z/VM Version 5 Release 1

Extends zSeries on demand capabilities with Linux-related enhancements and introduces a new pricing model

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December 2004

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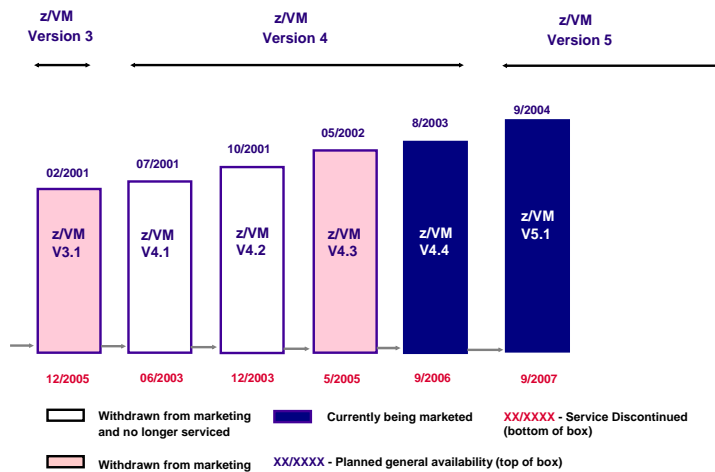
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Agenda

- z/VM® Evolution

- Servers Supported by z/VM

- z/VM Version 5 Release 1 (V5.1) Enhancements
  - ► Virtualization Technology and Linux Enablement
  - ► Network Virtualization and Security
  - ► Technology Exploitation
  - ► Systems Management Improvements
- Optional Features of z/VM V5.1

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z/VM Evolution

Expand your opportunities with z/VM

| z/VM Version 3 | z/VM Version 4 | z/VM Version 5 |

02/2001	07/2001	10/2001	05/2002	8/2003	9/2004
z/VM V3.1	z/VM V4.1	z/VM V4.2	z/VM V4.3	z/VM V4.4	z/VM V5.1
12/2005	06/2003	12/2003	5/2005	9/2006	9/2007

Withdrawn from marketing and no longer serviced	Currently being marketed	XX/XXXX - Service Discontinued (bottom of box)
Withdrawn from marketing	XX/XXXX - Planned general availability (top of box)	

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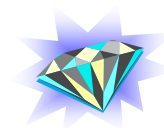ON DEMAND BUSINESS™

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Servers Supported by z/VM Version 5

- z/VM Version 5.1 supports:
  - IBM @server zSeries 990, 900, 890, and 800 in z/Architecture (64-bit) mode
  - Equivalent processors

z/VM Version 5 Release 1 Availability - 09/24/04

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z/VM Version 5 Enhancements

- New pricing model based on engine-based Value Units
  - Provides a lower entry price
  - Decreasing price curve as more processor engines are purchased
  - Aggregate licenses acquired across machines that are part of your enterprise
  - Engine-based Value Unit pricing of z/VM V5 is different than MSU-based Value Unit pricing, which is available on other IBM software products
- Virtualization enhancements for Linux and other guests
  - Install, IPL, and operate from SCSI FCP disks
  - Install of z/VM from a DVD to SCSI FCP disks and to 3390 DASD
  - Support for new HyperSwap™ command
  - PCIX Cryptographic Coprocessor (PCIXCC) support
  - Enhanced systems management APIs
  - Dynamic virtual machine timeout
- Networking virtualization and security enhancements
  - Enhanced virtual switch support
  - Authorization enhanced for guest LANs and virtual switches
- Technology exploitation
  - IBM @server zSeries 990 (z990) and 890 (z890) exploitation
  - Internet Protocol Version 6 (IPv6) support
- Systems management improvements
  - Performance Toolkit for VM™ enhanced
  - Service and installation enhancements

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z/VM V5.1 Enhancements announced October 7, 2004

- Available December 3, 2004
  - ► Virtual switch exploitation of OSA-Express Layer 2
  - ► Performance Toolkit for VM enhanced to support the monitor records created by the SUSE LINUX 2.6 kernel
- Available January 28, 2005
  - ► Crypto Express2 support for Linux and z/OS guests
  - ► OSA-Express2 support:
    - Gigabit Ethernet (Gbe) and 10-Gbe
    - Virtual switch exploitation of OSA-Express2 Layer 2
    - Improved virtualization with more TCP/IP stacks with OSA-Express2
  - ► OSA-Express TCP/IP stack utilization improvements
- FCP LUN access control for added control of SCSI devices is planned to be supported at the availability of this function on the z990 and z890
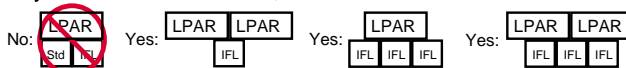
Enhancements to be delivered through the service stream

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z/VM Version 5 Terms and Conditions

- International Program License Agreement (IPLA)
  - ► Program Use License
    - One-time charge (OTC) for standard or IFL engines
      - Engine-based Value Units
    - Can be transferred within an enterprise
    - Service by mail, fax, and e-mail only under basic warranty
  - ► Subscription and Support (S&S)
    - Comparable service as traditional ICA products
    - Not required but highly recommended
    - Must decline when ordering if not desired
    - Annual renewable charge per engine
    - Adds telephone support
    - No additional charges for updates, new versions and releases
- SoftwareXcel available for an additional charge
- IPLA applies to z/VM base code and the optional features
  - ► DirMaint™, RACF® for z/VM, and the Performance Toolkit for VM
- No-charge upgrade to the Performance Toolkit for VM for:
  - ► Customers who purchased z/VM V4 S&S for the RTM, PRF, or Performance Toolkit for VM features
  - ► Customers who purchased the FCON/ESA program (5788-LGA)
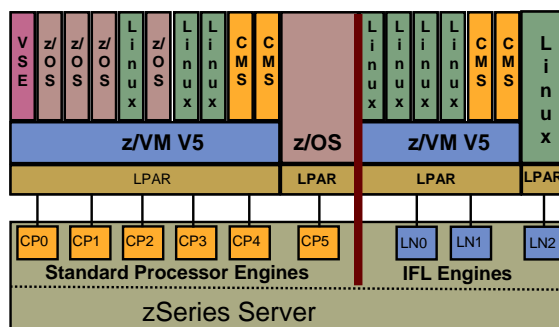
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Integrated Facility for Linux (IFL) Support

- z/VM Version 5 can run in an LPAR defined with IFL engines
- IFLs are processor engines dedicated to Linux-only workloads
  - ► Only IPLA software can be licensed on IFL engines
  - ► Allocated from the set of spare processors on MCM
  - ► Less expensive than standard engines
  - ► Will not support traditional mainframe operating systems
  - ► Only usable in LPAR mode; cannot be mixed with standard engines

  No: | LPAR | Std | IFL | Yes: | LPAR | LPAR | IFL | Yes: | LPAR | IFL IFL IFL | Yes: | LPAR | LPAR | IFL IFL IFL |

- IFL engines are available on the z990, z900, z890, and z800
  - ► One standard engine must exist before IFLs can be added
    - –Exceptions: z800-0LF, z890, and z990 servers
  - ► Some servers don't have spare processors available for IFLs
- Adding IFLs does not change a server's model designation
  - ► No increase in fees for IBM software installed on standard engines

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Example of IPLA Charges for z/VM Version 5

z/VM charges - 6 engines   z/VM charges - 3 engines

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5

Virtualization Technology
and
Linux Enablement

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SCSI FCP Disk Support

- Support SCSI FCP disk (SCSI disks) for both system and guest use
  - ► Within an IBM TotalStorage Enterprise Storage Server® (ESS) when it is connected to a fibre-channel fabric via zSeries FCP channels
  - ► Added security provided for SCSI devices (including system-owned disks) residing on a SAN with FCP LUN Access Control when function is available on the z990 and z890
- SCSI devices can be used by guests that contain their own SCSI device support such as Linux for zSeries
- Emulated as 9336 Model 20 FBA device by CMS and CP for:
  - ► System paging, spooling, directory services, minidisks, and all other system functions and programming services that can use FBA disks
  - ► Allows guests that support FBA (e.g. CMS, VSE) to run unchanged
  - ► Supports an individual emulated FBA disk up to 381 GB in size
- Potential benefits:
  - ► Install from DVD, IPL, and operate z/VM from SCSI disks
  - ► Deploy a Linux server farm on z/VM using only SCSI disks

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Logical Unit Numbers (LUN) Access Control Support

- Permits FCP channel sharing plus explicit definitions to individual LPARs (access rights to devices by individual operating systems)
  - ► IBM Configuration Utility for FCP LUN access control
    - – Download from:
      - • http://www.ibm.com/servers/resourcelink/
- Support of LUN Access Control
  - ► z/VM 5.1 for "system-owned" SCSI devices in addition to Linux guests
  - ► z/VM 4.4 for Linux guests
- Requires PTF for APAR VM63328
- Potential benefits:
  - ► Provides added security for SCSI devices
- FCP LUN access control for added control of SCSI devices is planned to be supported at the availability of this function on the z990 and z890

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Installation of z/VM from a DVD

- Capability to install z/VM from a DVD to an ESS SCSI disk emulated as an FBA device or to a 3390 DASD
- Requires the Hardware Management Console (HMC) Version 1.8 or later
- Potential benefits:
  - ► Significantly reduces the required installation media
  - ► Install to a zSeries server using only SCSI disks
  - ► Install without traditional installation devices such as IBM TotalStorage tape drives attached to an IBM zSeries server

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Support for HyperSwap Command

- New HyperSwap function allowing virtual devices associated with one real disk to be swapped transparently to another disk
- Can be used to switch to secondary disk storage subsystems mirrored by Peer-to-Peer Remote Copy (PPRC)
- Can also be helpful in data migration scenarios to allow applications to use new disk volumes
- GDPS® 3.1 plans to exploit the new z/VM HyperSwap function:
  - ► Requires GDPS, IBM Tivoli® System Automation for Linux, Linux for zSeries, and z/VM
  - ► The following recovery actions are provided by GDPS:
    - − In place re-IPL of failing operating system images
    - − Site takeover/failover of a complete production site
    - − Coordinated planned and unplanned HyperSwap of storage subsystems
- Potential benefit:
  - ► Helps GDPS provide a coordinated near-continuous availability and disaster recovery solution for distributed applications, such as WebSphere®, that span z/OS images running natively and Linux guests running under z/VM

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PCIX Cryptographic Coprocessor (PCIXCC) Support

- Cryptographic support for z/VM V4:
  - ► Shared use of the existing PCI cryptographic cards (PCICA and PCICC) by a large number of Linux guests for clear-key operations only
  - ► Cryptographic support for z/OS guests only for the cryptographic coprocessor
- V5.1 supports the PCICA/PCICC/PCIXCC features:
  - ► Shared-queue and dedicated-queue support for clear-key cryptographic functions for Linux guests
  - ► Dedicated-queue support for clear-key and secure-key cryptographic functions for z/OS guests
  - ► PCICC is not available on the z890 and z990
  - ► PCIXCC is only available on the z890 and z990
  - ► Satisfies PCIXCC SOD made in May, 2003
- Potential benefits:
  - ► Are designed to offer improved performance for secure cryptographic functions over PCICC
  - ► Helps protect your assets

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Crypto Express2 Planned for January 28, 2005

- Crypto Express2 feature
  - ► Dual Integrated Cryptographic Coprocessors
    - – Provides PCIXCC and PCICA functionality
  - ► Improved throughput over the PCIXCC
  - ► PCIXCC not available on z990/z890 after January 28, 2005
    - – Replaced by Crypto Express2
- V5.1 plans to support the Crypto Express2 feature:
  - ► Shared-queue and dedicated-queue support for clear-key cryptographic functions for Linux guests
  - ► Dedicated-queue support for clear-key and secure-key cryptographic functions for z/OS guests
- Potential benefits:
  - ► Improved security over the PCIXCC

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Systems Management APIs

- z/VM V4.4 provided a basic set of functions that may be called by applications to allocate and manage resources for guests running in z/VM virtual machines
  - ► Functions are invoked through Remote Procedure Calls (RPC)
- V5.1 provides:
  - ► New functions are implemented using Version 2 (V2) of the RPC server
    - – V4.4 functions will also function with the new V2 server
  - ► Some usability enhancements and new functions include:
    - – DASD volume management for virtual images
    - – Virtual Machine Resource Manager (VMRM) configuration file management
    - – Query VMRM measurement data
    - – Query status of active images
- Requires a directory manager
  - ► IBM DirMaint FL510 has been enhanced to support the new APIs
- Potential benefit:
  - ► Applications can be more easily written by customers or solution providers to help administrators, especially those who lack in-depth VM knowledge, manage large numbers of virtual images running in a single z/VM system

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Dynamic Virtual Machine Timeout

- New programming service is provided by an emulated DIAGNOSE instruction that enables a guest operating system to specify an action to be taken by CP when the guest becomes unresponsive
- Each guest can define what "unresponsive" means for itself and a time interval and action are specified by the guest
- A designated sequence of CP console functions are executed after a specified time interval elapses unless:
  - ► The guest sets a new interval by reissuing another DIAGNOSE instruction specifying a new time interval
  - ► The guest terminates or suspends the service
- Actions to be taken if a guest is unresponsive include:
  - ► Free shared resources or activate a backup machine
  - ► Remove unresponsive guest from a cluster
- Potential benefit:
  - ► Service is intended specifically to support Linux virtual machines but can be used by other guests allowing more reliable, high-availability, and multi-server solutions to be constructed more easily

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New Publication for Deploying Linux on zSeries with z/VM

- New publication, *Getting Started with Linux on zSeries,* describes z/VM basics and how to configure and use z/VM functions and facilities
  - ► "How to" create and manage Linux servers running on zSeries processors
- Specific subjects include:
  - ► Configuring, administering, and servicing a z/VM system
  - ► Configuring TCP/IP for z/VM
  - ► Creating and cloning Linux virtual machines
  - ► Setting up basic system automation
  - ► Monitoring performance and capacity
  - ► Diagnosing z/VM and Linux problems
- Potential benefit:
  - ► Helps systems personnel (system programmers, administrators, and operators) with limited knowledge of z/VM deploy Linux servers on z/VM more quickly and more easily.

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Network Virtualization and Security
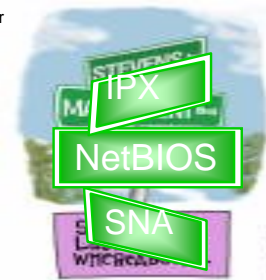
VMV51_330

Enhanced Virtual IP Switch Support

- z/VM V4.4 provided virtual switches to allow virtual-QDIO connections to physical LAN segments without requiring a router
  - ► Allows virtual machines on the guest LAN to be in the same subnet with the physical LAN segment
  - ► Reduces copying of the data being transported
  - ► Enables centralized network configuration and control
  - ► May reduce overhead associated with router virtual machines
- V5.1 provides enhanced failover support for less disruptive recovery for some common network failures including:
  - ► Recover from the failure of a virtual switch's network connection by swapping from a failing OSA-Express device to a partially initialized backup device in less time, helping to reduce data loss
  - ► Detect a stalled OSA-Express device associated with a virtual switch and failover to a backup device
  - ► Detect a non-functioning z/VM TCP/IP controller and failover to a backup controller
  - ► Limit the number of SETIP requests sent to an OSA-Express adapter to help prevent overload of the device
- Potential benefit:
  - ► Helps enable business continuity as well as infrastructure reliability and availability

VMV51_340

Layer 2 switching and transport on zSeries
Flexible and efficient data transfer of IP and non-IP traffic
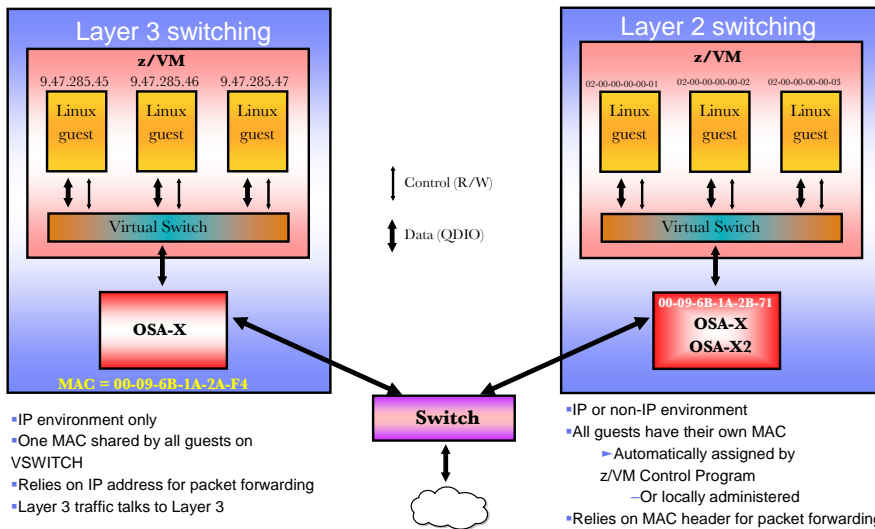
- OSA-Express2, OSA-Express, and z/VM virtual switch plan to support Link Layer (Layer 2) transport mode
- Now protocol-independent and Layer-3-independent
  - ► Each guest has a virtual hardware connection
    - – Each has a unique Media Access Control (MAC) address
  - ► Can support IP and non-IP based protocols
    - – IP (IPv4 or IPv6)
    - – Non-IP (such as AppleTalk, DECnet, IPX, NetBIOS, SNA)
- z/VM virtual switch
  - ► Performs protocol-independent Ethernet switching
  - ► Authorizes and manages guest connections and IEEE 802.1q VLAN assignments
  - ► Provides flexible and automatic MAC address generation and assignment ensuring uniqueness within and across z/VM images, LPARs, server
- Planned to be supported by:
  - ► z/VM V5.1 for OSA-Express on December 3, 2004
  - ► z/VM V5.1 for OSA-Express2 on January 28, 2005
  - ► Linux on zSeries on October 2004 (kernel 2.4) and in early 2005 (kernel 2.6) as an Open Source contribution
- Satisfies Layer 2 SOD made in April, 2004

IPX

NetBIOS

SNA

Layer 2 - an efficient way to host Linux images under z/VM

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Before (Layer 3) and after (Layer 2)

Layer 3 switching

z/VM

9.47.285.45 9.47.285.46 9.47.285.47

Linux guest   Linux guest   Linux guest

Virtual Switch

OSA-X

MAC = 00-09-6B-1A-2A-F4

- IP environment only
- One MAC shared by all guests on VSWITCH
- Relies on IP address for packet forwarding
- Layer 3 traffic talks to Layer 3

Control (R/W)

Data (QDIO)

Switch

Layer 2 switching

z/VM

02-00-00-00-00-01   02-00-00-00-00-02   02-00-00-00-00-03

Linux guest   Linux guest   Linux guest

Virtual Switch

00-09-6B-1A-2B-71

OSA-X
OSA-X2

- IP or non-IP environment
- All guests have their own MAC
  - ► Automatically assigned by z/VM Control Program
    - – Or locally administered
- Relies on MAC header for packet forwarding
- Layer 2 talks to Layer 2

VMV51_344

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Additional Device Connections for TCP/IP for z/VM planned to be available January 28, 2005

- TCP/IP stack utilization improvements for OSA-Express
  - ► TCP/IP stacks increase from 84 up to 160 to allow more virtual machines
  - ► Requires PTFs for APARs PQ91421 and VM63524 for z/VM V3.1, V4.3, V4.4, and V5.1
- Improved virtualization supporting more TCP/IP stacks with OSA-Express2
  - ► Reduces the number of OSA features required to host multiple images
  - ► Provides additional connections to help enable more virtual machines to be connected to an external network
  - ► Requires PTFs for APARs PQ91421 and VM63524 for z/VM V5.1

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Authorization Enhanced for Guest LANs and Virtual Switches

- Enhances the authorization capabilities for z/VM Guest LANs and virtual switches
- Supported by:
  - ► Resource Access Control Facility (RACF) for z/VM optional feature
  - ► Any equivalent External Security Manager (ESM) that supports this new authorization function
- Potential benefit:
  - ► Designed to provide ESM-centralized control of authorizations and Virtual LAN (VLAN) assignment

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Technology Exploitation

Exploitation of the z990 and z890 Servers

- Support for up to four LCSSs on the z990 and up to two LCSSs on the z890
  - ► Allows the definition of more than one channel subsystem
  - ► Each LPAR has access to one channel-subsystem image
  - ► Dynamic-I/O configuration support allows channel paths, control units, and devices to be dynamically added, changed, and deleted using:
    - – CP suite of interactive dynamic-I/O-configuration commands or HCM and HCD
- Support for internal and external spanned channels
  - ► Spanned channels can be shared among LPARs across LCSSs.
  - ► Helps enable communication among Linux guests
- Support for OSA-Integrated Console Controller
  - ► Helps eliminate the requirement for external console controllers (2074, 3174), which can reduce cost and complexity
  - ► Helps improve productivity by requiring fewer mainframe skills
- Improvements to Capacity Upgrade on Demand
- Up to 24 real processor engines in a single z/VM image are supported on a z990
- z/VM V3.1 and V4.3 support up to 4 LCSSs and spanned internal/external channels, however dynamic I/O configuration within LCSS0 only
- Additional exploitation by z/VM V5.1 of new function is planned to be available on December 3, 2004 and January 28, 2005

IBM TotalStorage Enterprise Tape Controller 3592 Model J70 and TotalStorage Enterprise Tape Drive 3592 Model J1A

- Designed to offer high performance and connectivity
  - ▶ Support for up to four FICON attachments, twice the number supported by the 3590 Model A60 Controller, and up to eight ESCON attachments
  - ▶ Attachment of the new 3592 Model J1A Tape Drives or 3590 Tape Drives
  - ▶ Up to 1.5 times the throughput of the 3590 Model A60, with FICON attachment using the 3592 Model J1A Tape Drive
- Enhanced cartridge support for the 3592 Model J1A Tape Drive
  - ▶ Write Once Read Many (WORM) data cartridges
  - ▶ Economy (short-length 60 GB) rewritable or WORM data cartridges
- Supported by z/VM including DFSMS:
  - ▶ V3.1, V4.3, V4.4, and V5.1
  - ▶ Configured to emulate either a 3490E or a 3590B
  - ▶ Attachment of 3592 Model J1A drives to the 3590 Model A60 and 3592 Model J70 tape controller
  - ▶ Requires PTFs for APARs VM63325 (CP) and VM63353 (DFSMS) in z/VM V3.1, V4.3, and V4.4 and integrated in V5.1

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IBM TotalStorage Enterprise Storage Server Model 750

- New model in the family of Enterprise Storage Servers
- The Model 750 includes:
  - ▶ Up to 4.6 TB of physical capacity with enclosures for up to 64 disk drives
  - ▶ 8 GB Cache, two-way processor, and up to six Fibre Channel/FICON or ESCON adapters
  - ▶ Support for 72.8 GB and 145.6 GB 10,000 rpm drives which can be intermixed and configured as RAID 5 and 10 or a combination of both
  - ▶ Peer-to-Peer Remote Copy (PPRC) and PPRC V2 options
  - ▶ FlashCopy® and FlashCopy V2 options
  - ▶ Parallel Access Volumes (PAV) and multiple allegiance to help enhance server performance
- Supported by z/VM V5.1 as well as V3.1, V4.3, and V4.4
- Potential benefits:
  - ▶ Offers the strong functionality and reliability of the Model 800
  - ▶ Ability to upgrade to the Model 800 providing investment protection
  - ▶ Provides an entry point into the ESS product family
  - ▶ Provides attractive price/performance for clients requiring smaller configurations

VMV51_0390

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IPv6 Support

- z/VM V4.4 provided IPv6 support for guest LANs. z/VM guest LAN support for the OSA-Express simulation in QDIO mode was updated for IPv6
- z/VM V5.1 enhances its IPv6 support:
  - Can allow the z/VM TCP/IP stack to be configured for IPv6 networks connected through OSA-Express operating in QDIO mode
    - Provides static routing of IPv6 packets and to send IPv6 Router Advertisements
    - TRACERTE and PING have been enhanced to support IPv6
  - Includes updates to the C-Language sockets through the Language Environment® and the OpenExtensions
- Potential benefits:
  - Relieves several constraints in IPv4, such as the limited number of available IP addresses
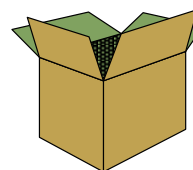 - Application developers can create socket applications for IPv6 communications

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Systems
Management
Improvements

VMV51_410

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Service and Installation Enhancements

- Automated service process has been updated to include:
  - ► An easier query of RSU levels and individual PTF levels for a component
  - ► Cataloging service memo files online and easily displaying the file using the VMFUPDAT command
  - ► A new command, LOCALMOD, to automate the local modification procedure
- Installation improvements include:
  - ► Ease-of-use items for installing Linux with your z/VM system
  - ► Spool and page space has been removed from the System Residence volume
  - ► Separate installation volumes have been assigned for spooling and paging
- Internet Delivery of z/VM SDO Licensed Products through ShopzSeries
  - ► V4.4 and V5.1 SDO licensed products are now eligible for Internet delivery
  - ► z/VM base operating system are not eligible for Internet delivery

VMV51_430

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z/VM Version 5 Product Packaging Changes

- System Delivery Option (SDO) changes
  - ► 3270 PC File transfer
    - − Not available in the SDO, shipped as a sample program on the system disk
  - ► Tivoli Storage Manager™
    - − Not available in the SDO, must be ordered as a standalone product
  - ► ISPF National Language Features
    - − Not available in the SDO, must be ordered using the standalone order process
  - ► DFSMS/VM®
    - − Previously shipped automatically with the system DDRs, orderable as a no-charge feature with the SDO
  - ► IBM Debug Tool for z/VM V4.1(5654-A23)
    - − Orderable as a chargeable feature with the SDO
- Restricted source feature
  - ► Previously available as a no-charge feature
  - ► Available as a no-charge download from Resource Link™
- PL/X source
  - ► Previously shipped automatically with the system DDRs
  - ► Available as a no-charge download from Resource Link
- Java™ and NetRexx™
  - ► Previously available as a no-charge download from z/VM Web site
  - ► Not supported in z/VM V5.1
  - ► Refer to www.**ibm.com**/zSeries/zvm/java/ for additional information

VMV51_440

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Other z/VM Version 5 Product Changes

- Installation from DVD using Hardware Management Console Level 1.8
- RealTime Monitor (RTM) and Performance Reporting Facility (PRF) are not available with z/VM v5.1
- Publications
  - ► New form numbers for all publications in the z/VM library
  - ► All updated publications shipped on September 24, 2004 are available as PDFs from the IBM Publication Center, z/VM Web site, or on z/VM Collection CD-ROM (supplied with order)
  - ► Some hardcopy publications will be available from the IBM Publication Center (charge)
  - ► Publications available in BookManager® format will be available from the z/VM Web site or the z/VM Collection CD-ROM
  - ► Publications are NOT orderable from IBM distribution centers
  - ► All optional feature publications will also be included in the z/VM library
- Functions Removed
  - ► IPL from a 31-bit image of the CP nucleus
  - ► V=R and V=F guest virtual machines
  - ► Paging of CP nucleus
  - ► SPTAPE for backup and recovery of spool files
    - −Replaced by SPXTAPE

VMV51_450

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Performance Toolkit for VM

- Licensed as an IPLA optional feature of z/VM V5
  - ► OTC charge based on engine-based Value Units
  - ► Operates on standard and IFL engines
  - ► S&S required for traditional service and no-charge upgrades
  - ► Preinstalled but disabled, license required
- Based on FCON/ESA
  - ► Replaces both PRF and RTM in V5.1
- New function level for V5.1
- Helps simplify performance analysis and resource management on your z/VM system by analyzing system monitor data and produces performance reports and history files, including:
  - ► System resource utilization, transaction response time, and throughput
  - ► Resource utilization by userID, DASD activity, and channel utilization
- Linux data provided by the RMF™ Linux performance gatherer
  - ► Displays both VM and Linux data
- New reports for Linux and for SCSI FCP disks in V5.1
  - ► Support for monitor records created by the SUSE LINUX 2.6 kernel is planned to be available on December 3, 2004 with PTF for APAR 63580

VMV51_460

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RACF for z/VM Feature

- Licensed as an IPLA optional feature of z/VM V5

  - ► OTC charge based on engine-based Value Units
  - ► Operates on standard and IFL engines
  - ► S&S required for traditional service and no-charge upgrades
  - ► Preinstalled but disabled, license required
  - ► Will only run on z/VM V5.1 or later

- RACF helps meet the need for security by providing:

  - ► Flexible control of access to protected resources
  - ► Protection of installation-defined resources
  - ► Ability to store information for other products
  - ► Choice of centralized or decentralized control of profiles
  - ► Transparency to end users
  - ► Exits for installation-written routines

- z/VM V5.1 feature is required to support enhanced authorization for guest LANs and virtual switches

VMV51_470

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Directory Maintenance Facility (DirMaint) FL510

- Licensed as an IPLA optional feature of z/VM V5

  - ► OTC charge based on engine-based Value Units
  - ► Operates on standard and IFL engines
  - ► S&S required for traditional service and no-charge upgrades
  - ► Preinstalled but disabled, license required
  - ► Will only run on z/VM V5

- New function level for V5.1

- Provides efficient and security-rich interactive facilities for maintaining your z/VM system directory

- Required support for the Systems Management APIs are applied to the DirMaint feature supplied with the V5.1 system DDRs and system image (DVD)

VMV51_480

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Statements of Direction

- IBM has applied for Common Criteria (ISO/IEC 15408) certification of z/VM V5.1 with the RACF for z/VM optional feature against the Labeled Security Protection Profile (LSPP) and the Controlled Access Protection Profile (CAPP), both at the EAL3+ assurance level.

- IBM intends to support greater than 24 CPs in a single z/VM image in the future on appropriate releases of z/VM in combination with designated zSeries server(s).

- z/VM V5.1 is the last release of z/VM to support the use of the IBM 2741 and TWX Terminal Model 33/35 (TTY), or their equivalents, as virtual consoles. This includes any ASCII device, such as the IBM 3101 or IBM 3163, that simulates one of these terminal types using the communication controller Emulator Program (EP).

- IBM intends to withdraw the System Administration Facility and Server-Requester Programming Interface (SRPI) from a future release of z/VM.

- New Statements of Direction announced October 7, 2004:

  ► IBM intends to expand the exploitation of 64-bit support in future z/VM releases to provide better utilization of main storage in configurations larger than 2 GB to help ease constraints imposed by demands for main storage below 2 GB.

  ► In the future, Linux guests running on z/VM may benefit from IBM Virtualization Engine support for Linux on zSeries, which is intended to include Enterprise Workload Manager support for zSeries, Linux for zSeries participation in IBM Director Multiplatform, and the IBM Dynamic Infrastructure for mySAP Business Suite, a solution using Virtualization Engine systems provisioning.

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