Welcome to
SUSE Expert Days 2017
Software Defined Infrastructure
Optimize the Data Center with a Software-defined Infrastructure
Keys Elements of a Successful Software-defined Infrastructure

- Automation
- Modular
- Orchestration
- Management
- Self-Service
- Self-Healing
Transform Your Data Center with SUSE Software-defined Infrastructure Solutions

Reducing costs
Increase IT agility and efficiency
Ensure business continuity
# SUSE Software-Defined Infrastructure

An Open, Flexible Infrastructure Approach

## Application Delivery

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<td>Custom Micro Service Applications</td>
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<td>Containers</td>
<td>SUSE CaaS Platform</td>
<td>SUSE Manager, openATTIC</td>
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<td>Platform as a Service</td>
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<td>Software Defined Everything</td>
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<td>Heat, Kubernetes</td>
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### Software Defined Everything

- **Virtualization**: KVM, Xen, VMware, Hyper-V, z/VM
- **Storage**: SUSE Enterprise Storage
- **Networking**: SDN and NFV

### Operating System

- SUSE Linux Enterprise Server

### Physical Infrastructure:

- Server, Switches, Storage
SUSE Enterprise Storage
Software-defined Storage
Challenges of Traditional Enterprise Storage

- Expensive
- Difficult to Scale and Manage Data Growth
- Not easily Extended to the Software-defined Data Center
SUSE Enterprise Storage
Enterprise Class Storage Using Commodity Servers and Disk Drives

Latest hardware

Hardware flexibility

Reduce Capital Expense
SUSE Enterprise Storage
Unlimited Scalability with Self-managing Technology

Increase capacity and performance by simply adding new storage or storage nodes to the cluster.
SUSE Enterprise Storage
Enable Transformation

Mode 1 – Gartner for Traditional

Legacy Data Center
• Network, compute and storage silos
• Traditional protocols – Fibre Channel, iSCSI, CIFS/SMB, NFS

Process Driven
• Slow to respond

This is where you probably are today

Support today’s investment

Mode 2 – Gartner for Software Defined

Software-defined Data Center
• Software-defined everything

Agile Infrastructure
• Supporting a DevOps model
• Business driven

This is where you need to get to

Adapt to the future
Use Cases

**Bulk Storage**
- SharePoint data
- Medical records
- Medical images
  - X-rays
  - MRIs
  - CAT scans
- Financial records

**Video Surveillance**
- Security surveillance
- Red light / traffic cameras
- License plate readers
- Body cameras for law enforcement
- Military/government visual reconnaissance

**Data Archive**
Long-term storage and back up:
- HPC
- Log retention
- Tax documents
- Revenue reports

**Virtual Machine Storage**
Low and mid i/o performance for major hypervisor platforms
- kvm – native RBD
- Hyper-V – iSCSI
- VMware - iSCSI
How does SUSE Enterprise Storage fit? It Replaces Dedupe appliances and it augments tape devices by keeping more data online cost effectively.
HPC Storage Archive Use Case

Archive Data not Needed Immediately to Secondary Tier

- Lower TCO
- Easy to Grow
- Reduce Footprint
- Never Migrate
SUSE Enterprise Storage 4
Major Features

• Unified block, object and files with production ready CephFS filesystem
• Expanded hardware-platform choice with support for 64 bit ARM
• Asynchronous replication for block storage and multisite object replication
• Enhanced ease of management with SUSE openATTIC
• Enhanced cluster orchestration using Salt
• Early access to NFS Ganesha support and NFS access to S3 buckets
November 8, 2016

SUSE Poised for Greater Growth in Software-defined Storage Market by Acquiring openATTIC Storage Management Assets from it-novum

http://tinyurl.com/hdz8ywu
SUSE Enterprise Storage 4 – openAttic
SUSE openATTIC advanced graphical user interface
SUSE Enterprise Storage Demo
SUSE Enterprise Storage 4
Major Feature Summary

- Object Storage
- Block Storage
- File System

- Industry Leading Storage Functionality
- Simple Install, Management and Monitoring
- Heterogeneous OS Access

- Highly Redundant Data Cluster
- Unlimited Scalability
- Policy Based Data Placement
- Stretch Cluster Replication
- Security
  - Data Encrypted in Flight
  - Data Encrypted at Rest
  - Data Compression
  - Data Deduplication
  - Async Remote Data Replication
SUSE Enterprise Storage Fit
An Actual Customer

Customer Situation
• Hospital chain with backup software
• Customer had 240TB of raw data and needed a scalable disk target for backups (instead of a disk library)
• Chose SUSE Enterprise Storage with x86-64 servers and connected the backup software with RBD

Benefits of Object Storage
• Lower acquisition and management cost (compared to data domain or any other dedupe device)
• No more migrations
Now is the Time!
Make Your OpenStack Move
SUSE OpenStack Cloud
Why Aren’t You Running OpenStack?
OpenStack is Mainstream

- 81% Large companies planning to use OpenStack\(^1\)
- 65% OpenStack deployments in production\(^2\)
- 93% of companies see IaaS as the future of data center \(^1\)

33% More than Last Year
OpenStack Maturity and Momentum

71% OpenStack deployments in full production¹

3x Faster Containers being adopted on OpenStack²
Three Strategies for OpenStack Cloud Adoption
“Being a **flexible framework** to build on is the most important aspect of the OpenStack platform.

Being able to **support both traditional and cloud-native workloads** is very important. Large enterprises don't have the luxury of dropping their legacy applications and forklifting them into the microservices-type designs from day one.

The **benefits of the cloud** are too great to only allow new workloads onto the platform.”

Jonathan Bryce  
Executive Director  
OpenStack Foundation
SUSE OpenStack Cloud

Foundation for software-defined data centers.

- Fast & easy setup and management
- The best interoperability
- Non-disruptive upgrades
- The widest hypervisor support
- Leading support for the entire OpenStack cloud platform
- Rock-solid reliability
- Business oriented release cycle & longer support
SUSE OpenStack 7

Powered by OpenStack Newton and including new CaaS capabilities and high availability enhancements.

SUSE OpenStack Cloud 7 delivers timely access to the latest cloud technologies for rapid innovation, improved agility and the robust production-ready private cloud needed to meet today’s business challenges.

Press announcement: October 25, 2016 at OpenStack Summit, Barcelona; GA: February 2017
SWIFT
Object Storage

KEYSTONE
Identity

NEUTRON
Networking

NOVA
Compute

CINDER
Block Storage

GLANCE
Image Service
SUSE OpenStack Cloud 7
Project Coverage

Information is forward looking and subject to change at any time.
SUSE OpenStack Cloud 7
New or Expanded Services

- Magnum support for Docker orchestration
- Manila integration with CephFS
- z/VM control plane
- Self-service physical server deployment
- Cloud Foundry integration
- Service catalog
- Partner support
  - Plugin integration
  - Deployment integration

Information is forward looking and subject to change at any time.
SUSE OpenStack Cloud 7
Operational Enhancements

• Live (non-disruptive) upgrade
• Post-GA (subject to change)
• Multi-data center deployment
• Virtual machine HA
• Day 2 management
  – Network reconfiguration
  – Central logging and log visualization

Information is forward looking and subject to change at any time.
SUSE OpenStack Cloud 7
Install Framework Upgrades

- Increased scalability
- Configuration support:
  - Magnum and Kubernetes
  - Ironic
  - Sahara
  - Murano

Information is forward looking and subject to change at any time.
Hypervisor Choice and Support
Investment Protection and Enhanced 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

SUSE Linux

KVM/XEN/Docker
OpenStack compute

Hyper-V
OpenStack compute

IBM System Z
OpenStack compute

z/VM
OpenStack compute

Vmware Proxy
OpenStack compute +

Microsoft

z/VM
®
High Availability OpenStack Infrastructure
Because Downtime is Not an Option
Orchestration Enhances Business Value of Containers

Containerized Micro Server
- Zero downtime
- Highly available
- Easy to migrate across hosts

On-demand Self-services
- Agile delivery
- Continuous development

Continuous Integration
- App lifecycle pipeline development
- Test
- Production

Deployment
Networking
High Availability
Scaling
Monitoring
Agile Platform Ideal for Containers

Mini SUSE Linux Enterprise Server

Ideal for Bimodal

Designed for the Future
What is Kubernetes?

An open source platform for automating deployment, scaling, and operations of application containers across clusters of hosts, providing container-centric infrastructure.
Magnum Kubernetes Cluster

Internet User

OpenStack Neutron Load Balancer

Cube Master #n
- API Server
- Controller Manager
- Scheduler
- etcd

Cube Minion #n
- Kube-proxy
- Container Engine
  - Docker
  - Pod
    - Container 1
    - Container 2
- Kubelet

OpenStack User

Service

Pods

Internet User

OpenStack Neutron Load Balancer
SUSE OpenStack Cloud
Magnum Demo
What container and PaaS Tools are Used to Manage Applications?

Figure 5.3  n=118

Percentages are rounded to the nearest whole number; bar length shows fractions.

- Kubernetes: 42% (Production: 27%, Dev/QA: 8%, Proof of Concept: 7%)
- Cloud Foundry: 24% (Production: 16%, Dev/QA: 3%, Proof of Concept: 5%)
- OpenShift: 24% (Production: 10%, Dev/QA: 9%, Proof of Concept: 5%)
- Mesos: 19% (Production: 11%, Dev/QA: 6%, Proof of Concept: 2%)
- Cloudify: 9% (Production: 5%, Dev/QA: 2%, Proof of Concept: 2%)
- Docker Swarm: 7% (Production: 2%, Dev/QA: 4%, Proof of Concept: 2%)
- Other: 24% (Production: 18%, Dev/QA: 3%, Proof of Concept: 3%)

OpenStack public survey report October 2016
# SUSE Software-Defined Infrastructure

## An Open, Flexible Infrastructure Approach

### Management
- Operations, Monitor and Patch
  - SUSE Manager
  - openATTIC

### Cluster Deployment
- Crowbar
- Salt

### Orchestration
- Heat
- Kubernetes

### Application Delivery

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### Containers
- SUSE CaaS Platform

### Private Cloud / IaaS
- SUSE OpenStack Cloud

### Software Defined Everything

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### Public Cloud
- SUSE Cloud Service Provider Program
Coming Soon: SUSE Container as a Service Platform Powered by Kubernetes

Information is forward looking and subject to change at any time.
SUSE Container as a Service Platform

SUSE Linux Enterprise MicroOS

Kubernetes

docker Project

Information is forward-looking and subject to change at any time.
SUSE Container as a Service (CaaS)
Benefits of being Powered by Kubernetes

• **Portable**: public, private, hybrid and multi-cloud capable
• **Extensible**: modular, pluggable, hookable, composable
• **Self-Healing**: auto-placement, auto-restart, auto-replication, auto-scaling

**Why Should You Care?**
• Deploy your applications quickly and predictably
• Scale your applications on the fly
• Seamlessly roll out new features
• Optimize the use of your hardware by using only the resources you need

Information is forward looking and subject to change at any time.
SUSE Container as a Service Platform
Executive Summary

What?
• Based on SUSE Linux Enterprise MicroOS, Kubernetes and docker project
• Ready to run containers/containerized applications
• Easy to install and manage
• First version available on x86-64

When?
• First customer shipment: July 2017; Beta: March 2017

Why?
• Improve IT efficiency while optimizing the costs

Information is forward looking and subject to change at any time.
SUSE Container as a Service Platform
What is SUSE Linux Enterprise MicroOS?

SUSE Linux Enterprise MicroOS is a modern Linux operating system designed for containers and optimized for large deployments. It inherits the SUSE Linux Enterprise knowledge while redefining the operating system into a small, efficient and reliable distribution.
SUSE Container as a Service Platform

Scope

Key features via SUSE Linux Enterprise MicroOS

- Transactional updates
  - Atomic updates
  - Automatic updates (can be disabled)
  - Maintenance window (policy defined updates)
- Easy to use installer
- Scalability (from a few to 1000s of workers)

Key Kubernetes Features

- Admin dashboard
  - Easy to use UI
  - Deploy and manage cluster
- Private / public registry
- Rolling updates

Information is forward looking and subject to change at any time.
Coming Soon:
Platform as a Service
Powered by Cloud Foundry
SUSE Joins the PaaS Party!

SUSE acquires HPE OpenStack and Cloud Foundry assets
SUSE has become not only HPE’s Linux of choice, but it is now its chief cloud developer as well.

By Steven J. Vaughan-Nichols for Linux and Open Source | November 30, 2016 — 17:31 GMT (14:31 PST) | Topic: Cloud

SUSE buys HPE’s OpenStack and Cloud Foundry assets
Posted Nov 30, 2016 by Frederic Lardinois (@frderic)
Cloud Foundry Members

Platinum

Cisco
Dell EMC
IBM
Pivotal
SAP
SUSE
vmware

Gold

Accenture
Allstate
BNY Mellon
Capgemini
CenturyLink
GE Digital
Google
Huawei
NTT
SAS
Swisscom
Telstra

Silver

acetti
Altoros
Hauwei MoPaaS
Anymines
Apigee
AppDynamics
ARM
Atos
BIARCA
Bosch
Bloomberg
Citi
Newell
Dynamx
Dynatrace
ECS
Euleria
Fujitsu
Gemalto
Grape up
Hazelcast
Hexad
Hitachi
Honeywell
Hiroko
Mirantis
MIMACOM
Mirantis
Mondex
Mirosoft
Niant
RediLab
Redislabs
TIBCO
Toshiba
Volkswagen
What is Cloud Foundry?

Cloud Foundry is an open-source platform as a service (PaaS) that provides you with a choice of clouds, developer frameworks, and application services.
## Cloud Foundry Platform Overview

<table>
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<tr>
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<th><img src="node.png" alt="Logos" /> <img src="php.png" alt="Logos" /> <img src="java.png" alt="Logos" /></th>
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Application Delivery with Cloud Foundry
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