OpenStack – Swift

SophiaConf
2013

Vincent Outters
Senior Architect
Leader of IBM Cloud Center for Industries

outters@fr.ibm.com

Mohamed Chabani
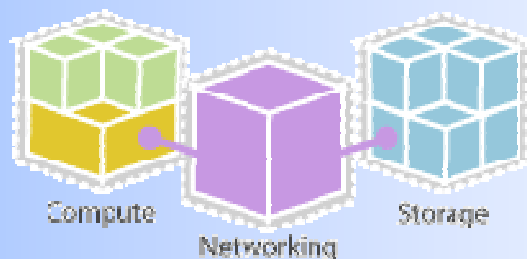Junior Developer

chabani.m@fr.ibm.com

Cloud Center for Industries
Business Solution Center
La Gaude

OpenStack – Projects

OpenStack's mission is to provide ubiquitous, free, open-source software for powering public and private clouds

Integrated Projects (Havana release)

- Compute (nova)
- Block Storage service (cinder)
- Image Service (glance)

- Identity (keystone)
- Dashboard (horizon)

- Virtual Network Service (quantum -> neutron)

- Object Storage (swift): https://launchpad.net/swift

- Monitoring, metering,… (ceilometer)
- Orchestration (heat)

SophiaConf
2013

Cloud Center for Industries
Business Solution Center
La Gaude

© 2013 IBM Corporation

OpenStack & IBM

OpenStack's mission is to provide ubiquitous, free, open-source software for powering public and private clouds

IBM Common
Cloud Stack →

products, services

IBM contributors to
Openstack

Integrated Projects (Havana release)

- Compute (nova)
- Block Storage service (cinder)
- Image Service (glance)

- Identity (keystone)
- Dashboard (horizon)

- Virtual Network Service (quantum -> neutron)

- Object Storage (swift): https://launchpad.net/swift

- Monitoring, metering,… (ceilometer)
- Orchestration (heat)

SophiaConf
2013

Cloud Center for Industries
Business Solution Center
La Gaude

© 2013 IBM Corporation

OpenStack - SWIFT

Object storage - What for ?

and price / Terabyte

versus SAN, NAS

- Custom file-sharing applications
- Document management

- Medical imaging

- Scientific data
- Data analytics

- Storage infrastructure-as-a-service
- Back-up, archive, virtual images
- …

OpenStack - SWIFT

Object storage - What for ?

IBM

EU projects,
Customer projects

and products, services

- Custom file-sharing applications
- Document management

- Medical imaging

- Scientific data
- Data analytics

- Storage infrastructure-as-a-service
- Back-up, archive, virtual images
- …

Cloud Center for Industries
Business Solution Center
La Gaude

© 2013 IBM Corporation

OpenStack - SWIFT

Architecture overview

- Proxy server: gatekeeper
  Receives requests through API and routes them to appropriate entities
  Handles failures of entities by rerouting requests to failover entities

- Storage nodes
  Provide the on-disk storage for the cluster (Account, Container, and Object services)

  All are replicated to multiple availability zones within swift cluster
  – Replication is typically 3-way

Cloud Center for Industries
Business Solution Center
La Gaude
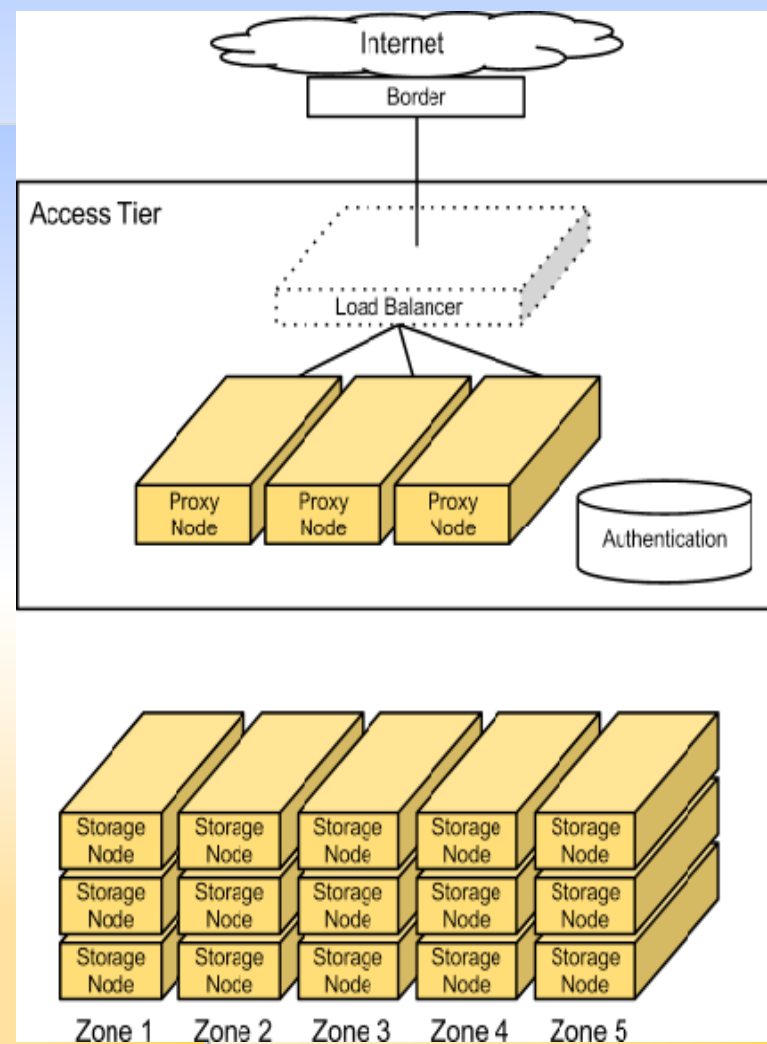
OpenStack - SWIFT

Characteristics

- All objects being stored have a **URL** (4 parts)

    Base/Account/Container/Object

    Objects include their own **metadata**

- **Replication** of objects across zones

- Interaction through a **REST API** (Get/Put/Delete + Post) (through proxy server)

- **Scalability** through addition of new nodes
- Failing nodes and disks can replaced with **no downtime**

- From commodity hardware to higher end

Cloud Center for Industries
Business Solution Center
La Gaude

OpenStack - SWIFT

Starting experimentation in our Center

- Initial choices:

  - Infrastructure to be delivered through IBM IaaS ('public cloud'):
    IBM SmartCloud Enterprise.

  - Start with SAIO (**Swift All In One**)
    In an Ubuntu based VM, emulation of
    a four node Swift cluster
    (with proxy and authentication (TempAuth))

  - Swift base client (CLI)

Cloud Center for Industries
Business Solution Center
La Gaude

Experimentation environment
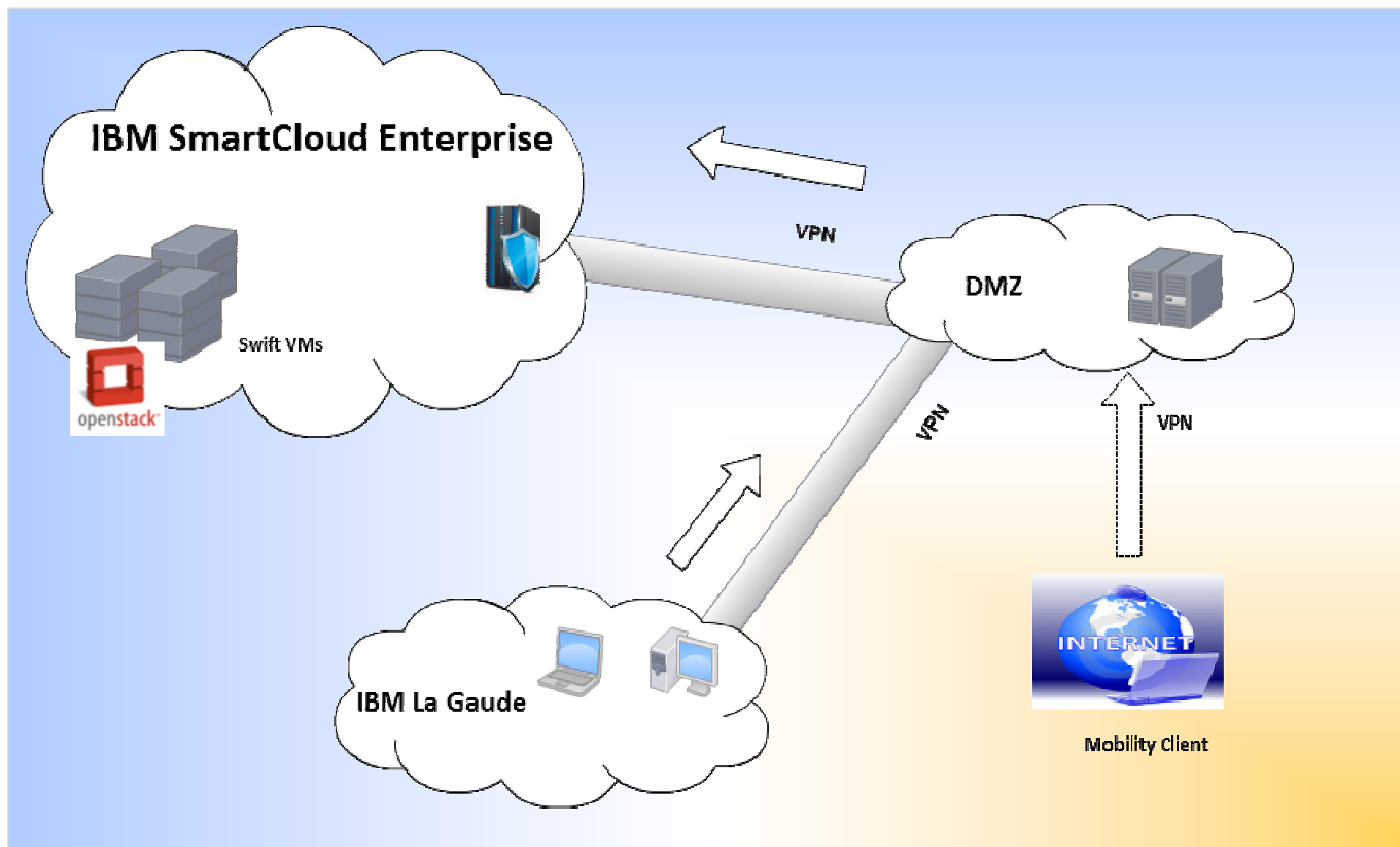
OpenStack - SWIFT

Feedback

- Went well !
  Good way of starting.

- Skills needed
  Linux admin. System

- Specifics with VMs on SmartCloud Enterprise

  Need to add extra storage to allow for an
  XFS partition (for small VMs)

Cloud Center for Industries
Business Solution Center
La Gaude

OpenStack - SWIFT

Next steps of experimentation in our Center

- Deploy Swift on SmartCloud Enterprise with integration with Keystone
  (instead of base TempAuth)

- Experiment Cyberduck (open source storage browser): (upload/download objects)

- Functional and integration tests
  - e.g. Hadoop integration
- Validate recovery procedures

Cloud Center for Industries
Business Solution Center
La Gaude

OpenStack - SWIFT

Initial feedback

- Community is active and ready to help

- Documentation, documentation, documentation !

  – Installation procedures.

  – Services architecture

  – Data flows, internal APIs

Cloud Center for Industries
Business Solution Center
La Gaude

IBM

SophiaConf 2013

Merci.

Cloud Center for Industries
Business Solution Center
La Gaude

OpenStack - SWIFT

For your information

–   Python-SwiftClient installation
    Need to install pbr package
        See https://support.rc.nectar.org.au/technical_guides/interfaces/python-swiftclient.html

–   account, container and object services
    Need to get them from Ubuntu archive
        apt-get install swift-account, swift-container, swift-object

    Scripts
      Not described here
          http://docs.openstack.org/grizzly/openstack-compute/install/apt/content/ch_installing-openstack-object-storage.html
      Could be found here
          http://docs.openstack.org/developer/swift/howto_installmultinode.html#

–   Start of proxy server
    Line had to be commented in proxy-server.conf
        delay_auth_decision = true

–   Documentation
     swift-account-updater versus swift-account reaper service
     proxy-server   versus swift-proxy service

–   Integration with Keystone
     Update Keystone.conf for logs

OpenStack - SWIFT

References

- **Documentations**

  http://docs.openstack.org/grizzly/openstack-compute/install/apt/content/index.html
  http://docs.openstack.org/developer/swift/howto_installmultinode.html#
  http://docs.openstack.org/developer/swift/

- **Documentation for SAIO**
  http://docs.openstack.org/developer/swift/development_saio.html

- **Developer community**
  http://irc.lc/freenode/openstack/t4nk@@@

- **Mailing list of contributors**
  openstack@lists.launchpad.net

- **Swift forum**
  https://answers.launchpad.net/swift

- **Openstack forum**
  https://ask.openstack.org/questions/

- **Devstack, a documented shell script to build complete OpenStack dev environments**
  http://devstack.org/

- **Swiftstack, a commercial package**
  http://swiftstack.com/openstack-swift/architecture/index.html#summary-_why_swift

Cloud Center for Industries
Business Solution Center
La Gaude

© 2013 IBM Corporation