

Most efficient platform for large-scale Linux consolidation

Linux® and the z/VM® Version 6 virtualization software on the IBM zEnterprise™ System¹ can help in creating a smart business infrastructure. Linux and z/VM offer a uniquely powerful solution for consolidation, virtualizing, managing and sharing resources with optimum efficiency.

z/VM virtualization software can help clients to:

- Virtualize each logical partition (LPAR²) into hundreds or more virtual servers
- Virtualize processors, memory, network, I/O, cryptographic features
- Maximize resource sharing to achieve high system utilization
- Dynamically redistribute resources to automatically manage server demands
- Efficiently manage and administer the virtual server environment
- New zEnterprise Unified Resource Manager extends virtual server lifecycle management capabilities



Running Linux as a guest of z/VM is designed to provide the capability of running hundreds to thousands of Linux images while benefiting from the reliability, availability, scalability, security and serviceability characteristics of System z servers. At the same time, it allows you to exploit the exceptional capabilities of z/VM virtualization technology.

Industry-leading virtualization helping control costs

z/VM virtualization is the result of over 40 years of innovation and refinement and can provide users with the ability to respond to rapidly changing market requirements more quickly and easily than with distributed servers.

z/VM solutions are designed to provide significant savings, which may help lower your Total Cost of Ownership (TCO) for deploying new business and enterprise application workloads.

- z/VM allows customers to virtualize processor, memory, communications, I/O, and networking resources to help reduce the need to duplicate hardware, programming and data resources.
- z/VM offers the highest levels of resource sharing—including the sharing of Linux program executables, over-commitment capabilities for processors and memory, cooperative memory management, I/O bandwidth, and system availability, resulting in nearly 100% utilization of the resources nearly 100% of the time.
- z/VM supports virtual networks (HiperSockets™³) to help reduce cabling, hubs, switches, and routers, as well as help to reduce maintenance effort.
- z/VM offers Discontiguous Saved Segment (DCSS) support, enabling users to store Linux program executables in a single z/VM memory location and share the executables with any or all of the hosted Linux systems.
- z/VM offers several data-in-memory techniques that enhance the scalability and performance of memory-intensive workloads.
- z/VM supports nondisruptive dynamic configuration of processors, channels, network adapters, and memory to individual Linux servers.
- z/VM performance toolkit provides enhances capabilities to monitor and report performance information.

- z/VM offers a backup and restore manager for effectively back up and restore of data from the Linux guest systems.
- z/VM offers the DirMaint™ feature for efficient and highly secure management of the z/VM systems directory.
- z/VM offers a RACF®⁴ security server to provide improved system access and data security controls.
- z/VM makes the Cryptographic features available to Linux guests for secure-key, clear-key and protected key operations.
- z/VM and IBM zEnterprise 196 (z196) provide rock-solid security⁵, ensuring the isolation of each virtual Linux server environment.
- Virtual server management functions permit virtual servers to be created and deleted, and allow real and virtual networking resources to be managed by the Unified Resource Manager.

Leadership virtualization means that you can *do more with less—the better approach*.

z/VM and Linux exploits new System z technology

Linux on IBM System z®, especially with the combination of z/VM Version 6 and the new z196, can address server consolidation and IT optimization issues faced by many large enterprises while providing greater availability, scalability, virtualization, security, and reliability.

The consolidation capabilities of the new z196 server will be extended through the 5.2 GHz processors, which means more processing power, along with the improved total system capacity with up to 80 user-configurable cores, and the new redundant array of independent memory (RAIM) structure that allows the amount of 3.0TB of real memory per server.

The new Out-of-Order execution sequence and the hundred new instructions will provide significant improvement for compute intensive applications.

The z196 server is based on the IBM z/Architecture®, which supports a standard of performance, capacity, and integration by expanding the balanced system approach.

System z technology delivers the high level of availability. Even in a single footprint, the platform is designed to avoid or recover from failures to minimize business disruptions. Linux and z/VM can leverage this high level of availability for its workload.

New with the zEnterprise is the possibility to deploy an integrated hardware platform that brings System z and distributed technologies together—z196 and IBM zEnterprise BladeCenter® Extension (zBX). As well, it introduces the IBM zEnterprise Unified Resource Manager, which is designed to deliver virtual life-cycle management—end-to-end virtualization—for Linux guests on z/VM and virtual servers on zBX.

Linux and z/VM on z196 will continue to deliver its class strengths, not available with the zBX environment.

Leveraging all these exceptional zEnterprise capabilities with z/VM virtualization provides the attractive attributes to the Linux on System z environment.

The IBM Enterprise Linux Server, based on the zEnterprise, combines the fastest and most scalable enterprise system with z/VM virtualization and maintenance, subscription and support to create a simplified, secure and highly available infrastructure for your server virtualization, that can easily scale to meet your needs adding efficiencies to drive down the cost of operations or at least control it.

Do more with less.

For more information:

- z/VM:
ibm.com/vm
- Linux on System z:
ibm.com/systems/z/os/linux
- IBM zEnterprise System:
ibm.com/systems/z



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¹ IBM zEnterprise System can help to replace individual islands of computing, reduce complexity, improve security, and bring applications closer to the data they need. The system consists of the IBM zEnterprise z196 (z196), the IBM zEnterprise Unified Resource Manager (Unified Resource Manager), and the IBM zEnterprise BladeCenter Extension (zBX).

² IBM zEnterprise 196 (z196) and IBM System z10 Enterprise Class (z10 EC) servers can support up to 60 LPARs which may be assigned processors, memory, I/O resources. PR/SM (Processor Resource/Systems Manager) provides the ability to configure and operate LPARs.

³ The HiperSockets function is an integrated function of the System z servers that provides users with attachments to virtual Local Area Networks with minimal system and network overhead. HiperSockets does not use an external network.

⁴ RACF = Resource Access Control Facility is the IBM security management product for operating systems z/OS and z/VM.

⁵ z/VM is certified at Common Criteria Evaluation Assurance Level (EAL4), augmented with ALC_FLR.2. System z servers are the world's only servers with the highest level of hardware security certification, EAL5. Details are available at: ibm.com/systems/z/os/linux/solutions/security_certification.html

IBM Systems and Technology Group

z/VM virtualization and Linux on IBM zEnterprise System

*Increased economics for server
consolidation and IT optimization*



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