

SUSE[®] Linux Enterprise Server 10

June 2006
v3

SUSE® Linux Enterprise 10.....	3
SUSE Linux Enterprise Server 10.....	3
Quick Profile	4
Features and Benefits	4
Changes in SUSE Linux Enterprise Server 10.....	9
Detailed Feature List.....	9
Pricing.....	16
System Requirements.....	17
Additional Resources	18
Summary.....	18
About Novell	18

SUSE® LINUX ENTERPRISE 10

SUSE Linux Enterprise 10 is an open, flexible and secure platform that is ready to host the applications and databases critical to your business—from the desktop to the data center, across a wide variety of workloads. The SUSE Linux Enterprise platform is tightly integrated with Novell solutions for systems management, identity management and workgroup services, and it also utilizes open standards, which simplifies integration with your existing IT environment.

With SUSE Linux Enterprise, your organization can better address the challenges of increasing competition, spiraling costs, growing security threats and demanding customers. When performance, reliability and world-class support really matter, organizations choose SUSE Linux Enterprise from Novell®.

SUSE Linux Enterprise 10 includes the following components:

- **SUSE Linux Enterprise Server.** The most reliable, secure and scalable enterprise Linux server, designed to run mission-critical applications in the data center.
- **SUSE Linux Enterprise Desktop.** The only enterprise-quality Linux desktop on the market, designed for the general purpose business user.
- **Novell Customer Center.** One location to obtain support, updates and renewals for all your SUSE Linux Enterprise product subscriptions.

Novell ZENworks® Linux Management is not part of the platform but is frequently discussed as a significant value-added patch-and-update tool that integrates into Novell Customer Center.

In the future, Novell will release additional products built on top of the SUSE Linux Enterprise 10 platform, including SUSE Linux Point of Service 10 and Novell Open Enterprise Server 2.

SUSE LINUX ENTERPRISE SERVER 10

With more than 1500 enhancements, new features and updates, SUSE Linux Enterprise Server 10 is the latest version of the world's best-engineered Linux* server.

SUSE Linux Enterprise Server is an enterprise-quality server designed to handle mission-critical workloads in the data center. Developed and backed by Novell, only SUSE Linux Enterprise Server 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. SUSE Linux Enterprise Server is deployable as a general-purpose server or can be tailored to run a variety of specialized workloads, and it offers seamless interoperability with your existing data center infrastructure.

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. With SUSE Linux Enterprise Server, businesses can dramatically reduce costs while deploying the most secure and reliable data center server on the market.

openSUSE™, SUSE Linux 10.1 and SUSE Linux Enterprise Server

- **openSUSE** is a worldwide community project, sponsored by Novell, that promotes the use of Linux. Through this project, everyone in the community has free and easy access to the popular SUSE Linux distribution.
- **SUSE Linux (formerly SUSE Linux Professional) 10.1** is a packaged version of the openSUSE project. It's released every eight months, and because it contains previews of new open source projects, it is

suitable for the Linux enthusiast. Novell provides 90 days of free installation support but does not provide support beyond that period. Also, Novell does not certify hardware or software for production use with SUSE Linux 10.1.

- **SUSE Linux Enterprise Server 10** is the certified and supported enterprise-class Linux distribution from Novell. Businesses of all sizes confidently choose SUSE Linux Enterprise Server because of its quality and because it's backed by the global Novell technical support network. Additionally, Novell has more than 1000 third-party hardware, software and implementation partners that are ready to help customers successfully deploy SUSE Linux Enterprise Server solutions.

QUICK PROFILE

Key Features in SUSE Linux Enterprise Server 10

- **Integrated virtualization.** Virtualization was first introduced in the 1960s to allow partitioning of mainframe hardware, and it has been a mainstay of high-end server environments ever since. SUSE Linux Enterprise Server 10 is armed with the Xen hypervisor and integrated management tools to support multiple virtual machines on commodity hardware. This gives data center administrators new levels of flexibility and agility in their environments at no additional charge.
- **Superior application security.** SUSE Linux Enterprise Server has long provided a multitude of security-related services, ranging from anti-virus programs to network firewalls. Version 10 provides something extra with the inclusion of Novell AppArmor™ enterprise-class application security. AppArmor protects the operating system and its applications from the harmful side effects of attacks, malicious applications and viruses. So no matter if an attack originates internally or externally, SUSE Linux Enterprise Server 10 ensures server integrity, reduces administration costs and prevents downtime.
- **Comprehensive systems management.** Many systems administrators will tell you that installing and configuring a single server is trivial, but it becomes a daunting task when scaled across the enterprise. SUSE Linux Enterprise Server 10 ships with a comprehensive set of administration, configuration and deployment tools that ease the burden of system maintenance and subscription management..
- **Cost-effective storage foundation.** Governance legislation has been just one component in the seemingly exponential growth of data storage in recent years. Traditionally, that need has been met by proprietary data systems, which come at a steep price. SUSE Linux Enterprise Server 10 addresses enterprise storage needs by being the *first* enterprise-class Linux distribution to deliver a fully integrated, high-availability (HA) storage foundation composed entirely of open source components—at no additional cost.

FEATURES AND BENEFITS

New Feature Summary

- Integrated virtualization
- Superior application security
- Comprehensive systems administration and management
- Cost-effective storage foundation

Enhancement Summary

- Industry-leading performance and scalability
- Reliability and high availability
- Versatile storage management
- Flexible application developer services and SDK
- Broad range of server services

Integrated Virtualization

Virtualization is almost as old as enterprise computing itself. First introduced in the 1960s to allow partitioning of mainframe hardware, it has been a mainstay of high-end proprietary server environments ever since. Today,

virtualization is once again a hot topic in the data center because several emerging virtualization technologies have the potential to improve resource utilization, efficiency, scalability and manageability for commodity hardware systems.

One of those technologies is the Xen hypervisor open source project. Armed with Xen virtual machines on commodity hardware, data center administrators hope to create new levels of flexibility and agility in their environments at a lower total cost of ownership.

Enterprises can take advantage of integrated Xen-based virtualization in SUSE Linux Enterprise Server 10 to:

- Increase server utilization by consolidating physical servers and applications, thus lowering hardware, maintenance and electrical costs.
- Increase business continuity and system uptime by migrating disparate workloads onto virtual machines without interruption.
- Leverage excess data center capacity and improve response times by balancing computing loads across data center resources at peak times.
- Redeploy physical server resources. Customers can migrate server workloads to virtual farms and release physical resources that can be redeployed for other uses.
- Provide application portability and flexibility across hardware platforms.

SUSE Linux Enterprise Server 10 is the *first* enterprise-class Linux server to:

- Fully support Xen 3.0 virtualization on both 32- and 64-bit x86-based architectures.
- Offer support for both paravirtualization through the Xen hypervisor and full virtualization support through partners like VMware* for Xen 3.0.
- Support both Intel* VT and AMD*-V chipsets. In fact, SUSE Linux Enterprise Server 10 is the first operating system of *any* type to support Intel VT and AMD-V.
- Offer fully graphical and command-line virtual machine management tools for easy VM administration and configuration.

Superior Application Security

Software flaws in applications that are exposed via the Internet can allow attackers to compromise systems that host critical data. Perimeter security only solves part of the problem, and firewalls do little to protect against the growing number of threats that originate from within company walls.

As a result, IT organizations regularly patch their servers to protect against the latest threats; however, this reactive security strategy still leaves businesses dangerously exposed. With experienced hackers becoming faster at exploiting security vulnerabilities, businesses often have little or no time to download, test and apply security patches to their systems.

The most effective solution is to use application security in addition to other security best practices. Application security, such as that provided by the Novell AppArmor technology integrated with SUSE Linux Enterprise Server 10, allows systems administrators to specify the files that a program may access and the operations that that program may perform on the files. Any other behavior beyond that scope is denied and logged.

SUSE Linux Enterprise Server 10 provides enterprise-class application security that protects the operating system and its applications from the harmful side effects of attacks, malicious applications and viruses. It does this by creating a firewall around applications. If an application is compromised by an intruder, damage is not permitted outside the “application firewall.” No matter where an attack originates—internally or externally—

SUSE Linux Enterprise Server 10 allows enterprises to ensure data integrity while reducing system administration costs and preventing downtime.

SUSE Linux Enterprise Server 10 is the *only* enterprise-class Linux server to:

- Provide out-of-the-box application security at no extra cost.
- Provide automated application-profiling and policy-creation tools that simplify application security administration and configuration. Security policies can be created and deployed in minutes, not days.
- Provide the best-performing application security solution. (The performance overhead is significantly lower than that of SELinux, which ranges between 7 and 16 percent).
- Permit dynamic policy updates without an interruption in service. Any change to SELinux security policies requires the system to be taken down and rebooted. No reboot is necessary when changing an AppArmor policy.
- Offer a complementary solution that assists in enterprisewide policy deployment. Novell ZENworks Linux Management (ZLM) has been enhanced so that it can manage AppArmor security policy administration as part of centralized systems management strategy.

Comprehensive Systems Management Capabilities

For most IT professionals, administering a small network is not particularly challenging. Adding extra servers, peripherals or users can be trivial, but this gets much harder as the network grows. Different types of networks such as Windows*, UNIX* and Linux need to interoperate. Security vulnerabilities need to be continually monitored, and patches need to be applied as soon as they are available. Finally, as the business grows, more applications are deployed, which requires more servers and even more maintenance.

The systems management tools included in SUSE Linux Enterprise Server address these challenges:

- SUSE Linux Enterprise Server 10 ships with a unique set of server administration, configuration and deployment tools (called YaST and autoYaST) that ease the burden of system maintenance. What makes YaST unique is that it is used to configure every aspect of the server. So no matter if you are adding users or configuring applications—such as DNS, Apache Web servers, Samba fileshares or Xen virtual servers—YaST is there to help. YaST is also open source, and 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*. AutoYaST is an extension to YaST that automates installation to a large number of machines. AutoYaST saves a significant amount of time because installations can be performed in parallel and without user intervention.
- SUSE Linux Enterprise Server 10 seamlessly integrates with Novell Customer Center so that customers and partners can easily manage their subscriptions and support entitlements. This ensures uninterrupted access to software updates and security patches.
- SUSE Linux Enterprise Server 10 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 run on 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 over any system in the enterprise. ZENworks Linux Management can provide desktop lockdown, imaging, remote control, inventory and software management, efficiently managing systems and lowering IT costs¹.

¹ The full Novell ZENworks family provides support for Windows, Linux and NetWare® environments and gives companies control over the operating systems in their environment, affording a quantifiable ROI of more than 1,012 percent.

Cost-effective Storage Foundation

In recent years, governance legislation has been just one component in the seemingly exponential growth of data storage. As data volumes grow, organizations need effective data-storage management solutions to ensure business continuity and data integrity. Traditionally, that need was met by proprietary data systems, which came at a high price.

Today, SUSE Linux Enterprise Server 10 addresses enterprise storage needs by being the *first* enterprise-class Linux server to:

- Deliver a fully integrated, high-availability (HA) storage foundation composed entirely of open source components, at no additional cost. SUSE Linux Enterprise Server 10 is the *only* enterprise Linux server to bind multi-node failover (Heartbeat 2) with a clustered file system (Oracle Cluster File System 2 or OCFS2) and a “cluster aware” volume manager (enterprise volume manager or EVMS).
- Provide management tools that make it easy to configure storage for mission-critical workloads such as LAMP stacks, Oracle Real Application Clusters and Virtual Server (Xen) images.
- Run Oracle RAC out of the box. Although OCFS2 has been accepted in the mainline kernel stream and is now part of other distributions, the version in SUSE Linux Enterprise Server 10 has been enhanced. Customers can install Oracle RAC directly on SUSE Linux Enterprise Server without having to update the OCFS2 file system. Other distributions that pull OCFS2 from the mainline kernel stream must first patch their systems before installing RAC.
- Support OCFS2 on all of its architectures (from 32-bit x86 to mainframe z390x).

Industry-leading Performance and Scalability

With advanced memory management and processor support, native POSIX Thread Library (NPTL) and advanced I/O capabilities, SUSE Linux Enterprise Server 10 rivals RISC/UNIX systems in performance and scalability for large-scale server deployments.

Here are a few SUSE Linux Enterprise Server 10 fast facts:

- SUSE Linux Enterprise Server 10 performs up to 15 percent faster on systems with multi-core processors (as compared to SUSE Linux Enterprise Server 9).¹
- SUSE Linux Enterprise Server 10 is massively scalable—it scales to 1,024 processors and supports up to 10 TB of RAM.
- SUSE Linux Enterprise Server 10 supports the latest network acceleration technologies to gain network performance for I/O-intensive applications (Intel I/O AT).

Reliability and High Availability

According to a 2004 survey completed by Gartner Symposium attendees, CIOs and IT directors said that reliability was the most important feature when selecting new computing systems. Today's enterprises are expected to be 24x7 operations. Maximizing uptime can mean the difference between winning and losing business. SUSE Linux Enterprise Server 10 maximizes the probability that systems will remain up and running.

SUSE Linux Enterprise Server 10 is architected for mission-critical use and minimal downtime. With its high-availability features, IT administrators can rely on Hotplug services; change hard disks, processors and other periphery at runtime; cluster IP aliases for non-cluster-aware applications; and use the administration console to configure clustered-server deployments.

SUSE Linux Enterprise Server 10 is the *only* enterprise-class Linux server to:

1 Internal Novell testing

- Ship a fully integrated, multi-node, high-availability solution at no extra cost. Heartbeat 2 is now part of SUSE Linux Enterprise 10.
- 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.

Versatile Storage Management

In recent years, many enterprises have seen a significant increase in data volumes, in terms of both production and retention. As a consequence, enterprises are continually seeking cost-effective storage methods.

iSCSI is a new technology that combines SCSI, Ethernet and TCP/IP to create simple, yet powerful IP-based storage area networks (SANs). iSCSI SANs provide a high-speed, low-cost, long-distance storage solution for Web sites, service providers and enterprises.

iSCSI delivers several key advantages because it:

- Builds on stable and familiar standards.
- Creates a SAN with a reduced total cost of ownership. Installation and maintenance costs are low since the TCP/IP suite can use commodity hardware, which reduces the need to hire specialized personnel.
- Enables Ethernet transmissions to travel over the Global IP Network, eliminating any distance limitations.
- Provides a high degree of interoperability by reducing disparate networks and cabling, and by using regular Ethernet switches instead of special Fibre Channel switches.
- Scales to 10 Gigabit. This is comparable to OC-192 SONET (Synchronous Optical Network) rates in Metropolitan Area Networks (MANs) and Wide Area Networks (WANs).

SUSE Linux Enterprise Server 10 is the *only* enterprise-class Linux server to:

- Provide graphical iSCSI management tools that facilitate easy configuration of both iSCSI initiators on clients and iSCSI targets on servers.
- Support iSCSI as both initiator and target.
- Integrate iSCSI with an open source storage foundation to provide high availability for mission-critical workloads such as LAMP stacks, Oracle Real Application Clusters, and virtual server (Xen) image stores.

Flexible Application Developer Services and Software Development Kit (SDK)

The IT environment is continually changing, and each new software development paradigm displaces the last with new languages and updated techniques. The challenge for developers is to learn new skills and implement new applications, while maintaining their “legacy” applications.

The SUSE Linux Enterprise 10 platform is the *only* enterprise-class Linux distribution to:

- Deliver a single SDK that is shared between both the server and desktop products, to provide the ultimate in developer flexibility.
- Support a broad variety of open development tools and runtime environments. So whether you’re using Apache or Ruby, Java* or .NET, C or Fortran, you have the right toolset to create Linux-compatible applications.
- Support Mono® tools and runtimes. Developers can use their existing .NET knowledge and skills to develop Linux-compatible applications.
- Offer IBM Apache Geronimo for Java Enterprise development.
- Provide a “build” service infrastructure so that developers can automatically create their own RPM packages based on SUSE Linux. Typically, packages can be built for various SUSE Linux architectures with a single command. (This is available at www.opensuse.org.)
- Provide custom distribution-configuration and deployment tools such as distribution CD creators.

CHANGES IN SUSE LINUX ENTERPRISE SERVER 10

If you have a current subscription to SUSE Linux Enterprise Server 9, then your expectations are high—and you won't be disappointed. SUSE Linux Enterprise Server 10 has all the hallmarks of an enterprise-class operating system from Novell. It includes the latest technologies—for example, Xen virtualization and Novell AppArmor—while still maintaining top levels of performance, security, manageability and reliability. Best of all, because it is delivered as a subscription model, you can upgrade from SUSE Linux Enterprise Server 9 to SUSE Linux Enterprise Server 10 at no additional charge as long as your SUSE Linux Enterprise subscription is paid and up to date.

In addition to the already highlighted feature changes, current SUSE Linux Enterprise Server 9 users will notice a few minor differences in SUSE Linux Enterprise Server 10:

Changes

- The default user interface is now Gnome*. Users who prefer KDE will need to select that option during system installation.
- The default Gnome installation “hides” the YaST icon. Just select “more applications” and search for YaST. Once you find it, drag the icon to the main toolbar, and you'll never “lose” YaST again.
- MIT Kerberos is now a default.
- “Standard” is the default server subscription, and it now includes 12x5 telephone support for your server.

Deprecated Features

- User Mode Linux
- Linux threads (because they are not compatible with NPTL glibc threads)
- Heimdal Kerberos
- SELinux
- S/390 technical support for 31-bit systems
- JFS
- All proprietary kernel modules

DETAILED FEATURE LIST

Integrated Virtualization

Xen 3.0 Hypervisor— Virtual Machine Monitor (VMM)	Runs many smaller virtual machines (VMs) on a single server, each with a separate operating system and application instance.
Processor architectures	Provide support for SMP x86 and SMP x86-64 systems. They also provide virtual SMP support for virtual servers, virtual block-device support and virtual network-interface support.
Native hardware support	Fully supports AMD-V and Intel VT hardware.
Administration interface	Creates virtual machine profiles and configures individual virtual servers with a fully integrated YaST module.

Guest operating systems	Run multiple SUSE Linux Enterprise Server 10 guest servers on the same SUSE Linux Enterprise Server 10 host server. In the future, SUSE Linux Enterprise Server 10 will support modified guest operating systems for SUSE Linux Enterprise Server 9, Red Hat* Enterprise Linux and NetWare. When used with Intel VT or AMD-V, SUSE Linux Enterprise Server 10 will support unmodified guest operating systems for Microsoft* Windows and Sun Solaris*.
-------------------------	--

Strong Application Security Services

Novell AppArmor 2.0	<p>Provides easy-to-use Linux security software that protects Linux servers and applications from malicious threats. Novell AppArmor features:</p> <ul style="list-style-type: none"> • YaST-integrated tools for easy configuration, maintenance and security-policy generation • Pre-defined security policies for many standard Linux programs and services • Robust reporting and alerting capabilities to facilitate regulatory compliance <p>Version 2.0 features:</p> <ul style="list-style-type: none"> • CIM-enabled clients that integrate with industry-standard management consoles • Novell ZENworks Linux Management integration for profile distribution and report aggregation • Enhanced auditing and reporting
MIT Kerberos 5 release 1.4.3	Uses secret-key cryptography to provide strong authentication for client/server applications.
Snort 2.4.3	Provides a lightweight network-intrusion detection system to enhance overall security. Snort performs protocol analysis and content searching and matching. It can also be used to detect a variety of attacks and probes, such as buffer overflows, stealth port scans, CGI attacks, SMB probes, OS fingerprinting attempts and much more.
Advanced Intrusion Detection Environment (AIDE) 0.10	Enhances security by performing data-integrity assurance with the file-manipulation monitoring system.

Comprehensive Systems Administration and Management

YaST2	Covers a wide range of management tasks and has been enhanced to deliver a consistent management experience across the entire SUSE Linux Enterprise platform.
CIM management	Delivers an open Web-based Enterprise Management (WBEM) Common Information Model Object Manager (CIMOM) as well as a variety of CIM

	providers for consumption by management frameworks.
LiMAL management library	Provides a common operating system interface for use by management utilities such as YaST, CIM and third-party tools.
Directory integration	Gives all organizations—both small and large—a choice of LDAP-compliant directory services, including: <ul style="list-style-type: none"> • Microsoft Active Directory* • OpenLDAP • Novell eDirectory™
SPident	Queries the RPM database and matches each installed package against all known service packs (SPs). Only the newest SP, the one that does not contain any out-of-date packages, is marked as being "installed."
Intelligent Platform Management Interface (IPMI) 1.4.19	Uses IPMItool to monitor health, inventory and remote power control of OpenIPMI 1.4.19 compatible servers.
iprutils 2.1.2	Includes a suite of utilities to manage and configure small computer system interface (SCSI) devices supported by the ipr SCSI storage device driver. Version 2.1.2 contains utilities for the IBM Power Linux RAID adapters.
net-snmp 5.3.0.1	Provides tools and libraries relating to Simple Network Management Protocol (SNMP). These resources include an extensible agent, an SNMP library, tools to request information from SNMP agents, and tools to generate and handle SNMP traps.

Cost-effective Storage Foundation

Oracle Cluster File System 2 (OCFS2)	Runs in shared Oracle home installations and makes the management of Oracle Real Application Cluster (RAC) installations easier. The following features are new in OCFS2: <ul style="list-style-type: none"> • Node and architecture local files that use Context Dependent Symbolic Links (CDSL) • Support on all architectures • Network-based pluggable Distributed Lock Manager (DLM) • Journaling Block Device (JBD) • Improved performance of meta-data operations • Improved data caching and locking
Heartbeat 2.0.5	Provides core cluster membership and messaging infrastructure. It implements the Open Clustering Framework APIs and provides services for node fencing, fault isolation and health monitoring.

	<p>The following features are new in Heartbeat 2.0.5:</p> <ul style="list-style-type: none"> • YaST enhancement to configure more than two-node failover • Sub-second failure detection • I/O data-integrity checks that are performed before resources are moved to alternate nodes • Failed nodes' "return to action" feature can be set to "automatic" or "manual"
Enterprise Volume Management System (EVMS)	Provides a cluster-aware tool that can administer storage through a single mechanism. Administrators can use EVMS to manage RAID*, LVM, various file-system formats, disk-checking and maintenance, bad-block relocation and more.

Industry-leading Performance and Scalability

CPU scalability	Scales to 512 processors on most standard architectures and up to 1024 processors on IA-64 systems.
CPU performance and scheduler enhancements	<p>Provide hyperthreading, which enables multi-threaded server software applications to execute threads in parallel within each individual server processor. This feature dramatically improves transaction rates and response times.</p> <p>In addition, system resource affinity table (SRAT) improvements increase multi-core performance by up to 15 percent.</p>
CPUSET	Delivers lightweight kernel objects (CPUSETs) that enable users to partition their multiprocessor machines in terms of CPUs. CPUSETs are strong "jails," meaning that processes running on predefined processors won't be able to run on other processors.
Pluggable I/O scheduler	<p>Improves performance and allows administrators to tune the server to match its usage with four I/O behavior policies:</p> <ul style="list-style-type: none"> • Complete Fair Queuing (CFQ): This default scheduler is suitable for a wide variety of applications, especially desktop and multimedia workloads. • Deadline: The deadline I/O scheduler implements a per-request service deadline to ensure that no requests are neglected. Deadline policy is best for disk-intensive database applications. • Anticipatory: The anticipatory I/O scheduler uses the deadline mechanism plus an anticipation heuristic to predict the actions of applications. The anticipation heuristic is best suited for file servers. • No-Op: This no-operation mode does no sorting at all and is used only for disks that perform their own scheduling or that are randomly accessible.
Intel I/O Acceleration Technology	Provides a kernel that supports networking acceleration technology from Intel. Customers using Intel server chipsets will experience increased network performance.

Memory limits	<p>Offer the following scalability:</p> <ul style="list-style-type: none"> • 10 TB in production for 64-bit architectures • Large memory support on 32-bit machines through efficient memory management (anon-vma and objrmap) • Up to 1 GB Highmem support on x86 systems • Up to 4 GB with Physical Address Extensions (PAE) support on x86 systems
---------------	---

Reliability and High Availability

Multipath I/O	<p>Enables greater load balancing and fault tolerance by simultaneously accessing storage devices through multiple “channels.” Multipath I/O tools include:</p> <ul style="list-style-type: none"> • multipath: scans the system for multipathed devices, assembles them, and updates the device-mapper’s maps • multipathd: waits for maps events and then executes multipath • devmap-name: provides a meaningful device name to udev for devmaps • kpartx: maps linear devmaps to device partitions <p>Version 0.4.6 improves support for EMC storage arrays.</p>
---------------	--

Versatile Storage Management

Network File System (NFS)	<p>Delivers network file-sharing capabilities for UNIX* and Linux installations. SUSE Linux Enterprise 10 supports NFS versions 2 and 3—and now also 4—over both UDP and TCP. Version 4 includes performance improvements, mandates strong security and introduces a “stateful” protocol.</p>
Distributed Replicated Block Device 0.7.15 (DRBD)	<p>Builds single partitions from multiple disks that mirror each other. Using this disk-management tool, performance is similar to a RAID1 system, but it runs over a network. DRBD 0.7.15 allows partition sizes to be changed at runtime.</p>
Internet Small Computer System Interface (iSCSI)	<p>Links data-storage facilities via local area networks (LANs), wide area networks (WANs) or the Internet.</p> <p>SUSE Linux Enterprise Server can act as both target and initiator. For example, SUSE Linux Enterprise Server can be used as a SAN box (target) or as an iSCSI client (initiator).</p>

Application Developer Services and SDK

Mono 1.1.13	<p>Accommodates developers who prefer to use .NET development skills. SUSE Linux Enterprise Server is the only distribution to include Mono.</p> <p>Mono 1.1.13 includes the following features:</p> <ul style="list-style-type: none"> • Optimized C# 2.0 compiler
-------------	--

	<ul style="list-style-type: none"> • Gtk# 2.0 • Mono debugger • System.Windows.Forms implementations • IronPython 0.9.6
Developer toolchain	<p>Delivers the latest developer toolchain with the following features:</p> <ul style="list-style-type: none"> • binutils 2.16.91 • GCC 4.1.0 • glibc 2.3.90 • GDB 6.4 • Tools for C, C++, Fortran77, Java, Ada and Objective-C
Non-uniform memory (NUMA) development tools	<p>Fine-tune applications for NUMA usage on both x86-64 (Opteron*) and IA-64 (Itanium*) systems.</p>

Server Services

Samba 3.0.22	<p>Provides authentication, file, print and Windows Internet Name Service (WINS) services for Microsoft Windows Client systems. Additionally, Samba allows a Linux client to integrate into existing Microsoft domains. With Samba 3.0.22, Linux clients can also join Active Directory domains and authenticate against Active Directory servers.</p>
Postfix 2.1.1 and Sendmail 8.12.10	<p>Provide mail serving. Postfix 2.1.1 is the default mail server for SUSE Linux Enterprise products. Sendmail 8.12.10 is available as an alternative and for backward compatibility.</p>
Internet Message Access Protocol (IMAP), specifically Cyrus IMAP Daemon 2.2	<p>Enhances data protection and generally runs on "sealed" servers.</p>
MySQL* 5.0	<p>Provides the popular open source database, now with rollback, crash recovery, low-level locking, database replication, clustering, full-text indexing and searching.</p>
PostgreSQL 8.1	<p>Offers another flexible and extensible open source database.</p> <p>The following features are new in PostgreSQL 8.1:</p> <ul style="list-style-type: none"> • Database roles that simplify the management of large numbers of users • IN/OUT parameters that improve support of complex business logic for J2EE* and .NET applications • Improved Two-phase Commit to support WAN applications, heterogeneous data centers and ACID-compliant transactions • Improved multiprocessor (SMP) performance

	<ul style="list-style-type: none"> • 64-bit shared memory to support up to 2 TB of RAM on 64-bit platforms
Apache Web Server 2.2.0	Deserves its reputation as the number-one HTTP server on the Internet. Apache 2.2.0 features a hybrid multi-process/multi-threaded implementation. It also supports extension modules for IPv6, filtering, multi-language error responses, simplified configuration and a new API.
Apache Geronimo	Delivers an open source Java Application Server from apache.org. Key features in Geronimo include: <ul style="list-style-type: none"> • J2EE 1.4 compatibility • New ASF code for a complete J2EE stack • Full Tomcat integration
Java 1.4	Provides the popular object-oriented development language. SUSE Linux Enterprise 10 ships with the Java 2 platform, version 1.4.2.
PHP 5.1	Provides a general-purpose scripting language that is especially suited for Web development. Key features in PHP 5.1 include: <ul style="list-style-type: none"> • Completely rewritten date-handling code, with improved timezone support • Significant performance improvements (compared to PHP 5.0.X) • Default enablement of the PHP Data Objects (PDO) extension • More than 30 new functions in various extensions and built-in functionality • Bundled libraries, PCRE and SQLite upgraded to latest versions • PEAR upgraded to version 1.4.5
Python	Delivers an object-oriented interpreted language that is often used for rapid development of cross-platform applications. SUSE Linux Enterprise Server 10 includes the current Python version along with bindings for QT, Gtk, LDAP, XML, MySQL, Tk and curses.
Tcl/Tk scripting tools	Enable the rapid development of cross-platform GUI applications.
Ruby	Provides an interpreted scripting language designed for quick and easy object-oriented programming. The latest version is suitable for many of the same processing tasks performed by Python or Perl.
Shell scripting	Delivers bash (default), ksh, tcsh and zsh in SUSE Linux Enterprise Server 10.
Orarun	Significantly simplifies Oracle configuration. With Orarun, you can: <ul style="list-style-type: none"> • Create Oracle users and groups • Set Oracle environment variables • Set Oracle-recommended kernel parameters • Automate the start and stop of Oracle system components • Rely on YaST integration
Suse-sapinit	Automatically or manually start and stop SAP-application components at system

startup, shutdown or reboot.

PRICING

SUSE Linux Enterprise Server 10 features flexible subscription-based pricing, available for a one- or three-year period. The subscription fee entitles customers to receive software updates and support¹ for the specified duration. The following pricing tables list SUSE Linux Enterprise Server 10 pricing options:

X86, AMD64, EM64T, IA64 and PPC Pricing Summary

Subscription Period Per Server	Basic <i>Web-based support, unlimited incidents</i>	Standard <i>12x5 unlimited incidents</i>	Priority <i>24x7 unlimited incidents</i>
One year	\$349	\$799	\$1,499
Three year	\$873	\$1,998	\$3,748

zSeries Pricing Summary

Subscription Period Per IFL	Basic <i>Web-based support, unlimited incidents</i>	Standard <i>12x5 unlimited incidents</i>	Priority <i>24x7 unlimited incidents</i>
One year	\$11,999	\$15,000	\$18,000
Three year	\$29,998	\$37,500	\$45,000

Please contact Novell if you require longer subscription periods or enterprisewide pricing options.

SUSE Linux Enterprise Server 10 Pricing Characteristics

- Simple pricing structure—choose the subscription period (one or three years), the architecture (x86, AMD64, EM64T, PPC, IA64 or zSeries) and the support level (basic, standard or priority)
- Easy-to-procure subscription that include updates *and* technical support
- Per-server pricing (or IFL, if zSeries)—no per-socket pricing
- All x86, AMD64, EM64T, PPC and IA-64 architectures are priced the same (zSeries systems are subject to a different pricing structure)
- No additional subscription cost for integrated application security (AppArmor)
- No additional subscription cost for integrated Xen virtualization
- No additional subscription cost for storage foundation (Heartbeat, OCFS2, EVMS and iSCSI)
- No additional subscription cost for Novell Customer Center access
- No additional subscription cost for running as a guest on native hardware VM partitions for PPC or zSeries

Availability

You can purchase SUSE Linux Enterprise Server 10 by visiting www.novell.com or by contacting a Novell Authorized Reseller or Solution Provider.

Technical Support

Novell provides enterprise-ready technical services and support to help you achieve your business objectives. Professional, flexible services are customer-focused—not product-driven—and backed by more than 20 years' experience in building and supporting technical solutions for the enterprise. The Novell global technical support team is the largest among all Linux vendors, and Novell is the only organization that offers comprehensive support for the entire Linux environment.

¹ Support is defined as telephone technical support.

Training

Novell Training Services is committed to the businesses that integrate Novell products and solutions. We provide a full spectrum of training opportunities to support Novell solutions and meet your business needs:

- Instructor-led training
- Online training
- Custom training
- Self-Study Kits
- QuickStart card

Consulting Services

Novell ConsultingSM provides customers with thought leadership, experience, best practices, methodologies and tools that ensure successful implementation of Novell solutions. Services include strategy, project management, architecture, development, training, support and managed services for heterogeneous environments. Expertise covers the gamut of Software for the Open Enterprise: data center, security and identity, resource management, workgroup and desktop solutions. In addition to ensuring a successful implementation, seasoned experts help minimize implementation time, reduce risk and maximize return on investment.

Partners

With more than 800 members in the Novell Technology Partner program, Novell offers a robust network of industry partners who stand ready to help you get the most from your Novell investment. 1,700 partners are certified on SUSE Linux Enterprise Server, and 2,400 are certified on other Novell products.

For more information on services associated with SUSE Linux Enterprise Server, please visit the following sites:

- Support services: http://support.novell.com/support_options.html
- Training: www.novell.com/training
- Consulting: www.novell.com/consulting

SYSTEM REQUIREMENTS

Minimum system requirements for installation

- Local installation: 512 MB RAM
- SSH-based network graphical installation: 512 MB RAM
- VNC-based network installation via FTP: 512 MB RAM

Minimum system requirements for operation

- 512 MB RAM (512 MB for 64 bit systems)
- 750 MB hard disk space for software
- 750 MB hard disk space for user data

Recommended system requirements

- 512 MB to 4 GB RAM, at least 256 MB per CPU
- 4 GB hard disk space
- Network interface (Ethernet or modem)

Supported processor platforms

- x86
- AMD64
- Intel EM64T

- Itanium Processor Family
- IBM POWER* (former IBM iSeries and IBM pSeries systems)
- IBM zSeries* (64-bit only)

ADDITIONAL RESOURCES

For more information on:

- SUSE Linux Enterprise 10, visit www.novell.com/linux
- SUSE Linux Enterprise Server 10, visit www.novell.com/products/linuxenterpriseserver
- SUSE Linux Enterprise Desktop 10, visit www.novell.com/products/desktop

SUMMARY

SUSE Linux Enterprise Server is an enterprise-quality server designed to handle mission-critical workloads in the data center. Developed and backed by Novell, only SUSE Linux Enterprise Server 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. SUSE Linux Enterprise Server is deployable as a general-purpose server or can be tailored to run a variety of specialized workloads, and it offers seamless interoperability with your existing data center infrastructure.

When performance, reliability, and world-class support really matter, organizations choose SUSE Linux Enterprise Server as an essential part of their data center strategy.

ABOUT NOVELL

Novell, Inc. (Nasdaq: NOVL) delivers Software for the Open Enterprise™. With more than 50,000 customers in 43 countries, Novell helps customers manage, simplify, secure and integrate their technology environments by leveraging best-of-breed, open standards-based software. With over 20 years of experience, more than 5,000 employees, 5,000 partners and support centers around the world, Novell helps customers gain control over their IT operating environments while reducing cost.

Find more information about Novell by visiting www.novell.com or by calling the Novell Customer Response Center at 888 321 4CRC (4272). Members of the press should visit www.novell.com/pressroom.

Copyright © 2006 Novell, Inc. All rights reserved. Novell, the Novell logo, NetWare, Mono, SUSE and ZENworks are registered trademarks, AppArmor, eDirectory, openSUSE, and Software for the Open Enterprise are trademarks, and Novell Consulting is a service mark of Novell, Inc. in the United States and other countries.

* Linux is a registered trademark of Linus Torvalds. All other third party trademarks are the property of their respective owners.