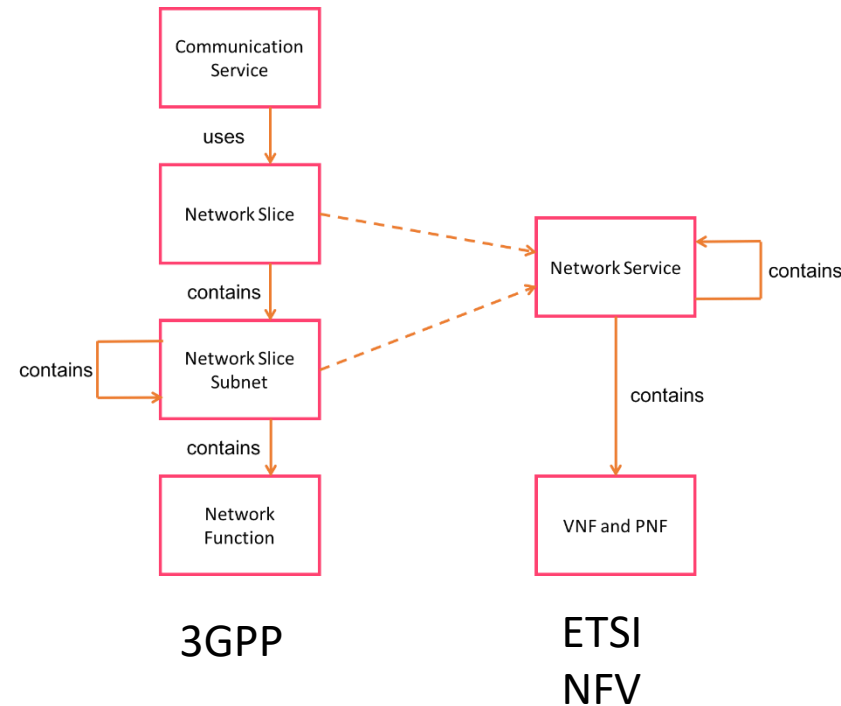


ETSI NFV framework for Network Slicing

Analysis of 3GPP and alignment of NFV architecture with it ETSI GR NFV-EVE 012

Considerations:

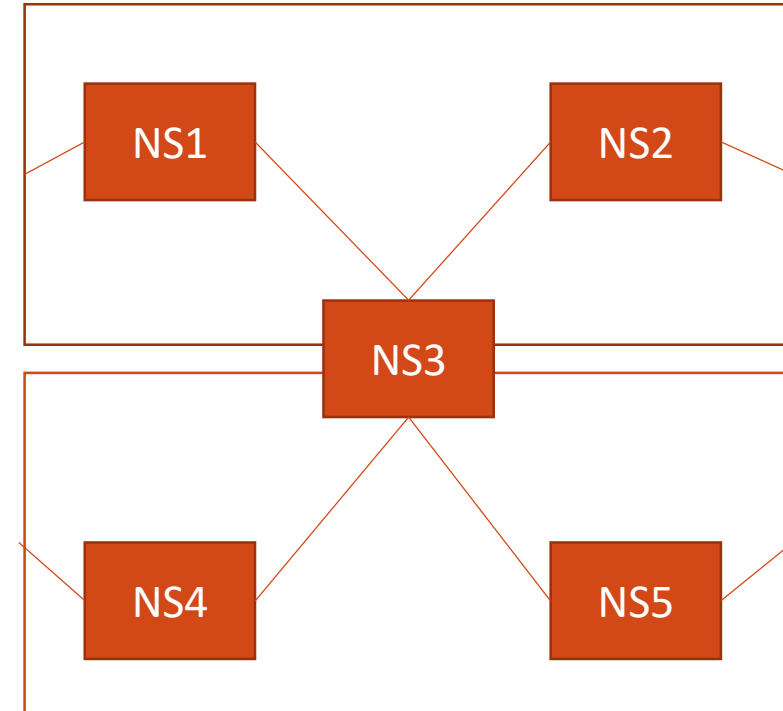
- Network Slice Subnet can be considered as an NFV Network Service.
- Network Functions can be described as VNF and PNF.



Shared Network Service

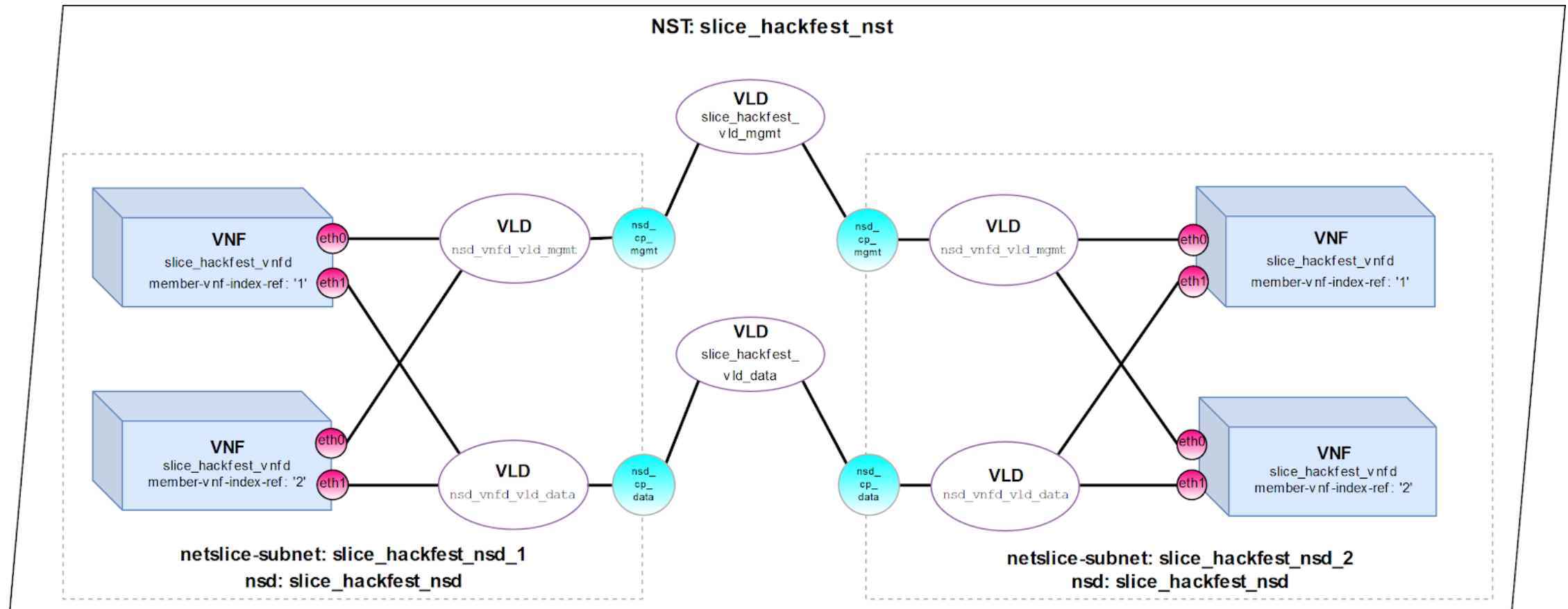
- Objective:
 - A NSI containing a PNF can be shared within multiple slices
- Implementation is not that complicated
 - Each NST includes the list of NS to be used
 - An NS can be shared/or not
 - If shared, Slice Manager looks for an already existing shared NSI. If not, an NSI is created.

Slice 1



Slice 2

OSM example: NST diagram



Network Slice Template

```
nst:
- id: slice_hackfest_nst
  name: slice_hackfest_nst
  SNSSAI-identifier:
    slice-service-type: eMBB
  quality-of-service:
    id: 1

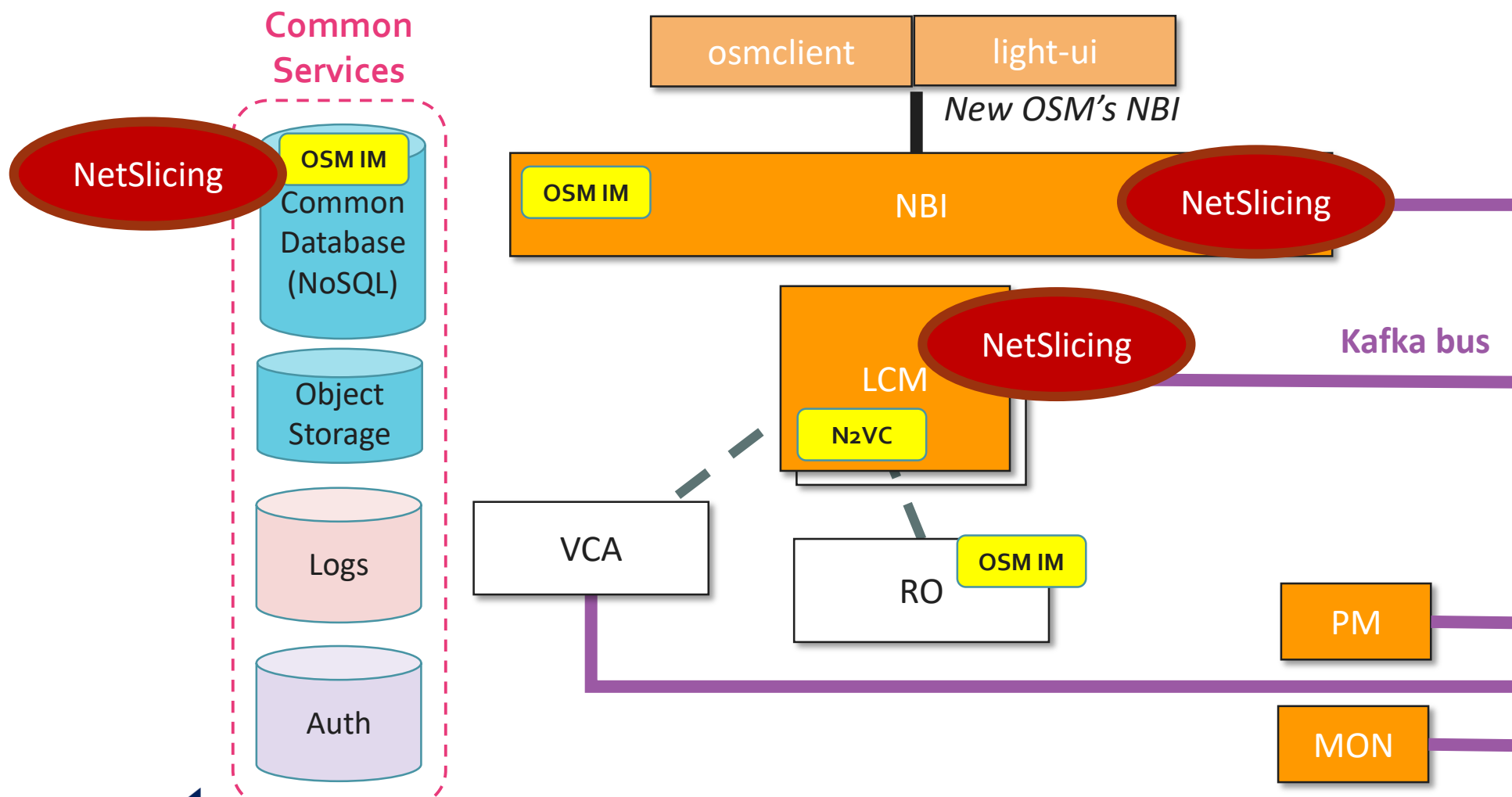
netslice-subnet:
- id: slice_hackfest_nsd_1
  is-shared-nss: 'false'
  description: NetSlice Subnet (service) composed by 2 vnfs and 4 cp (2 mgmt and 2 data)
  nsd-ref: slice_hackfest_nsd
- id: slice_hackfest_nsd_2
  is-shared-nss: 'false'
  description: NetSlice Subnet (service) composed by 2 vnfs and 4 cp (2 mgmt and 2 data)
  nsd-ref: slice_hackfest_nsd

netslice-vld:
- id: slice_hackfest_vld_mgmt
  name: slice_hackfest_vld_mgmt
  type: ELAN
  mgmt-network: 'true'
  nss-connection-point-ref:
    - nss-ref: slice_hackfest_nsd_1
      nsd-connection-point-ref: nsd_cp_mgmt
    - nss-ref: slice_hackfest_nsd_2
      nsd-connection-point-ref: nsd_cp_mgmt
- id: slice_hackfest_vld_data
  name: slice_hackfest_vld_data
  type: ELAN
  nss-connection-point-ref:
    - nss-ref: slice_hackfest_nsd_1
      nsd-connection-point-ref: nsd_cp_data
    - nss-ref: slice_hackfest_nsd_2
      nsd-connection-point-ref: nsd_cp_data
```

How this maps onto OSM release 5?



Open Source
MANO

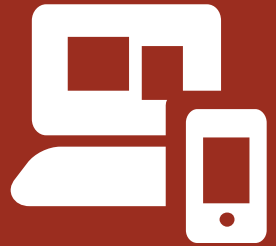


About us

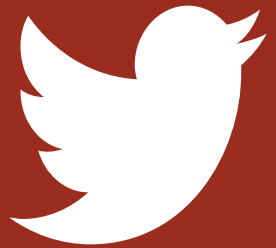
- 5GTANGO is an EU-funded project (Horizon 2020) and part of the 5G-PPP initiative
- 30 month work plan, started in June 2017
- 17 partners representing telecom operators, manufacturers, system integrators, service providers, SME developers, research and academic institutes



5GTANGO on the web



www.5gtango.eu



@5Gtango

