

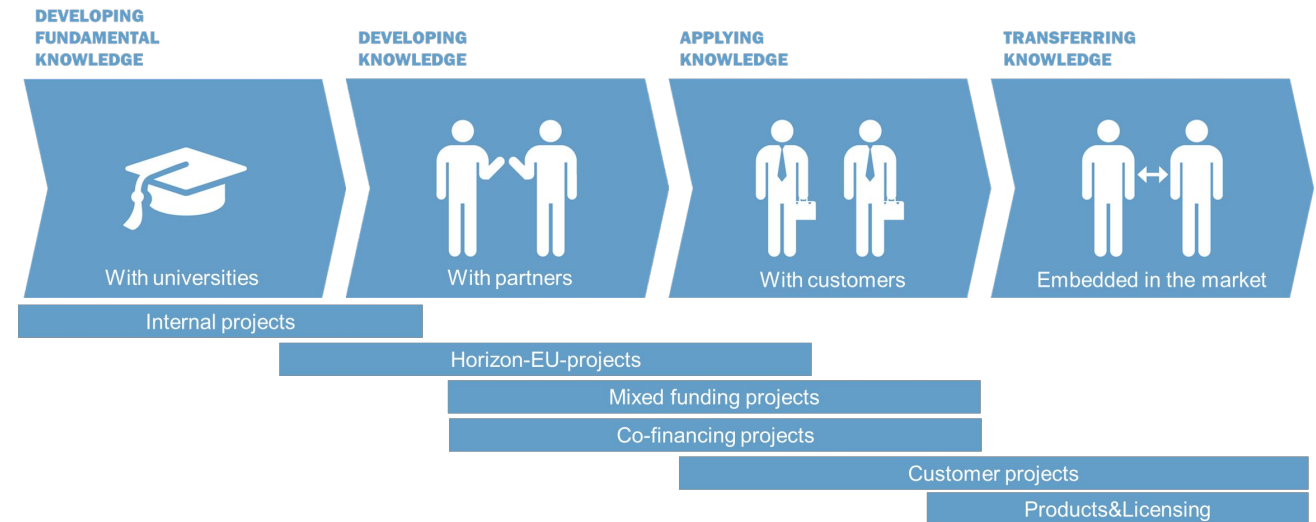
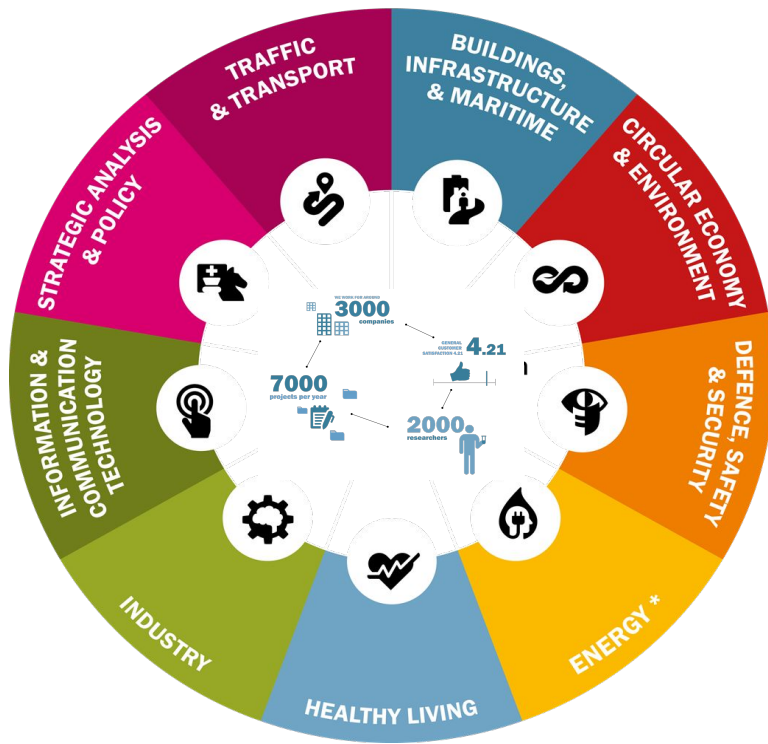
Open Source
MANO

8th OSM Hackfest
Demo 0 - OSM in action !

piotr.zuraniewski@tno.nl

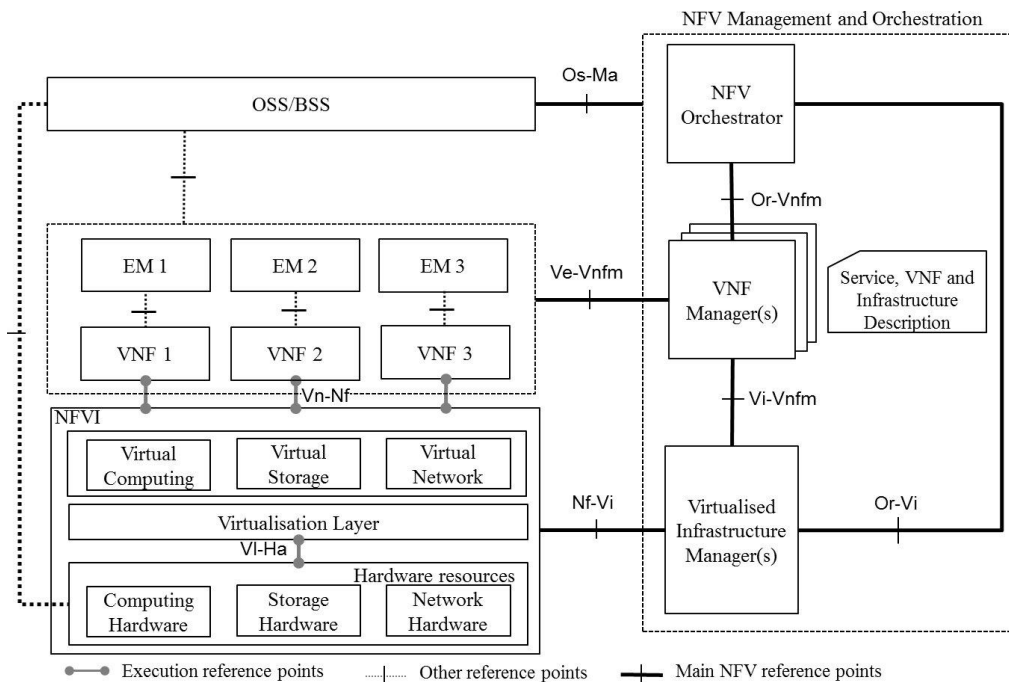
- Dutch national research institute, ~3500 people, 9 Units
- Connects business, academia and government for research and innovations

TNO innovation
for life



OSM in action !

- From standards and models to applications
- Please note this is demo session, hands-on sessions will follow



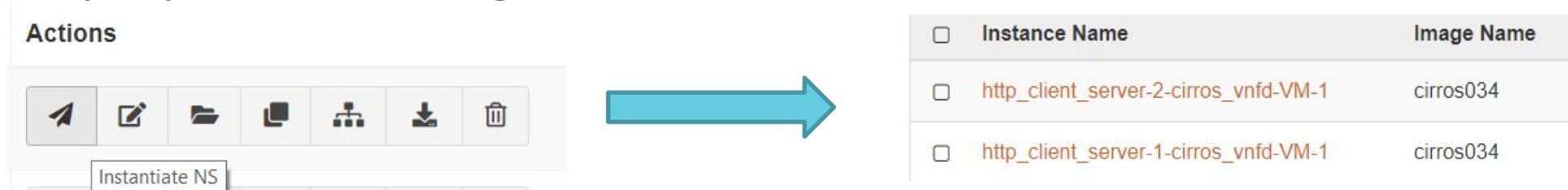
Design, deploy, operate – from one place

- OSM ambition: provide end-to-end solution for services:

- Design: components, functions, constraints



- Deploy: initial configuration and actual instantiation

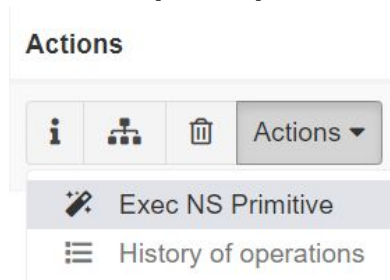


Actions

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



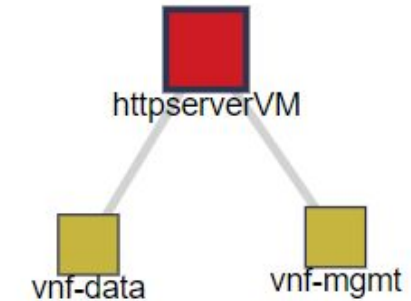
Actions

Exec NS Primitive

History of operations

Composition: VNFD

- VNFD – Virtual Network Function Descriptor
 - VNF \approx 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



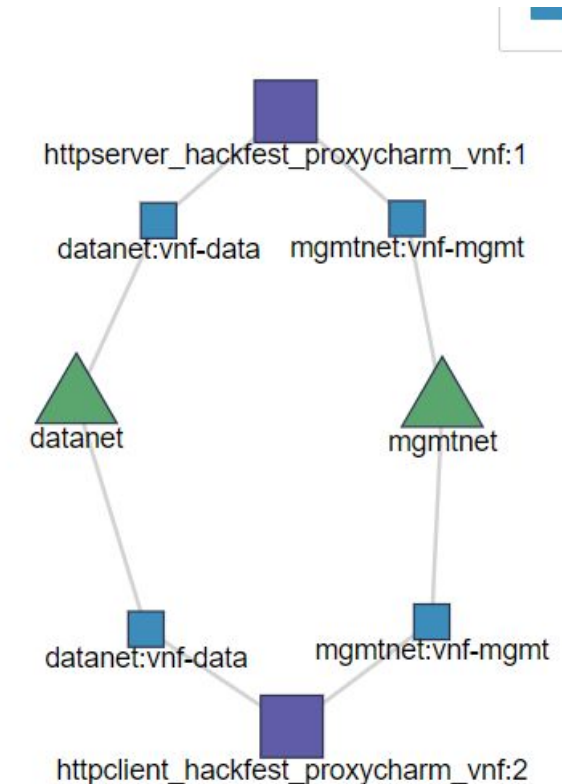
vm-flavor:
memory-mb: '2048'
storage-gb: '21'
vcpu-count: '1'

juju:
charm: httpserver



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


- 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



Instantiation

- Composed model is instantiated in cloud backend
 - Create VMs, create networks, configure VMs
- The same model is good for Openstack, VMware, AWS, ...

New Instance

Name * http_client_server

Description * http_client_server

Nsd Id * httpserver_httpclient_nsd

Vim Account Id * openstack2-CloudHi5

Create



☐ http_client_server-2-httpclientVM-1

Ubuntu 16.04.6
LTS

☐ http_client_server-1-httpserverVM-1

Ubuntu 16.04.6
LTS

Configuration

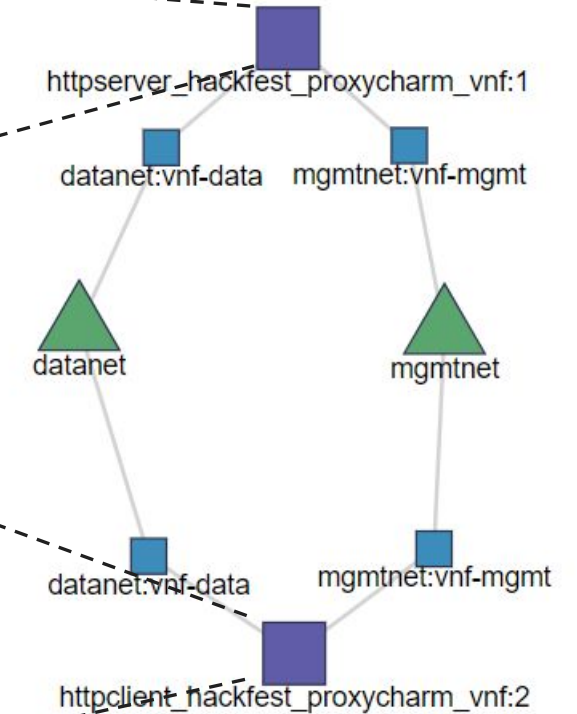
- Instantiated VMs are configured and operated by *juju charms*

```
ubuntu@http-client-server-1-httpservervm-1:~$ sudo  
● webfs.service - LSB: Webfs simple HTTP server  
   Loaded: loaded (/etc/init.d/webfs; bad; vendor  
   Active: active (running) since Sat 2019-09-07 1  
   Docs: man:systemd-sysv-generator(8)
```

```
lynx 192.168.177.7:8000
```

access	user	group	date	size	name
-rw-rw-r--	ubuntu	ubuntu	Sep 07 16:45	0 B	hi

webfs/1.21 07/Sep/2019 16:52:19 GMT



Actions: interaction with VNF

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

Perform Action ×

Primitive: VNF Member index:

Primitive parameters :

Name: Value:

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:

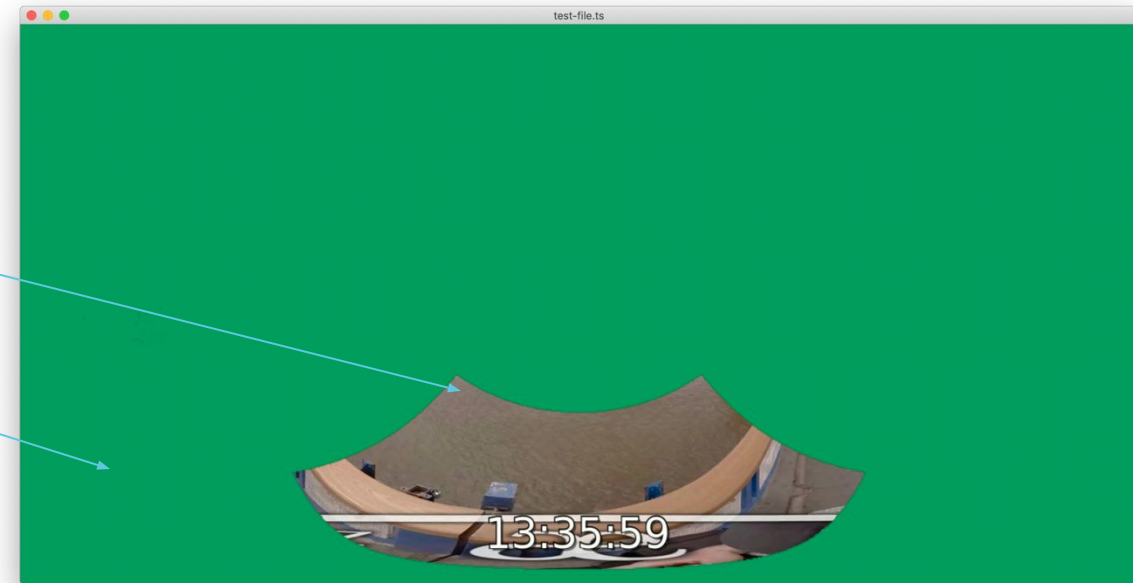


- 5Groningen Project
- OSM PoC#4 (w/Canonical)
- H2020 5GINFIRE 5GMedia Vertical

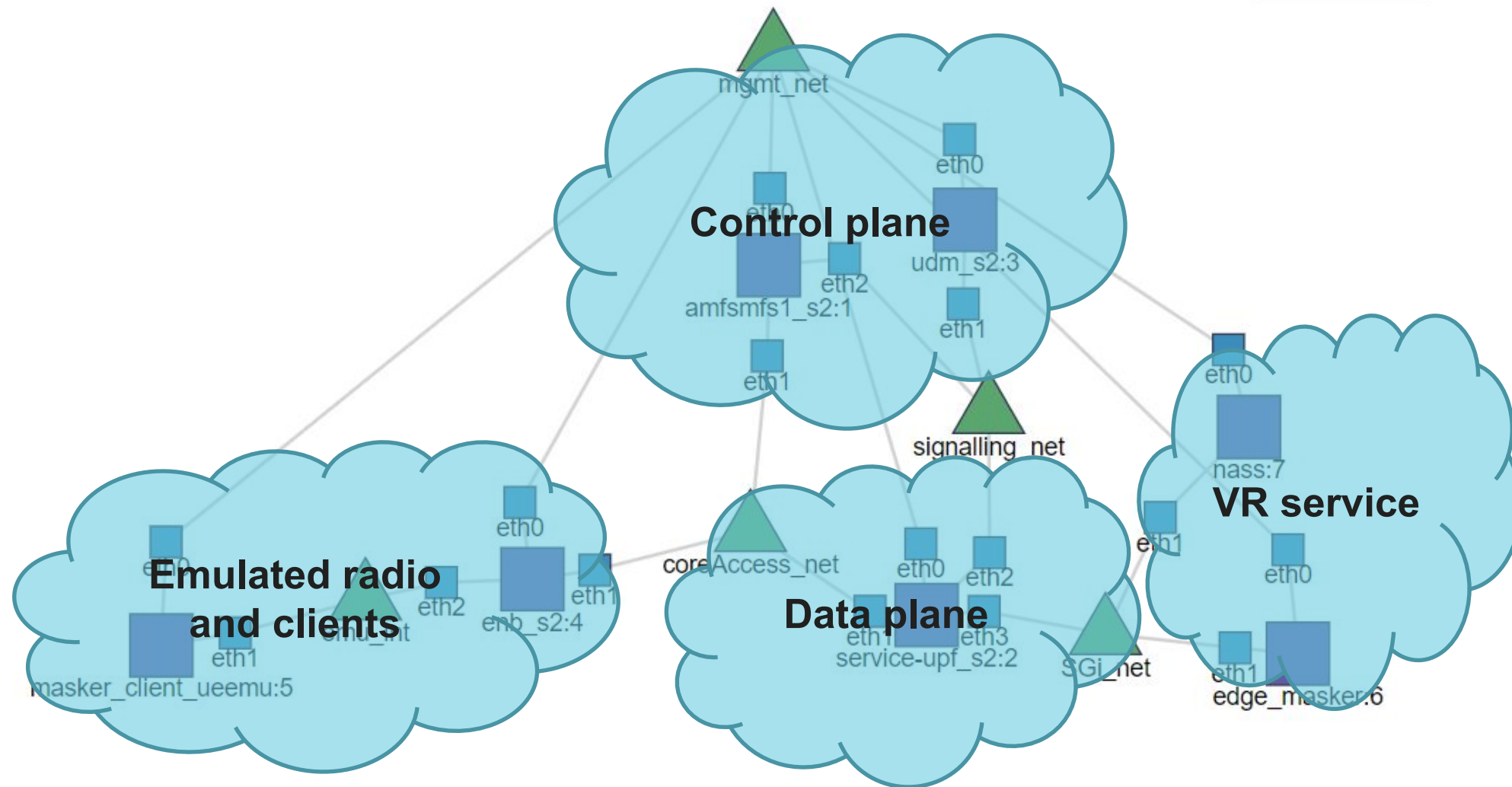


5G Edge Masker

- 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



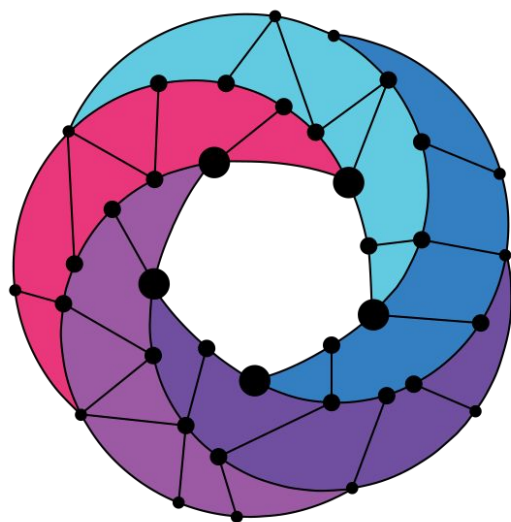
App and relations

- Deployed service consists of several apps
 - 5G specific
 - Media specific
- Model describes *relations* between apps
 - eNB provides connection parameters 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	slmme	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

- Welcome to OSM !
- After this week you will be able to develop a basic network service
- Join the community (it's “free” as “free lunch” and “free speech”)
 - OP, DEV, PoC, spread the word,...



Open Source MANO

Find us at:

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