White Paper

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SUSE® Linux Enterprise Server on Amazon EC2

Enterprise Linux* Comes to the Cloud

Novell®

Executive Summary

"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

See the complete article at: www.novell.com/success/basisone.html

Novell 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 now 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 Novell.

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.

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 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 Novell–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 1,500 ISVs have certified over 6,500 applications on SUSE Linux Enterprise Server, twice the number of the next most popular enterprise Linux distribution. Amazon EC2 Customers can run SUSE Linux Enterprise Server 10 SP3 and SUSE Linux Enterprise Server 11 SP1 on both 32-bit and 64-bit Amazon instance types.

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 Novell® technical support and a global ecosystem of partners and services. A 2010 survey by Lighthouse Research and Development found that enterprises using Novell Linux support continue to report higher levels of satisfaction than customers using Linux support from other leading distributors.

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 Novell 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. In addition to the basic and optional priority support services available from Amazon, customers can also purchase priority support for their SUSE Linux Enterprise Server instances directly from Novell. 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.

It's Fast, Simple and Affordable

Purchasing an on-demand instance of SUSE Linux Enterprise Server from Amazon EC2 couldn't be simpler. Unlike other Linux distributions available through Amazon, a basic subscription is included in the hourly use charge, so there's no separate licensing transaction to be completed with Novell. 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. Novell 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.

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

"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

See the complete case study at: www.novell.com/docrep/2011/02/ibm_accelerates_deployment_and_time_to_value_with_suse_appliance_toolkit.pdf

"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

See the complete article at: www.novell.com/success/pfortner.html

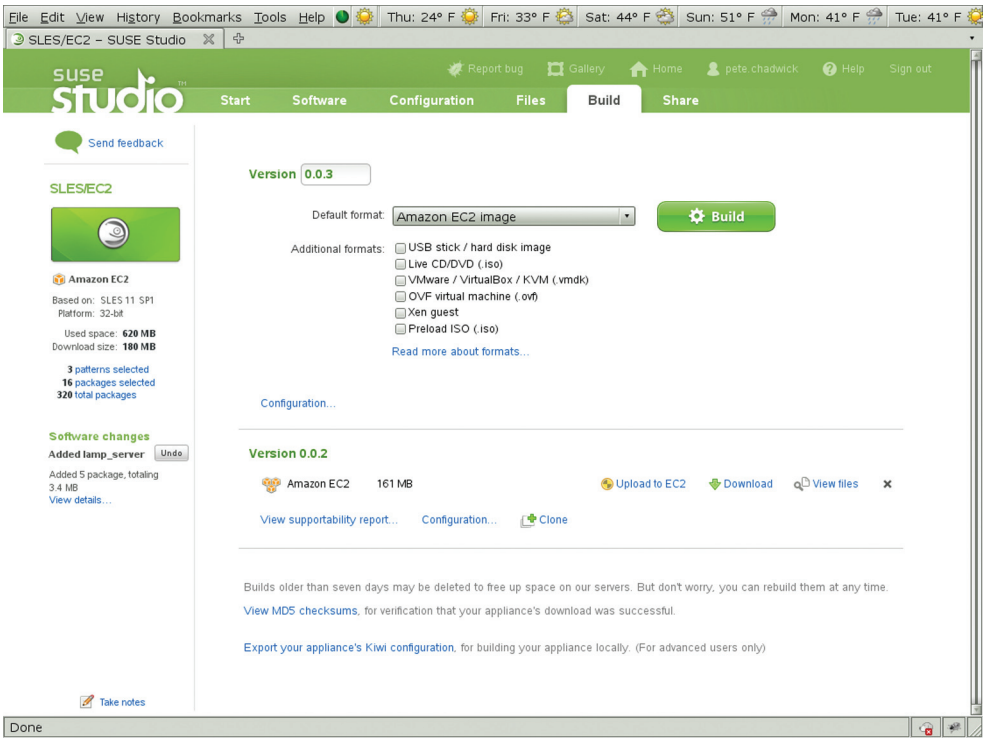
web browser. SUSE Studio enables users to quickly create and test fully supported software appliances based on SUSE Linux Enterprise. SUSE Studio creates images for almost any physical, virtual or cloud environment, including Amazon EC2.

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 Novell. 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, Amazon EC2 tools and a bundled AMI creation script can be used to create an Amazon EC2 AMI directly from SUSE Studio.

In addition to the free online service, SUSE Studio is also available in an on-site version, as part of the SUSE Appliance Toolkit.

Build Faster, More Secure AMIs with SUSE Linux Enterprise Server JeOS

SUSE Studio also gives you the option of building your AMIs on SUSE Linux Enterprise JeOS (Just Enough Operating System), a customizable configuration of SUSE Linux Enterprise designed as a bare minimum bootable image formatted for VMware, Xen and 64-bit x86 images. You decide which packages and elements you include, using only what you need and nothing that you don't.



Novell 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:

Features	Amazon EC2	SUSE Linux Enterprise Server
On-demand Elasticity	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.	Scalability is never an issue with SUSE Linux Enterprise Server. Its reliability and performance have been proven with up to 128 processors on most standard architectures, and up to 4,096 processors on specific Itanium architectures. It's the OS of choice for some of the world's largest deployments, including six of the top ten supercomputers.
Flexibility	Developers can choose the programming model and tools that make sense for their applications. A wide range of instance types provides 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.	SUSE Linux Enterprise JeOS is a slimmed-down configuration of SUSE Linux Enterprise that provides only the functionality you need. Create a customized, lightweight configuration of SUSE Linux Enterprise for your AMI that is easy to deploy and maintain, consumes fewer resources and improves security.
Reliability	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.	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.
Security	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.	SUSE Linux Enterprise Server provides integrated application security with AppArmor® technology that proactively protects the operating system and applications from external or internal threats, including zero-day attacks. AppArmor enforces safe program behavior through security profiles that completely define which system resources individual programs can access, and with what privileges.
Manageablilty	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.	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, plus tight integration with ZENworks® Linux Management (not included).
Low Cost	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).	SUSE Linux Enterprise Server is available for all EC2 instance types including Reserved and Spot. This enables customers to take full advantage of pay-as-you-go costs while still providing all of the benefits of using SUSE Linux Enterprise Server to support their cloud deployments.
A Service-rich Development Environment	Amazon EC2 simplifies new application development by providing a wide range of support services that are readily available through standard web service interfaces.	Novell 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.

"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

See the complete article at: www.novell.com/success/softlayer.html

"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 Wierenga
Manager
Yard-IT

See the complete article at: www.novell.com/success/yard_it.html

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.novell.com/solutions/enterprise-linux-servers/*
- *SUSE Appliance Program: www.novell.com/partners/isv/appliance/*
- *SUSE Studio: http://susestudio.com/*
- *SUSE Studio—The New Amazon EC2 Build Format: http://blog.susestudio.com/2010/10/new-amazon-ec2-build-format.html*
- *SUSE Cloud Program: www.novell.com/suse-cloud-program*

"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.novell.com

Contact your local Novell Solutions Provider, or call Novell at:

1 800 714 3400 U.S./Canada
1 801 861 1349 Worldwide
1 801 861 8473 Facsimile

Novell, Inc.
404 Wyman Street
Waltham, MA 02451 USA

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