



OPNFV

□ **LINUX FOUNDATION**
COLLABORATIVE PROJECTS

Lab as a Service

Compose Your Cloud Automatically with Few Clicks

Parker Berberian, UNH
Fatih Degirmenci, Ericsson
Jack Morgan, Intel

Agenda



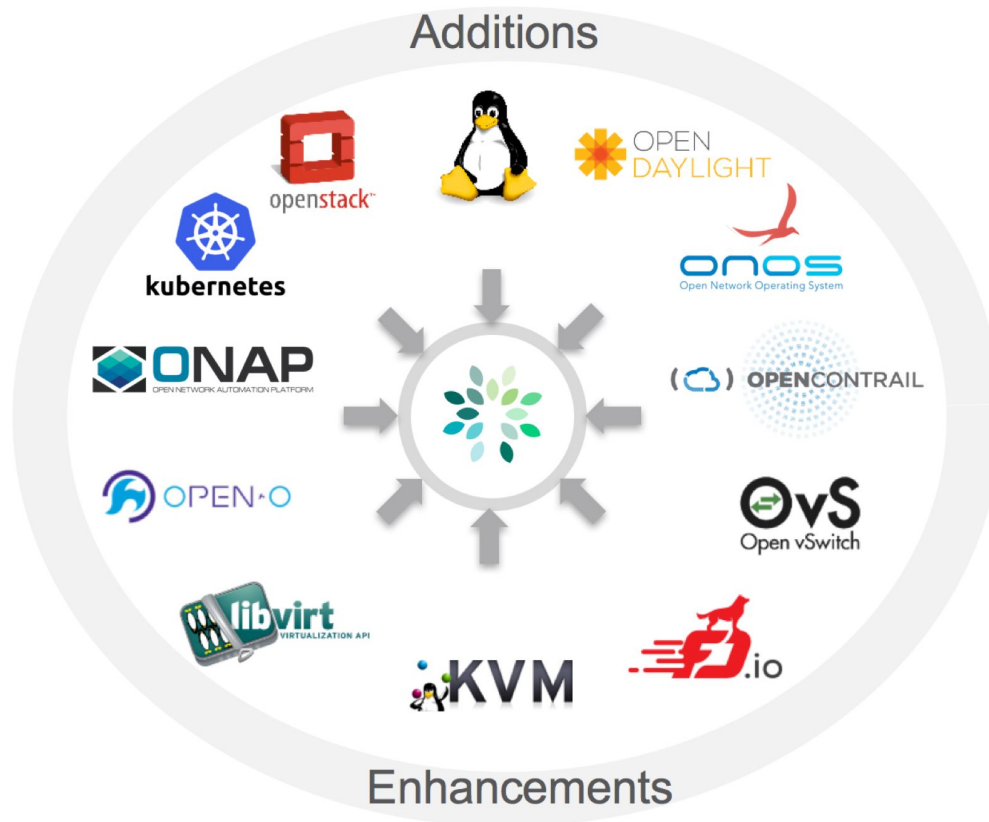
- ❖ What is OPNFV?
- ❖ Challenges
- ❖ The Solution
- ❖ Walkthrough / Demo



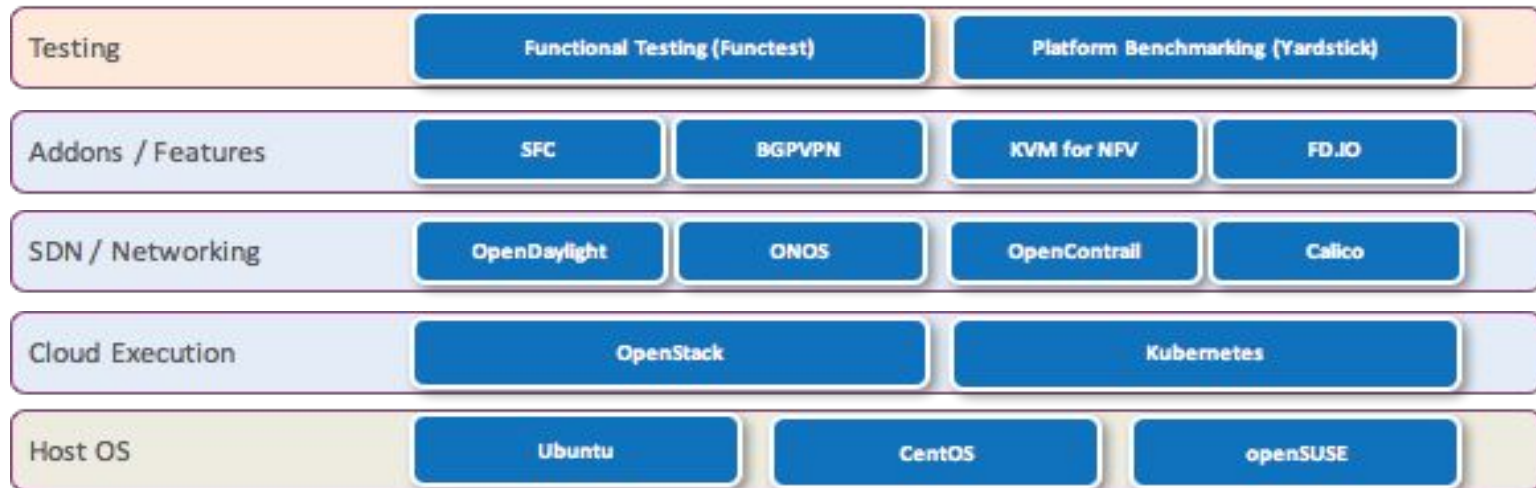
OPNFV facilitates the development and evolution of NFV components
across various open source ecosystems.

Through *system level integration, deployment and testing*, OPNFV creates
a reference NFV platform to *accelerate the transformation* of enterprise
and service provider networks.

What does OPNFV Actually do?



Resulting in lots of combinations...



Challenges



- ❖ It is not straightforward to bring entire stack up
 - Especially with the number of combinations we have
 - Resource intensive - cannot be done on a developer's laptop

- ❖ Allocating resources statically
 - Not scalable
 - Inefficient and under utilization
 - Bottleneck for development and releases

Community Labs



Several community labs

- ❖ Geographical located
- ❖ Standard configurations
- ❖ Hosted by member organizations

Multiple roles...

- ❖ CI Production (OPNFV releases)
- ❖ Testing
- ❖ Development

Pharos

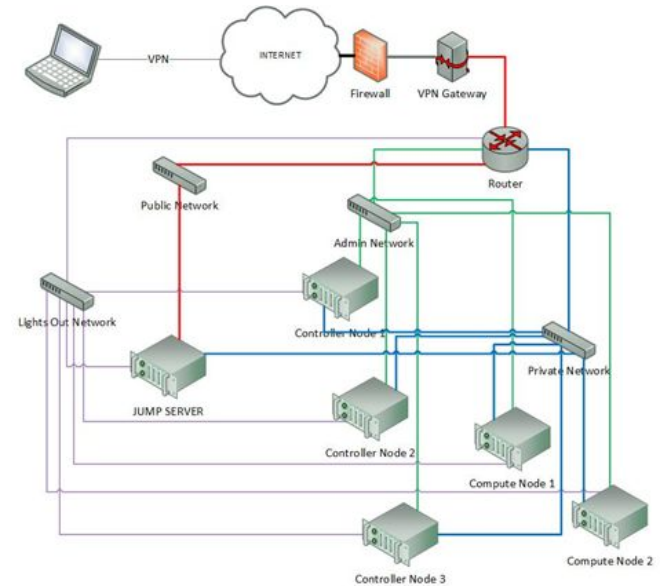


Pharos Specification

- ❖ Jump server - virtualized OpenStack/OPNFV installer
- ❖ Controller/Compute nodes – for high availability
- ❖ Network topology – LOM, Admin, Public, Private and Storage
- ❖ Remote management – OpenVPN + SSH access

Hardware requirements

- ❖ Intel and ARM processor
- ❖ Minimum 32GB RAM
- ❖ 1TB HDD – OS and additional software/tools
- ❖ 1TB HDD – CEPH object store
- ❖ 100GB SSD – CEPH journal



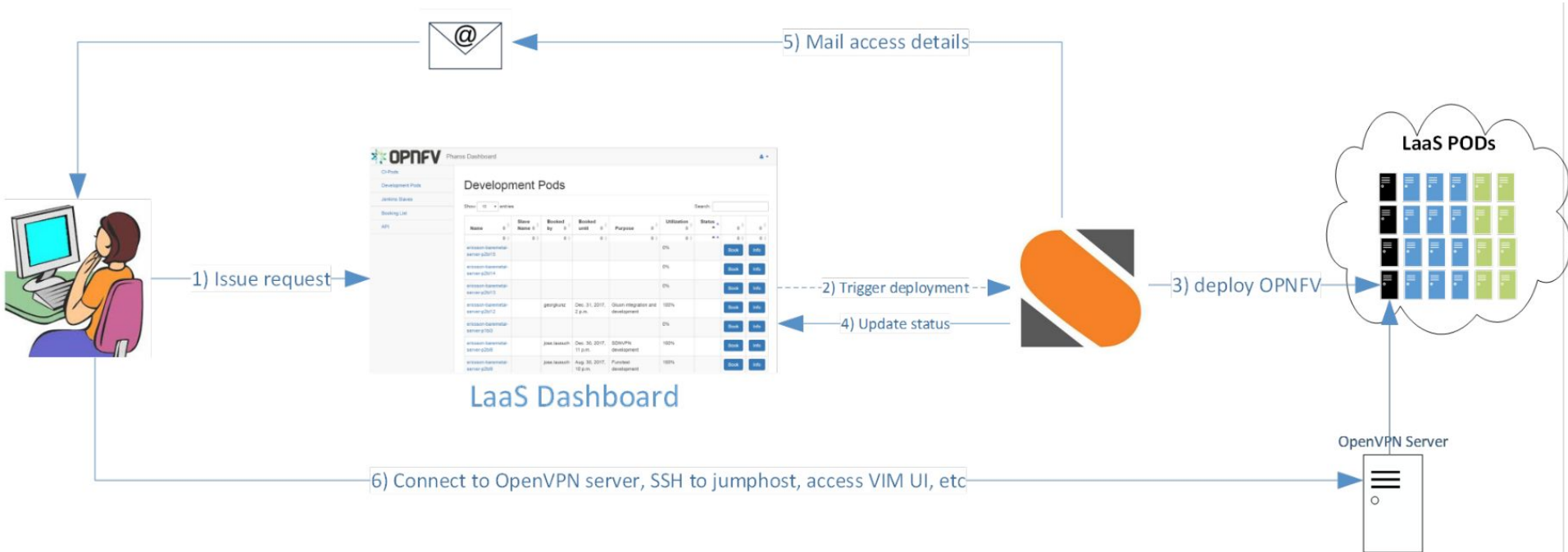


Lab as a Service (LaaS)

- ❖ Automated provisioning, deployment, and verification
 - Configurable to fit user's needs
 - Runs on baremetal servers

- ❖ Allocating resources dynamically
 - Use resources as they are needed
 - Scalable for development and releases

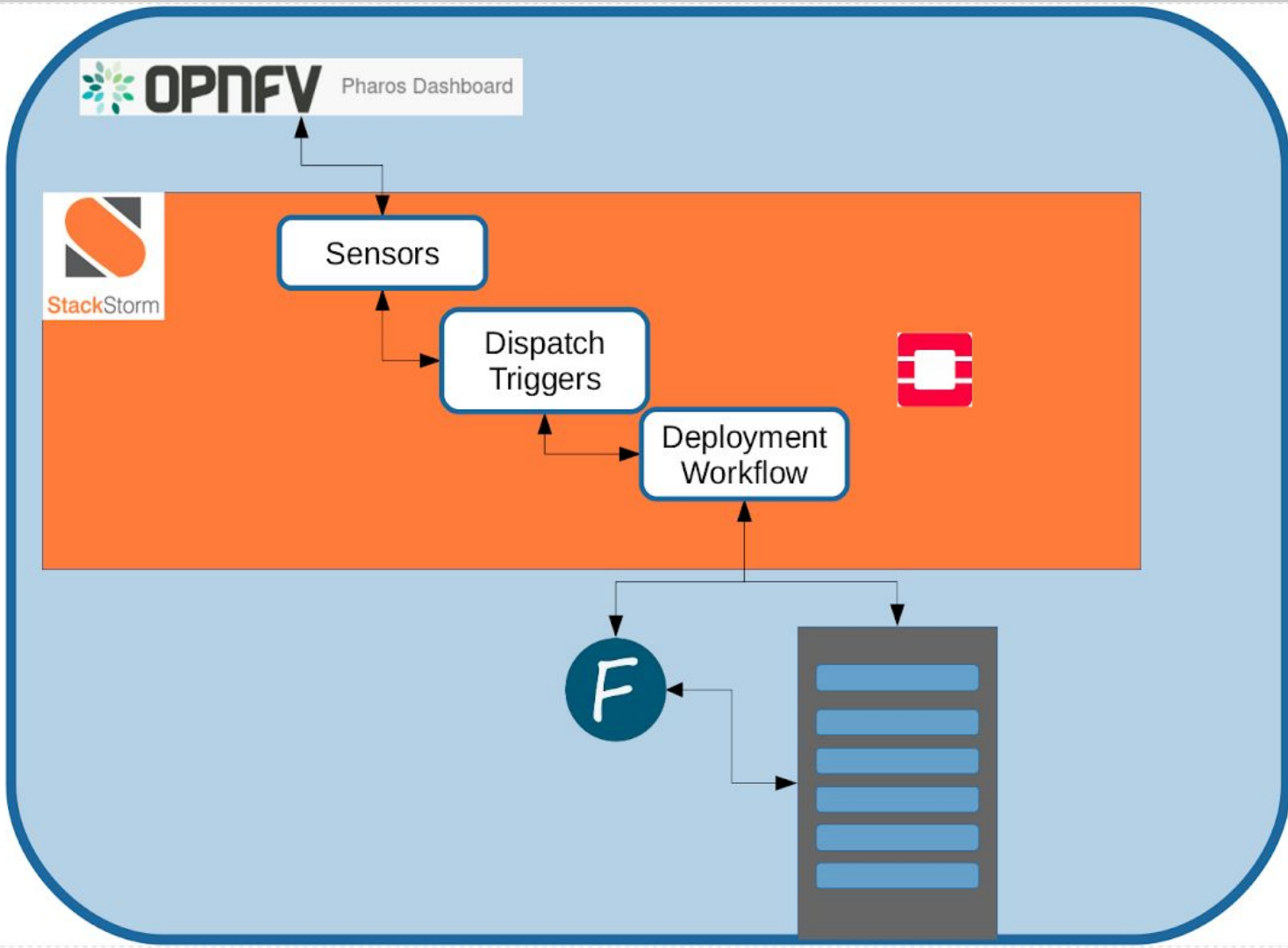
Architecture of LaaS





- ❖ 38 intel servers
 - 512 GB RAM
 - 1TB SSD Storage
- ❖ 14 arm servers
 - 256 GB RAM
 - 1TB SSD Storage
- ❖ All 10G networking, with 40G interconnect between switches

Deployment Overview



Dashboard



- CI-Pods
- Development Pods
- Jenkins Slaves
- User List
- Booking List
- API

Development Pods

Show 25 entries

Search:

Name	Slave Name	Booked by	Booked until	Purpose	Utilization	Status		
IOL Dev Machine hpe-1					0%		Book	Info
IOL Dev Machine hpe-10		mbuil	March 31, 2018, 10 a.m.	Show demo for ONS	53%		Book	Info
IOL Dev Machine hpe-11					0%		Book	Info
IOL Dev Machine hpe-12					0%		Book	Info
IOL Dev Machine hpe-13					0%		Book	Info
IOL Dev Machine hpe-14					0%		Book	Info
IOL Dev Machine hpe-15					0%		Book	Info
IOL Dev Machine hpe-16		Joe.kidder	March 28, 2018, 2 p.m.	testing some auto scripts on x86	43%		Book	Info
IOL Dev Machine hpe-17		Joe.kidder	March 30, 2018, 6 p.m.	host Auto pod 1 VM	50%		Book	Info
IOL Dev Machine hpe-18					0%		Book	Info
IOL Dev Machine hpe-19		Joe.kidder	March 29, 2018, midnight	virtual opnfv pod for auto project work	44%		Book	Info
IOL Dev Machine hpe-2					0%		Book	Info
IOL Dev Machine hpe-20					0%		Book	Info
IOL Dev Machine hpe-21		ParkerBerberian	March 29, 2018, midnight	Building FOG for ARM	44%		Book	Info

Booking Creation



- CI-Pods
- Development Pods
- Jenkins Slaves
- User List
- Booking List
- API

Booking: IOL Dev Machine hpe-20

Calendar

March 2018

week month

Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	27	28	1	2	3	4
5	6	7	8	9	10	11
				New Booking		
12	13	14	15	16	17	18
New Booking						
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Booking

Start
03/09/2018 00:00

End
03/17/2018 00:00

Operating System
ubuntu

Purpose
ONS Demo

Installer
.....

Scenario
.....

Book

StackStorm Automation Server



StackStorm
Event-driven automation



HISTORY



ACTIONS



RULES



PACKS



DOCS

st2admin@



CONTACT US

History

Status Action Trigger Type Rule

pharoslaas.fog_imageWorkflow

FRI, 16 MAR 2018

09:01:35	pharoslaas.deployment_workflow scenario='None', ipmi=true, host='hpe9', installer='None', os='ubuntu', booking='101'	Manual st2admin	
09:01:36	image_host	pharoslaas.fog_imageWorkflow ipmi=true, host='hpe9', os='ubuntu', powercmd='on'	
09:01:36	changelmage	pharoslaas.fog_changelmage image='None', os='ubuntu', host='hpe9'	
09:01:37	startImaging	pharoslaas.fog_startImaging host='hpe9'	
09:01:38	restartHost	pharoslaas.restart_workflow ipmi=true, host='hpe9', cmd='on', user='Administrator'	
09:01:39	branch	core.local cmd='exit 0'	
09:01:39	get_ipmi_hostname	pharoslaas.get_ipmi_hostname host='hpe9'	
09:01:40	get_ipmi_password	pharoslaas.get_ipmi_password host='ILOMXXQ74903BQ'	
09:01:42	ipmi_restart	pharoslaas.ipmi_restartHost	
09:01:47	waitForImaging	pharoslaas.fog_waitForImaging host='hpe9', timeout=3600	
09:01:29	pharoslaas.deployment_workflow scenario='None', ipmi=true, host='hpe36', installer='None', os='centos', booking='102'	Manual st2admin	
09:01:30	image_host	pharoslaas.fog_imageWorkflow ipmi=true, host='hpe36', os='centos', powercmd='on'	
09:01:30	changelmage	pharoslaas.fog_changelmage image='None', os='centos', host='hpe36'	
09:01:31	startImaging	pharoslaas.fog_startImaging host='hpe36'	
09:01:32	restartHost	pharoslaas.restart_workflow	

GENERAL

CODE

Status: Running
Execution ID: 5aabc02a02ebd505479743e2
Started: Fri, 16 Mar 2018 09:01:30
Finished: Invalid date

ACTION OUTPUT

ACTION INPUT

host *

hpe36 T

image T

ipmi

os

centos T

powercmd

on T

user

Administrator T

display_published

RERUN CANCEL

FOG - Free Open-source Ghost



Fri Mar 16, 2018 13:28 pm
Running Version: 1.4.4
SVN Revision: 6077

Open Source Computer Cloning Solution

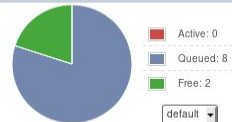


Dashboard

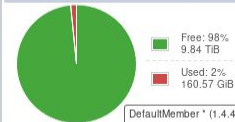
System Overview

Username	admin
Web Server	10.10.30.8
TFTP Server	10.10.30.8
Load Average	0.00, 0.01, 0.05
System Uptime	Up: 3 days 17 hrs 42 mins

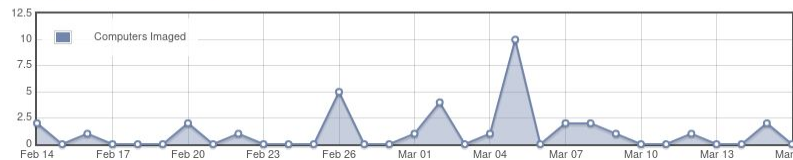
Storage Group Activity



Storage Node Disk Usage



Imaging Over the last 30 days



Bandwidth - Transmit



Partclone Disk Imaging and Cloning

```
Partclone v0.2.76 http://partclone.org
Starting to clone device (/dev/sda1) to image (-)
Reading Super Block
Calculating bitmap... Please wait... done!
File system:  NTFS
Device size:   136.3 GB = 33264582 Blocks
Space in use:  2.8 GB = 677020 Blocks
Free Space:    133.5 GB = 32587562 Blocks
Block size:    4096 Byte
```

```
Elapsed: 00:00:04 Remaining: 00:02:16   Rate:   1.18GB/min
Current Block: 19250   Total Block: 33264582
```

Data Block Process:



Total Block Process:



Post Installation Actions



- ❖ User management
- ❖ VPN Access
- ❖ IPMI and console access for developers
 - iLO / Integrated Lights Out
 - BMC/ Baseboard Management Controller
- ❖ Email notification to user

On Booking End



- ❖ All accounts deleted
- ❖ Server shut down
- ❖ Server made available for another booking

Roadmap



- ❖ We have brought our MVP to production
- ❖ Dynamic POD allocation
- ❖ Automatic deployment of OPNFV
- ❖ Multi-user bookings
- ❖ Snapshotting

Questions?



<https://labs.opnfv.org>

<https://wiki.opnfv.org/display/INF/Lab-as-a-Service+at+the+UNH-IOL>