

The background of the slide is a high-resolution image of Earth as seen from space. The top half shows the dark void of space with some stars, while the bottom half shows the curvature of the Earth with a blue atmosphere, white clouds, and green and brown landmasses. The text and logos are overlaid on this background.

OLF
NETWORKING

LFN Developer & Testing Forum

Cloud-Native Full Stack Conformance Validation

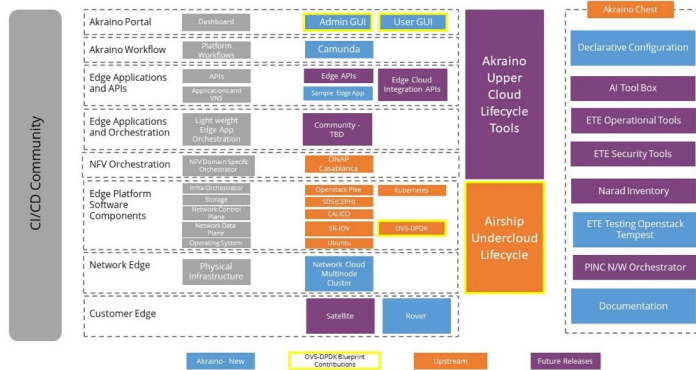
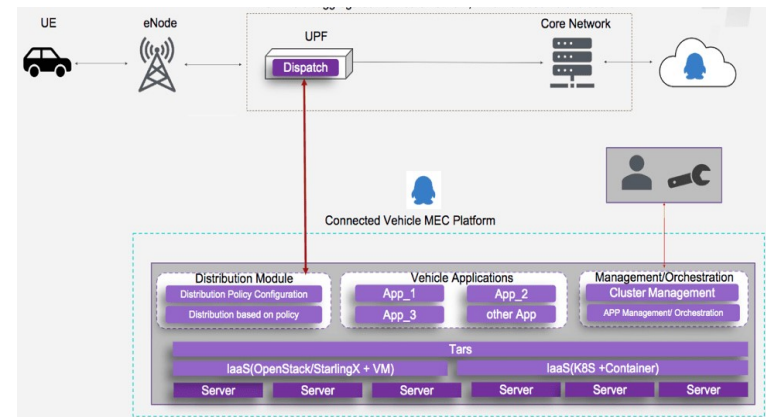
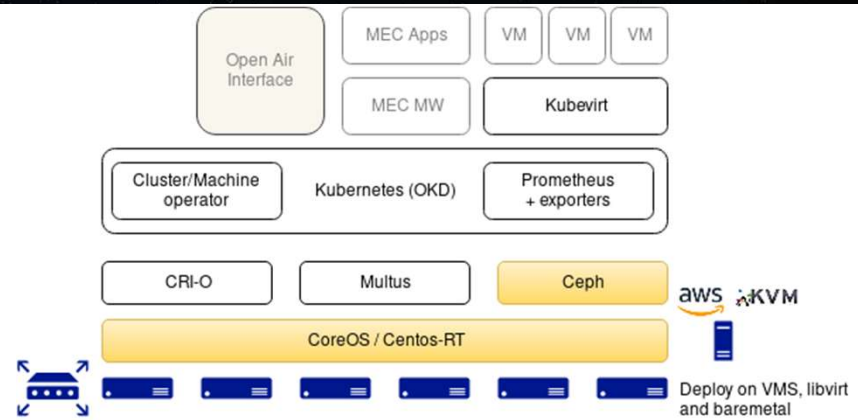
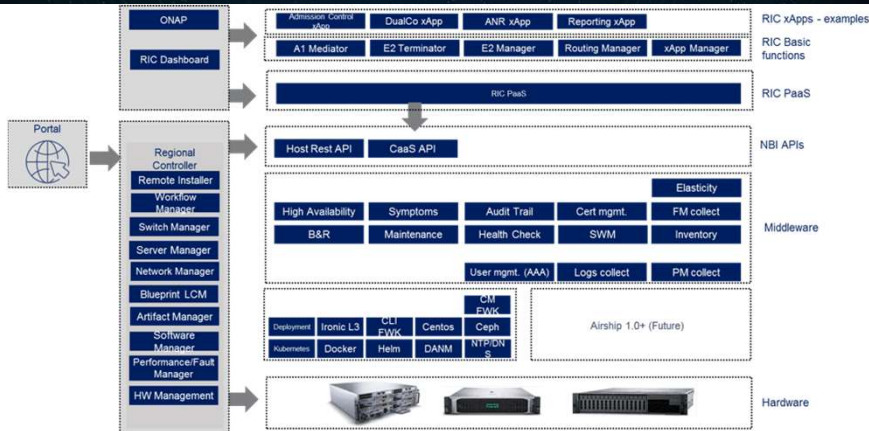
Deepak Kataria

June 08, 2021

Outline

- K8s/Container based Full Stack Edge Cloud Deployments
- Disaggregated and Layered Approach to Testing
- Full Stack Cloud Validation Framework
- Test Suites
- CI/CD Operations
- User Interface (UI)

K8s/Container based Edge Cloud Deployments – 1/2



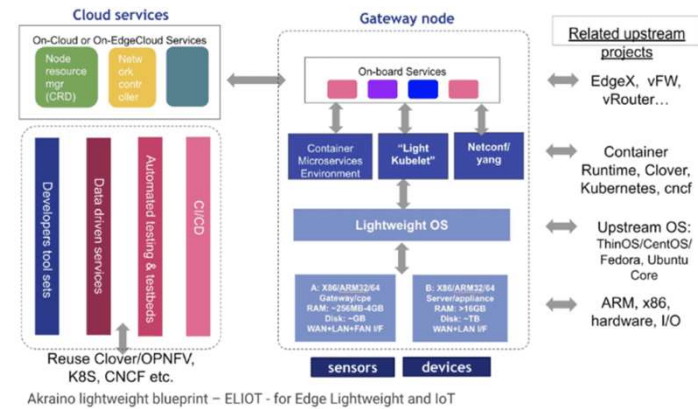
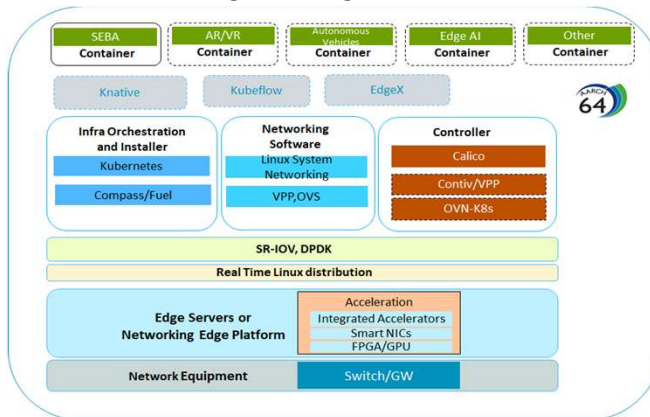
Source: Release 4 - LF Edge

K8s/Container based Edge Cloud Deployments – 2/2

ICN R2 Release

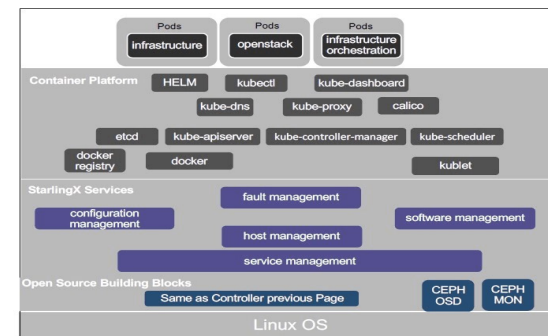
Zero Touch Provisioning	Apps, VNFs, CNFs	EdgeX Foundry	Containerized Firewall (cFW)	SDWAN	
	Multi Cluster Orchestration	MC Orchestrator (ONAP/K8S)			
	Site level Orchestration	Kubernetes (Kubernetes Deployer(KuD) – Multi cluster Installer)			
	Platform Services	Accelerator Plugins SRIOV	NFD	OVN4NFV	
	Virtualization & Container Run time	Docker		Virtlet	
	Networking	Multus	OVN	Flannel	
	Operating system	Ubuntu			
	Hardware platform	Intel Xenon Intel Ethernet Controller XL710 for 40GbE			
	Infrastructure Orchestration (ZTP - Binary Provisioning Agent (BPA), Meta3, Ironic – Baremetal(Physical Servers), Libvirt (KVM))				

Integrated Edge Cloud



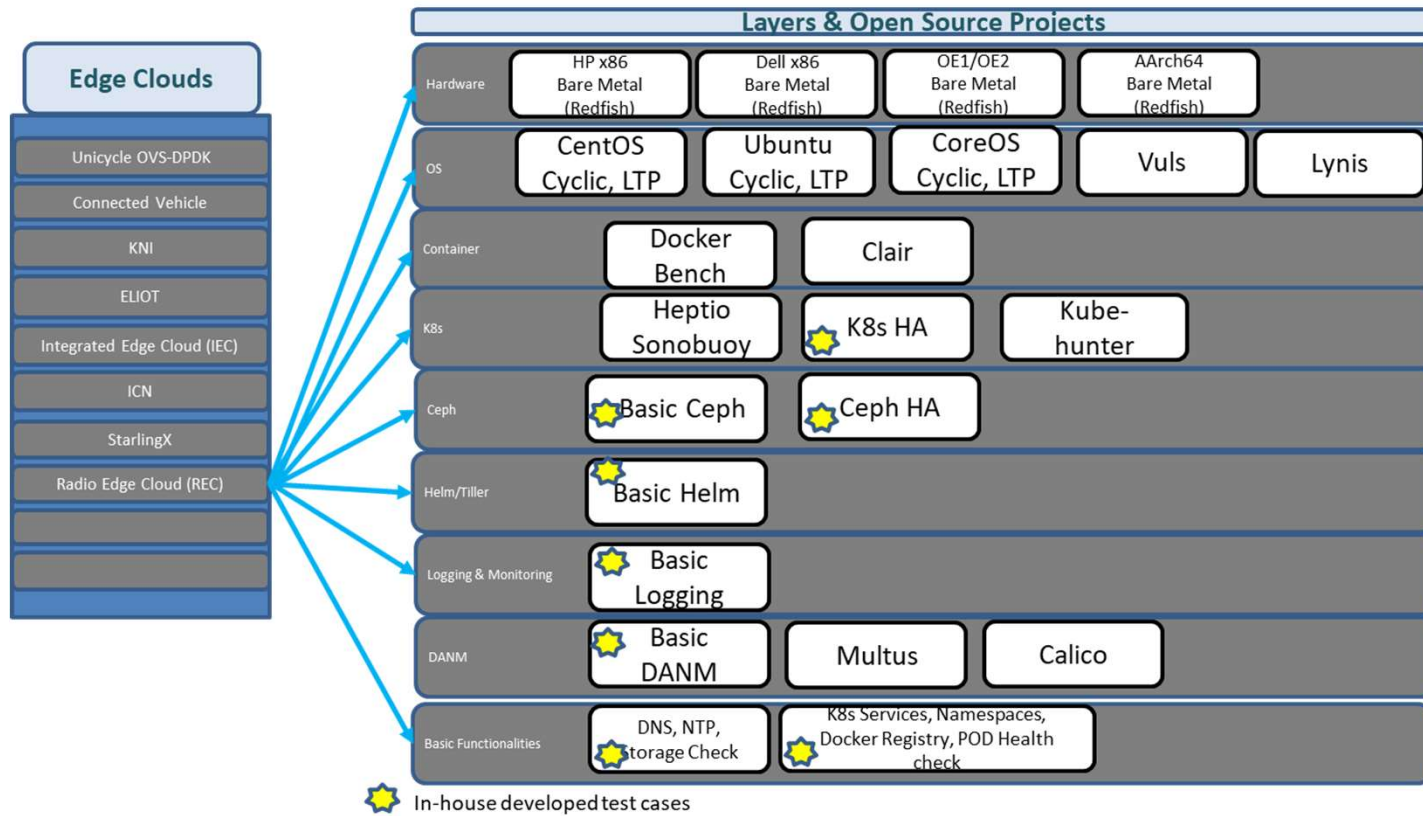
StarlingX - Far Edge Distributed Cloud

EDGE X FOUNDRY



Source: Release 4 - LF Edge

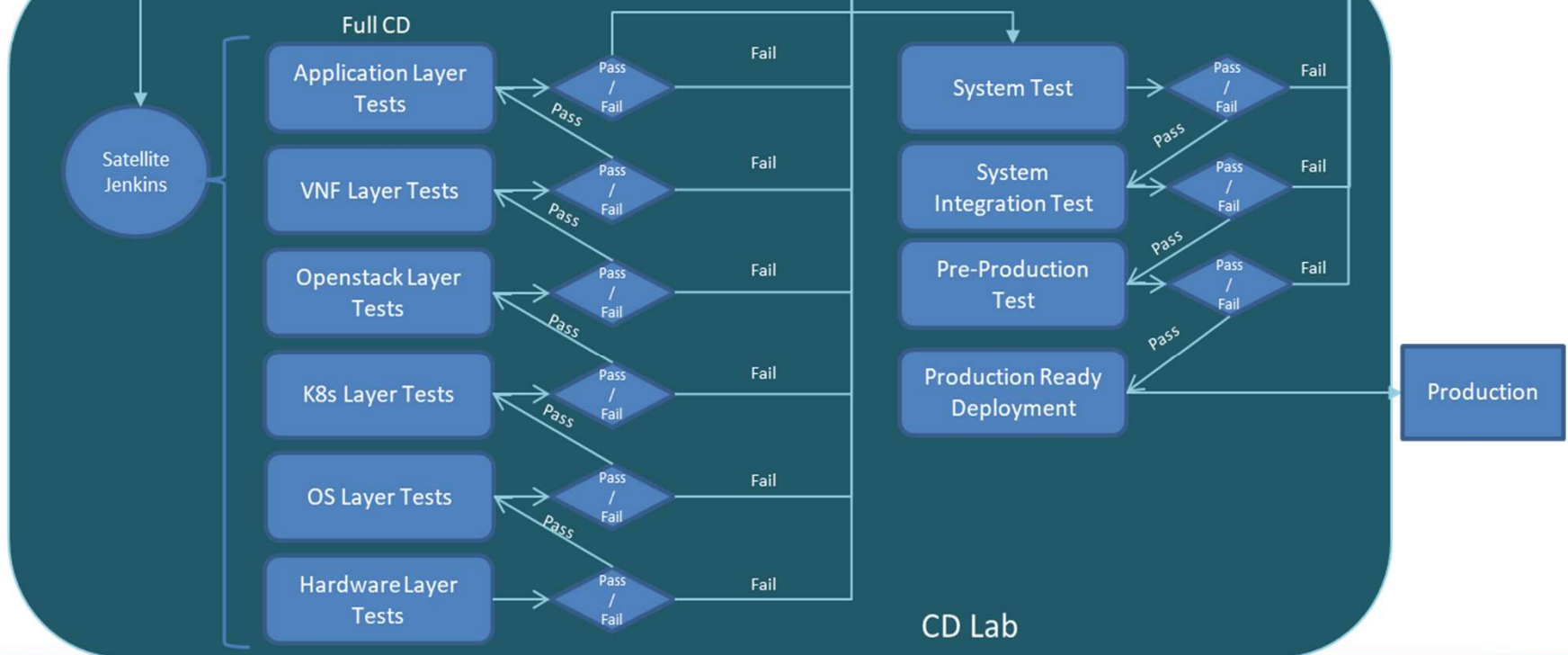
Disaggregating into Component Layers for Testing



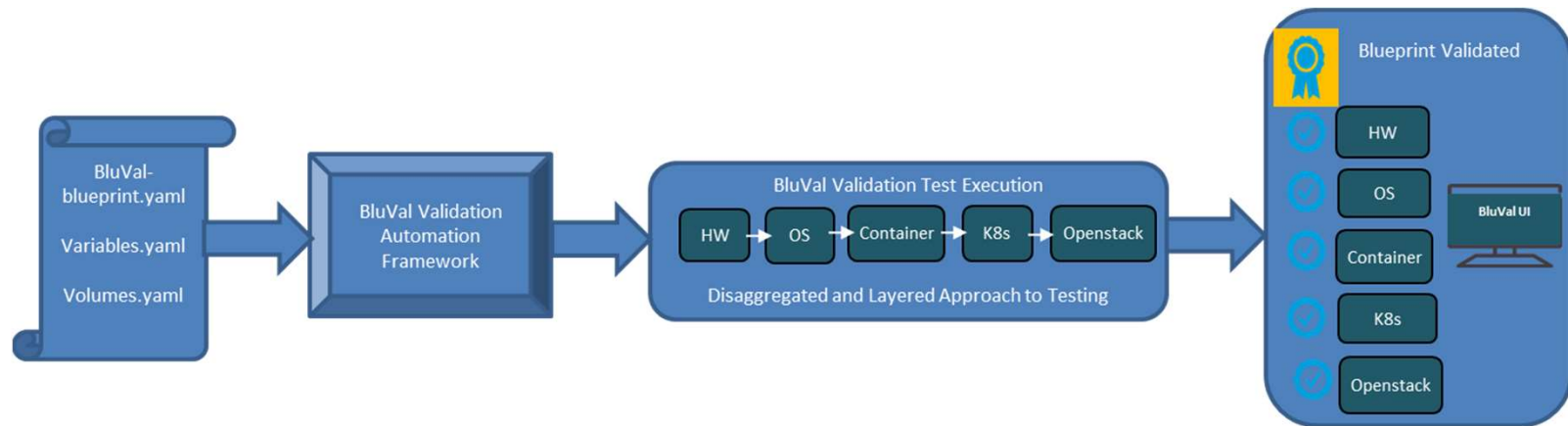
Linux Foundation CI Pipeline



Layered Approach to Testing



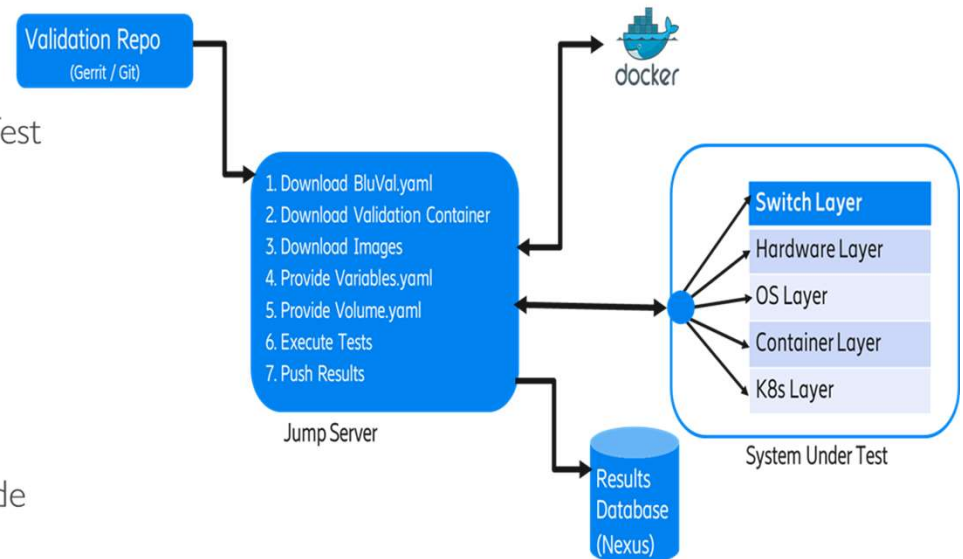
End-to-End Automated Blueprint Validation for Edge Cloud



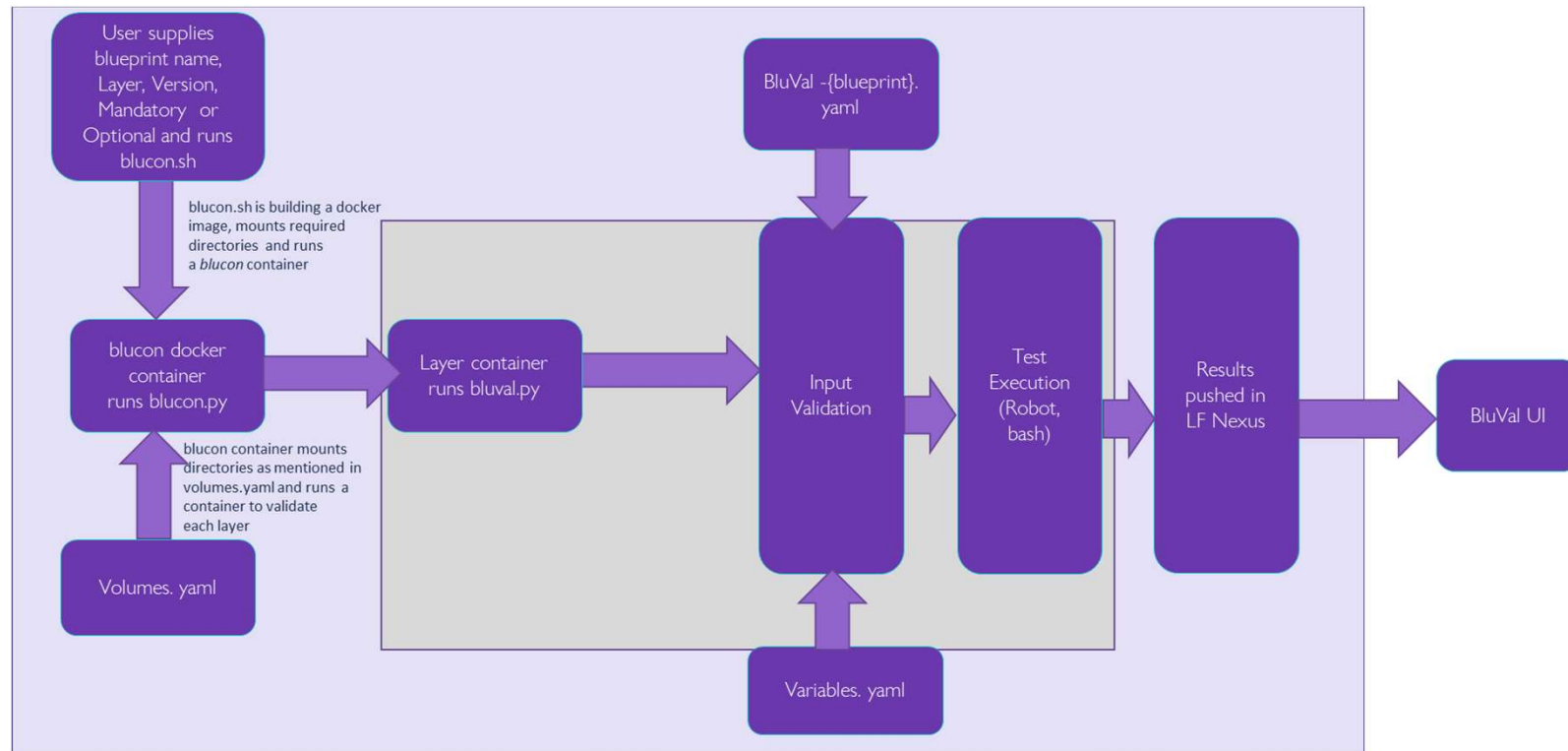
- BluVal (**Blueprint Validation**) provides complete, tested and production deployable blueprints meeting the use case characteristics
- It consolidates validation results from all blueprint CD labs in a single BluVal UI
- It provides flexibility to add additional layers and specify mandatory tests
- Additional functional, performance, resilience, stress and security tests can be added to improve confidence and quality of all blueprints

BluVal Framework – High Level View

1. A "bluval-*.yaml" file describes what tests will be run, and whether they are mandatory or optional
2. A "variables.yaml" file provides information on credentials (login/password) needed to connect to the System Under Test (e.g., cluster)
3. A "volumes.yaml" file provides for a specific CD the variables.yaml, ssh keys, k8s config, openrc file location, etc.
4. The next step is to execute `blucon.py` which pulls the appropriate image based on layer, deploys the container, mounts these files to this container and runs the tests using `bluval.py`
5. An enhancement to (4), that is being developed is to provide a single Docker Container to run all the tests without requiring (Dockerfile is included)
6. Test Results are uploaded in Linux Foundation's Nexus Repo



BluVal Framework – Software Flow



Tests integrated in BluVal Framework

Mandatory Tests

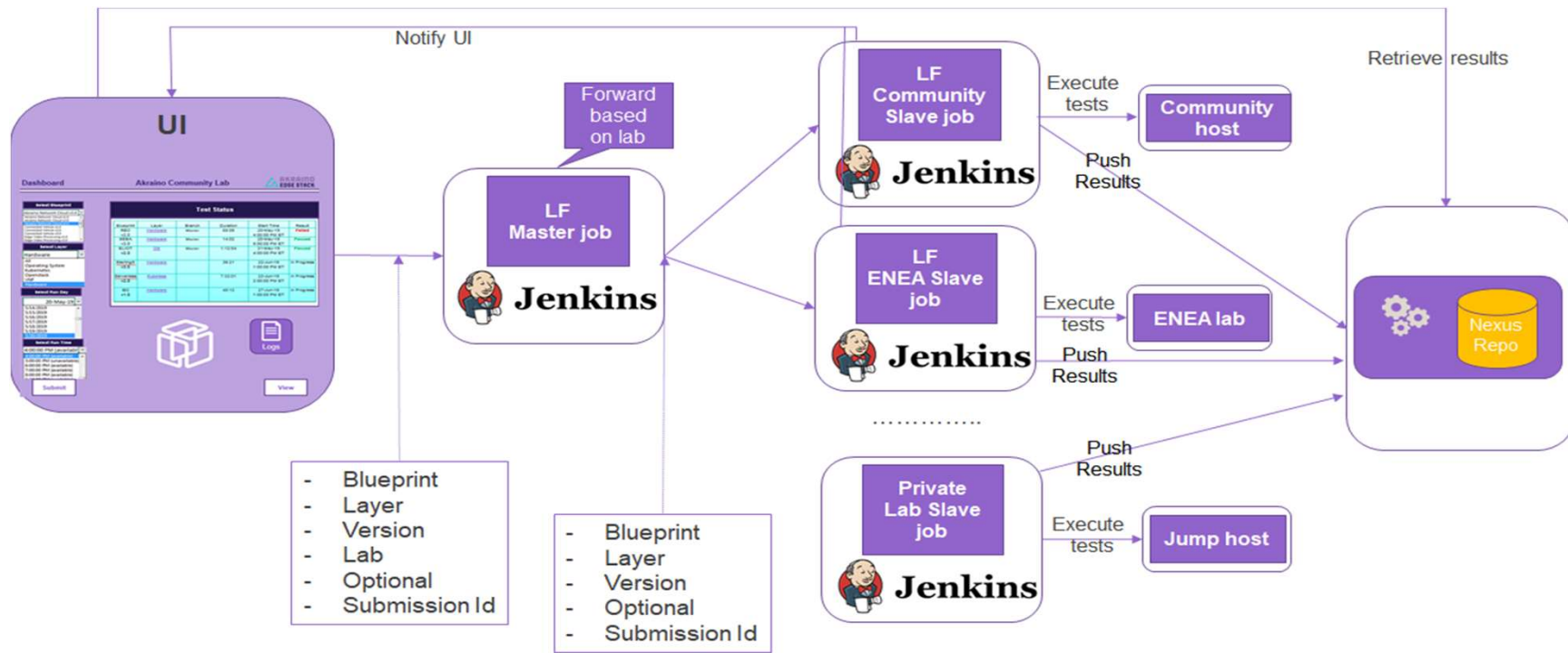
- › Redfish
- › Kubernetes Conformance 1.18
- › Lynis
- › Vuls
- › Kubehunter

For Mature projects additionally:

- › HA tests: etcd_ha, ha/*, ceph_service

For more information, please see: [Bluval Documentation - Akraino - Akraino Confluence](#)

CI/CD Operations



BluVal UI - Register a Lab

The screenshot shows the 'Register Lab' interface in the BluVal UI. The top navigation bar includes the 'AKRAINO EDGE STACK' logo, the title 'Blueprint Validation UI', and links for 'Manage' and 'Support'. A user profile icon labeled 'admin' is in the top right. A left sidebar menu lists various options: Home, New Submission, Committed Submissions, Validation Results, Register data, Unregister data, Modify data, Get data, Users, Update password, Sample Pages, Reports, Profile, and Admin. The main content area is titled 'Register Lab' and contains two input fields: 'Define lab name:' with the value 'enea' and 'Define lab silo:' with the value 'enea'. A blue 'Register' button is positioned below the second field.

Then, UI will automatically retrieve Bluval results for all the blueprints tested on this lab

BluVal UI - Display Results

AKRANO EDGE STACK Blueprint Validation UI Manage Support admin

Blueprint Validation Results

Blueprint layer: Result: Timestamp: Refresh

Lab	Blueprint	Version	Timestamp	Date/Time of result storage	Optional test cases	All layers	Layer(s)	Submission Id	Result
enea	iec	master	20200130-223003	Thu Jan 30 22:30:09 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200130-164408	Thu Jan 30 16:44:15 UTC 2020	true	false	k8s		FAILURE
enea	iec	master	20200130-021510	Thu Jan 30 02:15:15 UTC 2020	true	false	k8s		FAILURE
enea	iec	master	20200129-223023	Wed Jan 29 22:30:30 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200129-163649	Wed Jan 29 16:36:56 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200128-224015	Tue Jan 28 22:40:22 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200128-163249	Tue Jan 28 16:32:57 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200124-025213	Fri Jan 24 02:52:19 UTC 2020	true	false	k8s		SUCCESS
enea	iec	master	20200123-095741	Thu Jan 23 09:57:47 UTC 2020	false	false	k8s		FAILURE
enea	iec	master	20200117-230147	Fri Jan 17 23:01:53 UTC 2020	false	false	k8s		FAILURE
enea	iec	master	20200117-224354	Fri Jan 17 22:44:21 UTC 2020	false	false	k8s		FAILURE
enea	iec	master	20200110-181430	Fri Jan 10 18:14:35 UTC 2020			service		SUCCESS

More information can be found at:

The screenshot shows a web browser displaying the Akraino Wiki page for Bluval Documentation. The browser's address bar shows the URL <https://wiki.akraino.org/display/AK/Bluval+Documentation>. The page features a navigation sidebar on the left with a tree view of the site's structure, including sections like 'Documentation', 'Akraio Edge Stack', and 'Approved Incubation projects'. The main content area displays the title 'Bluval Documentation' and a list of links: 'Blueprint validation framework', 'Bluval User Guide', 'Running bluval in CI', 'UI Deployment / Installation guide', 'UI Developer Guide', and 'UI User Guide'. At the bottom of the page, there is a footer indicating it is powered by Atlassian Confluence Open Source Project License.

<https://wiki.akraino.org/display/AK/Bluval+Documentation>

Quick Walkthrough of BluVal UI

PORTAL DEMO



QLF NETWORKING

LFN Developer & Testing Forum