



COMAC-in-a-Box Tutorial

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COMAC-in-a-Box?

- A functional COMAC pod capable of E2E test
- Made for helping developers and users who want to work with or try out COMAC without requiring any special HW
- Requires
 - A physical server or VM (tested on AWS EC2, Google Cloud, DigitalOcean)
 - 4 cores and 8GB RAM or higher recommended
 - Intel Haswell CPUs or newer
 - Kernel version 4.15 or later
 - Tested on Ubuntu 16.04 and 18.04

How to install? Easy!

```
$ git clone https://gerrit.opencord.org/automation-tools  
$ cd automation-tools/comac-in-a-box  
$ make
```

Installation Procedure

- Install Kubernetes
- Install cord-platform & comac-platform
- Set up fabric
- Install OMEC
- Install OpenAirInterface emulator

Let's Start!

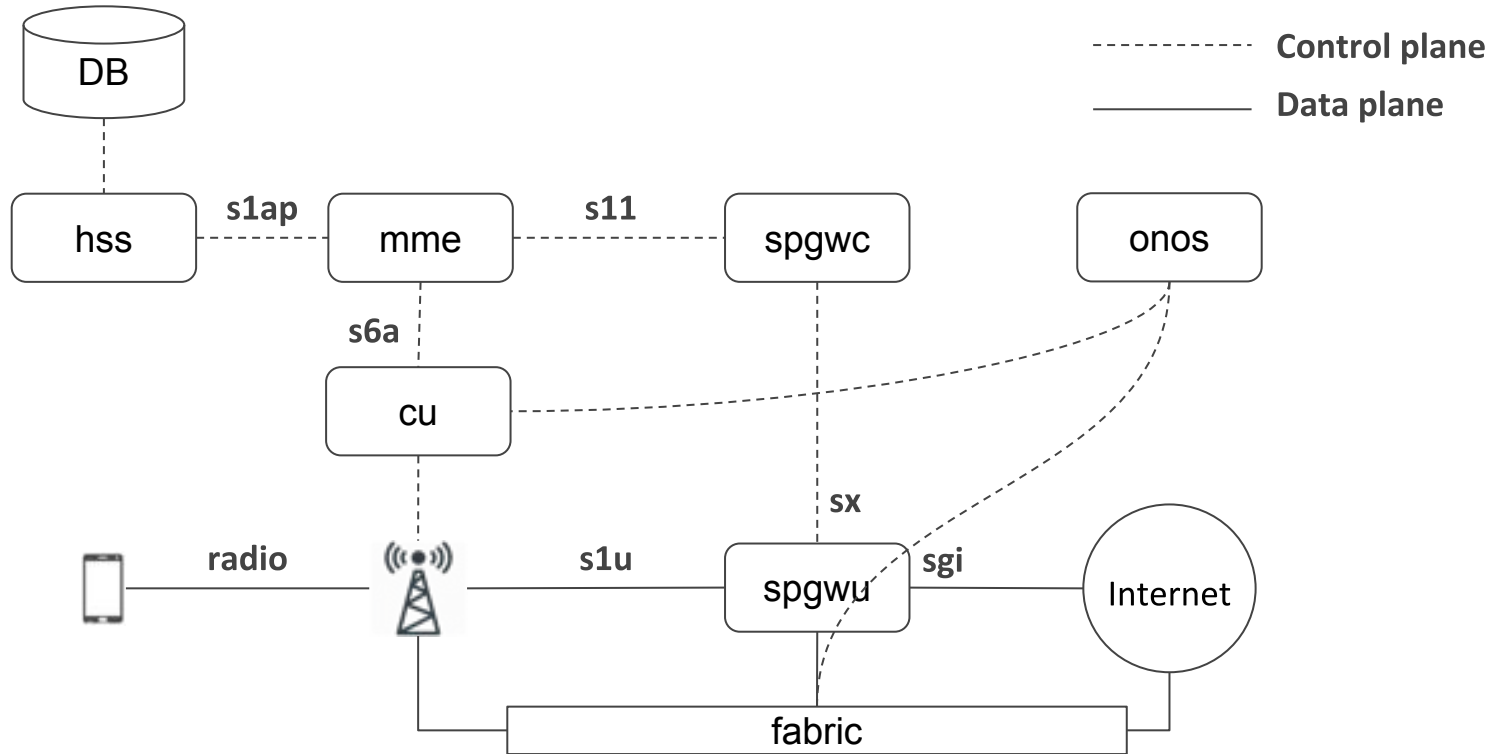
```
$ git clone https://gerrit.opencord.org/automation-tools
$ cd automation-tools/comac-in-a-box
$ export LC_ALL="en_US.UTF-8"
$ export M=/tmp/build/milestone
```

```
$ make $M/k8s-ready
```

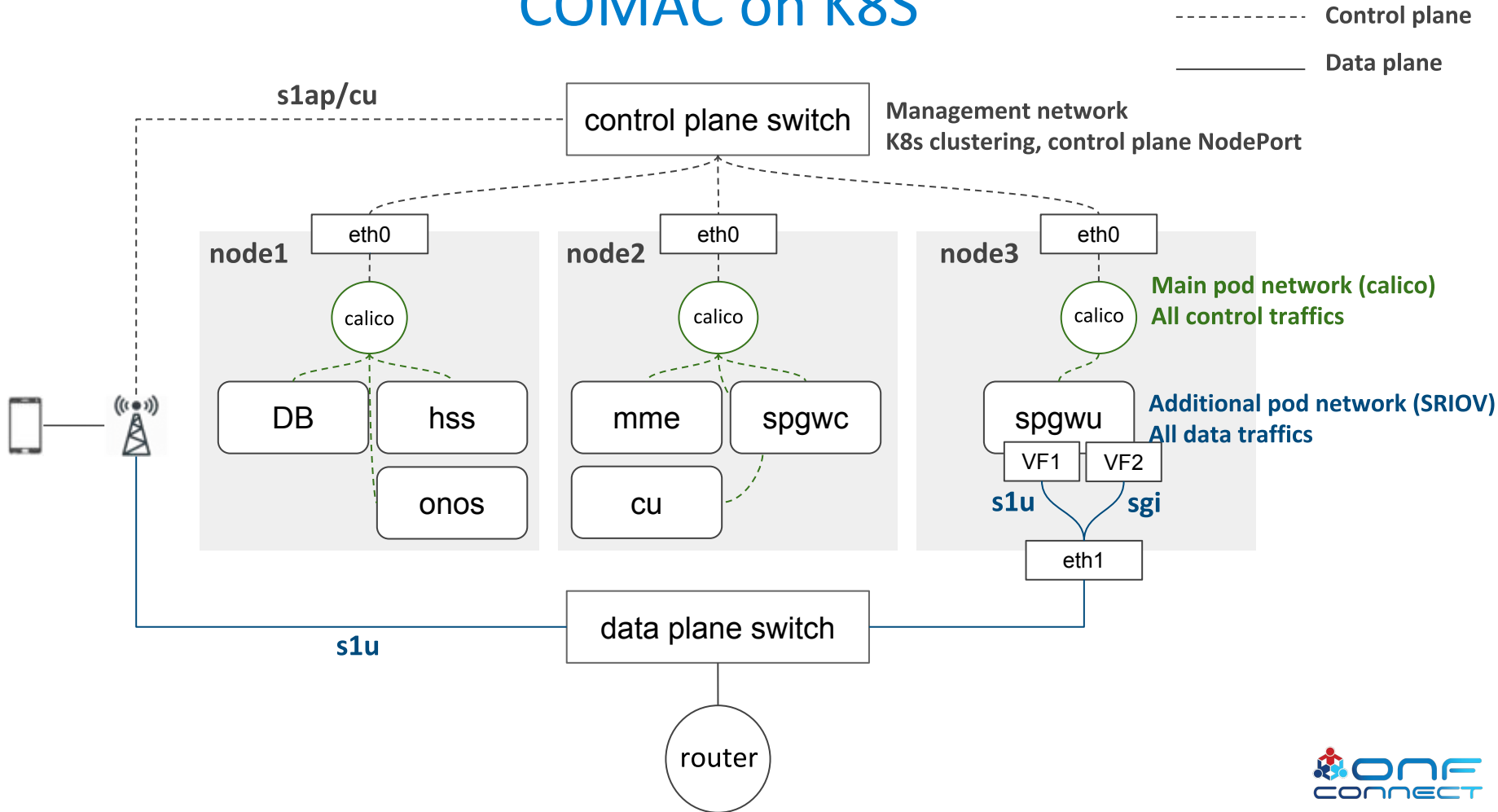
```
# it takes about 10 min.
```

```
# let's see how CiaB works
```

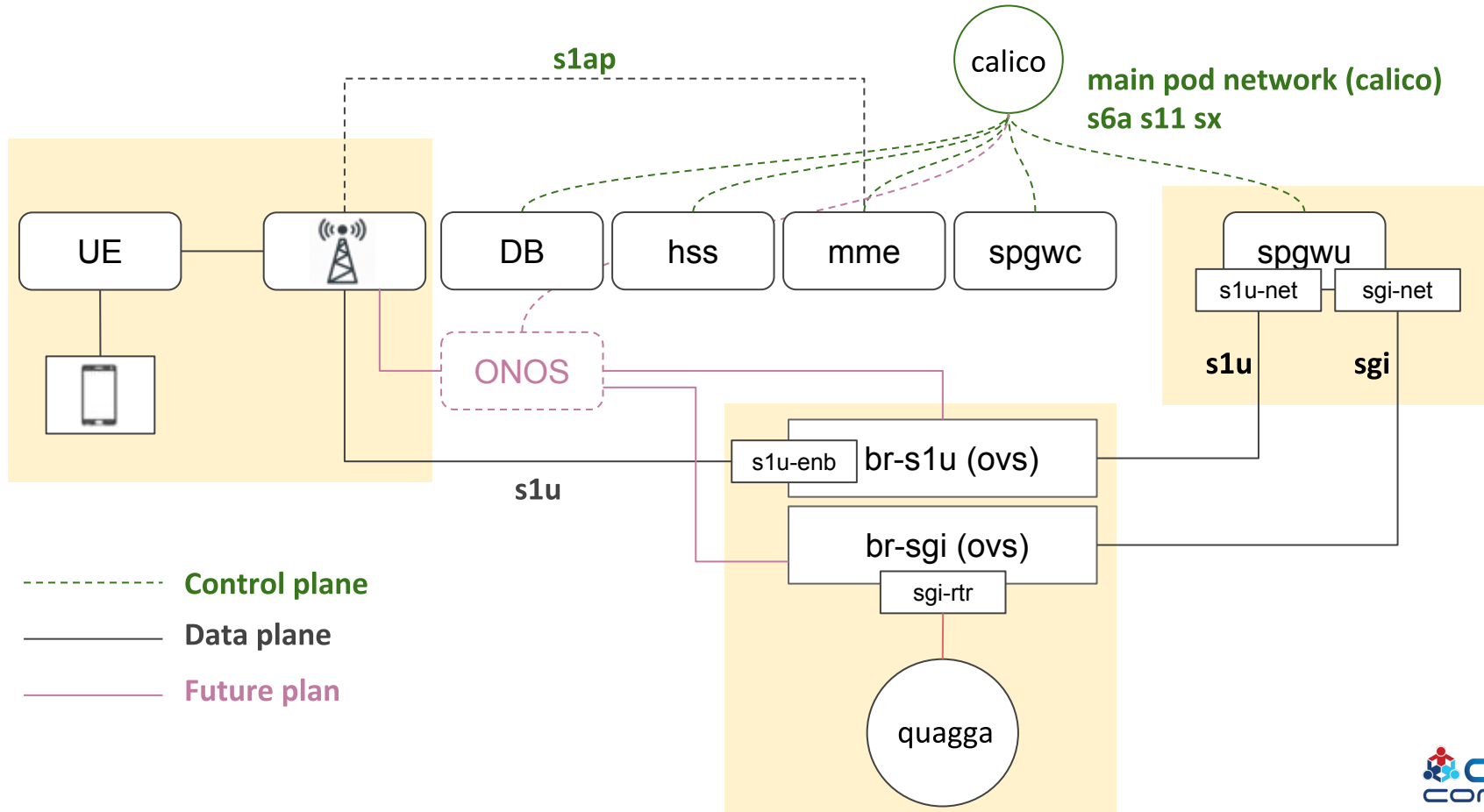
COMAC architecture today



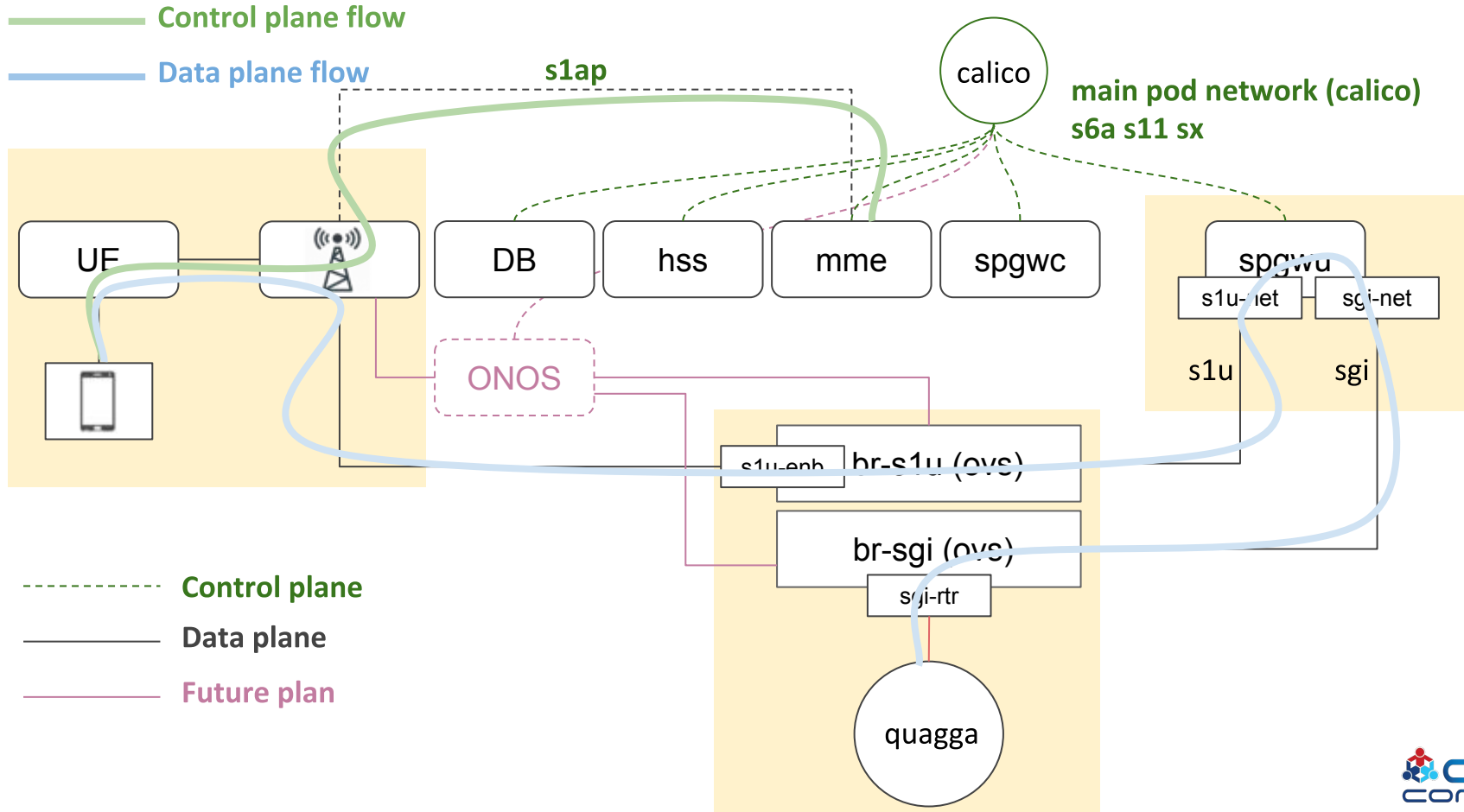
COMAC on K8S



COMAC-in-a-Box architecture



COMAC-in-a-Box architecture



```
$ make $M/helm-ready
```

```
$ helm repo list
```

```
$ make $M/cord-platform
```

```
# cord-platform components
```

- NEM: XOS
- Message Broker: Kafka
- Monitoring: Grafana, Prometheus, KPI exporter
- Logging: Logstash, Elasticsearch, Kibana
- Controller: ONOS

\$ make \$M/comac-platform

Check COMAC platform in XOS UI

- Service graph
- COMAC profiles
 - Fabric, Kubernetes, M-CORD, ONOS, vRouter

```
$ make /opt/cni/bin/simpleovs
```

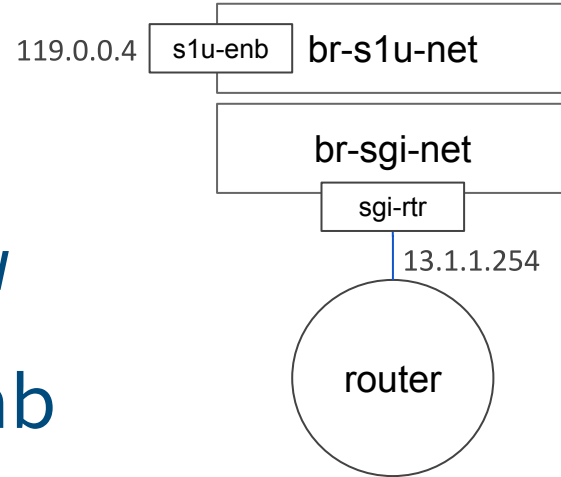
```
$ make /opt/cni/bin/static
```

```
$ make $M/fabric
```

```
$ sudo ovs-vsctl show
```

```
$ ip addr show s1u-enb
```

```
$ kubectl exec router ip addr show
```



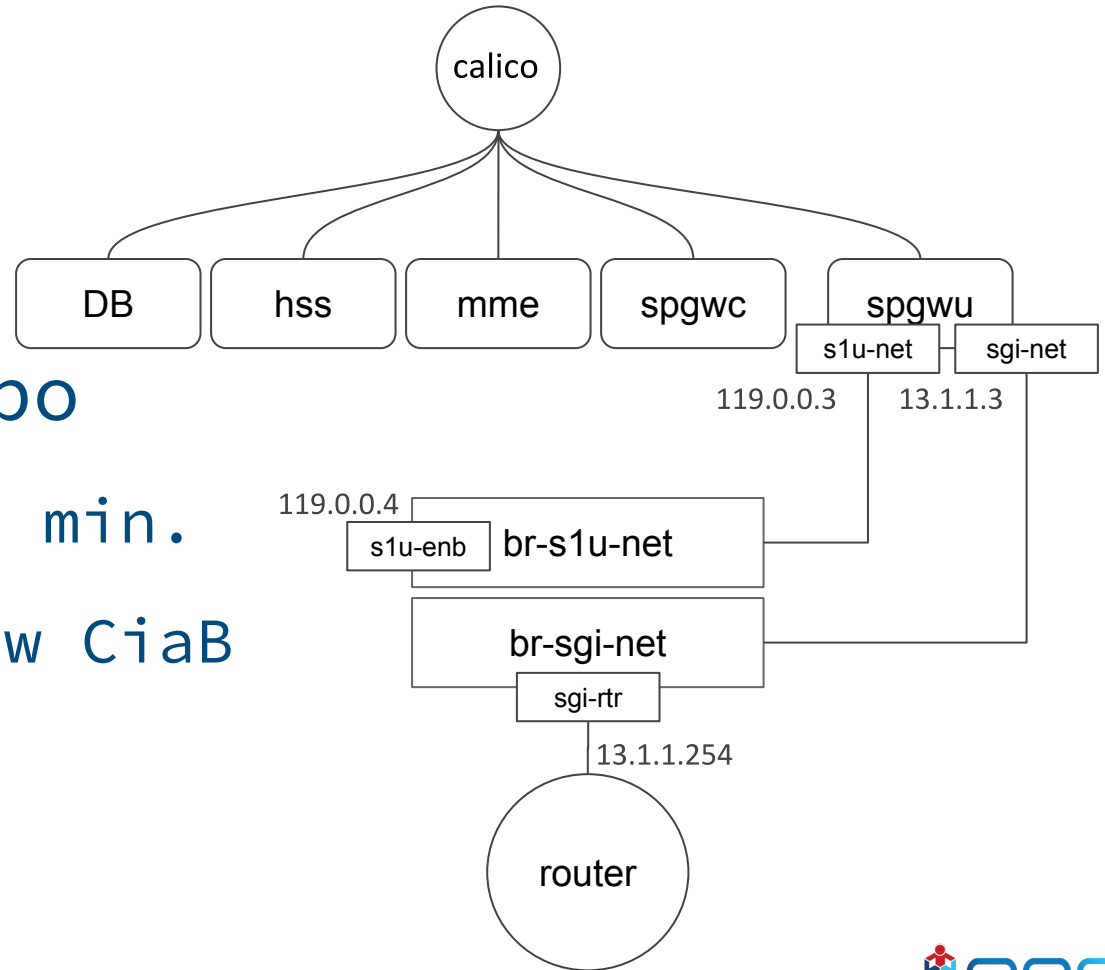
\$ make \$M/omec

\$ kubectl get po

it takes about 3 min.

let's look at how CiaB

implemented



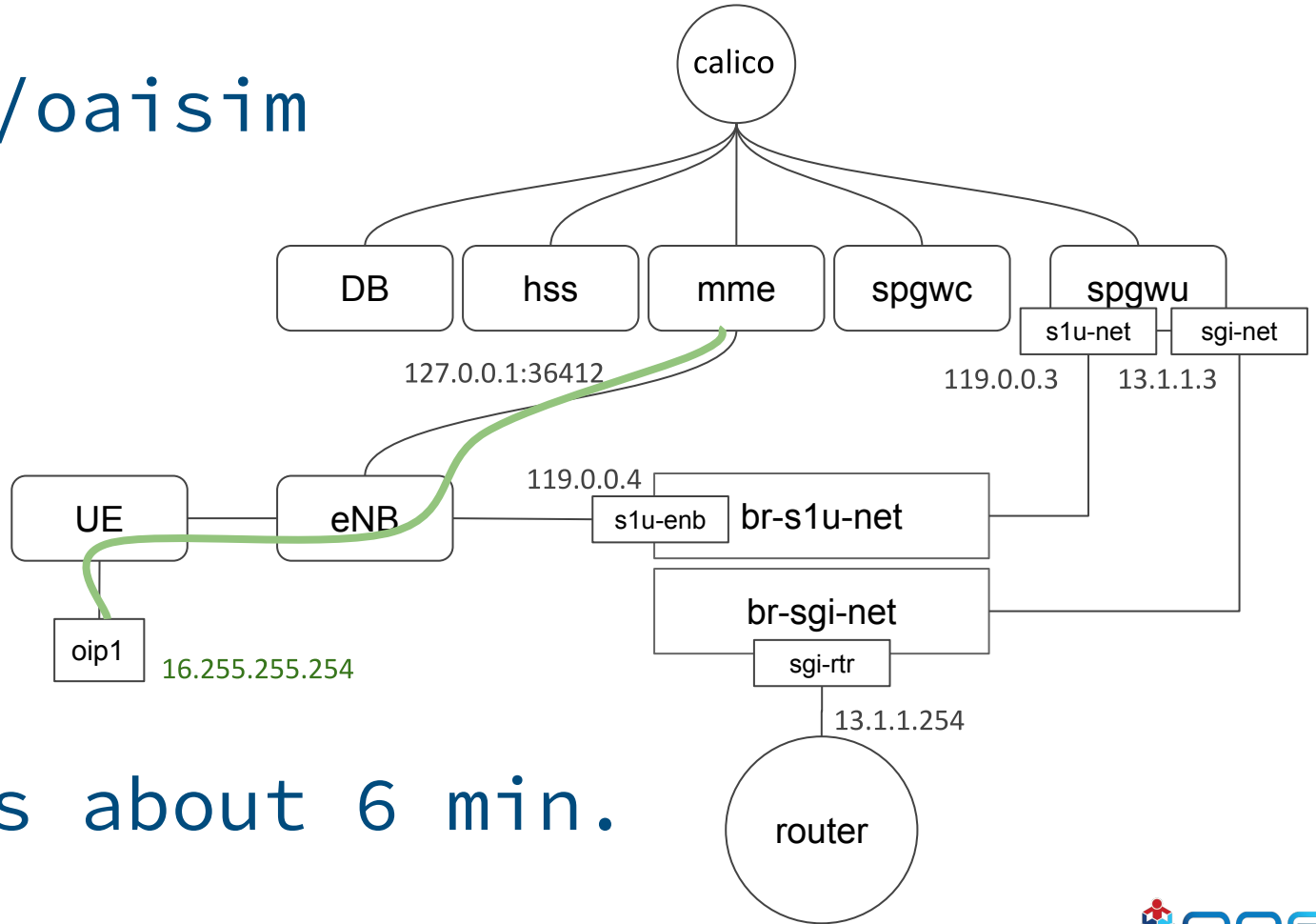
COMAC-in-a-Box Implementation

Makefile

Resources

comac-in-a-box-values.yaml

\$ make \$M/oaisim



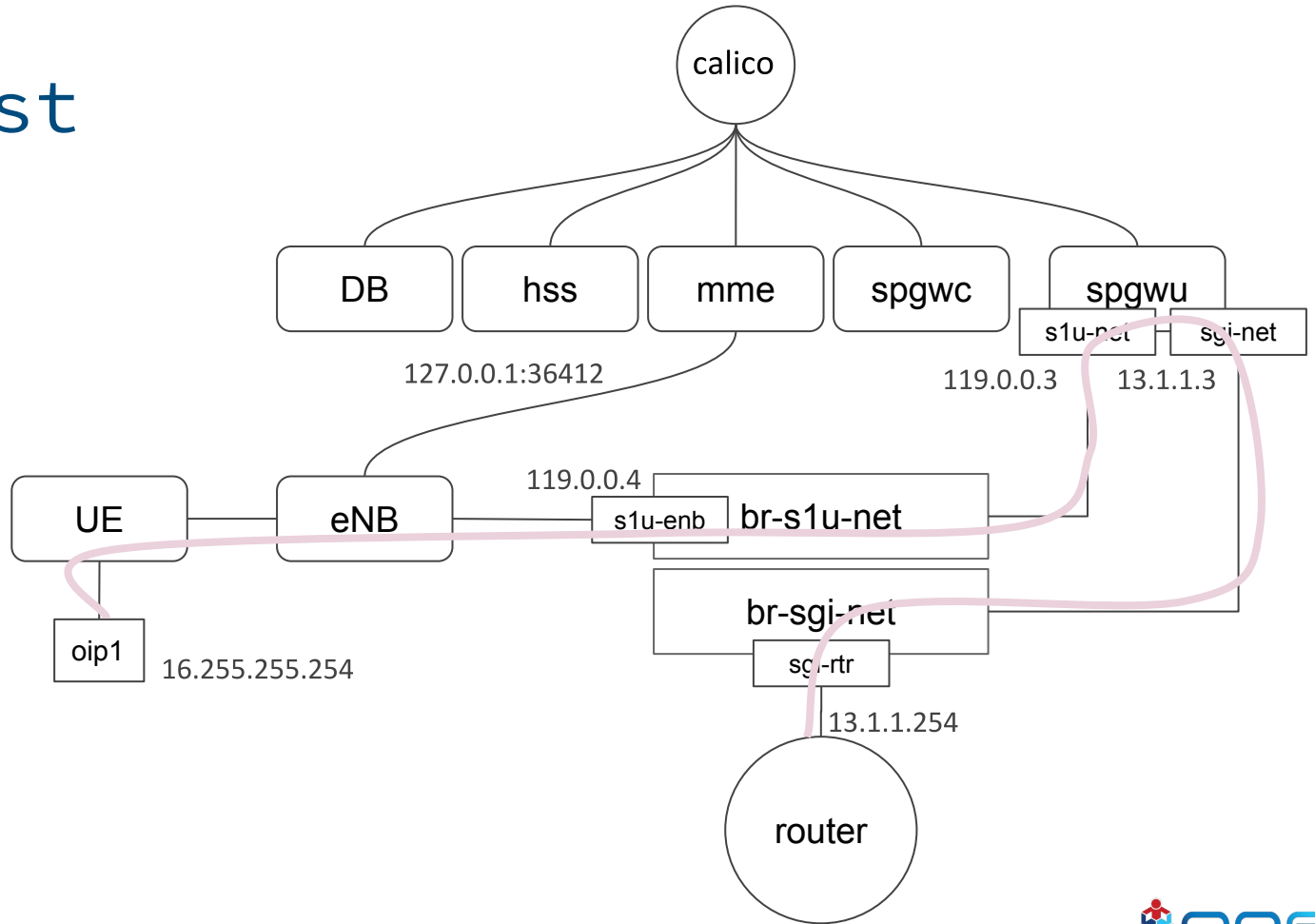
it takes about 6 min.

CORD/COMAC Platform

Major parts of cord-platform

- NEM: *http://{node_ip}:30001*
 - User: admin@opencord.org
 - Password: letmein
- Monitoring: *http://{node_ip}:31300*
 - User: admin
 - Password: strongpassword
- Logging: *http://{node_ip}:30601*

\$ make test



Future Works

- Integrate SEBA
- Add support of multiple UEs and eNBs
- Better containerization of OAI emulators
 - Remove use of ue_ip kernel module
 - Use isolated network namespaces
- SDN-RAN support



Thank You

Follow Up Links:

<https://guide.opencord.org>