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CHINA

Topic：OpenStack混合云之路

Speaker：黄舒泉@九州云99cloud

About

- Technical Director @ 99cloud
- Heavily involve in OpenStack Community since 2012
- Open Source Evangelist

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Agenda

- State of Hybrid Cloud
- Why Hybrid Cloud?
- Hybrid Cloud Use Cases
- Challenges
- Bridging Gaps
- Summary

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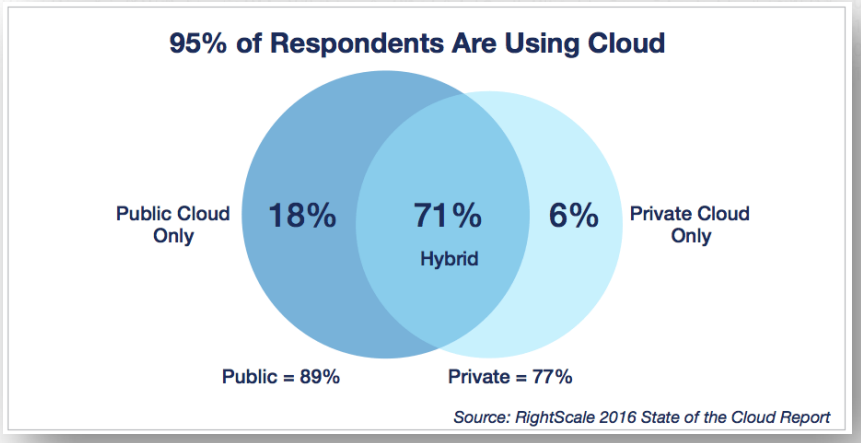
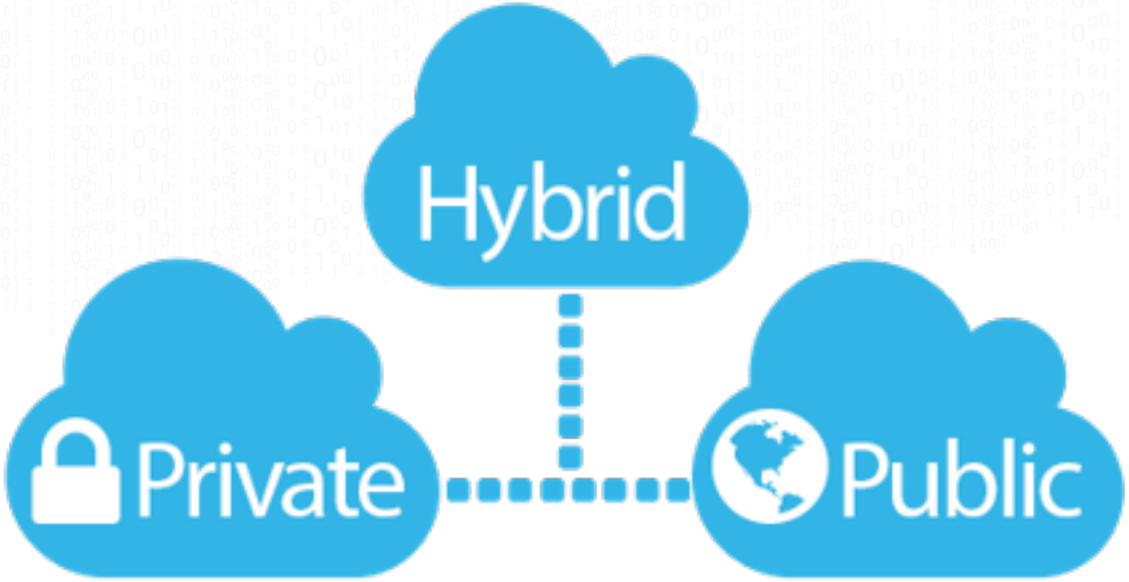
State of Hybrid Cloud

- **71%** of respondents enterprises are using hybrid cloud – *RightScale Report*
- **75%** of companies planned to adapt hybrid cloud – *Cloud Cruiser survey*
- **88%** of respondents believe hybrid cloud is 'important' or 'critical' to enable digital business transformation - *IDG Research survey*



Why Hybrid Cloud?

- Provide resources in a short timeframe
- “buying the base and renting the peak ”
- Full geographic reach needed.



Hybrid Cloud Use Cases

- Best Cloud Allocation
- Lifecycle-Based Deployment
- Disaster Recovery
- Cloud bursting

security, latency, cost, and application complexity.

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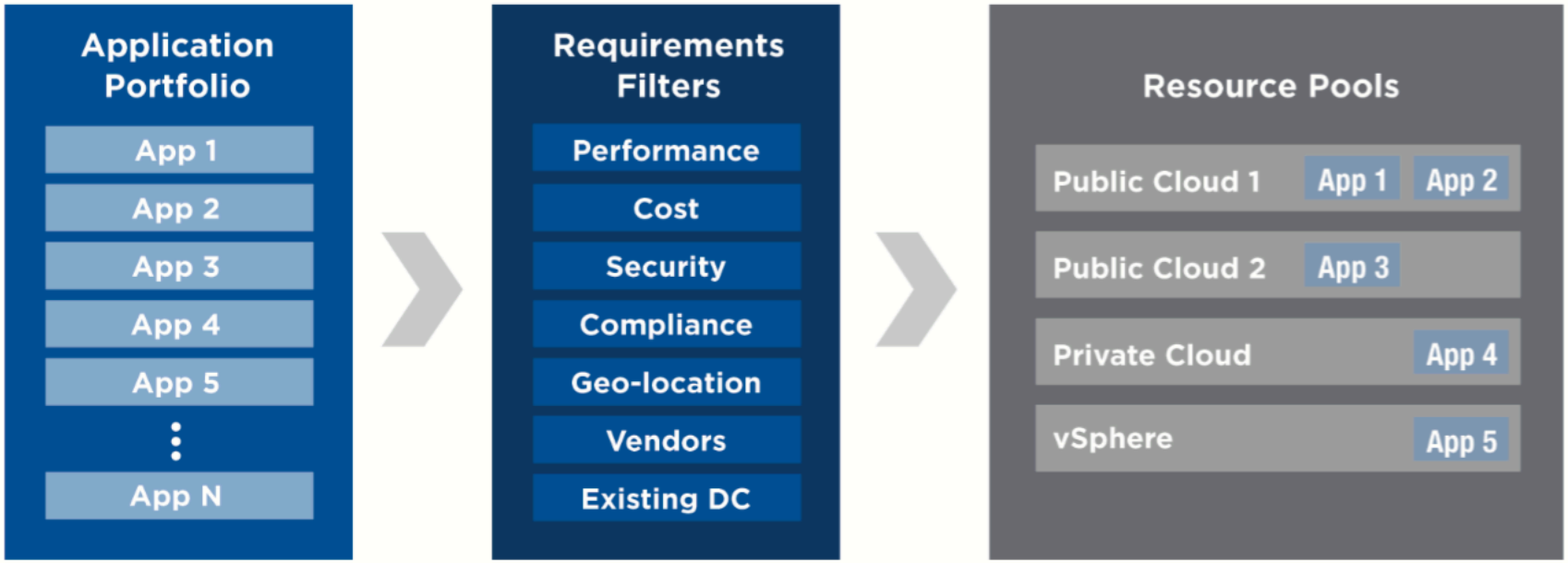
Best Cloud Allocation

- It involves selecting the best cloud for deploying each application.
- The entire application runs in that selected private or public cloud.

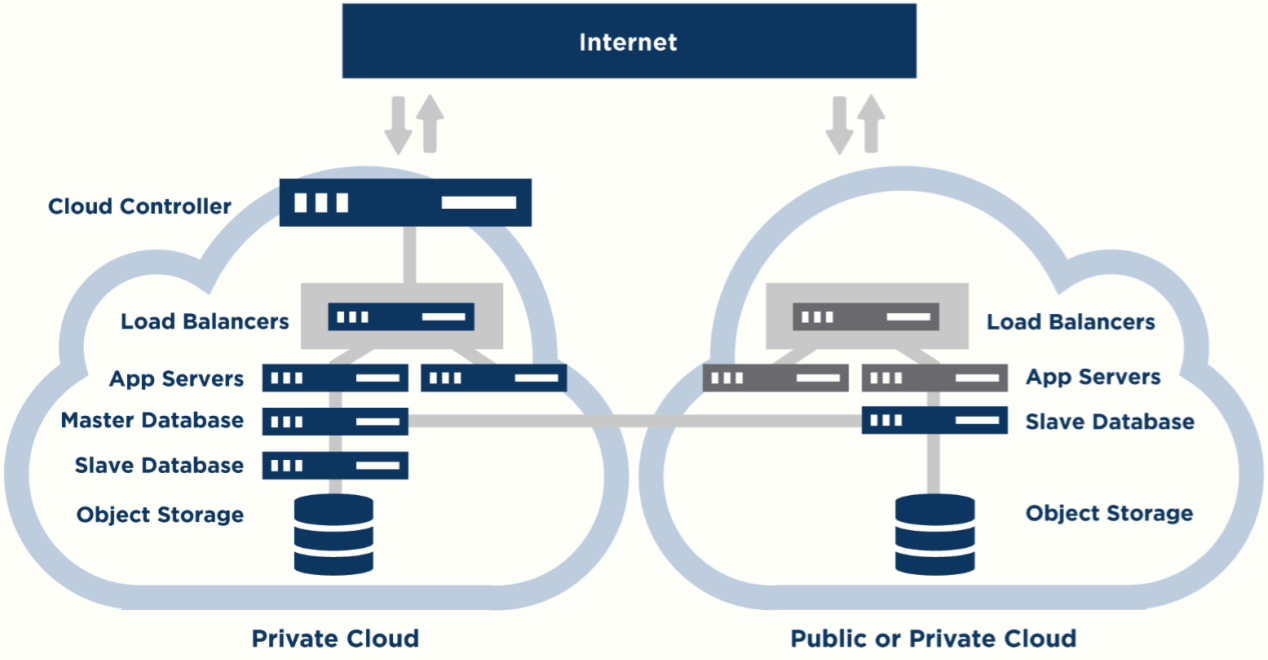


Lifecycle-Based Deployment

- Dev/Test in Public Cloud, Production in Private Cloud
- Dev/Test in Private Cloud, Production in Public Cloud
- New Apps in Public Cloud, Steady-State Apps in Private Cloud

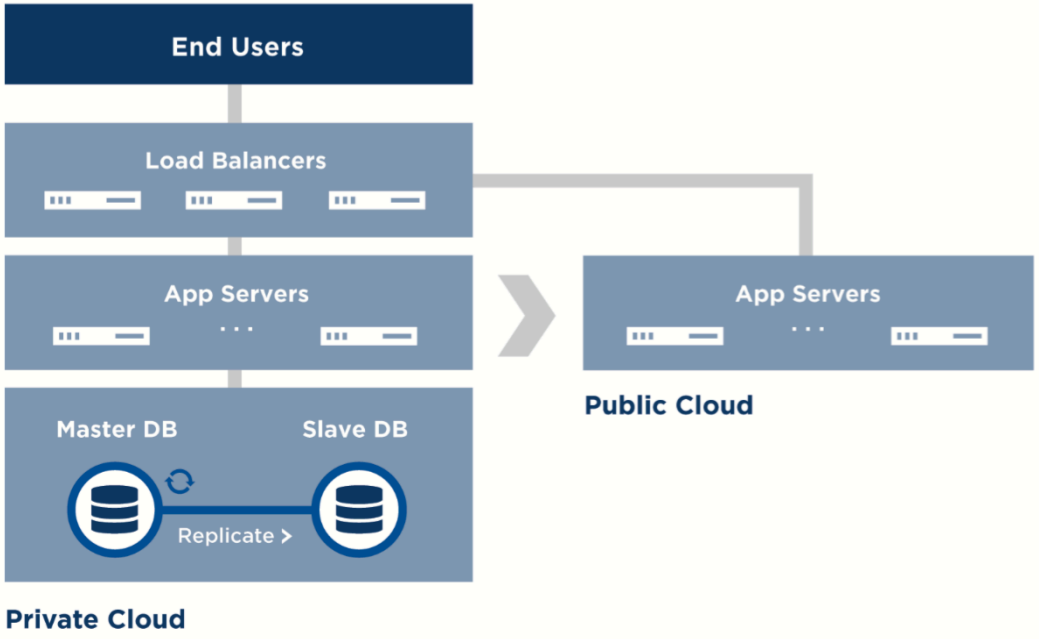
Disaster Recovery

- Using public cloud for disaster recovery avoid the cost of provisioning duplicate infrastructure that is rarely used.
- Greatly reducing the time required to bring the entire configuration to an operational state.



Cloud bursting

- Direct connection between cloud providers
  - AWS Direct Connect
  - Aliyun Express Connect
- Automation capabilities to handle auto-scaling



Challenges

- **Access Control**: how to handle different credentials with security manner?
- **Multi-Cloud Management**: how to manage clouds with a single pane?
- **Multi-Cloud Orchestration**: how to orchestrate applications among multi-cloud environment?
- **Audit & Compliance**: how to collect audit data and comply with regulations?
- **Network Connectivity**: how to manage network configurations and maintain connectivity across clouds?

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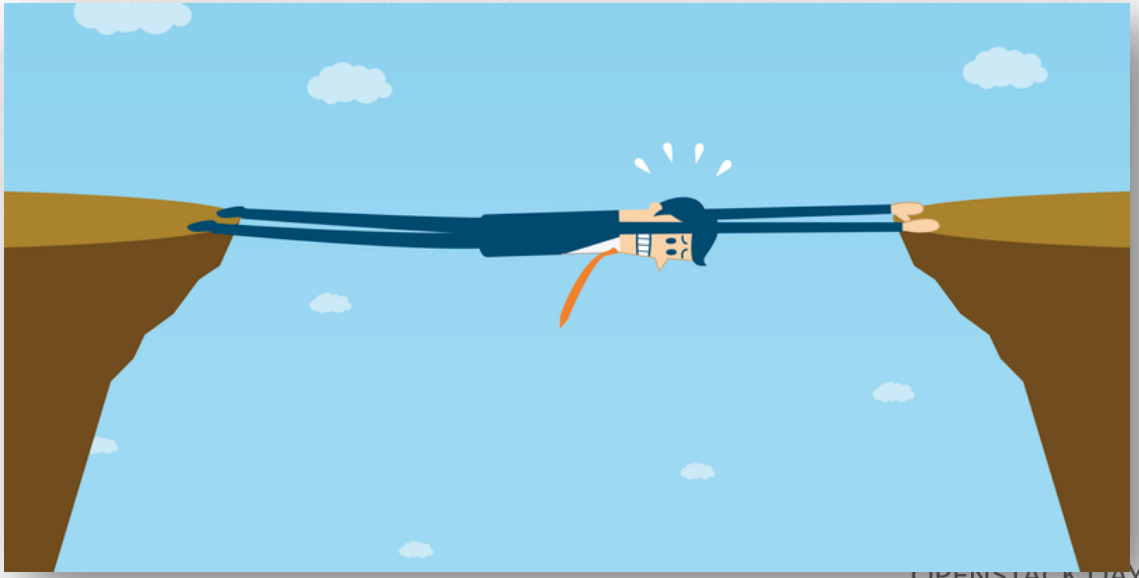
Bridging Gaps

Challenges	OpenStack Solutions
Access Control	Federated Identity
Multi-Cloud Management	*tricircle*
Multi-Cloud Orchestration	heat-multicloud
Audit & Compliance	✗
Network Connectivity	✗



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Federated Identity(1)

- Juno implemented specs:
  - Keystone to Keystone federation
  - Standardizing the federation process
  - Audit Support for Keystone Federation
- Kilo implemented specs:
  - Web Single Sign On Portal
  - Rescoping Spec - From Unscoped to Scoped
  - OpenID Connect federation
  - Enhance Federation mapping algorithms
  - Federated Service Providers in Keystone
  - Explicitly Unscoped Tokens
  - Direct users mapping for federated authentication
  - Scope federation tokens with token authentication method
  - IdP ID registration and validation
  - IETF ABFAB federation
- Liberty implemented specs:
  - New attributes for SAML Assertion generated by keystone IdP
  - Identity Provider Specific WebSSO

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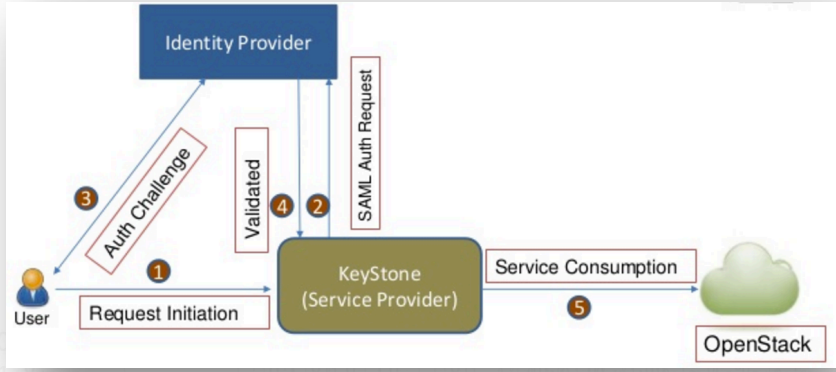
Federated Identity(2)

- Service Provider (SP)
- Identity Provider (IdP)
- SAML assertion



Federated Identity using Keystone

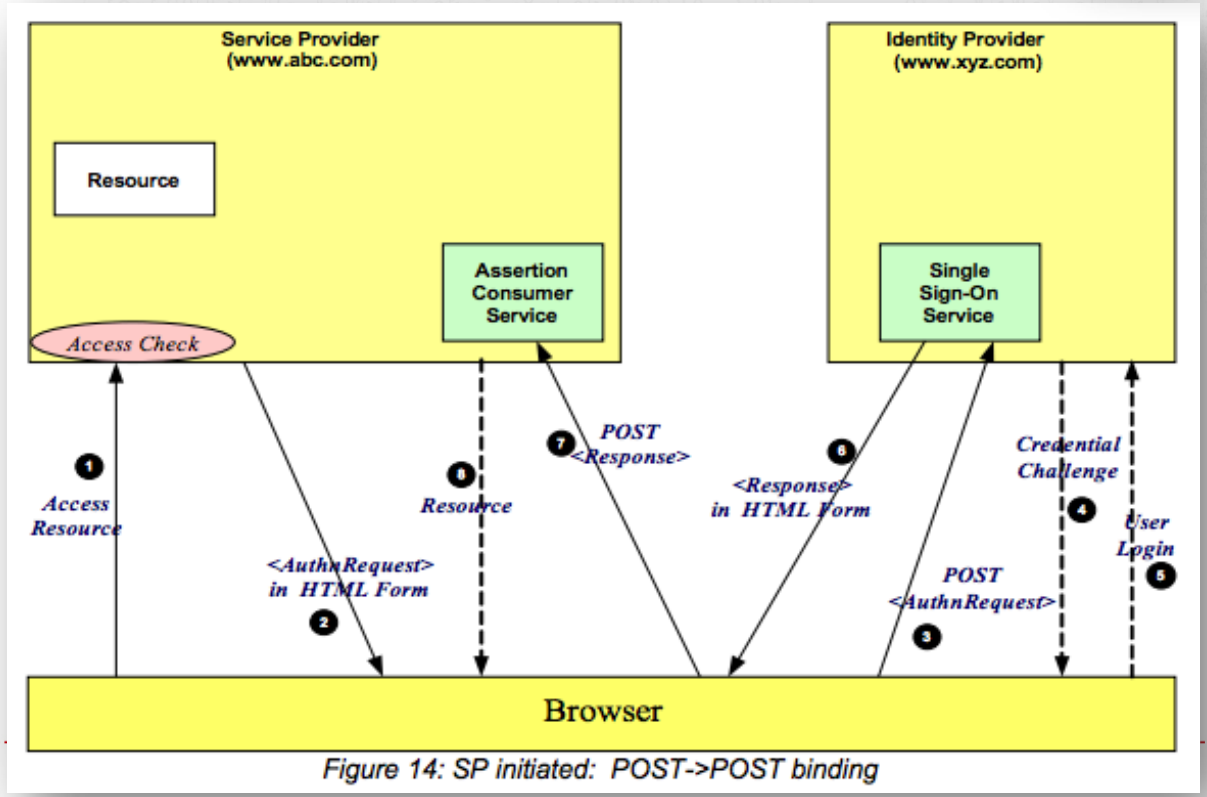
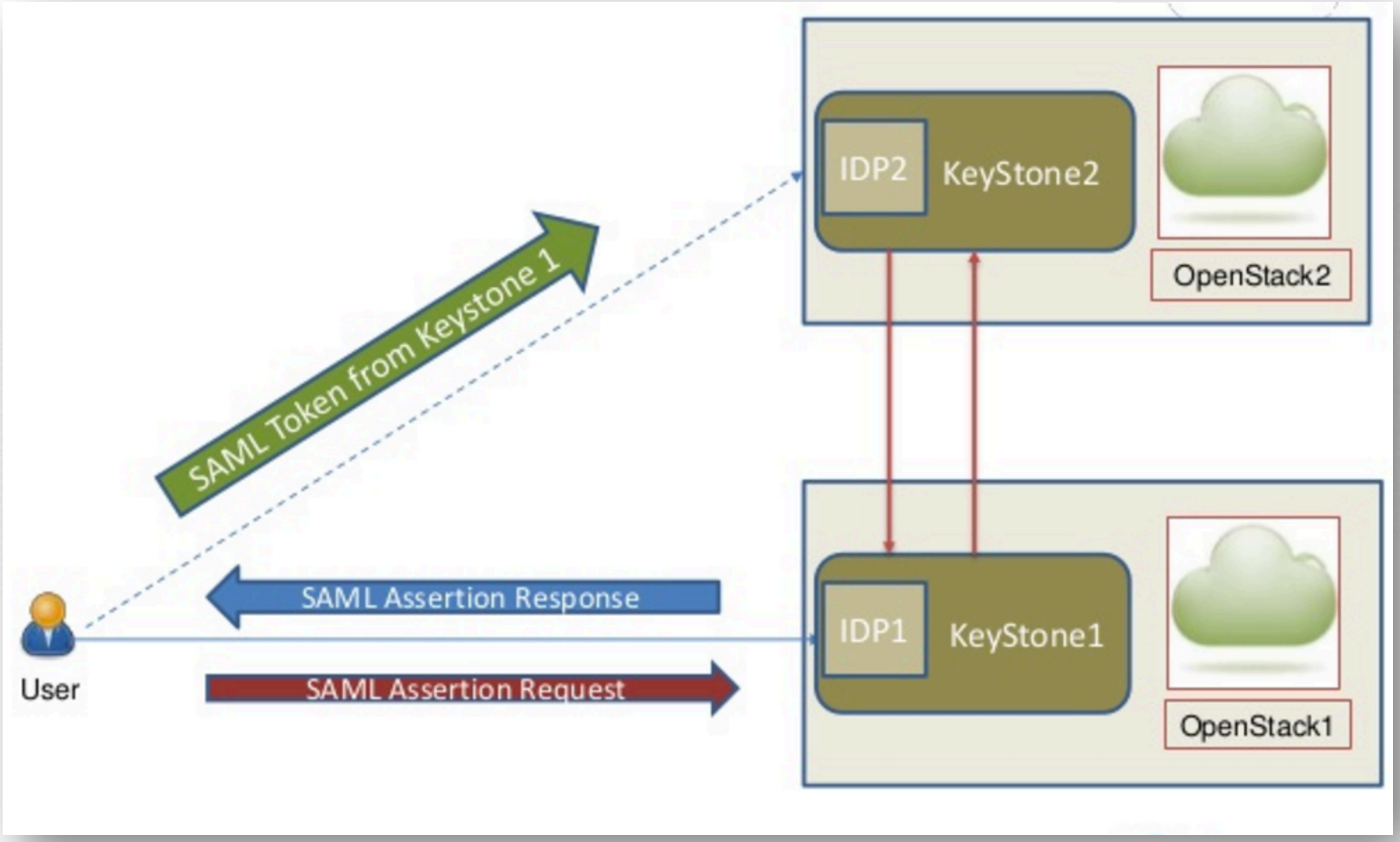


Figure 14: SP initiated: POST->POST binding

Federated Identity(3)



Keystone to Keystone Federation

Heat-Multicloud(1)

- Havana implemented
  - https://blueprints.launchpad.net/heat/+spec/heat-standalone
  - https://blueprints.launchpad.net/heat/+spec/heat-multicloud
- Kilo implemented
  - https://blueprints.launchpad.net/heat/+spec/multi-region-support
  - Multi-region scenario test
- Backlog
  - https://blueprints.launchpad.net/heat/+spec/multi-cloud-federation

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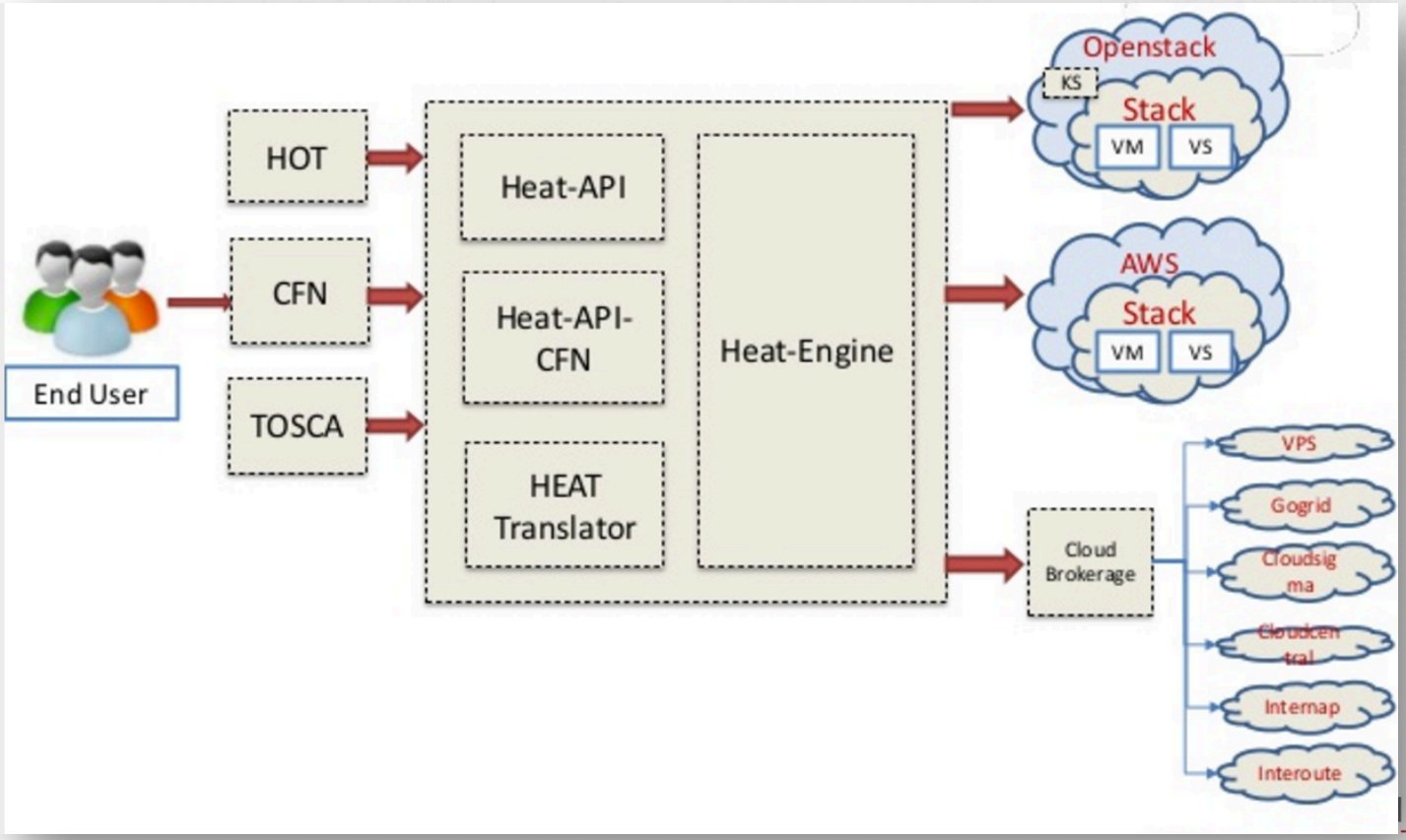
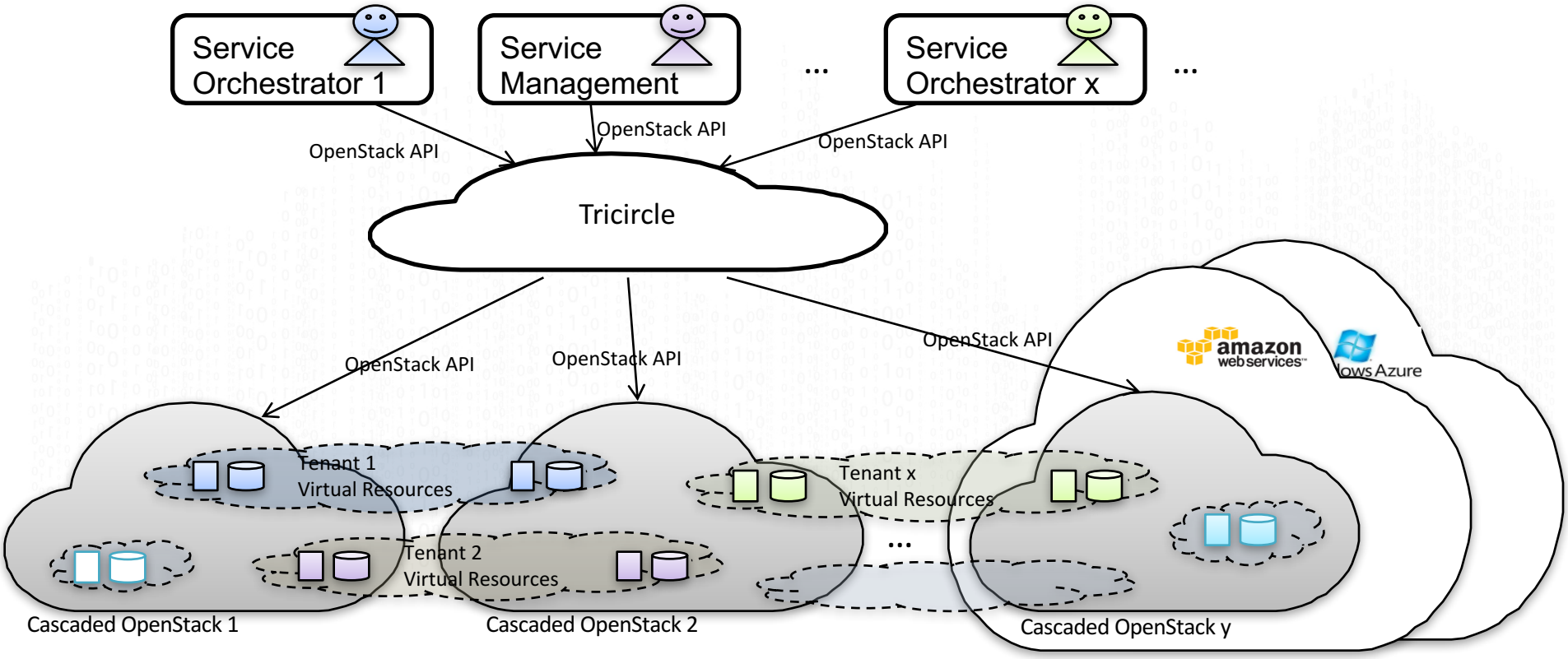
Heat-Multicloud(2)

- Heat Resource Plugin Structure
- Standalone Heat Deployment

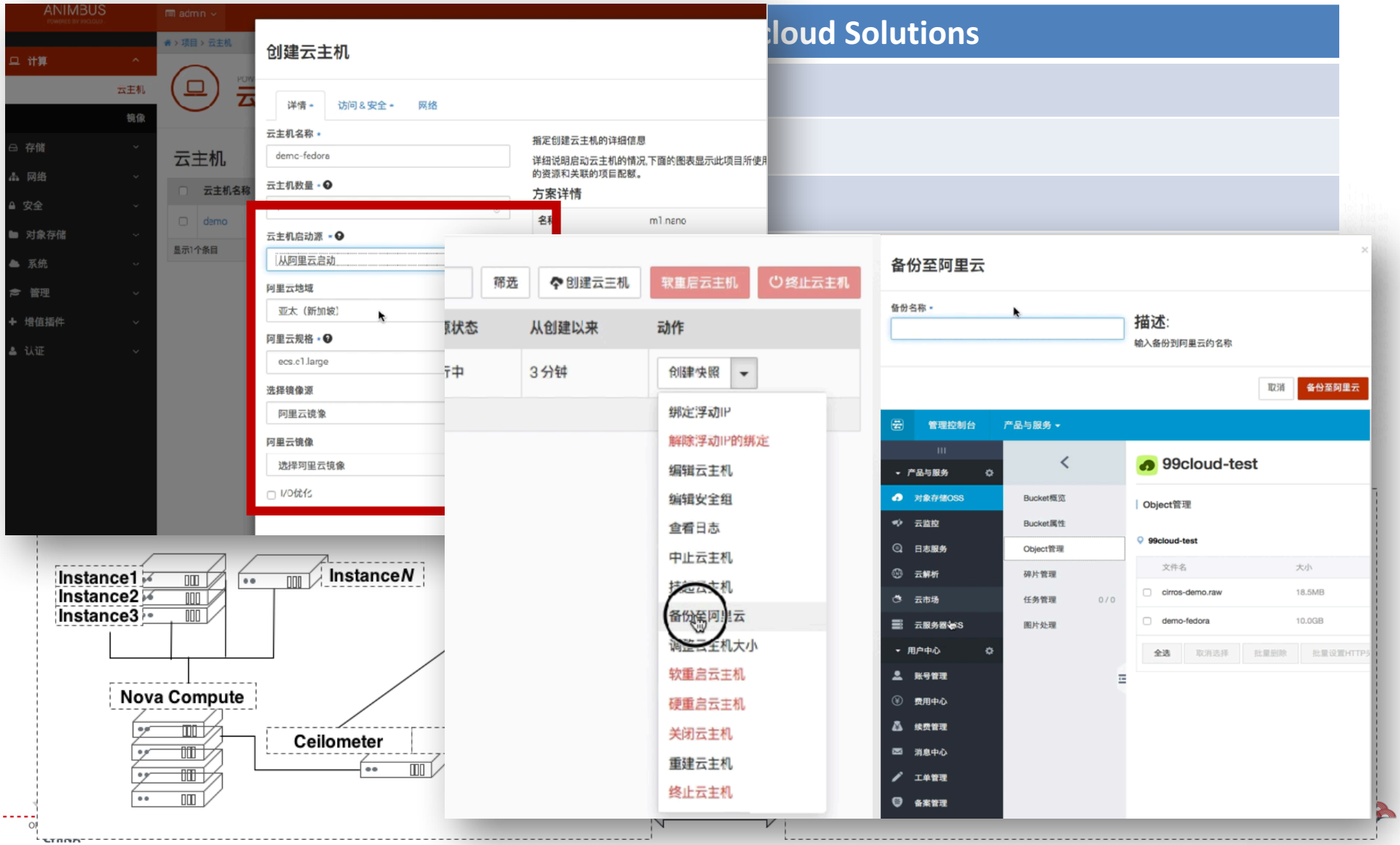


Tricircle



Cloud over clouds by OpenStack cascading: the cascaded OpenStack instance even can be running inside Amazon AWS or Windows Azure, and then being integrated into a cloud through the cascading OpenStack. This is cloud over clouds.

99cloud hybrid cloud solution



Summary

- The road to hybrid cloud with OpenStack is rough and steep.
- OpenStack itself lacks the capabilities to meet hybrid cloud scenarios.
- The 3rd platform can centrally leverage OpenStack APIs to implement hybrid cloud.

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Thanks

Reference

- http://www.rightscale.com/lp/2016-state-of-the-cloud-report
- https://www.emc.com/microsites/cio/articles/idg-research-study-hybrid-cloud/index.htm
- https://aws.amazon.com/directconnect/
- http://docs.openstack.org/developer/heat/getting_started/standalone.html