Hardware & Cloud Resource Management

An overview by Anil Belur, Bengt Thuree, Matt Watkins

Linux Foundation, Release Engineering

Presentation Overview, Topics

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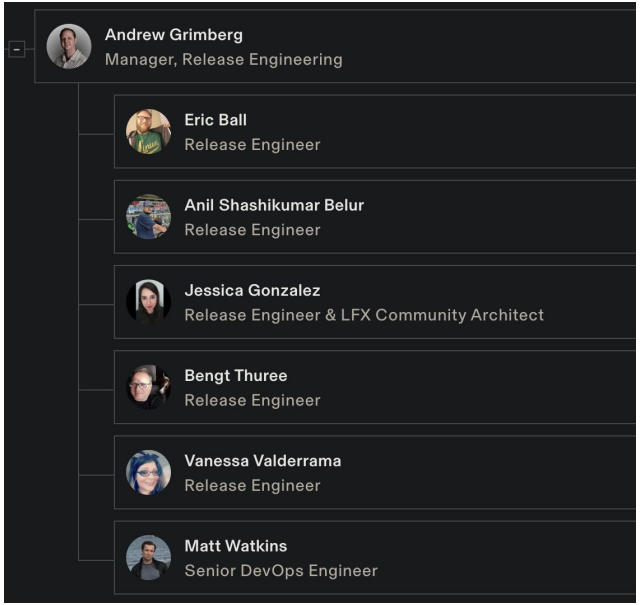
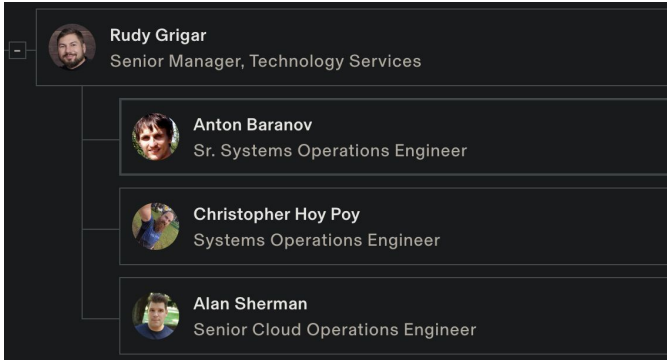
Introduction

Release Engineering



Technology Services



Release Engineering Team

Remit, Responsibilities

Concerned with the following aspects of software production:

Identifiability, Reproducibility, Consistency, Agility

Our portfolio:

Hardware

- On premise hardware, data centres (Portland, VEXXHOST)
- Cloud infrastructure (AWS, GCP, Azure)
- Lab environments/access/resources

Software

- Software platforms/tooling, Jenkins, GERRIT, Nexus
- Internally developed tooling, e.g. LFX, common-packer, etc.

Platforms Inventory

Project	SCM (Gerrit / GitHub / Mirror))	CI Platform	Jira	Artifact Repository	Build logs	Docs	Sonar	Insight Dashboard	Stats
Acumos	https://gerrit.acumos.org https://github.com/acumos	https://jenkins.acumos.org https://jenkins.acumos.org/sandbox	https://jira.acumos.org	https://nexus.acumos.org https://nexus3.acumos.org	https://logs.acumos.org	https://wiki.acumos.org https://docs.acumos.org	https://sonarcloud.io/organizations/acumos/projects	https://insights.lfx.linuxfoundation.org/projects/lfai%2Facumos/dashboard	Acumos Jenkins
AGL	https://gerrit.automotivelinux.org https://github.com/automotive-grade-linux	https://build.automotivelinux.org	https://jira.automotivelinux.org	N/A	N/A	https://wiki.automotivelinux.org https://docs.automotivelinux.org	N/A	N/A	AGL Jenkins
Akraino	https://gerrit.akraino.org https://github.com/akraino-edge-stack	https://jenkins.akraino.org https://jenkins.akraino.org/sandbox	https://jira.akraino.org	https://nexus.akraino.org https://nexus3.akraino.org	https://logs.akraino.org	https://wiki.akraino.org	https://sonarcloud.io/organizations/akraino-edge-stack/projects	https://insights.lfx.linuxfoundation.org/projects/lfedge%2Fakraino-edge-stack/dashboard	Akraino Jenkins
ASWF	https://github.com/AcademySoftwareFoundation	ASWF GitHub Actions	https://jira.aswf.io	Artifactory Docker Hub GitHub Releases for source releases	N/A	https://wiki.aswf.io	https://sonarcloud.io/organizations/academysoftwarefoundation/projects	https://insights.lfx.linuxfoundation.org/projects/academy-software-foundation	N/A
DENT	https://github.com/orgs/dentproject	https://jenkins.dent.dev https://jenkins.dent.dev/sandbox	N/A	https://nexus.dent.dev	https://logs.dent.dev/logs	https://github.com/dentproject/docs	N/A	https://lfanalytics.io/projects/dent/dashboard	DENT Jenkins
EdgeX	https://github.com/edgexfoundry	https://jenkins.edgexfoundry.org https://jenkins.edgexfoundry.org/sandbox	N/A	https://nexus.edgexfoundry.org https://nexus3.edgexfoundry.org	https://logs.edgexfoundry.org	https://wiki.edgexfoundry.org https://docs.edgexfoundry.org	https://sonarcloud.io/organizations/edgexfoundry/projects	https://insights.lfx.linuxfoundation.org/projects/lfedge%2Fedgexfoundry/dashboard	EdgeX Jenkins
FD.io	https://gerrit.fd.io https://github.com/FDio	https://jenkins.fd.io https://jenkins.fd.io/sandbox	https://jira.fd.io	https://nexus.fd.io	https://logs.fd.io	https://wiki.fd.io https://fd.io/documentation	https://sonarcloud.io/organizations/fdio/projects	https://insights.lfx.linuxfoundation.org/projects/lfn%2Ffdio/dashboard	FD.io Jenkins
HyperLedger	https://github.com/hyperledger	HyperLedger GitHub actions HyperLedger Circle CI HyperLedger Azure	https://jira.hyperledger.org	https://hyperledger.jfrog.io/ui/packages	N/A	https://wiki.hyperledger.org https://hyperledger-fabric.readthedocs.io	N/A	N/A	Hyperledger Jenkins
LF Edge	https://github.com/lf-edge	https://jenkins.lfedge.org	N/A	N/A	N/A	https://wiki.lfedge.org	N/A	https://insights.lfx.linuxfoundation.org/projects/lfedge%2Fdashboard	LF Edge Jenkins
LF RelEng	https://gerrit.linuxfoundation.org https://github.com/lfit	N/A	LF RelEng Projects LF Support Desk	N/A	N/A	https://docs.releng.linuxfoundation.org	N/A	N/A	N/A
ODPi	https://github.com/odpi	ODPi Azure Pipelines ODPi GitHub actions	N/A	https://odpi.jfrog.io/odpi/webapp	N/A	N/A	https://sonarcloud.io/organizations/odpi/projects	N/A	N/A
ONAP	https://gerrit.onap.org https://github.com/onap	https://jenkins.onap.org https://jenkins.onap.org/sandbox	https://jira.onap.org	https://nexus.onap.org https://nexus3.onap.org	https://logs.onap.org	https://wiki.onap.org https://docs.onap.org	https://sonarcloud.io/organizations/onap/projects	https://insights.lfx.linuxfoundation.org/projects/lfn%2Fonap/dashboard	ONAP Jenkins
OpenDaylight	https://git.opendaylight.org/gerrit https://github.com/opendaylight	https://jenkins.opendaylight.org/releng https://jenkins.opendaylight.org/sandbox	https://jira.opendaylight.org	https://nexus.opendaylight.org https://nexus3.opendaylight.org	https://logs.opendaylight.org	https://wiki.opendaylight.org https://docs.opendaylight.org	https://sonarcloud.io/organizations/opendaylight/projects	https://insights.lfx.linuxfoundation.org/projects/lfn%2Fodl/dashboard	ODL Jenkins
Anuket	https://gerrit.opnfv.org https://github.com/opnfv	https://build.opnfv.org/ci https://sandbox.opnfv.org	https://jira.opnfv.org	N/A	N/A	https://wiki.anuket.io https://docs.anuket.io	N/A	https://insights.lfx.linuxfoundation.org/projects/lfn%2Fanuket/dashboard	Anuket Jenkins
O-RAN	https://gerrit.o-ran-sc.org https://github.com/o-ran-sc	https://jenkins.o-ran-sc.org https://jenkins.o-ran-sc.org/sandbox	https://jira.o-ran-sc.org	https://nexus.o-ran-sc.org https://nexus3.o-ran-sc.org	https://logs.o-ran-sc.org	https://wiki.o-ran-sc.org https://docs.o-ran-sc.org	https://sonarcloud.io/organizations/o-ran-sc/projects	https://insights.lfx.linuxfoundation.org/projects/oran/dashboard	O-RAN Jenkins
Tungsten Fabric	https://gerrit.tungsten.io https://github.com/tungstenfabric	https://jenkins.tungsten.io https://jenkins.tungsten.io/sandbox	https://jira.tungsten.io	N/A	N/A	https://wiki.tungsten.io https://docs.tungsten.io	N/A	https://insights.lfx.linuxfoundation.org/projects/lfn%2Ftungsten-fabric/dashboard	Tungsten Fabric Jenkins
Zowe	https://github.com/zowe	Zowe GitHub Actions	N/A	https://zowe.jfrog.io	N/A	https://wiki.openmainframeproject.org https://docs.zowe.org	https://sonarcloud.io/organizations/zowe/projects	https://insights.lfx.linuxfoundation.org/projects/open-mainframe-project%2Fzowe/dashboard	N/A

v: latest

Observations, Industry Trends, Strategies

Strategy, Direction

- Broad discussion of industry trends
  - Increased use of public cloud, infrastructure as code, automation
- Modern CI/CD tooling, e.g. GitLab, GitHub
- Common challenges related to infrastructure management
  - Governance, finding consensus, agreeing strategy

Outline of current RelEng projects

Potential alignment with industry trends

Possible future changes to direction of travel


LAB
RESOURCES
strategy & planning
analysis
develop
execute
2010
2020
2030
2040
training
materials
roll out
35%
26%
27%
market research
personal resources
business model
search
trend analysis
business plan
marketing plan
development strategy
long term goals
team building
$$$
business
risk
goal
target
cloud
strategy
25%
50%
ABCDE

Existing Community Labs (or so we thought)

ONAP*:

- Orange OpenLab (Jan 9, 2021)
- Azure Lab
- Intel ONAP Integration Lab (Apr. 1, 2022)
- China Mobile ONAP Lab
- Reliance Jio R&D Labs
- China Telecom ONAP Lab
- TLAB (AT&T)
- WINLAB
- Auto Lab
- VMware OpenLab (VMware)
- ONAP Lab of OVP (Lenovo Labs)
- IoL-UNH ONAP Lab

Fd.io*:

- AWS
- Vexxhost

Anuket*:

- Intel
- IoL-UNH-LaaS

Status:
Available
Unsure
Decommissioned (Date)

5G SBP is using UNH (New Hampshire), Kaloom (Montreal), and WaveLabs (Hyderabad) labs. All are accessible upon request.

*Sources: https://wiki.onap.org/x/rINk, https://wiki.anuket.io/x/6olAAQ, https://wiki.fd.io/view/CSIT/csit_lab_2022_plan

SubCommittee for Labs

ONAP

- Community had a lab committee

  https://wiki.onap.org/x/4JZk
- Dormant since 2019 June

LFN TAC

- Had an infrastructure committee

  https://wiki.lfnetworking.org/x/_QKh
- Wasn't specifically lab focused
- Dormant since 2019 November

We really this to be active again…

Recommendation:

Allocate an active representative to coordinate with Anuket for lab utilizations, this resource also will promote the how to labs within their community

LFN Level Committee

Division of Responsibilities

LF Responsibilities

- Pay the bills
- Facilitate communications

Community Responsibilities

- Daily Tasks
- Configuration
- Booking
- Developing new labs

Lessons Learned

Potential causes of unnecessarily high infrastructure costs

- Poorly optimized hardware selection, higher specification than required
- Hardware utilization not optimally managed by software stack/tooling
- Poor lifecycle management, governance
- Unreliable infrastructure, unnecessary hardware redundancy
- Poor utilization, supplier/vendor selection

Lower utilizations could be due to:

- Poor governance, management overhead, political considerations
- Lack of communication, documentation or information sharing
- Platforms/tooling unsuitable for tasks, poor reliability, scheduling conflicts

Conclusion

Shared infrastructure, tooling and knowledge can reduce costs, improve productivity and potentially increase the effectiveness of governance/oversight

Lab Recommendations

- Use IaaS (Anuket) for new labs

  Always clean setup, two week default window/allocation, can request longer

  https://labs.lfnetworking.org/

- Transition to CI automation as much as possible

  OpenStack provides for dynamic K8S pods attached to Jenkins (see ODL)

- For ODL K8 jobs:

  https://github.com/opendaylight/releng-builder/blob/master/jjb/packaging/openstack-k8s-template.yaml

Summary

What LF will do:

- Pay the cost of acquiring H/W
- Strongly recommend LAAS service

What LF will NOT do:

(Community Responsibilities)

- Daily tasks
- Configuration
- Coordinate usage

Recommendation

- Allocate an active representative to coordinate with Anuket for lab utilizations, this resource also will promote the how to labs within their community
- LFN Level Committee

How to contact RELENG

- JIRA Service Desk
  - Use the portal for raising requests (issue tracking/logging)
  - Location: http://support.linuxfoundation.org/
  - Other release engineers have all history at hand
  - Will not be forgotten, even if sometimes it takes a bit of time to fix the issue

- Slack Channel
  - https://join.slack.com/t/onapproject/shared_invite/zt-1alh2xpo6-Rk2eUQljTrVcP4lBkl59Rg
  - Only informal communications between community and Releng
  - ONAP releng resources hang out on the slack channel, and will reply if available
  - Releng will 99% of the time ask for a JIRA ticket to be raised.

Contact Us

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