Tutorial Programming The Platform

Berlin

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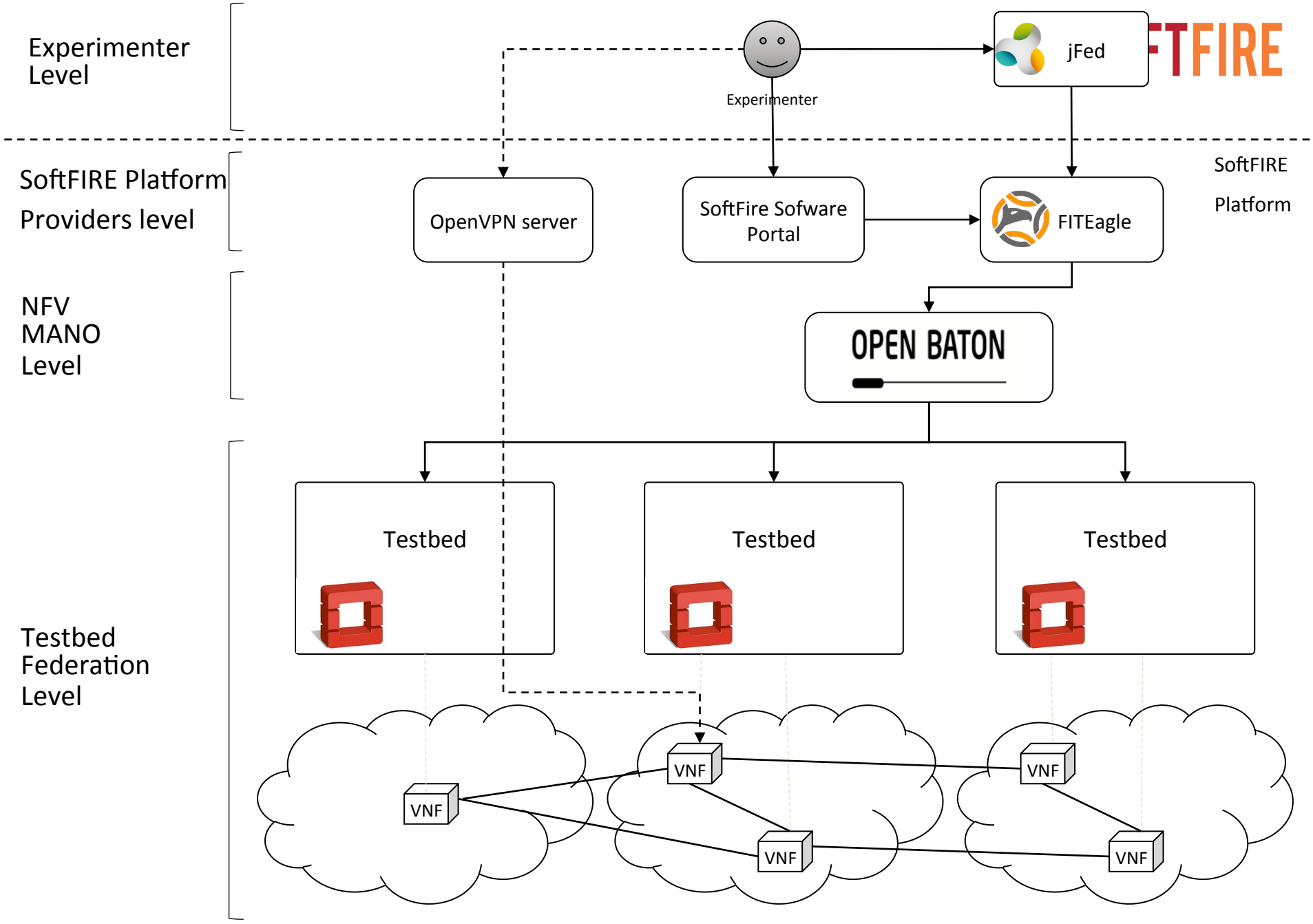
Agenda

- The SoftFIRE architecture
- Experiment lifecycle
  - Access to the federated testbed
  - Design and Programming
  - The MongoDB example
  - Discovery and Allocation of resources
  - Running and troubleshooting the experiment


Experimenter Level
Experimenter
jFed
FTFIRE
SoftFIRE Platform Providers level
SoftFIRE Platform
OpenVPN server
SoftFire Sofware Portal
FITEagle
NFV MANO Level
OPEN BATON
Testbed Federation Level
Testbed
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Testbed
VNF
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VNF

Experiment Lifecycle

- ❑Access to the federated testbed
- ❑Design and Programming
- ❑Discovery and Allocation of resources
- ❑Running and troubleshooting the experiment

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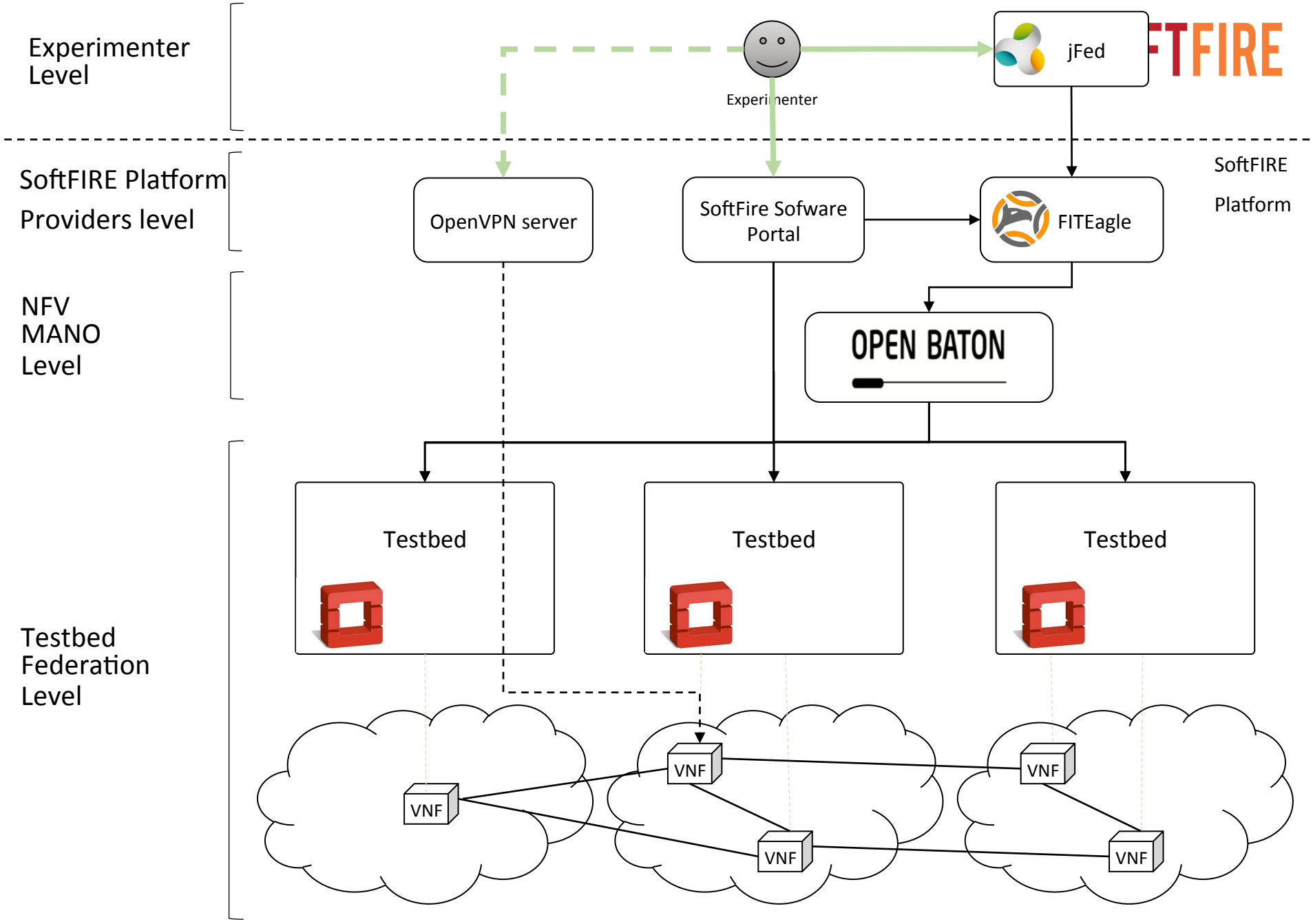
Access to the Federated Testbed

- The experimenters will receive
  - Username and password for the SSP
    - The same credential used to access the web portal
  - Certificate to access the SoftFIRE VPN
  - The same certificate and a new password for log in to jFed and discover the resources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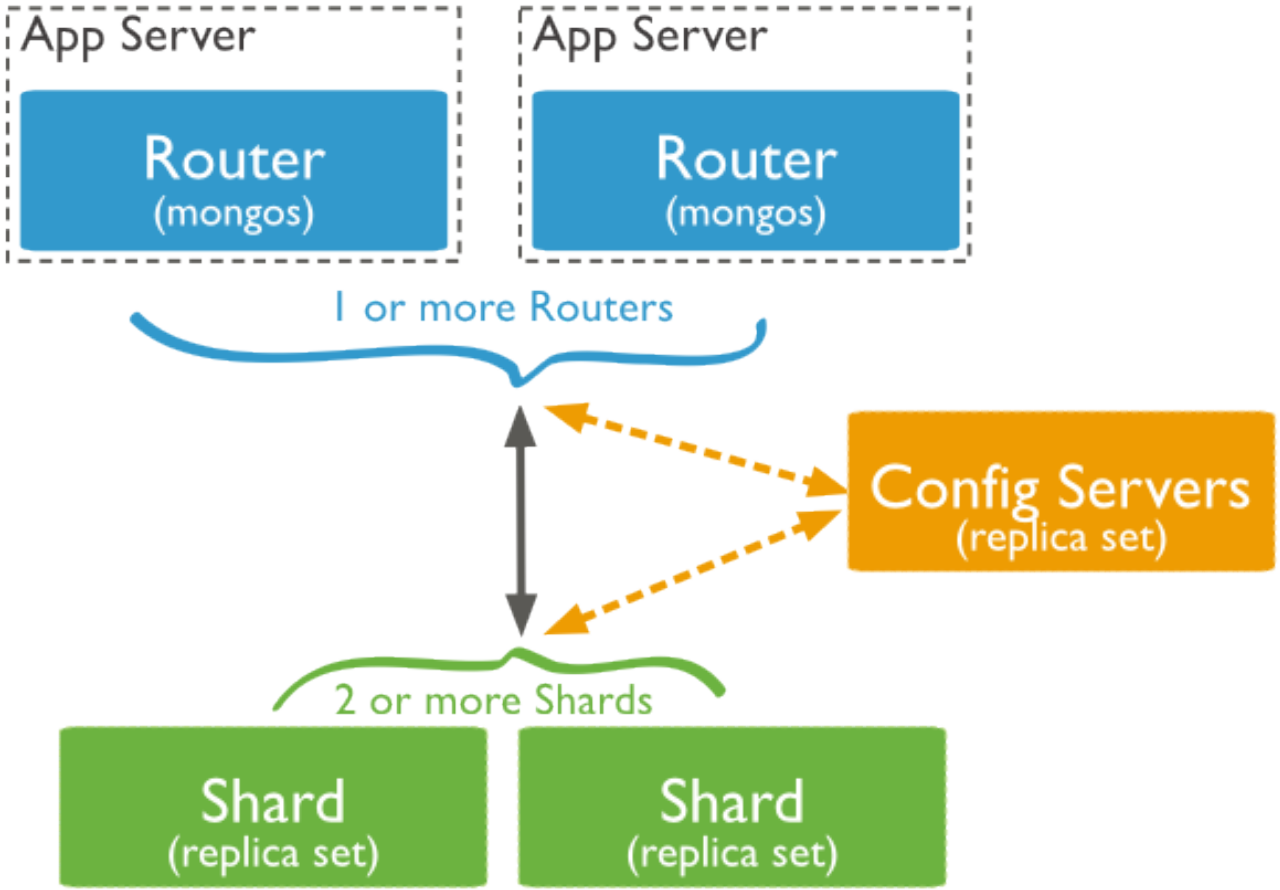
Design and Programming

1. Design the cloud solution
    1. How many VNF will I need?
    2. What requirements has each VNF?
    3. How are they connected?
    4. What requires each VNF from other VNFs?

MongoDB Sharded Cluster



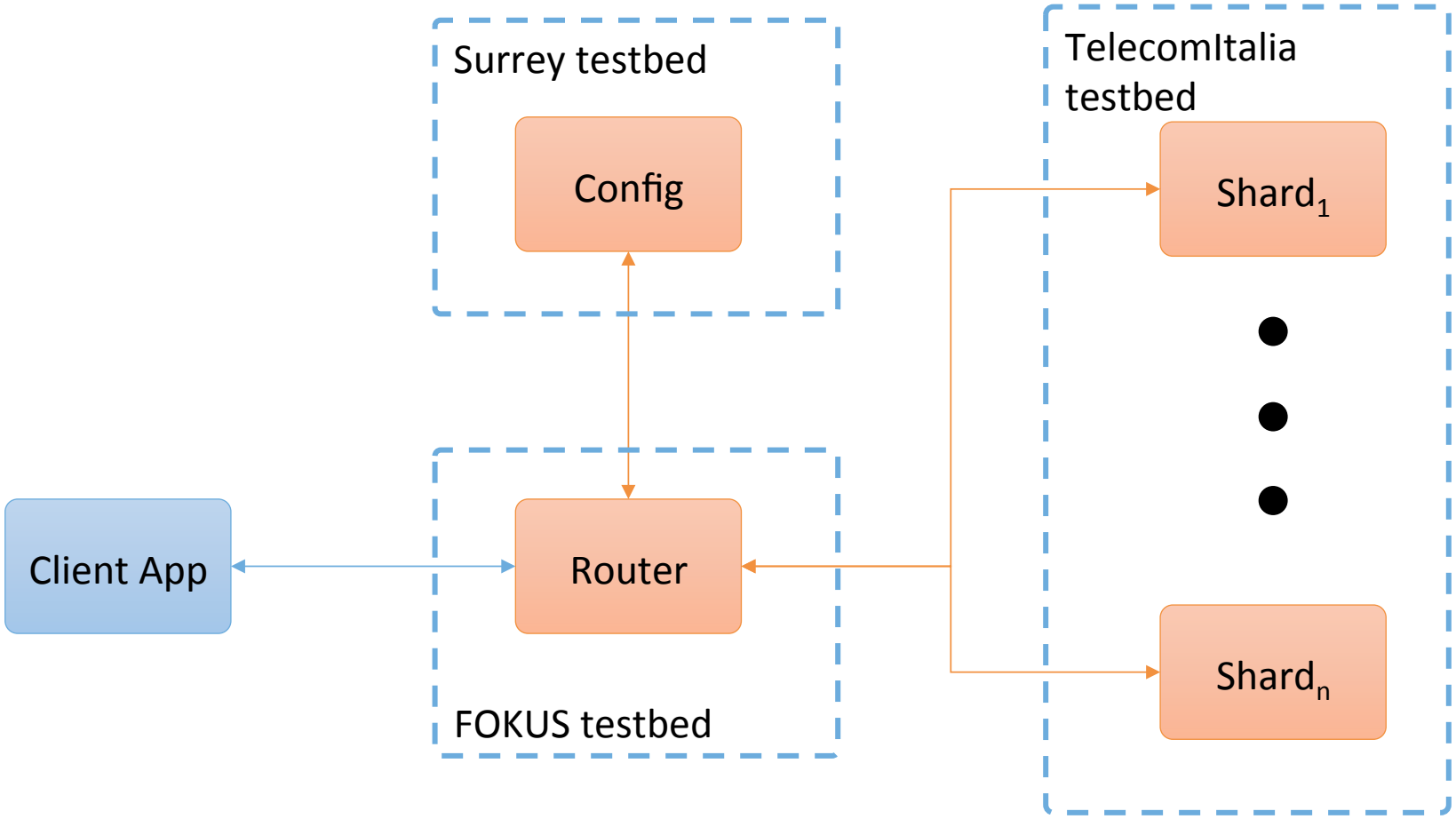
MongoDB Sharded Cluster

- **Shard**: Each shard contains a subset of the data. Each shard can be also deployed as a replica set.
- **Mongos (Router)**: The mongos router acts as a query *router*, providing an interface between client applications and the sharded cluster.
- **Config Server(s)**: Config servers store metadata and configuration settings for the cluster. *Config servers* can be deployed as a replica set

MongoDB Sharded Cluster

- Three type of VNF:
  - Shard
  - Config
  - Router
- This means three VNF Packages, one per VNF to be uploaded to the SSP

MongoDB example



Create a VNF Package

- VNF Package is a simple tar file containing:
  - Metadata.yaml
  - Scripts folder
  - vnfd.json

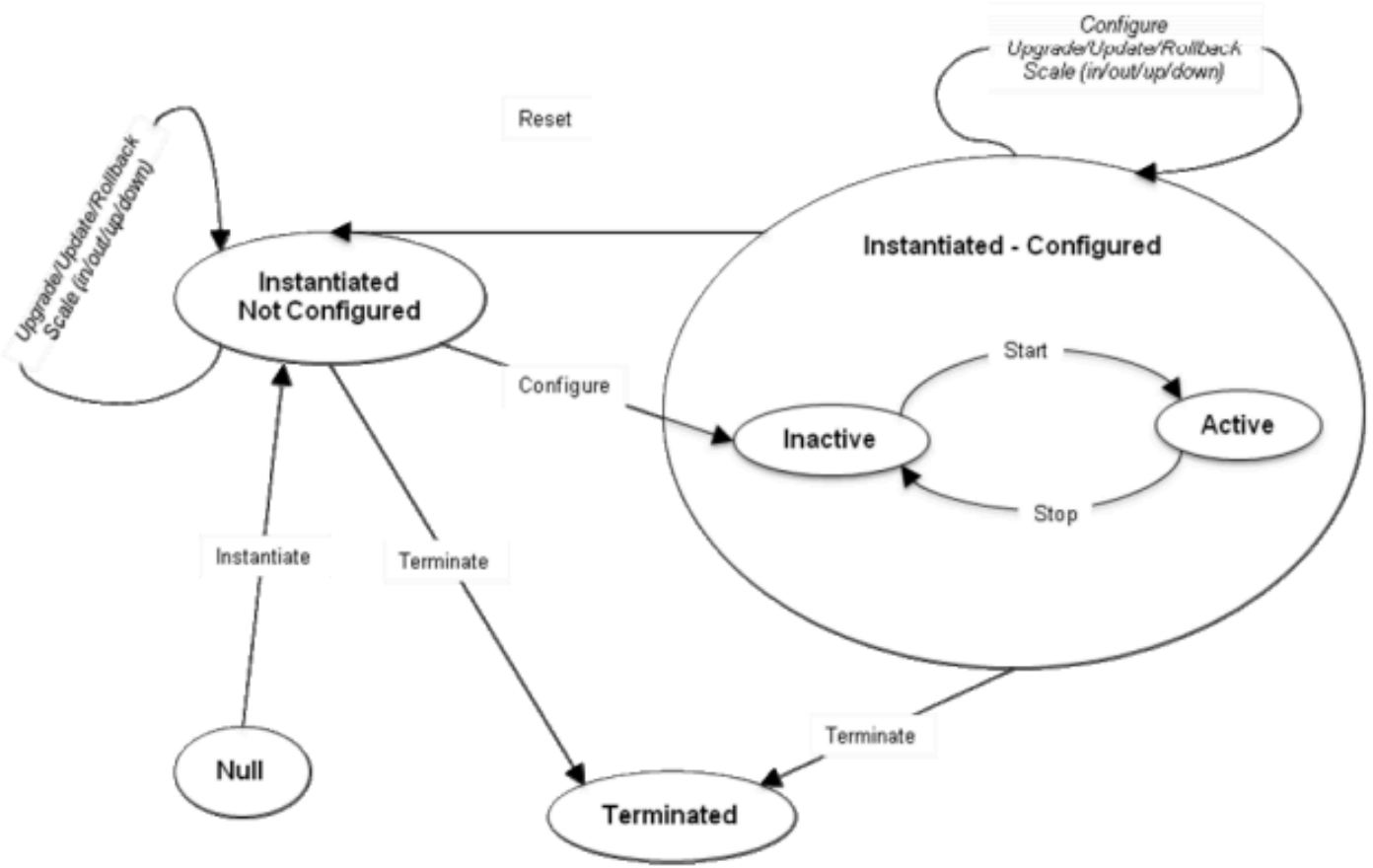
Metadata.yaml

- The Metadata.yaml defines essential properties for the VNF. This file is based on the YAML syntax where information are stored in simple <key> : <value> associations.

```
name: router
description: "The router module”
scripts-link: scripts_link
provider: TUB
shared: true
image:
        upload: false
        names:
                - Ubuntu 14.04 Cloud based
        link: http://link-to-image
Image-config:
        name: Ubuntu 14.04 Cloud based
        diskFormat: qcow2
        containerFormat: bare
        minCPU: 0
        minDisk: 0
        minRam: 0
        isPublic: true
```


nfpackage/

VNF Lifecycle event



Vnfd.json

- The vnfd.json contains the Virtual Network Function Descriptor (VNFD) onboarded to the Orchestrator.

Scripts folder

- The scripts folder contains all the scripts required for starting, configuring or whatever you want to do on the running instance during specific lifecycles. The execution order is defined by the lifecycle_events inside the VNFD. This lifecycle_events are triggered by the NFVO in the meaning of: if the event "INSTANTIATE" contains a script in the lifecycle_events, this script is executed when the NFVO calls the instantiate method for the specific VNFR.
- **Note:** The scripts in the folder scripts are fetched only if the scripts-link is *not* defined in the Metadata.yaml. This means that the scripts in that folder have less priority than the scripts located under scripts-link.
- **Note:** Scripts are executed when a specific Event is fired and this Event references to specific scripts.
- **Note:** sub folders are not allowed

Reference: http://openbaton.github.io/documentation/vnfpackage/

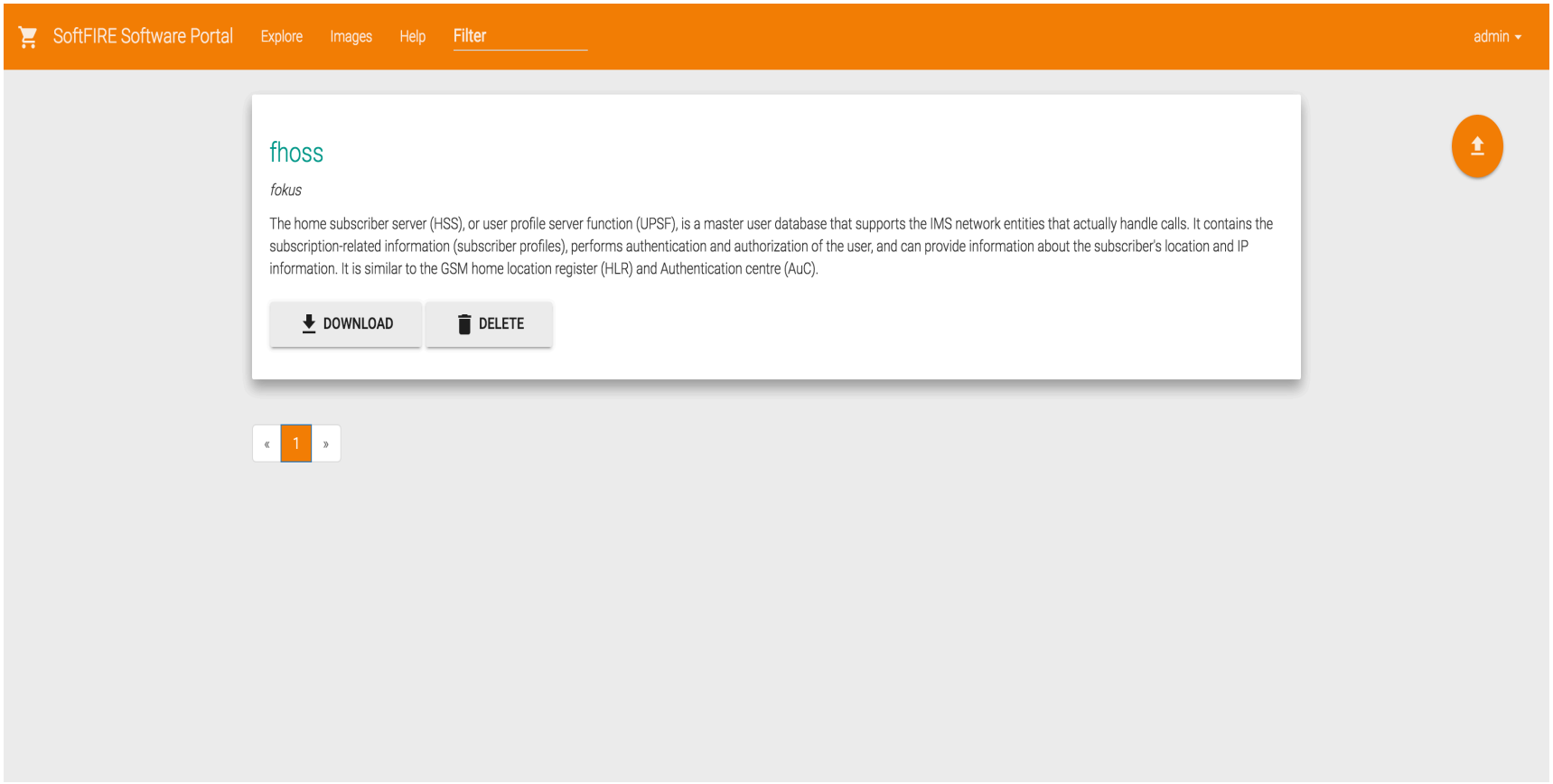
Script example

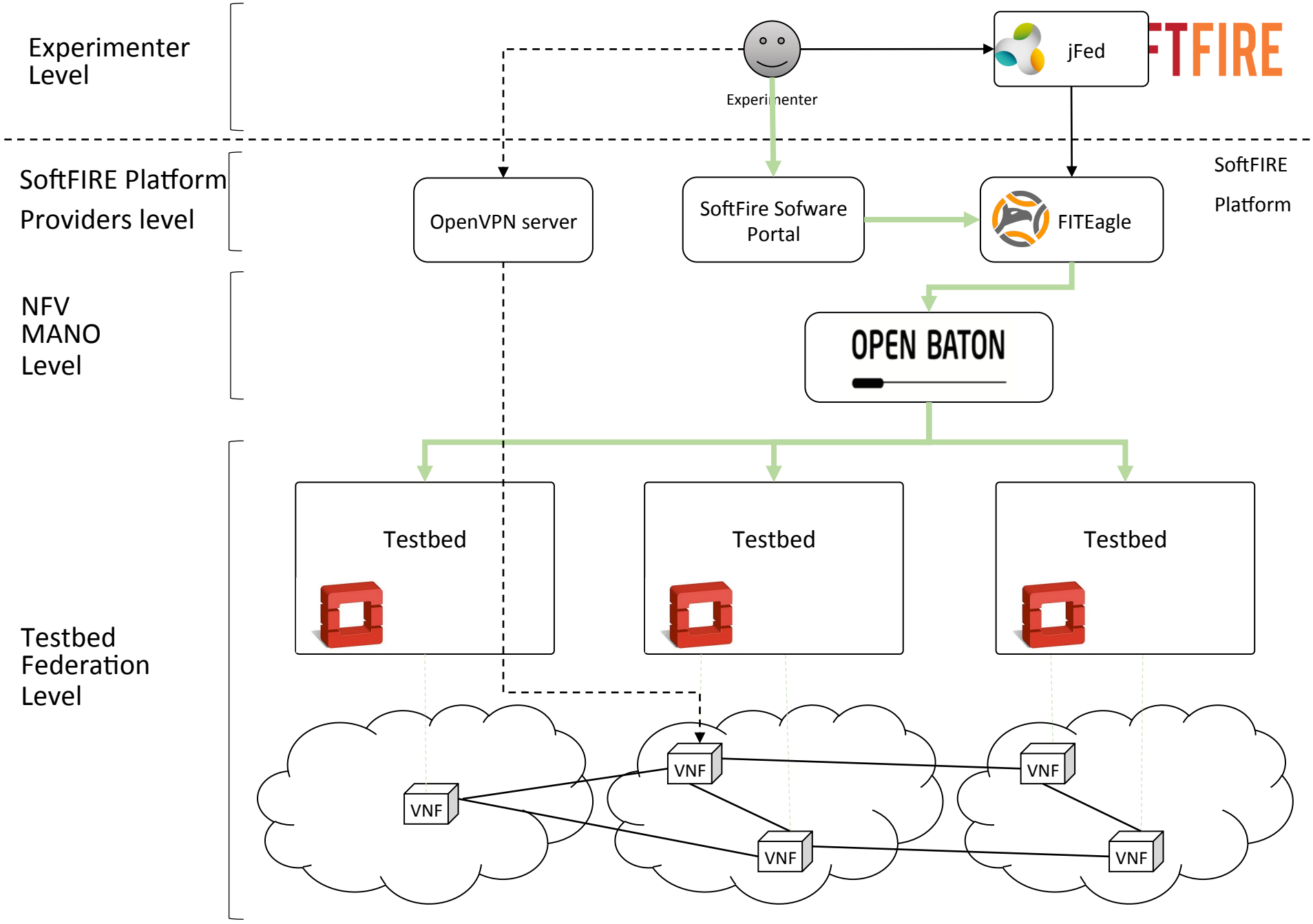
Router script: shard_configure.sh

```
#!/bin/bash

export LC_ALL=C
shard_uri="$shard_softfire_internal_floatingIp:$shard_port”
echo $shard_uri
echo "sh.addShard('$shard_uri')" > addShard.js
if [ -z $database ]; then
        database=softfire
fi
echo "sh.enableSharding('$database')" >> addShard.js
mongo --port $port < addShard.js
```

Softfire Software Portal

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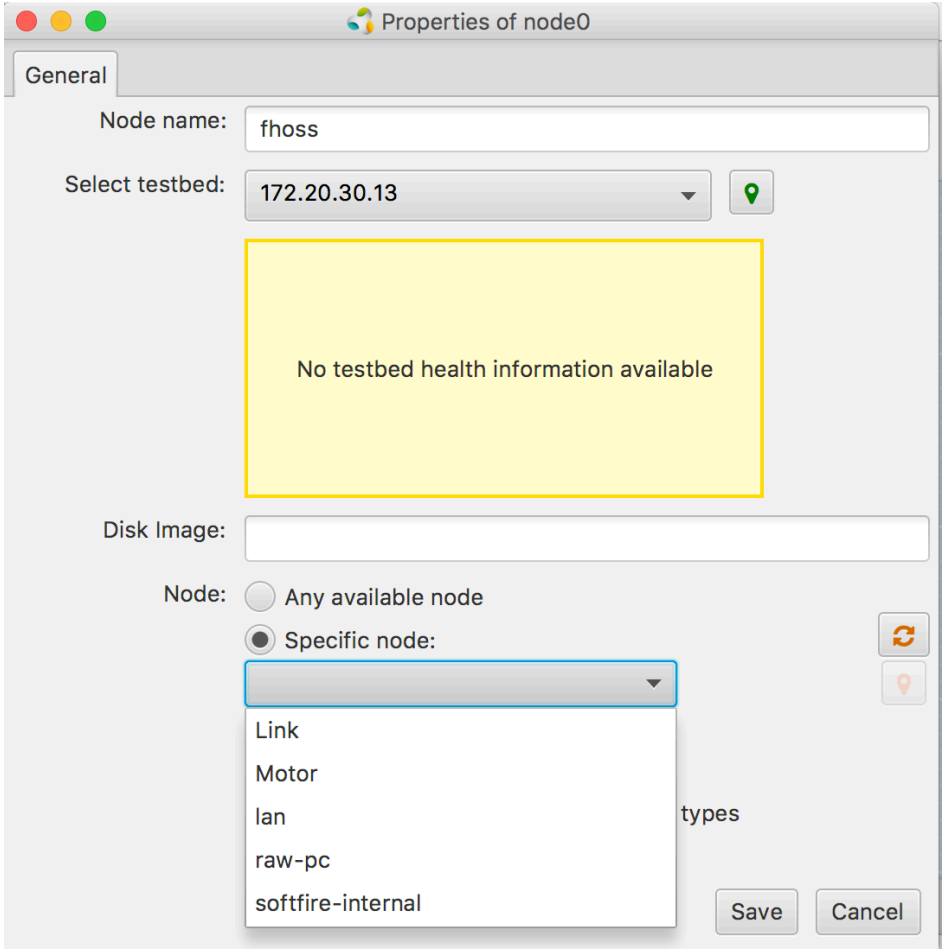
jFed for resource discovery



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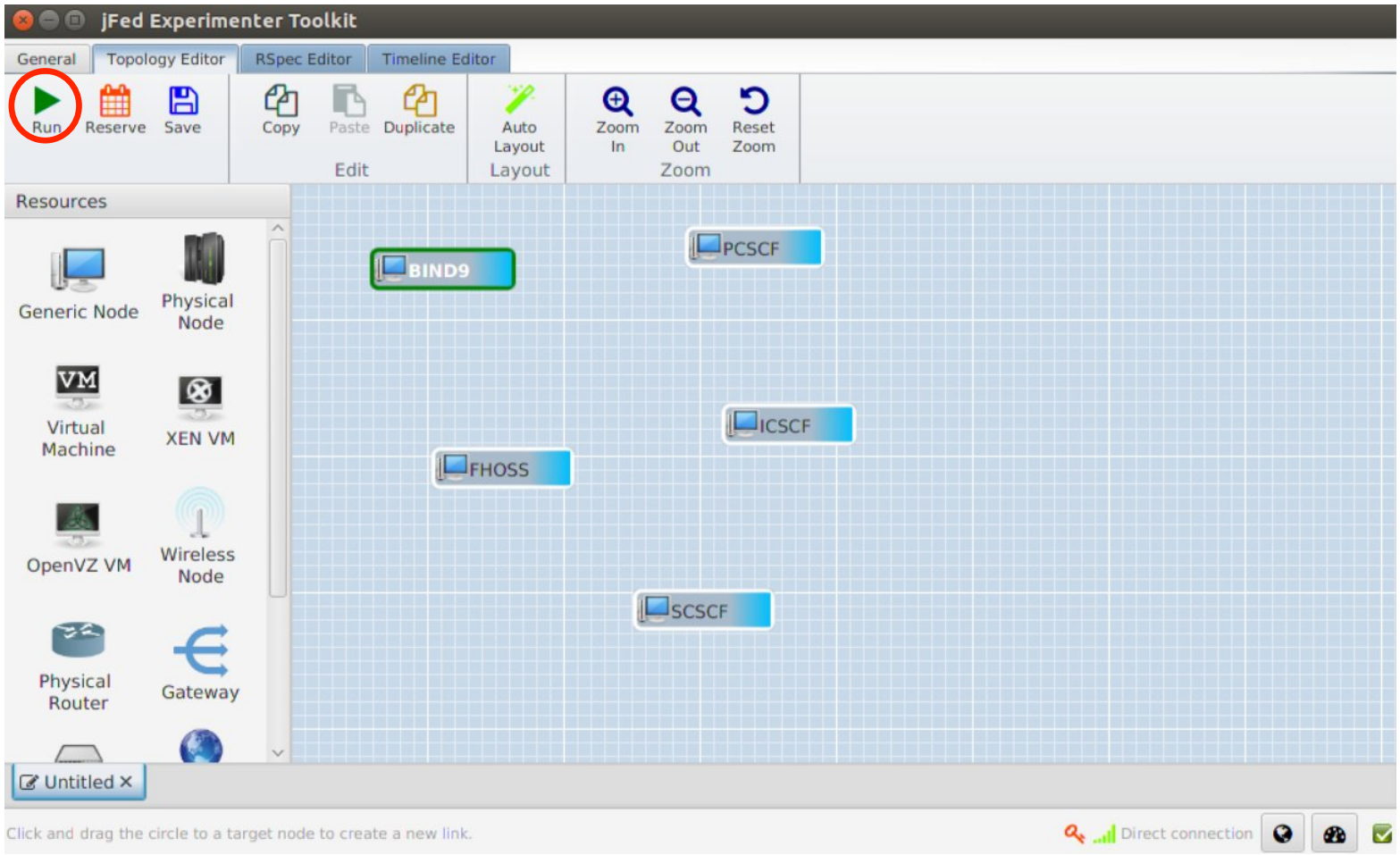
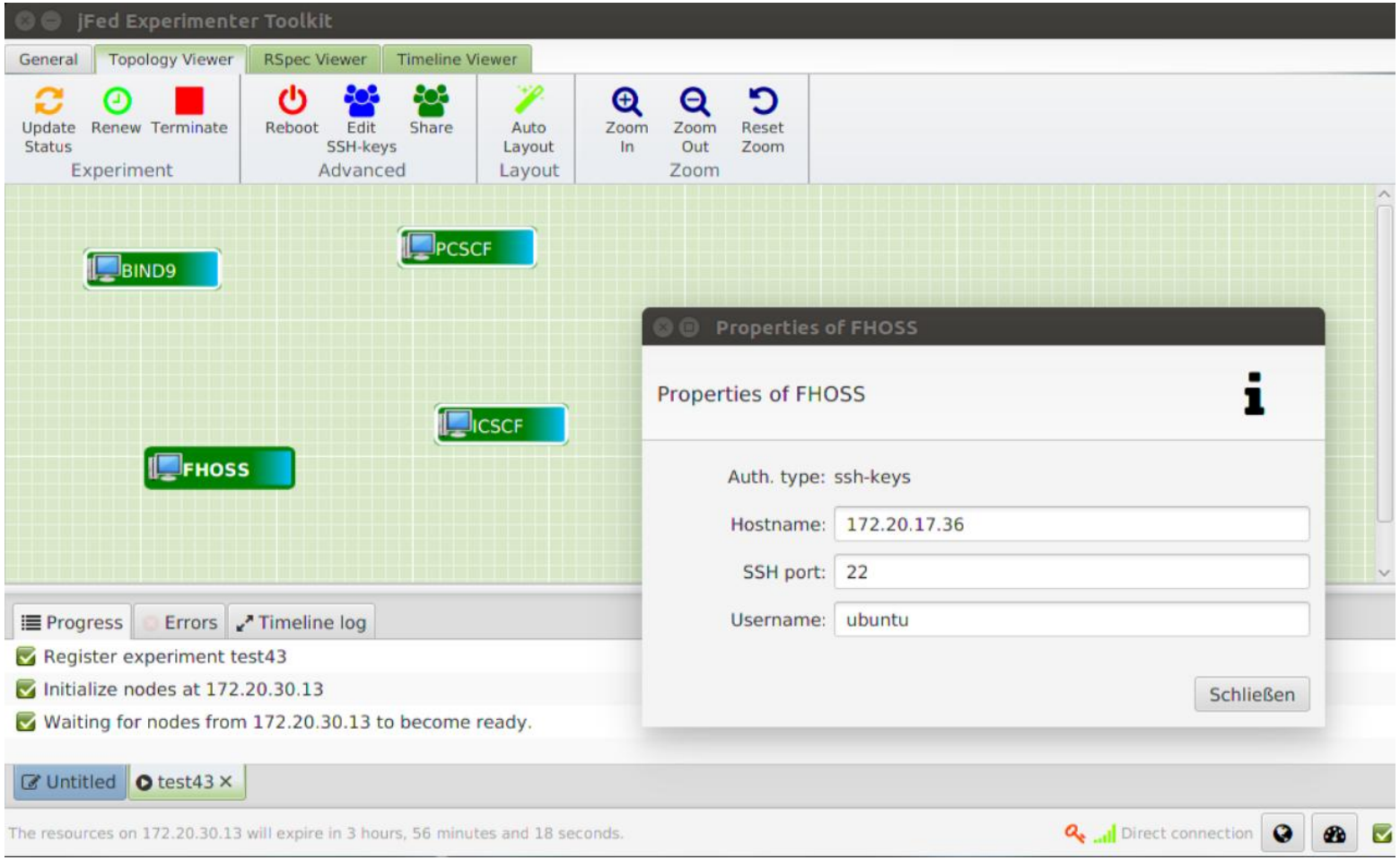
jFed for resource allocation



jFed for resource access



jFed for resource access