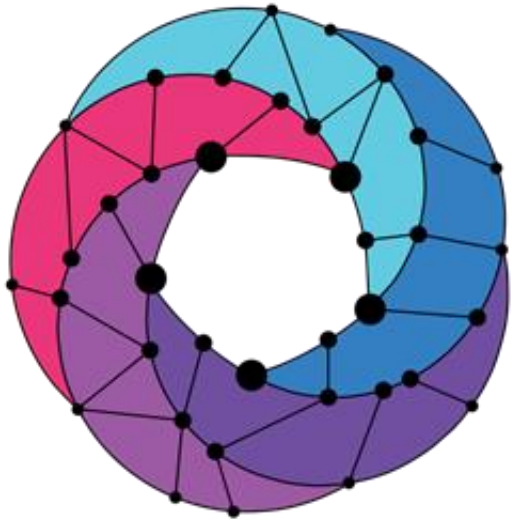

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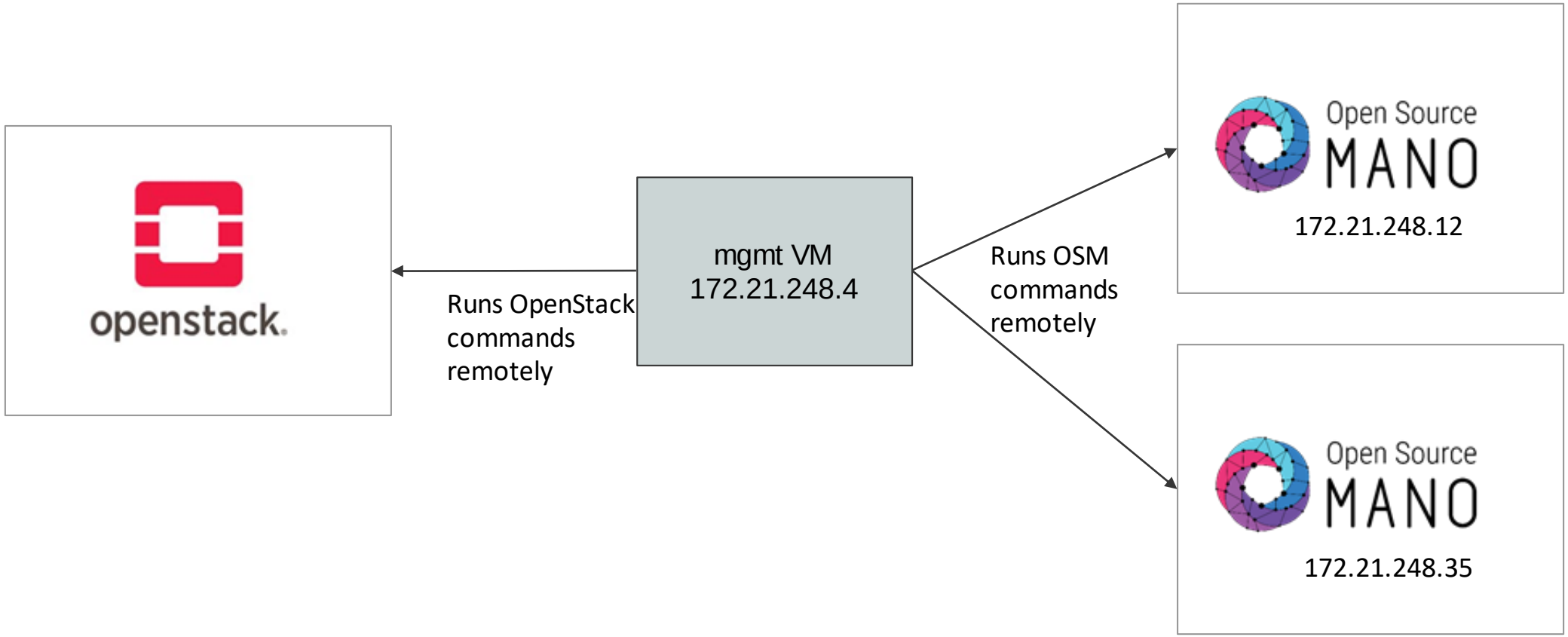
# OSM#9 Hackfest – Day 2
# Session 2. Orchestrating a KNF in OSM - Magma Orch

Gerardo García (Telefónica)
Fabián Bravo (Whitestack)

# Recap on the OSM environment
# We are using a shared OSM Instance

We are using a shared OSM instance, leveraging the OSM RBAC capabilities.

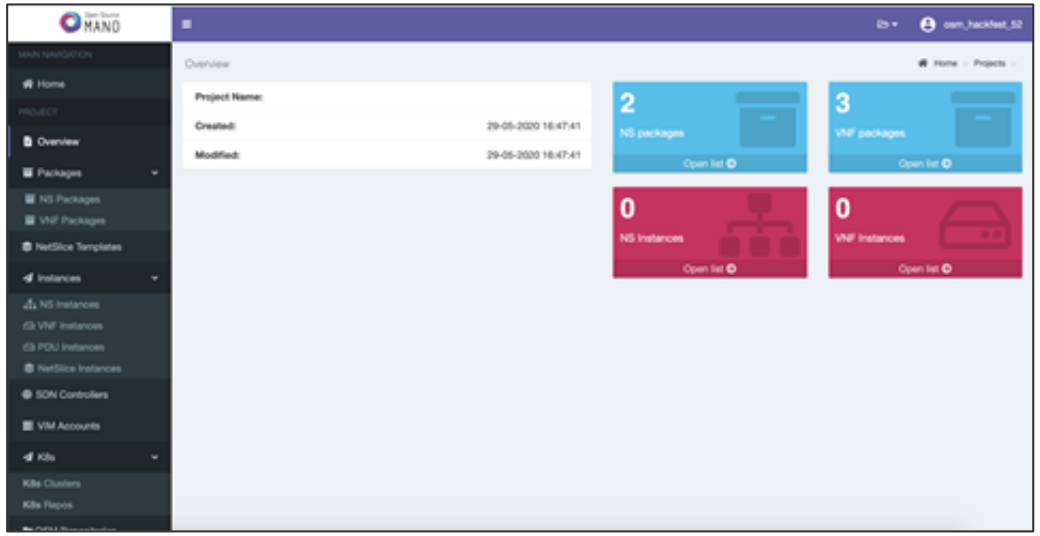


# Recap on the OSM environment
# Accessing your OSM project

Two ways to interact with OSM:

- Dashboard

  http://172.21.248.12
  http://172.21.248.35
  (user / pass: osm_hackfest_x)




- CLI, vía SSH to the mgmt VM

  ssh osm_hackfest_x@172.21.248.4
  (user / pass: osm_hackfest_x)

# Recap on the OSM environment
# Accessing your K8 Cluster

- CLI via SSH to the mgmt VM

  ssh osm_hackfest_x@172.21.248.4
  (user / pass: osm_hackfest_x)

  # try a command using the credentials at your home dir
  kubectl --kubeconfig ~/kube.yaml get pods -A

# Check that your VIM was added to OSM

Check that your VIM is there

```
osm vim-list
```

Otherwise, add it following the instructions that were provided yesterday.

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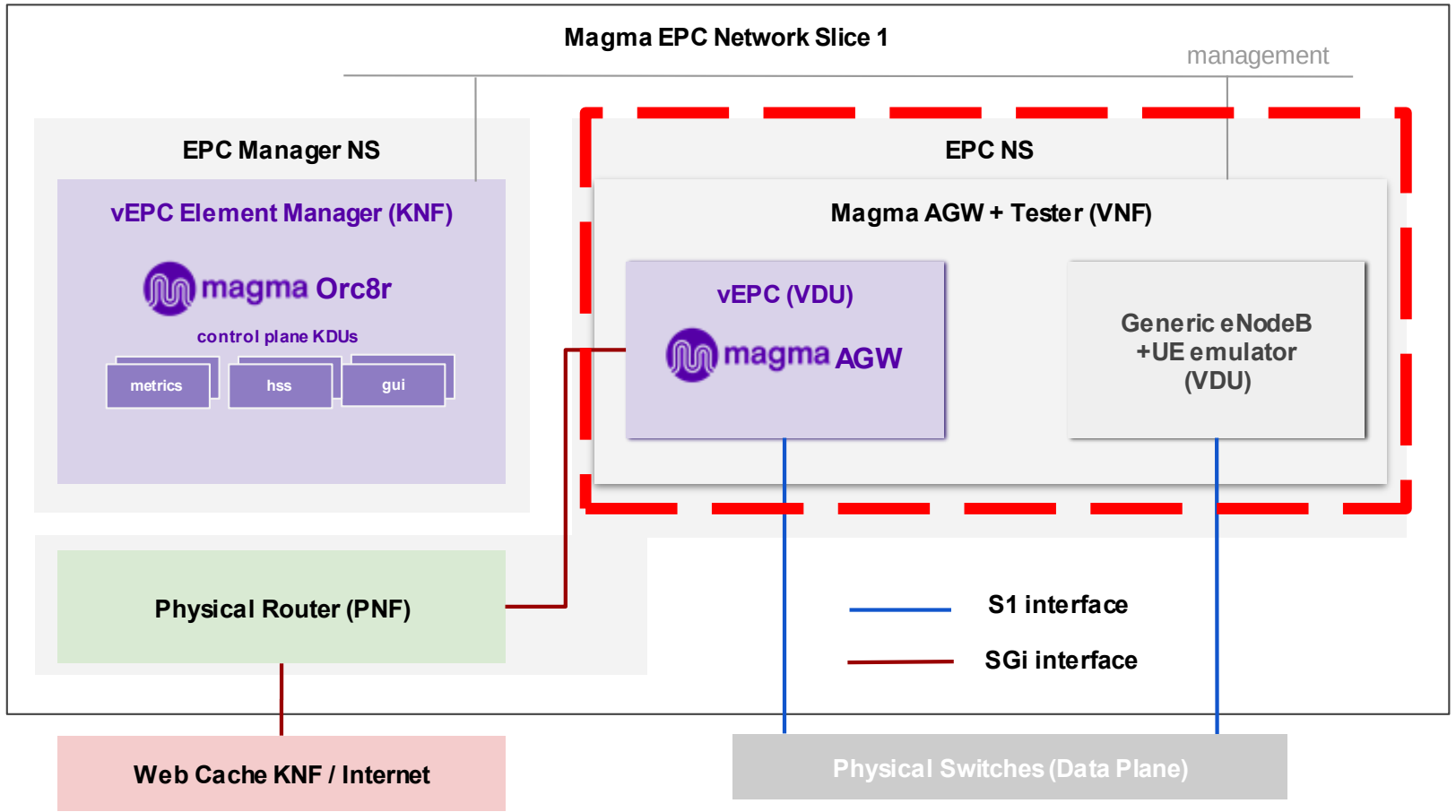
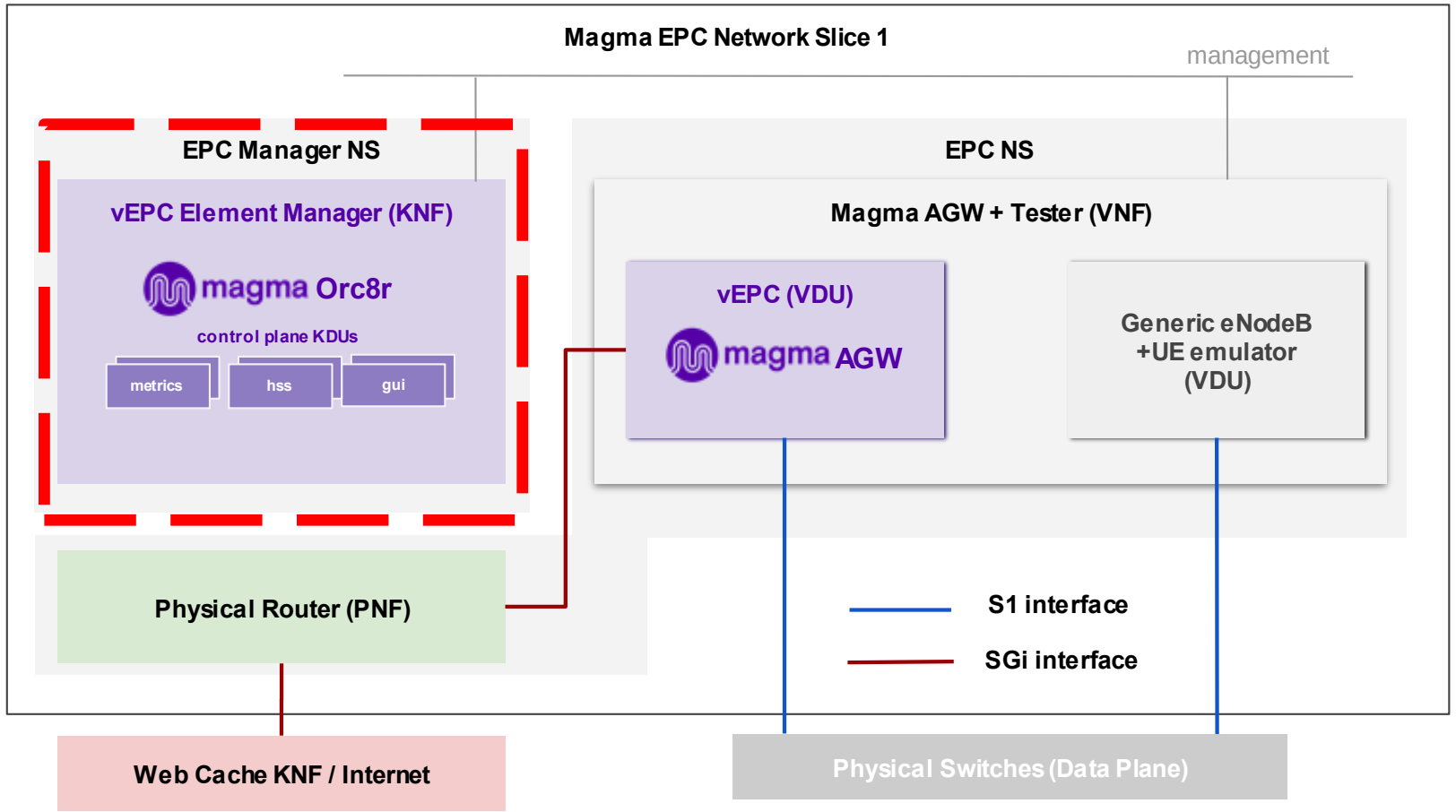
# Hands-on session

# Context of this hands-on session
# Yesterday you covered the design of the AGW VNF

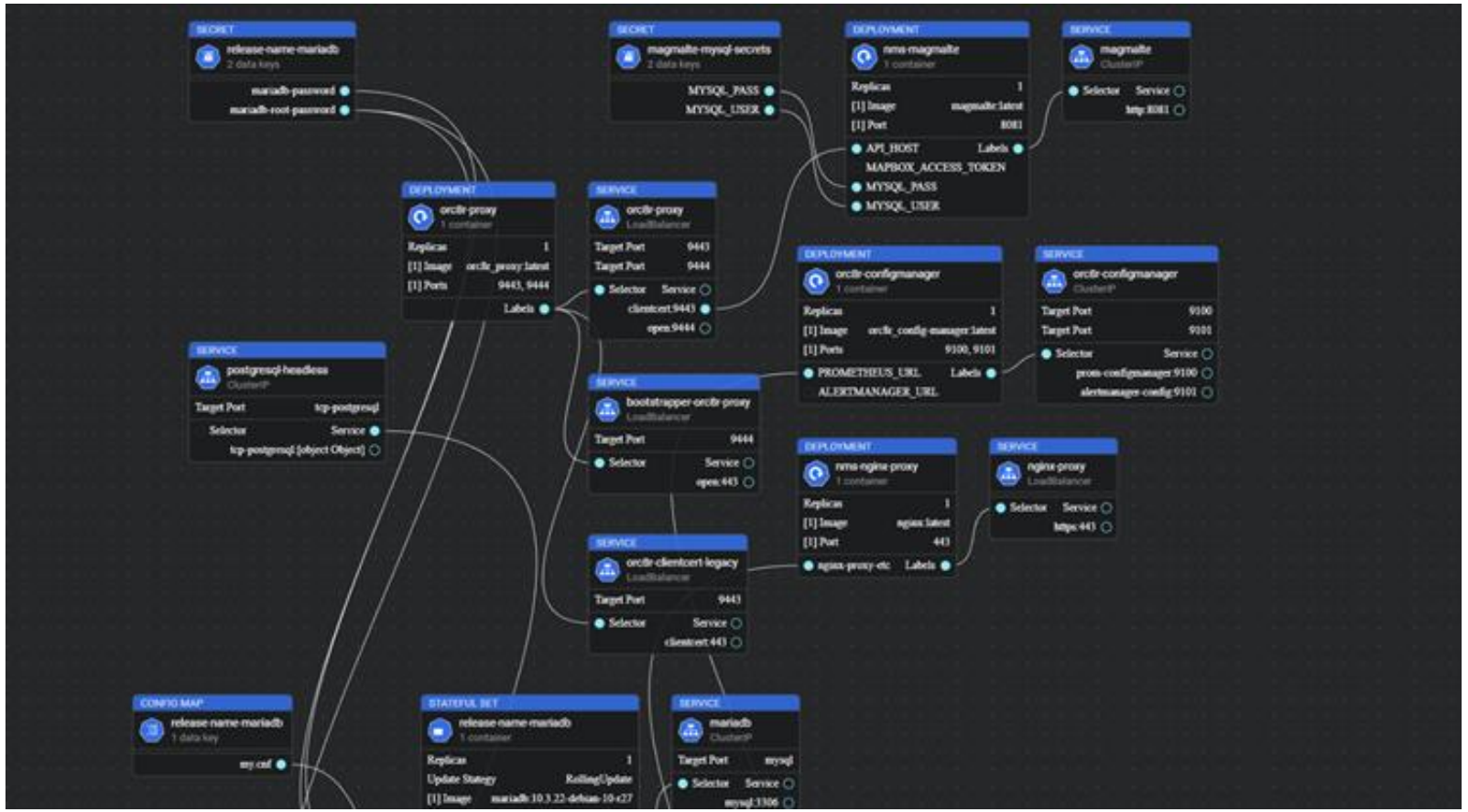


# Context of this hands-on session
# Today: Magma Orchestrator KNF



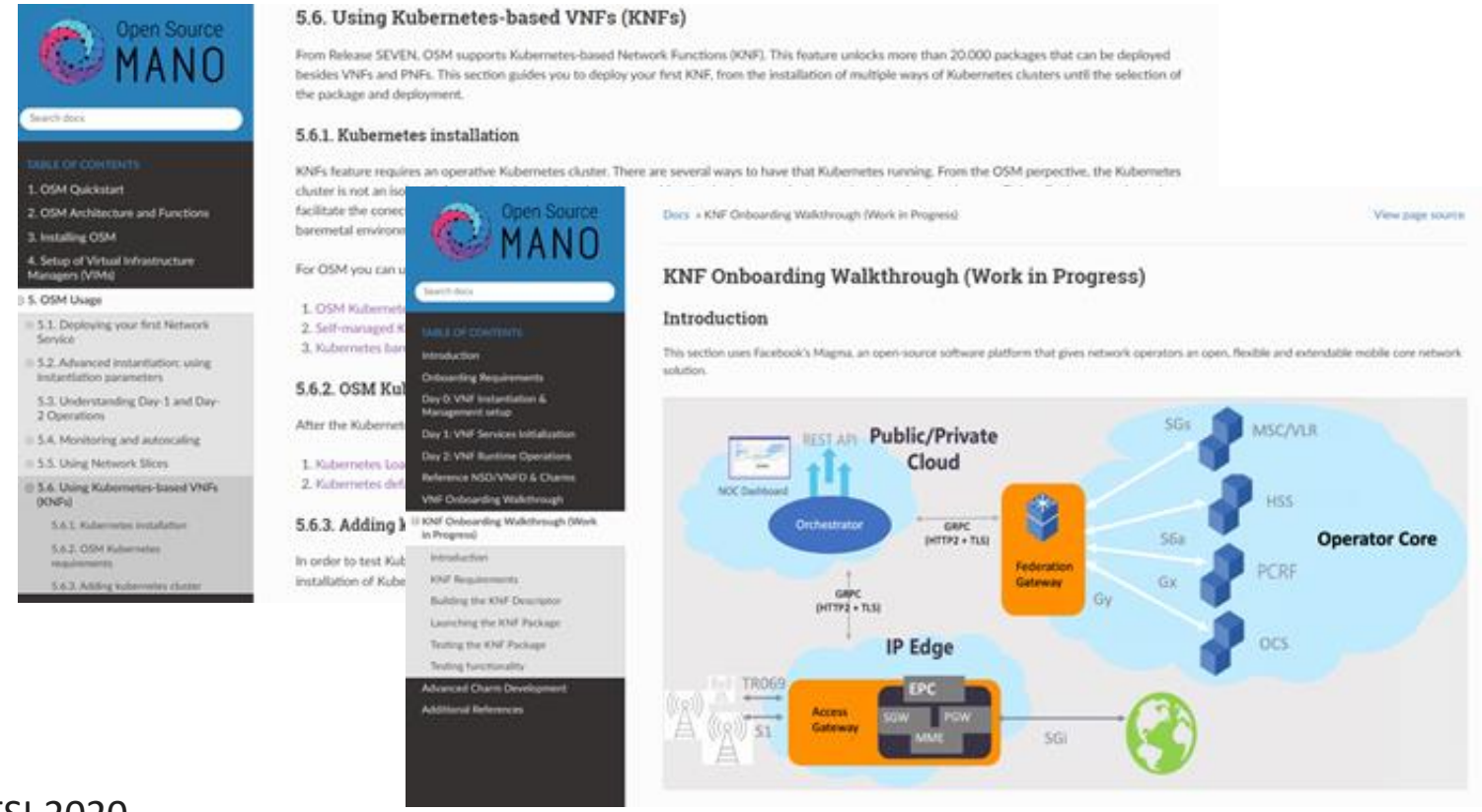
# The Magma Orchestrator helm chart

- Magma Orchestrator helm chart structure



# Session schedule

- We will follow these guides:
  - User Guide - Using Kubernetes-based VNFs
  - VNF Onboarding Guidelines - KNF walkthrough




- Create and onboard KNF and NS packages
- Add a K8s cluster
- Add a Helm-chart repo
- Instantiate and check status
- Running implicit primitives
- Terminate NS
- Instantiation parameters for the E2E demo

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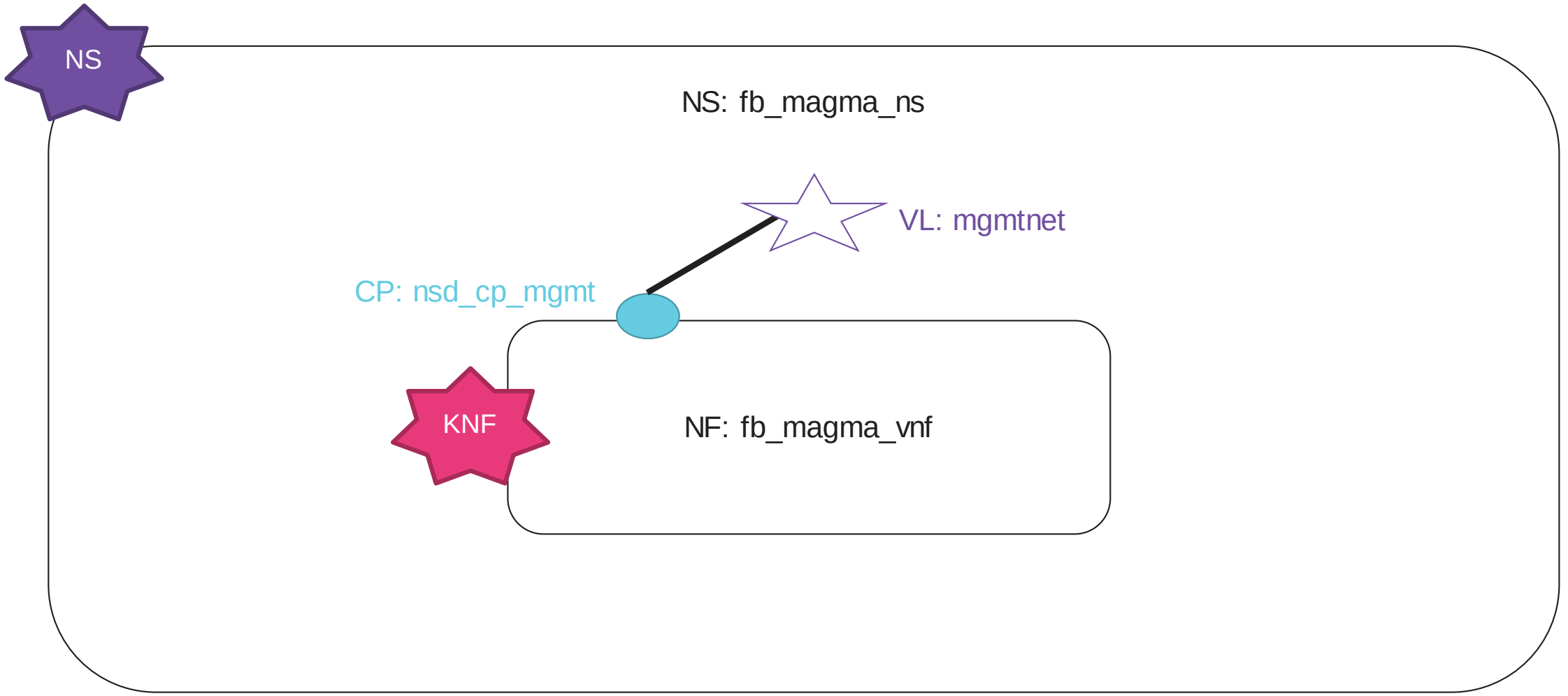
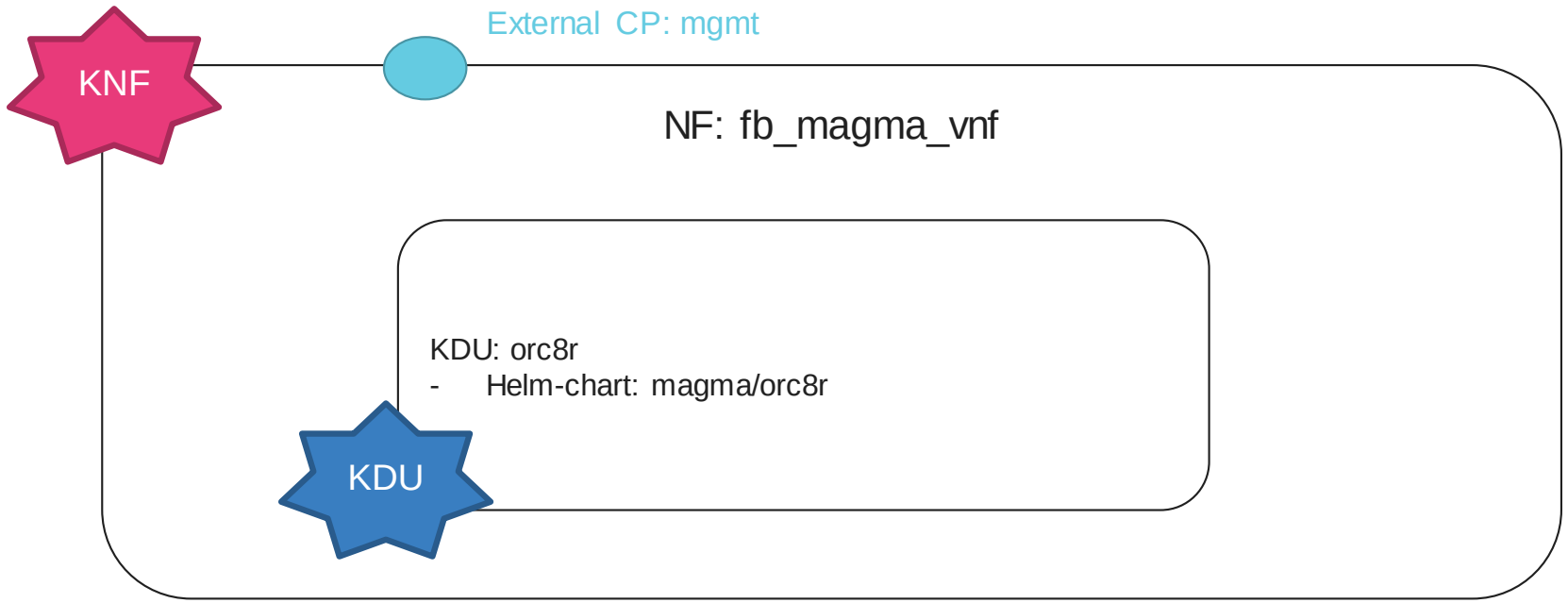
# Creating and onboarding NF and NS packages

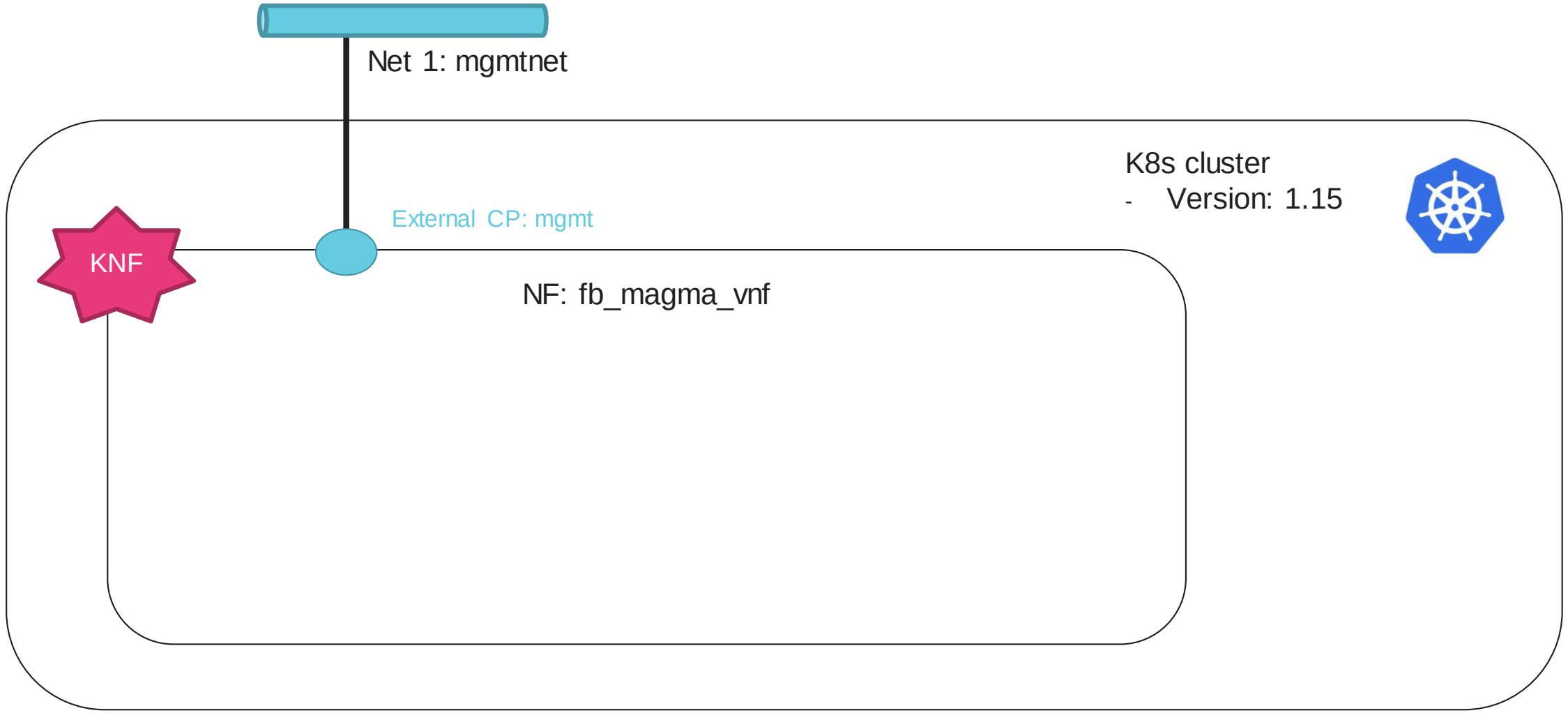

# NS diagram



# KNF diagram



# KNF diagram: K8s cluster requirements



# NF Walkthrough
# Creating a new NF Package from CLI

- Use the command line to create the complete structure of the package, modify as desired with an editor.

```
osm package-create --base-directory ~/magma --vendor OSM vnf fb_magma
```

- The final contents we need for this section are placed in the following folder:
/home/ubuntu/examples/03-orc8r-knf/fb_magma_vnf/fb_magma_vnfd.yaml

# NF Walkthrough
# Creating the NF descriptor

- Two options:

1. View the desired contents and replace your fb_magma_vnfd.yaml file, section by section.

```
cat /home/ubuntu/examples/03-orc8r-knf/fb_magma_vnf/fb_magma_vnfd.yaml
```

2. **[Faster]** Copy all the contents from the examples directory into your VNF folder

```
cp -a /home/ubuntu/examples/03-orc8r-knf/fb_magma_vnf/* ~/magma/fb_magma_vnf/
```

# NF Walkthrough
# Creating the NF descriptor

- Remove the whole VDU section:

```
        vdu:
        -   id: fb_magma_vnfd-VM
            name: fb_magma_vnfd-VM
            description: fb_magma_vnfd-VM
            count: 1
            ...
            # Flavour of the VM to be instantiated for the VDU
            vm-flavor:
```

- Add KDU section whose helm chart is magma/orc8r (repo: magma; chart: orc8r)

```
        kdu:
        -   name: orc8r
            helm-chart: magma/orc8r
```

# NF Walkthrough
# Creating the NF descriptor

- Connection points:

```
        connection-point:
        -   name: mgmt
```

- Management interface:

```
        mgmt-interface:
            cp: mgmt
```

# NF Walkthrough
# Creating the NF descriptor

- K8s cluster requirements:

```
        k8s-cluster:
            nets:
            -   external-connection-point-ref: mgmt
                id: mgmtnet
```

# NS Walkthrough
# Creating a new NS Package from CLI

- Use the command line to create the complete structure of the package, modify as desired with an editor.

```
osm package-create --base-directory ~/magma --vendor OSM ns fb_magma
```

- The final contents we need for this section are placed in the following folder:
/home/ubuntu/examples/03-orc8r-knf/fb_magma_ns/fb_magma_nsd.yaml

# NS Walkthrough
# Creating NS descriptor

- Two options:

1. View the desired contents and replace your fb_magma_nsd.yaml file, section by section.

```
cat /home/ubuntu/examples/03-orc8r-knf/fb_magma_ns/fb_magma_nsd.yaml
```

2. **[Faster]** Copy all the contents from the examples directory into your NS folder

```
cp -a /home/ubuntu/examples/03-orc8r-knf/fb_magma_ns/* ~/magma/fb_magma_ns/
```

# NS Walkthrough
# Creating NS descriptor

- Constituent-vnfd section (what NFs are part of the NS)

```
 constituent-vnfd:
-   member-vnf-index: orc8r
    vnfd-id-ref: fb_magma_vnf
```

- Management VLD

```
 vld:
-   id: mgmtnet
    name: mgmtnet
    type: ELAN
    mgmt-network: true
    vnfd-connection-point-ref:
    -   member-vnf-index-ref: orc8r
        vnfd-id-ref: fb_magma_vnf
        vnfd-connection-point-ref: mgmt
```

# Validating, building and uploading packages

- NF onboarding:
  - Validate the package according to the Information model:

```
osm package-validate fb_magma_vnf
```

  - Build:

```
osm package-build fb_magma_vnf
```

  - Upload:

```
osm nfpkg-create fb_magma_vnf.tar.gz
```

  - One-shot command (validate, build and upload)

```
osm nfpkg-create fb_magma_vnf
```

# Validating, building and uploading packages

- NS onboarding:
  - Validate the package according to the Information model:

```
osm package-validate fb_magma_ns
```

  - Build:

```
osm package-build fb_magma_ns
```

  - Upload:

```
osm nspkg-create fb_magma_ns.tar.gz
```

  - One-shot command (validate, build and upload)

```
osm nspkg-create fb_magma_ns
```

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# Adding a K8s cluster and a helm-chart repo


# Now, we need a K8s cluster

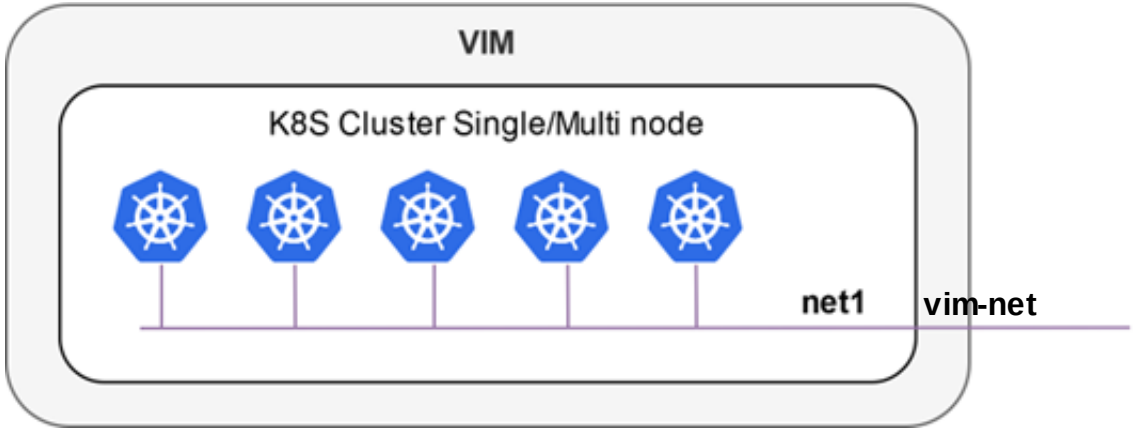
Your Kubernetes cluster needs to meet the following requirements:

- Kubernetes Loadbalancer, to expose your KNFs to the network
- Kubernetes default Storageclass, to support persistent volumes.

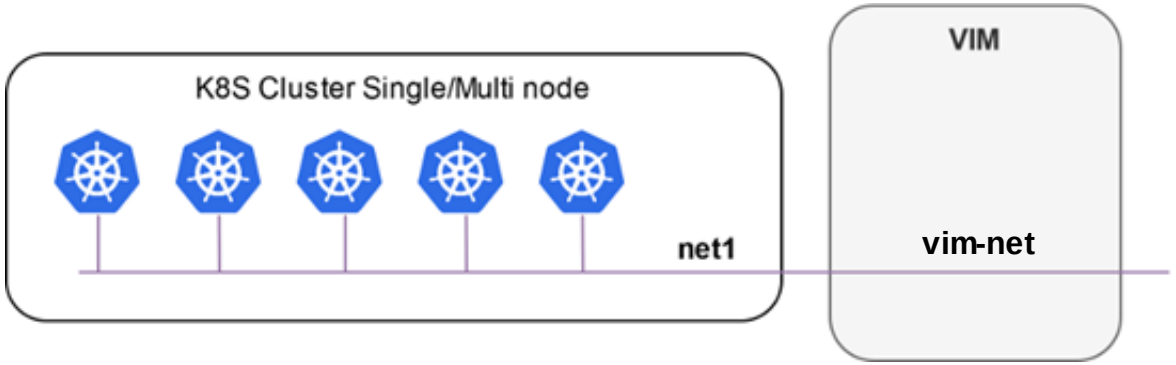
A K8s cluster has already been created for you!

# Association of K8s cluster to VIM
# A K8s cluster is expected to be connected

K8s cluster deployed inside a VIM




K8s cluster deployed outside a VIM, connected to a VIM network



# Adding a K8s cluster

- Information to create the cluster:
  - Credentials file: kube.yaml
  - Version: 1.15
  - VIM: etsi-openstack-X
  - K8s nets:
    - net1: osm-ext
  - ClusterName: etsi-cluster-X

# Let’s add your K8s cluster

- Add the cluster

```
osm k8scluster-add --creds ~/kube.yaml \
                   --version '1.15' \
                   --vim etsi-openstack-${HACKFEST_TENANT} \
                   --description "K8s cluster for user ${HACKFEST_TENANT}" \
                   --k8s-nets '{"net1": "osm-ext"}' \
                   etsi-cluster-${HACKFEST_TENANT}
```

- Check that the cluster was added and is marked as ENABLED

```
osm k8scluster-list
```

# Adding a helm-chart repo

- OSM needs to know where to obtain the ‘orc8r’ helm chart from:
  - Repo name: magma
  - URI: https://felipevicens.github.io/fb-magma-helm-chart/

```
osm repo-add --type helm-chart \
             --description "Repository for Facebook Magma helm Chart" \
             magma "https://felipevicens.github.io/fb-magma-helm-chart/"
```

- When the KNF is deployed, its helm chart will be downloaded from the repo

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# Launch the NS

# Instantiating the NS and checking status of the KDU instance

- Launch the NS

```
osm ns-create --ns_name magma_orc8r --nsd_name fb_magma_ns \
              --vim_account etsi-openstack-${HACKFEST_TENANT}
```

- Check status of NS in OSM

```
osm ns-list
```

# Instantiating the NS and checking status of the KDU instance

- Once ready, get the details of the KDU

```
osm vnf-list --ns magma_orc8r
VNF_ID=`osm vnf-list --ns magma_orc8r |grep orc8r |awk '{print $2}'`
osm vnf-show $VNF_ID --kdu orc8r
# Not all K8s objects are ready. Some are missing
```

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# Running implicit primitives in KDUs


# Running implicit primitives in KDUs

- Upgrade your KDU to use the IP address assigned to your tenant in the Resources Spreadsheet (172.21.251.**X**)

```
osm ns-action magma_orc8r --vnf_name orc8r --kdu_name orc8r \
                          --action_name upgrade \
                          --params '{"proxyserviceloadBalancerIP": "172.21.251.X"}‘
osm ns-op-list magma_orc8r
```

- Once completed, check that the IP address was updated

```
osm vnf-list --ns magma_orc8r
VNF_ID=`osm vnf-list --ns magma_orc8r |grep orc8r |awk '{print $2}'`
osm vnf-show $VNF_ID --kdu orc8r
osm vnf-show $VNF_ID --kdu orc8r|grep ^orc8r-proxy|grep LoadBalancer
```

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# Terminate previous NS and launch a new NS with instantiation parameters


# Terminate the previous NS

- Delete the NS

```
osm ns-delete magma_orc8r
osm ns-list
```

# Prepare a file with instantiation parameters

- Copy the file config_magma_orc8r.yaml from the examples directory to your magma folder

```
cp /home/ubuntu/examples/03-orc8r-knf/config_magma_orc8r.yaml ~/magma
```

- Edit the file to use the IP address assigned to your tenant in the Resources Spreadsheet (172.21.251.X)

```
additionalParamsForVnf:
- member-vnf-index: 'orc8r'
  additionalParamsForKdu:
  - kdu_name: orc8r
    additionalParams:
      proxyserviceloadBalancerIP: '172.21.251.X' # MetalLB IP Address
```

# Launch again the NS

- Use the option *--config_file* to feed the instantiation parameters:

```
osm ns-create --ns_name magma_orc8r --nsd_name fb_magma_ns \
              --vim_account etsi-openstack-${HACKFEST_TENANT} \
              --config_file config_magma_orc8r.yaml
osm ns-list
```

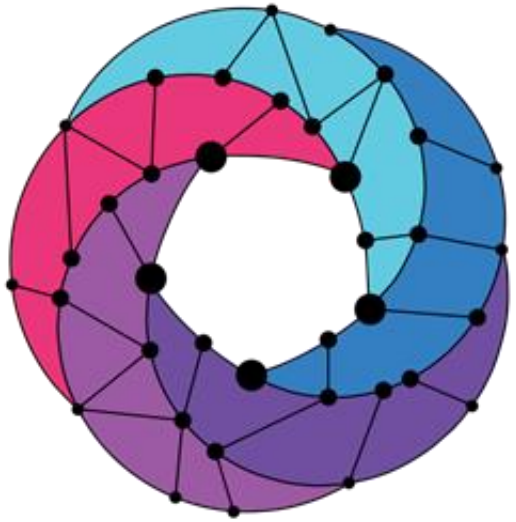
- Once ready, get the status of the KDU and check that the IP address was properly assigned

```
osm vnf-list --ns magma_orc8r
VNF_ID=`osm vnf-list --ns magma_orc8r |grep orc8r |awk '{print $2}'`
osm vnf-show $VNF_ID --kdu orc8r
osm vnf-show $VNF_ID --kdu orc8r|grep ^orc8r-proxy|grep LoadBalancer
```

# Finally terminate the NS to clean resources

- Delete the NS

```
osm ns-delete magma_orc8r
osm ns-list
```



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