OSM 7th Hackfest – Demo 0
OSM in action !
piotr.zuraniewski@tno.nl

TNO

- Dutch national research institute, ~3500 people, 9 Units

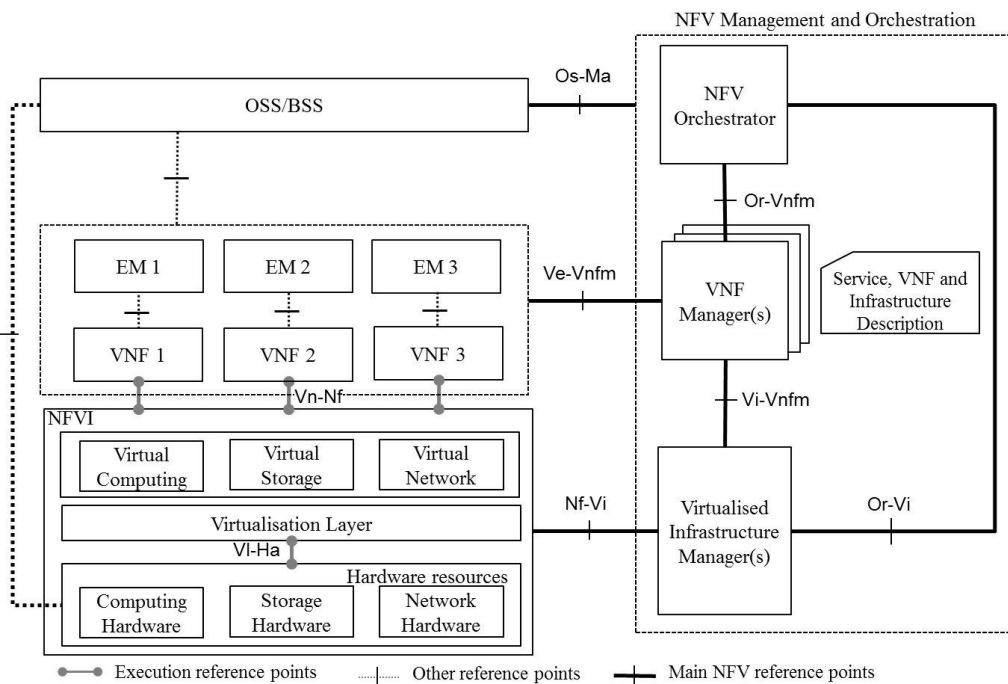- Connects business, academia and government for research and innovations
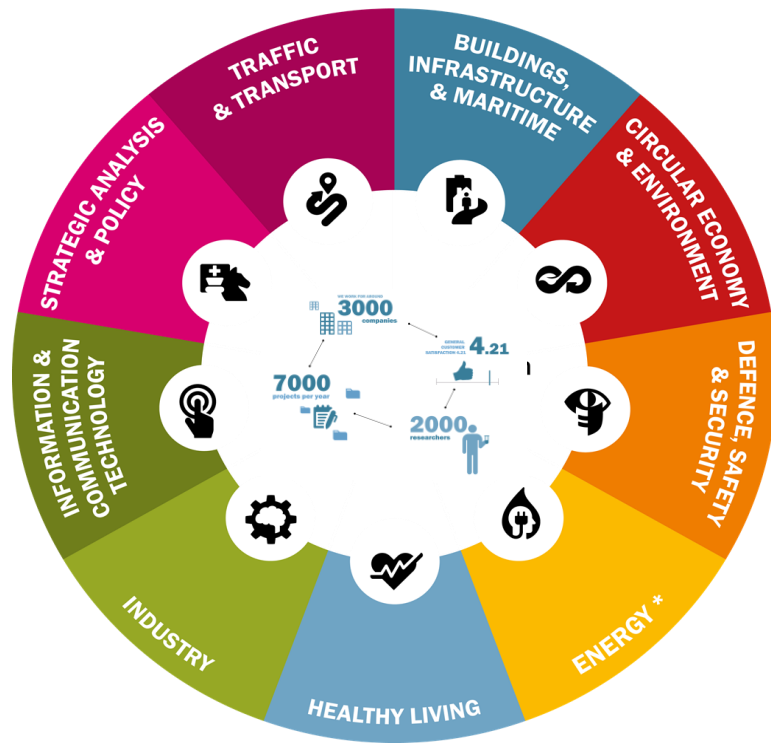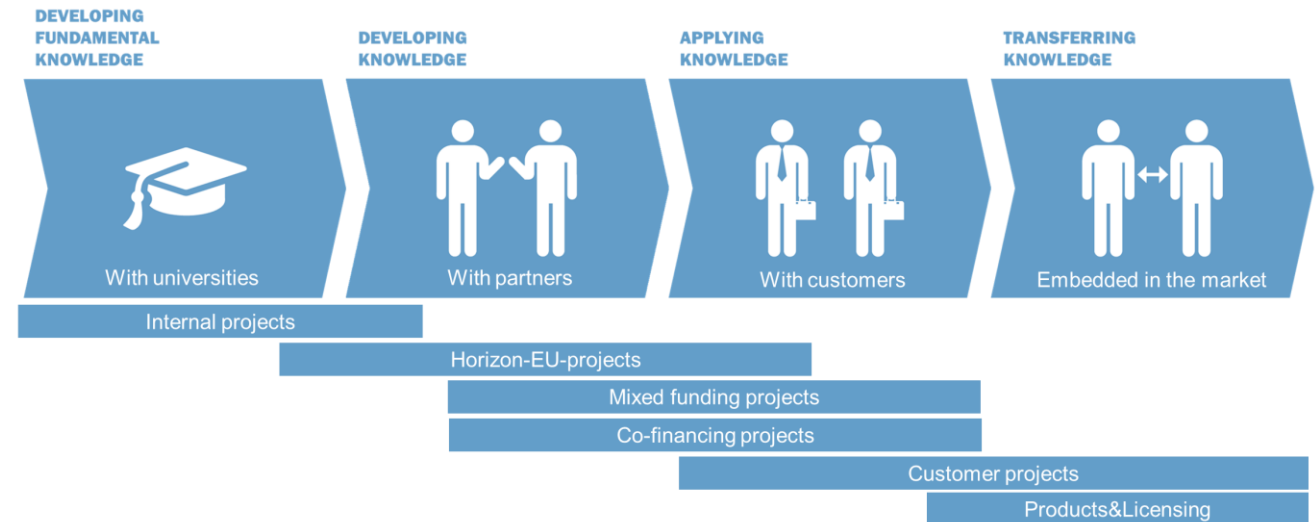
OSM in action !

- From standards and models to applications
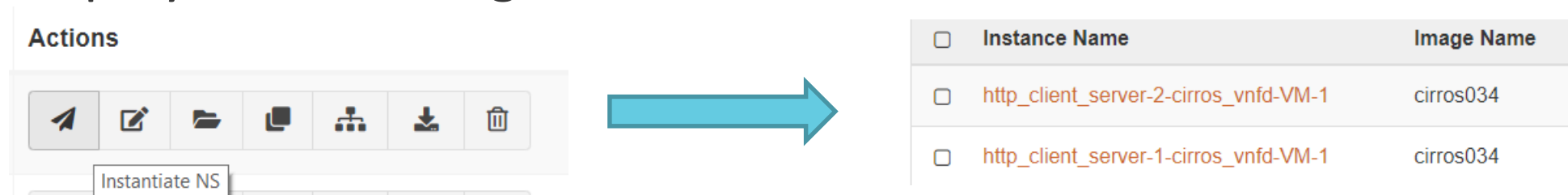 - Please note this is demo session, hands-on sessions will follow
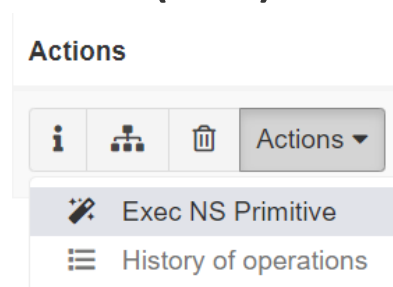
Design, deploy, operate – from one place

- OSM ambition: provide end-to-end solution for services:
  - Design: components, functions, constraints

```
memory-mb: 256
storage-gb: 2
vcpu-count: 2
```

client:1 switch:eth0 switch switch:eth0 server:2

  - Deploy: initial configuration and actual instantiation

Actions

Instantiate NS

	Instance Name	Image Name
☐	http_client_server-2-cirros_vnfd-VM-1	cirros034
☐	http_client_server-1-cirros_vnfd-VM-1	cirros034

 - Operate: run-time (re-)configuration

Actions

i ⊹ 🗑 Actions ▾

Exec NS Primitive
History of operations

Composition: VNFD

- VNFD – Virtual Network Function Descriptor
  - VNF ≈ Virtual Machine, performing certain function (e.g., HTTP server)
  - VNFs – building blocks of Network Service
  - Descriptor: VNF characteristics
    - CPU/memory/storage/network interfaces
    - Configuration script
    - Relations with other VNFs
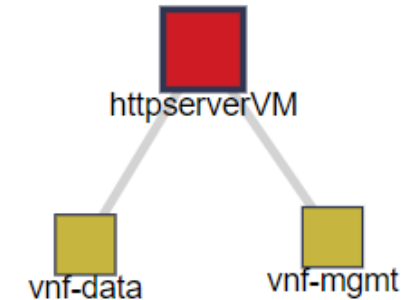
```
vm-flavor:
    memory-mb: '2048'
    storage-gb: '21'
    vcpu-count: '1'
```
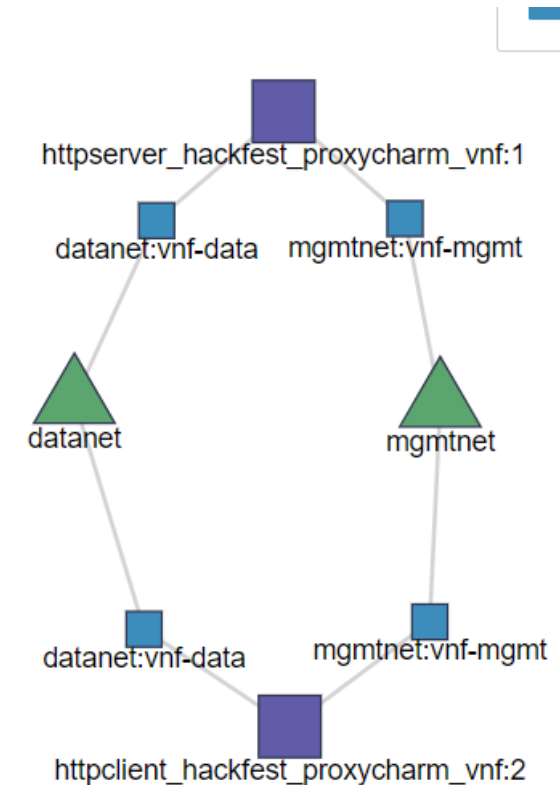
```
juju:
    charm: httpserver
```

```
cmd = ['sudo apt install webfs -y']
log('trying command')
log(cmd)
result, err = charms.sshproxy._run(cmd)
```

Composition: NSD

- ## NSD: Network Service Descriptor

  - ### Groups VNFs to provide service (e.g., HTTP server and HTTP client)

  - ### Provides topology information

  - ### Structured text file – fulfils Infrastructure-as-a-Code Principle

    - #### Versioning, sharing, reproducibility

httpserver_hackfest_proxycharm_vnf:1

datanet:vnf-data   mgmtnet:vnf-mgmt

datanet   mgmtnet

datanet:vnf-data   mgmtnet:vnf-mgmt

httpclient_hackfest_proxycharm_vnf:2

Instantiation

- Composed model in instantiated in cloud backend
  - Create VMs, create networks, configure VMs

- The same model good for Openstack, VMware, AWS, …

Configuration

- Instantiated VMs are configured and operated by *juju charms*

Actions: interaction with VNF

- Actions
  - Allow to expose certain operations
- Examples
  - Create new file on HTTP server
  - Stop HTTP server

Perform Action   ✕

Primitive: [touch]   **VNF Member index:**   [1]

Primitive parameters :

Name: [filename]   **Value:**   [/var/www/html/bye] [+]

[Cancel]   [Execute]

```
access         user       group      date               size  name

-rw-rw-r--     ubuntu     ubuntu     Sep 07 17:20       0  B  bye
-rw-rw-r--     ubuntu     ubuntu     Sep 07 16:45       0  B  hi


webfs/1.21    07/Sep/2019 17:21:32 GMT
```

Advanced service deployment

- Service for experimenting with 6DOF VR video...

- ...running on top of Fraunhofer Open5GCore

- ...with emulated eNB and emulated UE
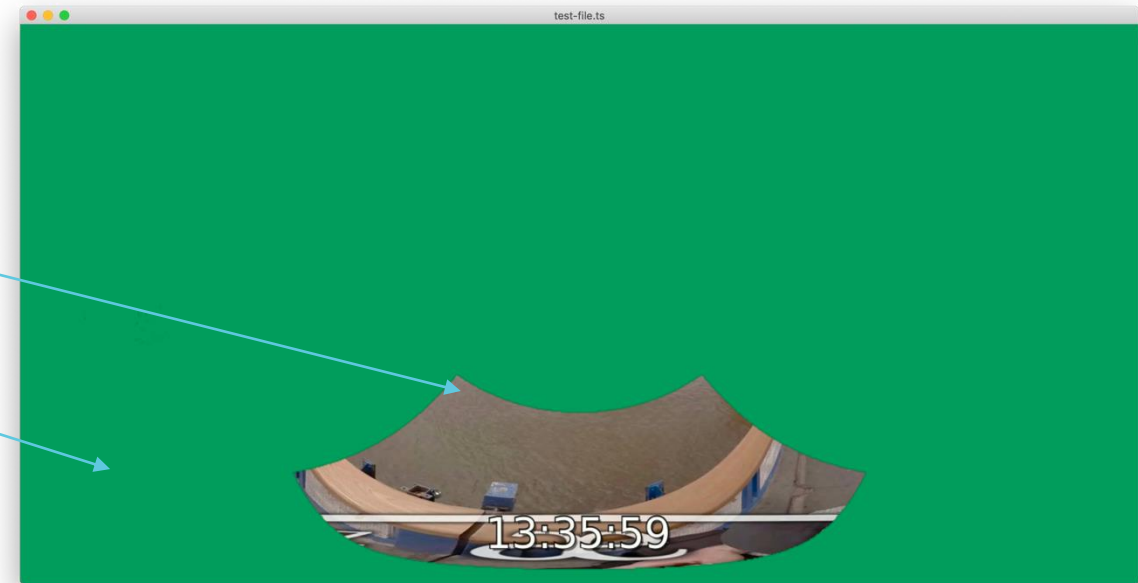
- Outcome of TNO activities in:

    - 5Groningen Project

    - OSM PoC#4 (w/Canonical)
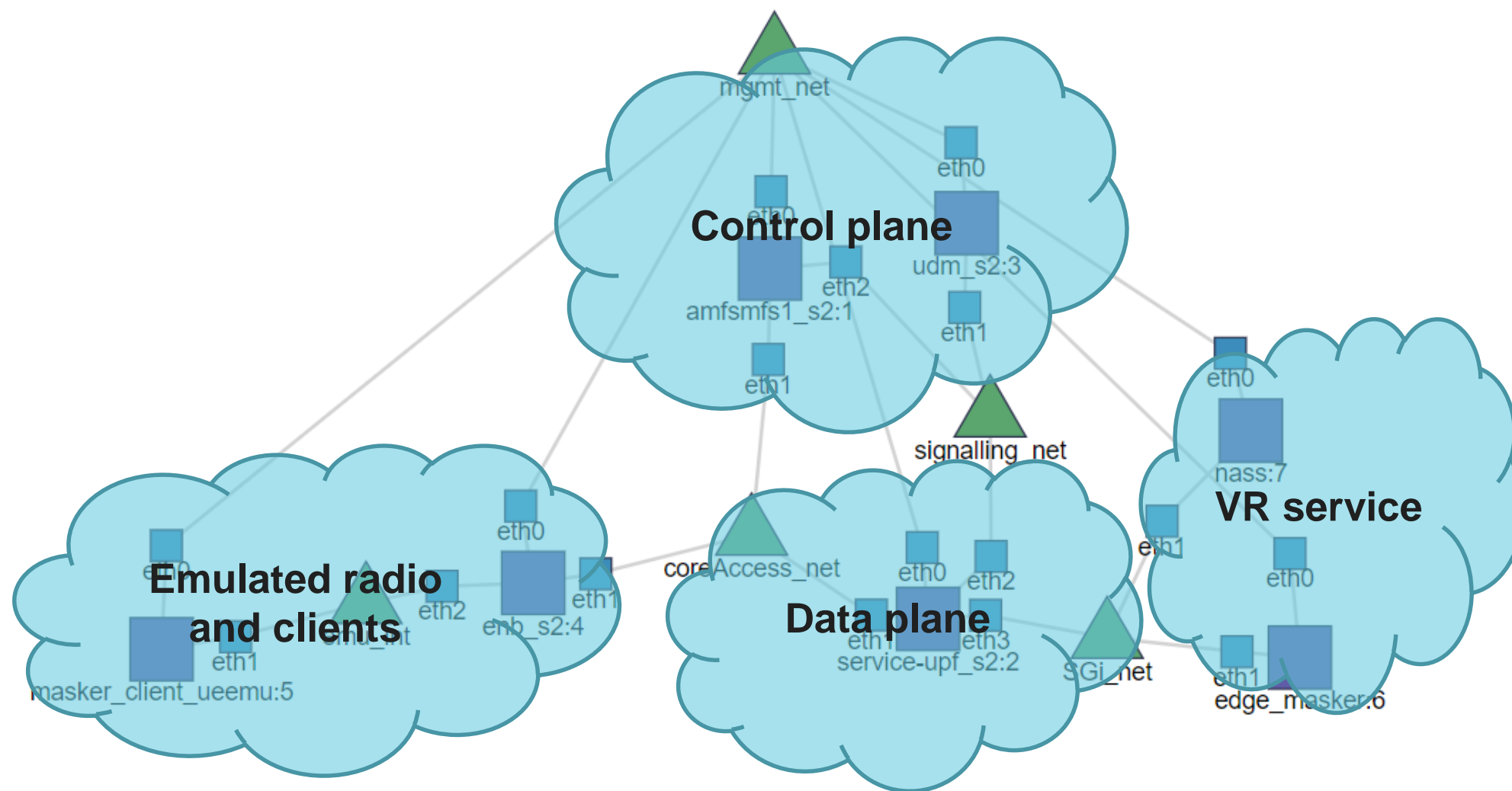
    - H2020 5GINFIRE 5GMedia Vertical

5G Edge Masker

- 6DOF VR – bandwidth hungry and delay sensitive

- Instead of sending full spherical video, send only interesting part and mask the rest

- If delay is too large, ask network to switch to faster path

VR over 5G NSD

App and relations

- Deployed service consists of several apps
  - 5G specific
  - Media specific

- Model describes *relations* between apps
  - eNB provides connection parapeters to UE etc.

```
App                     Version   Status   Scale   Charm
amfsmfs1                          active    1      amfsmfs1
enbemu                            active    1      enbemu
masker                            active    1      masker
masker-client-ueemu               active    1      masker-client-ueemu
nass                              active    1      nass
service-upf                       active    1      service-upf
udm                               active    1      udm
```

```
Relation provider       Requirer                        Interface          Type
amfsmfs1:enb            enbemu:mme                       s1mme              regular
amfsmfs1:switch         service-upf:controller           openflow           regular
enbemu:ue               masker-client-ueemu:enb          lte_uu_emu         regular
masker:masker_client    masker-client-ueemu:masker       ip_port_exchange   regular
nass:camera             masker-client-ueemu:nass         ip_port_exchange   regular
service-upf:service     masker:router                    ip_port_exchange   regular
service-upf:service     nass:router                      ip_port_exchange   regular
udm:aaa-client          amfsmfs1:aaa-server              diameter           regular
```

Summary

- Welcome to OSM !

- After this week you will be able to develop basic network service

- Join the community (it's "free" as "free lunch" and "free speech")
  - OP, DEV, PoC, spread the word,…
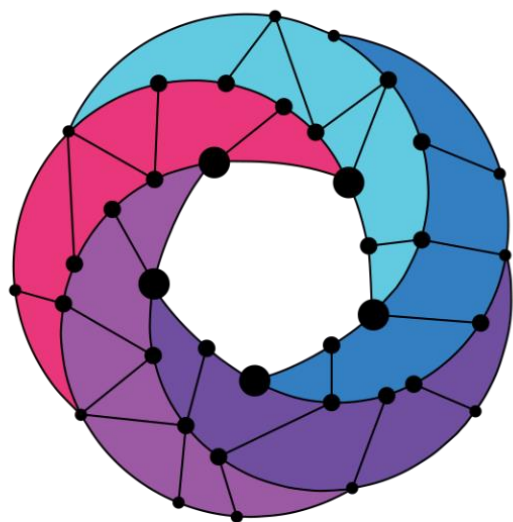
Find us at:

osm.etsi.org
osm.etsi.org/wikipub