# OPNFV – Functest

1) status Arno 5'

2) Functest: get started! 30'
2.1) project organization (who we are, doc, motivation of the project, how to join, JIRA)
2.2) git description (tree, location, main files, git/gerrit overview)
2.3) integration in CI (jenkins job, how to create a job for your testbed)
2.4) results analysis
2.5) how to integrate a new testcase
2.6) questions

# Get Started

We need you...

# Functest organization

Src: https://wiki.opnfv.org/opnfv_functional_testing

Project: Base System Functionality Testing Project (**functest**)
Project Creation Date: **January 20, 2015**
Project Category: **Integration & Testing**
Lifecycle State: **Incubation**
Primary Contact: Morgan Richomme (morgan.richomme@orange.com)
Project Lead: Trever Cooper (trevor.cooper@intel.com)
Jira Project Name: Base System Functionality Testing Project
Jira Project Prefix: FUNCTEST
Mailing list tag: [**functest**]
IRC: Server:freenode.net Channel:**#opnfv-testperf**
Repository: **functest**

## Test and Performance Sub-Group Meetings
   Weekly on Thursday at 1400 UTC (7am PDT)
   IRC channel: #opnfv-meeting (#opnfv-testperf is used for day-to-day communication)
   Chaired by trevor_intel / trevor.cooper@intel.com (Trevor Cooper)
   https://global.gotomeeting.com/join/305553637
   See meetings/test for agenda, details and previous meeting minutes.

# Functest organization

Committers:
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# Functest motivation

Project "OPNFV – Base system functionality testing" will provide comprehensive testing methodology, test suites and test cases to test and verify OPNFV Platform functionality that covers the VIM and NFVI components.

WORK

Testcase selection
Testcase integration (tooling, customization, new scenarios,..)
Analyzis of the results (same test suites run on several tesbeds (pharos federation)

GOAL

Define KPI of the Telco Cloud
Contribute to robustness & Interoperability of OPNFV

# How to join

Indicate to the project (mail or IRC) that you would like to join precising the field you want to be involved, your skills,...

Election by the members of functest (~ days)

Election OK => configuration of the account accordingly for IT stuff related ( ~ days/weeks)

Current open task/issues (JIRA used to track such things)
**FUNCTEST-1**: Rally Bench
**FUNCTEST-2**: Tempest
**FUNCTEST-3**: vPing
**FUNCTEST-4**: vIMS
**FUNCTEST-5**: SDN Controlleur suite
FUNCTEST-6: CI automation
FUNCTEST-7: CI -automation
FUNCTEST-8: add key project facts
FUNCTEST-9: doc
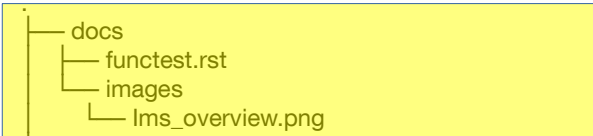FUNCTEST-10: automation
FUNCTEST-11: format results
FUNCTEST-12: result collection for analytics
*FUNCTEST-13*: run_rally tempest smoke not generating uuid

# Why joining

- Integrate new testcases

- Develop new scenarios

- Analyze results

- Define Telco Cloud KPI

- Automate analytics / dashboard

- Bridge ETSI NFV / Tests

- Develop tooling

- Synchro with OPNFV projects Pharos / Installer / Perfo projects / xxx
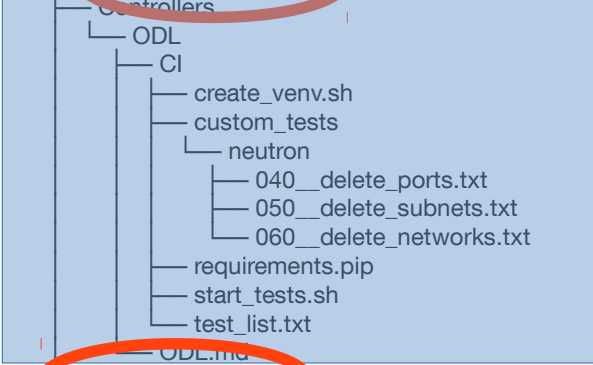
- ...

# Git Description

```
.
├── docs
│   ├── functest.rst
│   └── images
│       └── lms_overview.png
├── INFO
├── LICENSE
├── testcases
│   ├── config_functest.py
│   ├── Controllers
│   │   └── ODL
│   │       └── CI
│   │           ├── create_venv.sh
│   │           ├── custom_tests
│   │           │   └── neutron
│   │           │       ├── 040__delete_ports.txt
│   │           │       ├── 050__delete_subnets.txt
│   │           │       └── 060__delete_networks.txt
│   │           ├── requirements.pip
│   │           ├── start_tests.sh
│   │           ├── test_list.txt
│   │           └── ODL.md
│   ├── functest.yaml
│   ├── VIM
│   │   └── OpenStack
│   │       └── CI
│   │           ├── libraries
│   │           │   └── run_rally.py
│   │           └── suites
│   │               ├── opnfv-authenticate.json
│   │               ├── opnfv-cinder.json
│   │               ├── opnfv-glance.json
│   │               ├── opnfv-heat.json
│   │               ├── opnfv-keystone.json
│   │               ├── opnfv-neutron.json
│   │               ├── opnfv-nova.json
│   │               ├── opnfv-quotas.json
│   │               ├── opnfv-requests.json
│   │               ├── opnfv-smoke-green.json
│   │               ├── opnfv-smoke.json
│   │               ├── opnfv-tempest.json
│   │               └── opnfv-vm.json
│   │       └── OpenStack.md
│   └── vPing
│       └── CI
│           └── libraries
│               └── vPing.py
```
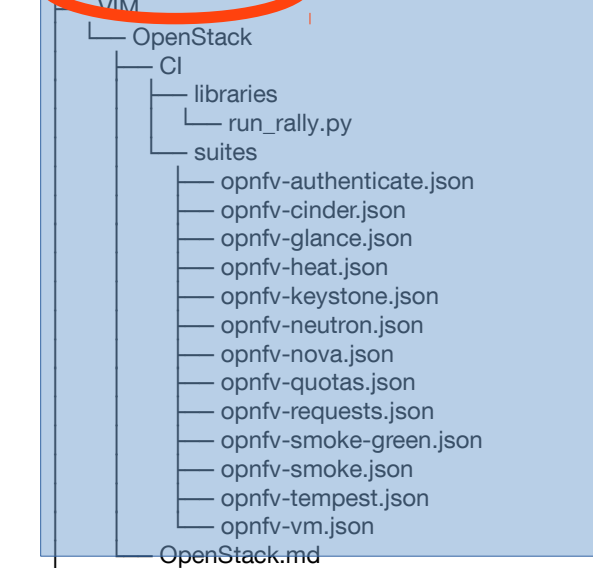
Official ref doc
Pdf and html automatically generated

Python script to prepare env, install tools, create network, upload images … before running test suites (in CI or manually on any POD)

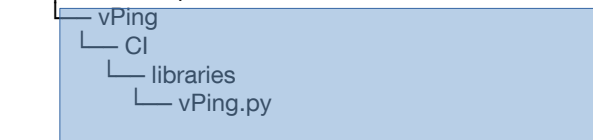*Testcase ODL (Peter)*

Config file used by config_functest.py

*Testcase*
*- Tempest (functional tests)*
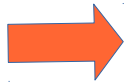*- Rally Bench (perfo)*
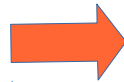
*Testcase vPing*

# Contribution

A problem, An Epic?

Create JIRA
FUNCTEST-?
e.g FUNCTEST-14: vEPC

Git clone functest

git clone https://git.opnfv.org/functest

Write code

test_epc.py
Test_epc.sh
….

Test it on a POD

Yours
or
any Pharos POD

Git add
Git commit –signoff
Git review

Including doc

Automate

# CI

- Functest jobs described in releng/jjb/functest/functest.yaml

```
pod:
  - 'opnfv-jump-1'
  - 'opnfv-jump-2'
jobs:
  - 'functest-{pod}'
  - 'functest-openstack-bench-test'
  - 'functest-openstack-tempest-smoke-test'
  - 'functest-odl-test'
  - 'functest-vims-test'
  - 'functest-vping-test'
  - 'functest-daily-{stream}'
  - 'functest-merge'
  - 'functest-verify'
...
- job-template:
    name: functest-{pod}

    project-type: freestyle

    node: '{pod}'

    logrotate:
      daysToKeep: 30
      numToKeep: 10
      artifactDaysToKeep: -1
      artifactNumToKeep: -1

    builders:
      - 'functest-all'
```

POD declaration
Functest can be set on any POD connected to CI
For V1 2 POD from LF

List of jobs
Functest-vEPC-test could be declared there and attached by default to one POD or any (using macro)

Ex of 1 job (the one running the 4 testcases for R1)
Pod name {pod} is a variable (can be used by the 2 LF PODs)

# CI

```
- builder:
    name: functest-all
    builders:
      - shell: |
          echo "Functest: prepare Functest environment"
          mkdir -p $HOME/functest/
          rm -f $HOME/functest/config_functest.py
          rm -f $HOME/functest/functest.yaml
          wget https://git.opnfv.org/cgit/functest/plain/testcases/config_functest.py -P $HOME/functest/
          wget https://git.opnfv.org/cgit/functest/plain/testcases/functest.yaml -P $HOME/functest/
          source $HOME/functest/opnfv-openrc.sh
          python $HOME/functest/config_functest.py -d start
          echo "Functest: run Tempest suite"
          rally verify start smoke
          rally verify list
          echo "Functest: run vPing"
          python $HOME/.functest/vPing/vPing.py -d
          echo "Functest: run Functest Rally Bench suites"
          python $HOME/.functest/Rally_test/run_rally.py -d all
          echo "Functest: run ODL suite"
          bash $HOME/.functest/ODL/start_tests.sh
          echo "Functest: copy results and clean Functest environment"
          mkdir -p $HOME/functest/results
          cp $HOME/.functest/Rally_test/results/* $HOME/functest/
          python $HOME/functest/config_functest.py -d -f clean
```

NB: builder shall have been refactored...(avoid wget for sync issues)

# Result Analyzis

Tempest (through Rally)

Rally Bench

vPing

ODL

Log file with test execution time

Json + html file with lots of figures
Possible to set SLA (not done for R1)

# Result Analyzis

## Rally benchmark results
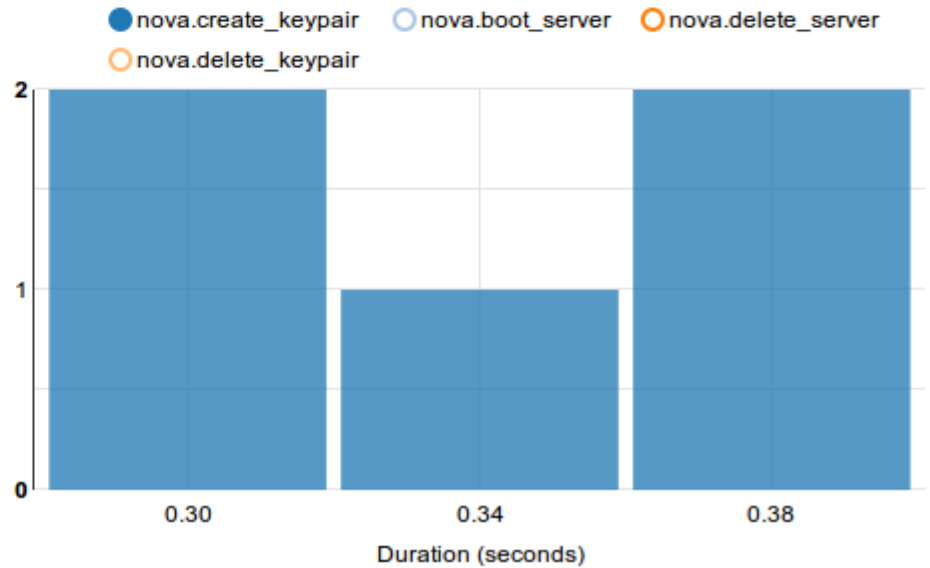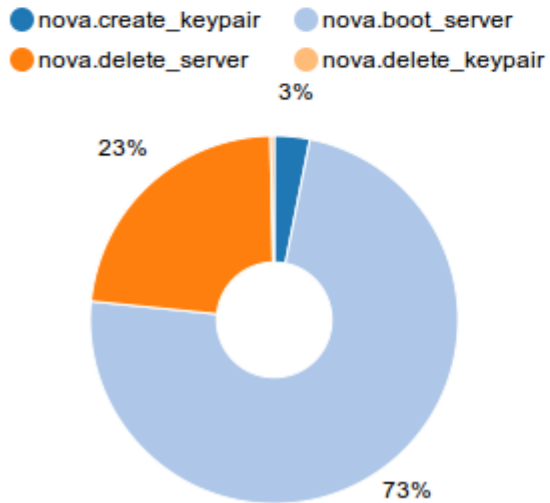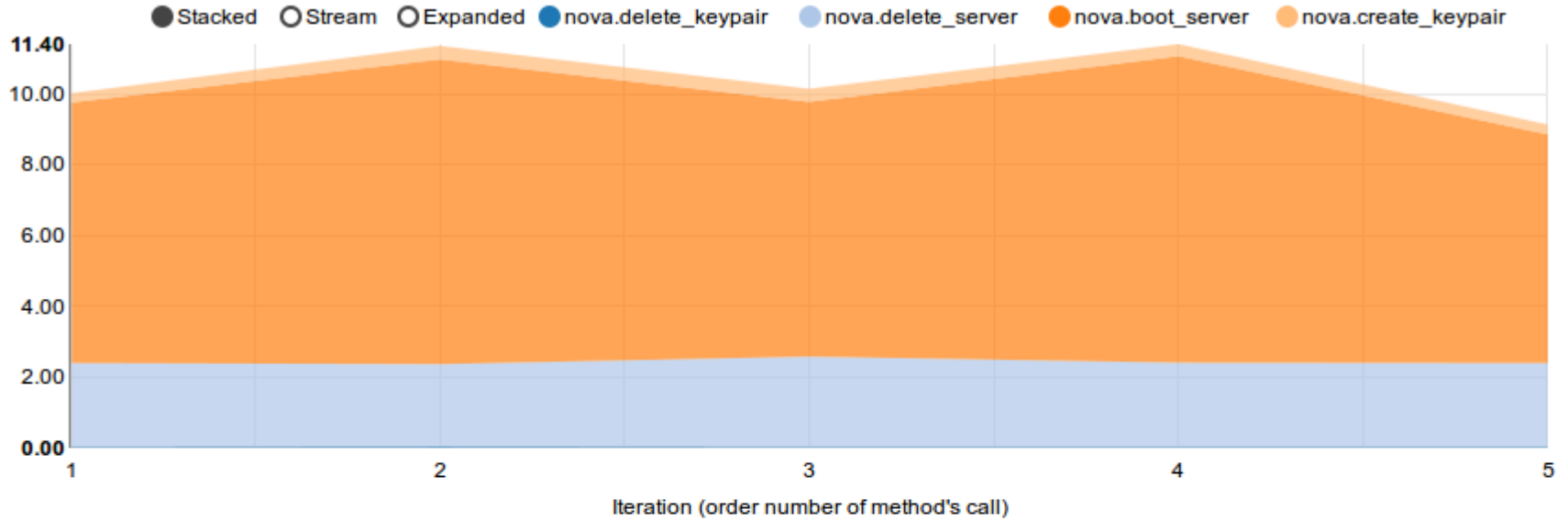
**Benchmark overview**

Input file

▶ CinderVolumes

## Benchmark overview

| Scenario ▲ | Load duration (s) | Full duration (s) | Iterations | Runner | Errors | Success (SLA) |
|---|---|---|---|---|---|---|
| CinderVolumes.create_and_attach_volume | 86.135 | 95.016 | 5 | constant | 0 | ✔ |
| CinderVolumes.create_and_delete_snapshot | 9.289 | 24.019 | 3 | constant | 0 | ✔ |
| CinderVolumes.create_and_delete_volume | 7.419 | 14.654 | 2 | constant | 0 | ✔ |
| CinderVolumes.create_and_extend_volume | 7.111 | 9.687 | 2 | constant | 0 | ✔ |
| CinderVolumes.create_and_list_snapshots | 2.435 | 13.445 | 2 | constant | 0 | ✔ |
| CinderVolumes.create_and_list_volume | 7.484 | 15.768 | 3 | constant | 0 | ✔ |
| CinderVolumes.create_and_upload_volume_to_image | 75.608 | 81.521 | 3 | constant | 0 | ✔ |
| CinderVolumes.create_from_volume_and_delete_volume | 4.922 | 12.611 | 2 | constant | 0 | ✔ |
| CinderVolumes.create_nested_snapshots_and_attach_volume | 7.543 | 32.931 | 1 | constant | 1 | ✔ |
| CinderVolumes.create_snapshot_and_attach_volume | 31.166 | 49.592 | 4 | constant | 0 | ✔ |
| CinderVolumes.create_volume | 4.782 | 13.896 | 3 | constant | 0 | ✔ |
| CinderVolumes.list_volumes | 19.487 | 34.417 | 100 | constant | 0 | ✔ |

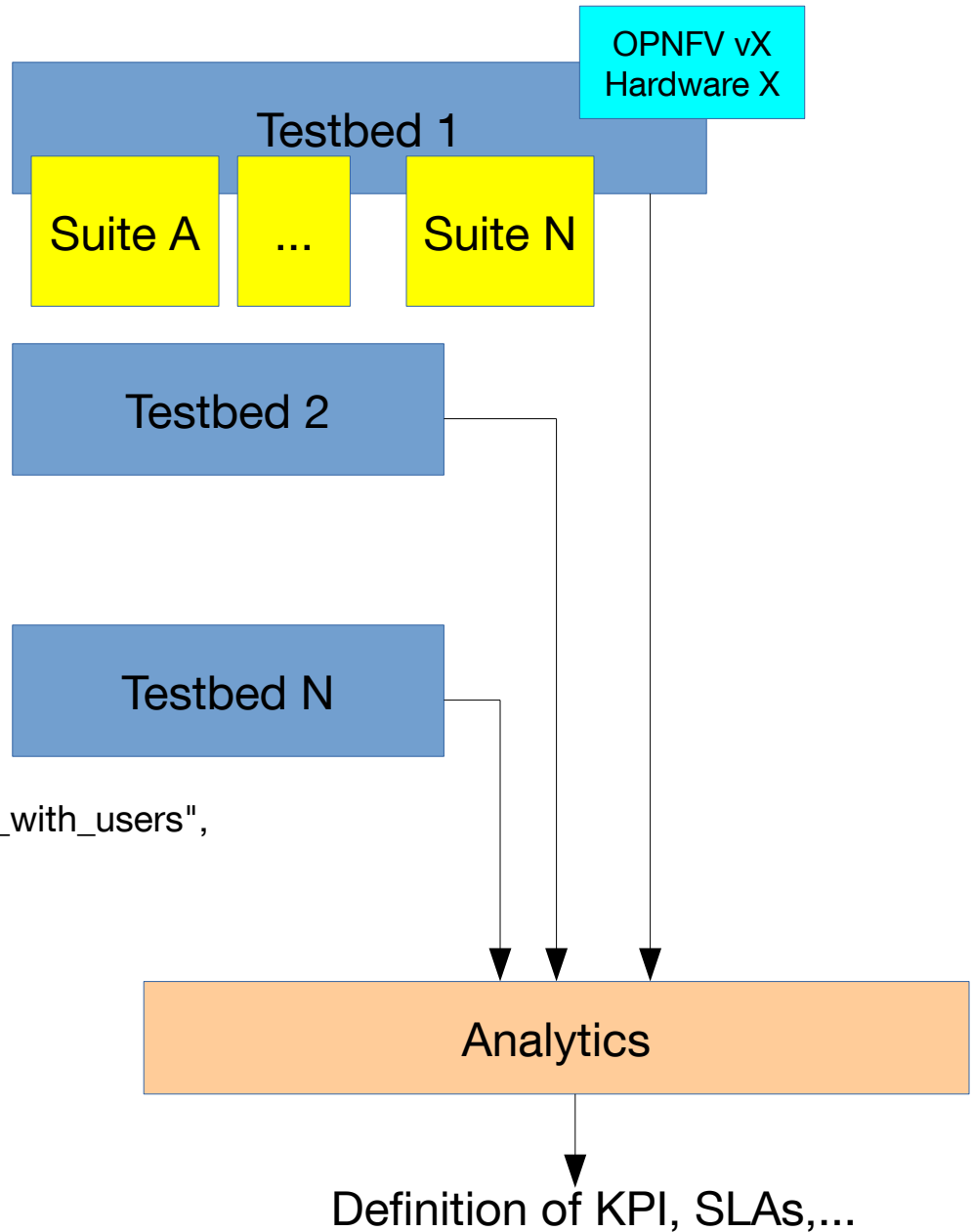# Charts for each Atomic Action

# Result Analyzis

# Result Analyzis

```
{
    "full_duration": 14.552824020385742,
    "key": {
        "kw": {
            "args": {
                "name_length": 10,
                "users_per_tenant": 10
            },
            "runner": {
                "concurrency": 10,
                "times": 10,
                "type": "constant"
            }
        },
        "name": "KeystoneBasic.create_tenant_with_users",
        "pos": 0
    },
```

OPNFV vX
Hardware X

Testbed 1

Suite A    ...    Suite N

Testbed 2

Testbed N

Analytics

Definition of KPI, SLAs,...

# New Testcase

| TODO | Example |
|------|---------|
| Discuss it on the mailing list/IRC | Testing vSBC would be cool! |
| Document it on the Wiki | Metaswitch, Oracle VNF, open source dev? Test scenario,.. |
| Code<br>Integrate VNF<br>+ Test VNF (Robot Framework, Rally already available)<br>+ Test scenario | Code the glue, the tester, the scenarios...the VNF (if open source VNF) |
| Integration in CI<br>+ (integration in future dashboard) | Write jenkins job |

# Arno

- 4 test cases
  - Tempest
  - Rally Bench (Keystone, Authenticate, Neutron, Nova, Quotas, Cinder, Glance, requests)
  - OLD
  - vPing

- 2 ref POD (on LF) – complete sequence Build/Deploy/Test every 6 hours
  - Fuel (POD1)
  - Foreman (POD2)

- Goal: full sequence OK run on the 2 PODs every 6 hours
- Still issues (Arno -7)....
  - See dedicated page
    - Tempest: https://wiki.opnfv.org/r1_tempest
    - Bench: https://wiki.opnfv.org/r1_rally_bench
    - vPing: https://wiki.opnfv.org/r1_vping
    - ODL: https://wiki.opnfv.org/r1_odl_suite

# Questions