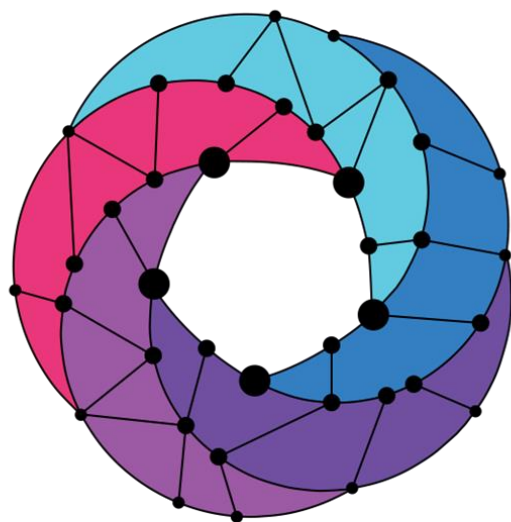




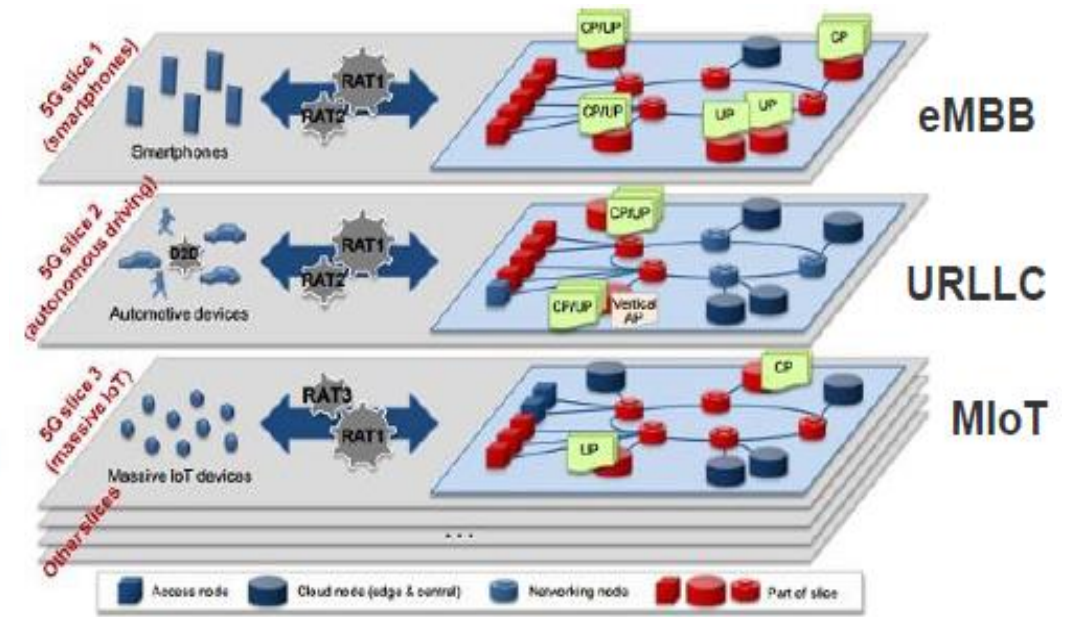
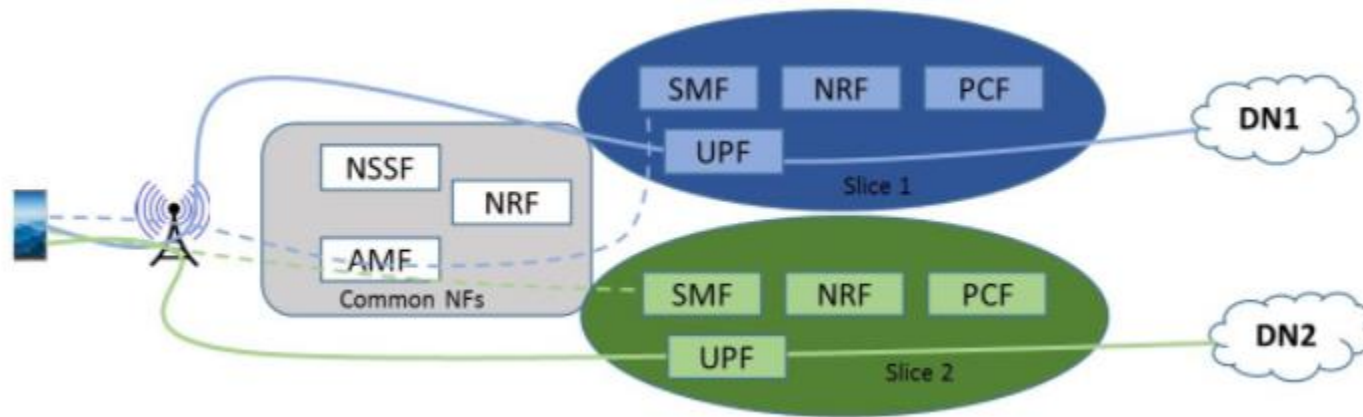
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OSM#10 Hackfest – HD1.5 – Network Slicing

Fernando Díaz (Atos)

Network Slicing Overview

- In the scope of 5G, a Network Slice is a logical network that provides specific network capabilities and network characteristics, through a set of Network Function instances and the required resources (e.g. compute, storage and networking resources).
- Different network slices addressing different types of usage requiring different levels of functionality, performance and reliability.



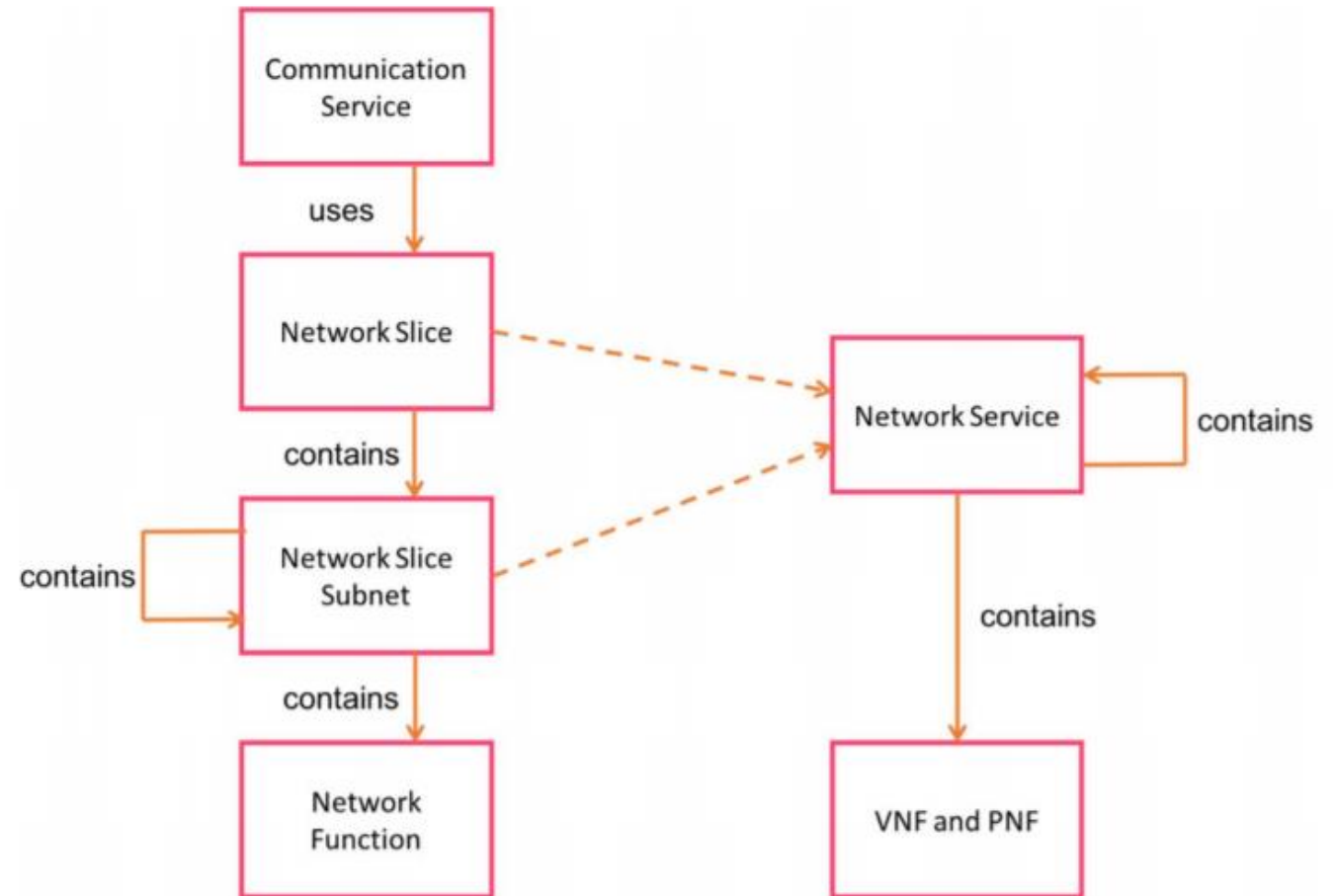
Source: NGMN

ETSI NFV Framework for Network Slicing

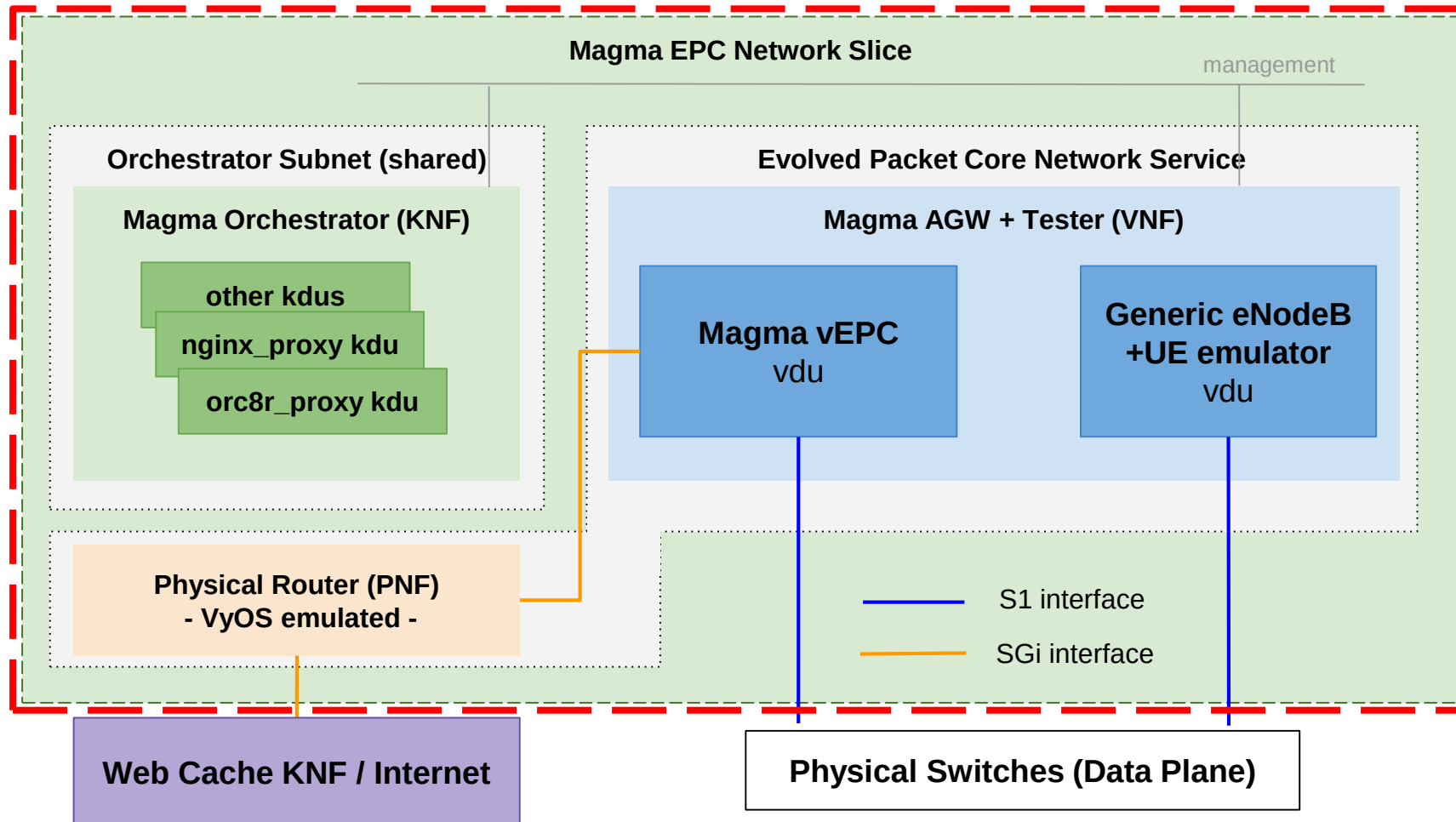
Analysis of 3GPP and alignment of NFV architecture in the ETSI GR NFV-EVE 012

Considerations:

- Network Slice Subnet can be considered as an NFV Network Service.
- Network Slice Subnets can be shared between different Network Slices

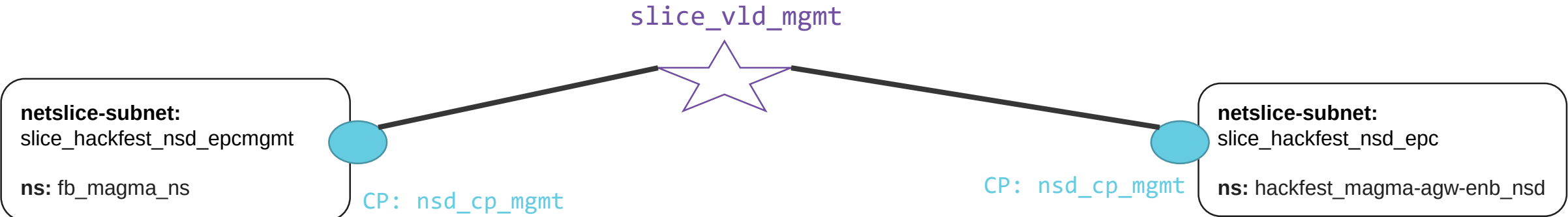


The EPC Network Slice



NST diagram

NST: magma_slice_hackfest_nst



Network Slice Template Requirements

VNFD:

- fb_magma_knf
- hackfest_magma-agw-enb_vnfd
- hackfest_gateway_vnfd

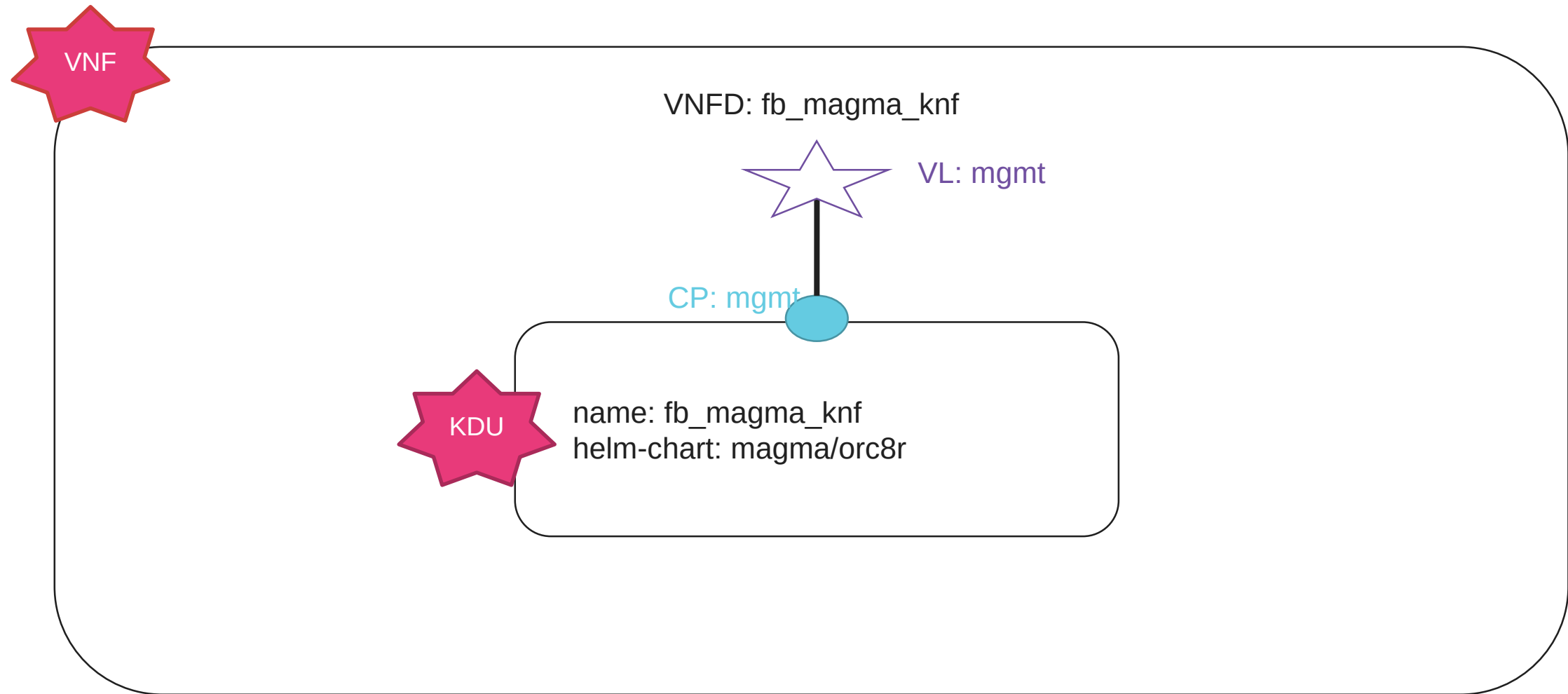
NSD:

- fb_magma_nsd
- hackfest_magma-agw-enb_nsd

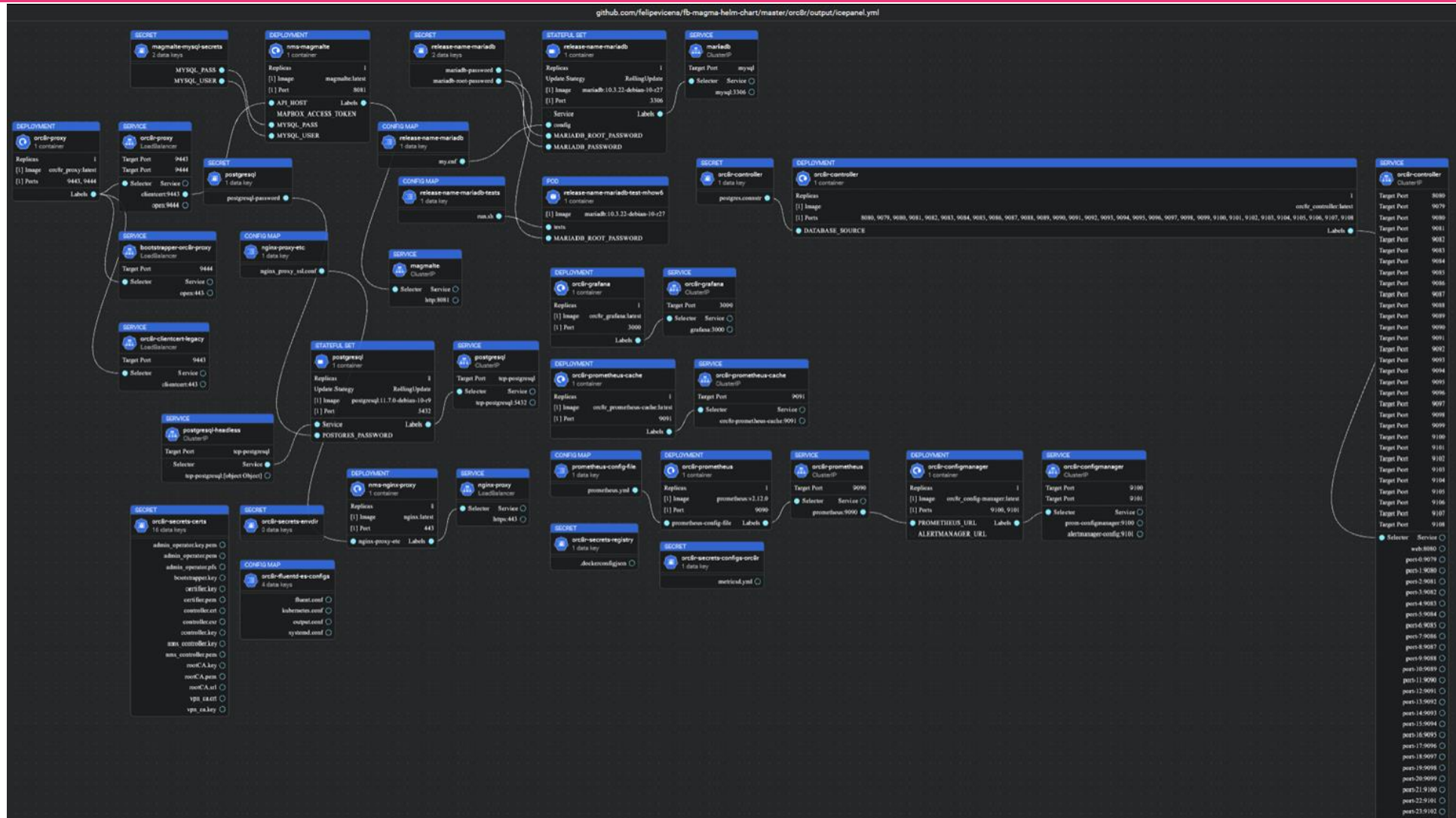
NST:

- [magma_slice.yaml](#)

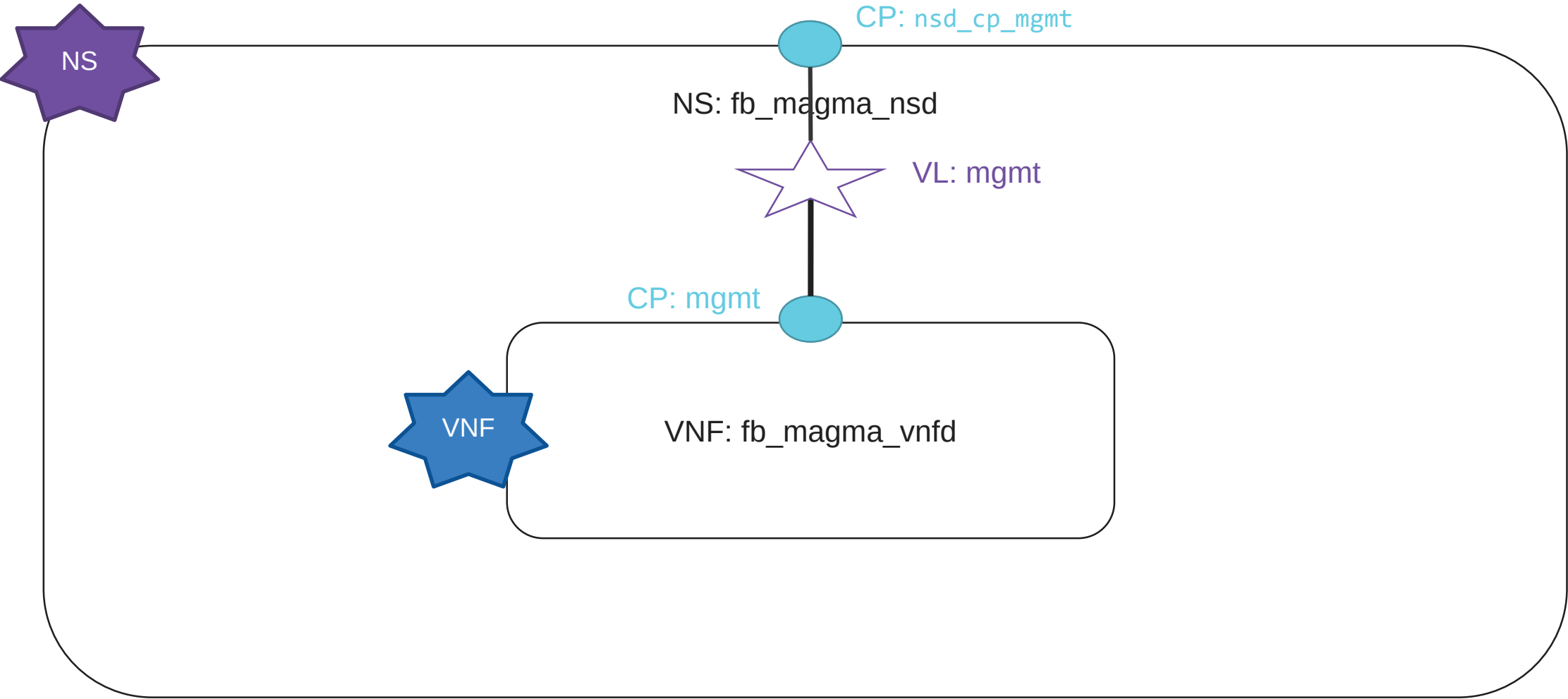
VNFD - fb_magma_knf



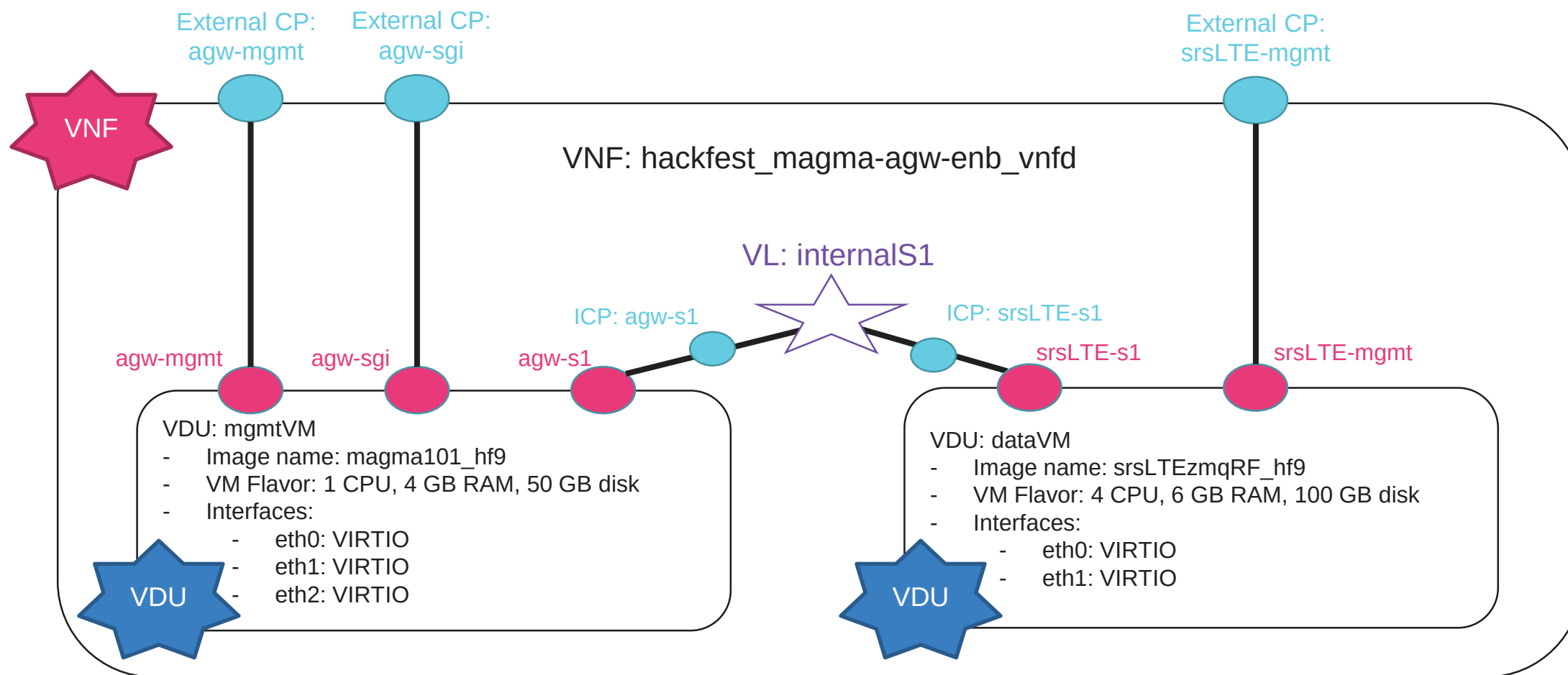
KDU - fb_magma_knf



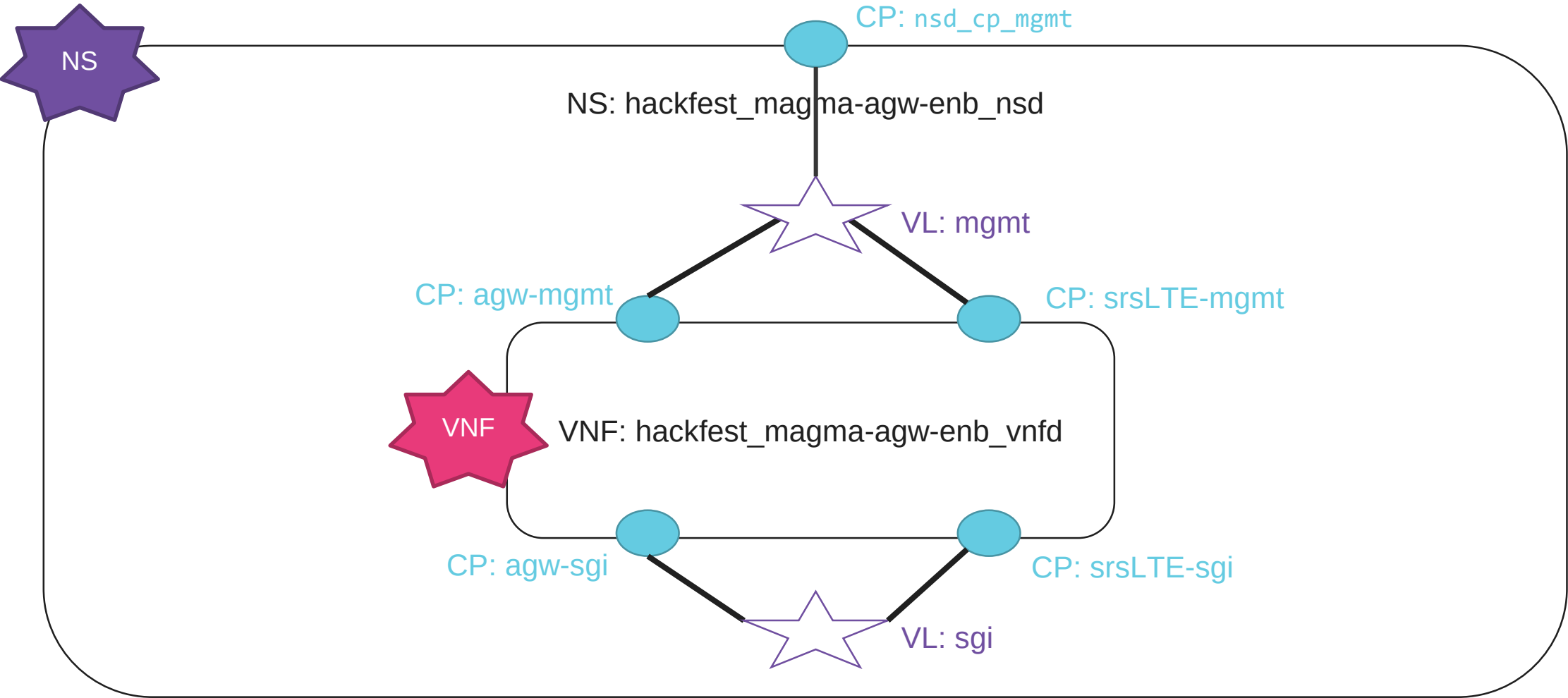
NSD - fb_magma_nsd



VNFD - hackfest_magma-agw-enb_vnfd

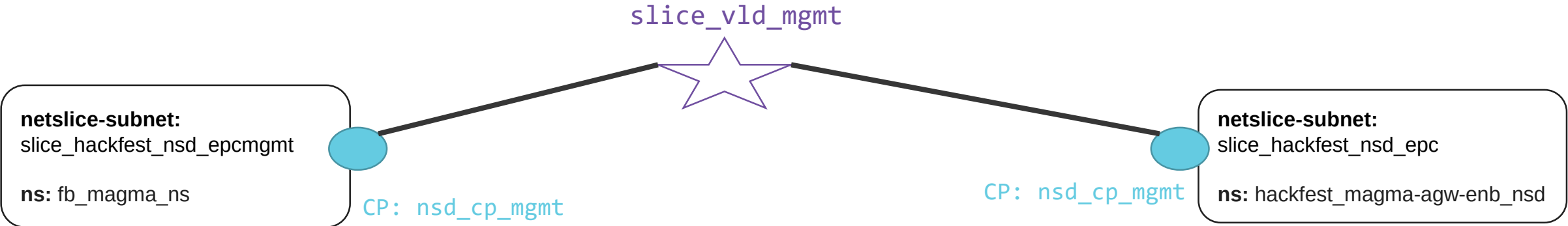


NSD - hackfest_magma-agw-enb_nsd



NST diagram

NST: magma_slice_hackfest_nst



Network Slice Template

nst:

- SNSSAI-identifier:
 - slice-service-type: eMBB
- id: magma_slice_hackfest_nst
- name: magma_slice_hackfest_nst
- quality-of-service:
 - id: 1

netslice-subnet:

- description: NetSlice Subnet (service) with magma agw
 - id: slice_hackfest_nsd_epc
 - is-shared-nss: false
 - nsd-ref: hackfest_magma-agw-enb_nsd
- description: NetSlice Subnet (service) with magma orch and nms
 - id: slice_hackfest_nsd_epcmgmt
 - is-shared-nss: true
 - nsd-ref: fb_magma_ns

netslice-vld:

- id: slice_vld_mgmt
- mgmt-network: true
- name: slice_vld_mgmt
- nss-connection-point-ref:
 - nsd-connection-point-ref: nsd_cp_mgmt
 - nss-ref: slice_hackfest_nsd_epc
 - nsd-connection-point-ref: nsd_cp_mgmt
 - nss-ref: slice_hackfest_nsd_epcmgmt
- type: ELAN

Creating a Network Slice Template (NST)

Information Model

```
module: nst
+--rw nst* [id]
  +--rw id                               string
  +--rw name                             string
  +--rw SNSSAI-identifier
    | +--rw slice-service-type           network-slice-type
    | +--rw slice-differentiator?       string
  +--rw quality-of-service
    | +--rw id                           uint16
    | +--rw resource-type?               resource-type
    | +--rw priority-level?              uint16
    | +--rw packet-delay-budget?        uint16
    | +--rw packet-error-rate?          uint16
    | +--rw default-max-data-burst?     uint16
```



NST - id, name, and slice parameters section

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

- The Information model for the NST is available:
http://osm-download.etsi.org/repository/osm/debian/ReleaseSEVEN/docs/osm-im/osm_im_trees/nst.html

Creating a Network Slice Template (NST)

Information Model

```
+---rw netslice-subnet*      [id]
| +---rw id                  string
| +---rw description?        string
| +---rw is-shared-nss?      boolean
| +---rw nsd-ref              -> /nsd:nsd-catalog/nsd/id
| +---rw instantiation-parameters
| +---.....
```



NST - netslice-subnet section

```
netslice-subnet:
-   description: NetSlice Subnet (service) with magma agw
    id: slice_hackfest_nsd_epc
    is-shared-nss: false
    nsd-ref: hackfest_magma-agw-enb_nsd
-   description: NetSlice Subnet (service) with magma orch and nms
    id: slice_hackfest_nsd_epcmgmt
    is-shared-nss: true
    nsd-ref: fb_magma_ns
```

- The Information model for the NST is available:

http://osm-download.etsi.org/repository/osm/debian/ReleaseSEVEN/docs/osm-im/osm_im_trees/nst.html

Creating a Network Slice Template (NST)

Information Model

```
+--rw netslice-vld* [id]
|   +--rw id                string
|   +--rw name?             string
|   +--rw short-name?       string
|   +--rw vendor?           string
|   +--rw description?       string
|   +--rw version?          string
|   +--rw type?              manotypes:virtual-link-type
|   +--rw root-bandwidth?   uint64
|   +--rw leaf-bandwidth?   uint64
|   +--rw provider-network
|   |   +--rw physical-network? string
|   |   +--rw segmentation_id? uint32
|   +--rw mgmt-network?     boolean
|   +--rw nss-connection-point-ref* [nss-ref nsd-connection-point-ref]
|   |   +--rw nss-ref        -> /nst/netslice-subnet/id
|   |   +--rw nsd-connection-point-ref -> /nsd:nsd-catalog/
|   |                                   nsd/connection-point/name
|   +--rw ip-address?       inet:ip-address
```



NST - netslice-vld section

```
netslice-vld:
-   id: slice_vld_mgmt
  mgmt-network: true
  name: slice_vld_mgmt
  nss-connection-point-ref:
  -   nsd-connection-point-ref: nsd_cp_mgmt
    nss-ref: slice_hackfest_nsd_epc
  -   nsd-connection-point-ref: nsd_cp_mgmt
    nss-ref: slice_hackfest_nsd_epcmgmt
  type: ELAN
```

• The Information model for the NST is available:

http://osm-download.etsi.org/repository/osm/debian/ReleaseSEVEN/docs/osm-im/osm_im_trees/nst.html

Managing Network Slice Templates (via CLI)

- Creates a new Network Slice Template
 - `netslice-template-create / nst-create`
- Deletes a Network Slice Template
 - `netslice-template-delete / nst-delete`
- List all Network Slice Templates
 - `netslice-template-list / nst-list`
- Shows the content of a Network Slice Template
 - `netslice-template-show / nst-show`
- Updates a Network Slice Template
 - `netslice-template-update / nst-update`

Creating a Network Slice Instance

- `osm nsi-create --help`

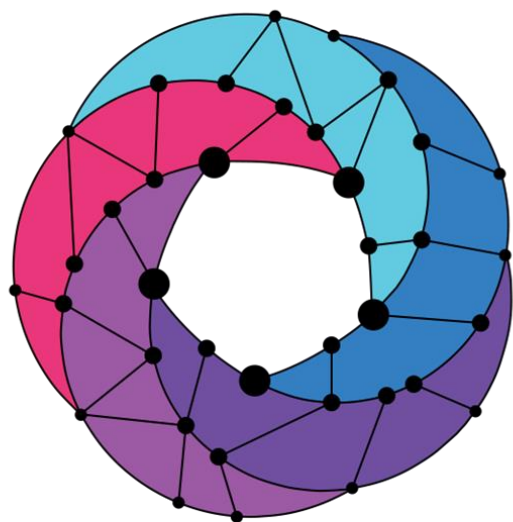
Usage: `osm nsi-create [OPTIONS]`
creates a new Network Slice Instance (NSI)

Options:

`--nsi_name TEXT` name of the Network Slice Instance
`--nst_name TEXT` name of the Network Slice Template
`--vim_account TEXT` default VIM account id or name for the deployment
`--ssh_keys TEXT` comma separated list of keys to inject to vnfs
`--config TEXT` Netslice specific yaml configuration:
 netslice_subnet: [
 id: TEXT, vim_account: TEXT,
 vnf: [member-vnf-index:
 TEXT, vim_account: TEXT]
 vld: [name: TEXT, vim-network-
 name: TEXT or DICT with vim_account, vim_net entries]],
 netslice-vld: [name: TEXT, vim-network-name: TEXT or
 DICT with vim_account, vim_net entries]
`--config_file TEXT` nsi specific yaml configuration file
`--help` Show this message and exit.

Managing Network Slice Instances (via CLI)

- Creates a new Network Slice Instance
 - `netslice-instance-create / nsi-create`
- Deletes a Network Slice Instance
 - `netslice-instance-delete / nsi-delete`
- List all Network Slice Instances (NSI)
 - `netslice-instance-list / nsi-list`
- Shows the history of operations over a
 - `netslice-instance-op-list / nsi-op-list`
- Shows the info of an operation over a Network Slice Instance(NSI)
 - `netslice-instance-op-show / nsi-op-show`
- Shows the content of a Network Slice Instance (NSI)
 - `netslice-instance-show / nsi-show`



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