



## Preview: IBM z/VM V6.1 - Foundation for future virtualization growth

### Table of contents

<b>1</b>	<a href="#">At a glance</a>	<b>6</b>	<a href="#">Product positioning</a>
<b>1</b>	<a href="#">Overview</a>	<b>7</b>	<a href="#">Statement of general direction</a>
<b>2</b>	<a href="#">Key prerequisites</a>	<b>8</b>	<a href="#">Reference information</a>
<b>2</b>	<a href="#">Planned availability date</a>	<b>8</b>	<a href="#">Product number</a>
<b>2</b>	<a href="#">Description</a>	<b>8</b>	<a href="#">IBM Electronic Services</a>

### At a glance

z/VM® V6.1 is designed to offer:

- Exploitation of the System z10 server cache management instructions to help improve the performance of virtual networking
- Closer integration with IBM® Systems Director by shipping the Manageability Access Point Agent for z/VM
- Inclusion of post-z/VM V5.4 enhancements delivered in the IBM service stream including:
  - A CMS-based z/VM SSL server
  - Support for:
    - Linux® guests using dynamic storage reconfiguration
    - IBM FlashCopy® SE
    - Worldwide port name (WWPN) prediction tool
    - OSA-Express QDIO data connection isolation
    - Additional tape encryption
    - Multiple file dumps

### Overview

Version 6 Release 1 (V6.1) is the newest version of z/VM and is intended to be the base for all future z/VM enhancements. This release implements a new Architecture Level Set (ALS) available only on the IBM System z10 Enterprise Class server and System z10 Business Class server and future generations of System z® servers. Requiring z10 technology or later:

- Acknowledges the highly attractive economics of workload consolidation on the more environmentally friendly, highly secure, and reliable System z10 servers
- Allows z/VM to take advantage of newer hardware technology for future exploitation

Much of the success of Linux on System z can be attributed to the advanced virtualization technologies available in z/VM. Many IBM System z clients have found that the combination of Linux and z/VM not only offers server consolidation savings, but also enables the flexible deployment of business-critical enterprise solutions. Clients can run Linux on System z as a guest of z/VM on a System z server also running z/OS®, z/VSE<sup>™</sup>, and/or z/TPF systems. IBM also offers System z servers

configured with Integrated Facility for Linux (IFL) specialty engines for running Linux on z/VM.

The z/VM hypervisor is designed to help clients extend the business value of mainframe technology across the enterprise by integrating applications and data while providing exceptional levels of availability, security, and operational ease. IBM System z has a rich heritage of innovation in the area of virtualization and has refined the infrastructure with a coordinated investment in hardware, firmware, hypervisors, and operating systems to enable exceptional qualities of service in the support of virtualization. z/VM virtualization technology is designed to provide the capability for clients to run hundreds or thousands of Linux servers in a single mainframe, running with other System z operating systems such as z/OS and z/VSE, or as a large-scale Linux enterprise-server solution. z/VM is designed to help improve productivity by hosting non-Linux workloads such as z/OS, z/VSE, and z/TPF.

For the most current information on z/VM, refer to the z/VM Web site at

<http://www.ibm.com/vm>

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## Key prerequisites

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z/VM V6.1 requires a new Architecture Level Set (ALS) that is available on the:

- System z10 Enterprise Class  
Refer to the DEVICE2097 Preventive Service Planning (PSP) bucket for the minimum MCL level and any required updates.
- System z10 Business Class  
Refer to the DEVICE2098 Preventive Service Planning (PSP) bucket for the minimum MCL level and any required updates.

Specific processor facilities required by z/VM V6.1 can be found on the z/VM Web site at

<http://www.ibm.com/vm/zvm610/architecture/>

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## Planned availability date

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Fourth quarter 2009

Previews provide insight into IBM plans and direction. Availability, prices, ordering information, and terms and conditions will be provided when the product is announced.

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## Description

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### **Virtualization technology and Linux enablement**

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#### **Support for Linux guests using dynamic storage reconfiguration**

Further enhancements to z/VM storage management allow better cooperation with Linux on System z guests exploiting dynamic storage reconfiguration (DSR). z/VM support:

- Allows operation when running second level on z/VM to be more compatible with operation when running in a logical partition
- Displays configured, standby, and reserved values for each virtual storage element via the QUERY VIRTUAL STORAGE command
- Improves z/VM handling of unexpected DSR conditions that can occur

This support is also available for z/VM V5.4 with the PTF for APAR VM64524.

## Technology exploitation

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### IBM FlashCopy SE

z/VM V6.1 is designed to provide support for the IBM FlashCopy SE feature on the IBM DS8000<sup>™</sup> providing an instantaneous space-efficient snapshot capability that can greatly reduce the storage capacity needed for point-in-time copies. With a FlashCopy SE relationship, disk space will only be consumed for the target copy when data is written to the source volume or when a write is directed to the target. For a source volume without much write activity, the target volume can consume significantly less physical space than the source. In addition to the benefit of more efficient storage utilization, less capacity can mean fewer disk drives and lower power and cooling requirements. FlashCopy SE may be especially useful in the creation of temporary copies for tape backup, online application checkpoints, or copies for preproduction or disaster recovery testing.

This support is also available for z/VM V5.4 with the PTF for APAR VM64449.

### Worldwide port name prediction tool

A worldwide port name (WWPN) prediction tool is now available from IBM Resource Link<sup>™</sup> to assist you with preplanning of your Storage Area Network (SAN) environment prior to the installation of your System z10 server. This standalone tool is designed to allow you to set up your SAN in advance, so that you can be up and running much faster once the server is installed. The tool assigns WWPNs to each virtual Fibre Channel Protocol (FCP) channel/port using the same WWPN assignment algorithms a system uses when assigning WWPNs for channels utilizing N\_Port Identifier Virtualization (NPIV). The Hardware Configuration Definition (HCD) component of z/VM provides I/O device information from the input/output definition file (IODF) for input into the WWPN prediction tool.

This support is also available for z/VM V5.3 and V5.4 with the PTF for APAR VM64579. The PTF is also applicable to the HCD level supplied with z/VM V6.1 and has been preapplied to the z/VM base.

For more information on setting up a SAN using the WWPN prediction tool, refer to IBM System z enhancements Hardware Announcement [109-230](#), dated April 28, 2009.

### IBM System Storage<sup>™</sup>

z/VM V6.1 provides support for IBM Full Disk Encryption and Solid State Disk features of the IBM System Storage DS8000. The **QUERY DASD DETAILS** command now indicates when a DASD volume is an encrypted volume or when it is comprised of Solid State Drives. This function is also available for z/VM V5.4 with the PTF for APAR VM64650.

DFSMS/VM<sup>™</sup> now provides services that enable a z/VSE guest to manage resources of the IBM Virtualization Engine<sup>™</sup> for the TS7720 configured without a physical tape library with the PTF for APAR VM64657. This PTF must be applied to the DFSMS/VM component of z/VM V6.1 and it is also available for DFSMS/VM on z/VM V5.3 and V5.4.

## Network virtualization

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### Prefetch guest data into processor cache

Guest LAN and Virtual Switch support has been updated in z/VM V6.1 to use cache prefetch capabilities that are exclusive to the IBM System z10 servers and later in order to give the hardware hints about likely memory access patterns. This enables

the hardware to prefetch data into the processor cache so that the processor does not have to wait for data to be moved from main memory. Avoidance of a "cache miss" may help improve the performance of heavy guest-to-guest streaming workloads.

## Security

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### OSA-Express QDIO data connection isolation

z/VM V6.1 supports port isolation security that provides the ability to restrict guest-to-guest communications within a VSWITCH and between other partitions sharing the OSA-Express adapters used by the VSWITCH. Virtual Switch port isolation and QDIO data connection isolation can help you design virtual networks that adhere to strict traffic-separation policies.

For more information on QDIO data connection isolation, refer to:

- IBM System z10 Enterprise Class Hardware Announcement [108-794](#), dated October 21, 2008, or
- IBM System z10 Business Class Hardware Announcement [108-754](#), dated October 21, 2008.

Traffic isolation on shared OSA-Express adapters is available for OSA-Express2 and OSA-Express3 features on a System z10 EC server and a z10 BC server and is exclusive to CHPID type OSD with the following minimum MCLs:

- OSA-Express2 on z10 requires N10953.002
- OSA-Express3 on z10 requires N10959.004 and N10967.055

This support is also available for z/VM V5.3 and V5.4 with the PTFs for APARs VM64463 and PK67610. Refer to the Preventive Service Planning (PSP) buckets for the minimum MCL levels and any required updates for the IBM System z9® and IBM System z10 servers.

### CMS-based z/VM SSL server

The z/VM SSL server does not require a Linux distribution or Linux skills to maintain. The CMS-based SSL server may enable encryption services to be deployed more quickly and can help make installation, service, and release-to-release migration simpler. Other enhancements to the CMS-based SSL server include:

- Network-free SSL server administration  
The SSL server can be managed without requiring a network connection between the SSL server administrator and the SSL server.
- Encryption and decryption engine  
The SSL server uses z/OS V1.10 System SSL technology for encryption, decryption, and certificate management.
- Certificate-management services  
The System SSL GSKKYMAN utility is used to manage the SSL server certificate database. Services available for the SSL server include certificate renewal, certificate signing, and certificate exportation with or without the private key. The GSKKYMAN application also manages certificates for the z/VM LDAP server.

The CMS-based SSL server is also available for z/VM V5.4 with the PTFs for APARs PK65850, PK73085, PK75268, VM64540, VM64519, and VM64570.

### Additional tape encryption

z/VM V6.1 is designed to support drive-based data encryption with the IBM System Storage TS1130 Tape Drive (machine type 3592, model E06) to help protect data on tape in a cost-effective way. Guest operating systems running under z/VM can take advantage of these encryption features through z/VM, even if the guest does not

exploit them itself for reading and writing tapes. In addition, this tape drive can be used for native z/VM tape functions, such as SPXTAPE, DDR, and CMS TAPE.

DFSMS/VM FL221 supports locating encryption-capable 3592 tape drives in an Enterprise Automated Tape Library. This DFSMS/VM support provides an environment for a z/VSE guest running on z/VM to exploit tape encryption.

This support is also available for z/VM V5.3 and V5.4 with the PTFs for APARs VM64459 (CP) and VM64458 (DFSMS/VM).

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## **Serviceability enhancements**

### **Multiple file dumps**

The DUMPLD2 utility splits a single dump into multiple files and can now be used as an alternative to the DUMLOAD command. Dumps which have been split into multiple smaller files can be stored across multiple DASD devices instead of requiring a single, larger disk. Segmenting a large dump into multiple files allows for easier handling of the dump by the support teams.

VMDUMPTL has also been enhanced to work with dumps that have been loaded to multiple files. All files must be available to view the entire dump, but may span multiple file modes.

This support is also available for z/VM V5.3 and V5.4 with the PTF for APAR VM64495.

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## **Packaging enhancement**

### **Closer integration with IBM Systems Director**

The Manageability Access Point Agent for z/VM currently shipped with IBM Systems Director V6.1 will now be shipped with z/VM to help allow for a simpler installation of the agent. This eliminates the need to obtain the file from IBM Systems Director.

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## **Miscellaneous**

### **Withdrawal from marketing extended for z/VM V5.4**

The customary removal of the previous release from marketing with the planned general availability of z/VM V6.1 in fourth quarter, 2009 will not occur for z/VM V5.4. z/VM V5.4 will continue to be marketed for operation on IBM System z10 EC, z10 BC, z9<sup>tm</sup> EC, z9 BC, z990, z890, z900, and z800 servers. IBM will provide at least three months notification prior to the planned withdrawal date.

### **Discontinuation of service support extended for z/VM V5.4**

IBM announced its intention to discontinue service support for z/VM V5.4 to be effective September 30, 2011, in Software Announcement [208-249](#), dated August 05, 2008.

The new date planned for discontinuing service support for z/VM V5.4 has been extended to September 30, 2013.

As previously announced, central service for z/VM V5.3 is planned to be available by IBM until September 30, 2010.

### **Discontinuation of support for HMF on z/VM V6.1**

Host Management Facility (HMF) V1.1 (5684-157) was withdrawn from marketing effective September 8, 2008, as announced in Withdrawal Announcement [908-114](#), dated June 03, 2008. HMF is not supported on z/VM V6.1 and has been replaced by IBM Operations Manager for z/VM V1.3.0 (5697-J10), or later.

## **VMPRF mode not supported by the Performance Toolkit for z/VM V6.1**

VMPRF mode, which provided compatibility with the report file specifications of the VM Performance Reporting Facility (5684-073), is not supported by the Performance Toolkit for VM on z/VM V6.1. All reports must now follow the current Performance Toolkit for VM specifications.

Service support for VM Performance Reporting Facility was discontinued on December 31, 2005, as announced in Withdrawal Announcement [904-151](#), dated August 03, 2004.

## **Withdrawal of support for the RPC-based systems management APIs**

With z/VM V6.1, IBM has withdrawn support for the RPC-based systems management APIs. This satisfies the statement of direction made in IBM Software Announcement [207-019](#), dated February 06, 2007. The sockets-based systems management APIs continue to be supported.

## **Withdrawal of German translation files**

With z/VM V6.1, the files for message repositories, help files, and other panels or files will not be translated into German.

## **IBM Global Financing**

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## **Product positioning**

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The Information Technology industry has recognized the business value of exploiting virtualization technologies on any and all server platforms. IBM mainframe products have pioneered high levels of server virtualization technology for many years. z/VM V6.1 is planned to be the latest offering of the industry-acclaimed server-virtualization support available with IBM System z. Building on a 40-year history of innovation, z/VM is becoming an even more popular component of on-demand System z computing solutions.

The success of Linux on System z can be attributed in part to the business value that Linux-based solutions derived from the IBM mainframe virtualization technology provided by z/VM running on IBM System z servers. z/VM technology offers clients the ability to host a large number of Linux servers on a single mainframe while also providing a highly flexible, adaptable, and efficient operational environment that is well-suited for on demand computing.

z/VM V6.1 operates only on IBM System z10 EC and z10 BC servers. Like z/VM Version 5, z/VM V6.1 requires z/Architecture® (64-bit) for execution and can host 31-bit (ESA/390) guest operating systems and z/Architecture (64-bit) guest operating systems.

z/VM V6.1 offers new levels of price/performance, functional capabilities, and hardware exploitation that may increase the attractiveness of deploying Linux solutions on the mainframe. Clients can add capacity to IBM mainframe servers for hosting Linux-on-z/VM workloads by configuring their servers with Integrated Facility for Linux (IFL) processors.

z/VM V6.1 provides additional support and exploitation opportunities for many users who have built enterprise-wide automation and infrastructure enhancements on the VM platform in support of their applications, database systems, and on-demand business solutions.

z/VM V6.1 is intended to address the following situations:

- **Running more Linux server images on a single System z server:** Considerably more images than are currently supported by the LPAR mode of operation (up to 60 on z10 EC and z10 BC) may be supported with z/VM guest support. These Linux on System z server images can be deployed on standard processors (CPs) or IFL processors. Running multiple Linux images on an IFL-configured z/VM system may not increase the IBM software charges of your existing System z environment. Clients running z/OS, z/VM, TPF, z/TPF, z/VSE, or Linux on System z can add z/VM V6.1 on IFL processors to their environments without increasing IBM software costs on the standard processors (CPs).
- **Moving selected Linux and UNIX® workloads to a single System z server:** Moving workloads while maintaining distinct server images and current LAN topology can help reduce systems-management complexity. By managing large server farms deployed on virtual servers instead of using multiple hardware servers, the number of real hardware servers and associated physical LANs may be reduced, which may lead to cost savings. Deploying Linux workloads on z/VM V6.1 may be particularly attractive if they interact with applications or data located on the same System z server.
- **Enhancing virtual networking:** z/VM virtual switch support provides external connectivity for guest LANs through an OSA-Express adapter without requiring a VM or Linux router virtual machine, which may increase the efficiency and reliability of network communication.
- **Consolidating operating systems on the System z platform:** z/VM V6.1 offers extensive scalability support for CPUs, memory, I/O, and networking, making it easier to consolidate workloads on a single z/VM image. This support is provided for both ESA/390 and z/Architecture guest operating systems such as Linux for System z, TPF, z/TPF, z/OS, and z/VSE.
- **Migrating to newer releases of z/OS:** This may provide added flexibility for migration and testing, as well as for production.
- **Enhancing guest Parallel Sysplex® support:** The exploitation of z/Architecture may enable addressability to larger amounts of real and virtual memory, allowing the development and testing of 64-bit Parallel Sysplex applications in a guest environment.

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## Statement of general direction

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- **z/VM Single System Image**

IBM intends to provide capabilities that permit multiple z/VM systems to collaborate in order to provide a single system image. This is planned to allow all z/VM member systems to be managed, serviced, and administered as one system across which workloads can be deployed. The single system image is intended to share resources among all member systems.

- **z/VM Live Guest Relocation**

IBM intends to further strengthen single system image support by providing live guest relocation. This is planned to provide the capability to move a running Linux virtual machine from one single system image member system to another. This is intended to further enhance workload management across a set of z/VM systems and to help clients avoid planned outages for virtual servers.



- **Withdrawal of z/VM Domain Name System (DNS) Server Support**

IBM intends to withdraw support in a future z/VM release for its native DNS server (NAMESRV). IBM does not plan to provide a replacement DNS server, but will continue to support the use of DNS servers on other platforms for TCP/IP host name resolution.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

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## Reference information

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For information on the System z10 Enterprise Class, refer to:

- Hardware Announcement [109-230](#), dated April 28, 2009
- Hardware Announcement [108-794](#), dated October 21, 2008
- Hardware Announcement [108-296](#), dated May 06, 2008
- Hardware Announcement [108-154](#), dated February 26, 2008

For information on the System z10 Business Class, refer to:

- Hardware Announcement [109-230](#), dated April 28, 2009
- Hardware Announcement [108-754](#), dated October 21, 2008

For z/VM V5.4 capabilities, refer to:

- Software Announcement [208-249](#), dated August 05, 2008

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## Product number

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Type-Model	Program name
5741-A07	z/VM V6.1

### Business Partner information

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If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=209-207>

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## IBM Electronic Services

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IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.



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<http://www.ibm.com/support/electronic>

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