

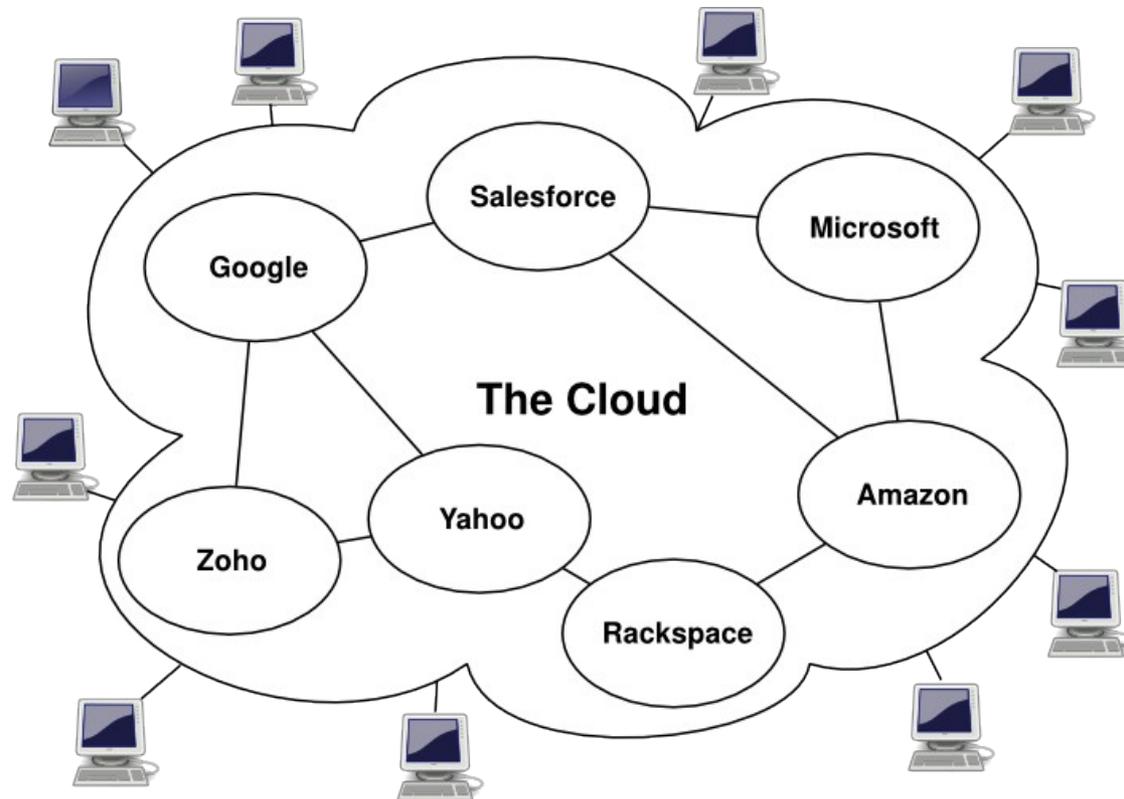
UAB Research Cloud an Update

UAB IT Food For Thought
July 17, 2013

John-Paul Robinson
UAB IT Research Computing

Back in 2010....

What's a Cloud?

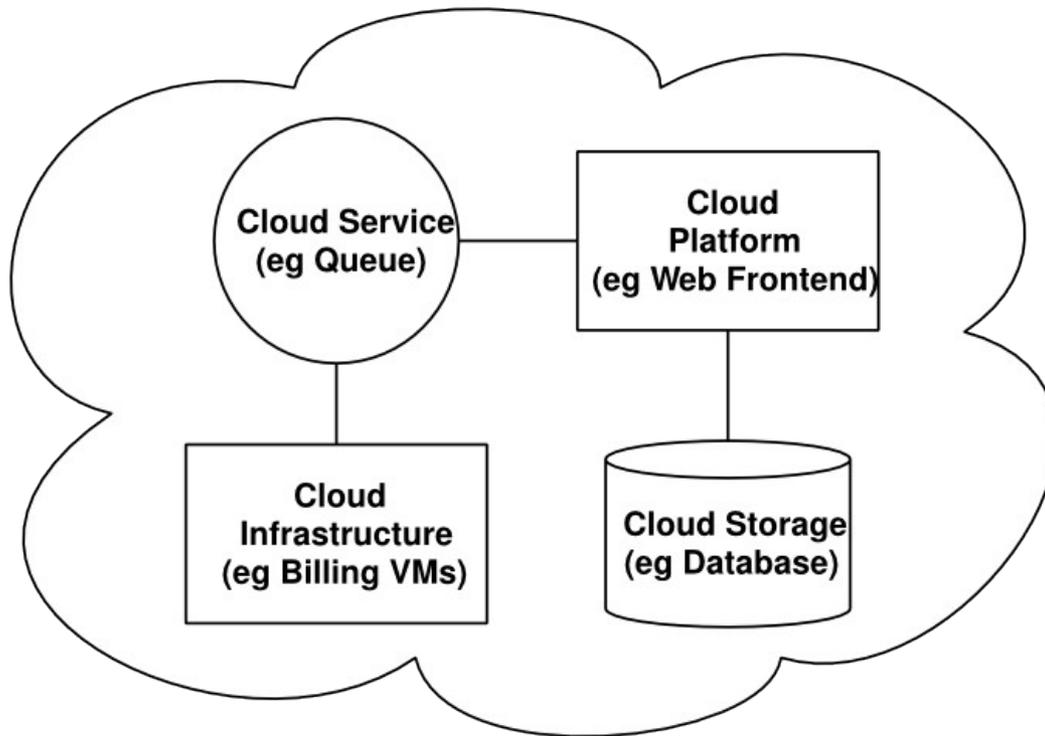


Wikipedia Sez:

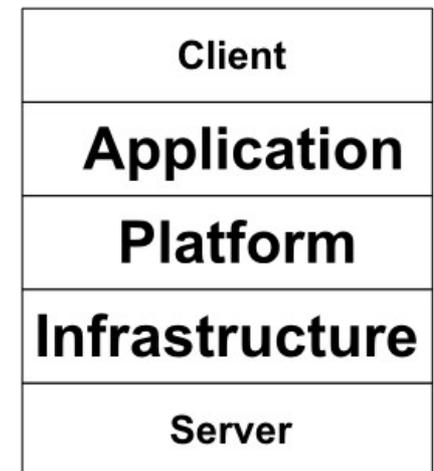
Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the electricity grid.

The Stuff of Clouds

Clouds have services....



...and clouds have structure



The “aaS” of Clouds

- SaaS – Software as a Service
 - This is the application layer. It’s what the ordinary consumer of cloud services sees, typically via their web browser or a dedicated app.
- PaaS – Platform as a Service
 - This is the layer on which applications are built. It’s what the ordinary consumer of developer services uses to build the applications delivered in the SaaS layer.
- IaaS – Infrastructure as a Service
 - This is the layer that makes everything possible. It’s deep in the stack and not typically seen by the consumer, but it’s the layer we’re leveraging to build a coherent service stack.

What does it mean to use the cloud today?

- It's not always about being “out there”
- It's about autonomy
- It's about choice
- It's about self direction
- It's about a lot of things that we do already
- It's about how we can work *with* technology

What are the Apps?

I really rather buy this...

drobo

Global | Resources | Partners | Corporate | News | Blogs | Forums |

How it Works **Products** Solutions Customers Support

Buy

Products

Overview

Drobo For Business

Drobo For Professionals

Drobo Dashboard

Capacity Calculator

Drobo Home > Products > Overview



Drobo FS

Easiest-to-Use Network Attached Storage

The revolutionary Drobo FS was designed with one purpose in mind: to deliver the best file sharing experience ever. From the moment you plug it in and it instantly appears on your desktop, you'll know there's nothing like it. The all-in-one Drobo FS is perfect for any connected home, home office, or small office environment needing a simple, safe device for sharing and backing up files over the network.

Like all Drobo storage products, Drobo FS provides redundant data protection without the complexities of RAID. Just plug in your Drobo FS and your data protection is all set up with no configuration required. We call this **BeyondRAID™** technology. You'll call it peace of mind.

The Drobo FS storage array is available from \$699 US.

Live Chat with

Like DropBox...

Wherever you are

Put your stuff in Dropbox and get to it from your computers, phones, or tablets. Edit docs, automatically add photos, and show off videos from anywhere.



Share with confidence

Share photos with friends. Work with your team like you're using a single computer. Everything's automatically private, so you control who sees what.

Safe and secure

Even if your phone goes for a swim, your stuff is always safe in Dropbox and can be restored in a snap.

Dropbox secures your files with AES-256 bit encryption and two-step verification.





[Overview](#) [Solutions](#) [Features](#) [Learn More](#)

ONE CLICK TO THE CLOUD: MULTIPLE COPIES, LOCATIONS AND PROVIDERS



[▶ NO WAITING: TRY IT NOW](#)

[▶ FIND OUT MORE](#)

[▶ PURCHASE](#)

[▶ **NEW** LOW-COST STORAGE](#)

VISIT SPECTRUM
OF DURACLOUD
USE CASES



See comparisons of costs vs benefits
Find a use case similar to your institution
Look at simple vs robust use cases

UAB Galaxy Platform for NextGen Sequencing

The screenshot displays the UAB Galaxy web interface. At the top, the navigation bar includes 'Galaxy / UAB', 'Analyze Data', 'Workflow', 'Shared Data', 'Visualization', 'Admin', 'Help', and 'User'. A dropdown menu is open under 'User', showing 'Logged in as jpr@uab.edu', 'Saved Histories', 'Saved Datasets', 'Saved Pages', 'API Keys', and 'Public Name'. The main content area features a green welcome message: 'Welcome to UAB Galaxy! Where all you need is a BlazerId and a web browser to run NGS analyses on the UAB Cheaha Cluster!'. Below this, there are sections for 'Local Resources' (UAB Galaxy Wiki, Mailing Lists, Cheaha Computing Cluster), 'Internet Resources' (Learn Galaxy, Galaxy Project, Galaxy Toolshed, Public Galaxy Server), and 'Brought to you by' (UAB IT Research Computing, UAB CCTS, Galaxy Platform). A 'Live Quickies' section at the bottom contains eight tiles for various tasks like 'Mapping against custom genome', 'Illumina mapping: Single Ends', 'Illumina mapping: Paired Ends', 'Basic fastQ manipulation', 'Advanced fastQ manipulation', '454 Mapping: Single End', 'Uploading Data using FTP', and 'Managing account histories'. The left sidebar lists various tool categories such as 'Get Data', 'Send Data', 'Demo Tools', 'ENCODE Tools', 'Lift-Over', 'Text Manipulation', 'Filter and Sort', 'Join, Subtract and Group', 'Convert Formats', 'Extract Features', 'Fetch Sequences', 'Get Genomic Scores', 'Operate on Genomic Intervals', 'Statistics', 'Wavelet Analysis', 'Graph/Display Data', 'Regional Variation', 'Multiple regression', 'Multivariate Analysis', 'Evolution', 'Motif Tools', 'Multiple Alignments', 'Metagenomic analyses', 'FASTA manipulation', 'NCBI BLAST+', 'NGS TOOLBOX BETA', 'NGS: QC and manipulation', 'NGS: Picard (beta)', 'NGS: Assembly', 'NGS: Mapping', and 'NGS: Indel Analysis'. The right sidebar shows a 'History' section with 'Unnamed history 0 bytes' and a message: 'Your history is empty. Click 'Get Data' on the left pane to start'.



CLC GENOMICS SERVER

A flexible enterprise level infrastructure and analysis backbone for next generation sequencing data analysis.

GET STARTED

DESKTOP SOFTWARE

ENTERPRISE PLATFORM

PRODUCTS

CONSULTING

SUPPORT

Genomics Server

Features

Clients

Customization

Data Management

Scalability

Latest Improvements

Download

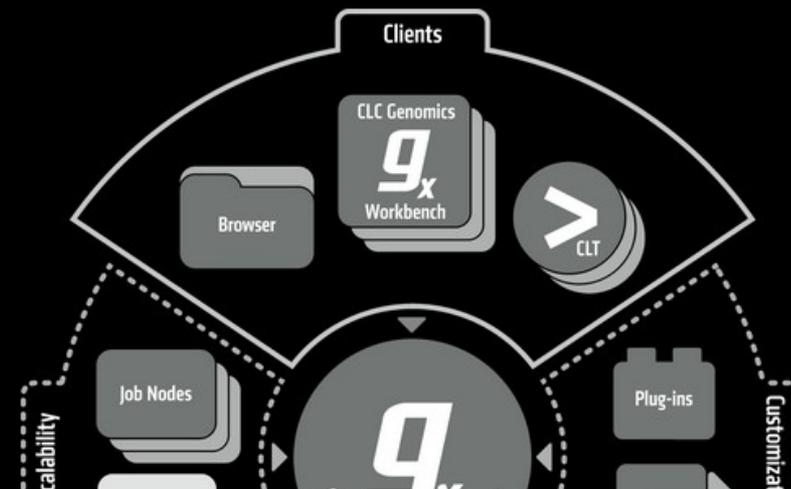
To Top

Overview

GENOMICS SERVER

Centralized Bioinformatics Analyses

CLC Genomics Server is an advanced high-throughput sequencing focused three-tier solution offering secure, powerful, and flexible bioinformatics computing on a server-architecture located centrally in your organization.



Overview

This is the home page of the Section on Statistical Genetics (SSG) Mobile Lab Virtual Machine we call *ssglabvm*. If you are unfamiliar with the concept of virtualization, you can think of this "virtual" machine as a custom computer for statistical genetics research, analysis, and demonstration that you can run on your own computer.

What programs are installed?

Here is a short, representative, but non-exhaustive list:

- PLINK
- R
- Bioconductor
- Bowtie
- SAMtools
- Haploview
- R/maanova
- minimac
- PLINK/SEQ
- MACS
- CpGassoc
- R/qtlbim
- HDBSTAT
- The Power Atlas

Why a virtual machine?

While it is true that anyone can download and install these freely available programs themselves on their own computers, doing so takes time and in some cases, specialized system administration or programming expertise. Though many software come with pre-compiled binaries for different operating systems, some statistical genetics programs may require non-trivial effort to compile and install.

Furthermore, after the initial installation, the software should ideally be rigorously tested, by both the system administrator and by the data analyst or statistical programmer. These challenges make the creation and availability of an installed, tested, and reliable collection of statistical genetics programs a worthwhile exercise for us.


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[Oracle ACE Program](#)
[User Groups](#)
[Developer Day](#)
[Women in Technology](#)
[TechCasts](#)
[Pre-Built Developer VMs](#)
[Java Magazine](#)


Pre-Built Developer VMs (for Oracle VM VirtualBox)

Learning your way around a new software stack is challenging enough without having to spend multiple cycles on the install process. Instead, we have packaged such stacks into pre-built [Oracle VM VirtualBox](#) appliances that you can download, install, and experience as a single unit. Just download/assemble the files, import into VirtualBox (available for free), import, and go (but not for production use or redistribution)!

Some of these VMs are designed to support Developer Day workshops, and have specific hands on labs embedded in them, but they're available to all.) Be sure to install [VirtualBox](#) first.

▶ See also: [Oracle VM Templates](#) for use with Oracle VM (production use and redistribution are OK)

VM's on this page include:

- | | |
|--|---|
| <ul style="list-style-type: none"> ▪ Database App Development VM ▪ Enterprise Java Development VM ▪ Oracle VM Manager & Server VMs ▪ Solaris 11 Admin VM | <ul style="list-style-type: none"> ▪ Oracle Tuxedo Web Application Server Demo VM ▪ Oracle Business Intelligence SampleAppV305 ▪ SOA & BPM Development VM ▪ Enterprise PHP Development VM |
|--|---|

Popular Downloads

- ↓ [Berkeley DB](#)
- ↓ [Enterprise Manager](#)
- ↓ [Database EE and XE](#)
- ↓ [Developer VMs](#)
- ↓ [Enterprise Pack for Eclipse](#)
- ↓ [Java](#)
- ↓ [JDeveloper and ADF](#)
- ↓ [Oracle Linux and Oracle VM](#)
- ↓ [MySQL](#)
- ↓ [NetBeans IDE](#)
- ↓ [NoSQL Database](#)
- ↓ [Solaris](#)
- ↓ [SQL Developer](#)
- ↓ [VirtualBox](#)
- ↓ [WebLogic Server](#)

Related Communities

[Java.net](#)
[MySQL.com](#)
[NetBeans.org](#)
[Java Community Process Program](#)
[AskTom](#)

Splunk Hadoop Connect

Reliable Interoperability between Splunk and Hadoop

Developing Hadoop applications is time consuming. Finding or training data scientists to get value from your data is also challenging. As a result, most Hadoop-related projects can take a long time to develop and require specialized knowledge to adapt to new requirements.

Deploy Splunk Enterprise quickly for real-time collection, indexing, analysis and visualizations and then reliably forward events to Hadoop for long-term archiving and additional batch analytics. With Splunk Hadoop Connect, you can stand up reliable, secure, enterprise-grade big data projects in days instead of months.

[Get Splunk Hadoop Connect.](#)

Overview	Why Splunk	Features
-----------------	------------	----------

Overview

With bi-directional data integration, Splunk Hadoop Connect lets you move data between Splunk Enterprise and Hadoop easily and reliably.

Splunk Hadoop Connect enables you to benefit from the best of both worlds. Quickly deploy Splunk Enterprise for real-time collection, indexing, analysis and visualizations and then reliably forward events to Hadoop for long-term archiving and additional batch analytics. Further leverage Splunk software by importing and indexing data already stored in Hadoop.

- Export events collected and aggregated in Splunk Enterprise reliably to HDFS
- Explore and browse HDFS directories and files
- Import and index data from HDFS for secure searching, reporting, analysis and visualizations in Splunk

BIG DATA

Hunk Beta

Splunk Hadoop Connect

Splunk App for Hadoop Operations

Splunk DB Connect

Next Steps

 **FACT SHEET**
[Splunk Hadoop Connect](#)

 **SOLUTIONS GUIDE**
[Splunk for Big Data](#)

 **DOCUMENTATION**
[Splunk Hadoop Connect](#)

Get Splunk Hadoop Connect

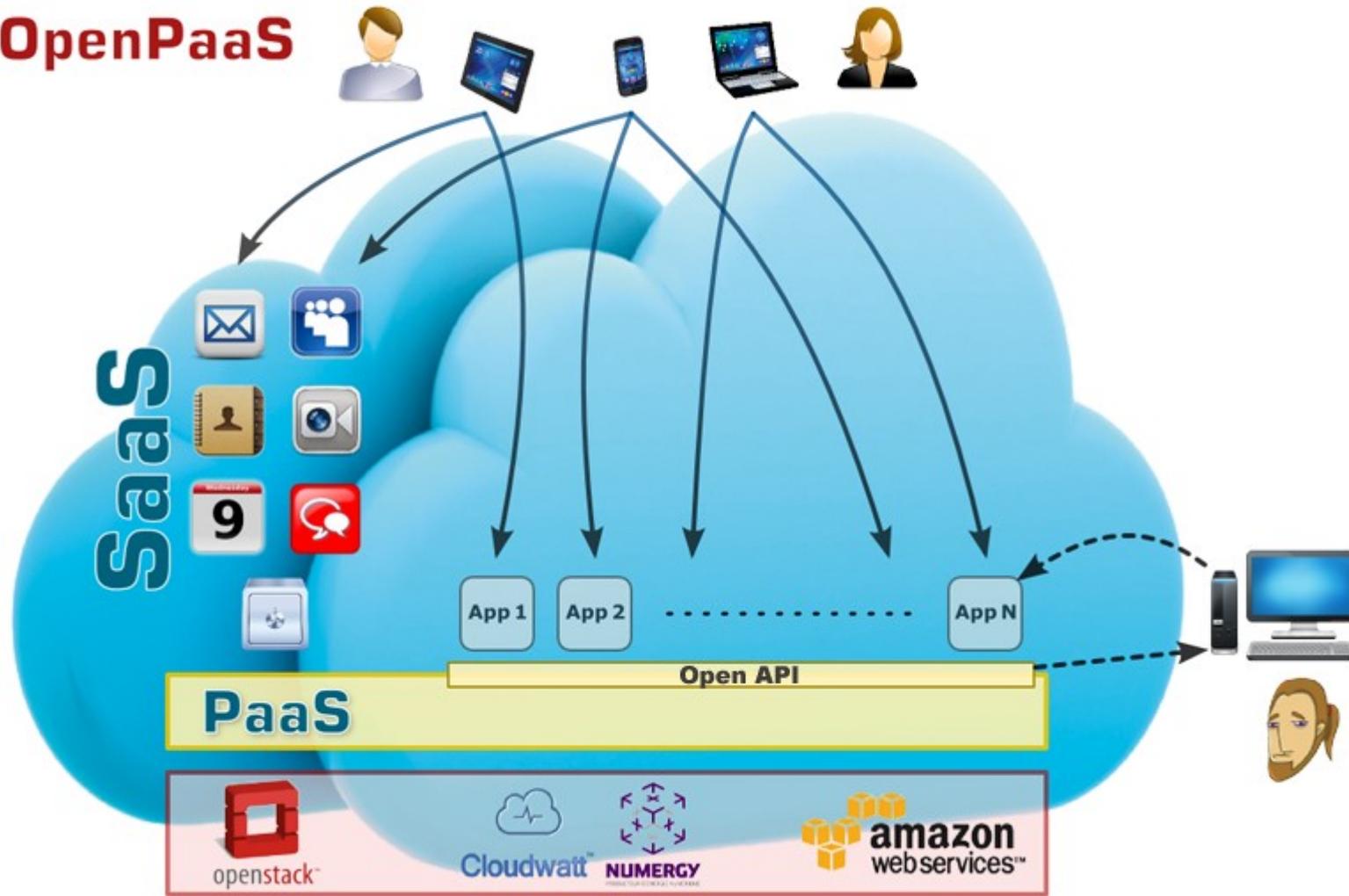
 Download Splunk Hadoop Connect from our community site for free.

Free Download

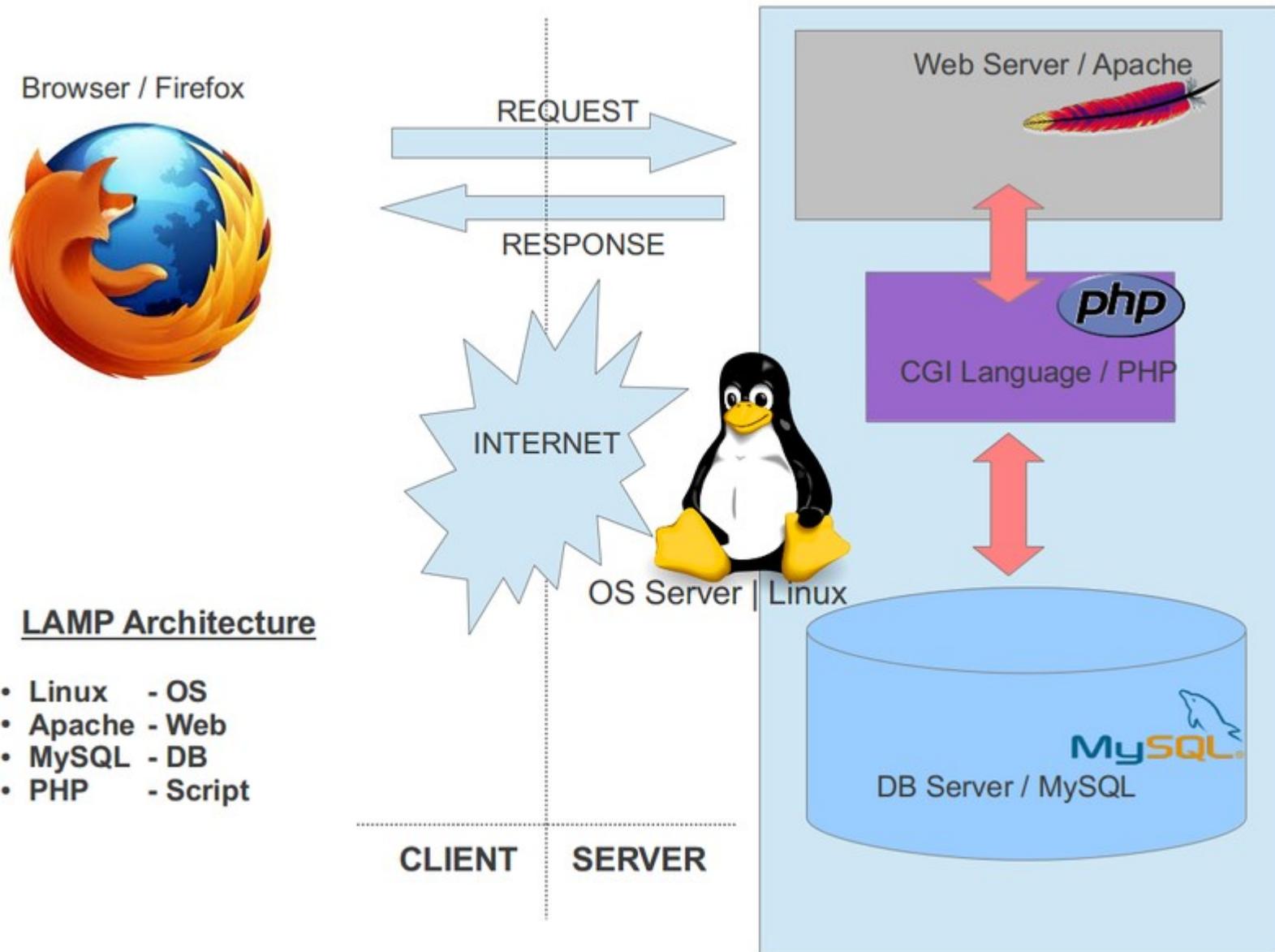
Platform as a Service (PaaS)

Architecture

OpenPaaS



Building and Using LAMP Stacks



Tools to Build Cloud-ready Systems



[VMWARE INTEGRATION](#)

[DOWNLOADS](#) [DOCUMENTATION](#) [SUPPORT](#) [ABOUT](#)

**Development
environments
made easy.**

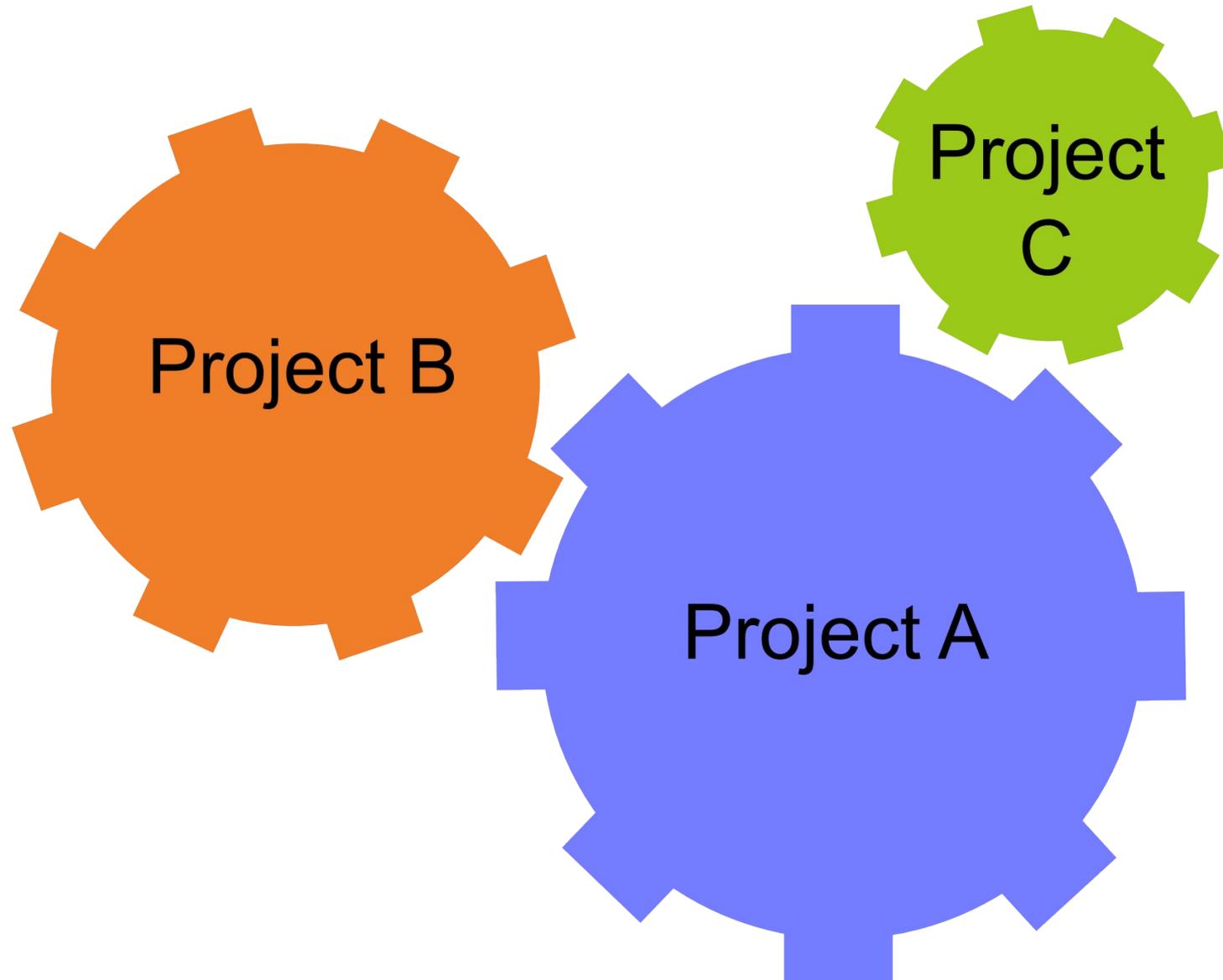
Create and configure lightweight, reproducible,
and portable development environments.

[DOWNLOAD](#)

[GET STARTED](#)

VAGRANT WILL CHANGE HOW YOU WORK

Free Downstream Developers to Build at the Speed of Research



What's It Look Like?

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:11 AM

Instance Overview - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

File Edit View History Bookmarks Tools Help

Instance Overview OpenSta... +

172.22.0.10/nova/ Google

Logged in as: jpr Settings Sign Out



Overview

Select a month to query its usage:

July 2013 Submit

Active Instances: 5 Active Memory: 7GB This Month's VCPU-Hours: 2045.29 This Month's GB-Hours: 39511.72

Usage Summary

[Download CSV Summary](#)

Instance Name	VCPU	Disk	RAM	Uptime
jpr-test-ubuntu-11.04	1	-	512MB	2 months
jpr-devops-2013-05-28ubuntu-11.04	1	30	2GB	1 month, 2 weeks
jpr-test-ubuntu-12.04	1	30	2GB	1 month, 2 weeks
jpr-test3	1	30	2GB	1 month, 2 weeks
test4	1	-	512MB	1 month

Displaying 5 items

Project: PROJECT admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

crowbar@d90-b1-1c-3a-c4-8f: ~ Chef Server - Mozilla Firefox (on rc... VNC config Instance Overview - OpenStack Da...



Instances & Volumes

Logged in as: jpr [Settings](#) [Sign Out](#)

[Launch Instance](#) [Terminate Instances](#)

Instances

<input type="checkbox"/>	Instance Name	IP Address	Size	Status	Task	Power State	Actions
<input type="checkbox"/>	thor	172.21.0.71 172.22.128.11	16GB RAM 8 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	test4	172.21.0.74 172.22.128.7	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test3	172.21.0.69 172.22.128.6	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-12.04	172.21.0.73 172.22.128.2	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-devops-2013-05-28ubuntu-11.04	172.21.0.70 172.22.128.4	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-11.04	172.21.0.67 172.22.128.1	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance

Displaying 6 items

Volumes

[Create Volume](#) [Delete Volumes](#)

<input type="checkbox"/>	Name	Description	Size	Status	Attachments	Actions
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Project

PROJECT [admin](#)

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security



Instances & Volumes

Logged in as: jpr Settings Sign Out

Instances

Launch Instance Terminate Instances

<input type="checkbox"/>	Instance Name	IP Address	Size	Status	Task	Power State	Actions
<input type="checkbox"/>	thor	172.21.0.71 172.22.128.11	16GB RAM 8 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	test4	172.21.0.74 172.22.128.7	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test3	172.21.0.69 172.22.128.6	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-12.04	172.21.0.73 172.22.128.2	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-devops-2013-05-28ubuntu-11.04	172.21.0.70 172.22.128.4	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-11.04	172.21.0.67 172.22.128.1	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance

Displaying 6 items

Volumes

Create Volume Delete Volumes

<input type="checkbox"/>	Name	Description	Size	Status	Attachments	Actions
--------------------------	------	-------------	------	--------	-------------	---------

Project

PROJECT admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:32 AM

Instances & Volumes - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

File Edit View History Bookmarks Tools Help

Instances & Volumes - OpenS...

172.22.0.10/nova/instances_and_volumes/

Google

Instances & Volumes

Images & Snapshots

Access & Security

		172.22.128.2						
<input type="checkbox"/>	jpr-devops-2013-05-28ubuntu-11.04	172.21.0.70 172.22.128.4	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance	
<input type="checkbox"/>	jpr-test-ubuntu-11.04	172.21.0.67 172.22.128.1	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance	

Displaying 6 items

Volumes

[Create Volume](#) [Delete Volumes](#)

<input type="checkbox"/>	Name	Description	Size	Status	Attachments	Actions
<input type="checkbox"/>	jpr-test-vol-1	-	10 GB	In-Use	Instance jpr-test-ubuntu-12.04 (7553d5a4-b4f1-400b-91d9-805b472e0c21) on /dev/vdc	Edit Attachments
<input type="checkbox"/>	billb-test-volume	Test Storage	10 GB	Available	-	Edit Attachments
<input type="checkbox"/>	jpr-large-100GB	A large storage volume for performance testing	100 GB	Available	-	Edit Attachments
<input type="checkbox"/>	jpr-bigvol2	itrc demo	100 GB	In-Use	Instance jpr-test3 (c7917a41-70b6-4869-aafa-315e2a9e2e14) on /dev/vdc	Edit Attachments
<input type="checkbox"/>	another test	devops test	500 GB	In-Use	Instance jpr-test3 (c7917a41-70b6-4869-aafa-315e2a9e2e14) on /dev/vdd	Edit Attachments
<input type="checkbox"/>	small-volume	unix group example	10 GB	Available	-	Edit Attachments

Displaying 6 items

crowbar@d90-b1-1c-3a-c4-8f: ~ Crowbar: nodes - Mozilla Firefox (o... VNC config Instances & Volumes - OpenStack ...

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:34 AM

Images & Snapshots - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

File Edit View History Bookmarks Tools Help

Images & Snapshots - OpenSt...

172.22.0.10/nova/images_and_snapshots/ Google

Logged in as: jpr Settings Sign Out

Images & Snapshots

Delete Images

Images

<input type="checkbox"/>	Image Name	Type	Status	Public	Container Format	Actions
<input type="checkbox"/>	DevStack-v0.4	Image	Active	Yes	BARE	Launch
<input type="checkbox"/>	DevStack-0.3	Image	Active	Yes	BARE	Launch
<input type="checkbox"/>	DevStack-0.2	Image	Active	Yes	BARE	Launch
<input type="checkbox"/>	DevStack	Image	Active	Yes	BARE	Launch
<input type="checkbox"/>	Oracle-DevDays	Image	Active	Yes	BARE	Launch
<input type="checkbox"/>	ubuntu-12.04.2-lts	Image	Active	Yes	OVF	Launch ▾
<input type="checkbox"/>	ubuntu-11.04-image	Image	Active	Yes	AMI	Launch ▾

Displaying 7 items

Instance Snapshots

<input type="checkbox"/>	Image Name	Type	Status	Public	Container Format	Actions
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openstack
DASHBOARD

Project

PROJECT
admin ▾

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots**
- Access & Security

crowbar@d90-b1-1c-3a-c4-8f: ~ Crowbar: nodes - Mozilla Firefox (o... VNC config Images & Snapshots - OpenStack ...

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:35 AM

Access & Security - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

file Edit View History Bookmarks Tools Help

Access & Security - OpenStac... 172.22.0.10/nova/access_and_security/ Google

openstack DASHBOARD

Project: PROJECT admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

Access & Security Logged in as: jpr Settings Sign Out

Floating IPs

Allocate IP To Project Release Floating IPs

<input type="checkbox"/>	IP Address	Instance	Floating IP Pool	Actions
<input type="checkbox"/>	172.22.128.1	44435930-55f1-472f-9492-eb13eea74b88	nova	Disassociate IP
<input type="checkbox"/>	172.22.128.2	7553d5a4-b4f1-400b-91d9-805b472e0c21	nova	Disassociate IP
<input type="checkbox"/>	172.22.128.4	2a5b5175-e2ff-46b3-ad3d-06e62ae51a02	nova	Disassociate IP
<input type="checkbox"/>	172.22.128.5	-	nova	Associate IP
<input type="checkbox"/>	172.22.128.6	c7917a41-70b6-4869-aafa-315e2a9e2e14	nova	Disassociate IP
<input type="checkbox"/>	172.22.128.7	1483c21a-4b51-4da8-a6da-dd0a94c4d46e	nova	Disassociate IP
<input type="checkbox"/>	172.22.128.11	20ec26b7-d6a6-426c-9170-1dce6e193acb	nova	Disassociate IP

Displaying 7 items

Security Groups

Create Security Group Delete Security Groups

<input type="checkbox"/>	Name	Description	Actions
--------------------------	------	-------------	---------

crowbar@d90-b1-1c-3a-c4-8f: ~ Crowbar: nodes - Mozilla Firefox (o... VNC config Access & Security - OpenStack Da...

Displaying 7 items

Security Groups

Create Security Group

Delete Security Groups

<input type="checkbox"/>	Name	Description	Actions
<input type="checkbox"/>	default	default	Edit Rules
<input type="checkbox"/>	ssh-only	allow port 22 access	Edit Rules ▾

Displaying 2 items

Keypairs

Create Keypair

Import Keypair

Delete Keypairs

<input type="checkbox"/>	Keypair Name	Fingerprint	Actions
<input type="checkbox"/>	jpr-test-keypair	81:f5:5a:20:18:00:dc:10:f2:7f:6f:0c:63:a7:59:76	Delete Keypair
<input type="checkbox"/>	jpr-test-keypair-2	af:42:ec:b0:d6:90:2f:c6:e4:63:e1:17:f2:f1:46:ed	Delete Keypair
<input type="checkbox"/>	jpr-pub-key	bd:5d:e6:62:12:97:e9:04:4b:68:4e:00:59:d2:b7:e5	Delete Keypair
<input type="checkbox"/>	jpr-test-devops-key	31:c3:f6:6f:0d:1d:dc:d0:a2:36:c3:1b:de:3e:39:ac	Delete Keypair

Displaying 4 items

Project: admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

Image Name	Image ID	Image Size	Image Format	Image Architecture	Image Visibility
DevStack					
Oracle-D					
ubuntu-1					
ubuntu-1					

Displaying 7 items

Instance

Image Name	Image ID	Image Size	Image Format	Image Architecture	Image Visibility

Displaying 0 items

Volume S

Server Name

User Data

Flavor

Keypair

Instance Count

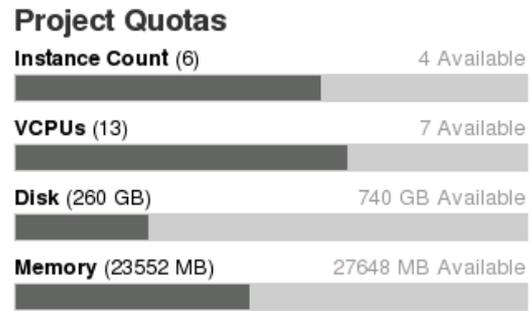
Security Groups

- default
- ssh-only

Boot From Volume ▶

Description:

Specify the details for launching an instance. The chart below shows the resources used by this project in relation to the project's quotas.



Actions

Launch

Launch

Launch

Launch

Launch

Launch

Launch

Launch

Launch

Actions

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:44 AM

Instances & Volumes - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

File Edit View History Bookmarks Tools Help

Instances & Volumes - OpenS...

172.22.0.10/nova/instances_and_volumes/ Google

Logged in as: jpr Settings Sign Out

Instances & Volumes

Success: Instance "jpr-example" launched.

Launch Instance Terminate Instances

Instances

<input type="checkbox"/>	Instance Name	IP Address	Size	Status	Task	Power State	Actions
<input type="checkbox"/>	jpr-example	172.21.0.75	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	thor	172.21.0.71 172.22.128.11	16GB RAM 8 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	test4	172.21.0.74 172.22.128.7	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test3	172.21.0.69 172.22.128.6	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-12.04	172.21.0.73 172.22.128.2	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-devops-2013-05-28ubuntu-11.04	172.21.0.70 172.22.128.4	2GB RAM 1 VCPU 10.0GB Disk	Active	None	Running	Edit Instance
<input type="checkbox"/>	jpr-test-ubuntu-11.04	172.21.0.67 172.22.128.1	512MB RAM 1 VCPU 0 Disk	Active	None	Running	Edit Instance

Displaying 7 items

Project: admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

crowbar@d90-b1-1c-3a-c4-8f: ~ Crowbar: nodes - Mozilla Firefox (o... VNC config Instances & Volumes - OpenStack ...

TightVNC: cheaha.uabgrid.uab.edu:2 (jpr)

Applications Places System 7:48 AM

Instance Detail - OpenStack Dashboard - Mozilla Firefox (on rcs-srv-02.uabgrid.uab.edu)

File Edit View History Bookmarks Tools Help

Instance Detail - OpenStack ...

172.22.0.10/nova/instances_and_volumes/instances/7d425bca-b257-42e1-97d5-eb59d3ce5cfd/detail

Google

Instance Detail: jpr-example

Logged in as: jpr [Settings](#) [Sign Out](#)

Overview Log **VNC**

Instance VNC Console

If VNC console is not responding to keyboard input: click the grey status bar below.

Connected (unencrypted) to: QEMU (instance-00000026) [Send CtrlAltDel](#)

```
Ubuntu 12.04.2 LTS jpr-example tty1
jpr-example login: _
```

openstack DASHBOARD

Project

PROJECT admin

Manage Compute

- Overview
- Instances & Volumes
- Images & Snapshots
- Access & Security

crowbar@d90-b1-1c-3a-c4-8f: ~

Crowbar: nodes - Mozilla Firefox (o... VNC config

Instance Detail - OpenStack Dashb...

ubuntu@jpr-test3:/mnt4\$ glance index

ID	Name	Disk Format	Container Format	Size
c7623b86-d54a-4fb6-81c1-e263018cf731	DevStack-v0.4	raw	bare	8589934592
aba9f595-daeb-44a0-a87b-1d538bf70f73	DevStack-0.3	raw	bare	8589934592
795598c0-3255-459a-81dd-31949842091b	DevStack-0.2	raw	bare	8589934592
826edd2d-7a39-45ee-8847-366662846f78	DevStack	raw	bare	8589934592
79ba17b3-4511-4da1-8424-2bf7a8a576b9	Oracle-DevDays	raw	bare	25769803776
c6e31b8c-dff1-40fc-855a-d47649d93abb	ubuntu-12.04.2-lts	raw	ovf	252313600
46590c13-4e79-49b0-b3e0-0fd9e0b04c94	ubuntu-11.04-image	ami	ami	1476395008
ec4749fb-63f6-40ae-8e57-3e91734a5395	ubuntu-11.04-initrd	ari	ari	91708
08c2307b-3624-438c-a5b0-36b5cbae707a	ubuntu-11.04-kernel	aki	aki	4594816

ubuntu@jpr-test3:/mnt4\$ nova list

ID	Name	Status	Networks
1483c21a-4b51-4da8-a6da-dd0a94c4d46e	test4	ACTIVE	private_1=172.21.0.74, 172.22.128.7
20ec26b7-d6a6-426c-9170-1dce6e193acb	thor	ACTIVE	private_1=172.21.0.71, 172.22.128.11
2a5b5175-e2ff-46b3-ad3d-06e62ae51a02	jpr-devops-2013-05-28ubuntu-11.04	ACTIVE	private_1=172.21.0.70, 172.22.128.4
44435930-55f1-472f-9492-eb13eea74b88	jpr-test-ubuntu-11.04	ACTIVE	private_1=172.21.0.67, 172.22.128.1
7553d5a4-b4f1-400b-91d9-805b472e0c21	jpr-test-ubuntu-12.04	ACTIVE	private_1=172.21.0.73, 172.22.128.2
7d425bca-b257-42e1-97d5-eb59d3ce5cfd	jpr-example	ACTIVE	private_1=172.21.0.75
c7917a41-70b6-4869-aafa-315e2a9e2e14	jpr-test3	ACTIVE	private_1=172.21.0.69, 172.22.128.6

ubuntu@jpr-test3:/mnt4\$

Meat for Carnivores...



OpenStack+Ceph

Overview and Background

The [research computing system \(RCS\)](#) is built on a collection of distinct hardware systems designed to provide specific services to applications. The RCS hardware includes [dedicated compute fabrics](#) that support high performance computing (HPC) applications where hundreds of compute cores can work together on a single application. These clusters of commodity compute hardware make it possible to do data analysis and modelling work in hours, work that would have taken months using a single computer. The clusters are connected with dedicated high bandwidth, low latency networks for applications to efficiently coordinate their actions across many computers and access a shared high speed storage system for working efficiently with terabytes of data.

Our newest hardware fabric, acquired 2012Q4, is designed to support emerging [data intensive scientific computing](#) and [virtualization](#) paradigms. This hardware is very similar to the commodity computers used by our traditional HPC fabrics, however, in addition to having many compute cores and lots of RAM, each individual computer contains 36TB of built in disk storage. Taken together, this newest hardware fabric adds 192 cores, 1TB RAM, and 420TB of storage to the RCS.

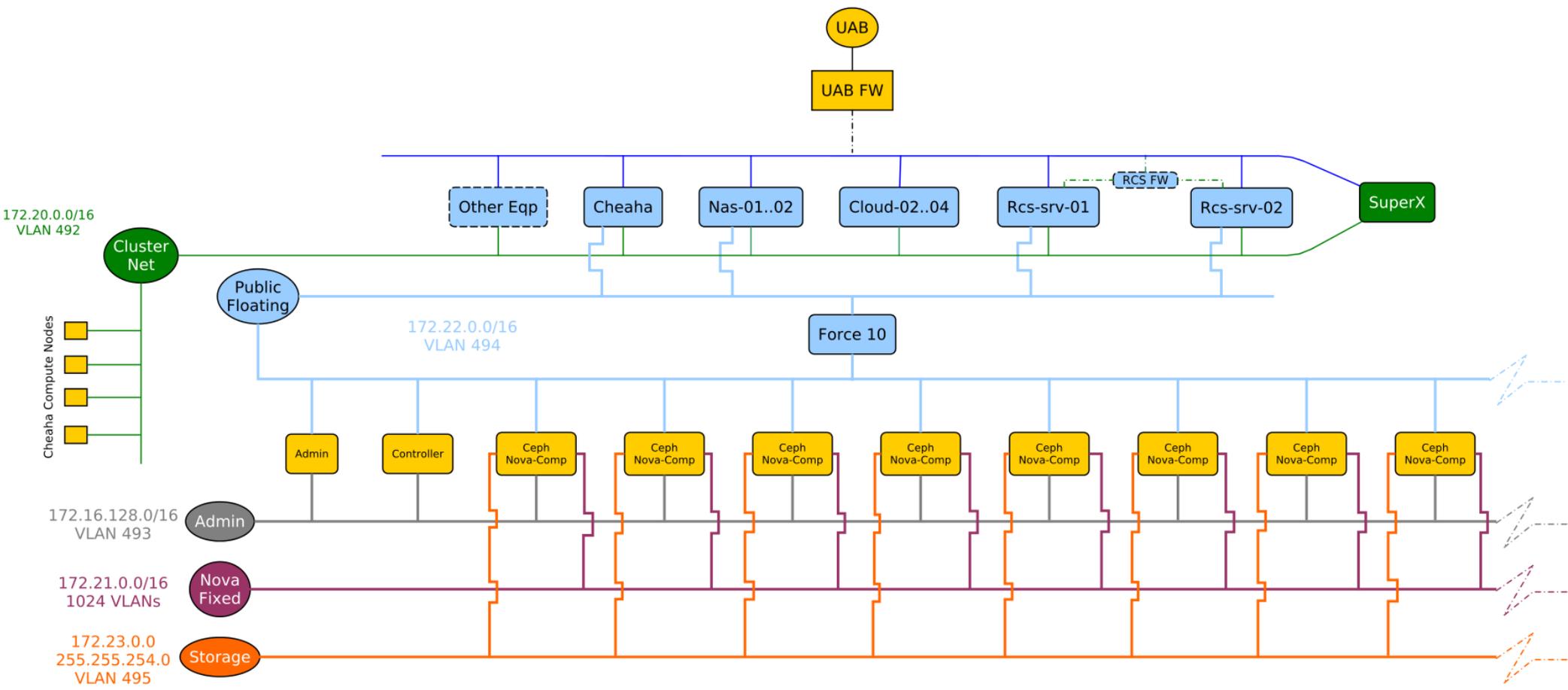
The built in disk storage is designed to support applications running local to each computer. The data intensive computing paradigm exchanges the external storage networks of traditional HPC clusters with the native, very high speed system buses that provide access to local hard disks in each computer. Large datasets are distributed across these computers and then applications are assigned to run on the specific computer that stores the portion of the dataset it has been assigned to analyze. The hardware requirements for data intensive computing closely resemble the requirements for virtualization and can benefit tremendously from the configuration flexibility that a virtualization fabric offers.

In order to enhance flexibility and further improve support for scaling research applications, we are engineering our latest hardware cluster to act as a virtualized storage and compute fabric. This enables support for a wide variety of storage and compute use cases, most prominently, ample storage capacity for reliably housing large research data collections and flexible application development and deployment capabilities that allow direct user control over all aspects of the application environment.

In short, we are tooling this hardware to build a cloud computing environment.

We are building this cloud using [OpenStack](#) for compute virtualization and [Ceph](#) for storage virtualization. [Crowbar](#) will provision the raw hardware fabric. This approach is very similar to the mode we have been following with our traditional [ROCKS-based HPC cluster](#) environment. The new approach enhances our ability to automatically provision hardware and further improve the economics large scale computing.

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Install the Nova and Glance clients
Set up the Shell
Interact with the OpenStack? API
Accessing Management Tools
Accessing Nagios & Ganglia
Accessing Crowbar
Accessing Chef
Crowbar and Chef



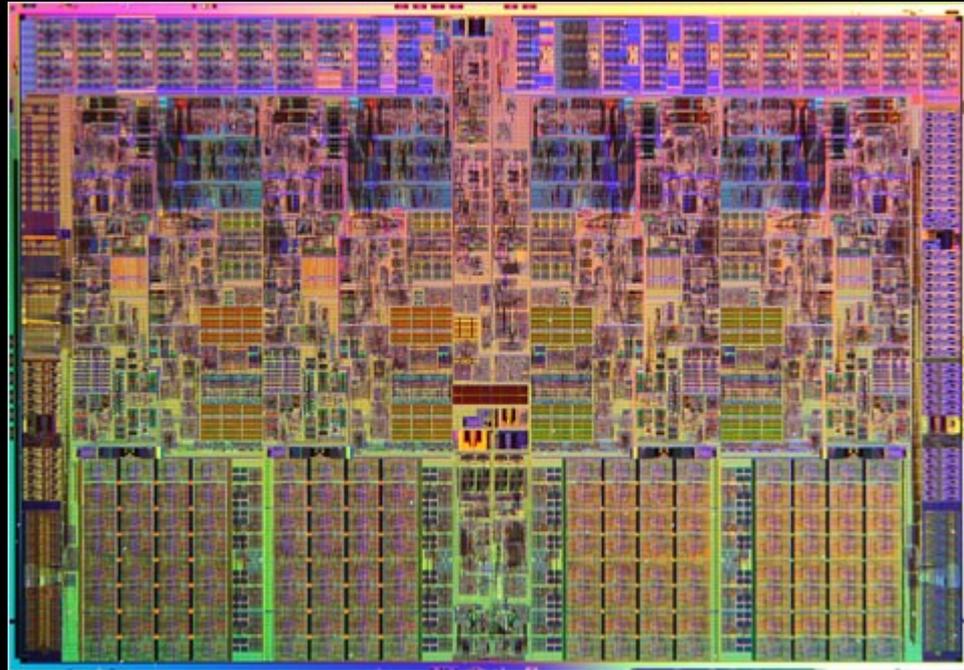
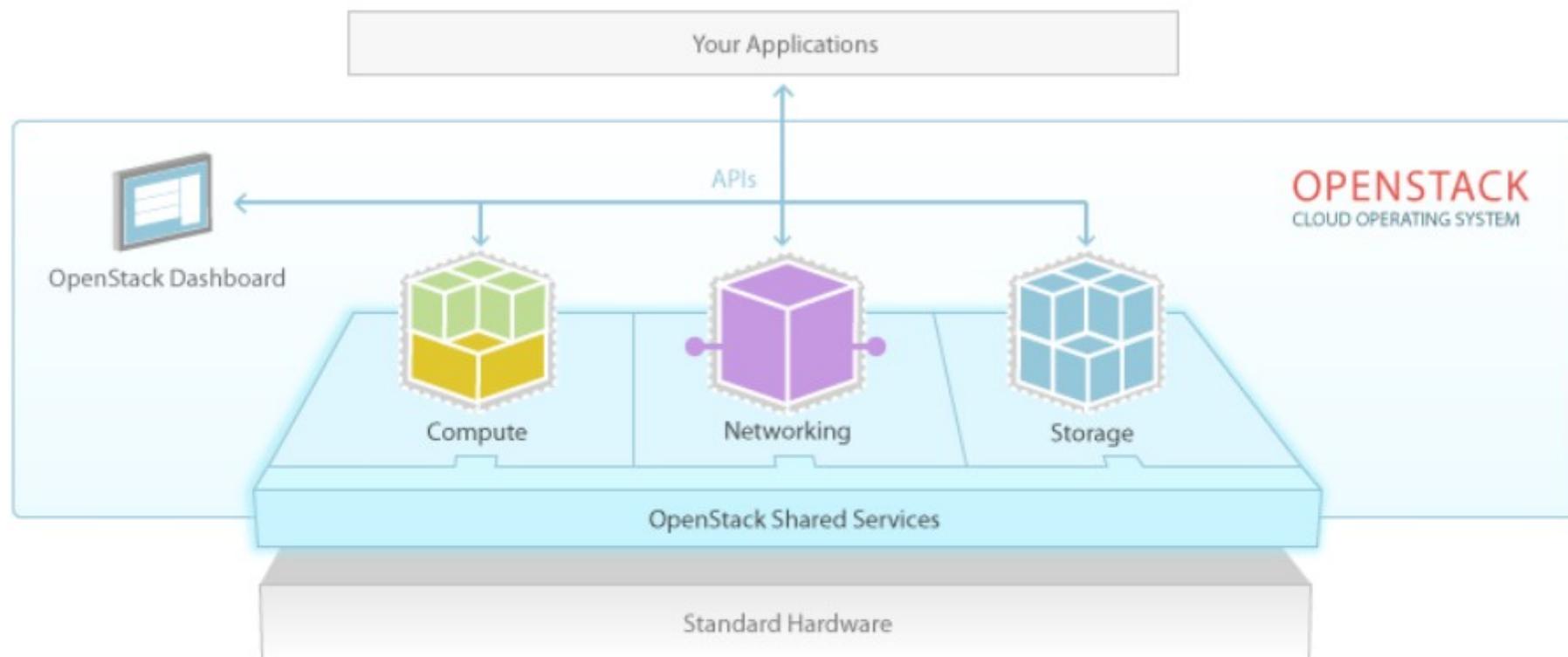


Image: nytimes.com

OpenStack: The Open Source Cloud Operating System



About OpenStack

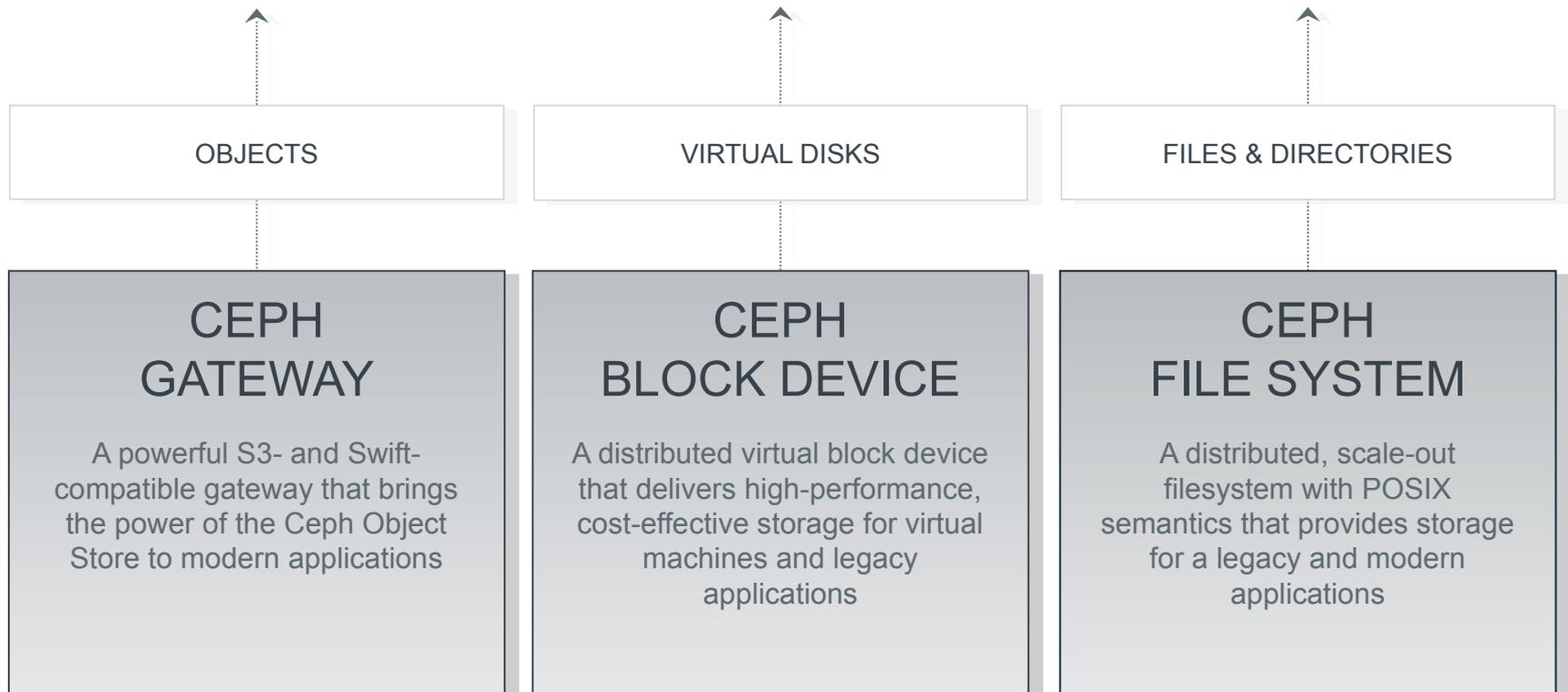
OpenStack is a cloud operating system that controls large pools of compute, storage, and networking resources throughout a datacenter, all managed through a dashboard that gives administrators control while empowering their users to provision resources through a web interface.

THE SEVENTH OPENSTACK RELEASE

GRIZZLY

A QUICK VIDEO OVERVIEW

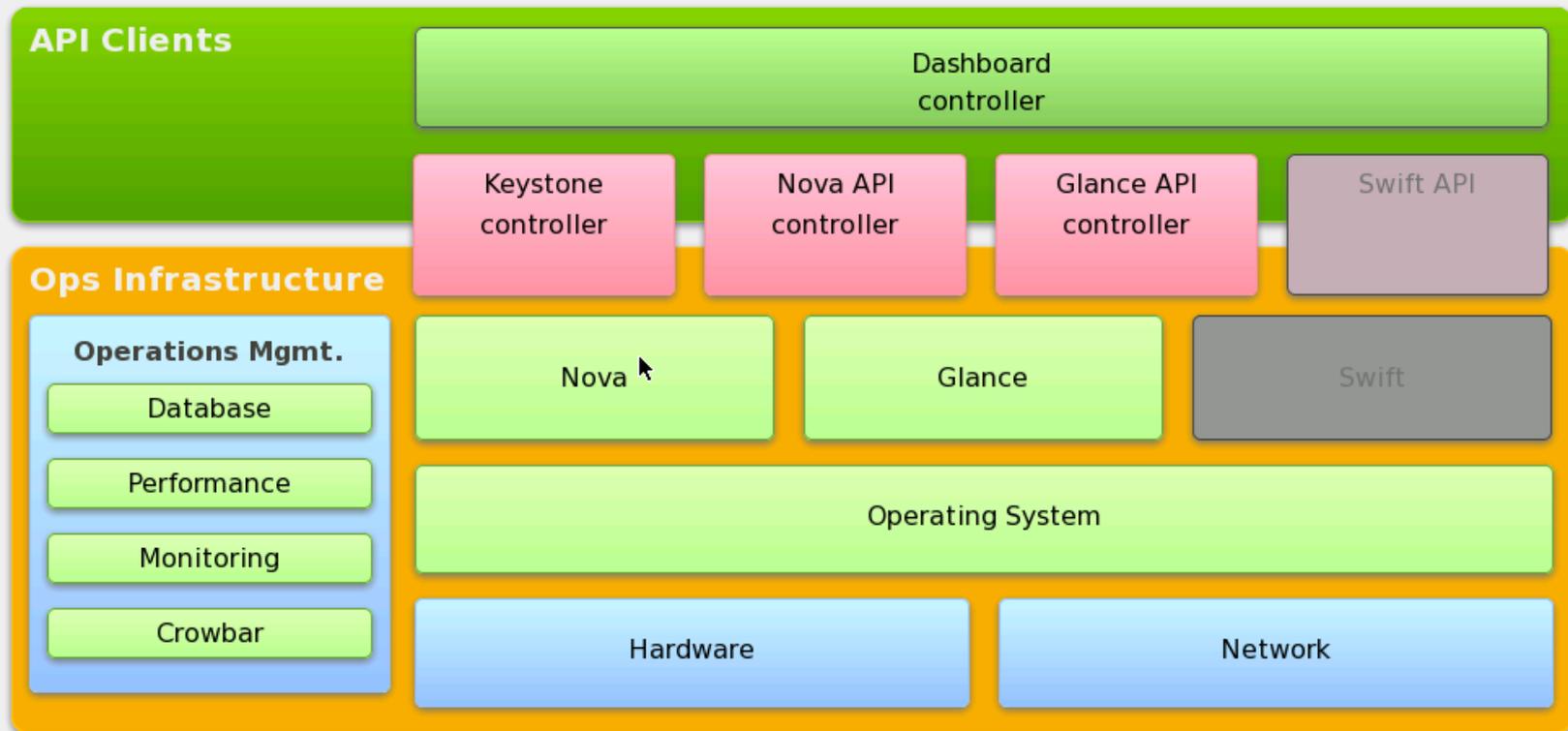
Ceph Unified Storage Platform



CEPH STORAGE CLUSTER

A reliable, easy to manage, next-generation distributed object store that provides storage of unstructured data for applications

OpenStack Overview



- QuickStart Guide
- Workstation Setup
- Using Chef Repo
- Converge the node
- Common Use Cases
- Screencasts
- Errors & Problems

Chef QuickStart Guide

Welcome to the Chef QuickStart Guide - the easiest and fastest way to get started with Chef. We've broken the Chef process into three simple steps:

1. [Workstation Setup](#)
2. [Using Chef Repo](#)
3. [Converge the node](#)

 [Help I'm Stuck!](#)

Turn Infrastructure into Code

Extend the Platform with Upstream Developers

GitHub

This repository

Search or type a command

Explore

Features

Enterprise

Blog

Sign up

Sign in

PUBLIC



crowbar / crowbar

★ Star

579

Fork

227

Home

Pages

History

New Page

Development

Page History

Clone URL

Crowbar is Open Source for a reason. If you find a problem and have a fix, or want to propose a cool new feature, you are very welcome - read on.

Developer community resources

Contact us before you spend too much time on a problem or a new feature.

To contribute code, you may also need to sign an individual or corporate [collaborator's license agreement](#).

- [Mailing list](#)
- [IRC channel](#)
- We have regular [meetings](#), usually via conference calls and screen-sharing, but sometimes in person too.
- We use Trello boards for tracking all work. There are three boards:
 - [current sprint](#)
 - [backlog \(work for future sprints\)](#)
 - [archives \(work completed in past sprints\)](#)
- [Roadmap](#) (and [release notes](#))

Documentation for developers

Crowbar 2.0 is under heavy development and design. Join in! See [Crowbar 2.0](#).

We're currently in the process of moving any key documentation which is coupled to code from the wiki to the source tree. However, any documentation which applies across all branches/releases should remain in the wiki.

- See also [user documentation](#)
- (**new**, still work in progress) [Developer's Guide](#) which lives in the source tree
- [Dev-tool-build](#) has rough notes on how to get hacking quickly with 2.0 (latest nit `master`)

Beware!

Beware!

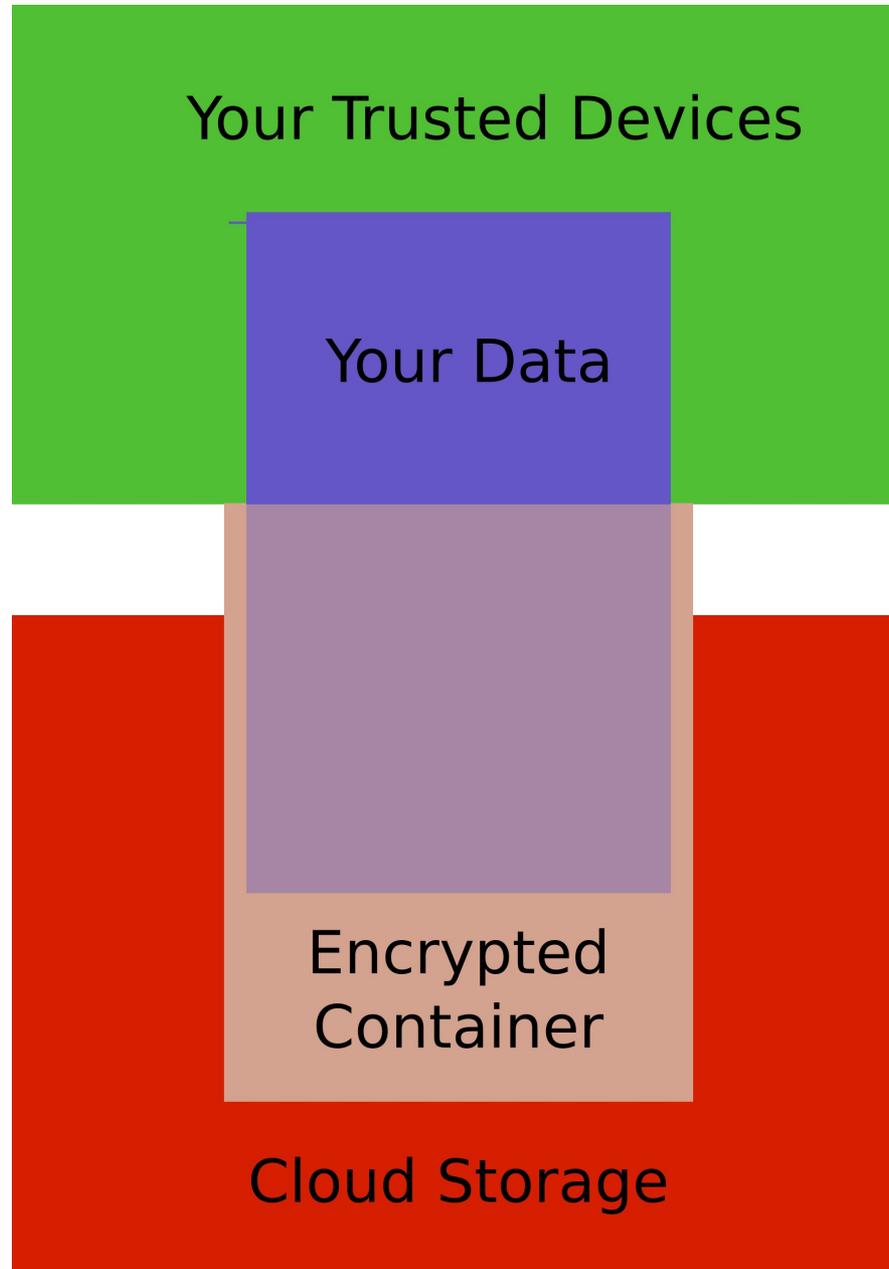


Beware!

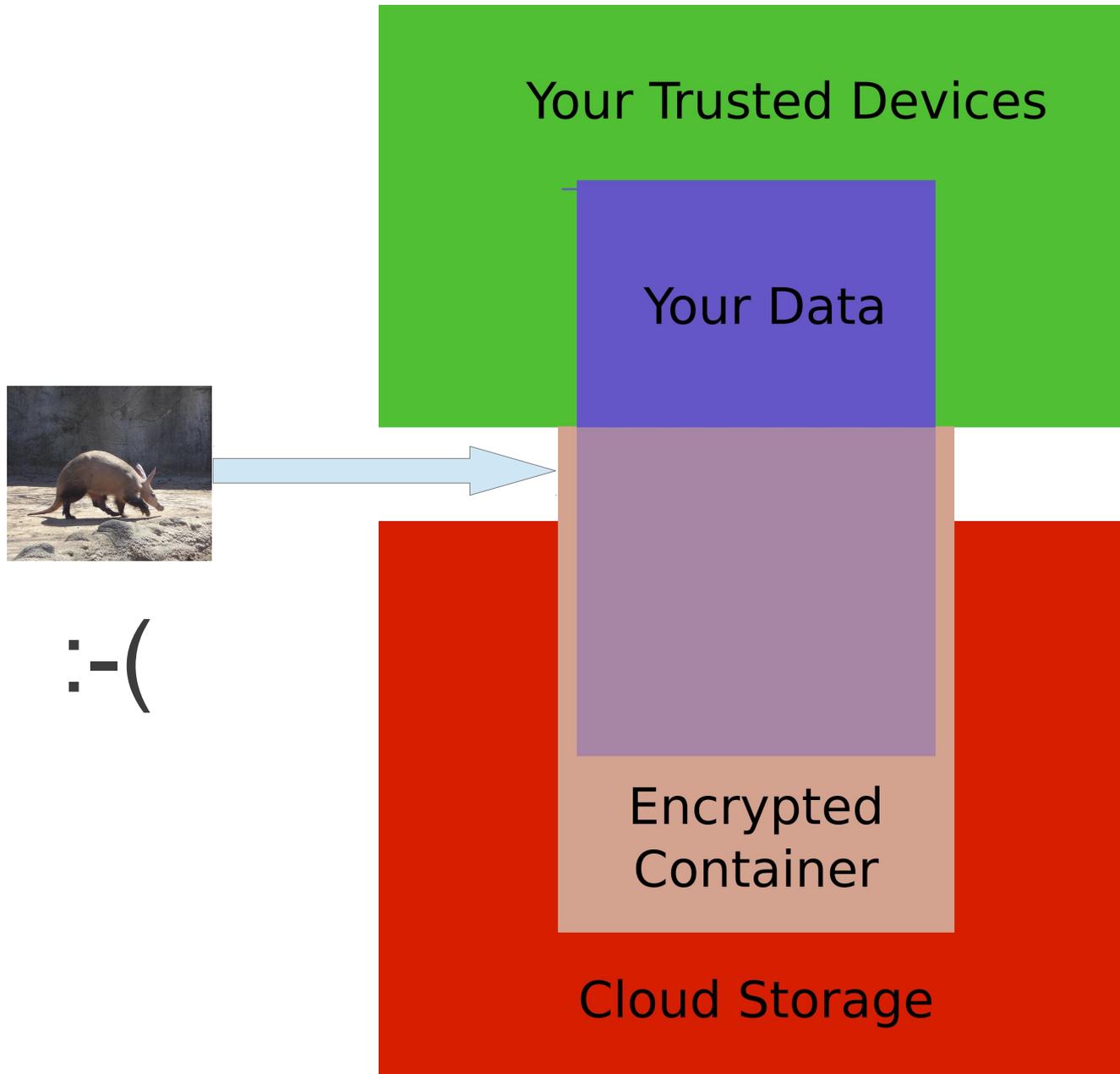


Notorious Sniffing Aardvark

Secure Containers



Secure Containers



Going Forward

- UAB's cloud is here
- It's ready for the explorers
- It'll be easier to get to once we expose campus IPs
- Our first cloud app is “research storage” – targeted for Fall 2013
- Join us – google “uab openstack plus ceph”

Thanks All Around IT!

- VPIT – funding :)
- Enterprise Infrastructure Services
 - Hardware
 - People
 - Projects
 - Desktop
- Business & Resource Management
 - Storage billing
 - Research Associate position
- Enterprise Information Security
 - Early engagement
 - Patience with our experiments :)
- Academic Technology & Relationship Management
 - MATLAB ancontract help
 - Cloud contract review
-