Case Study on Enterprise Private Cloud

A TCS Case Study

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Agenda

• **Tata Consultancy Services**
  • Company Overview
  • Private Cloud Challenges
  • Present infrastructure
  • TCS Requirements

• **SUSE Advantage**

• **Q&A**
Private Cloud Challenges for an CSI
Challenges faced as SI

Faster response to:
- Customer on boarding
- Provisioning
- Metrics / Billing / Chargeback
- Customizations

Challenges
- MSSP (Security, Privacy)
- Hybrid Cloud Management Platform
- Next generation features – NFV, IoT etc
- Migration of workloads into Cloud
- Time to setup infrastructure
- Elasticity and management of infrastructure
Existing Infrastructure

Custom Cloud infrastructure

- Provides emulated IaaS
- Less automation
- Higher turnaround time
- No PaaS and DBaaS
- No FWaaS and LBaaS
- No FileShare-As-A-Service (FSaaS)
- No Big Data-As-A-Service (BDaaS)
- No IPAM Solution
- No VPNaaS
- No Billing and Chargeback
Tata Consultancy Services

Requirements

Industry standard best practice on automation and orchestration

Seamless integration with infrastructure devices and applications

Faster resolution with contextual, dynamic knowledge base

Rapid onboarding with fewer resources
SUSE OpenStack Cloud - Introduction
SUSE OpenStack Cloud Overview

Best Private Cloud for Enterprise Business

- Pain free cloud experience
- Business ready, solid & reliable
- Best value investment protection

Fast & Easy Deployment
High Availability Built In
No vendor lock-in BYO Hypervisor

Outstanding Enterprise Open Source Heritage
Engineering Excellence Industry-Leading Support

Best Software defined Solution
"OpenStack is…consistently recognized as overly complex to configure, deploy and upgrade."

451 Research Feb 2015

SUSE OpenStack Cloud gives you:
- A pre-built solution you can start driving now
- Quality, reliability and performance
- Top class service, maintenance & support
- Excellent value
SUSE OpenStack Cloud

Key Differentiators

• Fastest to deploy and easiest to manage
• Enhanced and elegant HA
• Bring Your Own Hypervisor (widest hypervisor support available)
• Broadest interoperability
• Business oriented release cycle and extended support
• Strong customer focus
• Open source pioneer and heritage
• Engineering excellence and Enterprise focus
• World class support for the entire solution stack
SUSE OpenStack Cloud Architecture

Foundation for a Software Defined/Driven Data Center

Resource Orchestration

Virtual Systems
- KVM
- Xen

Operating System: Linux
- SUSE

Physical Devices
- Servers
- Storage
- Network

Platform as a Service

Big Data

Infrastructure as a Service

Containers

Public Cloud
SUSE OpenStack Cloud - Advantage
Bring Your Own Hypervisor

Investment Protection and Value

Deployment UI

Admin Server
- SUSE Linux
- Chef Server
- Crowbar
- Software mirror
- DHCP/TFTP

Control Node
- Database
- Message queue
- Identity
- Image store
- Cinder
- Neutron
- Dashboard
- Scheduler
- Other

Cloud UI

Hyper-V
- OpenStack compute

SUSE Linux

KVM/XEN/Docker
- OpenStack compute

IBM System Z
- OpenStack compute

z/VM
- OpenStack compute

Vmware Proxy
- OpenStack compute +
Automatic High Availability Deployment

Because Downtime is Not an Option

HA Proxy

Node 1
Node 2
Node 3

PACEMAKER REMOTE

SUSE Linux
KVM or Xen
OpenStack compute
PACEMAKER REMOTE

Keep my workload running

Keep my cloud running
Enterprise Technology Stack – Private Cloud

**SUSE OpenStack**
- SUSE Linux
  - Database
  - Message Queue
  - Identity
  - Image store
  - Cinder
  - Neutron
  - Horizon
  - Nova
  - Manila
  - Ceilometer
  - Trove
  - Sahara

**Enterprise Network**
- Cisco Nexus / ACI, Juniper Contrail
- Midokura, PLUMgrid, Nuage Networks

**Load Balancer (LBaaS)**
- F5, Citrix NetScaler

**Firewall (FWaaS)**
- Brocade vRouter, Cisco CSR, Check Point vSec

**VPN (VPNaaS)**
- Brocade vRouter, Cisco CSR

**DNS / DHCP / IPAM**
- Infoblox

**Backup / Disaster Recovery**

**Directory Service**
- LDAP, Active Directory, RADIUS

**Enterprise Storage**
- Hitachi, EMC, HP 3PAR, NetApp etc

**Bare Metal (Ironic)**
- Hitachi LPAR, HPE, Cisco, Dell etc

**Hypervisors / Containers**
- KVM, VMware, Docker

**File Share (FSaaS)**
- Hitachi HNAS, NetApp

**Database (DBaaS)**
- Tesora (Oracle, MongoDB, MariaDB)

**Big Data (BDaaS)**
- CDH, HDP, MapR, Apache Hadoop

**Monitoring**
- Zenoss, Zabbix, Cloud Monitoring Manager

**Enterprise Technology Stack – Private Cloud**

**Billing Solution**
- Talligent, Cloud Cruizer

**Network**
- Cisco Nexus / ACI, Juniper Contrail
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Enterprise Technology Stack – Hybrid Cloud

Cloud Management Platform
Scalr / Open Service Catalog Manager / RightScale

End Users

Cloud APIs

SUSE OpenStack Cloud

Public Cloud

Enterprise Network
- Cisco Nexus / ACI, Juniper Central
- Molekura, FULMgrid, Nuage Networks

Firewall (FWaaS)
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VPN (VPNaas)
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- Talgent, Cloud Cruiser

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Public Cloud

End Users
TCS Cloud – powered by SUSE OpenStack Cloud
Value to TCS with SUSE OpenStack Cloud

**Automate**
- Allocation of Compute Resources
- Creation of Tenant Networks (both Overlay and Underlay)
- Storage Allocation / De-allocation
- Deployment of Service Stacks
- Deployment of Firewall Policy
- Create and Deploy Load balancer Policy

**Protect Investments**
- Align SUSE OpenStack Cloud to existing infrastructure
- Protects existing virtualization investments
- Offer customers multiple price points with choice of hypervisor
- Target broader set of customers with support for Xen, Hyper-V, VMWare, z/VM and KVM
- Offer Container as an option for customers with Support for Docker

**Always Available**
- Enterprise ready OpenStack solution with support for High Availability cluster
- Highly available Control infrastructure and compute infrastructure
- Live migration of KVM guest instances ensures availability at all time
## Value to TCS with SUSE OpenStack Cloud

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<thead>
<tr>
<th>Easy to setup</th>
<th>Broader Storage support</th>
<th>Broader Network support</th>
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</thead>
<tbody>
<tr>
<td>Fully automated installation framework</td>
<td>Leverage existing storage investments with support for (not limited to): EMC, NetApp, HP 3PAR, Hitachi, Fujitsu, IBM, VMWare DataStore</td>
<td>Leverage existing Network infrastructure with support for (not limited to): Cisco, VMWare NSX, Juniper, Brocade</td>
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<tr>
<td>Browser based installation framework</td>
<td>Integrated SES for massively scalable and reliable Block, Object, File / FileShare storage</td>
<td>Embrace SDN solutions through integrations with (not limited to): Cisco ACI, OVS / OVN, OPNFV, PLUMgrid, Midokura, Nuage Networks</td>
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<td>Tighter integration with Storage and Network drivers/plugins</td>
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<tr>
<td>Power up and PXE boot to add newer nodes</td>
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<tr>
<td>Manual setup option is available</td>
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Value to TCS with SUSE OpenStack Cloud

Integrated solution

• Software Defined Converged Storage
  - Block, Object and File
• Image Build Tool
  - Easier to build and upload image templates
• Patch and Configuration Management Tool
  - Non disruptive upgrades

Partner solutions

• Rich and open API
• Protect IT investments by integrating existing solutions with SUSE OpenStack cloud
• Build Hybrid Cloud solution by integrating with a Cloud Management Platform
SUSE OpenStack powered TCS Cloud - Architecture
SUSE powered TCS Cloud Architecture

Stretched DC Architecture

- Multi-Region setup
- Master Region hosts Keystone and Horizon
- Geographical Location == Region
Staging Setup - Tasks

Accomplished

• 1 Admin Node
• 2 Node Controller with DRBD and SBD
• 2 KVM Compute Nodes with remote-pacemaker
• SDN integration
• Tenant network creation
• Policy Contract creation and verification
• VXLAN and VLAN support verification
• Volume attachment/detachment
• NAS file shares
• Docker integration
• Load Balancer as a service using Proprietary Load Balancer
• Firewall integration using default Security Policies

Work-in-progress

• Non-KVM instance placement to specific non-KVM hypervisor hosts/cluster
• Proactive capacity reporting of various storage backends
Questions & Discussion