IBM System z
Introduction
November 2009

The Enterprise Linux Server

Frequently Asked Questions

Worldwide

IBM

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IBM Enterprise Linux Server

Question:

What is the IBM Enterprise Linux® Server?

Answer:

The IBM Enterprise Linux Server (ELS) is a uniquely powerful and comprehensive solution for virtualizing, consolidating and managing Linux workloads that offers:

- Single-server simplicity with saving opportunities in software and management costs, power and floor space.

- Advanced resource utilization and dynamic allocation through industry leading virtualization and sharing of system resources such as processors, communication, memory, storage, I/O and networking.

- Massive scalability, running up to thousands of virtual Linux servers concurrently.

- Rock-solid system security and ensured isolation and protection of each virtual server environment.

The Enterprise Linux Server delivers a cost effective and dynamic platform to grow your business into the 21st century. It includes a customized hardware configuration designed to meet your specific business needs, combined with virtualization software.

Question:

What are the key benefits of the Enterprise Linux Server?

Answer:

In short, the Enterprise Linux Server (ELS) can benefit you by freeing your business from IT complexity and improving the responsiveness of your systems and your people. The ELS helps you extract the maximum value from your IT budget through software, operations, power and space savings, as well as providing rock-solid security and virus-resistance while delivering legendary system availability.

The ELS helps you to incrementally grow an enterprise Linux infrastructure, with mission-critical qualities of service, with pricing starting as low as $40 per image per month over a three-year period*?

* Based on IBM and client experiences. Results can vary based on workload type and capacity utilization.

Question:

How can the Enterprise Linux Server help transform to a dynamic infrastructure?

Answer:

With the Enterprise Linux Server, you can transform your IT infrastructure to a flexible, dynamic infrastructure that provides high-level resource utilization, an extensive set of virtualization management features and cost-attractive business resilience and failover solutions. Now you can standardize your IT infrastructure to virtual Linux servers on one physical server, minimizing the number of operating systems – Microsoft® Windows® and multiple UNIX® versions – and the number of physical servers.

The infrastructure, delivered through the Enterprise Linux Server is designed to provide:

- Virtualization for rapid deployment, configuration and management of virtual Linux servers;
- Open and industry standards;
- Fast data access and sharing of all resources for high utilization efficiency to integrate data and applications;
- Robust security, built-in from bottom to top;
- Workload and systems management for dynamic responses of a large variety of workloads;
- Resilience and availability with high qualities of service to run mission-critical applications.

The Enterprise Linux Server delivers a Linux-ready virtualization infrastructure to "do more with less".

Question:

What are the unique advantages of the Enterprise Linux Server as opposed to Linux running on other server platforms?

Answer:

The Enterprise Linux Server provides unique advantages through the exploitation of the leading capabilities of the virtualization software and the server hardware:

- Single-server simplicity
    - Low power, cooling, and floor space requirements
    - Saving opportunities in software costs through less licenses
    - Saving opportunities in management costs through Single Point of Control for administration and operation
    - Internal, very fast communication capabilities
    - Reduced IT complexity
- Advanced resource utilization and dynamic allocation
    - Scale-up, share-everything system architecture
    - Resources can be dynamically shared or reconfigured
    - Over-commit system resources at high levels
    - Create and deploy virtual Linux servers in minutes rather than days
- Rock-solid system security and ensured isolation and protection
    - Take advantage of certified security
    - Well-known for its strong security features
    - Virus and intrusion resistance
    - Virtual server images are totally isolated and protected
- Massive workload consolidation capability
    - Virtual growth instead of physical expansion on x86 or RISC servers
    - Proven horizontally and vertically scalability
    - Run from tens to thousands of virtual Linux servers on a single physical server without adding costs associated with new server footprints
    - Run workloads with very large resource requirements on one physical server

The advantages position the Enterprise Linux Server to run and manage many and mixed mission-critical workloads concurrently – a got fit for a server consolidation and virtualization infrastructure.

Question:

What components constitute the Enterprise Linux Server?

Answer:

- The Enterprise Linux Server includes IBM hardware and IBM software components.
- zRewards program points can be redeemed for IBM services (**ibm.com**/systems/migratetoibm/systems/z/rewards.html).
- Linux is not included. Linux can be ordered from the Linux distributors Novell SUSE or Red Hat. Both Linux distribution partners provide specific offerings for the Enterprise Linux Server.

Question:

What hardware is included in the Enterprise Linux Server?

Answer:

You can choose from the IBM System z10™ family of servers, an IBM System z10 Business Class™ (z10 BC™) or an IBM System z10 Enterprise Class (z10 EC™) server.

The Enterprise Linux Server includes an IBM System z10 server with processors, memory and I/O connectivity; the details are:

- 1 processor* minimum on z10 BC (maximal 10 processors), 1 processor minimum on z10 EC (maximal 64 processors)
- 16 GB memory per processor
- 2 FICON® ports on z10 BC, 5 FICON ports on z10 EC
- 2 OSA ports on z10 BC, 2 OSA ports on z10 EC
- 3 years maintenance for the z10™ server and all components (1 year warranty and 2 years pre-paid)

Additional hardware can be included optionally.

* Linux processors on an Enterprise Linux Server are named "Integrated Facility for Linux (IFL)".

Question:

What software is included in the Enterprise Linux Server?

Answer:

The Enterprise Linux Server includes virtualization software:

- z/VM® Version 5
- z/VM Version 5 features:
  - z/VM Directory Maintenance Facility
  - z/VM Resource Access Control Facility
  - z/VM Performance Toolkit for VM™
  - z/VM RSCS Feature

- Three to five years Subscription and Support (S&S)
  - Three to five years z/VM S&S - z/VM Version 5
  - Three to five years z/VM S&S - Directory Maintenance Facility
  - Three to five years z/VM S&S - Resource Access Control Facility
  - Three to five years z/VM S&S - Performance Toolkit for VM
  - Three to five years z/VM S&S - RSCS Feature S&S

Linux is <u>not</u> included in the IBM solutions; it can to be ordered from the Linux distributors Novell SUSE or Red Hat. Both distributors provide specific offerings for the Enterprise Linux Server.

Additional IBM software can be included optionally.

Question:

Do I have to take all of the products and features of the Enterprise Linux Server?

Answer:

No. You can determine which of the recommended products and features you need to implement your solution, and take only those products.

Question:

What benefits does the z/VM virtualization software provide?

Answer:

The z/VM virtualization software enables to run a large number of Linux server images on a single Enterprise Linux Server. It provides an ideal platform for integrating applications and data and consolidating select UNIX, Microsoft Windows, and Linux workloads deployed on many physical servers onto a single physical server, while maintaining the same number of distinct logical server images.

Reducing the amount of physical servers may result in cost savings realized by managing large server farms deployed on virtual Linux servers instead of many physical servers.

When using z/VM virtualization software, virtual backup Linux servers, hot standby Linux servers and other Linux servers that would require physical resources in competitive environments require minimal resources when not in use.

New Linux server images can be deployed in minutes and resources can be reclaimed quickly when they are no longer needed.

Virtual Linux servers residing on an Enterprise Linux Server can share data and applications, and be managed and controlled from a central point, thus reducing complexity. z/VM software provides particular value in this area by having the capability to host the whole development life cycle of servers from development, test, training, to production.

Also, z/VM software can virtualize hardware cryptographic features so they can be shared by many Linux servers for clear key RSA (SSL) acceleration. z/VM software can balance this cryptographic load across multiple features and should one cryptographic feature fail or be brought offline, z/VM software can transparently shift a Linux server to use an alternate feature, without user intervention.

Question:

Where do I find information about the specific Linux distributor offerings for the Enterprise Linux
Server?

Answer:

The Linux distributors provide their information on the following Web pages:

- Novell SUSE: www.novell.com/mainframe/els

- Red Hat: www.redhat.com/rhel/server/mainframe/promo

Question:

Is the Enterprise Linux Server available globally?

Answer:

Yes.

IBM Middleware and Solutions

Question:

Which IBM middleware products are available for the Enterprise Linux Server?

Answer:

There many IBM middleware products available today from the DB2® family, Lotus® family, Rational® family, Tivoli® family and WebSphere® family, and new products are added constantly.

Question:

What are "best fit" solutions/software products available to be used with the Enterprise Linux Server?

Answer:

"Best fit" solutions/software products available with the Enterprise Linux Server (ELS) to support following major solution areas:

- **Web Serving, Web Application Serving** and **Web 2.0,**
  The ELS is an excellent choice for customers who wish to re-host Web applications that have been running on competitive hardware.

- WebSphere on the ELS is no more difficult to deploy than WebSphere on competitive systems. You can still use the logical competitive architecture model, but gain the advantage of a single physical model that is closer to the existing data since it is on the same server.
  Many popular Web 2.0 applications for the types of Wikis, Blogs or Content Management Systems run on Linux, using open source components like Apache, PHP, Perl, Ruby and Dojo (Ajax).

- **Business Intelligence and Data Warehousing**
  IBM Cognos® Business Intelligence combined with the IBM Information Server and other IBM information management products, such as IBM DB2, IBM DataQuant™, IBM DB2 Alphablox®, allow you to build a comprehensive Information On Demand / "Information as a Service" solution.

- **Data Serving**
  Enable high volume of transactions through the ELS strengths in I/O throughput, scalability and availability, combined with the broad range of information management software for Linux. DB2, Oracle, Informix®, and mySQL are available databases for the ELS.

- **Collaboration and E-mail**
  An ELS provides an attractive infrastructure which can support a variety of customer requirements from simple messaging to sophisticated collaboration / groupware implementation. IBM Lotus Domino™ is a security-rich collaboration platform that helps users work more efficiently, supporting industry standards.

- **Application Development**
  The ELS is capable of isolating multiple execution environments, therefore one or more virtual Linux servers can be easily created for each developer, isolated from other developer or production servers.

- **Backup Consolidation**
  Backup consolidation replaces backup islands onto enterprise class ELSs, disk and tape systems, which are more reliable and more cost-effective than smaller components.

- **Patch & Software Distribution**
  Patch distribution and management is a function available with Tivoli Provisioning Manager for the ELS, which is probably the most important part of the day-to-day systems management activities. And even more, using the ELS as the hub for enterprise-wide systems management can help to simply the efforts for provisioning and configuration of servers and virtual servers, operating systems, middleware, applications and more.

- **Security**
  The ELS offer an attractive foundation on which to build a comprehensive IT security infrastructure. Numerous security applications and tools are available from IBM and other ISVs that provide a complete and cost-effective security infrastructure.

- **Infrastructure Servers**
  The ELS excels in doing the work of many smaller servers on a single physical ELS. Many of the smaller servers are the so called 'Infrastructure' servers such as file, print, DNS, FTP, NFS, security, etc.

- **Systems Management**
  The ELS can help to optimize IT resources, simplify systems management and reduce the complexity, costs, and efforts associated with today's heterogeneous IT environment. IBM Tivoli products for the ELS include a comprehensive suite of solutions that include products to monitor and manage workloads. In addition, providing the functions necessary to manage and maintain the virtual Linux servers is a key element in running a highly efficient and successful optimized infrastructure (Workload Management for Linux on ELS with z/VM, Performance Toolkit for VM).

- **Application Deployment**
  Some products provide an application development and deployment environment to develop on non-Linux and deploy the application on Linux. Some offer migration and bridging components to move modern enterprise applications to Linux.

Question:

Does IBM maintain a list of software vendor products that are being offered for Linux on the ELS?

Answer:

Yes. You can access a list of software developer products available for Linux on ELS via the Web page: **ibm.com**/systems/z/solutions/isv/linuxproduct.html

Since this list could not cover all products, we recommend to search in the Global Solutions Directory: www-304.**ibm.com**/jct09002c/gsdod/homepage.do

Here a pre-generated link for the applications available for Linux on ELS: www-304.**ibm.com**/jct09002c/gsdod/searchprofile.do?name=Linux_for_System_z_English

Please note, the information on these Web pages has been provided to IBM by the Software Developers and is subject to change. Any dates presented as future deliverable dates for General Availability are also subject to change as well at any time. Any questions on these products or specific delivery dates should be addressed to the supplier of those products.

Support, Services and Education

Question:

From which companies, IBM or the distributors, can I buy support services for Linux on the Enterprise Linux Server? Do I have a choice?

Answer:

Yes. You can choose whom you wish to provide support services for Linux.

IBM Global Services does offer IBM Operational Support Services – Support Line for Linux on Enterprise Linux Server.

You have to contact the Linux distribution partners Novell SUSE or Red Hat for a description of their service and support offerings.

Question:

What kind of support is available by the IBM Operational Support Services – Support Line for Linux?

Answer:

IBM Operational Support Services – Support Line for Linux which provides comprehensive around-the-clock enterprise-level remote usage and defect support for distributions of the Linux operating system. Support Line provides telephone or electronic access to our highly-trained technical support specialists, who can serve as your one source for remote software support services.

Highlights
- High-quality technical support for IBM and select multivendor software including the Linux operating system and Linux clusters
- A supplement to your internal staff with IBM's skilled services specialists
- Fast, accurate problem resolution to help keep your IT staff productive
- Options for enhanced coverage and a single interface for remote support
- Software support for non-IBM platforms
- Includes software defect support
- Leverages IBM alliances with Red Hat and Novell
- Support for your international environment
- Support Line is designed to offer the kind of support that best suits your environment.

For more information, visit: **ibm.com**/services/us/index.wss/so/its/a1000030

Question:

What services are available for Linux on the Enterprise Linux Server?

Answer:

IBM Server and Technology Group offers the following specific Lab Services for Linux on the Enterprise Linux Server (equates to Linux on System z) and z/VM software:

- z/VM and Linux on IBM System z Health Check
- Linux on System z Services

Question:

What education is available for the Enterprise Linux Server environment?

Answer:

The following classes are designed to introduce you to Linux and give you the hands-on experience you need to install and configure Linux on an Enterprise Linux Server.

Linux Implementation for System z – ZL100

Learn how to install Linux on System z and dramatically increase the number of applications available to your System z. Learn about Linux on System z distributions, installation and administration, preparing you to exploit the newest operating system.

Installing, Configuring and Servicing z/VM for Linux Guests – ZV062

Learn to perform a basic Input/Output (I/O) configuration, initial installation, define new virtual machines, define and save segment, configure TCP/IP, and apply service to your z/VM software for the support of Linux guest operating systems.

Advanced Solutions for Linux on System z – ZL150

Learn to prepare your Linux for System z system for a production environment. Install middleware products, set up a Samba solution for file and print servers and clone Linux instances. Also, discuss alternative authentication methods, hardening Linux, and methods for backing up data.

z/VM and Linux Connectivity and Management – ZV100

Learn to perform TCP/IP tailoring of HiperSockets™ and guest Local Area Networks (LAN) for support of a Linux guest system and to configure MPROUTE for the support of dynamic routing in the z/VM TCP/IP environment. Learn to install and configure Real Time Monitor (RTM), Full Screen Operator Console (FCON) and Programmable Operator (PROP) for the system management environment on z/VM software. This course also covers many topics in the areas of connectivity and system management.

z/VM RACF® and DIRMAINT™ Implementation - ZV200

Learn how to implement DirMaint in a z/VM 5.1.0 system environment, how to define additional DirMaint administrators, and how to create and modify virtual machines using DirMaint commands. Also, discuss defining password attributes and expiration dates for DirMaint controlled virtual machines.

Linux System Administration I: Implementation – LX030

If you are an experienced Red Hat, Fedora, or SUSE Linux user, learn the techniques, methods and policies in both Red Hat and SUSE Linux system administration.

Linux Network Administration I: TCP/IP and TCP/IP Services – LX070

Learn to be an effective network administrator for Linux. Learn the fundamentals of TCP/IP and Linux networking. Become productive in setting up or running a network that uses Linux systems. Learn how to perform TCP/IP network configuration and administration on Linux systems and how to detect and solve problems in a TCP/IP environment.

Linux Network Administration II: Network Security and Firewalls – LX240

Learn how to set up and administer a Linux-based firewall.

Linux as a Webserver (Apache) – LX250
Learn to install, configure, and use the Apache package, to provide Web services for intranet and/or Internet networks.

Linux Integration with Windows (Samba) – LX260
Learn to install, configure, and use the Samba package to share files and printers from a Linux system on a Windows-based Local Area Network (LAN). Also, learn about Windows NT®/2000 domain membership and domain control.

Information Sources

Question:

What are the information resources for the IBM Enterprise Linux Server?

Answer:

Web pages	
Enterprise Linux Server	**ibm.com**/systems/z/os/linux/els.html
Linux on System z	**ibm.com**/systems/z/linux
Linux on System z: White papers, Articles, FAQs, Performance papers	**ibm.com**/systems/z/linux/library
Linux on System z: Redbooks® and Redpapers	www.redbooks.**ibm.com** Searching for "Linux AND System z": www.redbooks.**ibm.com**/cgi-bin/searchsite.cgi?Query=Linux AND System z&SearchOrder=4
z/VM virtualization software	www.vm.**ibm.com**
IBM System z10 Enterprise Class (z10 EC)	**ibm.com**/systems/z/hardware/z10ec
IBM System z10 Business Class (z10 BC)	**ibm.com**/systems/z/hardware/z10bc
IBM STG Lab Services for System z	**ibm.com**/systems/services/labservices/platforms/labservices_z.html
IBM Global Services	**ibm.com**/services
IBM Education Services	**ibm.com**/services/learning
IBM Global Finance	**ibm.com**/financing

ZSQ03043-USEN-00