Open Source

MANO

Engineering Internship

Axel Velez

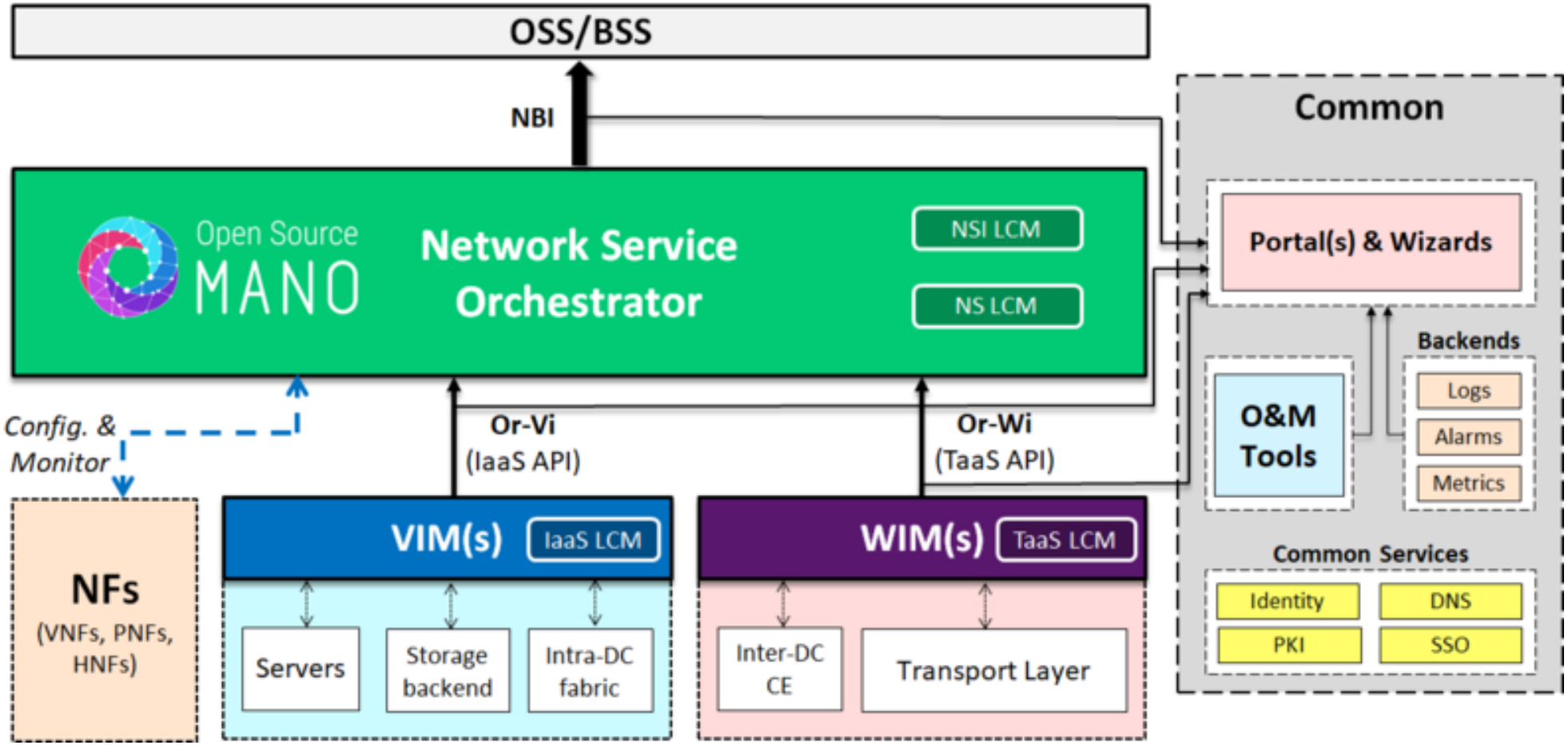
Whoami

- Axel Velez
- 4th year student at UTBM (Université de Technologie de Belfort-Montbéliard)
- 23 weeks internship at ETSI
- Working on OSM

Internship goals

- Get familiar with OSM and NFV
- Revive NFV TST010 test suite
  - Test OSM NBI conformance with NFV SOL005 specification
  - Automate the process
- Initiate transition of the testing pipeline from Jenkins to GitLab

OSM Architecture



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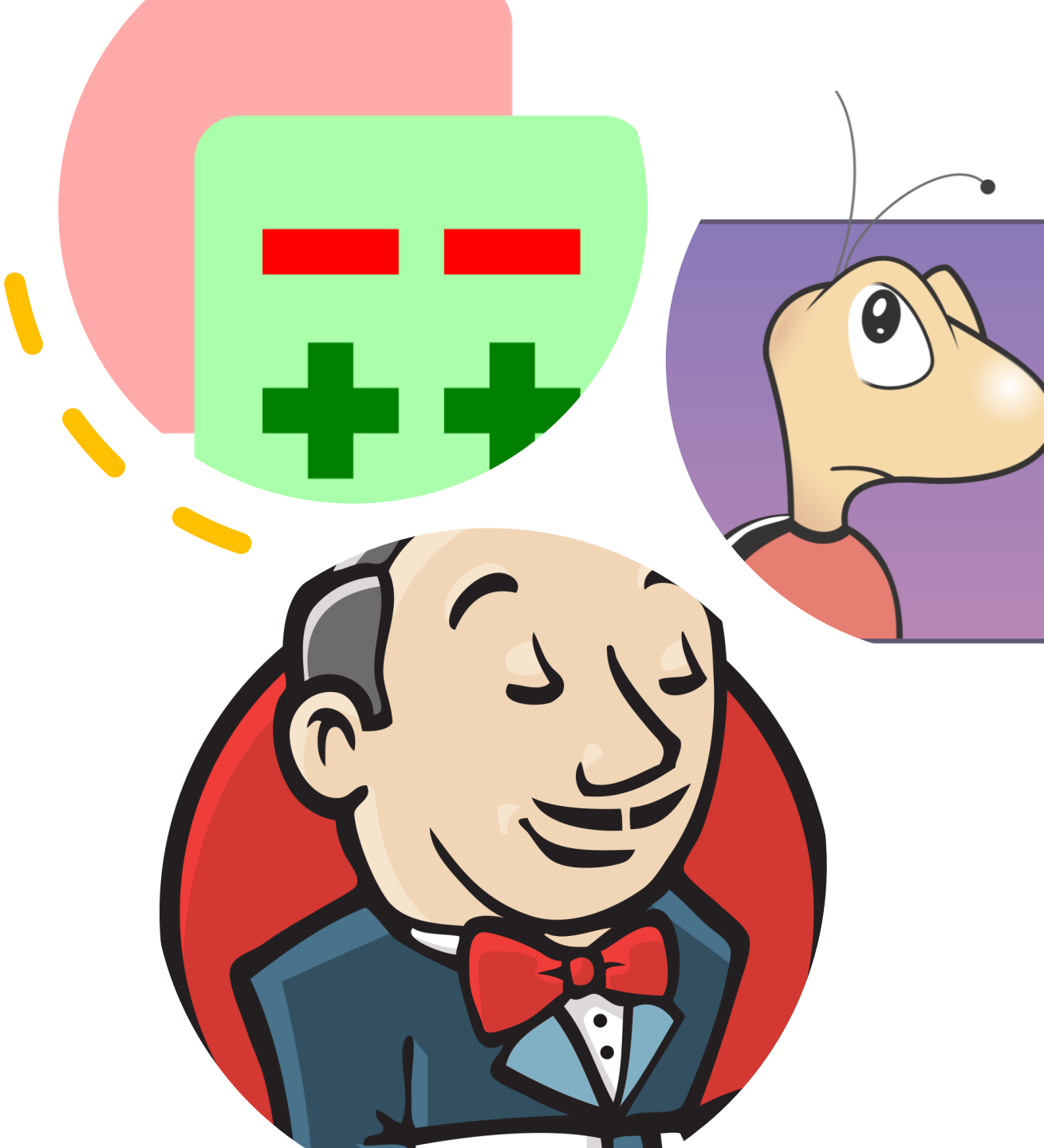
Reviving TST010

- Fixing bugs
- Update depencencies
- Automating the process :
  - Authentification
  - NS/NSD/VNFD deployments
- Test selection
- QoL improvements
- Report to OSM TECH team

Moving from Jenkins to GitLab



Pipeline

passed **Pipeline #3194** triggered 1 month ago by **veleza**

Fixing logs and reports

1 job for `veleza-master-patch-89606` in 20 minutes and 51 seconds (queued for 2 seconds)

latest

`43d7ad3a`

1 related merge request: !4 Added .gitlab-ci.yml

Pipeline Needs Jobs 1 Tests 0

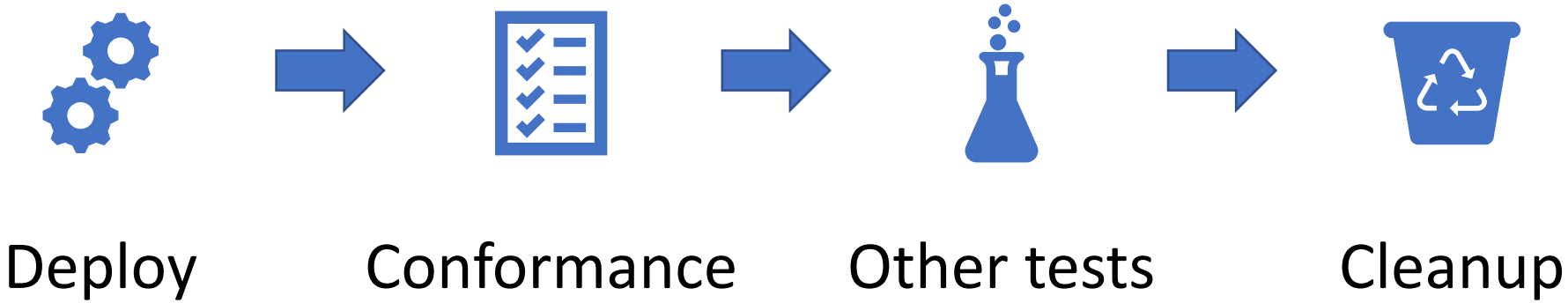
Deploy

daily-robot

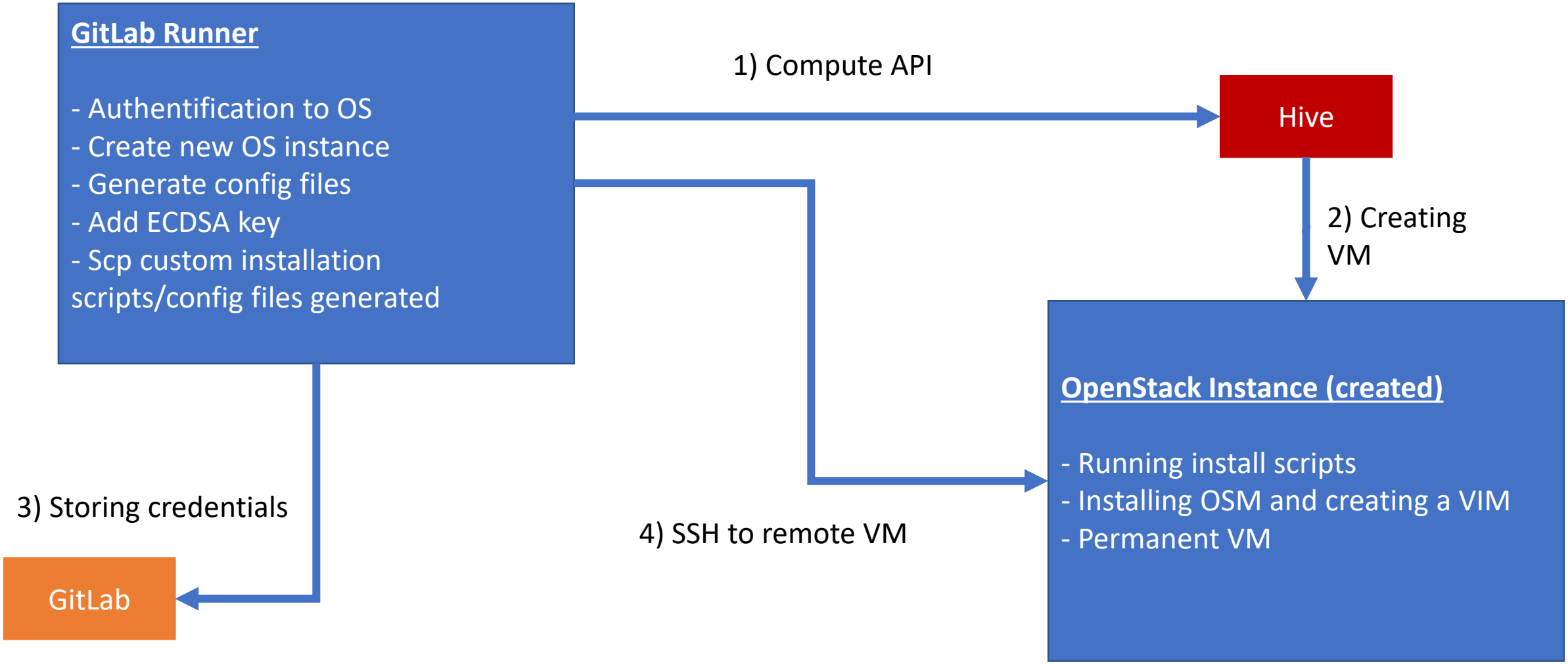
Environments & deployments

- Dedicated OSM instance
- Speed up testing
- More modular

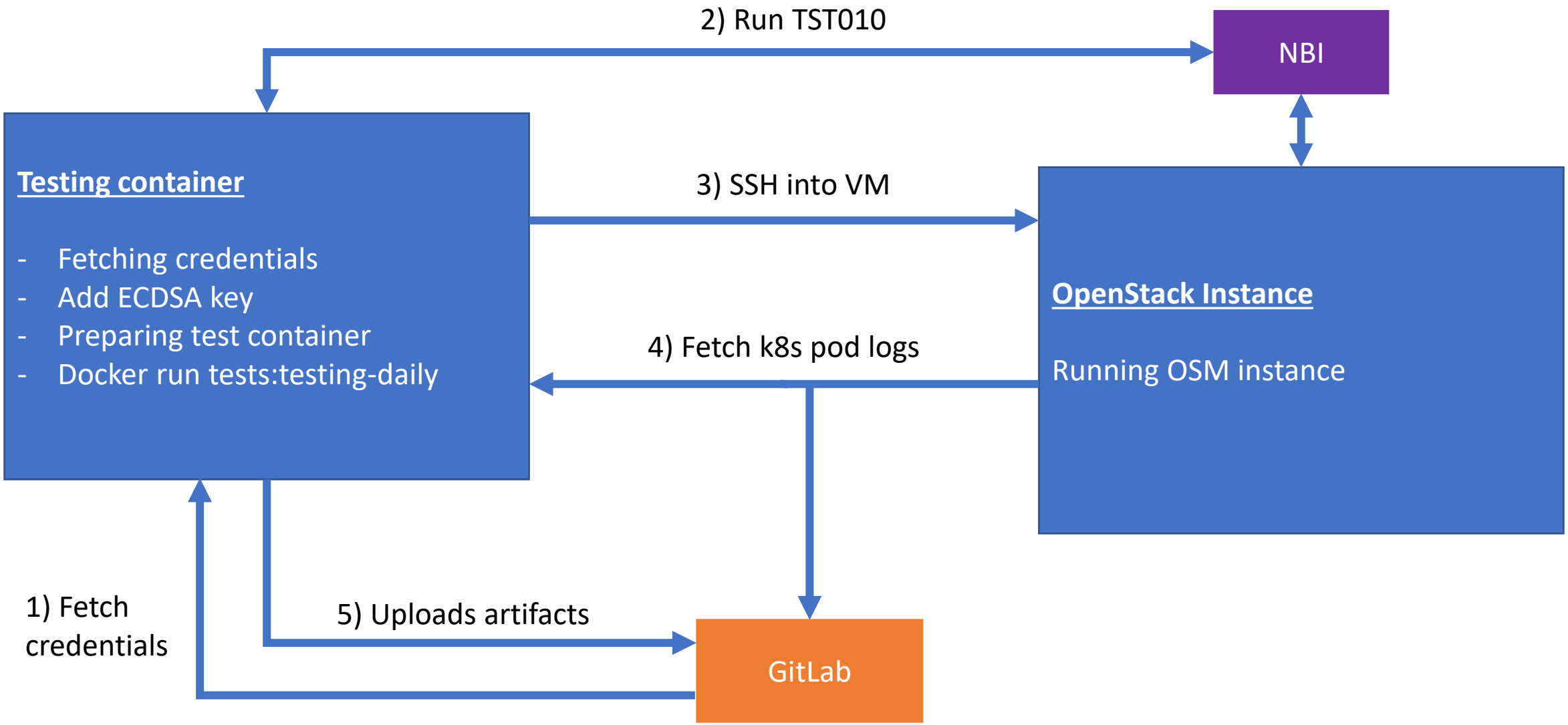
Pipeline



Deploying OSM



Testing


2) Run TST010
NBI
Testing container
- Fetching credentials
- Add ECDSA key
- Preparing test container
- Docker run tests:testing-daily
3) SSH into VM
OpenStack Instance
Running OSM instance
4) Fetch k8s pod logs
1) Fetch credentials
5) Uploads artifacts
GitLab

Test summary

Test summary contained 11 failed out of 20 total tests

View full report | Collapse

testing found 11 failed out of 20 total tests

New

- ✖ Disable Individual Network Service Descriptor
- ✖ Enable Individual Network Service Descriptor
- ✖ Get NSD Content in Zip Format
- ✖ Get NSD Content with conflict due to onboarding state

Merge ☐ Delete source branch ☐ Squash commits ?

14 commits and **1 merge commit** will be added to `master`. Modify merge commit

Reports

TST010

20 tests | 11 failures | 0 errors | 45% success rate | 2.88s

Tests

Suite	Name	Filename	Status	Duration	Details
TST010.VNFPackageManagement-API. IndividualVNFPackageArtifacts	GET Individual VNF Package Artifact		✖	584.00ms	View details
TST010.NSDManagement-API. IndividualNSDescriptor	Enable Individual Network Service Descriptor		✖	337.00ms	View details
TST010.NSDManagement-API. IndividualNSDescriptor	Disable Individual Network Service Descriptor		✖	243.00ms	View details
TST010.NSDManagement-API. NSDArchiveContent	Get NSD Content in Zip Format		✖	220.00ms	View details
TST010.NSDManagement-API. NSDArchiveContent	Upload NSD Content as Zip file in synchronous mode		✖	200.00ms	View details

Security

API Fuzzing

DAST

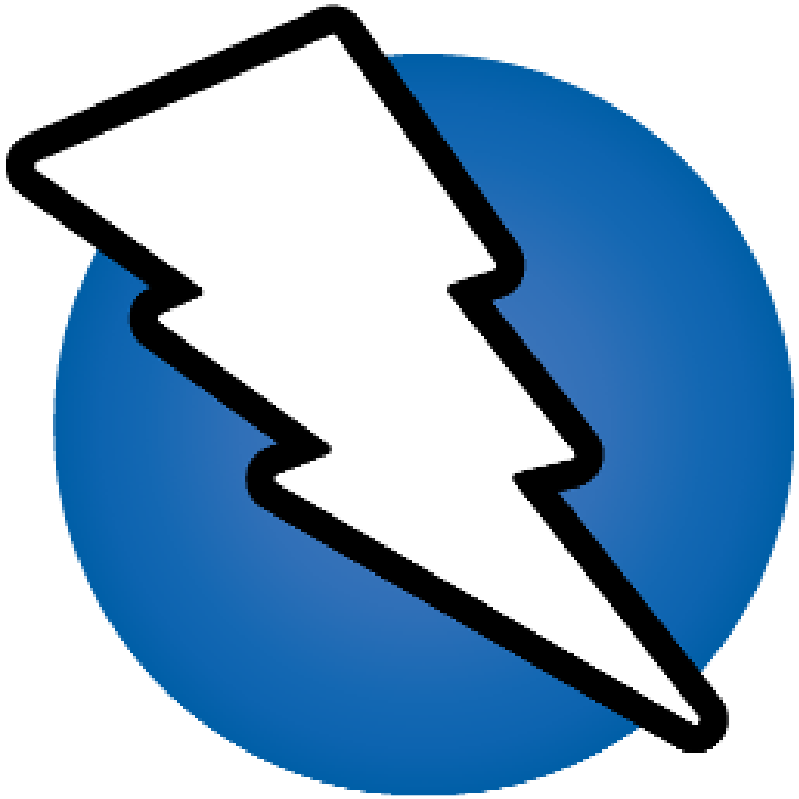
Container scanning

API Fuzzing

- Using Peach Fuzzer
- 128 endpoints tested
- 11 698 API requests (Quick)
- Customizable

DAST

- Using OWASP Zed Attack Proxy (ZAP)
- Web app scanning & API Scanning
- Vulnerabilities:
  - SQL injection
  - Broken Authentication
  - Sensitive data exposure
  - Cross Site Scripting (XSS)
  - Components with known vulnerabilities
  - …



DAST

- 246 065 API requests
- 13 Security checks:
  - 8 Active checks
  - 5 Passive Checks

Severity: All severities | Scanner: DAST | Coverage fuzzing: Download results | Hide dismissed

Severity	Vulnerability	Identifier	Scanner
Medium	Content Security Policy (CSP) Header Not Set	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab
Medium	Content Security Policy (CSP) Header Not Set /	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab
Medium	Content Security Policy (CSP) Header Not Set /packages	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab
Medium	Content Security Policy (CSP) Header Not Set /packages/ns	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab
Medium	Content Security Policy (CSP) Header Not Set /robots.txt	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab
Medium	Content Security Policy (CSP) Header Not Set /sitemap.xml	Content Security Policy (CSP) Header Not Set + 1 more	DAST GitLab

Container scanning

- PoC
- Scan images for vulnerabilities
- Can be included into each module
- More efficient pipeline: push images to container registry and immediately scan

Container scanning

Scan details Hide details

Container Scanning 237 vulnerabilities

Severity All severities | **Scanner** Container Scanning | **Coverage fuzzing** Download results | **Hide dismissed**

Severity	Vulnerability	Identifier	Scanner
Medium	CVE-2013-7445 in linux-libc-dev-4.15.0-166.174 osm.etsi.org:5050/devops/cicd/opensourcemano/tests:osm-master-8655	CVE-2013-7445	Container Scanning GitLab
Medium	CVE-2015-8553 in linux-libc-dev-4.15.0-166.174 osm.etsi.org:5050/devops/cicd/opensourcemano/tests:osm-master-8655	CVE-2015-8553	Container Scanning GitLab
Medium	CVE-2016-8660 in linux-libc-dev-4.15.0-166.174 osm.etsi.org:5050/devops/cicd/opensourcemano/tests:osm-master-8655	CVE-2016-8660	Container Scanning GitLab
Medium	CVE-2018-17977 in linux-libc-dev-4.15.0-166.174 osm.etsi.org:5050/devops/cicd/opensourcemano/tests:osm-master-8655	CVE-2018-17977	Container Scanning GitLab
Medium	CVE-2018-20217 in krb5-locales-1.16-2ubuntu0.2 osm.etsi.org:5050/devops/cicd/opensourcemano/tests:osm-master-8655	CVE-2018-20217	Container Scanning GitLab

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Challenges

- COVID, of course
- No background with NFV
- Scope and complexity of OSM

Skills obtained

- Docker/Kubernetes/containers
- Working on a large scale project
- Devops and CI/CD pipelines
- GitLab
- More Telco knowledge: NFV
- Linux environment
- And of course OSM

OSM Hackfest

Thanks

- Silvia Almagia
- Mark Beierl
- Everyone at ETSI and on the OSM team

Thank you for your attention