Agenda

The following information will be covered:

• The Public Cloud Market in 2016
• SUSE Solutions in the Cloud
• SUSE Global Alliance Partners
• Tools and Features for the Cloud
• Migration
• Demo
The Market
Forecast calls for increasing clouds….

If you’re not there yet, you will be.

“…worldwide spending on public cloud services will grow at a 19.4% compound annual growth rate (CAGR) – almost six times the rate of overall IT spending growth – from nearly $70 billion in 2015 to more than $141 billion in 2019.”

Growth of the Cloud

![Growth of the Cloud graph]

- Trad IT
- Prv Cloud
- Pub Cloud
IaaS Growth vs. SaaS/PaaS

Public cloud Infrastructure as a Service (IaaS) hardware and software spending from 2015 to 2026, by segment (in billion U.S. dollars)
Core Advantages and Benefits

- Trade CAPEX for OPEX
- Massive Economies of Scale
- Increase Speed and Agility
Who’s who in the cloud

Four cloud vendors dominate the market

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Share</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS</td>
<td>32%</td>
<td>63%</td>
</tr>
<tr>
<td>Microsoft Azure</td>
<td>10%</td>
<td>124%</td>
</tr>
<tr>
<td>IBM Softlayer</td>
<td>7%</td>
<td>57%</td>
</tr>
<tr>
<td>Google</td>
<td>5%</td>
<td>108%</td>
</tr>
</tbody>
</table>
Market Update

Microsoft’s Motivated

- 30% growth

Morgan Stanley predicts Microsoft cloud products will be 30% of revenue by 2018.

Amazon’s on Fire

- $7.88B

In 2015, Amazon Web Services (AWS) generated $7.88B in revenue with Q4 2015, up 69% over last year.

Worldwide Growth

- 20% CAGR
- WW

Worldwide spending on public cloud services will grow at a 19.4% compound annual growth rate (CAGR) from nearly $70B in 2015 to more than $141B in 2019.
Reality check: They actually use an average of 730 cloud services. That’s 15x more than IT departments assumed their companies use.

Let’s bring cloud usage out of the shadows.
Shadow IT

**Noun**

1. *When business units and departments in your organization purchase and consume cloud services without going through your IT department.*

Source: Cisco

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**An overview of bimodal IT**

**Fluid IT**
- Agile and fluid
- Measured by innovation, brand, profit
- Thinks continuous
- Thinks immediate

**Core IT**
- Reliable, compliant, secure
- Thinks price/performance
- Plan- and approvals-driven
- Long lifecycles

*Today’s IT organizations need to deliver new capabilities focused on speed and agility, as well as traditional IT functions.*

Source: HP
Open Source Solutions for Enterprise

Customer Benefits

- Increased Agility
- Reclaimed Budget
- Reduced Risk

Enterprise-quality Innovation and Service

Mission-critical Performance Made Affordable

Open, Flexible, Optimized for Mixed IT

Run Anywhere

(Private/Public Cloud, On-prem)

Open Source

Community

Results
Moving to the Cloud: Lots of Choices

- tools
- workload
- security
- containers
- support
- lifecycle
- portability
- management
SUSE Stands Out in the Public Cloud

- Certified applications
- Portability between data center and multiple clouds
- Multiple products and image types
- Enterprise supported
- Bring Your Own Subscription
- Cloud-specific features
11,000 + Certified Applications

SUSE on-premise certifications extend to the cloud

Most certified applications of any Linux provider

Run the same on-premise applications with confidence in private and public clouds

ISV tested and ISV supported on SUSE Linux Enterprise Server
Portability

Move your SUSE Linux Enterprise Server workload between on-premise and private and public clouds.

Supported on Amazon Web Services, Microsoft Azure, Google Cloud Platform, OpenStack and local/regional Cloud Service Providers.

Flexibility to run your workload where you want, when you want.
Bring Your Own Subscription

Easily migrate your existing subscriptions to select SUSE Certified Public Cloud Service Providers.

Transfer the benefits of your current subscription, including your level of SUSE support, to your workloads running in a public cloud.

Available for SUSE Linux Enterprise Server and SUSE Manager.
## Product Selection

<table>
<thead>
<tr>
<th>Product</th>
<th>On-Demand (hour/month)</th>
<th>Hosting (month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUSE Linux Enterprise Server</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server for SAP Applications</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Linux Enterprise High Availability</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server (unlimited virtual)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Linux Enterprise High Availability GEO</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Manager Server</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Manager Lifecycle Management</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Manager Proxy</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Manager Monitoring</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE OpenStack Cloud</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUSE Enterprise Storage</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
SUSE Linux Enterprise Server is backed by global support with 20+ years of Linux expertise

Available 24x7 support

Certified patches and updates

Quick turn on critical bug fixes and security patches when it matters most

Lifecycle policy that ensures timely publishing of images with known severe vulnerabilities
Finding SUSE in the Cloud

You can find SUSE images in the largest global cloud providers....

... and in more than 40 cloud and hosting providers worldwide.
Hyper-Scalable Solutions and the Perfect Platform for SAP Applications on – AWS the Leader in Public Cloud

- AWS and SUSE have teamed to offer SUSE Linux Enterprise Server on AWS for reliable, scalable, enterprise-class computing and services for cloud applications and business-critical workloads.
- Multiple consumption models are available to provide choice and flexibility in procurement (On-demand, BYOS, Reserved Instances)
- SUSE Linux Enterprise Server for SAP Applications on AWS is on-demand and the perfect platform for scalable SAP Applications
Scalable, Secure, Interoperable Linux on Microsoft Azure – the Public Cloud Poised for Hybrid Success

- SUSE and Microsoft’s decade of partnership has delivered joint solutions to thousands of customers
- A focus on interoperability and mixed IT environments
- SUSE and Microsoft deliver scalable solutions for enterprise-class hyper-scale compute and for hybrid cloud through Microsoft Azure Stack*

*Microsoft Azure Stack Planned GA in 2017
## AWS and Azure

<table>
<thead>
<tr>
<th>By The Hour</th>
<th>Amazon</th>
<th>Microsoft Azure</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLES</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>SLES Priority (Support from SUSE)</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>SLES HPC</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>SLES HPC Priority (Support from SUSE)</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>SLES for SAP</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

### Bring Your Own Subscription Images
- SLES, SUSE Manager
- SLES on Microsoft Azure Stack
SUSE on Amazon Web Services
Scalable Solutions for Enterprise Cloud
Partnership Milestones

2010
SUSE Linux Enterprise Available on AWS EC2

2013
SUSE Linux available via the AWS free tier

2014
SUSE is the first Enterprise Linux in the AWS GovCloud

2015
SUSE Manager available on AWS via bring-your-own-subscription program
SUSE Linux Enterprise Server for SAP Applications released on AWS

2016
SUSE Linux Enterprise Server for SAP Applications available on the AWS Marketplace with High Availability
On Demand Subscriptions
Optimized for Amazon Web Services

SUSE Linux Enterprise Server
11 SP4, 12 & 12 SP1

SUSE Linux Enterprise Server 12 SP1
for SAP Applications

On-demand on EC2 and AWS
Marketplace with seamless
integration to AWS cloud services

The Leading OS for SAP Applications
– now on the AWS Marketplace
Bring Your Own Subscription
Optimized for Amazon Web Services

SUSE Linux Enterprise Server 11 SP3 – 12 SP1

SUSE Manager 3

SUSE Linux Enterprise Server 12 SP1 for SAP Applications
SUSE Linux Enterprise Server on Amazon EC2 and AWS Marketplace

<table>
<thead>
<tr>
<th>Increased Portability</th>
<th>Improved Operational Efficiency</th>
<th>Enterprise Support and Security</th>
<th>Cloud Enhanced Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move your workload between on-premises and the cloud • Images supported on multiple infrastructures • Easily migrate your existing subscriptions</td>
<td>Take advantage of optimizing your resource utilization • Get the same performance and reliability in hybrid cloud • Simplify and automate system management</td>
<td>Security and support impact on uptime • Security standard compliance • Ward off malicious attacks and service shutdowns • Global premium 24x7 support</td>
<td>Public cloud module (web UI and command line) • Ease image deployment maintenance, and updates • Manage cloud services and server deployments</td>
</tr>
</tbody>
</table>

80% Linux in Large Enterprise Over 80% of the Fortune Global 50 are active SUSE Customers

www.suse.com/products/server
SUSE Linux Enterprise Server for SAP Applications on AWS

Boost Performance

- Performance and scalability for mission-critical applications
  - Boost your overall performance up to 60%
  - Accelerate time to value

Reduce Downtime

- High availability with automated failover
  - Built-in clustering solution and live kernel patching
  - SAP HANA resource agents
  - 99.99% availability

Optimize for SAP HANA

- Thousands of SAP HANA installations worldwide
  - Operating system security hardening for SAP HANA
  - Global premium 24x7 support

Enhance Agility

- On-Demand or BYOS to run SUSE Linux Enterprise Server for SAP Applications on AWS
  - Amazon Machine Image available to deploy right now on the AWS Marketplace

70% SAP on Linux
- 70% of all SAP applications running on Linux run on SUSE

99% SAP HANA on Linux
- SUSE is the de facto standard for SAP HANA deployments on Linux

Qualify for a Free PoC

www.suse.com/products/sles-for-sap
## AWS Instances Certified for SAP HANA

### Compute Optimized

<table>
<thead>
<tr>
<th>Instance Type</th>
<th>vCPU</th>
<th>Mem</th>
<th>SAPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>c4.large</td>
<td>2</td>
<td>3.75</td>
<td>2,379</td>
</tr>
<tr>
<td>c4.xlarge</td>
<td>4</td>
<td>7.50</td>
<td>4,758</td>
</tr>
<tr>
<td>c4.2xlarge</td>
<td>8</td>
<td>15.00</td>
<td>9,515</td>
</tr>
<tr>
<td>c4.4xlarge</td>
<td>16</td>
<td>30.00</td>
<td>19,030</td>
</tr>
<tr>
<td>c4.8xlarge</td>
<td>36</td>
<td>60.00</td>
<td>37,950</td>
</tr>
<tr>
<td>c3.large</td>
<td>2</td>
<td>3.75</td>
<td>1,989</td>
</tr>
<tr>
<td>c3.xlarge</td>
<td>4</td>
<td>7.50</td>
<td>3,978</td>
</tr>
<tr>
<td>c3.2xlarge</td>
<td>8</td>
<td>15.00</td>
<td>7,957</td>
</tr>
<tr>
<td>c3.4xlarge</td>
<td>16</td>
<td>30.00</td>
<td>15,915</td>
</tr>
<tr>
<td>c3.8xlarge</td>
<td>32</td>
<td>60.00</td>
<td>31,830</td>
</tr>
</tbody>
</table>

*Certified for SAP HANA

### General Purpose

<table>
<thead>
<tr>
<th>Instance Type</th>
<th>vCPU</th>
<th>Mem</th>
<th>SAPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>m4.large</td>
<td>2</td>
<td>8.00</td>
<td>2,214</td>
</tr>
<tr>
<td>m4.xlarge</td>
<td>4</td>
<td>16.50</td>
<td>4,428</td>
</tr>
<tr>
<td>m4.2xlarge</td>
<td>8</td>
<td>32.00</td>
<td>8,856</td>
</tr>
<tr>
<td>m4.4xlarge</td>
<td>16</td>
<td>64.00</td>
<td>17,712</td>
</tr>
<tr>
<td>m4.10xlarge</td>
<td>40</td>
<td>160.00</td>
<td>44,280</td>
</tr>
</tbody>
</table>

### Memory Optimized

<table>
<thead>
<tr>
<th>Instance Type</th>
<th>vCPU</th>
<th>Mem</th>
<th>SAPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>r3.large</td>
<td>2</td>
<td>15.00</td>
<td>1,995</td>
</tr>
<tr>
<td>r3.xlarge</td>
<td>4</td>
<td>30.50</td>
<td>3,990</td>
</tr>
<tr>
<td>r3.2xlarge</td>
<td>8</td>
<td>61.00</td>
<td>7,980</td>
</tr>
<tr>
<td>r3.4xlarge</td>
<td>16</td>
<td>122.00</td>
<td>15,960</td>
</tr>
<tr>
<td>r3.8xlarge*</td>
<td>32</td>
<td>244.00</td>
<td>31,920</td>
</tr>
<tr>
<td>x1.32xlarge*</td>
<td>128</td>
<td>1,952.00</td>
<td>135,000</td>
</tr>
<tr>
<td>x1.16xlarge*</td>
<td>64</td>
<td>976.00</td>
<td>67,500</td>
</tr>
</tbody>
</table>

*Certified for SAP HANA
X1 Instances are Here!

X1 system at SAPPHIRE 2016

2TB HANA systems

Scales up to 131,500 SAPS

SAP Certified with SUSE Linux

Provides advanced SLES functions

SUSE Manager on Amazon Web Services

Reduce Complexity
Regain control of your IT assets with a single tool
- Provision, patch and maintain your servers more quickly and accurately
- Manage your Linux servers across physical, virtual and cloud environments

Ensure Compliance
Adhere to security policies and external regulations
- Automatically monitor and track your configurations and changes
- Maintain and demonstrate compliance for all your Linux workloads and eliminate risk

Optimize Operations
Automate to improve efficiency and reduce costs
- Automate Linux server provisioning, patching and configuration for faster, consistent and repeatable server deployments
- Easy onboarding of new HW with automated discovery

AWS-Ready
Bring your own subscription to AWS for SUSE Manager
- Simple process to transfer your subscription to cloud
- Manage systems in your private data center and on AWS

http://www.suse.com/products/suse-manager
Container Support in Amazon EC2

Container support in Amazon EC2

• Updated SUSE Linux Enterprise Server 12 on demand images in Amazon EC2
• Full integration with the Amazon EC2 Container Service
• Slimmer version of SUSE Linux Enterprise Server that just functions as a container host
• Docker daemon enabled by default
• Containers Module and Toolchain Module repositories are automatically registered
Amazon EC2 Image Management

Set of utilities hosted on Github that help with management of images on Amazon EC2

- ec2uploadimg: Automate the process of creating an EBS backed AMI.
- ec2publishimg: Control the visibility of an image you own from your account, make public, share with one or more specific accounts, or make private.
- ec2deprecateimg: Create tags that detail deprecation date and replacement image.
SUSE on Microsoft Azure
Scalable Solutions for Enterprise Cloud
SUSE + Microsoft Azure

Delivering interoperable solutions for enterprises running mixed Linux and Windows data centers.

• First supported Linux OS on Microsoft Azure
  - Business critical workloads, Hyper-V standardization, application modernization

• Optimized for High Performance Compute
  - SLES 12 HPC image enables compute-intensive workloads to be published in the Microsoft Azure cloud

• Hybrid Cloud Enabled
  - SLES 12 image available for Azure Stack

• Supported by SUSE
  - Service levels guaranteed with seamless support available directly from SUSE engineers

Microsoft Azure
# SUSE Linux Enterprise Server on Microsoft Azure

## Increased Portability
- Move your workload between on-premise and the cloud
  - Images supported on multiple infrastructures
  - Easily migrate your existing subscriptions

## Improved Operational Efficiency
- Take advantage of optimizing your resource utilization
  - Get the same performance and reliability in hybrid cloud
  - Simplify and automate system management
  - Run HPC and SAP HANA workloads

## Enterprise Support and Security
- Security and support impact on uptime
  - Security standard compliance
  - Ward off malicious attacks and service shutdowns
  - Global premium 24x7 support

## Cloud Enhanced Features
- Public cloud module (web UI and command line)
  - Ease image deployment and maintenance
  - Manage Azure services and server deployments
  - Set up and maintain update infrastructure with ease

---

80% **Linux in Large Enterprise**

Over 80% of the Fortune Global 50 are active SUSE Customers

[www.suse.com/products/server](http://www.suse.com/products/server)
SUSE Linux Enterprise Server HPC on Microsoft Azure

Proven Performance

A leader in HPC for decades
- Record-setting benchmarks
- Strong ecosystem & partners
- Innovative roadmap

Optimized for HPC

SUSE Linux Enterprise Server is optimized for complex workloads
- Up-to-date Linux Kernal for optimal performance
- Lustre enabled Kernal
- Run HPC and SAP HANA workloads

High Speed Data Transport with RDMA

Eliminate roadblocks to leveraging the cloud for HPC
- RDMA drivers and Infiniband supported for enhanced server and storage connectivity and advanced I/O processing

Efficient and Economic Scalability

The perfect solution for departmental workloads
- Ease of HPC image deployment and maintenance
- Fully supported
- Set up and maintain update infrastructure with ease

50% Linux in HPC
Half of the world’s 20 largest super computers run on SUSE

Test Drive it on Azure Today

www.suse.com/products/server/hpc
# SUSE Linux Enterprise Server for SAP Applications on Microsoft Azure

## Boost Performance

Performance and scalability are fundamental requirements for mission-critical applications
- Boost your overall performance up to 60%
- Accelerate time to value

## Reduce Downtime

High availability with automated failover
- Built-in clustering solution
- SAP HANA resource agents
- Live kernel patching
- 99.99% mission-critical availability

## Optimize for SAP HANA

Thousands of SAP HANA installations worldwide
- Operating system security hardening for SAP HANA
- Global premium 24x7 support

## Enhance Agility

Bring your own subscription (BYOS) to run SUSE Linux Enterprise Server for SAP Applications in Azure
- Standard cloud image for pre-configured SAP solutions, including SAP HANA, in the SAP Cloud Appliance Library.

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### SAP on Linux

70% of all SAP applications running on Linux run on SUSE

### SAP HANA on Linux

99% of all SAP HANA deployments on Linux

www.suse.com/products/sles-for-sap
SUSE Manager on Microsoft Azure

Easier System Updates
- Automate your patch management
  - Provision, patch and maintain your servers more quickly and accurately
  - Manage your Linux servers across physical, virtual and cloud environments

Effortless Compliance
- What everyone ought to know about compliance
  - Automatically monitor and track your configurations and changes
  - Maintain and demonstrate compliance for all your Linux workloads and eliminate risk

Gain Interoperability
- Systems that work together
  - Minimize management costs by integrating into Microsoft System Center
  - Higher returns on information technology investments
  - Greater productivity

Azure-Ready
- Bring your own subscription (BYOS) to run SUSE Manager in Azure
  - SUSE Manager images available on Azure
  - Run SUSE Manager on Azure to manage systems in the data center and on Azure

http://www.suse.com/products/suse-manager
Customer Success Story

Building Highly-Available, Scalable Web Apps for Enterprise

Altran wanted to deploy an authentication gateway for their web application without the cost and complexity of setting up internal infrastructure. It chose a solution based on SUSE Linux Enterprise Server virtual servers running on Microsoft Azure. The results:

✓ Altran gained a flexible, highly available and secure platform
✓ Enabled low-touch management and systems administration
✓ Achieved scalability at low total cost of ownership

“We were already familiar with the Microsoft Azure cloud and SUSE Linux Enterprise Server from other projects - when we saw that SUSE Linux Enterprise Server images were available on Azure, we never considered any other option.”

IVAR LYSE, Business Manager, Altran
Customer Success Story

Secure and Scalable Infrastructure for Government Applications

The National Office of Electoral Processes (ONPE) in Peru wanted to reduce voter absenteeism in the 2016 Peruvian presidential election. Through a local partner, they built an open-source solution running on the Azure cloud platform leveraging SUSE. The results:

✓ Rapid development and scalability of an app that allowed 7 million citizens to preselect their voting location
✓ Absenteeism decreased 59% compared to previous election with the help of sustained 24/7 support and a resilient cloud platform

“Microsoft Azure provides 24/7 support, avoiding risk of application malfunction. We can count on Microsoft’s technology to protect personal data and to provide trusted, high-quality service.”

GILBERT VALLEJOS,
General Manager
ONPE

Solutions: SUSE Linux Enterprise Server on Microsoft Azure
Tools & Features for the Public Cloud
Public Cloud Module

Public Cloud Module in SUSE Linux Enterprise Server 12

- A set of command-line tools, instance initialization tools and packages delivered as a module in SUSE Linux Enterprise Server 12.

- Module architecture allows relatively frequent version updates to take advantage of new features or services that are introduced by cloud service providers.
Live Patching

Available for Bring Your Own Subscription images

• Apply SUSE Linux Enterprise Server 12 kernel fixes on the fly—without interruption!

• Keep up with compliance and security and increase your service availability.

• Access to update repository containing Linux kernel fixes for any SUSE Linux Enterprise Server 12 maintenance Linux kernel released within the last 12 months.
Information Tracker

Public cloud INformation Tracker (pint) Tool

• Provides information about images and the SUSE operated update infrastructure in Amazon EC2, Google Compute Platform and Microsoft Azure.

• Available in the SUSE Linux Enterprise 12 Public Cloud Module repository, the SUSE Linux Enterprise Server 11 Public Cloud channel, or in the SUSE Open Build Service (OBS).
Planning a Cloud Migration
**Migration Checklist**

**Key things to look at when considering moving to the cloud**

1. Identify areas where you can leverage higher-level cloud provider services.
2. Understand and validate SLA requirements.
3. Find your single points of failure and understand impact when it fails.
4. Have a plan to mitigate risk before and after your migration.
5. Know when and how to optimize cost.
6. Experts can add a lot of value.
A little help!

- Managed Services
  - Migration
  - App Development
  - DevOps (CI/CD)
  - Billing
  - Security

- Consulting Services
  - ROI/Business Case
  - Cloud Adoption Strategy
  - Security & Risk Assessment
  - Business Continuity
  - Cloud Architecture
  - DevOps Strategy
  - Account Management
  - Governance & Compliance
DEMOs
How to Make $1M on AWS

Deploy a SLES-based web server on AWS

1. Create an AWS EC2 account
2. Create a web server appliance in SUSE Studio
3. Upload appliance from SUSE Studio to EC2
4. Create a really cool web site
5. Make $1M
Get Started

For a quick start, visit the SUSE website and learn how to:

On AWS
- Run SUSE Image in EC2
- Set up a SUSE Test Drive
- Take advantage of AWS Free Usage Tier


On Azure
- Launch a SLES12 premium image
- Receive $200 credit towards your first month's service
- Use SUSE Studio to quickly develop a SLES image

https://www.suse.com/promo/cloud/public/azure/