SUSE® Linux Enterprise Server on Amazon EC2

Table of Contents

Enterprise Linux in the Cloud ......................................................... 2
Which Way to the Cloud: Why Amazon EC2? ........................... 2
Compute Capacity On Demand .................................................... 3
Why Run Your Amazon EC2 Services on
SUSE Linux Enterprise Server? .................................................. 3
SUSE and Amazon EC2: A Shared Vision of
Enterprise-class IT ........................................................................ 6
SUSE Linux Enterprise Server: Enterprise-class
Linux for Amazon EC2 ................................................................. 7
Enterprise Linux in the Cloud

SUSE and Amazon Web Services (AWS) have joined forces to offer software developers and enterprise IT organizations the opportunity to build and run their applications in the cloud on a completely packaged Infrastructure-as-a-Service (IaaS) solution stack that includes the Amazon Elastic Compute Cloud (EC2) and SUSE® Linux Enterprise Server.

Amazon EC2 customers can purchase on-demand instances of SUSE Linux Enterprise Server in a one-stop, pay-as-you-go transaction that entails no long-term commitment and requires no separate agreement with SUSE.

This paper lays out the aggregate value proposition for this platform, which brings together the distinctive features and benefits of AWS and SUSE Linux Enterprise Server in a uniquely well-integrated, convenient and aggressively priced solution.

“We made a strategic decision to choose SUSE Linux Enterprise Server based on the quality of the software. Our tests revealed that it offers far higher performance and lower total cost of ownership for SAP solutions than we could achieve with Microsoft Windows. It also uses less system resources and is more stable—keeping hardware costs low while enabling extremely high availability for customers of Swicon360 in the new SAP BPO service.”

WARREN SMALL
Managing Director
BasisOne

Which Way to the Cloud: Why Amazon EC2?

Amazon EC2 is an IaaS web service that provides on-demand compute capacity quickly, conveniently and affordably to anyone with an application to run or a service to deliver. As a core component of the expanding AWS portfolio, Amazon EC2 offers enterprise IT organizations and independent software developers a way to build, launch and scale a new application or service with no upfront investment in compute infrastructure, no long-term service commitments and no restrictions on architectural decisions or development tools.

Since its initial beta release in 2006, AWS has steadily built out all the essential features and functions of a true enterprise-class development and service delivery platform. Today, Amazon EC2 and the entire AWS platform are extraordinarily flexible, manageable, reliable and secure. To enterprise IT organizations, they offer an always-available expansion environment for new applications or additional capacity. To ISVs, they offer an extremely appealing alternative to the conventional SaaS delivery model, with vastly lower initial costs and faster time to value.
**Compute Capacity On Demand**

In Amazon EC2, customers use a web interface to open an account, then select or create a Amazon Machine Image (AMI)—a software appliance that includes the desired application, libraries, data, operating system and configuration settings. The AMI is then used to boot one or more virtual server instances. Virtual server instances are available for a wide range of applications, with various configurations of compute capacity, memory, storage and I/O bandwidth. Users can create, launch and terminate instances as needed, paying by the hour for only the instances that are active. Taken together, the unique features of Amazon EC2 and the vast scale of the AWS platform offer enterprise and developer customers a truly unique value proposition.

**Why Run Your Amazon EC2 Services on SUSE Linux Enterprise Server?**

In its effort to offer the widest possible range of development tools and services, Amazon EC2 supports a number of operating system options, including several Linux distributions. The inevitable question for any Linux developer is what factors differentiate the available candidates as guest operating systems in the Amazon virtual cloud environment?

“In Using SUSE Appliance tools, IBM and our business partners were able to cut deployment time for a software image from a week and a half down to 10 hours for a larger system and four hours for a smaller system. This enables the company to bring offerings to market quicker and less expensively. IBM has been able to expand the market for its products by bringing an offering to the customer without forcing them to invest the time and expense of picking components, testing them and installing them. It shortens the time to value.”

**JIM LAWRIE**

*Product Manager*

**IBM**

In fact, several significant distinctions mark SUSE Linux Enterprise Server as the perfect guest OS for Amazon EC2 virtual machine instances. Some of these advantages are inherent in SUSE Linux Enterprise Server itself, others derive from unique features of the SUSE–Amazon partnership agreement.

**It’s a True Enterprise-class Linux**

SUSE Linux Enterprise Server is a highly reliable, interoperable and manageable server operating system built to power all types of workloads, including mission-critical and real-time applications. That’s one reason more than 1,600 ISVs have certified over 10,000 applications on SUSE Linux Enterprise Server, twice the number of the next most popular enterprise Linux distribution. And through the SUSE forward-looking development model, SUSE is able to offer the latest features and performance enhancements, support the latest hardware, and do all while continuing to deliver enterprise reliability and application compatibility. Amazon EC2 customers can run SUSE Linux Enterprise Server on all instance types and sizes, enabling them to maximize cost-effectiveness and performance for a particular workload.

**It’s the Best-supported Enterprise Linux**

SUSE Linux Enterprise Server is supported and certified by the world’s leading hardware and software vendors. It’s backed by award-winning technical support and a global ecosystem of partners and services. A survey by Lighthouse Research and Development found that enterprises receiving Linux support from SUSE continue to report higher levels of satisfaction than those using Linux support from other leading distributors.

“With SUSE Linux Enterprise Server, Adobe is able to expand support for our technical field and strategic partners who leverage the Adobe LiveCycle Enterprise Suite. Adobe is always seeking new ways to deliver technology in a more streamlined and cost-effective manner, and the SUSE Appliance Program as an important component to our continuing success.”

**ALEX CHOY**

*Vice President, LiveCycle Engineering*

**Adobe**

www.suse.com
All SUSE Linux Enterprise Server instances on Amazon EC2 include maintenance service that provides access to the most recent security patches, bug fixes and features. Amazon and SUSE have worked together to place update servers in each EC2 region. Every instance is automatically registered to the update server and will receive notification of available patches, upgrades and security fixes.

The advantages of this approach are two-fold: customers use the same tools to manage updates for their SUSE Linux Enterprise Server images as they do for on-premise deployments, and incur no EC2 bandwidth charges to download updates. Customers purchasing premium support from Amazon will also receive support for their SUSE Linux Enterprise Server images. Amazon and SUSE will work together to resolve issues. Because there is no difference between SUSE Linux Enterprise Server running in Amazon EC2 or in a customer's own data center, existing ISV application certifications are valid when those applications are running in Amazon EC2.

**Manage All Linux Workloads with a Single Solution**

SUSE Manager delivers best-in-class Linux server management capabilities that provide comprehensive management across physical, virtual, and cloud environments. SUSE Manager automates Linux management tasks, such as updating, patching, and configuring servers, so you can maintain servers faster and more accurately whether they are running on Amazon EC2 or in the Data Center.

**It’s Fast, Simple and Affordable**

Purchasing an on-demand instance of SUSE Linux Enterprise Server from Amazon EC2 couldn’t be simpler. A basic subscription is included in the hourly use charge, so there’s no separate licensing transaction to be completed with SUSE. This is the fastest and most intuitive Linux operating system solution for launching and scaling services on Amazon EC2, and pricing is very aggressive, with no additional service fees to drive up costs.

**It’s the Perfect Virtual Machine Guest**

SUSE Linux Enterprise Server is optimized for efficient and reliable performance on most leading hypervisors, including not only Xen—the designated hypervisor for all AMI—but also VMware ESX and vSphere, Microsoft Hyper-V and KVM. SUSE is an active contributor to both the Xen and KVM open source hypervisor projects, both of which ship as fully integrated components of SUSE Linux Enterprise Server.

“*In today’s economic climate, there is an even greater need for enterprises to lower their total cost of IT, but no one can afford to do that at the cost of power or stability. Our enterprise customers need a supported Linux platform that has been certified by all of the major software providers. SUSE Linux Enterprise Server provides unmatched reliability for mission-critical applications.*”

**NATHAN DAY**

Chief Technical Officer

SoftLayer
Build Custom AMIs Quickly and Easily with SUSE Studio

SUSE Studio is our award-winning web application for building, testing, configuring and deploying software appliances in a web browser. SUSE Studio enables users to quickly create and test fully supported software appliances based on SUSE Linux Enterprise. SUSE Studio creates images for almost any physical, virtual or cloud environment, including Amazon EC2.

The intuitive interface of SUSE Studio makes it easy to browse and search the official SUSE repositories and select individual packages that you wish to add. Package dependencies are checked and resolved automatically, and the Supportability Analyzer scans SUSE Linux Enterprise images. If the image passes the scan, the underlying operating system is fully supported by SUSE. You can also add additional third-party repositories and files, or upload your own RPM files that are compatible with SUSE Linux Enterprise. Once an image build is complete, customers can directly upload and launch EC2 images from SUSE Studio.

In addition to the free online service, SUSE Studio is also available in an on-site version, SUSE Studio Enterprise.

Cloud Platform for ISVs

ISVs can expand their market opportunities by building their applications on SUSE Linux Enterprise Server for Amazon EC2. SUSE Studio accelerates time to market by virtually eliminating the inefficient manual processes for application deployment by streamlining the entire process for building and deploying applications in the cloud.

Through just the click of a button, ISVs can use SUSE Studio to deploy customized applications that are configured and optimized with just the code needed for specific use cases.

Build Faster, More Secure AMIs with SUSE Linux Enterprise Server

SUSE Studio gives you the option of building your AMIs from the JeOS template—a minimal set of packages from SUSE Linux Enterprise Server that are required for creating a bootable image. This provides a fully customizable configuration of SUSE Linux Enterprise Server where you decide which packages and elements you include, using only what you need and nothing that you don’t.

“In the past, it was difficult for us to respond as rapidly as we wanted to new requests from clients. With SUSE Studio, we have a well controlled set of base templates with the tools to rapidly customize, test and deliver new appliances. It’s like having jet engines when we previously just had propellers! The demand for customization is enormous in the financial sector, so the ability SUSE Studio gives us to deploy completely new appliances in one or two days is a huge competitive advantage.”

— ALLAN SWANEPOEL
Systems Developer
Pfortner

“SUSE Linux Enterprise Server offers significant benefits in a hosting scenario: high stability and easy administration minimize the time spent on support, and the small footprint of the operating system means we require less hardware to support a given number of customers. Of course, our ASP customers don’t care about the operating system—but they certainly appreciate the high availability and performance we deliver.”

— ROB WIERNAG
Manager
Yard-IT
SUSE and Amazon EC2: A Shared Vision of Enterprise-class IT

Even a short list of features and competitive differentiators for Amazon EC2 and SUSE Linux Enterprise Server reveals a shared philosophy of infrastructure design based on integration, efficiency and true, long-term economy. Consider a few examples:

<table>
<thead>
<tr>
<th>Features</th>
<th>Amazon EC2</th>
<th>SUSE Linux Enterprise Server</th>
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<tbody>
<tr>
<td>On-demand Elasticity</td>
<td>Amazon EC2 customers can rapidly launch and terminate instances as workloads rise and fall. Tens, hundreds or even thousands of instances can be commissioned simultaneously, using Auto Scaling to dynamically match capacity with demand, and Elastic Load Balancing to efficiently distribute incoming application traffic.</td>
<td>SUSE Linux Enterprise Server is the most scalable operating system currently available: 1. Has been certified with 4,096 logical CPUs (256 physical CPU sockets x 8 cores x hyperthreading) and 16 TiB of RAM 2. SUSE Linux Enterprise 11 contains the OFED Stack for low latency inter-machine communication 3. Delivers XFS filesystem</td>
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<td>Flexibility</td>
<td>Developers can choose the programming model and tools that make sense for their applications. A wide range of instance types provide tailored configurations of CPU, memory, storage and boot partition sizes for various application types, including standard, micro, high-memory, high-CPU, HPC cluster node and HPC graphics node instances.</td>
<td>The JeOS template within SUSE Studio is a slimmed-down configuration of SUSE Linux Enterprise that provides a minimal set of packages from SUSE Linux Enterprise Server that are required for creating a bootable image. This enables you to create a customized, lightweight configuration of SUSE Linux Enterprise Server for your AMI that is easy to deploy and maintain, consumes fewer resources and improves security.</td>
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<td>Reliability</td>
<td>Amazon EC2 service runs within the same proven network and data center infrastructure as Amazon’s own applications and services. Instances can be deployed across multiple geographically dispersed Availability Zones to enhance availability and reduce latency. Amazon’s Service Level Agreement guarantees 99.95 percent availability for each Amazon EC2 Region.</td>
<td>SUSE Linux Enterprise Server is packed with enterprise-class RAS features, making it one of the most reliable software infrastructure solutions available in the market, with the lowest server downtimes of any enterprise platform. It includes Swap over NFS, Control Groups and scheduler enhancements.</td>
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<td>Security</td>
<td>Amazon provides a web services interface allowing customers to configure firewall settings and network access for groups of instances. Additional services let customers isolate a set of compute resources within the AWS cloud, and connect that environment to their existing IT infrastructure, extending internal management and security systems to those resources.</td>
<td>SUSE Linux Enterprise Server provides application confinement with AppArmor® and system confinement via the SELinux stack. Also included is full disk encryption and intrusion prevention capabilities, and it is accompanied with rich security and hardening documentation. All SUSE Linux Enterprise Server releases are built using the unique SUSE Open Build Service technology, which tracks the source code, build parameters, build environment and is used to create updates as part of our maintenance process. By using a standardized build environment throughout the product lifecycle, SUSE ensures a stable and secure operating environment. SUSE Linux Enterprise Server 11 SP2 has been awarded the Common Criteria Certification on the x86-64 and s390x architectures, and a FIPS 140-2 certification for the OpenSSL module.</td>
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SUSE Linux Enterprise Server: Enterprise-class Linux for Amazon EC2

Together, the Amazon EC2 and SUSE Linux Enterprise Server combine the best of conventional enterprise-class information technology—reliability, availability, performance and security—with the flexibility, scalability, low cost and faster time to value that only the cloud can deliver. This is a complete IaaS solution that ISVs and enterprise IT organizations can adopt and build on as a foundation for innovation and growth.

For more information on SUSE Linux Enterprise Server for Amazon EC2 we recommend the following resources:

- Amazon EC2 Running SUSE Linux Enterprise Server: http://aws.amazon.com/suse/
- SUSE Linux Enterprise Server: www.suse.com/products/server/
- SUSE Appliance Program: www.suse.com/partners/isv/appliance/
- SUSE Studio: http://susestudio.com/
- SUSE Cloud Program: www.suse.com/partners/cloud-service-providers/
- SUSE Manager: www.suse.com/susemanager

### Features

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<td>Customers have complete control of their resources in Amazon EC2, with root access to each instance. Amazon Cloud Watch provides monitoring and alerting services for all AWS resources, offering visibility into resource utilization and operational performance including CPU utilization, disk reads/writes and network traffic.</td>
<td>SUSE Linux Enterprise Server ships with a comprehensive suite of integrated management tools that simplify Linux server deployment, installation, configuration, administration, patching and updating. Integrated tools include YaST®, AutoYaST, ZYpp and a small footprint CIM broker.</td>
<td>SUSE Manager provides comprehensive Linux management for workloads running on premise, in a private or public cloud (not included).</td>
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<td>Low Cost</td>
<td>Amazon EC2 pricing allows customers to minimize costs through various instance purchasing arrangements, including: On-Demand (pay by the hour, no long-term commitment), Reserved (discounted hourly rates with a one-time instance reservation fee) and Spot (auction purchasing on a spot capacity exchange).</td>
<td>SUSE Linux Enterprise Server is available for all EC2 instance types, including Reserved and Spot. This enables customers to take full advantage of all of the pricing options EC2 provides to tune costs, while still providing all of the benefits of using SUSE Linux Enterprise Server to support their cloud deployments.</td>
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<td>A Service-rich Development Environment</td>
<td>Amazon EC2 simplifies new application development by providing a wide range of support services that are readily available through standard web service interfaces.</td>
<td>SUSE provides the development tools to allow users to quickly create and test fully supported software appliances, plus the development kits to create or port applications to SUSE Linux Enterprise Server.</td>
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