LINUX FOUNDATION
COLLABORATIVE PROJECTS

Lab as a Service

Compose Your Cloud Automatically with Few Clicks

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

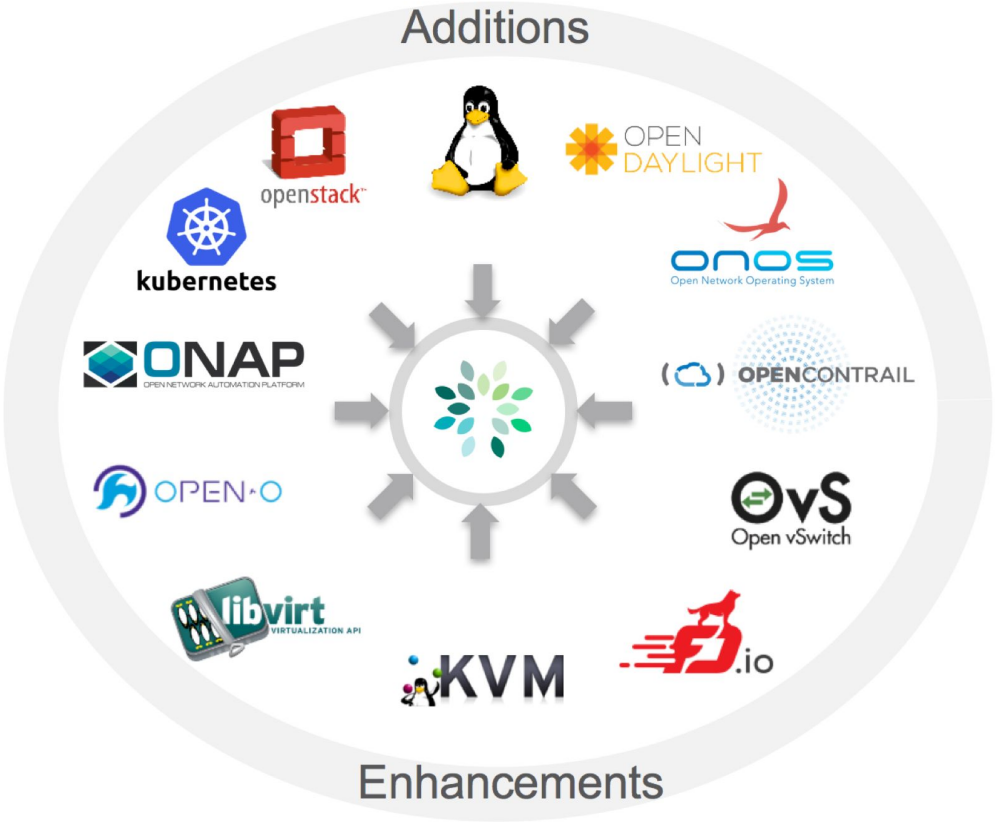
Agenda

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

Open Platform for NFV

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

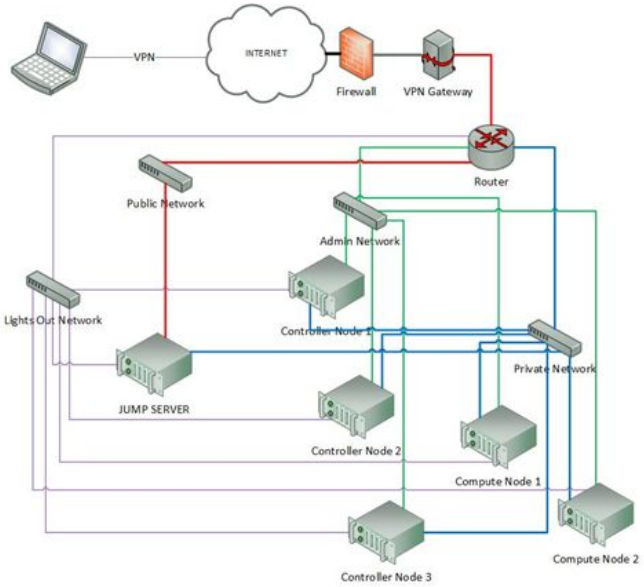
Pharos

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



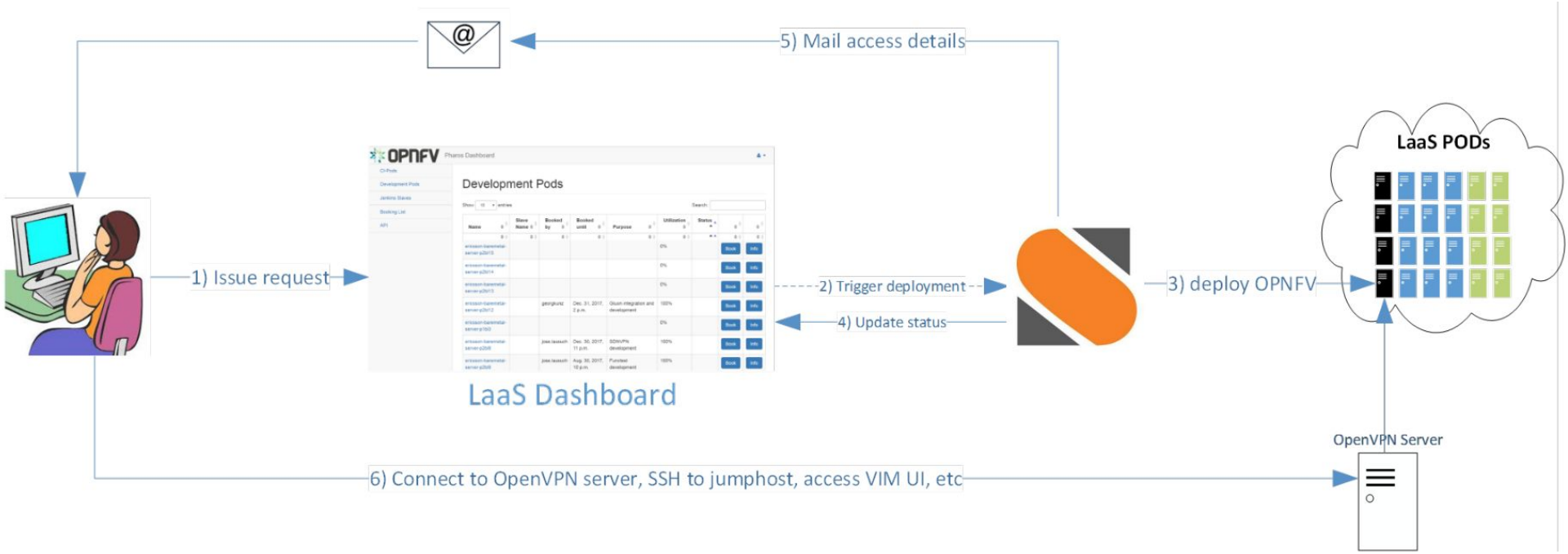
Solution

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

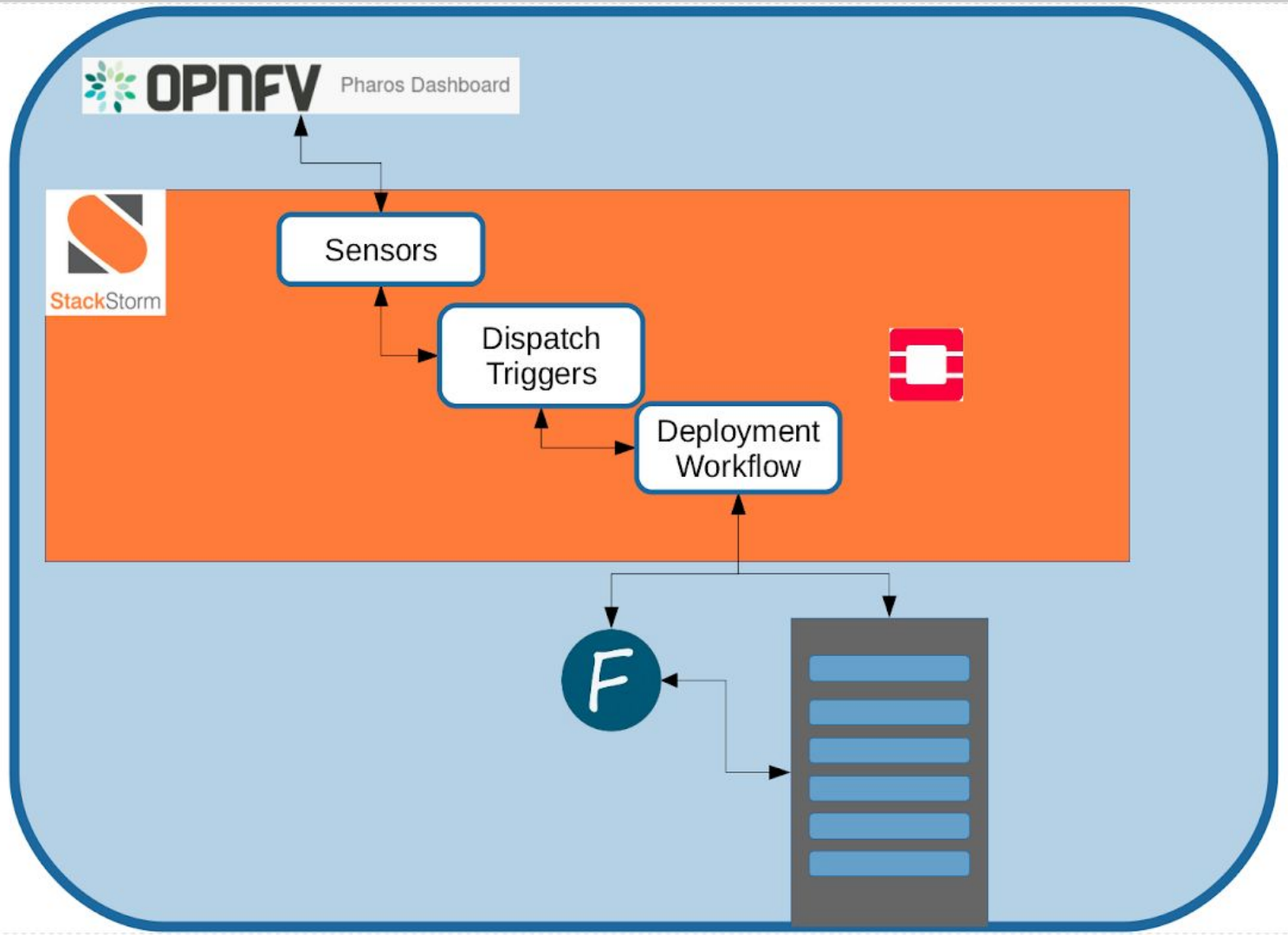
Architecture of LaaS



UNH IOL Lab

- 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

OPNFV Pharos Dashboard

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

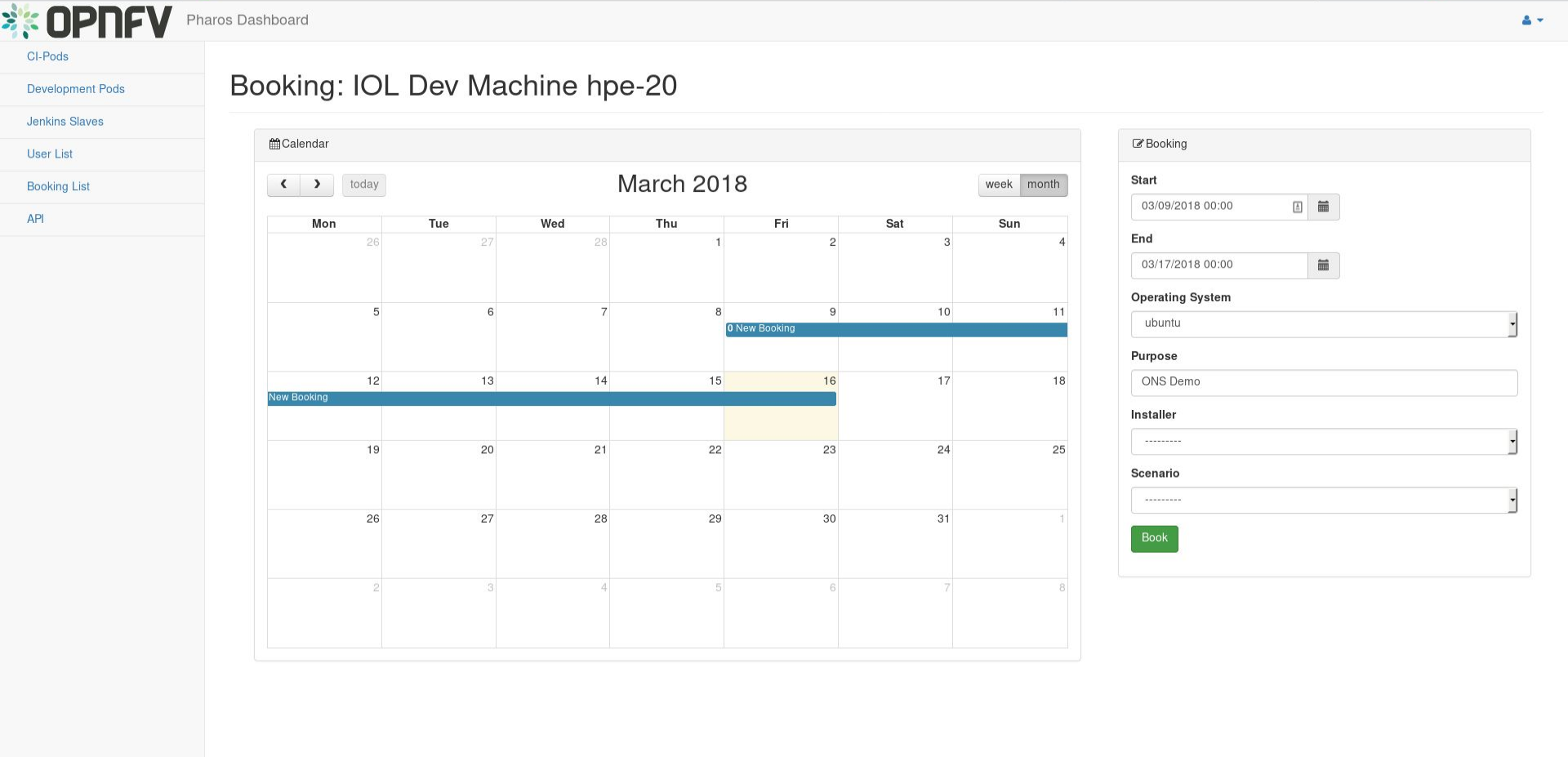
Development Pods

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



Stackstorm Automation Server

StackStorm
Event-driven automation

HISTORY ACTIONS RULES PACKS DOCS

st2admin@ CONTACT US

History

Status Action Trigger Type Rule

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	changeImage	**pharoslaas.fog_changeImage** 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="ILOMXQ74903BQ"	
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	changeImage	**pharoslaas.fog_changeImage** image="None", os="centos", host="hpe36"	
09:01:31	startImaging	**pharoslaas.fog_startImaging** host="hpe36"	
09:01:32	restartHost	**pharoslaas.restart_workflow**	

pharoslaas.fog_imageWorkflow

GENERAL CODE

Status: Running

Execution ID: 5aabc02a02ebd505479743e2

Started: Fri, 16 Mar 2018 09:01:30

Finished: Invalid date

ACTION OUTPUT

ACTION INPUT

host *
hpe36

image

ipmi

os
centos

powercmd
on

user
Administrator

display_published

RERUN CANCEL

FOG - Free Open-source Ghost

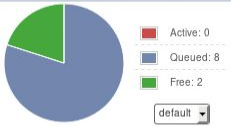
Fri Mar 16, 2018 13:28 pm
Running Version 1.4.4
SVN Revision: 6077

Open Source Computer Cloning Solution

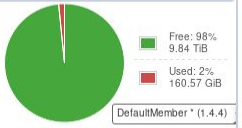
Dashboard

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

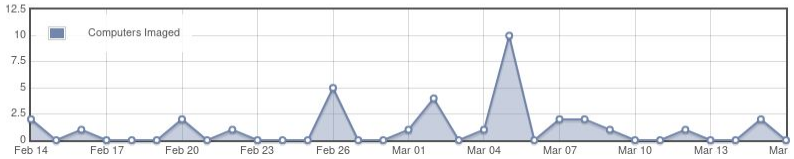
Storage Group Activity



Storage Node Disk Usage

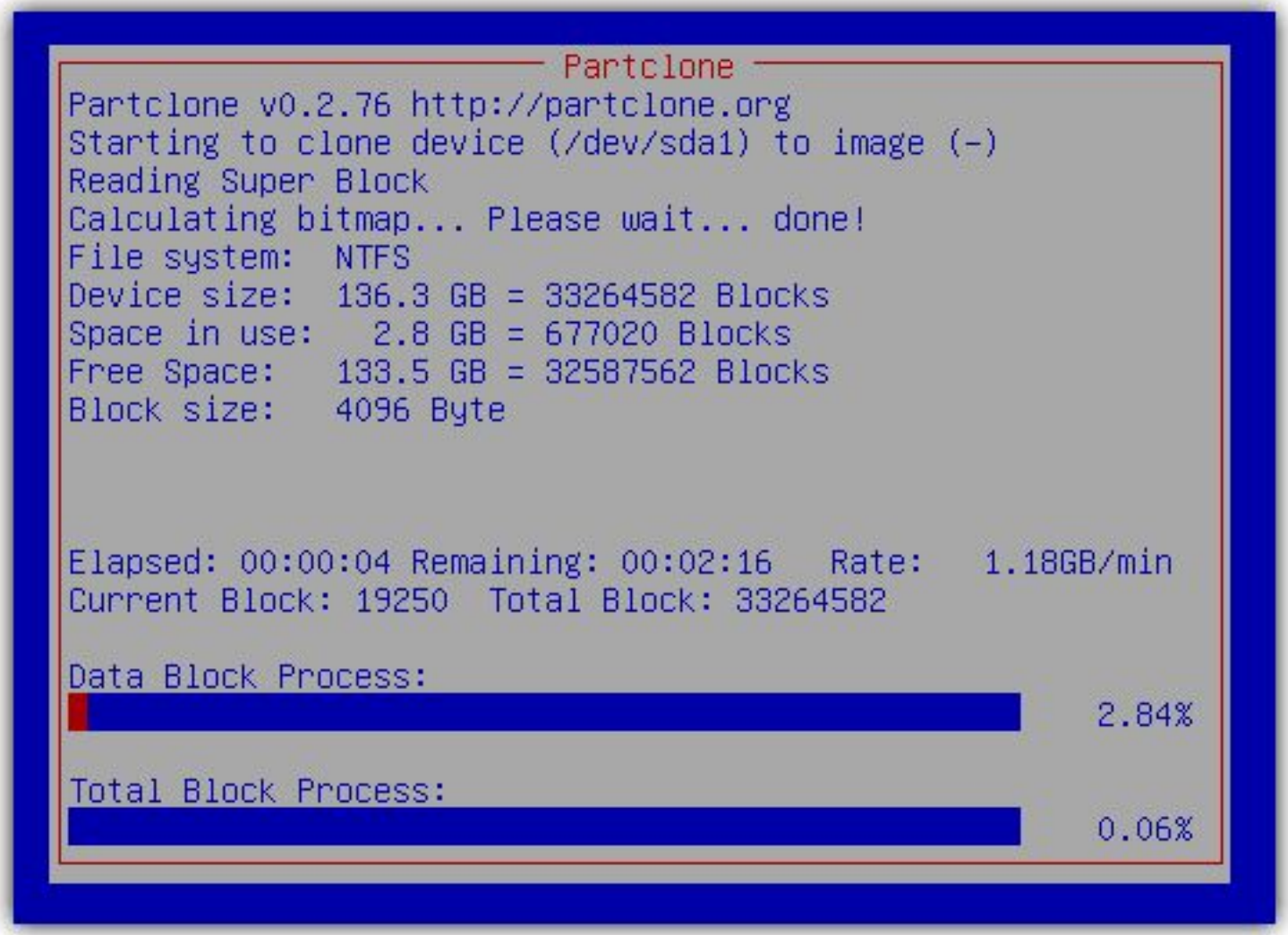


Imaging Over the last 30 days



Bandwidth - Transmit

Partclone Disk Imaging and Cloning



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