51CTO.com
技术成就梦想

UBM

2012 / 10 / 25 ► 2012 / 10 / 26
中国 · 北京
October 25-26,2012
Beijing · China

World of Tech
WOT

2012云计算架构师峰会

Cloud Computing Architects Summit China 2012

揭示企业级IT架构转型 分享最新技术的应用落地

主办单位：51CTO.com 技术成就梦想

联合主办：UBM

DevOps in OpenStack Public Cloud

Presented at OpenStack Summit, Fall 2012, San Diego

Hui Cheng
freedomhui@gmail.com | freedomhui.com
Community Manager of COSUG
Technical Manager in Sina Corporation
2012/10/17

Why OpenStack?

Why OpenStack?

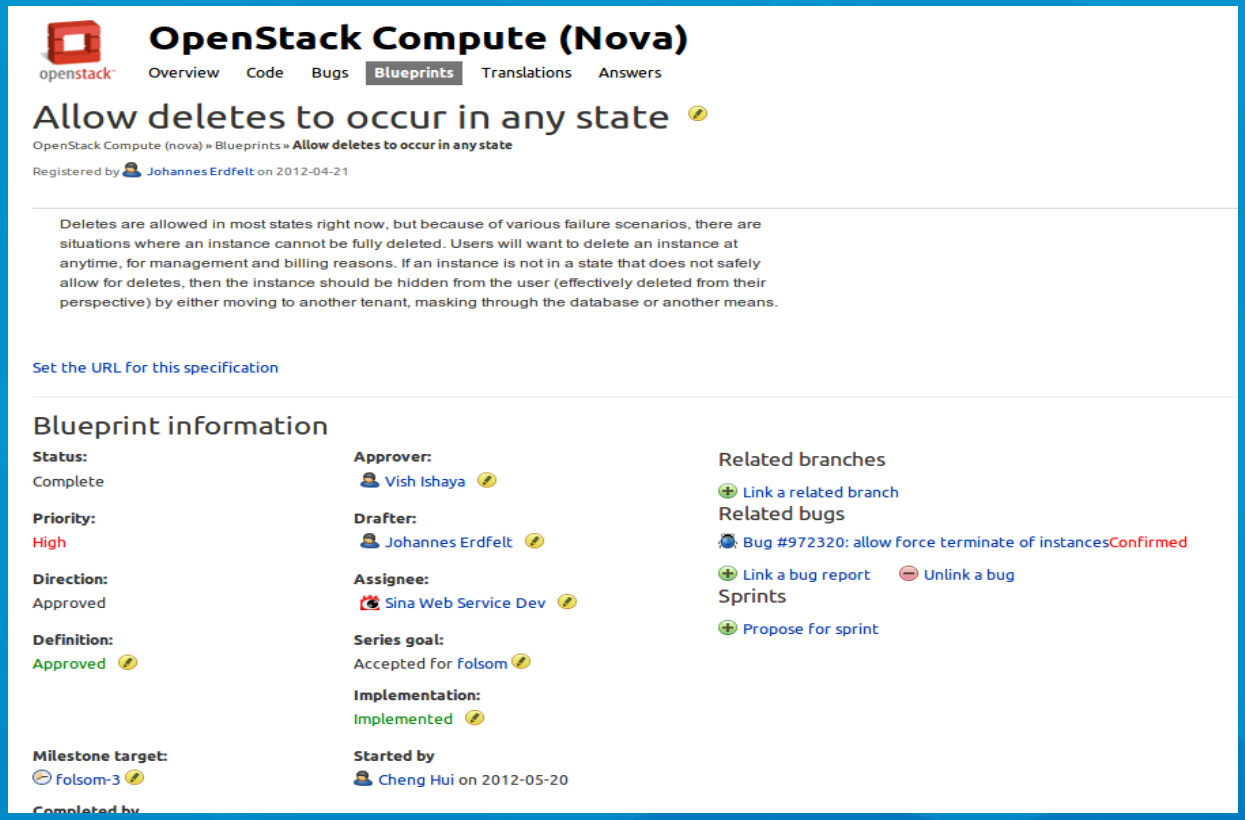
Open Source

Apache 2 License

Open Design

Grizzly Design Summit

Open Development



OpenStack Compute (Nova)

Overview Code Bugs **Blueprints** Translations Answers

Allow deletes to occur in any state

OpenStack Compute (nova) » Blueprints » **Allow deletes to occur in any state**

Registered by Johannes Erdfelt on 2012-04-21

Deletes are allowed in most states right now, but because of various failure scenarios, there are situations where an instance cannot be fully deleted. Users will want to delete an instance at anytime, for management and billing reasons. If an instance is not in a state that does not safely allow for deletes, then the instance should be hidden from the user (effectively deleted from their perspective) by either moving to another tenant, masking through the database or another means.

Set the URL for this specification

Blueprint information

Status: Complete

Priority: High

Direction: Approved

Definition: Approved

Milestone target: folsom-3

Approver: Vish Ishaya

Drafter: Johannes Erdfelt

Assignee: Sina Web Service Dev

Series goal: Accepted for folsom

Implementation: Implemented

Started by Cheng Hui on 2012-05-20

Completed by

Related branches

Link a related branch

Related bugs

Bug #972320: allow force terminate of instances Confirmed

Link a bug report Unlink a bug

Sprints

Propose for sprint

Propose features in launchpad

Open Development

Code Review

OpenStack is the #2 FOSS foundation

1. The Linux Foundation = $9.6M
2. Openstack = $6M
3. Mozilla Foundation = $1.9M
4. The Apache Foundation - $0.53M

Open Foundation Board

Platinum Members(8)

Gold Members(8)

DreamHost, Cloudscaling, ITRI/CCAT, DELL, Piston, Mirantis, Yahoo!, Cisco

Open Foundation Board

Individual Members(8)

Rank	Candidate	Weighted Votes	%	Voters	Weight per vote	%	Company	Title
1	**Rob Hirschfeld**	2218	14.52	514	4.315	26.56	**Dell**	Principal Architect / OpenStack Lead
2	**Monty Taylor**	1981.25	12.97	375	5.283	19.38	**HP**	OpenStack Automation Engineering Manager
3	**Hui Cheng**	1766.12	11.56	350	5.046	18.09	**Sina**	Technical Manager
4	Joseph George	1373.38	8.99	390	3.521	20.16	Dell	Director of Product Strategy
5	**Yujie Du**	760.25	4.98	201	3.782	10.39	**99Cloud**	Community Development Director
6	**Troy Toman**	677.12	4.43	209	3.240	10.8	**Rackspace**	Senior Director of Cloud Compute Engineering
7	Anne Gentle	561.12	3.67	268	2.094	13.85	Rackspace	Community Documentation Coordinator
8	Thierry Carrez	435.38	2.85	239	1.822	12.35	Rackspace	Release Manager for OpenStack
9	**Tim Bell**	434.5	2.84	243	1.788	12.56	**CERN**	Infrastructure manager
10	**Tristan Goode**	424	2.78	123	3.447	6.36	**Aptira**	CEO
11	**Jesse Andrews**	418.12	2.74	208	2.010	10.75	**Nebula**	Director of Technology

"No one company may control more than two board seats"

OpenStack Public Cloud

However They never tell you how to operate their public cloud based on OpenStack!

Content

- **SinaCloud Introduction**
- **Challenges to build a OpenStack Public Cloud**
  1. Network topology
  2. Security Enhancement
  3. Storage Solution
  4. Identity Integration
  5. Billing & Monitoring
  6. Dashboard Improvement
- **Operate an production OpenStack**
  7. Platform stack
  8. Automated Deployment
  9. Continuous Integration
  10. Project Management
- **StackLab: A community OpenStack Public Cloud**
- **Summary**

Cloud Requirement

Sina.com

- Largest infotainment web portal in China
- Provides various on-line services, like news, Finance, video, email, blog hosting, etc.
- Needs unified infrastructure & app platform to host heterogeneous services and apps.

Sina Weibo

- twitter-like microblog service
- over **350m** users, #1 SNS in China.
- huge influence on China's society
- Weibo Open Platform to build a social ecosystem through Open API and cloud environmental.

We are building a **reliable**, **scalable** and **secure** cloud platform to support our business and external customers.

SinaCloud Portfolio

<Sina>

新浪云计算

sinacloud.com

Sina App Engine

- First and most popular PaaS cloud in China, launched in 2009
- Support PHP, Python and Java runtime.
- 250,000 developers, 380,000 apps running on SAE.

新浪云商店
(Sina Cloud Market)

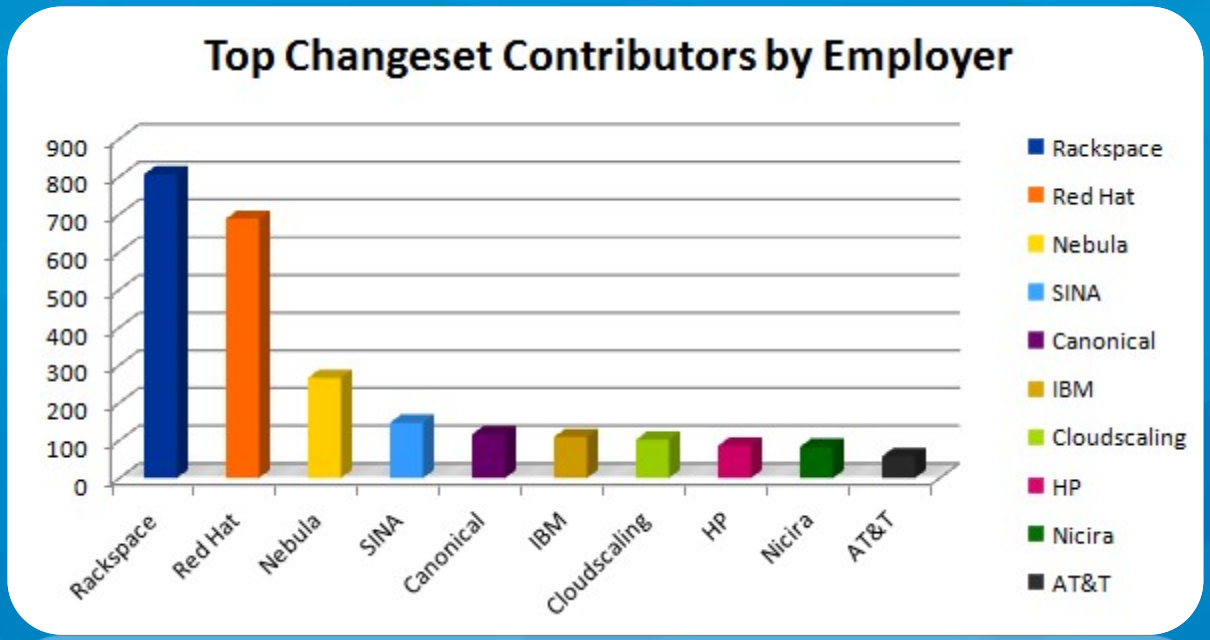
- First commercial cloud app market in China.
- SaaS cloud based on SAE tech.
- Design for the common users, 1-Click purchase and install apps.

Sina Web Services

- First OpenStack based public IaaS cloud in China

Sina OpenStack dev Team

- For Community
  - Top 9 contributor by bugfix at Essex
  - Top 4 contributor either by changeset or bugfix at Folsom
  - Contribute community project Dough, Kanyun addressing Monitoring and Billing
  - Develop Island as Cinder would-be plugin
  - Lead COSUG to be largest OpenStack user group



More info: http://www.openstack.org/blog/2012/10/how-sina-contributes-to-openstack/

Content

- SinaCloud Introduction
- **Challenges to build a OpenStack Public Cloud**
  1. Network topology
  2. Security Enhancement
  3. Storage Solution
  4. Identity Integration
  5. Billing & Monitoring
  6. Dashboard Improvement
- Operate an production OpenStack
  7. Platform stack
  8. Automated Deployment
  9. Continuous Integration
  10. Project Management
- StackLab: A community OpenStack Public Cloud
- Summary

Network Topology

Nova-network vs Quantum

	Multi host	Multi Talent	Flat, FlatDHCP	Tunneling	SDN	Sec Group	Dashboard Support
Nova-Network	✓	✓	✓	✗	✗	✓	✗
Quantum	✗	✓	✓	✓	✓	✗	✓

- Nova-Network is simple, robust and reliable, except lack of some advanced features.
- Quantum is not ready for production use, it's OVS plugin has great potential to be open-source NVP solution.
- I would suggestion to continue use nova-network for production deployment until next release.

Nova-Network

- **Flat**
  - Need external DHCP Server, and human intervention, not flexible, hardly use in practical deployment.
- **FlatDHCP**
  - Like Amazon EC2 networking(not VPC, VPC corresponds to Quantum), VM get IP from single network pools.
  - Simple, easy to hack.
  - Widely used in public cloud, also preferred topology in many scenarios.
- **VLAN**
  - A little complex, hardware configuration may be involved.
  - Not suggest to use except strong requirement of tenant isolation,

Network Topology —— Real User Case

Nova Network(FlatDHCP+Multi-host)

Capability:

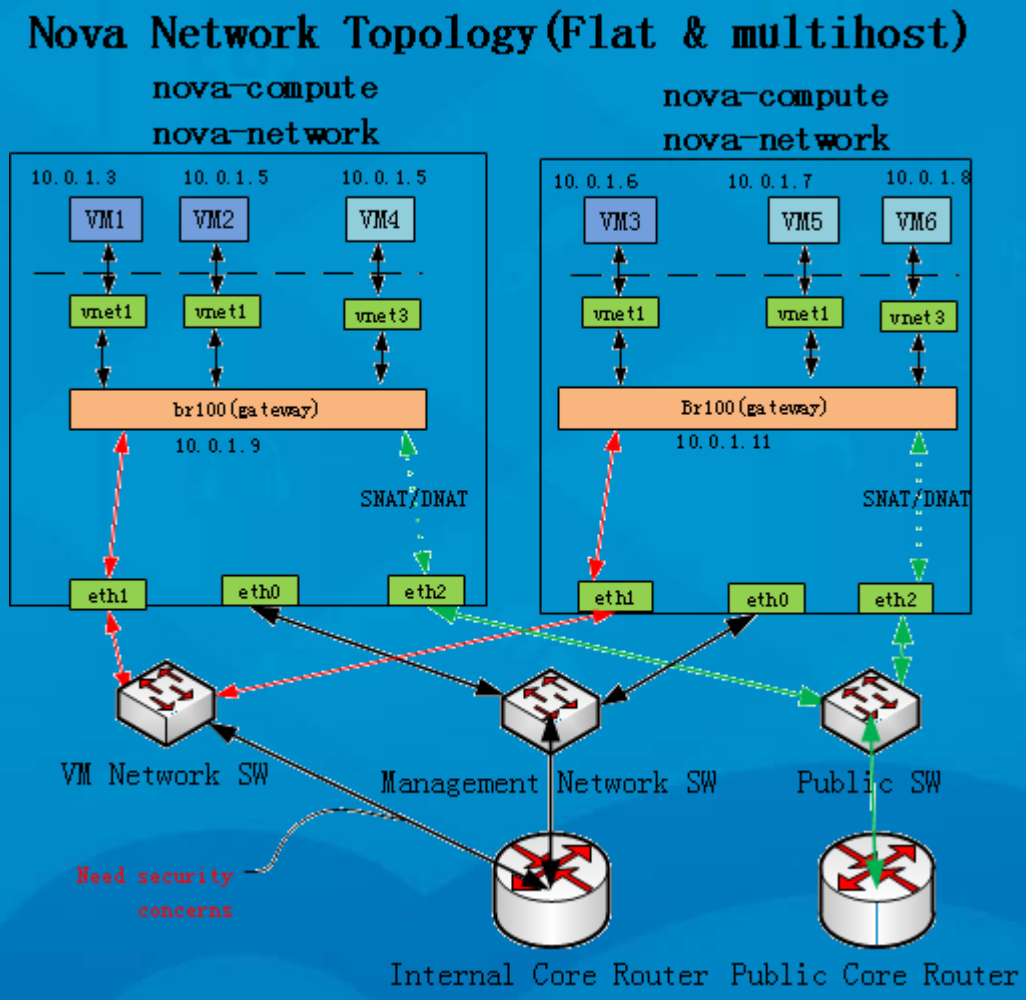
- Accessibility of all VMs in the fixed IP range
- VM is able to access public network
- VM can be accessible from public network

Bonus:

- Totally distributed architecture avoid single-point failure.
- Multiple gateway eliminates NAT bottleneck
- **High speed between OS regions**

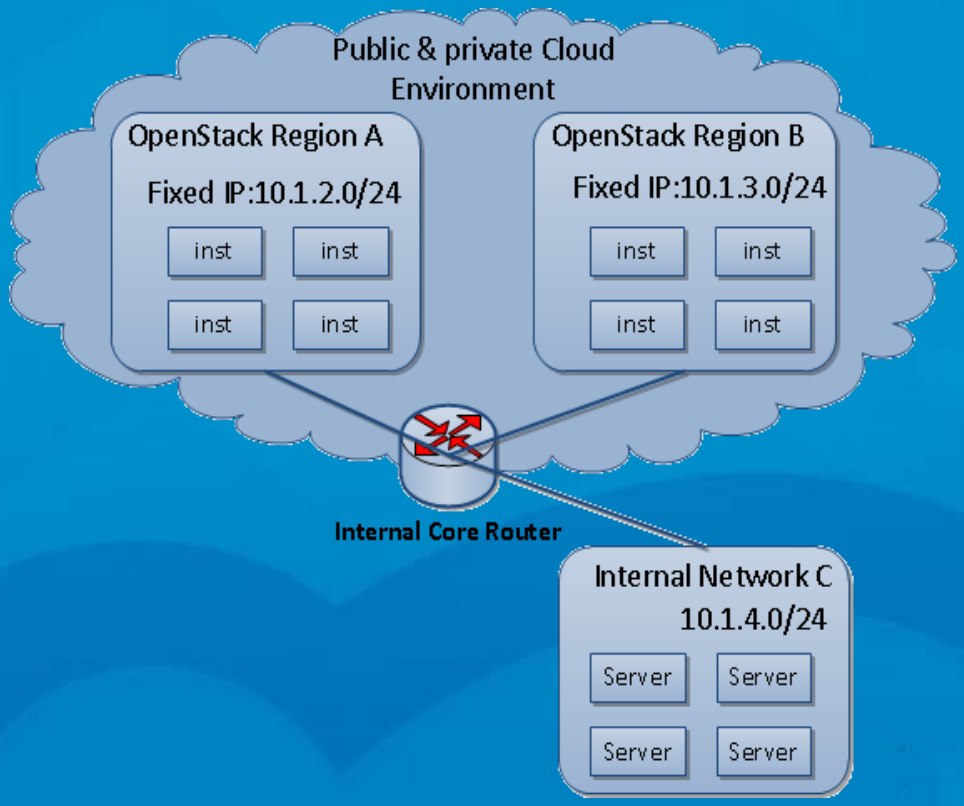
Drawback:

- Tenant isolation lessens
- Need security facility(*SWS-filter*) to protect intranet



Security Enhancement

- SWS Filter: a extension to security group in nova-network
  - Used to filter egress traffic from VM to internal network
  - Define whose traffic could be able to reach which internal network IP/segment.

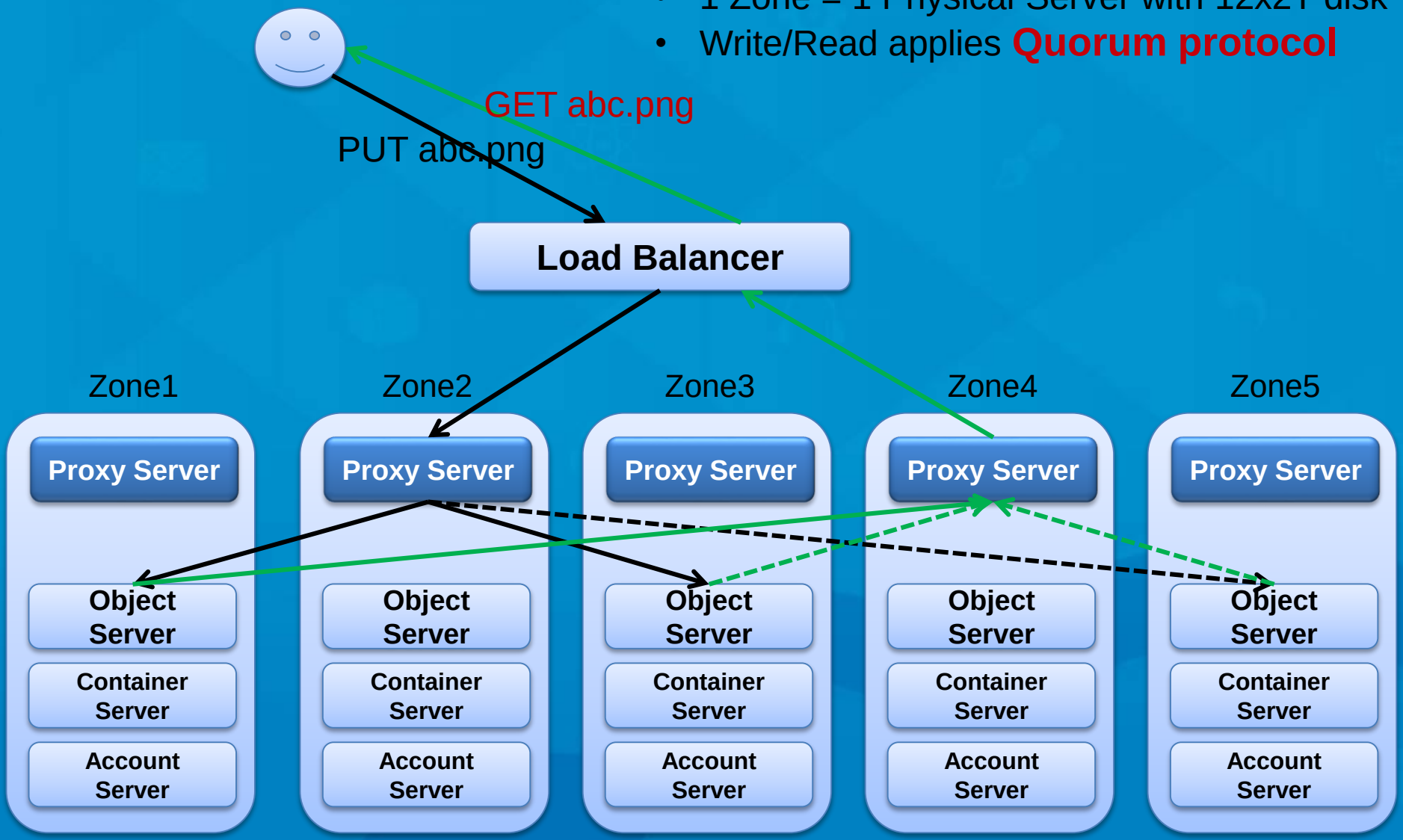


Storage Solution

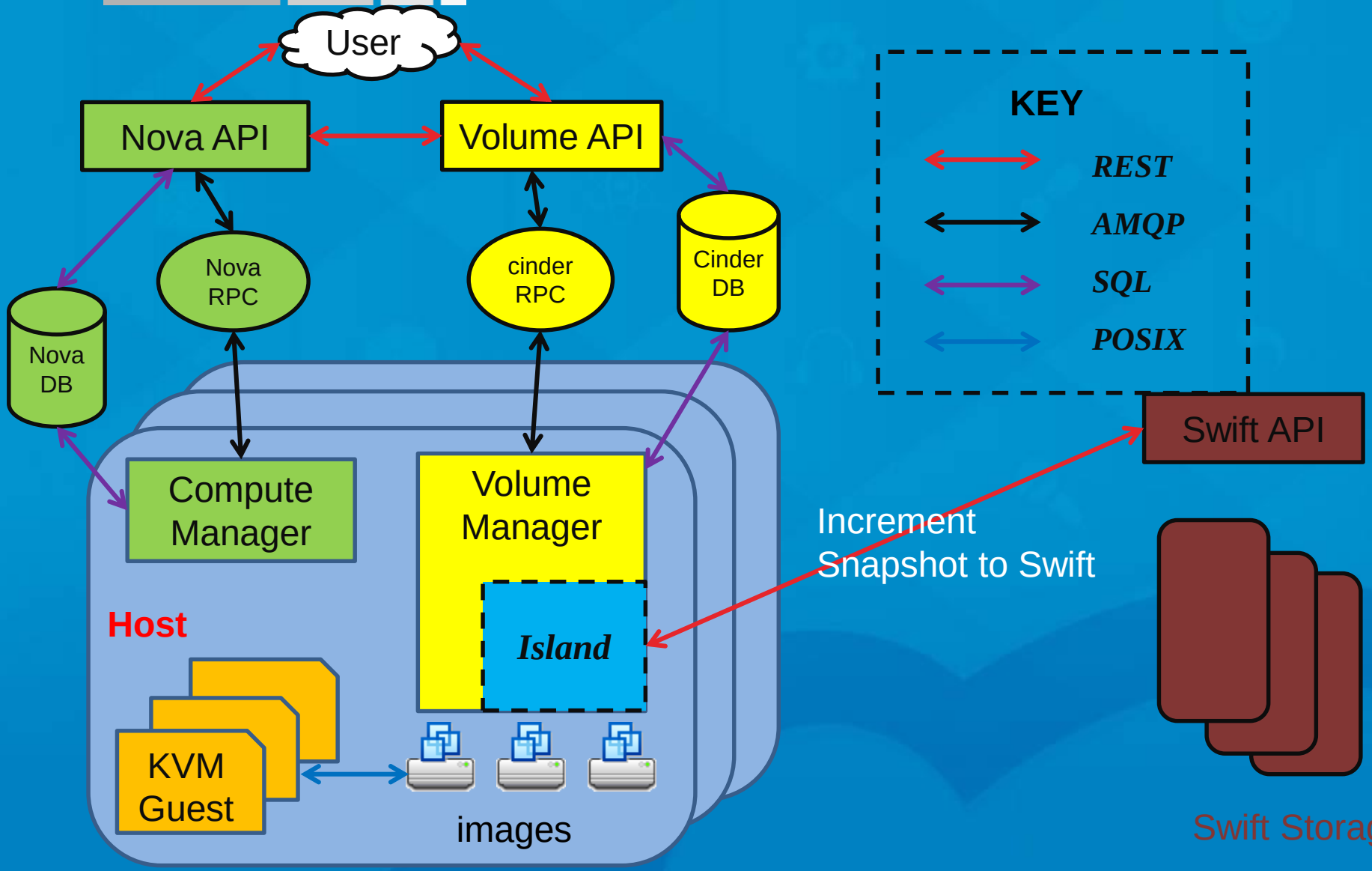
- Object Storage: Definitely we choose **Swift**
- Block Storage
  - Cinder is not Amazon EBS, just a framework to include multiple open-source/commercial storage solution.
  - Nova-volume/Cinder(iSCSI) is not applicable to public cloud.
  - Sheepdog/Gluster/Ceph plugins need time to be stable.
- **Island**: Local Storage Volume plugin for Cinder is coming.
  - High performance local storage
  - Incremental & independent snapshot
  - Snapshot store in swift

Swift Architecture

- 1 Zone = 1 Physical Server with 12x2T disk
- Write/Read applies **Quorum protocol**

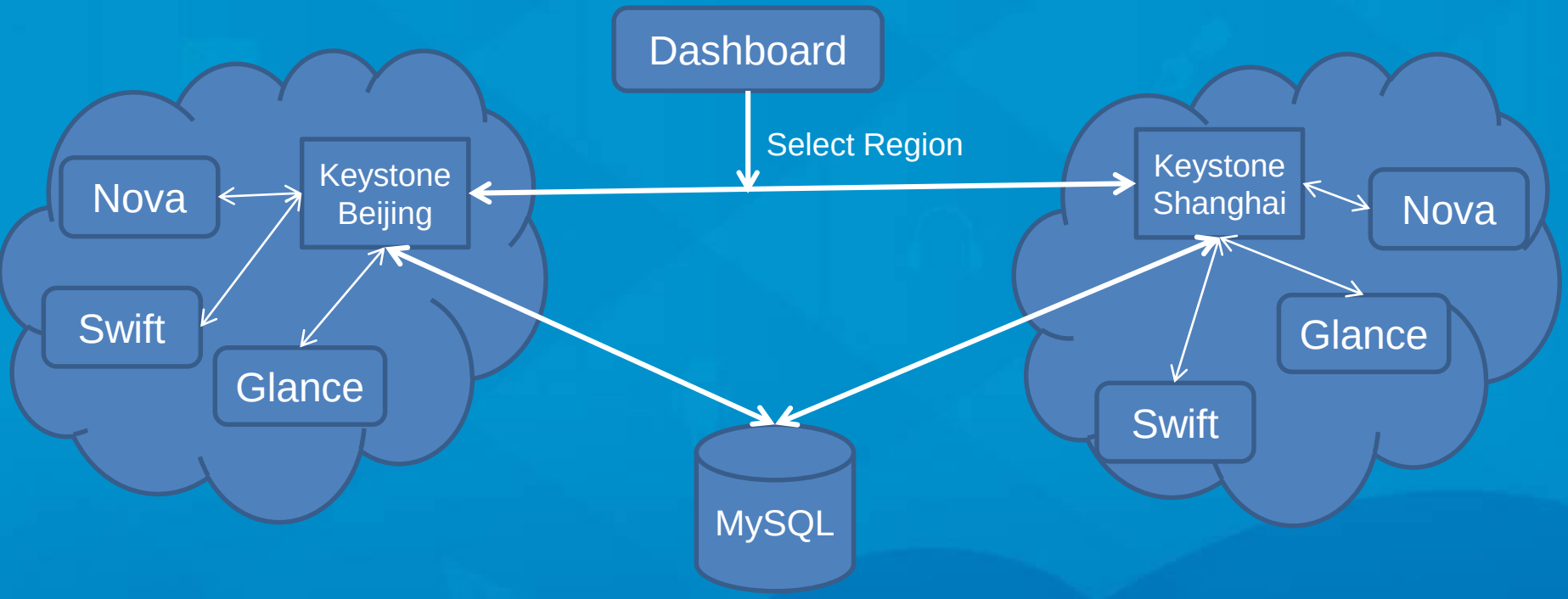


Cinder Island Plugin Architecture

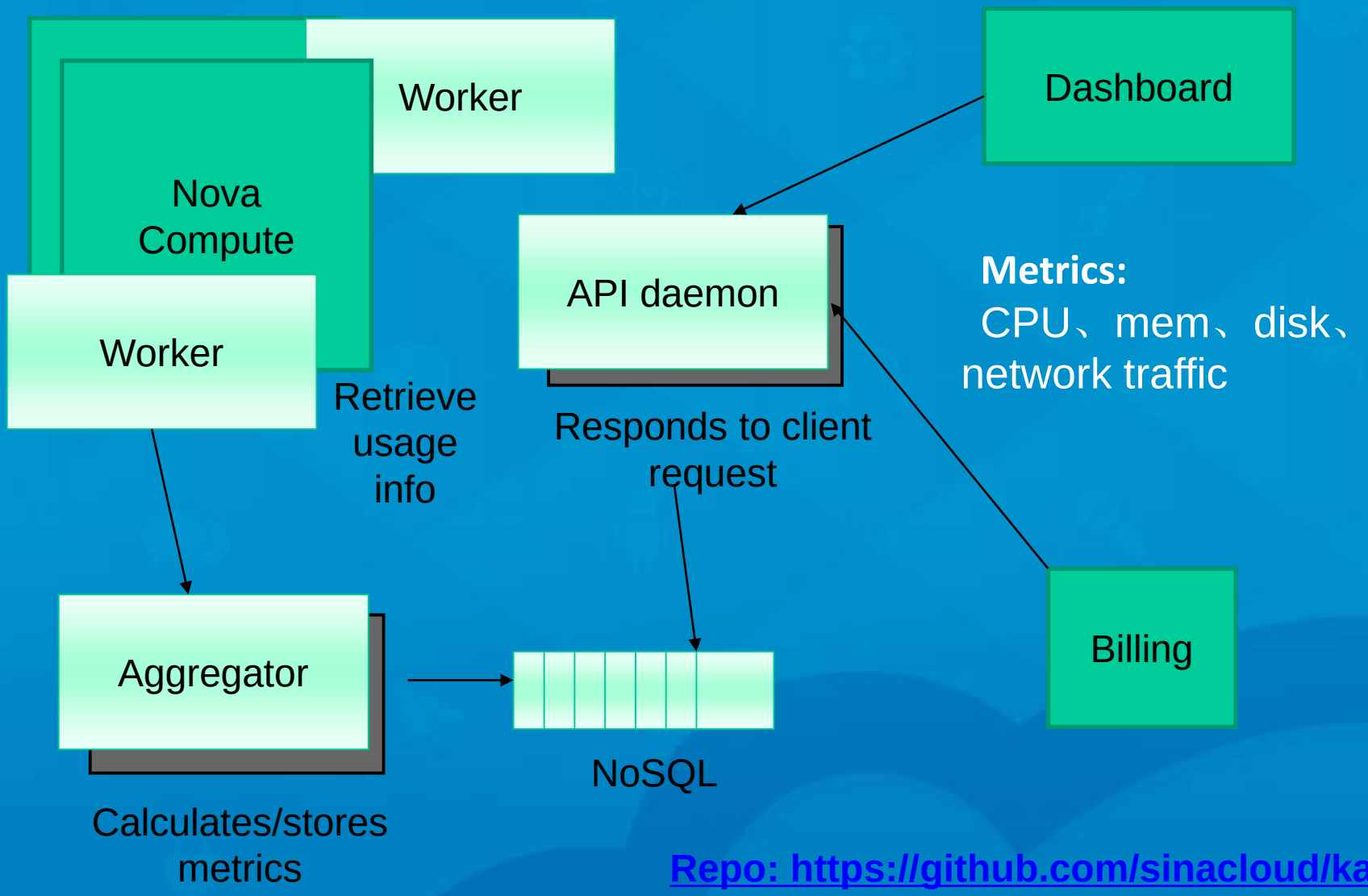


Identify Integration: Keystone

- AWS-like Multi-region support

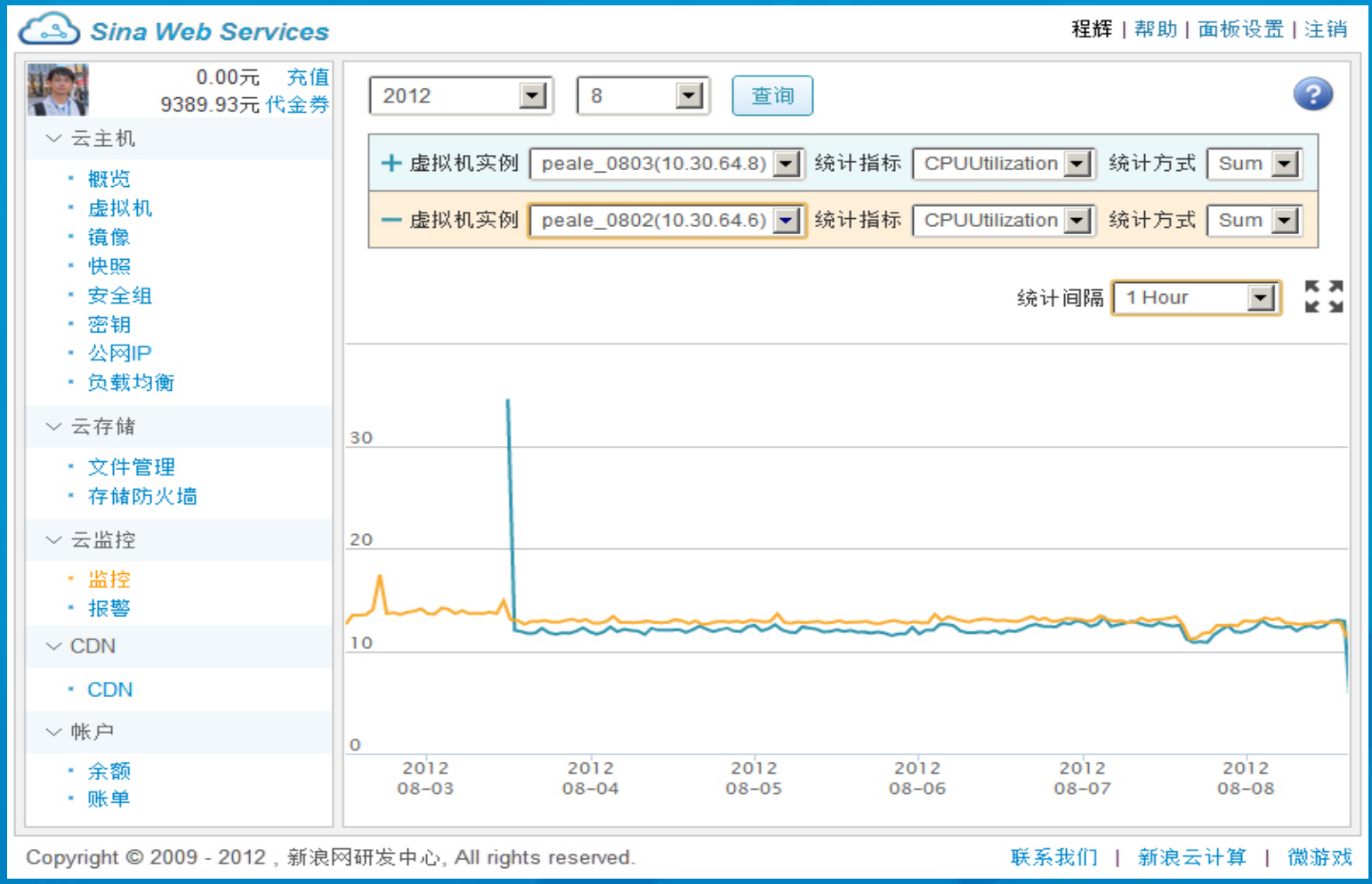


Kanyun: Monitoring system

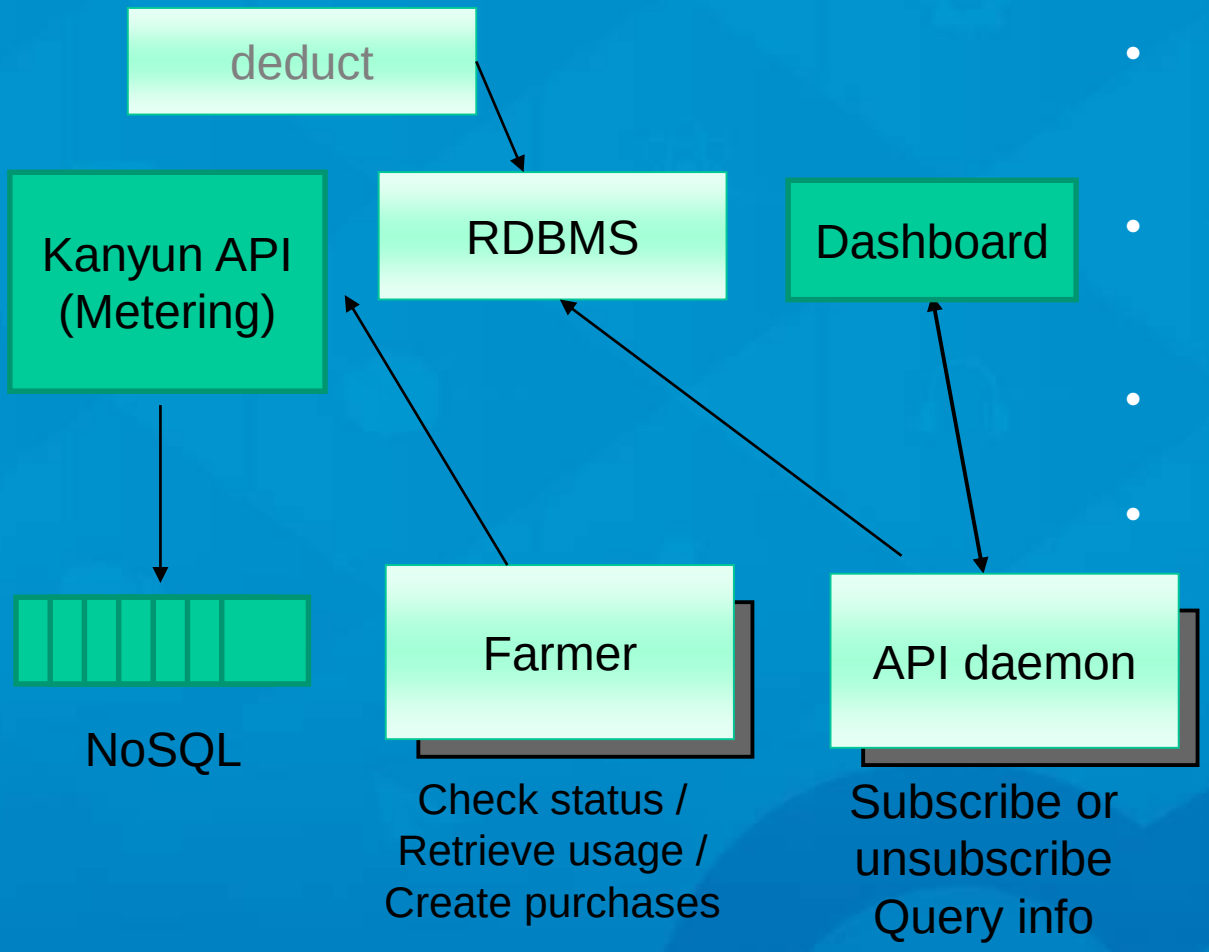


Repo: https://github.com/sinacloud/kanyun

Kanyun demo


Sina Web Services
程辉 | 帮助 | 面板设置 | 注销
0.00元 充值
9389.93元 代金券
云主机
概览
虚拟机
镜像
快照
安全组
密钥
公网IP
负载均衡
云存储
文件管理
存储防火墙
云监控
监控
报警
CDN
CDN
帐户
余额
账单
2012
8
查询
虚拟机实例 peale_0803(10.30.64.8) 统计指标 CPUUtilization 统计方式 Sum
虚拟机实例 peale_0802(10.30.64.6) 统计指标 CPUUtilization 统计方式 Sum
统计间隔 1 Hour
30
20
10
0
2012 08-03
2012 08-04
2012 08-05
2012 08-06
2012 08-07
2012 08-08
Copyright © 2009 - 2012 , 新浪网研发中心, All rights reserved.
联系我们 | 新浪云计算 | 微游戏

Dough:Billing system



- Keep track of billing info to charge tenants
- Flexible customization of payment policies
- How much/often to charge for resource unit
- Handles prepaid or pay-as-you-go
- Coupon Support

Repo: https://github.com/sinacloud/dough, you should also consider *Celiometer* project.

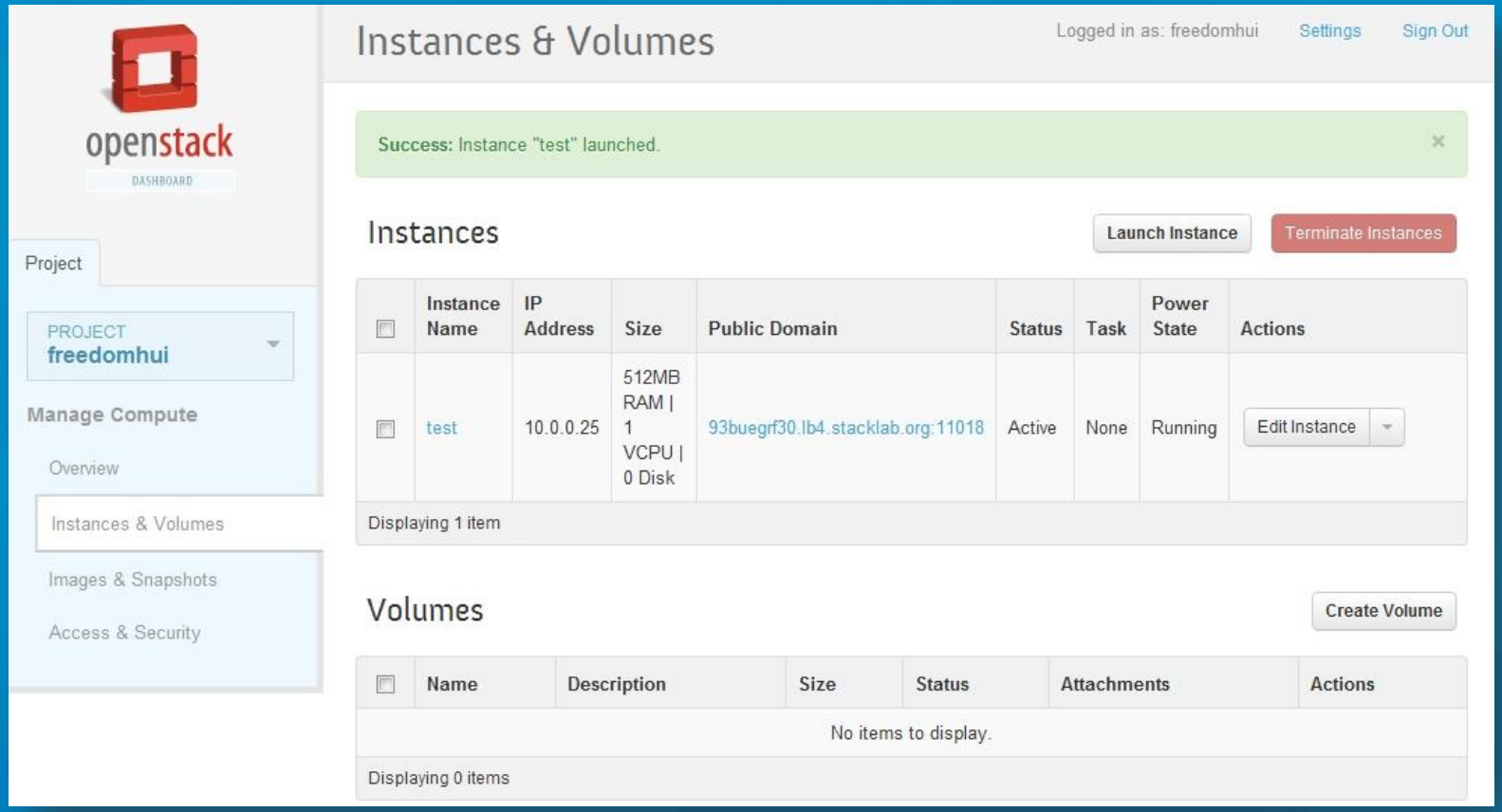
Dough:Billing info page

Dashboard Improvement

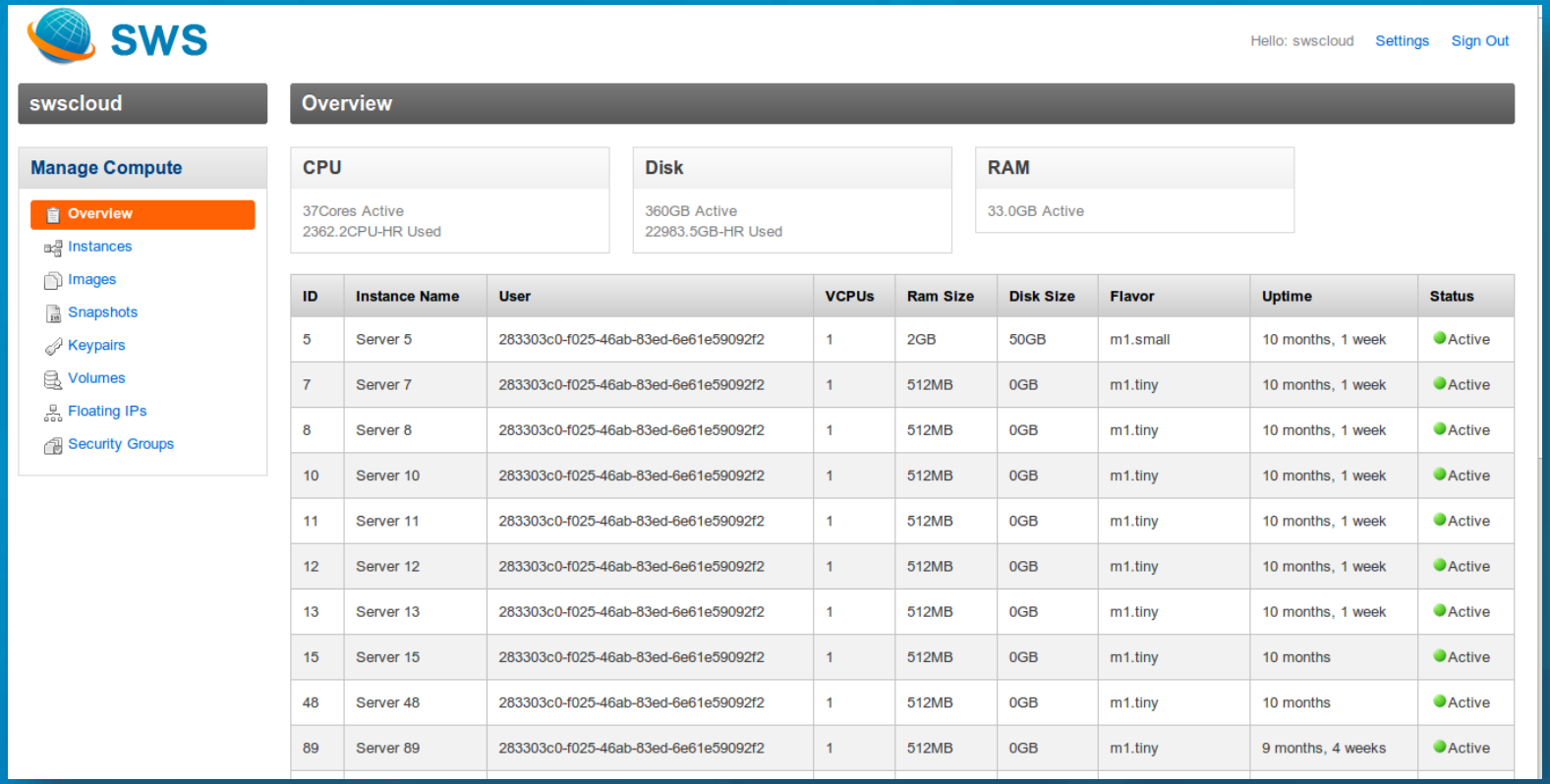
- **We did not use Horizon, because:**
  - Horizon's UI is not easy to customize
  - Front end and back end is tightly coupled
  - we need much customization, it's hard to keep pace with Horizon.

- **What we do?**
  - Decouple the frontend design and backend implementation.
  - Make dashboard a lightweight frontend.
  - Separate user console and admin console.

Horizon Dashboard

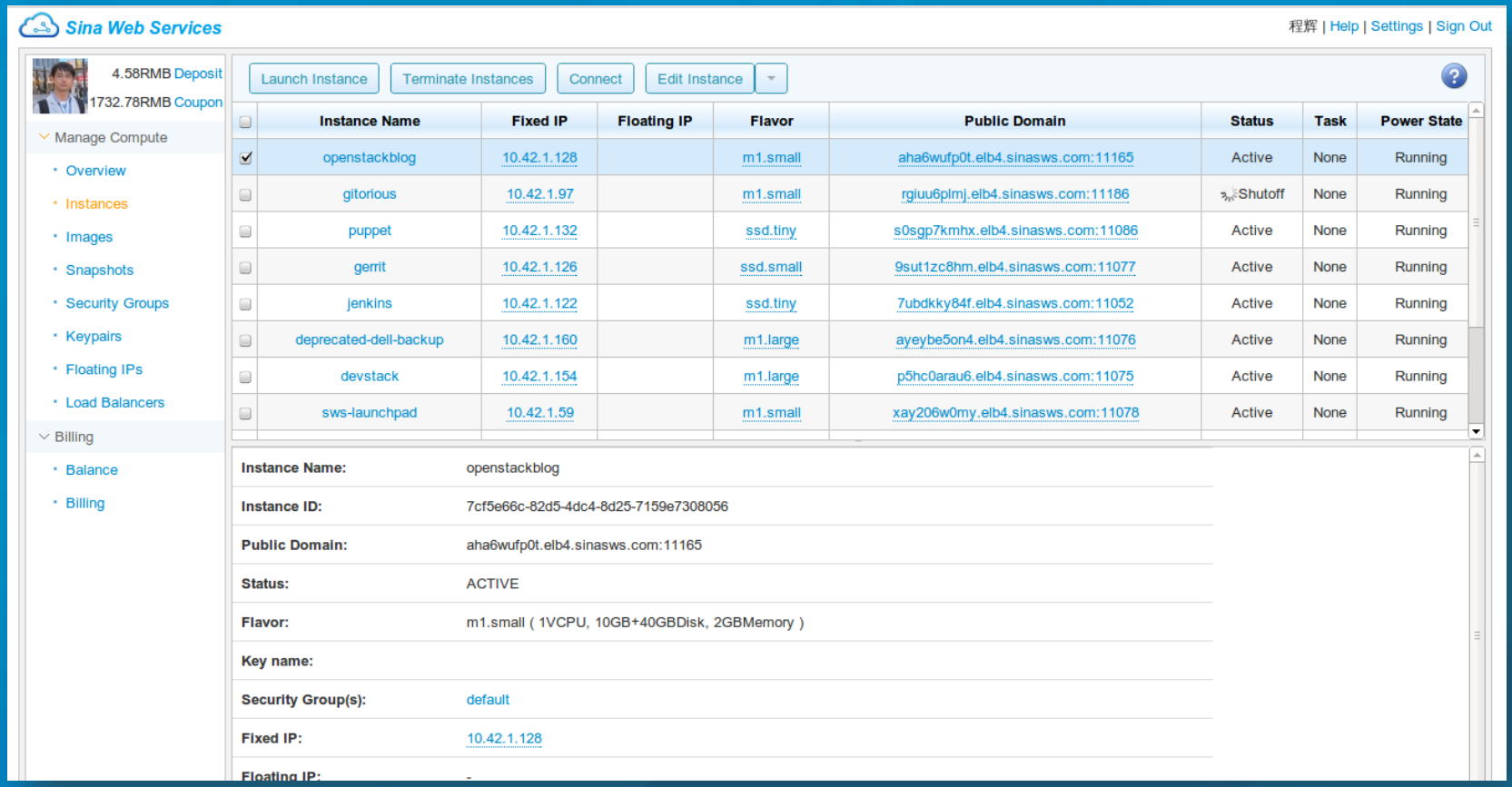


SWS v1

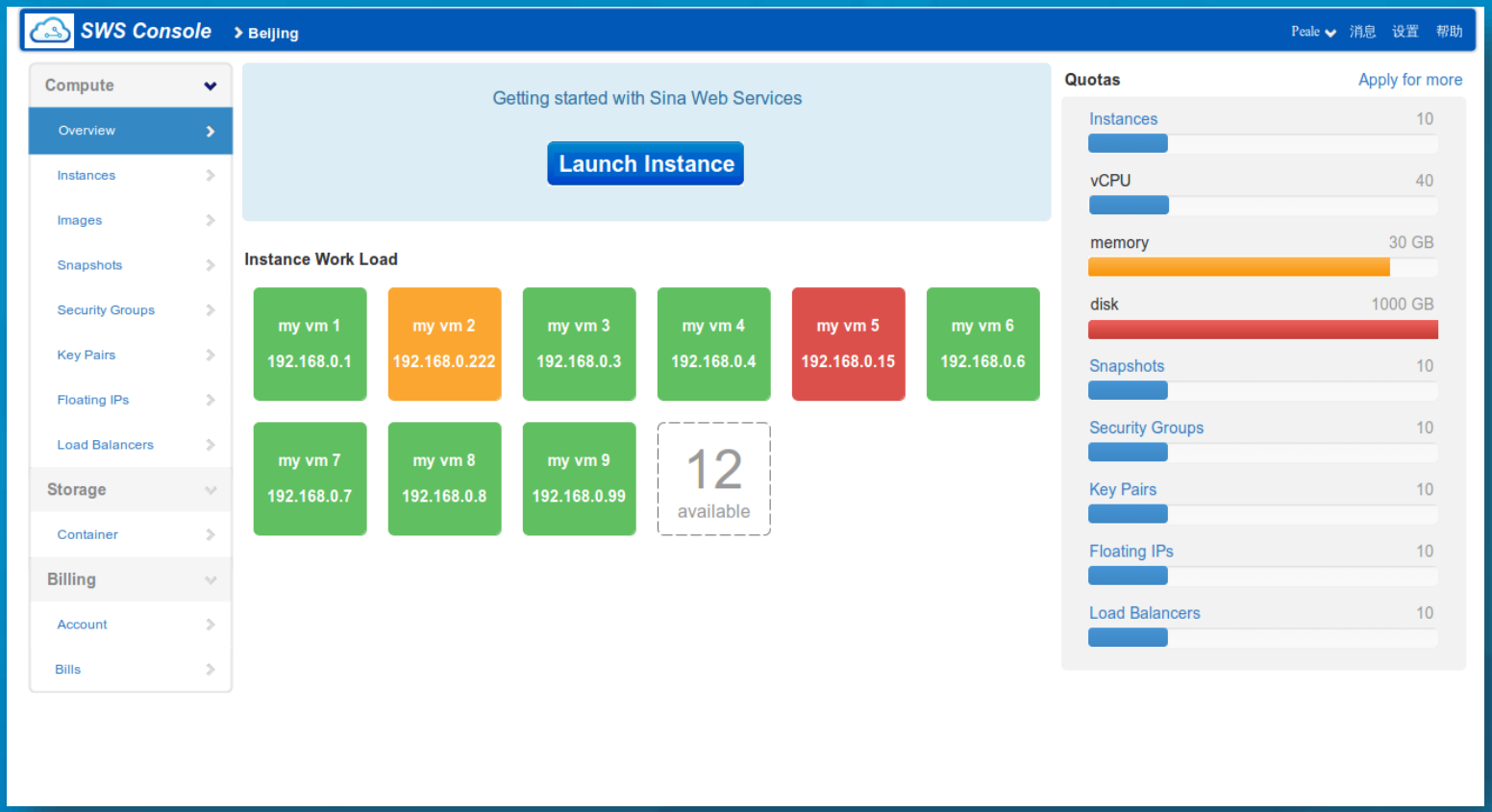


ID	Instance Name	User	VCPUs	Ram Size	Disk Size	Flavor	Uptime	Status
5	Server 5	283303c0-f025-46ab-83ed-6e61e59092f2	1	2GB	50GB	m1.small	10 months, 1 week	Active
7	Server 7	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
8	Server 8	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
10	Server 10	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
11	Server 11	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
12	Server 12	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
13	Server 13	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months, 1 week	Active
15	Server 15	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months	Active
48	Server 48	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	10 months	Active
89	Server 89	283303c0-f025-46ab-83ed-6e61e59092f2	1	512MB	0GB	m1.tiny	9 months, 4 weeks	Active

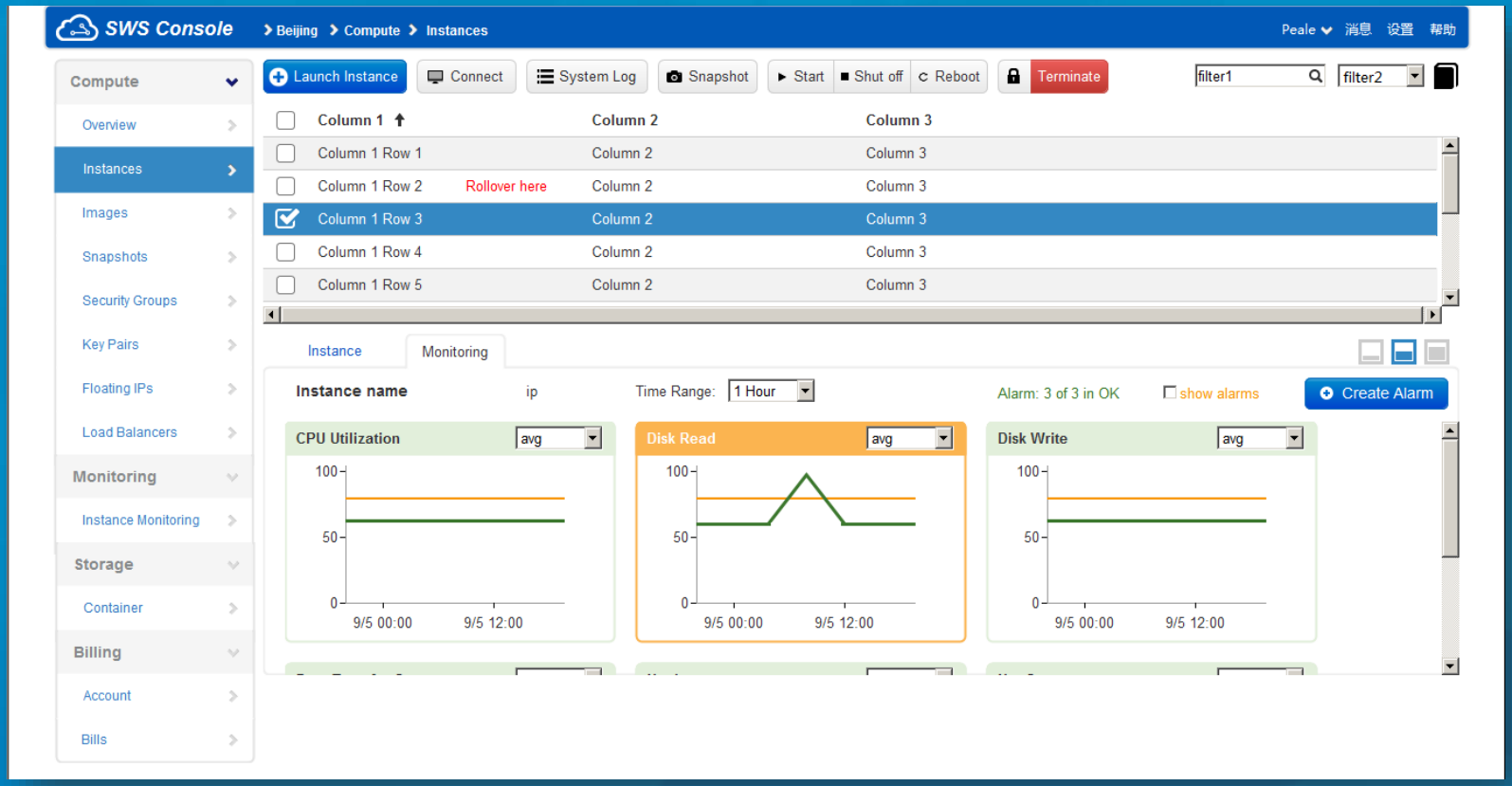
SWS v2


Sina Web Services
程辉 | Help | Settings | Sign Out
4.58RMB Deposit
1732.78RMB Coupon
Launch Instance
Terminate Instances
Connect
Edit Instance
Manage Compute
Overview
Instances
Images
Snapshots
Security Groups
Keypairs
Floating IPs
Load Balancers
Billing
Balance
Billing
Instance Name | Fixed IP | Floating IP | Flavor | Public Domain | Status | Task | Power State
openstackblog | 10.42.1.128 | | m1.small | aha6wufp0t.elb4.sinasws.com:11165 | Active | None | Running
gitorious | 10.42.1.97 | | m1.small | rgiuu6plmj.elb4.sinasws.com:11186 | Shutoff | None | Running
puppet | 10.42.1.132 | | ssd.tiny | s0sgp7kmhx.elb4.sinasws.com:11086 | Active | None | Running
gerrit | 10.42.1.126 | | ssd.small | 9sut1zc8hm.elb4.sinasws.com:11077 | Active | None | Running
jenkins | 10.42.1.122 | | ssd.tiny | 7ubdkky84f.elb4.sinasws.com:11052 | Active | None | Running
deprecated-dell-backup | 10.42.1.160 | | m1.large | ayeybe5on4.elb4.sinasws.com:11076 | Active | None | Running
devstack | 10.42.1.154 | | m1.large | p5hc0arau6.elb4.sinasws.com:11075 | Active | None | Running
sws-launchpad | 10.42.1.59 | | m1.small | xay206w0my.elb4.sinasws.com:11078 | Active | None | Running
Instance Name: openstackblog
Instance ID: 7cf5e66c-82d5-4dc4-8d25-7159e7308056
Public Domain: aha6wufp0t.elb4.sinasws.com:11165
Status: ACTIVE
Flavor: m1.small (1VCPU, 10GB+40GBDisk, 2GBMemory)
Key name:
Security Group(s): default
Fixed IP: 10.42.1.128
Floating IP: -

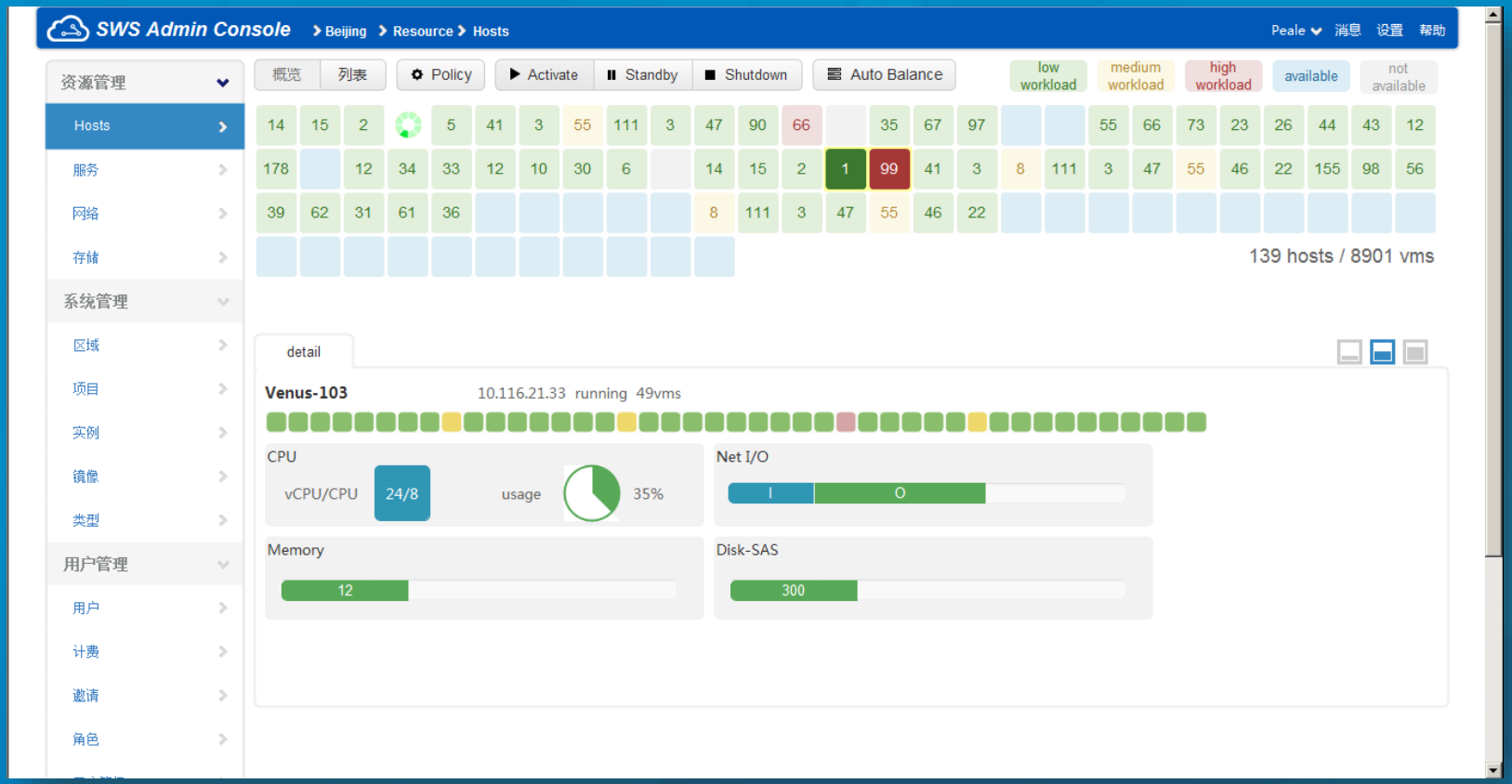
SWS v3 – User Dashboard



SWS v3 - Monitoring



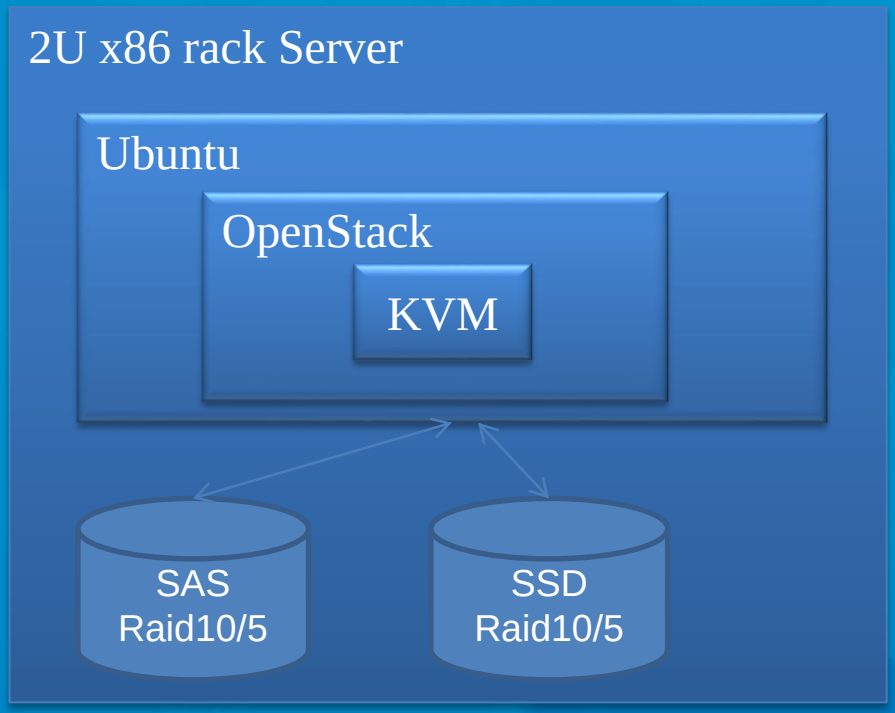
SWS v3 – Physical Server Mgt



Content

- **SinaCloud Introduction**
- **Challenges to build a OpenStack Public Cloud**
  1. Network topology
  2. Security Enhancement
  3. Storage Solution
  4. Identity Integration
  5. Billing & Monitoring
  6. Dashboard Improvement
- **Operate an production OpenStack**
  7. Platform stack
  8. Automated Deployment
  9. Continuous Integration
  10. Project Management
- **StackLab: A community OpenStack Public Cloud**
- **Summary**

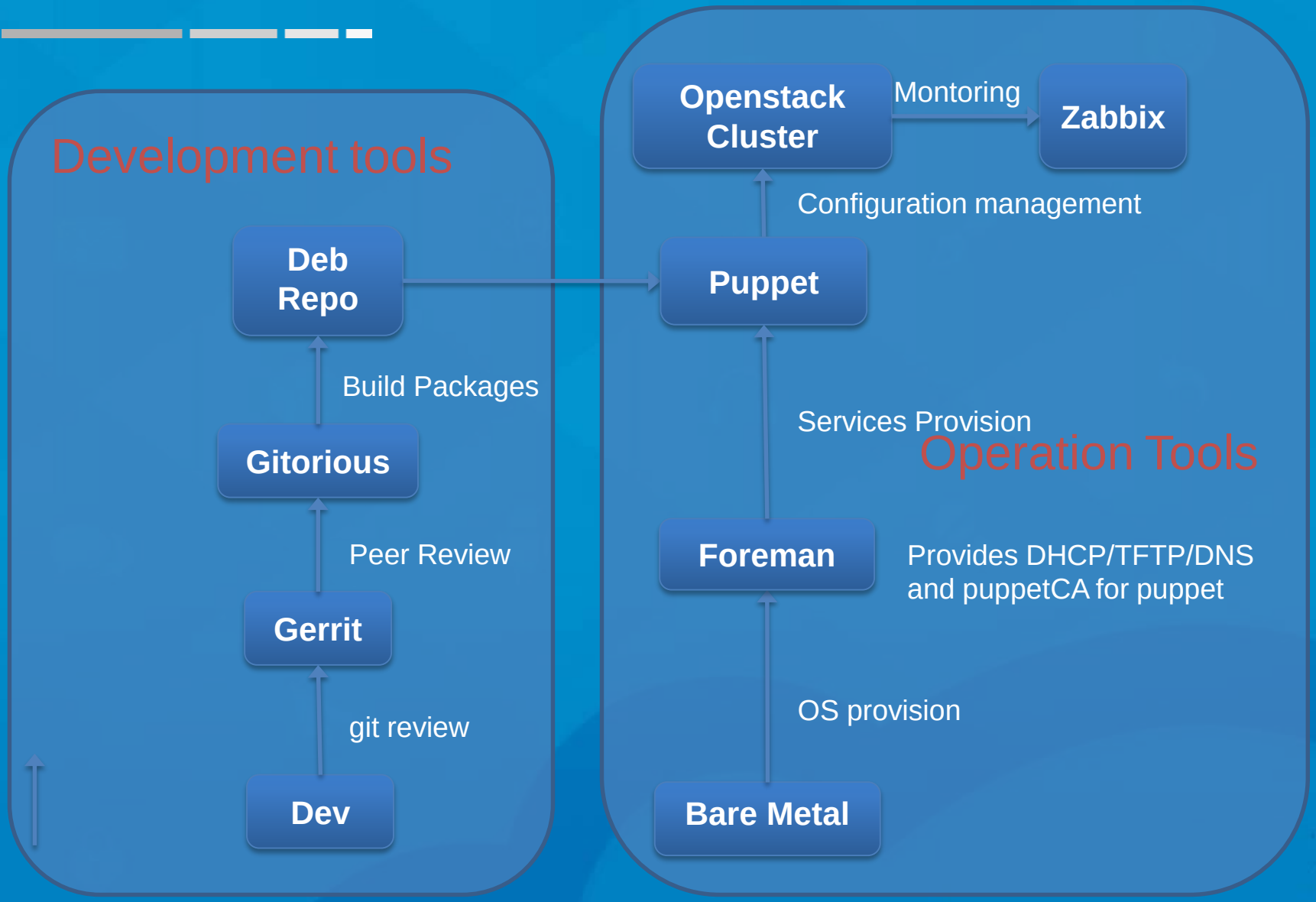
Platform Stack



Challenges in Deploying Cloud

- Cloud in essence are big data centers
- Requirement:
  - Provision large scale physical infrastructures
  - Software deployment
  - Orchestrate all the heterogeneous components

SWS automation toolchain.



SWS continuous integration

Dev

Something failed…

Wish my code passed

Packaging

Jenkins

Need change!

Hey, test PASS!

Peer review PASS!

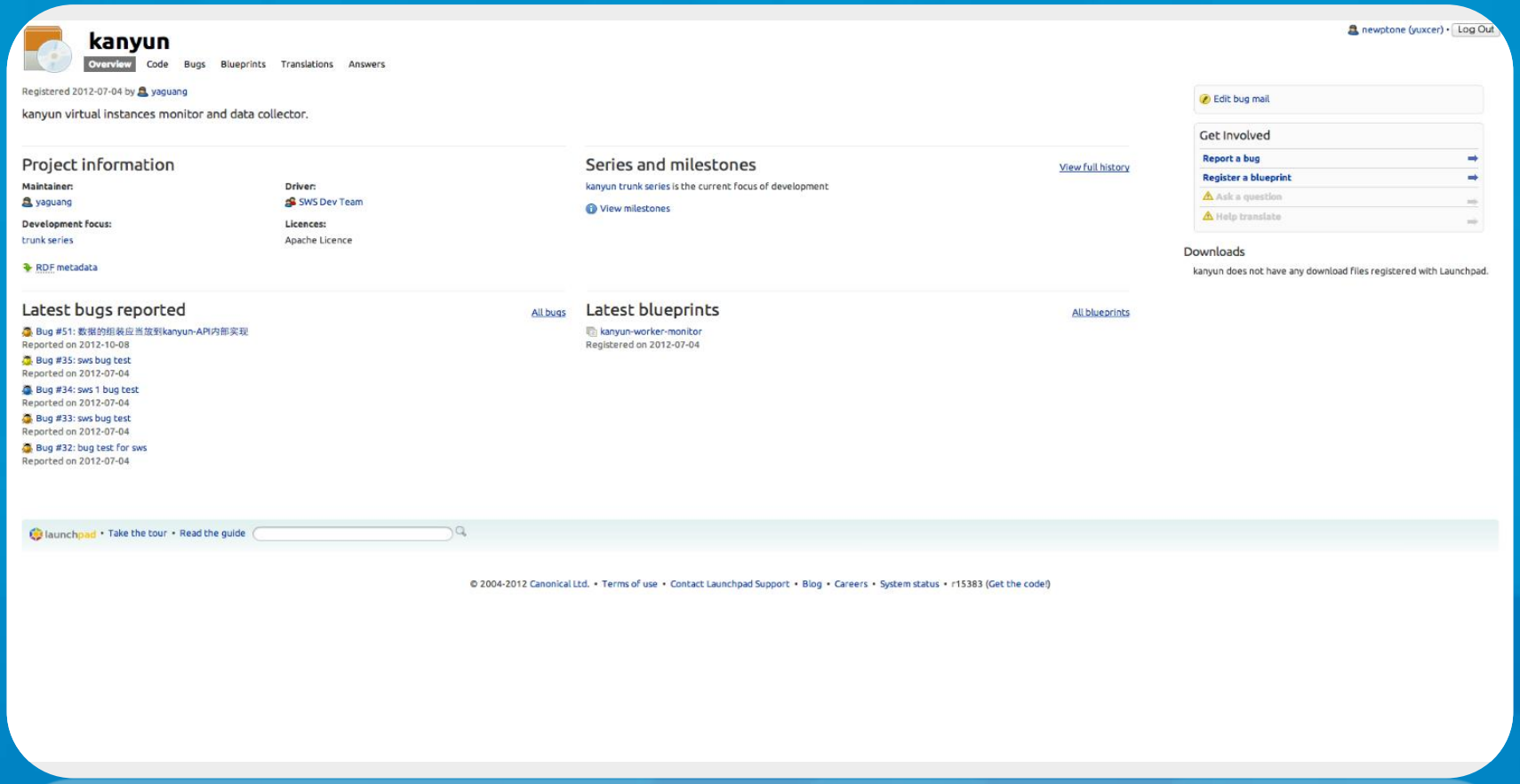
Newbie

Old Bird

It looks good to me,
But need someone approve…

Good, Approve!

Project Management



Deploy open-source version Launchpad in-house as project management system.

Content

- **SinaCloud Introduction**
- **Challenges to build a OpenStack Public Cloud**
  1. Network topology
  2. Security Enhancement
  3. Storage Solution
  4. Identity Integration
  5. Billing & Monitoring
  6. Dashboard Improvement
- **Operate an production OpenStack**
  7. Platform stack
  8. Automated Deployment
  9. Continuous Integration
  10. Project Management
- **StackLab: A community OpenStack Public Cloud**
- **Summary**

StackLab.org

A Community free OpenStack Public Cloud, more than just a OpenStack sandbox.

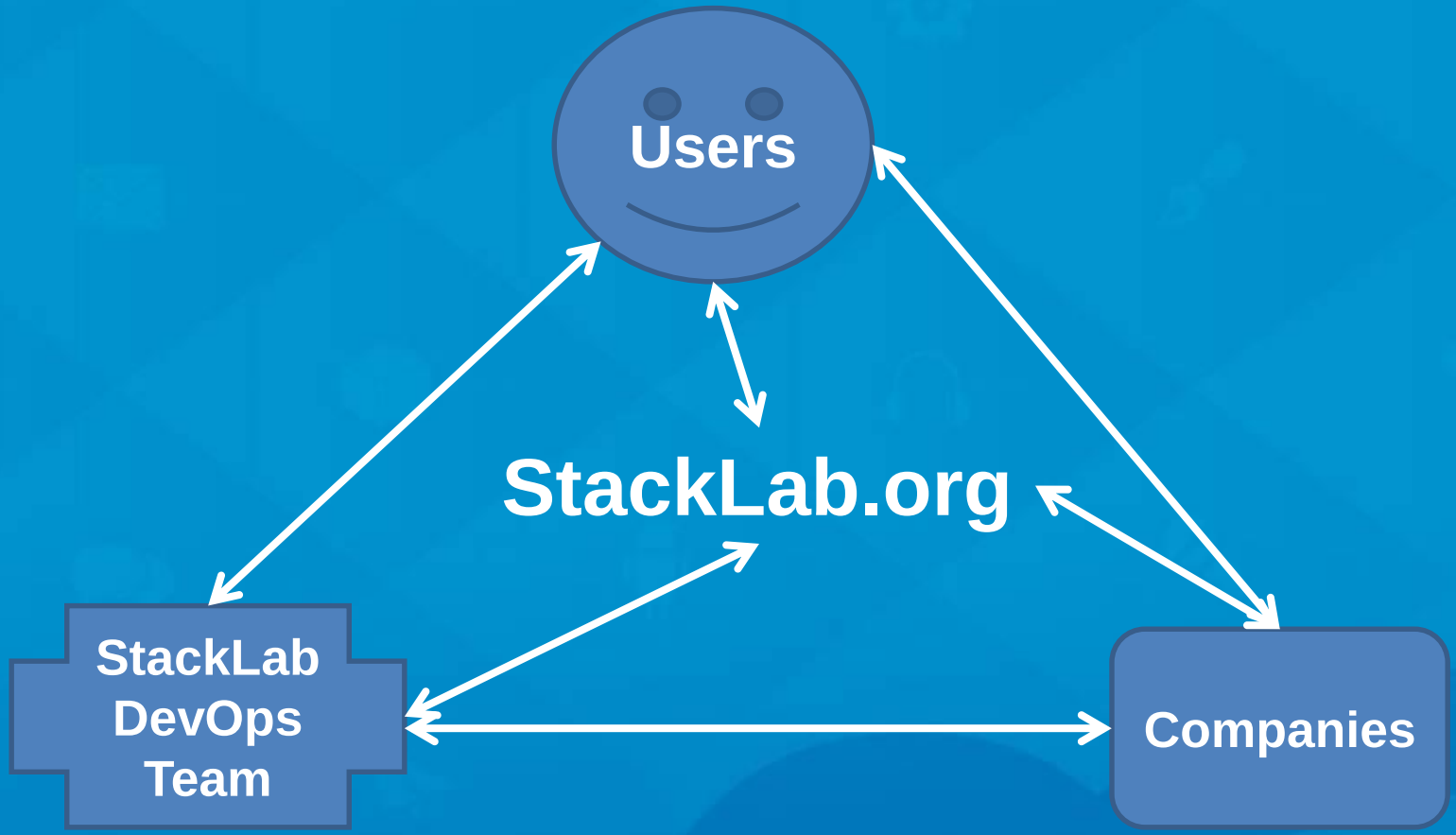
StackLab is initiated and operated by Sina OpenStack team, as well as tech volunteers from community, while resources sponsored by Sina, Intel.

StackLab news report: http://freedomhui.com/2012/10/coscl-launches-stacklab/

Why StackLab

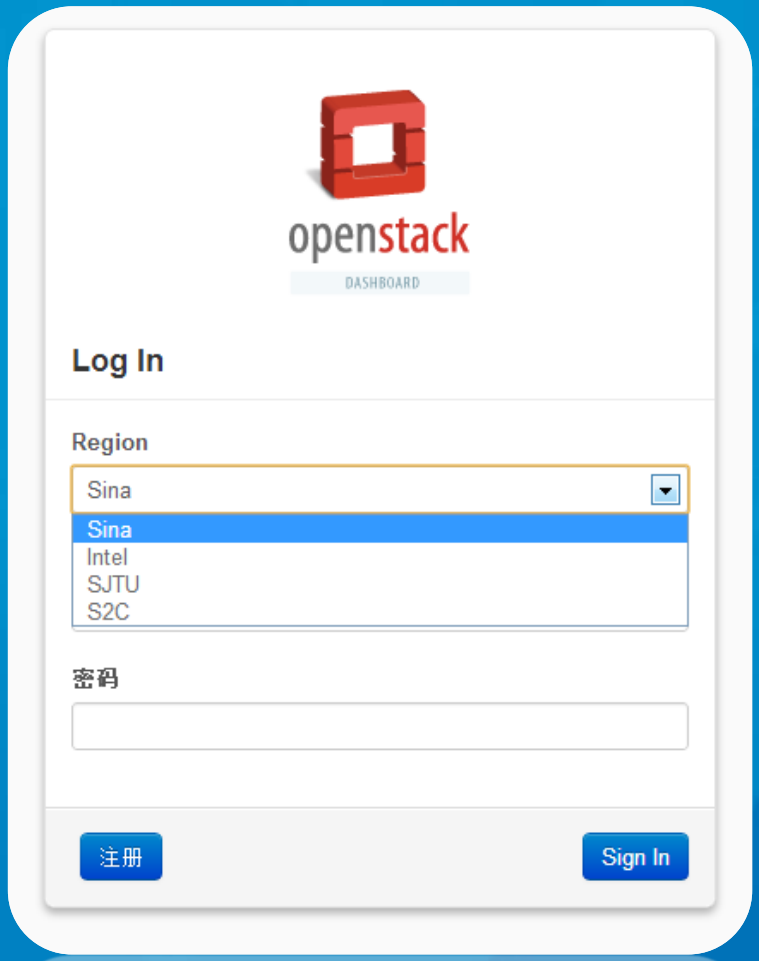
Not everyone has the opportunity to run a OpenStack public cloud when no resources, no users, no market, but StackLab will change this.

Why StackLab

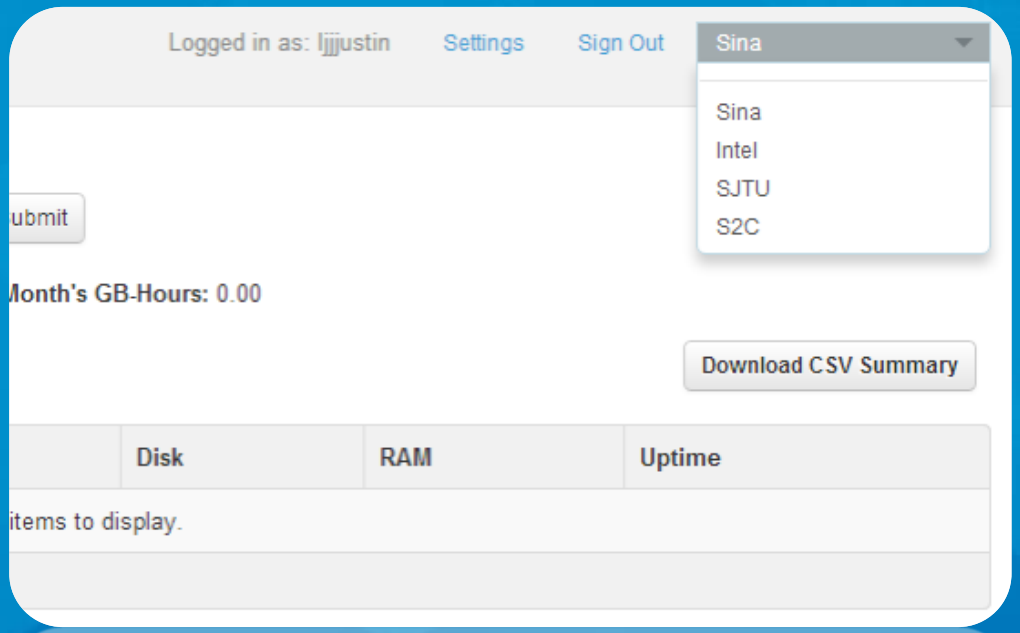


What does StackLab Look Like?

Choose the region before login



Or choose the region after login



StackLab Goals

A community OpenStack public cloud which benefits users, contributors and sponsors.

For OpenStack Users who experience StackLab

- Understand what exactly OpenStack is and what does it provide
- Develop application on StackLab or using OpenStack API
- Build faith on OpenStack, possibly become real adopters and supporter

For OpenStack contributors involved in StackLab

- Testing patches on real production-like environmental, and get feedback from users, thus facilitate development and QA processes
- Gains experiences through operating StackLab without risk of SLA
- Better understand the requirement of OpenStack users

For StackLab sponsors

- Build band acknowledgement in OpenStack community
- Own one StackLab region in their own data center
- Prior access to free technical support, consultant, of StackLab DevOps team

How to join StackLab

For OpenStack Users who want to experience StackLab

Really Easy! Goto StackLab.org, register a free account instantly without approvement by admin.

For OpenStack contributors to join StackLab DevOps team

1. Persuade your company to become a StackLab sponsor, thus you will have a StackLab region in your own DC, and you are one admin of StackLab.
2. Contact us to join as an individual member.

For StackLab sponsors

1. Send a email to openstacklab@gmail.com, expressing your willing to join StackLab
2. Sign a agreement with StackLab DevOps team
3. StackLab team help you build one StackLab region in your own DC. The minimum requirement is 3 servers with access to public network.
4. List your StackLab region in Stacklab.org portal.

How to join StackLab(cont.)

StackLab: http://stacklab.org
StackLab Discussion Group:
https://groups.google.com/group/stacklab
stacklab@googlegroups.com
StackLab DevOps Team:
https://groups.google.com/group/stacklab-devops
stacklab-devops@googlegroups.com

Content

- **SinaCloud Introduction**
- **Challenges to build a OpenStack Public Cloud**
  1. Network topology
  2. Security Enhancement
  3. Storage Solution
  4. Identity Integration
  5. Billing & Monitoring
  6. Dashboard Improvement
- **Operate an production OpenStack**
  7. Platform stack
  8. Automated Deployment
  9. Continuous Integration
  10. Project Management
- **StackLab: A community OpenStack Public Cloud**
- **Summary**

Summary

- OpenStack definitely the best open-source cloud platform for building public cloud
  - Open, open, open, open
  - Fast growing ecosystem around OpenStack
  - No vendor lock-in
  - Etc.
- OpenStack Public cloud needs much more customization and development to differentiate.
- Require strong technical skills and involvement in community.

Thank you, OpenStack Community and Foundation.

Q & A

freedomhui@gmail.com
Freedomhui.com