IBM System z
August 2012

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 IT Optimization and cloud computing. It provides an IT infrastructure for consolidation, re-deployment and new Linux® workload deployment.

The ELS is particularly suitable for deploying Linux workloads from x86 and UNIX® architectures, because its uniquely powerful capabilities offer:

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

- Massive scalability, 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.

These capabilities allow running up to thousands of virtual Linux servers with different workloads concurrently on one physical ELS, which can result in a significant IT simplification.

Another unique powerful ELS capability is its

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

- The ELS hardware is the world's only server with the highest level of hardware security certification, Common Criteria Evaluation Assurance Level 5 (EAL5).

- With its built-in protection, availability is a given for the Enterprise Linux Server. Unlike distributed systems – for instance a cluster with one machine backing up another and an additional failover machine – peace of mind comes included in the price.

Bottom-line: the Enterprise Linux Server delivers a cost effective and flexible Linux platform to grow your business into the 21st century. It includes a customized IBM System z® hardware configuration combined with IBM virtualization software.

Question:

What are the key benefits of the Enterprise Linux Server?

Answer:

The Enterprise Linux Server (ELS) provides an IT infrastructure for consolidation of applications and servers, re-deployment of existing workloads and new workload deployments that is integrated, automated and secured.

The ELS based IT infrastructure fits with the new era IBM calls Smarter Computing, which is designed for data - handle big data and makes it possible to generate insight from the data, tuned to the task - helps transforming the economics of the IT, and managed in the cloud - delivers IT services without boundaries.

The ELS is addressing IT optimization through industry-leading virtualization and outstanding server capacities, which provide unmatched scalability, high levels of availability and security, as well as operational efficiency.

The complexity of maintaining large numbers of x86 or UNIX server environments, even when virtualized, can be relieved with a single ELS.

In short, the 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, and lower operational costs by up to 50% versus a distributed infrastructure[1].

Question:

What are the potential savings when consolidating to an Enterprise Linux Server?

Answer:

Linux workload consolidation onto an EL can:

- Result in reduced energy costs by 80 percent and lower overall solution acquisition costs by 60 percent compared to x86 alternatives [1]
- Provide up to 90% reduction is software costs[2]
- Deliver a virtual Linux server for under $0.70 per day[1]
- Let you pay less as you consolidate more.

Question:

How can the Enterprise Linux Server help transform to smarter computing?

Answer:

The ELS is designed to provide you a smarter IT infrastructure for Linux workloads through:

- Open and industry standards,
- Virtualization for rapid deployment, configuration and management,
- Fast data access and resource sharing for high utilization efficiency,
- Workload and service management for dynamic responses,
- Robust security, built-in from bottom to top,
- Options for business resilience and failover solutions,
- Availability with high qualities of service to run mission-critical applications.

With the ELS, 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.

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 IBM System z server hardware and the IBM virtualization software:

- Single-server simplicity
  - Saving opportunities in software costs through less licenses
  - Saving opportunities in management costs through Single Point of Control for administration and operation
  - Low power, cooling, and floor space requirements
  - Internal, very fast communication capabilities, allows to reduce the physical network
  - Bootom line: Reduced IT complexity
- Advanced resource utilization and dynamic allocation
  - Share-everything system architecture
  - Resources can be dynamically shared and reconfigured
  - Over-commitment of system resources at high levels
  - Create and deploy virtual Linux servers in minutes
- Massive workload consolidation capability
  - Large-scale 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
  - Run workloads with very large resource requirements on one physical server
- 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

These advantages position the Enterprise Linux Server to run and manage many and mixed Linux workloads concurrently – a got fit for IT optimization and cloud computing.

Question:

What components constitute the Enterprise Linux Server?

Answer:

The Enterprise Linux Server includes IBM System z hardware, hardware maintenance, IBM virtualization software components and software support & subscription.

- Hardware options:
- You can choose from the IBM System z family of servers, the recently announced IBM zEnterprise® EC12 (zEC12), IBM zEnterprise 114 (z114), IBM zEnterprise 196 (z196), 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 z server with processors (Integrated Facility for Linux (IFL[3]) is the name of the dedicated and attractive-priced Linux processor on System z), memory and I/O connectivity. The detailed server configurations are:

  - ELS based on a zEC12:
    - 6 IFL processors minimum (maximal 101 IFLs),
    - 32 GB memory per IFL (except in cases where the configuration increment rules don't support),
    - 24 FICON® ports,
    - 8 OSA ports

  - ELS based on a z114:
    - 2 IFL processors minimum (maximum 10 IFLs)
    - 24 GB memory per IFL up to 5 IFLs; 32 GB memory per IFL for 6 IFLs to 10 IFLs
    - 8 FICON ports
    - 8 OSA ports

  - ELS based on a z196:
    - 6 IFL processors minimum (maximal 80 IFLs),
    - 32 GB memory per IFL (except in cases where the configuration increment rules don't support),
    - 24 FICON ports,
    - 8 OSA ports

  - ELS based on a z10 BC:
    - 2 IFL processors minimum (maximal 10 IFLs),
    - 16 GB memory per IFL,
    - 8 FICON ports,
    - 8 OSA ports

  - ELS based on a z10 EC:
    - 6 IFL processors minimum (maximal 64 IFLs),
    - 16 GB memory per IFL,
    - 24 FICON ports,
    - 8 OSA ports
- 3 years maintenance for the System z server and all hardware components (1 year warranty and 2 years pre-paid).

  - *Additional hardware components can be included optionally with all options.*
- Virtualization software:
  - z/VM® Version 6 or z/VM Version 5
  - z/VM 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 6 or 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

Additional IBM software can be included optionally.

- **Linux is not included.** Linux can be ordered from the Linux distributors Red Hat or SUSE. Both Linux distribution partners provide specific offerings for the Enterprise Linux Server.

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:

- Red Hat: www.redhat.com/products/enterprise-linux/for-ibm-system-z

- SUSE: www.novell.com/partners/ibm/mainframe

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 ELS. 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 ELS, while maintaining the same number of distinct logical server images.

Virtual Linux servers residing on an ELS 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.

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

In addition, z/VM software can virtualize hardware cryptographic features, therefore many Linux servers can share them 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.

For detailed information about the outstanding z/VM functions and features refer to: z/VM Data Sheet.

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.

IBM Software and Solutions

Question:

Which IBM software is available for Linux on the Enterprise Linux Server?

Answer:

IBM software is available from the Information Management and Business Analytics families, Lotus® family, Rational® family, Tivoli® family and WebSphere® family, and new products are added constantly.

The latest information about IBM software available for the "Red Hat Enterprise Linux (RHEL)" versions and "SUSE Enterprise Linux Server (SLES)" versions for System z are available via the IBM Software Product Availability tool (http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/productsOnOs.html).

Question:

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

Answer:

"Best fit" solutions/software products are:

- **Data Serving**
  The ELS strengths in I/O throughput, scalability and availability can be leveraged with the broad range of information management software for Linux, such as IBM DB2®, Oracle Database, Informix®, and mySQL.

- **Business Intelligence & Analysis, Data Warehousing and Master Data Management**
  IBM Cognos® Business Intelligence combined with IBM SPSS® and the IBM InfoSphere® software and other IBM information management products, such as DB2, IBM DataQuant™, IBM DB2 Alphablox®, allow you to build a comprehensive solution for critical, information intensive business problems.

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

- **Application serving**

  Many independent software vendors, like SAP, offer their products on Linux on the ELS as well. Often it is a simple re-compile of the Linux software to get it run on an ELS.

- **Collaboration and E-mail**

  From simple messaging to sophisticated collaboration/groupware implementations, the IBM Lotus family offers a comprehensive software set for these workloads: Domino® provides a world-class platform for critical collaboration and messaging applications. Quickr™ delivers a new user experience for efficient management of team and company content. Connections is social software for business, and Sametime® offers real-time communication services.

- **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, for a quick rebuild for development and test servers for example, isolated from other developers or production servers. As well, the Rational Software Development Platform provides a comprehensive, well-integrated development platform.

- **Infrastructure Servers**
  More with less, and because the ELS excels in doing the work of many smaller servers on a single physical server, many clients run a mix of business workloads and small infrastructure servers, such as file, print, DNS, FTP, NFS, security, as well as WebSphere MQSeries® and DB2 Connect™ to leverage the ELS advantages.

- **Asset Management**

  The IBM Maximo® Asset Management software available for the ELS unifies comprehensive asset life cycle and maintenance management on a single platform. Maximo software is used as a single point of management for every aspect of a wide range of services.

- **Business Process Management**

  IBM Business Process Management software available for the ELS, such as the Business Process Manager, WebSphere Business Monitor or the FileNet® Business Process Manager provide visibility and insight to manage business processes.

- **Enterprise Content Management**

  The Enterprise Content Management solutions help companies realize the strategic value of content for better business insight and outcomes. Products, like FileNet Content Manager, Content Manager and Content Manager On Demand, deliver high value solutions that can help companies transform the way they do business by enabling them to put content in motion throughout the entire lifecycle.

- **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 software vendors that provide a complete and cost-effective security infrastructure.

- **Backup Consolidation**
  Backup consolidation can replace backup islands onto the ELS, with disk and tape systems, which are more reliable and more cost-effective than smaller components.

- **Service Management – Cloud Computing**
  IBM Tivoli software offer a comprehensive solution suite to manage workloads as a cloud. The solution is designed to benefit from cloud computing on the ELS. The operational efficiency is delivered through the standardization, automation and virtualization of services. The workloads above can be managed in a cloud on an ELS.

- **Recently announced IBM Industry Solutions running on ELS**
  - IBM Health Plan Integration Hub
  - IBM Intelligent Operations Center for Smarter Cities
  - IBM Smarter Analytics: Anti-Fraud, Waste and Abuse Solution
  - IBM Smarter Analytic Signature Solution: Anti-Fraud, Waste and Abuse
  - IBM Genelco Insurance Administration Solution

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/partnerworld/gsd/homepage.do

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 Linux 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 Support Line for Linux on Enterprise Linux Server.

  IBM is delivering high quality, reliable, comprehensive remote support. We have established strategic alliances with both Red Hat and SUSE and we are one of the largest commercial contributors to Linux. We offer a full portfolio of flexible Linux remote support services including Support Line for Linux with Linux Subscription, which authorizes you, access to the distributor's version of Linux and to maintenance packages, updates and upgrades. The service provides unlimited calls for unlimited callers and assistance with:

  – Linux usage and installation
  – Compatibility and interoperability issues
  – Product documentation
  – Problem determination and resolution
  – Software fix plans
  – Support from the IBM change team for software defects, including emergency fixes

  For more information, visit: ibm.com/linux/services.html

- The Linux distributors offer support, you can explore the extent of their support services via:

  – Red Hat support services
  – SUSE support services

Please contact the Linux distribution partners for further questions about their service and support offerings.

Question:

What are the IBM tested and supported Linux distributions for an ELS?

Answer:

The latest information can be found on the Tested platforms Web page (ibm.com/systems/z/os/linux/resources/testedplatforms.html).

Note: You can get an Enterprise Linux Server based on a zEnterprise or a System z10 server.

Question:

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

Answer:

▪ IBM Systems Lab Services and Training offers specific Services and Training Kits: Training and services designed (and priced) to match your requirements (ibm.com/systems/resources/sysserv_linuxonsystemz_kits.pdf).

IBM Global Services offers Linux services as well. The latest information can be found on the Services Web page for Linux on System z (ibm.com/systems/z/os/linux/support/services.html).

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 , Code: ZL100

– z/VM and Linux Boot Camp , Code: ZL000

– Advanced Solutions for Linux on System z (Red Hat) , Code: ZL160

– Advanced Solutions for Linux on System z (SUSE) , Code: ZL150

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

– Linux Basics - A System z Perspective , Code: ZL120

– z/VM Introduction and Concepts , Code: ZV020

– z/VM RACF® and DIRMAINT™ Implementation , Code: ZV200

The latest information can be found on the Linux on System z Education Web page (ibm.com/systems/z/os/linux/education).

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, FAQs, Performance papers, etc.	**ibm.com**/systems/z/os/linux/resources/doc_wp.html
Linux on System z: Redbooks®and Redpapers	**ibm.com**/systems/z/os/linux/resources/doc_redbks.html
z/VM virtualization software	www.vm.**ibm.com**
IBM System z servers	zEC12: **ibm.com**/systems/z/hardware/zenterprise/zec12.html z114: **ibm.com**/systems/z/hardware/zenterprise/z114.html z196**:** **ibm.com**/systems/z/hardware/zenterprise/z196.html z10 BC: **ibm.com**/systems/z/hardware/z10bc/index.html z10 EC: **ibm.com**/systems/z/hardware/z10ec/index.html
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

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[1] Distributed server comparison is based on preliminary IBM internal measurements and projections and subject to change. Given there are multiple factors in this analysis such as utilization rates, application type, local pricing, etc., savings may vary by user.
[2] When using z/VM virtualization to consolidate and manage Oracle software.
[3] Integrated Facility for Linux (IFL): ibm.com/systems/z/os/linux/solutions/ifl.html

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