

Make the Move from UNIX* to Linux*: Now Is the Time



Novell.

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Executive Summary

According to Gartner, support for Linux in the data center is growing rapidly, with its use in the data center doubling in 2006. Furthermore, about 63 percent of Linux users are very happy, and 83 percent of data center managers expect to increase spending on Linux.

Gartner

Linux Continues to Advance into the Data Center
March 2006, #G00138277

For the past 15 years or more, UNIX* has established a history of solid reliability in the data center. It typically runs mission-critical applications, including back-end databases, and has a reputation for good performance, high reliability, proven scalability and trustworthy security. But these benefits come at a high total cost of ownership (TCO). UNIX generally requires expensive proprietary software and hardware as well as budget-draining annual maintenance costs. These expenses have been a key factor in the recent, widespread migrations to other platforms, specifically Linux*.

Today's IT professionals are making strategic investments in Linux, preferring its open architecture and low cost to proprietary UNIX platforms that often create vendor lock-in. As an IT manager, you will see several opportunities to optimize your data center and control costs by migrating to Linux. You should give it serious consideration, especially if you:

- *Need to replace older hardware offering lower performance*
- *Would like an operating system (OS) that is flexible and interoperates well with your other platforms*
- *Can reduce TCO by consolidating applications or systems*
- *Want to deploy or upgrade large applications*
- *Have a UNIX maintenance contract that is expiring soon*
- *Are tired of being locked into using a single vendor*

Linux elevates enterprise computing: you get the power, reliability and scalability of UNIX, but you save up to 25 percent or more in TCO. You also get a platform that supports your entire infrastructure, works with thousands of

applications, and is the focus of developer efforts worldwide.

Linux: Better Performance, Greater Savings

As you plan your move to Linux, its flexibility gives you many deployment options. You could start slowly at the edge of your enterprise, migrating basic infrastructure services, such as file and Web serving. Or, you could begin immediately and use Linux to run enterprise applications and host databases. Whatever your preferences, Linux is equal to the task.

You want a server platform that can do it all: run your infrastructure services, support enterprise applications and host the database at the heart of your organization. What's more, you need a platform you can count on—one synonymous with reliability and security—that doesn't decimate your budget. A decade ago, you might have chosen UNIX, a platform historically known for its dependability and data center leadership. Now, older UNIX systems are showing their age. They cannot run the latest generation of IT services without significant—and expensive—upgrades to proprietary hardware and software. Moreover, the capabilities of commercial off-the-shelf (COTS) hardware options, such as multi-core Intel® processors, have increased dramatically, relative to their single-core predecessors of just a few years ago. Thousands of organizations worldwide are evolving their environments from legacy UNIX platforms in favor of cost-efficient, open source Linux computing on multi-core Intel® architecture.

Why Linux? Linux is powerful, secure and reliable, and it is quickly becoming the OS of choice for enterprise deployments. As Gartner noted, Linux has reached its third

generation, and is scalable and reliable enough for workloads that have traditionally been relegated to proprietary UNIX hardware and software.¹ Gartner further observed, “Linux is growing rapidly as the database management system platform of choice.”² And the consulting firm REALTECH noted, “There is no doubt that the movement towards Linux in SAP data centers is gaining momentum fast. The stability and readiness [of Linux] for business-critical applications are assumed.”³

For IT managers seeking dramatic server consolidation capabilities, Intel® multi-core processors provide a powerful virtualization platform for Linux in the data center. When combined with the advanced virtualization capabilities of the Xen* hypervisor integrated in SUSE® Linux Enterprise Server from Novell®, this solution helps to reduce the number of servers needed to support growing workloads. So data center systems gain increased agility and scalability—enabling next-generation IT managers to meet the dual challenges of increased demand and shrinking budgets. If you’re still running UNIX, it’s time to take a look at what SUSE Linux Enterprise Server from Novell running on Intel® Xeon® processors and Itanium®-based platforms can deliver to your organization.

When it comes to Linux, choosing the right vendor is important. Novell offers enterprise-ready solutions that span from the desktop to the data center, unified by common identity management and resource management tools. SUSE Linux Enterprise Server features advanced Linux technology that can support the services, applications and databases that drive your business. What’s more, SUSE Linux Enterprise Server is backed by a global, enterprise-class ecosystem that includes technical support, consulting services, training, certification and an extensive partner network. If you are ready to migrate from UNIX to enterprise-class Linux, Novell is an excellent choice.

Flexibility and Options

As an open source technology, Linux gives you considerable flexibility in implementing solutions to meet your specific requirements. Linux works with thousands of applications and is the focus of developer efforts worldwide. Best of all, you get this flexibility and interoperability while lowering your costs.

The Linux Value Proposition

According to leading analysts, Linux delivers significant benefits that range from hardware flexibility and proven reliability hosting mission-critical workloads to affiliation with the global open source community. For many UNIX users, Linux is a logical choice for several reasons:

- *Linux offers a clear and open roadmap.*
- *Linux is reliable, secure and stable, and it provides enterprise-class scalability and performance that enable it to take over roles previously dominated by UNIX.*
- *The similarities between the UNIX and Linux operating environments simplify application migration and IT staff training.*
- *Linux has the support of the entire open source community, which is committed to the security and viability of the platform. Have you ever had to wait weeks on end for your UNIX vendor to provide the latest support pack or security patch to fix an OS bug? With Linux, you might wait only a couple of days—or even hours. The open source community can often deliver with lightning speed the updates that take traditional organizations multiple development cycles to release.*
- *The number of independent hardware vendors and independent software vendors (ISVs) supporting Linux has grown tremendously. Major hardware vendors explicitly support Linux, including IBM, HP, Dell, Fujitsu Siemens and Fujitsu Computer Systems. Software vendors include BMC Software, IBM Software Group, McAfee, Oracle, SAP, Software AG, Symantec/Veritas and many others.*



“With our previous UNIX environment, we never had capacity on demand, so we ended up paying too much overhead just to be prepared for two days a month. With our SUSE Linux Enterprise/ IBM zSeries* environment, we can handle periodic increases in transaction volumes without constantly paying for excess capacity.”

Kenneth J. Kucera

Senior Vice President and CIO
First National Bank of Omaha

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- 1 Gartner report G00152086. “What is Third-Generation Linux,” October 2007.
 - 2 Gartner. “Does UNIX have a Future?,” Gartner Annual Data Center Conference, November 2007.
 - 3 REALTECH white paper. “The Trend from UNIX to Linux in SAP Data Centers,” April 2008.

Linux is powerful, secure and reliable, and it is quickly becoming the operating system of choice for enterprise deployments. Companies start by implementing Linux for general infrastructure roles—such as Web serving and DNS/DHCP—and then move it to the core of the enterprise, where it supports mission-critical applications and databases in the data center.

Historically, Linux was generally used in the lighter-weight infrastructure software segment—such as file/print, office productivity applications and Web servers. Increasingly, Forrester’s clients are deploying Linux to handle the heavy-lifting tasks of the high performance technical computing (HPTC) and mission-critical business applications from vendors like SAP and Oracle. Leading independent software vendors (ISVs), server systems vendors, and professional services are optimizing their Linux solutions for more complex line-of-business, mission-critical environments.

- *Linux offers a wide choice of hardware vendors and Linux distributors. Although UNIX is marketed as an open system, the reality is that you are often tied to a particular hardware vendor. Linux is truly an open system.*

Because every organization is different, it’s difficult to predict exact expense reductions or return-on-investment levels that will result from a UNIX-to-Linux move. However,

Enterprise Deployments

The considerable savings are motivating many organizations to move from UNIX to Linux. Most of these companies complete their migrations during major IT milestones, switching platforms as they upgrade hardware or key software, or when they renew maintenance. So, how exactly are these businesses using Linux? Just as they used UNIX—to support infrastructure services, enterprise applications and mission-critical databases throughout the organization.

Linux on Intel® processor-based servers or clusters that provide performance equivalent to that of several-year-old UNIX systems can cost up to 75 percent less. Linux with Intel processor-based hardware also slashes hardware maintenance costs, which can be 90 percent less than for older UNIX hardware with comparable computing performance.

Intel processor-based servers are power-efficient workhorses that bring out the best of SUSE Linux Enterprise Server in your data center. Enormous performance headroom lets you support enterprise workloads with fewer servers, which saves on initial hardware costs, supporting infrastructure and ongoing operational expenses. The ability to squeeze more work out of every watt of power builds continuing cost-of-ownership advantages over the long haul.

Furthermore, although commercial Linux and the applications that run on Linux are not free, annual software license and maintenance fees are typically up to 60 percent less for Linux than for UNIX.

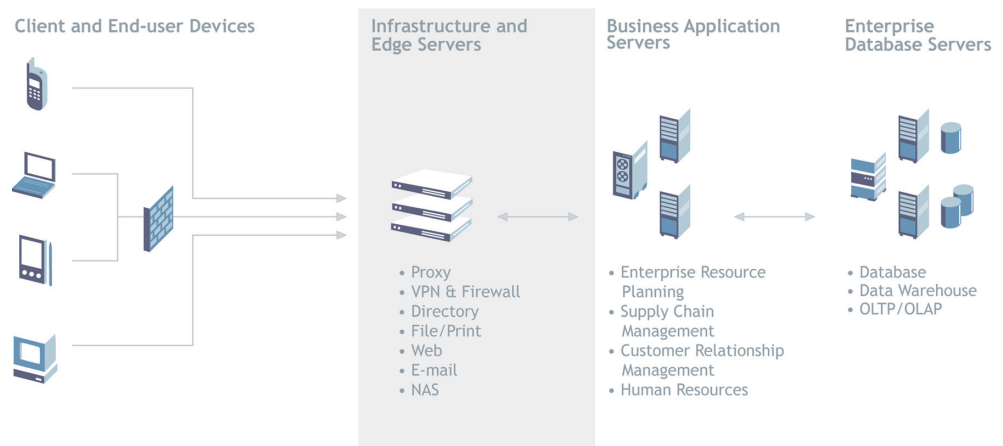


Figure 1. Linux deployment in the enterprise

Edge Computing and Infrastructure Services

Your business depends on its “edge” servers, the ones that connect users to the Web, e-mail, storage, files, printers and other key infrastructure services. If your company—like many others—originally deployed these services on the UNIX platform, it may be time for a change. Savvy IT professionals are rapidly moving to Linux on multi-core Intel® architecture-based servers for edge computing and infrastructure workloads. Linux is the current focus of widespread developer efforts and supports thousands of applications while delivering security, reliability and affordability to edge computing. Linux supports the following infrastructure services and workloads:

- *Web servers*
- *Firewall*
- *DNS*
- *DHCP*
- *File/Print*
- *Proxy*
- *Caching*
- *VPN*
- *WAP*
- *VoIP gateway*
- *Directory*
- *Security*
- *Load balancing*
- *NAS*

By migrating to Linux, you can deliver the same set of Web and edge services to your end users, with the same levels of performance, reliability, scalability and security—but at lower levels of annual investment.

Linux can be deployed in all the major enterprise topologies, including server farms, clusters and grid environments. For new edge deployments, Linux is often the preferred platform. If you are still running your edge servers and infrastructure workloads on UNIX, then you should consider switching to SUSE Linux Enterprise Server. Running SUSE Linux Enterprise on servers based on

COTS Intel architecture delivers mainframe-class reliability and scalable performance without compromise.

Enterprise Applications

Mission-critical applications factor heavily in your organization’s day-to-day operations and overall success. These include applications for enterprise resource management, supply chain management, customer relationship management and proprietary line-of-business applications. In many cases, you can now deploy these same applications on Linux without sacrificing performance, security or reliability. By switching from older UNIX servers to SUSE Linux Enterprise Server on Intel architecture-based machines, you will transition your IT infrastructure from expensive, inefficient systems to modern, efficient industry-standard machines. You’ll save anywhere from thousands of dollars to potentially millions of dollars annually.

Today’s multi-core Intel Xeon and Itanium processors deliver mainframe-class reliability and scalable performance that are unprecedented from COTS servers. Running SUSE Linux Enterprise Server on Intel architecture delivers superior results at mainstream prices. In addition, SUSE Linux Enterprise Server can easily scale up or scale out to meet your present and future requirements. Today, Linux is supported for many large-scale applications, such as those of commercial database vendors, including Oracle and IBM, and critical corporate applications from SAP*, Oracle and many others. For many vendors, Linux has become the reference platform for database development; this means that new applications are developed first for Linux architectures and then ported to other platforms.

It’s no surprise that because of the expenses associated with maintaining UNIX deployments, IT leaders everywhere are adopting SUSE Linux Enterprise Server for enterprise application workloads. By migrating their application infrastructure to Linux systems,



“We had more than 10 years of experience with UNIX, so moving to Linux was a logical step. The transition was relatively easy, since our employees could use their existing skills with very little retraining required.”

Matthias Heidegger

Head of Data Center
FRITZ EGGER GmbH & Co.



“Linux gives us a reliable platform for business software. As a data center provider, customers depend on us to deliver high-performance solutions. We can implement solutions faster and less costly with SUSE Linux Enterprise Server than we could with UNIX.”

Michael Gebauer

Solution Architect
Siemens IT Solutions and Services

Here are just a few of the leading ISVs that provide software applications that run on Linux:

- Arkeia
- BEA
- BMC Software
- Computer Associates
- Egenera
- IBM Cognos
- IBM (Lotus*)
- IBM (Tivoli*)
- IBM (WebSphere*)
- Legato
- Lutris
- Metrowerks
- MySQL
- Oracle
- PolyServe
- Progress Software
- Quadratec
- SAP
- Sendmail
- Software AG
- SteelEye
- Sybase
- Symantec/Veritas
- Teamware
- TIBCO
- Trend Micro
- VMware

they can achieve the same levels of performance, reliability, scalability and security with much lower levels of annual investment. In many cases, switching to Linux may be unnecessary because most ISVs providing applications on UNIX deliver Linux versions of their applications as well. For specialized in-house or heavily customized applications, the similarity of Linux to UNIX helps to reduce the complexity of application porting. And the skill set needed to move applications from UNIX to Linux has become mainstream, making qualified technical staff and consultants widely available.

Many companies are now considering a refresh of their enterprise resource planning (ERP) and similar systems. As you consider

this type of refresh, it is also a good time to examine the underlying OS for your ERP applications. By moving from older UNIX systems to SUSE Linux Enterprise Server, you can achieve significant software and hardware savings. Figure 2 demonstrates the continuing growth of Linux and decline of UNIX.

SAP customers can even receive integrated support for both SAP applications and SUSE Linux Enterprise Server directly from SAP. Through a strategic partnership with Novell, SAP officially recommends SUSE Linux Enterprise Server as a preferred platform for customers who want to deploy SAP applications on Linux.

Mission-critical Relational Databases

Relational databases sit at the heart of every enterprise, providing mission-critical data that drives the business. IT departments must deploy enterprise databases on the most robust server hardware and OSs available. It's no surprise, then, that data serving consumes a significant portion of your IT budget and resources.

	2005	2006	2007	2010	2005-2010 CAGR
Linux (paid)	3.18M	3.84M	4.33M	6.7M	16.1%
UNIX	3.24M	3.15M	3.10M	3.09M	-1.0%
Windows	16.42M	18.90M	21.50M	30.90M	13.5%
Others	2.86M	2.31M	1.87M	1.62M	-10.7%
Total	25.70M	28.20M	30.80M	41.50M	10.1%

Figure 2. Installed base of server and host operating systems (Source: Worldwide Client and Server Operating Environments 2007–2010 Forecast and Analysis, IDC, February 2007)

Historically, enterprise databases have been deployed on UNIX, OS/2* and Windows*. Now, Linux delivers the same—or better—reliability, security, performance and scalability at a fraction of the cost.

With the maturation of Linux into an enterprise-class OS, IT executives now have a better choice that lowers software costs and allows deployment on COTS server platforms. SUSE Linux Enterprise Server is supported by nearly all the major commercial database vendors, including Oracle and IBM. In situations where a commercial database is not required,

robust open source alternatives, such as MySQL* and PostgreSQL*, are also available on SUSE Linux Enterprise Server.

The Benefits of Linux

When you migrate your workloads from aging UNIX systems to SUSE Linux Enterprise Server, you'll experience considerable benefits:

- **Lower server costs.** *Linux runs on COTS Intel® servers, delivering superior performance per price and per watt, relative to older UNIX machines*

- **Lower lifecycle costs.** *With Linux, there's no need to pay UNIX-level hardware and software maintenance or continue running inefficient servers that require excessive power and cooling.*
- **Better utilization of assets through virtualization.** *You can easily virtualize Linux servers and move them to where they are needed, eliminating stranded capacity and over-provisioning. You can also run virtualized Windows and other guests at near-native performance on the same Linux host.*
- **Improved operational efficiency.** *With Linux, you have one place to install and manage software and only one set of file systems to back up.*
- **Vendor independence.** *With Linux, you choose from numerous hardware and OS vendors and are not locked into a single choice over time.*

By moving from UNIX to Linux, organizations have realized savings of up to 50 percent or more in their hardware, maintenance and software expenses. Now may be the time to free yourself from the shackles of a proprietary UNIX platform and move to an open source computing model and Linux.

To see if your applications already run on SUSE Linux Enterprise Server, visit: www.novell.com/partnerguide

Novell: The Right Choice for Linux

However you choose to deploy Linux in your enterprise, you need a Linux distribution—and vendor—you can rely on. The optimal vendor will deliver the following:

- *An enterprise-ready Linux distribution that supports complex high-end applications*
- *An OS that is flexible and interoperates with your existing heterogeneous infrastructure*
- *Value-added software and tools to simplify Linux deployment and management*
- *A comprehensive support ecosystem—including technical support, consulting, training, certification and partnerships—to support you before, during and after migration*

Novell meets these criteria, combining advanced Linux technology with more than 20 years of experience in enterprise-ready



“Oracle has made a long-term commitment to enabling Linux adoption in the enterprise, so mac can be confident that SUSE Linux Enterprise Server is a sound investment for the future.”

Eduard Puchner

CIO
FRITZ EGGGER GmbH & Co.



“With Oracle 10g on SUSE Linux Enterprise Server, we have a cutting-edge solution that provides the stability and reliability our users demand, with a relatively low cost of ownership.”

Manuel Machado

Information Systems Manager
for Engineering Faculty
University of Porto

Supported Hardware:

- Dell*
- EMC*
- Fujitsu Siemens* Computers
- HP*
- IBM*
- Network Appliance
- SGI*
- Sun*
- Unisys*

Supported Chip Architectures:

- AMD 64
- IBM POWER*
- IBM S/390*
- IBM System z*
- Intel Xeon processors
- Intel® Itanium® processors
- Intel® 64 architecture
- x86

Supported Databases:

- IBM DB2*
- MySQL*
- Oracle* 8
- Oracle 9i
- Oracle 10g
- Oracle RAC
- PostgreSQL*

Supported Cluster File Systems:

- OCFS2
- PolyServe
- Veritas

SUSE Linux Enterprise Server is backed by Novell and optimized for multi-core Intel architecture. With global scale and a wealth of enterprise experience, this combination of software and hardware has an established track record of success in the data center.



“We completed the implementation in a surprisingly short time frame. It helped that SUSE Linux Enterprise Server ships with technologies that make it easy to install across large numbers of systems across a campus.”

Dr. James Murray

*Cluster Manager and Research Scientist
Centre for Astrophysics and Supercomputing, Swinburne University of Technology*

software, support and services. SUSE Linux Enterprise Server from Novell is a high-powered Linux distribution for enterprise computing. It works with thousands of applications and provides the foundation for secure, reliable and cost-effective solutions. For all of these reasons—and an unmatched support ecosystem—Novell is the clear choice to help you reap the benefits of open source computing and to expand your use of Linux.

Enterprise-ready Linux

SUSE Linux Enterprise Server is an enterprise-quality server designed to handle mission-critical workloads in the data center. It offers an open, scalable, high-performance data center solution that comes with application security, virtualization and integrated systems management across a full range of hardware architectures. Supported and certified by the world's leading hardware and software vendors, SUSE Linux Enterprise Server is backed by award-winning Novell technical support and a global ecosystem of partners and services. SUSE Linux Enterprise Server is deployable as a general-purpose server, or it can be tailored to run a variety of specialized workloads, and it offers seamless interoperability with your existing data center infrastructure.

With advanced memory management and processor support, Native POSIX Thread Library and advanced I/O capabilities, SUSE Linux Enterprise Server rivals UNIX systems in performance and scalability for large-scale server deployments:

- SUSE Linux Enterprise Server shows great performance on systems with multi-core Intel processors.
- According to HP, “solid performance evidence [indicates] that with almost no tuning, the Linux kernel scales well on systems with 32 cores and beyond running typical commercial workloads, and on systems with 64 cores and beyond running typical HPC [high performance computing] workloads.”⁴ It can also be massively scaled out: On specific Intel Itanium systems it scales to 4,096 processors and supports up to 10 TB of RAM.
- SUSE Linux Enterprise Server supports the latest network-acceleration technologies to gain network performance for I/O intensive applications (Intel® QuickData Technology).

Open source technologies—including Linux—are constantly evolving. Novell is a Linux vendor that's already ahead of the curve when it comes to product quality and open source innovation. And, with hundreds of talented open source engineers, Novell contributes heavily to key open source projects, including the Linux kernel, Linux-HA (Heartbeat* v2), Xen, GCC*, YaST, Mono®, the GNOME* and KDE* desktops, Novell Evolution™, AppArmor®, Mozilla*, OpenOffice.org and Samba*.

Interoperability and Flexibility

Almost all data centers have some combination of Linux, UNIX and Windows OSs. Each year about 20 percent of the UNIX installed base migrates to Linux, Windows, another UNIX platform, or another platform. More than 500,000 UNIX systems are migrated each year, and more than 80 percent of the migrated UNIX systems end up on Linux and Windows.⁵

As a data center director, you want maximum interoperability among your systems. If you migrate your UNIX platforms to SUSE Linux Enterprise Server, you will receive the benefits of an excellent Linux distribution coupled with high interoperability with Windows systems:

⁴ Gartner report G00152086. “What is Third-Generation Linux,” October 2007.

⁵ IDC, UNIX Migration: Market Analysis and End-User Survey Results.

- **Virtualization.** *SUSE Linux Enterprise Server includes integrated Xen virtualization at no extra cost. Managed by YaST or Novell ZENworks Virtual Machine Management, Xen supports bi-directional virtualization with Microsoft Hyper-V*, Microsoft Virtual Server 2005 R2, Windows Server* 2003 R2 and Windows Server 2008. With this interoperability, you can run SUSE Linux Enterprise Server on Windows Server 2008 and Windows Server 2008 on SUSE Linux Enterprise Server—with near-native performance and with full support from both Novell and Microsoft.*
- **Heterogeneous systems management.** *WS-Management provides interoperability for managing mixed environments of SUSE Linux Enterprise Server and Windows Server. UNIX systems are more difficult to manage with Windows in a heterogeneous environment.*
- **Directory and Identity federation.** *You will benefit from improved identity interoperability and improved access control between Microsoft and Novell products and IT resources managed with either Novell eDirectory™ or Microsoft Active Directory*. Your authorized users can seamlessly access Web-based systems whether their user accounts principally reside in Novell eDirectory or Microsoft Active Directory.*
- **Committed partnership.** *A recent interoperability agreement between Novell and Microsoft ensures that SUSE Linux Enterprise and Windows solutions will work well together now and in the future. You can be certain that Windows and SUSE Linux Enterprise will cooperate to help your business grow.*

Migrating your UNIX systems to SUSE Linux Enterprise Server enhances flexibility and interoperability in your IT environment, but that's just the beginning. Such a move also allows you to consolidate your systems and reduce the number of platforms through the Novell desktop to data center strategy. UNIX does not play well in the desktop space, and Windows is not able to meet the RAS

requirements of a mission-critical workload typically reserved for UNIX. SUSE Linux Enterprise can fill both needs.

Integrated Security

Today's enterprises are expected to be 24x7x365 operations. Maximizing uptime can mean the difference between winning and losing business. SUSE Linux Enterprise Server helps you keep your systems up and running by providing a multitude of security-related services, ranging from antivirus programs to network firewalls. It provides something extra with the inclusion of AppArmor from Novell, an enterprise-class application security solution. AppArmor protects the OS and its applications from the harmful side effects of attacks, malicious applications and viruses. So whether an attack originates internally or externally, SUSE Linux Enterprise Server helps protect server integrity, reduce administration costs and avoid downtime-related business losses.

High Availability and Clustering

SUSE Linux Enterprise Server is designed for mission-critical use and minimal downtime. With its high-availability features, your IT administrators can rely on hot-plug services to change hard disks, processors and other components at runtime and use the administration console to configure clustered-server deployments.

SUSE Linux Enterprise Server also includes a robust High Availability Storage Infrastructure. This solution binds multi-node failover (Heartbeat v2) with a clustered file system (Oracle Cluster File System 2, or OCFS2) and a cluster-aware volume manager (Enterprise Volume Management System, or EVMS). Together, these integrated components enable you to support business-critical workloads previously reserved for traditional UNIX and mainframe systems. Without this solution, you would have to purchase a number of expensive proprietary components, and then integrate them in a way that prevents



“The Novell team behind SUSE Linux Enterprise has a strong focus on stability and security, making the platform extremely well-suited to the business environment. It is reassuring for us and for our customers that Novell ships SUSE Linux Enterprise Server with a seven-year warranty. And with SUSE Linux Enterprise, we can complete patches and upgrades in minutes, not the hours typically required by other operating systems.”

“The key benefit of running the same operating system on all our machines is that it enables us to realize cost savings, not just in terms of software licensing, but hardware, too. SUSE Linux Enterprise gives us complete independence in our choice of hardware vendor, so we can always buy the best-value machines at any given time. What's more, Linux offers very high performance on standard x86 processor technology, so we do not need to invest in more expensive proprietary chipsets.”

Norbert Diehl

*Head of IT
MTU Aero Engines*

conflicting administration operations from affecting shared storage.

The High Availability Storage Infrastructure has also been validated by SAP LinuxLabs as a multi-node high availability solution for SAP applications. In other words, it's a proven, robust, enterprise-class solution that offers tremendous value without adding any cost—something that no UNIX vendor or competing Linux vendor can provide.

SUSE Linux Enterprise Server is the only enterprise-class Linux server to:

- *Ship a fully integrated multi-node, high-availability solution at no extra cost. Heartbeat v2 is part of SUSE Linux Enterprise Server and supports up to 16 nodes simultaneously (tested case).*
- *Allow the integrated cluster software to be easily installed and configured, using the YaST setup tool.*
- *Provide cluster-aware multipath fault tolerance for a wide variety of industry-standard storage subsystems.*
- *Run Oracle Real Application Clusters (RAC) out of the box, with no need to update the OCFS2 file system—a capability no other vendor can provide.*
- *Offer a proven high availability stack for SAP applications that has been validated by SAP LinuxLabs.*

Virtualization

With SUSE Linux Enterprise Server 10, Novell offered the first enterprise-class Linux platform to support Xen 3.0 for virtualization. The Xen code and management tools ship as part of SUSE Linux Enterprise Server, and the embedded virtualization features in Intel processors let you take maximum advantage of them. With Xen, you can run multiple network infrastructure applications on the same piece of hardware with minimal performance impact, getting the optimal benefit from the latest multi-core Intel processors.

Intel® Virtualization Technology (Intel® VT) offers IT the flexibility to make more efficient use of the data center, offering peak load responsiveness for the unpredictability of newly virtualized applications. By removing the need for resource-intensive software-based translation between the Xen hypervisor and the server hardware, Intel VT helps you optimize server utilization, reduce server sprawl and lower costs.

Simplified Administration

Novell delivers outstanding Linux management capabilities, integrating unique tools that drive down your cost to deploy, update and manage Linux throughout its lifecycle and address the challenges emerging in today's data center:

- *YaST, the administration, configuration and deployment tool integrated in SUSE Linux Enterprise Server, is used to configure every aspect of the server. If you are adding users or configuring applications—such as DNS, Apache* Web servers, Samba file shares or Xen-based virtual servers—YaST can help. Because it is an open source solution, many third-party companies have provided YaST plug-ins so that you can easily administer their applications, too. For example, SUSE Linux Enterprise Server 10 ships with YaST plug-ins for both SAP and Oracle applications and databases.*
- *AutoYaST is an extension to YaST that automates installation to a large number of machines. AutoYaST saves a tremendous amount of time because installations can be performed in parallel and without user intervention.*
- *SUSE Linux Enterprise Server seamlessly integrates with Novell Customer Center so that customers and partners can easily manage their subscriptions and support entitlements. This approach ensures uninterrupted access to software updates and security patches.*

- *SUSE Linux Enterprise Server has adopted the open common information management (CIM) standard as a vendor-independent framework for system management. This allows other CIM-enabled system management solutions to easily work with SUSE Linux Enterprise Server systems.*
- *As enterprise networks grow, Novell ZENworks Linux Management can be used to augment the YaST tools and provide centralized control of any Linux system in the enterprise. ZENworks Linux Management can provide desktop lock-down, imaging, remote control, inventory and software management, efficiently managing systems and lowering IT costs.*
- *ZENworks Orchestrator and ZENworks Virtual Machine Management from Novell provide high-level virtualization management capabilities—another advantage for SUSE Linux Enterprise Server. ZENworks Orchestrator allows you to manage a group of physical servers—not just Novell servers—and virtual machines (VMs) in a data center. ZENworks Virtual Machine Management provides for failover of VMs in some scenarios, live migration for paravirtualized guests, a host-based management interface for VM management, saving and restoring of paravirtualized guests, automatic balancing of VMs across physical nodes, a well-designed management interface for the whole of the data center, and cross-platform VM management. The ZENworks Virtual Machine Management tool is interoperable with VMware ESX*, and it can manage VMware ESX 3 VMs when the customer has VMware's Virtual Center installed. Overall, it can manage Xen, Microsoft Hyper-V and VMware VMs.*

Novell also provides an array of advanced networking services and cross-platform identity and access management solutions. These solutions—combined with an integrated service-oriented architecture (SOA) environment—can help you rapidly expand your use of Linux into complex business applications.

Comprehensive Support Ecosystem

Linux gives you the technology advantage, and choosing Novell as your vendor gives you the business advantage. In fact, 80 percent of Fortune 500 companies are Novell customers. With Novell, you have an entire ecosystem of services focused on your success. Novell is the only vendor that provides all of these services for Linux today, giving you the edge over competitors:

- **Technical services and support.** *Novell and our partners have the Linux expertise to provide you with the confidence and peace of mind knowing that should technical issues arise, you will be assisted by the industry's finest. Novell experts are available to give you the support you need, when you need it—online, on the phone or on-site. In addition to the highly trained and experienced Linux support teams in our global support centers, Novell has an expansive field team in every region of the world, ensuring the highest levels of availability and responsiveness.*
- **Business and IT consulting.** *Novell Consulting® is a team of highly skilled professionals with a mission to ensure you get the maximum value from your Novell investment. We help you minimize implementation time, reduce risk and get rock-solid performance.*
- **Training and certification.** *Novell Training Services prepares you and your technical staff with the education and expertise needed to take advantage of the growing business and career opportunities promised by the increasing adoption of Linux in the enterprise. From customized training to certification, advanced instruction and events, Novell Training Services delivers the full spectrum of training elements that contribute to your continued success.*
- **Extensive partner network.** *Novell has a broad technology partner network with more than 1,300 members, all of whom*

can help you deploy SUSE Linux Enterprise Server, no matter the size of your organization.

■ **Certified hardware and software.**

Certifications on or for an OS are essential for productive and secure operation. Only the complete certification of a solution stack—that is, integrated certifications for hardware, OSs and software—creates the type of data center security needed to run centralized applications. Novell partners offer thousands of certified software and hardware products for SUSE Linux Enterprise Server.

With options for businesses of all sizes, this comprehensive set of Linux-focused guarantees and programs enables you to deploy Linux successfully and with confidence.

Making the Move: Low Costs, Limitless Possibilities

Linux saves you money—lots of it—but it does more than that: It opens exciting new opportunities for growth. With the money you won't be spending on UNIX, you can explore strategic initiatives, fund critical research or recruit talented IT personnel. When you choose SUSE Linux Enterprise Server over UNIX, you get an extraordinarily well-engineered platform from a vendor that delivers a global ecosystem surrounding it.

When you choose Novell, you get:

- *The most robust, scalable and powerful Linux platform on the market*

- *A data center solution that fits seamlessly into your existing environment*
- *Value-added software that simplifies deployment and management of your Linux infrastructure*
- *A broad selection of open-source and closed-source software optimized to run on a Linux platform*
- *Technical support available 24x7x365 from more than 800 support technicians*
- *A consulting organization that will support you from design through implementation*
- *Training that can bring your IT staff up to speed on the latest technologies*
- *Thousands of partners who deliver the hardware and software solutions you need*

Moving your infrastructure services, enterprise applications and essential databases to Linux is no longer a shot in the dark. Novell is here to help in whatever capacity you need, whether it's through enterprise-caliber software, superior support, a broad selection of services or all of the above. You deserve expertise and answers tailored to your company, and above all, you deserve a vendor that will exceed your expectations and partner with you every step of the way. Novell is that company—start planning your move to Linux today.

For more information, visit: www.novell.com/unixtolinux/

“Support is absolutely critical for us because downtime at the wrong time of day will cost us a lot of money very fast. We have a heterogeneous environment with a lot of moving parts, so having access to immediate enterprise support from Novell is mandatory.”

Norbert Their
Manager of Server Systems
SIG

www.novell.com



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1 801 861 1349 Worldwide
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