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**IBM System z  
Introduction  
October 2009**

# **Linux on IBM System z**

Frequently Asked Questions

Worldwide



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## Linux on System z

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### Question:

What are today's requirements on an IT infrastructure?

### Answer:

Today's IT infrastructure should be build as a dynamic infrastructure which aligns business and IT assets and to supports the overall goals of the business.

A dynamic infrastructure ...

- Integrates visibility, control, and automation across all business and IT assets;
- Is highly optimized to do more with less;
- Addresses the information challenge;
- Manages and mitigates risks;
- Utilizes flexible delivery choices like clouds.

A dynamic infrastructure can help improve service, reduce cost and manage risk, while accelerating growth in your business.

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### Question:

How can Linux® on IBM System z® help transform to a dynamic infrastructure?

### Answer:

The infrastructure, delivered through the Linux on System z environment 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: hardware, virtualization, operating system and applications.
- 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 synergistic combination of Linux, z/VM® virtualization software and the dramatically increased capabilities of the IBM System z10™ servers provide capabilities that can help transform your IT to a dynamic infrastructure.

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### Question:

What are the unique advantages of Linux on System z as opposed to Linux running on other hardware platforms?

### Answer:

Linux on System z allows for massive consolidation through the exploitation of the leading capabilities of the z/VM virtualization software and the System z servers:

- Linux benefits from the industry-leading z/VM virtualization technologies, virtualizing the amount of system resources to up to thousands of virtual servers.
- Linux benefits from the dynamic and intelligent workload and systems management capabilities, built-in z/VM and the server hardware.

- Linux benefits from the outstanding security, robustness and processes of the mainframe.
- Linux benefits from the enormous System z10 server capacity, the resource sharing and high resource utilization.
- Linux benefits from the internal communication capabilities offered by z/VM and the System z10 servers.
- Linux benefits from the low power, cooling, and floor space requirements of a System z10 server.

The advantages position Linux on System z to run and manage many and mixed mission-critical workloads concurrently – a got fit for a server consolidation infrastructure.

**Question:**

What are the Linux benefits from the IBM mainframe virtualization technologies?

**Answer:**

IBM mainframe industry-leading virtualization technologies – z/VM software and System z servers - enable a substantial IT infrastructure optimization. Customers can run from tens to thousands of virtual Linux servers on a single IBM System z10 server – easily deployed and maintained without adding costs associated with new server footprints in distributed environments.

The benefits are:

- Massive workload consolidation capability.
- Virtual growth instead of physical expansion on Intel® or RISC servers.
- Efficient resource utilization because test, development, education, backup and other servers can share resources, applications or utility code, which can reduce software licensing costs.
- Network simplification through a highly virtualized internal network. Security is also enhanced since the network is internal to the System z, and not exposed and vulnerable to eavesdropping devices.
- Easier systems management through Single Point of Control for administration and operation.

The industry-leading mainframe virtualization technologies are a major reason that sets Linux on the mainframe apart from other operating environments.

**Question:**

What are the Linux benefits from the IBM mainframe security, robustness and processes?

**Answer:**

Linux on IBM System z can benefit from the outstanding Qualities of Service of the IBM mainframe hardware features and the existing processes, as well as from z/OS® and z/VM functions.

IBM System z servers have implemented world-class security technologies such as:

- High-performance cryptography,
- Large-scale digital certificate authority and management,
- Improved Secure Sockets Layer (SSL) performance,
- Advanced resource access control function and secure key cryptography.

IBM System z servers provide technology and services to help identify and remove single points of failures (SPOFs) in critical components. Planned outages are a thing of the past. All this can be done with system and performance management advantages over other platforms.

As well, IBM mainframe customers run well proven processes, such as:

- Backup and restore processes,

- Parallel Sysplex® clustering environment and/or Geographically Dispersed Parallel Sysplex™ (GDPS®) for disaster recovery,
- Capacity BackUp (CBU) for emergency situations.

With Linux on IBM System z, your applications can stay up 24 x 7, all while making concurrent changes to the environment - Linux, leveraging the mainframe strengths, is evolving to an even higher level of quality.

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**Question:**

What are the Linux benefits from the IBM mainframe workload and systems management capabilities?

**Answer:**

IBM mainframe workload and systems management capabilities are designed to allow resource sharing and direct resources dynamically and virtually whenever and wherever they are needed according to customer business priorities.

Fast, simple, and repeatable deployment of virtual Linux servers under z/VM, is provided with the IBM Systems Director for Linux on System z.

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**Question:**

Where can I get information on customers running Linux on System z in production?

**Answer:**

Customer success stories can be found at: [ibm.com/systems/z/linux/stories.html](http://ibm.com/systems/z/linux/stories.html)

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**Question:**

Where can I get commercial Linux for System z distributions?

**Answer:**

Commercial Distributions are available from IBM Linux Distribution Partners Novell SUSE LINUX ([www.suse.com](http://www.suse.com)), and Red Hat ([www.redhat.com](http://www.redhat.com)). Commercially available Linux distributions can include the Linux operating system enabled for specific hardware platforms, an assortment of device drivers, routines for installation, and value add programs like Web servers and shells. Typically these distributions are delivered over the Internet or packaged on a physical deliverable. IBM suggests that these distributions be your first choice for production environments because of their availability of service and support from the Linux Distributor, or IBM Support Line.

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**Question:**

What is Linux on System z?

**Answer:**

Linux on System z is the synonym for Linux running on any IBM mainframe, which includes

- The IBM System z10 Enterprise Class and IBM System z10 Business Class™ (z10 EC™, z10 BC™)
- IBM System z9® (Enterprise Class and Business Class),
- IBM eServer™ zSeries® 990, 890, 900, 800, (z990, z890, z900, z800) and S/390® (9672 G5, G6 and Multiprise® 3000).

Linux has been ported and is supporting these mainframe architectures. In addition, the ports are supporting some devices that are specific to these environments.

Linux on System z exploits the strengths and reliability features of the outstanding z/VM virtualization and System z hardware technologies, while preserving the openness and stability of Linux.

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**Question:**

What are the differences between the terms Linux on IBM System z, Linux on IBM System z10, Linux on IBM System z9, Linux on IBM eServer zSeries, and Linux on S/390?

**Answer:**

Linux on System z refers to Linux running on any IBM mainframe. Linux on System z10 refers to Linux running on System z10 specifically. Linux on System z9 refers to Linux running on System z9 specifically. Linux on zSeries refers to Linux running on zSeries specifically, and Linux on S/390 refers to Linux running on S/390 specifically.

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**Question:**

What is the difference between the Linux 64-bit and 31-bit distributions?

**Answer:**

Linux 64-bit distributions support the IBM System z10, System z9 and IBM eServer zSeries architecture, which is 64-bit enabled. They are supported on the recently introduced IBM System z10 Business Class (z10™ BC), IBM System z10 Enterprise Class (z10 EC), the IBM System z9 Business Class (z9™ BC) and IBM System z9 Enterprise Class (z9 EC), the IBM eServer zSeries 990 (z990), IBM eServer zSeries 890 (z890), IBM eServer zSeries 900 (z900) and IBM eServer zSeries 800 (z800) models. These systems are also capable of running 31-bit Linux distributions, and can run 31- and 64-bit distributions concurrently.

Linux 31-bit distributions are supported on the z10 BC, z10 EC, z9 BC, z9 EC, the IBM eServer zSeries servers (z990, z890, z900, z800), and the 9672 S/390 Parallel Enterprise Server™ Generation 5 and 6, and the S/390 Multiprise 3000 servers.

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**Question:**

Where can I get the latest and more information on Linux on IBM System z?

**Answer:**

The most current information about Linux on System z is available at: [ibm.com/systems/z/linux](http://ibm.com/systems/z/linux)

## System z Virtualization Technology

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### Question:

What is IBM System z virtualization technology?

### Answer:

System z virtualization technology allows customers to create virtual processors, communications, storage and I/O, and networking resources, thus helping to reduce the overhead of planning, purchasing and installing hardware to consolidate and support new workloads. Notice that the virtualization technology for System z platforms is composed of multiple dimensions. There is a hardware dimension and a software dimension, and both dimensions are considered at the time that the System z servers are designed - from the bottom up.

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### Question:

What does the hardware dimension provide for System z virtualization technology?

### Answer:

The IBM System z hardware provide the foundation dimension with functions critical to the success of virtualization, particularly on a large scale, such as the ability to partition the machine, device sharing, and inter-partition communication.

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### Question:

What does the software dimension provide for System z virtualization technology?

### Answer:

The software dimension can extend the capabilities of the hardware from the standpoint of sharing hardware, virtualizing resource, and communication. It also introduces the flexibility required to support large numbers of virtual servers in an on-demand enterprise. Operational support, control, accountability and maintenance are a large part of the operation of any group of servers. The z/VM hypervisor is the IBM System z products providing the software dimension functionality. The most current information is available at: [www.vm.ibm.com](http://www.vm.ibm.com) In addition, a systems management dimension is composed of some hardware features, and some products related to the z/VM hypervisor. The products are DirMaint™, Operations Manager for z/VM, VM Resource Manager (VMRM) and the IBM Systems Director.

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### Question:

What benefits does z/VM virtualization provide for the Linux server environment?

### Answer:

z/VM virtualization enables to run a large number of Linux server images on a single System z server. It is an ideal platform for integrating applications and data and consolidating select UNIX®, Microsoft® Windows®, and Linux workloads deployed on multiple servers onto a single physical mainframe, while maintaining the same number of distinct logical server images. These Linux images can be deployed on standard processor or IFL processor engines. Reducing the amount of physical servers may result in cost savings realized by managing large server farms deployed on virtual servers instead of multiple physical servers.

By implementing z/VM virtualization, virtual backup servers, hot standby servers and other servers that would require physical resources in distributed environments require minimal resources when not in use.

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

Virtual Linux servers residing on a System z platform can share data and applications, and be managed and controlled from a central point, thus reducing complexity. z/VM 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 can virtualize System z cryptographic features so they can be shared by many Linux guests for clear key RSA (SSL) acceleration. z/VM can balance this cryptographic load across multiple features and should one cryptographic feature fail or be brought offline, z/VM can transparently shift a Linux guest to use an alternate feature, without user intervention.

The most current information is available at: [www.vm.ibm.com/linux](http://www.vm.ibm.com/linux)

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**Question:**

Where can I get more information on the z/VM hypervisor?

**Answer:**

The most current information about z/VM is available at: [www.vm.ibm.com](http://www.vm.ibm.com)

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**Question:**

What is the IBM Systems Director?

**Answer:**

The IBM Systems Director delivers a simplified platform management solution that streamlines the way physical and virtual systems are managed across a multi-system environment. Leveraging industry standards, IBM Systems Director supports multiple operating systems and virtualization technologies across IBM and non-IBM platforms. Through an easy-to-use, point-and-click, single user interface, IBM Systems Director provides consistent views for visualizing managed systems and determining how these systems relate to one another while identifying their individual status, thus helping to correlate technical resources with business needs.

An additional agent is provided for z/VM to communicate with SMAPI. The agent allows IBM Systems Director server to obtain information about the guest virtual machines running within the z/VM system and resources associated with the servers. This agent runs in a Linux on System z guest on z/VM.

The IBM Systems Director VMControl Image Manager for Linux on System z, V2.1 is designed to simplify the management of virtual environments across multiple virtualization technologies and physical platforms to support the growing requirements of a dynamic infrastructure. IBM Systems Director VMControl Image Manager V2.1 is a plug-in to IBM Systems Director V6.1, providing support to manage and automate the deployment of virtual appliances (images) from a centralized location.

The most current information is available at: [ibm.com/systems/z/advantages/virtualization/director.html](http://ibm.com/systems/z/advantages/virtualization/director.html)



## Integrated Facility for Linux (IFL)

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**Question:**

What is the Integrated Facility for Linux (IFL)?

**Answer:**

The IFL is an optional feature, designed to add additional processing capacity, exclusively for Linux workload, with no effect on the existing model designation.

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**Question:**

What is value of the Integrated Facility for Linux (IFL)?

**Answer:**

The IFL processor enables you to purchase attractive priced processing capacity exclusively for Linux workloads:

- An IFL does not affect the MSU rating or the IBM System z model designation. This means that an IFL will not increase charges for System z software running on general purpose (standard) processors in the server.
  - An IFL has the functionality of a general purpose System z processor and operates on full capacity.
  - IFL engine migrations to IBM System z typically move with no charge (exception for all IFL server and short path upgrades).
  - z/VM V4/V5 and most IBM middleware products that run on Linux on System z are priced per processor.
  - Since the performance of the IFL processor increase compared to previous generations, you get a price/performance improvement for Linux workload with each successive generation of technology.
  - Many software vendors have adopted the IBM pricing model for the traditional and Linux workloads.
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**Question:**

On which machine types is the Integrated Facility for Linux (IFL) available?

**Answer:**

The IFL is available for all System z servers currently in production. They are the recently introduced IBM System z10 EC, IBM System z10 BC, IBM System z9 BC, IBM System z9 EC and the IBM eServer zSeries models z900, z890, z900 and z800.

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**Question**

On the z10 BC, z9 BC or z890, when I add an IFL to a sub-uniprocessor z10 BC, z9 BC or z890, will I receive a sub-uniprocessor IFL?

**Answer:**

No, when adding an IFL engine to a subcapacity machine, the machine will be able to run with mixed capacities. The IFLs will be full-capacity engines (same as for System z Application Assist Processor (zAAP), System z Integrated Information Processor (zIIP) or Internal Coupling Facility (ICF) engines).

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**Question:**

Does IBM support On/Off Capacity on Demand (On/Off CoD) and Capacity Backup Upgrade (CBU) for IFL engines?

**Answer:**

Yes. The temporary capacity on demand offering (On/Off CoD) for IFL engines on the z10 BC, z10 EC, z9 BC, z9 EC, z990 and z890 is available to assist customers that require additional capacity for peak demand, application testing or disaster recovery.

Yes, with the new z10 BC, z10 EC, z9 EC and z9 BC the Capacity Backup Upgrade has been extended to the IFL engine, same as for zAAP, zIIP or ICF engines.

The most current information is available at:

**[ibm.com/systems/z/advantages/resiliency/cod/index.html](http://ibm.com/systems/z/advantages/resiliency/cod/index.html)**

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**Question:**

Can I buy a machine that is made up entirely of Integrated Facility for Linux (IFL) engines and no traditional engines?

**Answer:**

Yes. A dedicated IBM System z Linux server is available. Please see your IBM or Business Partner representative for more information.

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**Question:**

Can I run z/VM V5 in an LPAR which has a mix of standard and IFL processors?

**Answer:**

Yes, z/VM 5.4 and System z10 supports mixed engine LPARs

z/VM is able to exploit the new System z10 support for a new logical partition (LPAR) mode "VM", exclusively for running z/VM LPARs. This new LPAR mode allows z/VM to utilize a wider variety of specialty processors in a single LPAR. For instance, in a VM mode LPAR, z/VM can manage Linux on System z guests running on IFL processors while also managing z/OS guests on central processors and zIIPs and zAAPs.

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**Question**

Where can I get more information on the Integrated Facility for Linux (IFL)?

**Answer:**

The most current information is available at: [ibm.com/systems/z/linux/ifl.html](http://ibm.com/systems/z/linux/ifl.html)

## IBM Project Big Green & IBM Enterprise Computing Model transformation

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### **Question:**

What is the IBM Project Big Green and what is the IBM Enterprise Computing Model transformation?

### **Answer:**

IBM had announced the Enterprise Computing Model (ECM) transformation project as Project 'Big Green' in 2007, and said that thousands of distributed servers will be migrated to IBM System z servers running virtual Linux servers. z/VM was chosen to provide the virtualization environment.

The systems management was to be done together with IBM Tivoli® products.

The applications being selected for the consolidation to IBM System z included applications from all parts of the business that were primarily internally-developed, complex, strategic and mission critical applications. The workloads had been evaluated for their suitability based on their technical attributes regarding their software compatibility or platform dependency, the workload characteristics, and their optimization level.

In parallel with the workload evaluation, the IBM Global Technology Services (GTS) team started to develop a toolset for an automatic migration of the workload to Linux on System z. This toolset not only helped IBM to do its consolidation, it is now available to clients via services offered by GTS.

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### **Question:**

What are the expected benefits of the IBM Enterprise Computing Model transformation?

### **Answer:**

The expected benefits of the transition are significant. Substantial savings are expected, with an 80% decrease in energy consumption, an 85% decrease in floor space, reduced software and system support costs, along with an improved inventory control, dramatically faster provisioning, improved security and reliability, higher quality due to reduced complexity, and increased stability and availability.

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### **Question:**

What are the elements used for the IBM Enterprise Computing Model transformation?

### **Answer:**

The IBM Enterprise Computing Model transformation has been built around the five elements necessary for a green data center:

- Diagnose: Evaluate existing facilities—energy assessment, virtual 3-D power management and thermal analytics.
- Build: Plan, build or update to an energy efficient data center.
- Virtualize: Virtualize IT infrastructures and special purpose processors.
- Manage: Seize control with power management software.
- Cool: Exploit liquid cooling solutions—inside and out of the data center.

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**Question:**

What is the status of the IBM Enterprise Computing Model transformation?

**Answer:**

IBM has made significant progress since the announcement in August 2007. IBM has inventoried thousands of servers and completed multiple successful migrations, delivering benefits as expected. IBM has successfully:

- Created a reference architecture and workload migration selection criteria and process.
- Established a comprehensive project management approach and management system.
- Integrated business priorities with transformational objectives.
- Lean 'Work in progress' approach to maximize server migrations.
- Driven "Time to Value" initiatives, integrated into IBM capabilities.
- Evaluated application, server, location and facility characteristics to ensure successful migrations.
- Decommissioned servers for reuse or removal through end-of-life management.
- Received IBM's first Energy Efficiency Certificates to certify our energy savings by a third party.
- Operationalized the business case to continually refine our expectations.
- Continued to maintain support from Executive team across IBM.

IBM has not completed its journey, but we are sharing our dynamic infrastructure experience with our clients. Most are interested in where to start, how to execute and what capabilities they will need.

IBM has the hands-on knowledge of what it takes to migrate and virtualize workloads and servers from distributed environments to a streamlined mainframe environment and how to determine the resulting benefits.

For more information see the "GTS Server Consolidation and Migration Solution Demo" video at:

[ibm.com/systems/migratetoibm/systems/z/demo.html](http://ibm.com/systems/migratetoibm/systems/z/demo.html)

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**Question:**

What are the results of the IBM Enterprise Computing Model transformation?

**Answer:**

The results – huge savings.

We estimate the potential for 60-75 percent Gross Cost Savings over five years. Just to begin to show how that savings is being driven, there is dramatic simplification in this environment – 97 percent reduction in Ports, 55 percent reduction in physical network connections, and so on. Application owners are seeing significantly less time to create server images and add system resources, and are better able to manage scalability.

Infrastructure owners are seeing great improvements in system stability and resiliency and improved change management.

## IBM Middleware and Solutions with Linux on System z

### Question:

Which IBM middleware products are available for Linux on System z?

### 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.

Therefore, the list of the available IBM middleware products is kept in one place, available at:

[ibm.com/linux/matrix](http://ibm.com/linux/matrix)

### Question:

What software products/solutions are available to be used with Linux on System z?

### Answer:

Software products are available to support the major solution areas:

- **Web Serving, Web Application Serving and Web 2.0,**

Linux on IBM System z is an excellent choice for customers who wish to re-host Web applications that have been running on competitive hardware.

WebSphere on mainframe Linux is no more difficult to deploy than WebSphere on distributed systems. Customers still use the logical distributed architecture model, but gain the advantage of a single physical model that is closer to the existing data since it is on the same mainframe. Mainframe technology and business connectors helps customers get rapid data access to help integrate Linux, z/OS, z/VM, and z/VSE™ systems and the vast amount of data and applications they support.

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). Learn more at: [ibm.com/systems/z/os/linux/zlinux\\_web2.0.html](http://ibm.com/systems/z/os/linux/zlinux_web2.0.html)

- **Business Intelligence and Data Warehousing**

IBM Cognos® Business Intelligence for Linux on System z, combined with the IBM Information Server and other IBM information management products, such as IBM DB2, IBM DataQuant™, IBM DB2 Alphablox® or IBM DB2 Connect™, all available on Linux or z/OS, allow you to build a comprehensive Information On Demand / Information as a Service solution on System z. Learn more at: [ibm.com/systems/z/os/linux/solutions/bi.html](http://ibm.com/systems/z/os/linux/solutions/bi.html)

- **Data Serving**

Enable high volume of trans-actions through the System z 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 mainframe Linux environment.

- **Collaboration and E-mail**

Linux on IBM System z provides an attractive platform 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. Learn more at: [ibm.com/systems/z/os/linux/solutions/ld.html](http://ibm.com/systems/z/os/linux/solutions/ld.html)

- **Application Development**

Mainframe servers are capable of isolating multiple execution environments with LPAR and z/VM

functionality. One or more virtual Linux servers can be easily created for each developer, isolated from other developer or production servers. Learn more at:

[ibm.com/systems/z/os/linux/solutions/appdev.html](http://ibm.com/systems/z/os/linux/solutions/appdev.html)

- **Backup Consolidation**

Backup consolidation replaces backup islands onto enterprise class System z servers, disk and tape systems, which are more reliable and more cost-effective than smaller components. Learn more at: [ibm.com/systems/z/os/linux/solutions/sm.html](http://ibm.com/systems/z/os/linux/solutions/sm.html)

- **Patch & Software Distribution**

Patch distribution and management is a function available with Tivoli Provisioning Manager for Linux on System z, which is probably the most important part of the day-to-day systems management activities. And even more, using Linux on System z as the hub for enterprise-wide systems management can help to simplify the efforts for provisioning and configuration of servers and virtual servers, operating systems, middleware, applications and more. Learn more at:

[ibm.com/systems/z/os/linux/solutions/psd.html](http://ibm.com/systems/z/os/linux/solutions/psd.html)

- **Security**

IBM System z servers running Linux 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 for the Linux on System z environment. Learn more at: [ibm.com/systems/z/os/linux/security/index.html](http://ibm.com/systems/z/os/linux/security/index.html)

- **Business Connectors**

Business connectors are the “code” for the integration of the various systems, including: DB2 Connect, CICS<sup>®</sup> Transaction Gateway, IMS<sup>™</sup> Connect, WebSphere MQ, and VSE Connectors.

- **Infrastructure Servers**

Linux on IBM System z excels in doing the work of many smaller servers on a single mainframe server. Many of the smaller servers are the so called ‘Infrastructure’ servers such as file, print, DNS, FTP, NFS, security, etc.

- **Systems Management**

Linux on IBM System z 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 Linux on IBM System z 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 on System z is a key element in running a highly efficient and successful optimized infrastructure (Workload Management for Linux on System z with z/VM, Performance Toolkit for VM<sup>™</sup>).

- **Network Communication**

SNA Network Communication, IBM Communication Controller for Linux (CCL) allows customers to keep their business data and applications on the mainframe while moving Network Control Program (NCP) functions, and the associated CPU cycles, to Linux on System z.

CCL offers a smooth transition and attractively priced alternative for aging 3745 and 3746 Communication Controller networking hardware. CCL provides a migration path for enterprises using traditional Systems Network Architecture (SNA) including SNA Network Interconnect (SNI) to communicate with their customers and business partners.

IBM Communications Server for Linux (CS) enables applications to run over multiple network protocols, acting as a multiprotocol gateway. CS also works as a Telnet server, providing systems network architecture (SNA) network access to client applications running anywhere in your TCP/IP network. Also included is Enterprise Extender, a leading-edge solution for accessing SNA applications over TCP/IP networks.

- **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.

For the most current information visit: [ibm.com/systems/z/os/linux/solutions](http://ibm.com/systems/z/os/linux/solutions)

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**Question:**

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

**Answer:**

Yes. You can access a list of software developer products available for Linux on System z via the Web page: [ibm.com/systems/z/solutions/isv/linuxproduct.html](http://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](http://www-304.ibm.com/jct09002c/gsdod/homepage.do)

Here a pre-generated link for the applications available for Linux on System z:

[www-304.ibm.com/jct09002c/gsdod/searchprofile.do?name=Linux\\_for\\_System\\_z\\_English](http://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 for Linux on System z

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### Question:

From which companies, IBM or the distributors, can I buy support services for Linux on System z? 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 System z.

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

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### 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](http://ibm.com/services/us/index.wss/so/its/a1000030)



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**Question:**

What services are available for Linux on System z?

**Answer:**

IBM Server and Technology Group offers the following specific Lab Services for Linux on System z and z/VM:

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

For the most current information visit:

[ibm.com/systems/services/labservices/platforms/labservices\\_z.html](http://ibm.com/systems/services/labservices/platforms/labservices_z.html)

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**Question:**

What education is available for the Linux on System z 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 a Linux on System z system and related applications.

**Linux Implementation for System z, zSeries and S/390 – ZL100**

Learn how to install Linux on mainframes and dramatically increase the number of applications available to your mainframe. Learn about Linux on System z, zSeries and S/390 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, configure the Control Program (CP) component, define and save segment, configure TCP/IP, and apply service to your z/VM system 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. This course also covers many topics in the areas of connectivity and system management.

**z/VM RACF® and DIRMAINT Implementation - ZV200**

The IBM z/VM Directory Maintenance Facility (DirMaint) and the Resource Access Control Facility (RACF) for z/VM are optional features of z/VM V5. 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<sup>®</sup>/2000 domain membership and domain control.

## Information Sources

### Question:

Where can I go for more detailed information on Linux on System z?

### Answer:

The “Information resources” document provides an overview of the available information resources for Linux on System z. It’s a PDF document and by using this document online you can benefit from the hyperlinks for easy access to the information.

 Information resources (PDF, 706KB):

<ftp://ftp.software.ibm.com/common/ssi/sa/wh/n/zsw03050usen/ZSW03050USEN.PDF>

### Question:

What are the most used Web pages for Linux on System z?

### Answer:

The most used Linux on System z Web sites are:

Linux on System z	<a href="http://ibm.com/systems/z/linux">ibm.com/systems/z/linux</a>
z/VM	<a href="http://www.vm.ibm.com">www.vm.ibm.com</a>
White papers, Articles, FAQs, Performance papers	<a href="http://ibm.com/systems/z/linux/library">ibm.com/systems/z/linux/library</a>
Redbooks® and Redpapers	<a href="http://www.redbooks.ibm.com">www.redbooks.ibm.com</a> Searching for “Linux AND System z”: <a href="http://www.redbooks.ibm.com/cgi-bin/searchsite.cgi?Query=Linux AND System z&amp;SearchOrder=4">www.redbooks.ibm.com/cgi-bin/searchsite.cgi?Query=Linux AND System z&amp;SearchOrder=4</a>
Software Vendor Products	<a href="http://www-304.ibm.com/jct09002c/gsdod/searchprofile.do?name=Linux for System z English">www-304.ibm.com/jct09002c/gsdod/searchprofile.do?name=Linux for System z English</a>
Integrated Facility for Linux (IFL)	<a href="http://ibm.com/systems/z/os/linux/solutions/iftl.html">ibm.com/systems/z/os/linux/solutions/iftl.html</a>
Technical Support	<a href="http://ibm.com/systems/z/linux/support_resources.html">ibm.com/systems/z/linux/support_resources.html</a>
IBM developerWorks® Linux	<a href="http://ibm.com/developerworks/linux">ibm.com/developerworks/linux</a>
IBM System z	<a href="http://ibm.com/systems/z">ibm.com/systems/z</a>
IBM Systems Director	<a href="http://ibm.com/systems/management/director">ibm.com/systems/management/director</a>
IBM STG Lab Services for System z	<a href="http://ibm.com/systems/services/labservices/platforms/labservices_z.html">ibm.com/systems/services/labservices/platforms/labservices_z.html</a>
IBM Global Services	<a href="http://ibm.com/services">ibm.com/services</a>
IBM Education Services	<a href="http://ibm.com/services/learning">ibm.com/services/learning</a>
IBM Global Finance	<a href="http://ibm.com/financing">ibm.com/financing</a>
Linux at IBM	<a href="http://ibm.com/linux">ibm.com/linux</a>

Linux on System z distributor Web sites:

Novell SUSE	<a href="http://www.novell.com/partners/ibm/mainframe">www.novell.com/partners/ibm/mainframe</a>
Red Hat	<a href="http://www.redhat.com/rhel/server/mainframe">www.redhat.com/rhel/server/mainframe</a>



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