

# z/VM Platform Update

August 28, 2013 Version 2.7  
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## Acknowledgments – Platform Update Team

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## Agenda

- Release Status and Information
- z/VM® Version 6 Release 2
- z/VM Version 6 Release 3
- Futures and Statements of Direction
- Value of z/VM





# Release Status and Information



## z/VM Release Status Summary

z/VM	Level	GA	End of Service	End of Marketing	Minimum Processor Level	Security Level
Version 6	Release 3	7/2013	4/2017		IBM System z10®	EAL 4+ <sup>[2]</sup> OSP-LS
	Release 2	12/2011	4/2015	3Q/2013	IBM System z10®	-
	Release 1	10/2009	4/2013	12 2011	IBM System z10®	EAL 4+ OSP-LS
Version 5	Release 4	9/2008	12/2014 <sup>[1]</sup>	3/2012	IBM eServer zSeries 800& 900 (z800, z900)	-
	Release 3	6/2007	9/2010	9/2010	z800, z900	EAL 4+ CAPP/LSPP

<sup>[1]</sup> Or later (Announced August 7, 2012)

<sup>[2]</sup> Targeted Security Level in V6.3 SOD

Marketed & Serviced

Serviced, but not Marketed

End of Service & Marketing

Extended support contracts are available.

## z/VM Version 5 Release 4



- The last release of z/VM to support IBM System z9<sup>®</sup> and older processors
  - **No longer available as of March 12, 2012**
  - Also supports the IBM zEnterprise<sup>®</sup> EC12 (zEC12) and IBM zEnterprise BC12 (zBC12)
  
- End of Service has been extended to **December 31, 2014** or end of IBM service for System z9, whichever is *later*
  - Was September 30, 2013
  - Later, but not *too* much later!
  - See SOD on z/VM 5.4 later in presentation



## z/VM Version 6


### Security Certification Plans



- Common Criteria (ISO/IEC 15408)
  - z/VM 6.1 has been certified: [BSI-DSZ-CC-0752](https://www.bsi.com/Products/BSI-DSZ-CC-0752)
  - Evaluated to EAL 4+ for the Operating System Protection Profile (OSPP) with:
    - Virtualization extension (-VIRT)
    - Labeled Security extension (-LS)
- Federal Information Protection Standard (FIPS) 140-2
  - z/VM 6.1 System SSL is FIPS 140-2 Validated<sup>(TM)</sup>
  - Enablement requirements for certificate database and servers
    - <http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2012.htm#1735>
- z/VM 6.2 is designed to conform to both Common Criteria and FIPS 140-2 evaluation requirements



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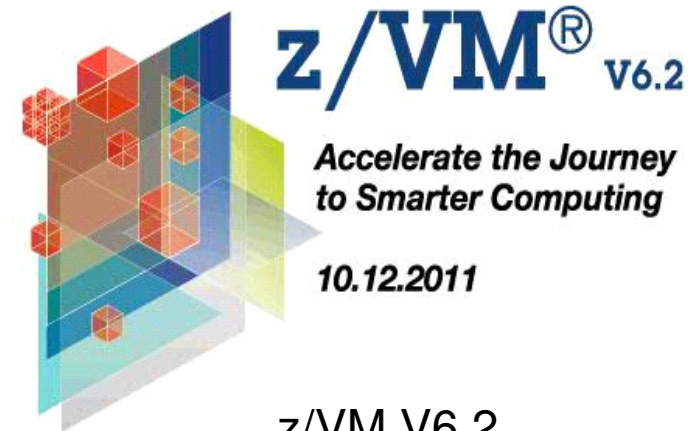
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# z/VM Version 6 Release 2

*and other recent  
functional enhancements*

## z/VM Version 6 Release 2

- Generally available December 2, 2011
- Withdrawn from marketing in July 2013
  - Concurrent with z/VM V6.3 GA
- Major changes include:
  - Single System Image
  - Live Guest Relocation

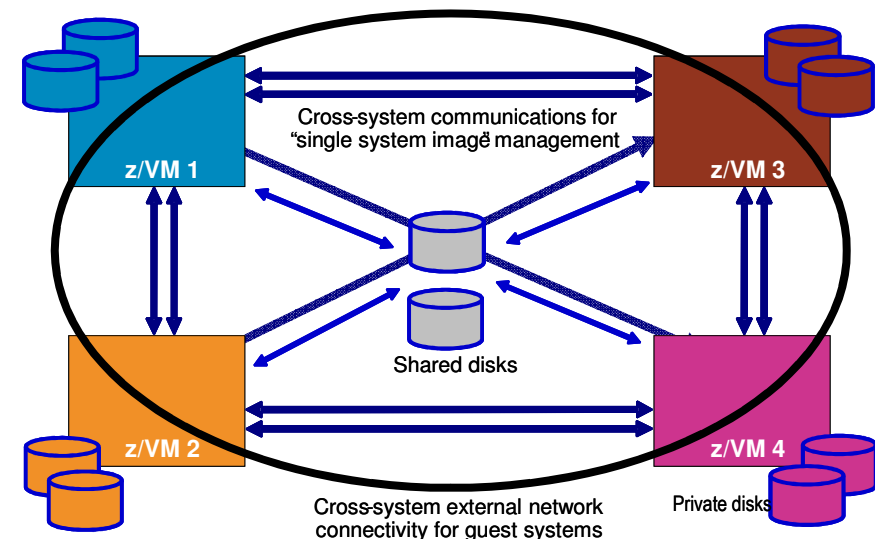


z/VM V6.2  
End of Service  
April 30, 2015

## Single System Image (SSI) Feature

### Clustered Hypervisor with Live Guest Relocation

- Optional priced feature
- Connect up to four z/VM systems as members of a Single System Image cluster
- Cluster members can be run on the same or different System z servers
- Simplifies management of a multi-z/VM environment
  - Single user directory
  - Cluster management from any member
    - Apply maintenance to all members in the cluster from one location
    - Issue commands from one member to operate on another
  - Built-in cross-member capabilities
  - Resource coordination and protection of network and disks



## Benefits and Uses of z/VM SSI Clusters

- Horizontal growth of z/VM workloads
  - Increased control over virtual server sprawl
  - Distribution and balancing of resources and workloads
- Flexibility for planned outages for service and migration
  - z/VM
  - Hardware
  - Less disruptive to virtual server workloads
- Workload testing
  - Different service/release levels
  - Various environments (stress, etc.)
  - New/changed workloads and applications can be tested before moving into production
- Simplified system management of a multi-z/VM environment
  - Concurrent installation of multiple-system cluster
  - Single maintenance stream
  - Reliable sharing of resources and data

## Systems Management and the Single System Image Feature



- Support for SSI and LGR by
  - xCAT 2.8 supports SSI and LGR
    - Available with March 2013 code drop
- No Support for SSI and LGR by
  - Unified Resource Manager (zManager) *does not* support SSI and LGR
  - IBM Systems Director *does not* support SSI and LGR
- Suggested best practice is to not combine SSI and LGR with zManager or Systems Director
  - Work with your IBM Sales Team, IBM Lab Services, or z/VM Development Lab to determine which technologies are most critical to your environment and business.

## z/VM 6.2 SSI and GDPS Support

- GDPS® V3.10 was generally available March 29, 2013
  - Adds support for Live Guest Relocation with Standard Actions panel and Automation scripts
  - If an SSI member is being shutdown, GDPS automatically asks if any virtual machines should be relocated prior to the shutdown.
  - See <http://www-03.ibm.com/systems/z/advantages/gdps/whatsnew.html> for details.
- GDPS/PPRC xDR 3.9 supports SSI configuration
  - All Members of the SSI cluster must be in the same GDPS managed group.
  - APAR PM64211
  - Requires z/VM APAR VM65176
- All supported GDPS releases (3.8, 3.9, & 3.10) supported with non-SSI environment
  - See GDPS PSP buckets for required service (z/OS®, Linux, & z/VM)
  - If GDPS environment shared with older z/VM releases, z/VM service is required on them before adding z/VM 6.2

Environment	3.8	3.9	3.10
z/VM 6.2 Non-SSI	Yes	Yes	Yes
z/VM 6.2 SSI	No	Yes	Yes
z/VM 6.2 SSI + LGR	No	No	Yes



## z/VM Single System Image and Live Guest Relocation Implementation Services

- IBM System z<sup>®</sup> **Lab Services Offering:**
  - In-depth **education** on the functions of Single System Image
  - Cluster **planning and deployment assistance**
  - Operational **guidance** and recommendations
  - **Migration assistance** for users of CSE
  - **Demonstrate** the technology in your own environment.
  - **Analyze** how SSI and LGR will affect your system initialization, recovery, and automation procedures
  - Early **identification of any inhibitors** to use
  - Identification of any required z/VM or Linux operating system **patches**

For more information, contact **[systemz@us.ibm.com](mailto:systemz@us.ibm.com)**

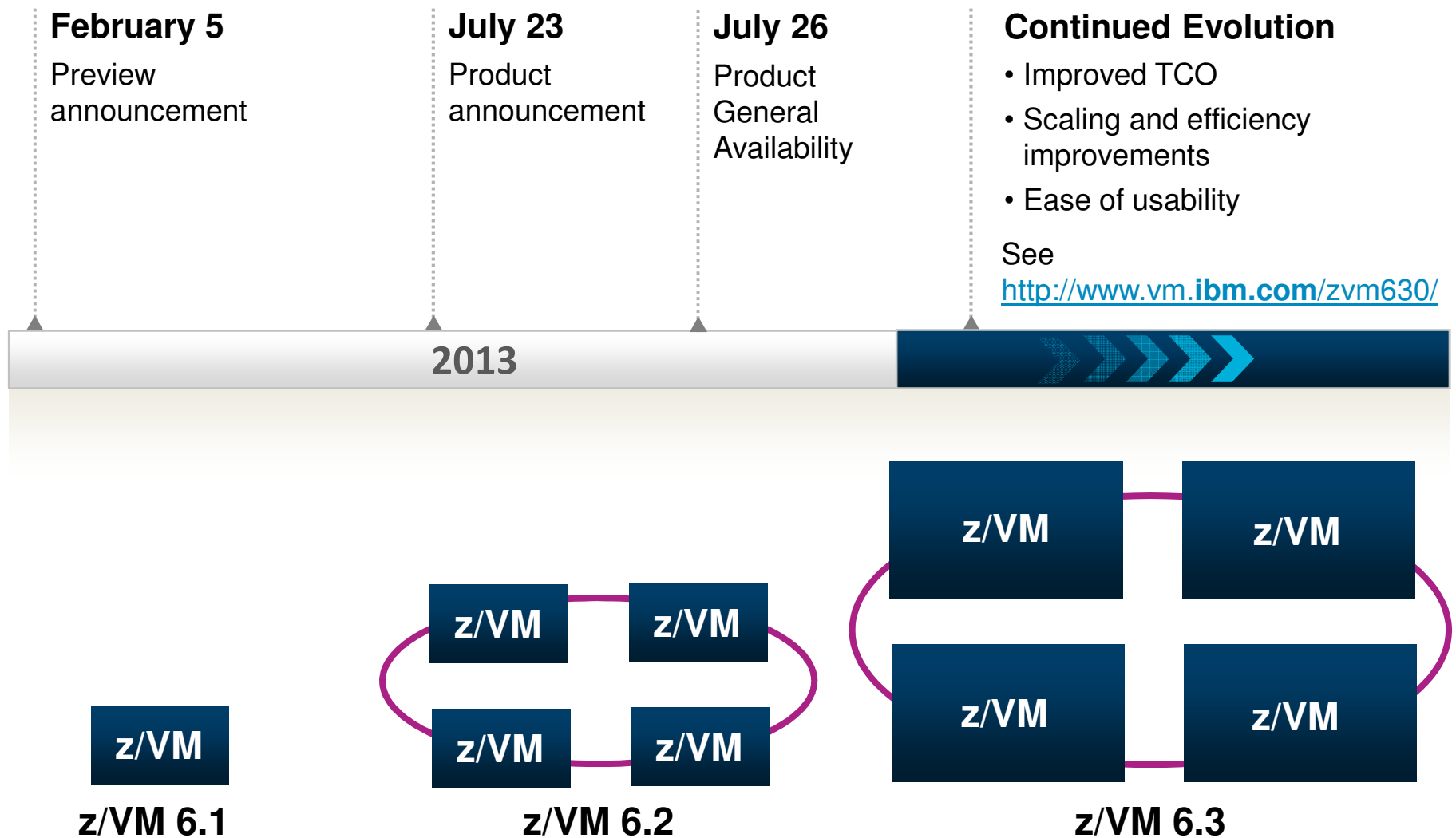




# z/VM Version 6 Release 3

## z/VM Version 6 Release 3

### Making Room to Grow Your Business



## Reduce the number of z/VM systems you need to manage z/VM 6.3



- Expand z/VM systems constrained by memory up to four times (almost two times on the zBC12), thus increasing the number of Linux virtual servers in a single z/VM system
- Exploit HiperDispatch to improve processor efficiency, allowing more work to be done per IFL and therefore supporting more virtual servers per IFL, potentially requiring fewer systems for applicable workloads
- Expand the real memory used in a Single System Image Cluster up to 4 TB
  - z/VM 6.3 has the ability to fully utilize memory of a zBC12 at a maximum of 496 GB
- Exploit multiple subchannel sets in GDPS environment to place secondary Peer-to-Peer volumes in alternate subchannel set

## Improved Memory Management Flexibility and Efficiency



- Benefits for z/VM systems of all memory sizes
- Prioritize virtual server use of real memory more effectively through enhanced memory reservation support
- Exploit improved management of memory on systems with diverse virtual server processor and memory use patterns
- Eliminate use of expanded storage for z/VM paging, allowing greater flexibility and avoiding some of the restrictions associated with expanded storage

## Simplify z/VM Systems Management



- Managing z/VM virtual servers with xCAT (Extreme Cloud Administration Toolkit) is ready to go after z/VM 6.3 installation; nothing else needs to be installed
- Adopt a foundation to allow future extensions for open source systems management solutions, in particular through OpenStack® support
- Enable scalable support for the larger systems that z/VM 6.3 supports
- Safely migrate an existing z/VM V6R2 SSI Cluster to z/VM 6.3 in a step-wise approach, without having to shut down the cluster, using the new “Installation Upgrade In Place” capability



## Large Memory Support



- Real memory limit raised from 256GB to **1 TB**
  - Proportionately increases total virtual memory based on tolerable over- commitment levels and workload dependencies
- Virtual machine memory limit remains unchanged at **1 TB**
- Paging DASD utilization and requirements change
  - Removed the need to double the paging space on DASD
  - Paging algorithm changes increase the need to have a properly configured paging subsystem
- Expanded Storage continues to be supported with a limit of **128 GB**



## Large Memory Support (cont.)

- Reorder processing removed
  - Commands remain, but have no impact
  - Improves environment for running larger virtual machines
- Improved effectiveness of the CP SET RESERVE command
  - Stronger “glue” to hold reserved pages in memory
  - Support for reserving pages of NSS or DCSS
    - Example: Use with the Monitor Segment (MONDCSS)
  - Ability to limit the overall number of reserved pages for the system

## Enhanced Dump Support



- Stand-alone Dump utility has been rewritten
  - Creates a CP hardabend format dump
  - Dump is written to ECKD™ or SCSI DASD
- Larger memory sizes supported, up to a maximum of 1 TB
  - Includes Stand-alone dump, hardabend dump, SNAPDUMP, DUMPLD2, and VM Dump Tool
- Performance improvements for hardabend dump
  - Reduces time to take a CP hardabend dump

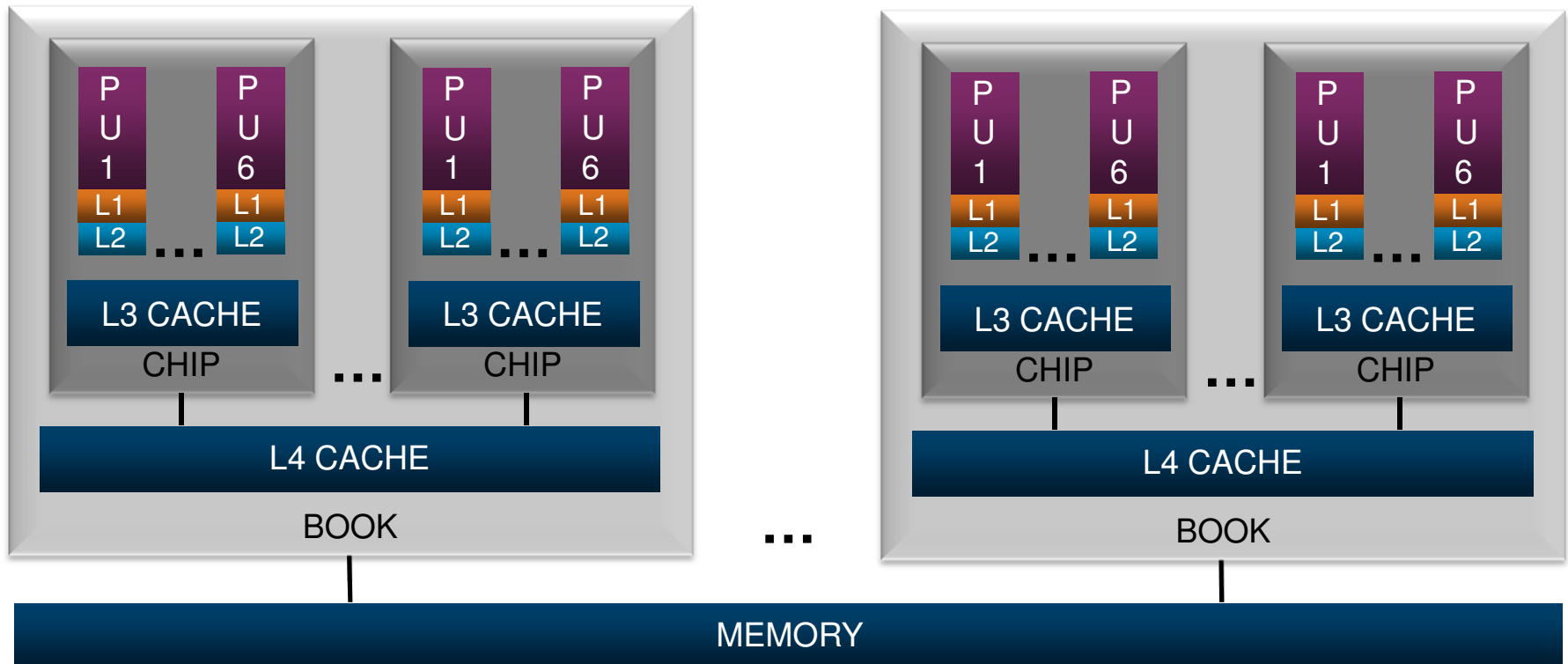
## HiperDispatch



- Improved processor efficiency
  - Better n-way curves
    - Supported processor limit of 32 remains unchanged
  - Better use of processor cache to take advantage of cache-rich system design of more recent machines
- Two components:
  - Dispatching affinity
  - Vertical CPU management

## HiperDispatch – Dispatching Affinity

- Processor cache structures become increasingly complex and critical to performance
- Goal is to re-dispatch work close (in terms of topology) to where it last ran



## HiperDispatch – Dispatching Affinity



- Dispatcher is aware of the cache and memory topology
  - Dispatch virtual CPU near where its data may be in cache based on where the virtual CPU was last dispatched
- Better use of cache can reduce the execution time of a set of related instructions
- z/VM 6.2 and earlier uses “soft” affinity to dispatch virtual CPUs
  - No awareness of chip or book

## HiperDispatch – Vertical CPU Management



- Today's “horizontal” management distributes the LPAR weight evenly across the logical processors of the z/VM LPAR
- “Vertical” management attempts to minimize the number of logical processors, allowing LPAR to similarly manage logical CPUs

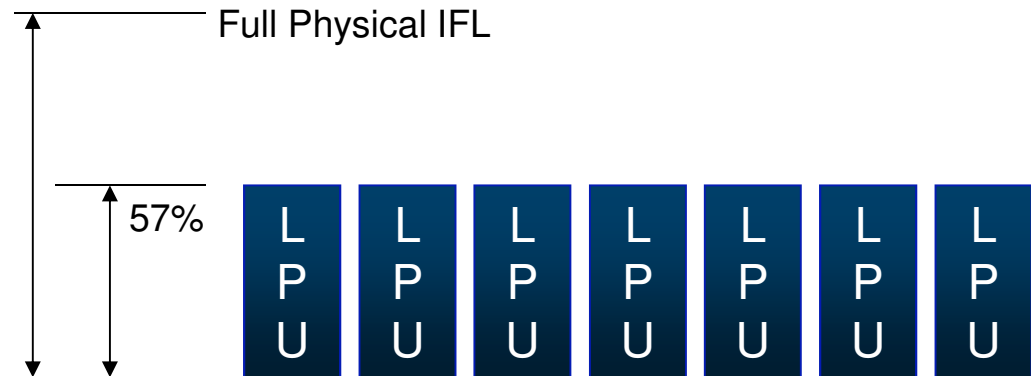
### Example:

- Ten Physical IFLs, seven logical IFLs, weight of 400 out of 1000
  - Each logical IFL (LPU) entitled to 57% of an IFL
- When CEC is constrained, the LPAR’s entitlement is reduced to four IFLs, so seven is more than required
- z/VM and LPAR will cooperate
  - z/VM will concentrate the workload on a smaller number of logical processors
  - LPAR will redistribute the partition weight to give a greater portion to this smaller number of logical processors (~100% of four CPUs)

## Horizontal vs. Vertical CPU Management

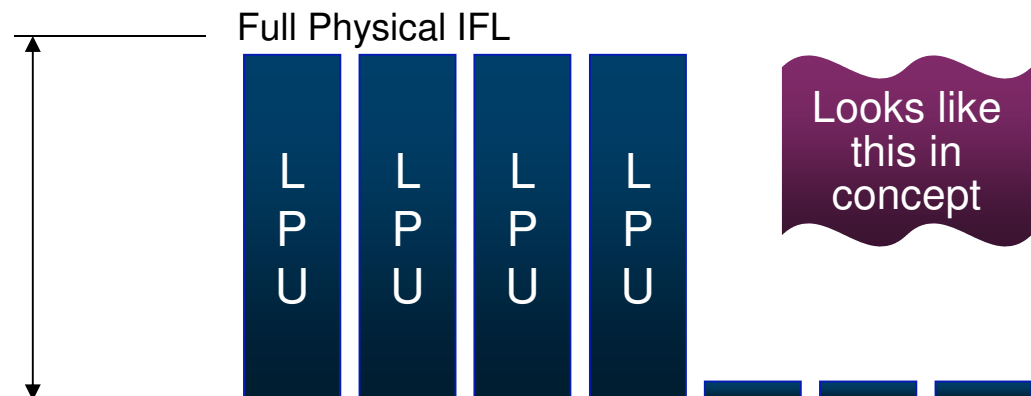
### Horizontal:

- The logical processors are all created/treated equally.
- z/VM dispatches work evenly across the seven logical processors



### Vertical:

- The logical processors are skewed to where some get greater share of the weight.
- z/VM dispatches work accordingly to the heavier weighted workload.





## Technology Exploitation

- Fibre Channel Protocol Data Router Support
  - FCP QEBSM support enhanced for guest support use of FCP Data Router
- FICON DS8000 Series New Functions
  - Storage Controller Health message
    - New attention message from hardware providing more details for conditions in past reflected as Equipment Check.
    - Intended to reduce the number of false HyperSwap® events.
  - Peer-to-Peer Remote Copy (PPRC) Summary Unit Check
    - Replaces a series of state change interrupts for individual DASD volumes with a single interrupt per LSS
    - Intended to avoid timeouts in GDPS environments that resulted from the time to process a large number of state change interrupts.
    - Satisfies a SOD from October 12, 201
- Multiple Subchannel Set (MSS) support for mirrored DASD
  - Support to use MSS facility to allow use of an alternate subchannel set for Peer-to-Peer Remote Copy (PPRC) secondary volumes.
  - Satisfies a SOD from October 12, 2011

## z/VM 6.3 and GDPS Support

- z/VM 6.3 alternate subchannel set support
  - GDPS V3.10 prereqs the PM71447 New Function: GDPS/PPRC XDR MSS1 Support APAR
- z/VM 6.3 FICON DS8000 Series new function (DS8K synergy initiative)
  - GDPS/PPRC V3.8, V3.9, & V3.10 and prereqs the PM44141 New Function: GDPS/PPRC XDR PPRCSUM and Storage Controller Health Message APAR, and DS8K R6.2 u-code.
- Cannot mix new MSS support in an SSI environment with older z/VM systems.
- See <http://www-03.ibm.com/systems/z/advantages/gdps/whatsnew.html> for details.
- See GDPS PSP buckets for required service (z/OS, Linux, and z/VM)
  - Remember to check for required service for systems that share the GDPS environment.

Environment	3.8	3.9	3.10
z/VM 6.3 w/ MSS 1	No	No	Yes <sup>1</sup>
z/VM 6.3 DS8K Synergy	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
z/VM 6.3 SSI + LGR	No	No	Yes <sup>1</sup>

1 – with appropriate service – Check Bucket

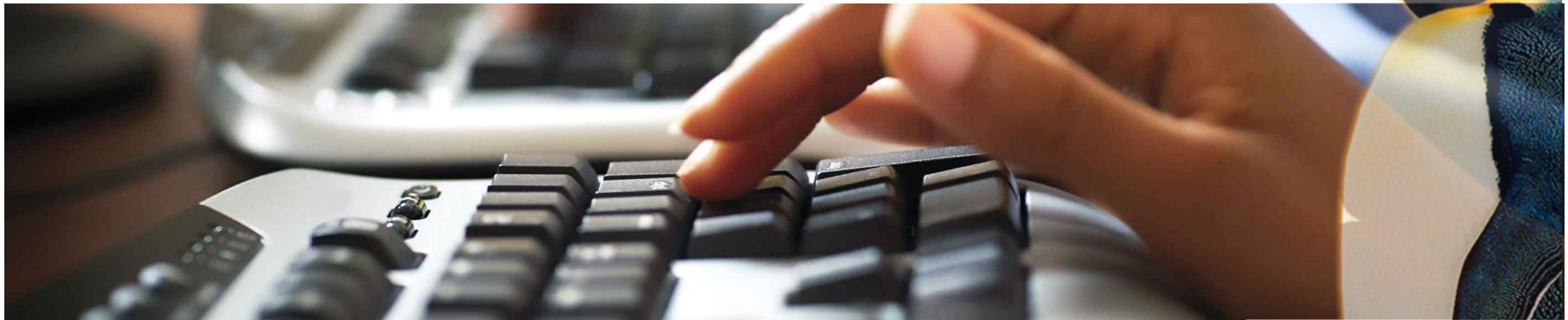
## Virtual Networking Improvements

- Live Guest Relocation support for port-based virtual switches built on existing support:
  - Allow relocation of port-based interface
  - Prevent relocation of an interface that will be unable to establish proper network connectivity
  - Adjust the destination virtual switch configuration, when possible, by inheriting virtual switch authorization from the origin
- MPROUTE server upgraded to z/OS V1.13 OMPROUTE functional equivalency
- Support for OSA-Express5S devices
- Virtual Switch recovery and stall prevention
  - New SET VSWITCH UPLINK SWITCHOVER command
  - Change from current device to one of the configured backup devices

## Security Enhancements

- Crypto Express4S
  - Guest support for Crypto Express4S which is a feature available on zEC12 and zBC12
  - Can be configured in one of three ways:
    - IBM Common Cryptographic Architecture (CCA) Coprocessor mode
    - IBM CCA Accelerator mode
    - IBM Enterprise Public Key Cryptographic Standards (PKCS) #11 (EP11) coprocessor
- SSL Server Upgrade
  - System SSL update to z/OS V1.13 equivalency
  - Client certificate validation
  - Includes support for:
    - Transport Layer Security (TLS) protocol, Version 1.2
    - SHA2 certificate support
    - TLS Protocol Selection
  - IPv6 support for SSL-enabled Telnet, FTP, and SMTP

## Linux Disk Dump Utility can now include the NSS



- The Linux Disk Dump utility is preferred over the CP VMDUMP command in most cases.
- Previously, the contents of an NSS could not be captured with Linux Disk Dump utility.
- Changes in IPL now allow the NSS to be included
  - New NSSDATA parameter
- For more background, see:
  - <http://download.boulder.ibm.com/ibmdl/pub/software/dw/linux390/docu/l26ddt01.pdf> for Linux Disk Dump utility information
  - <http://www.vm.ibm.com/perf/tips/vmdump.html> for information on differences between VMDUMP and Linux utility

## z/VM 6.3 Withdraws Cross System Extensions (CSE) Support

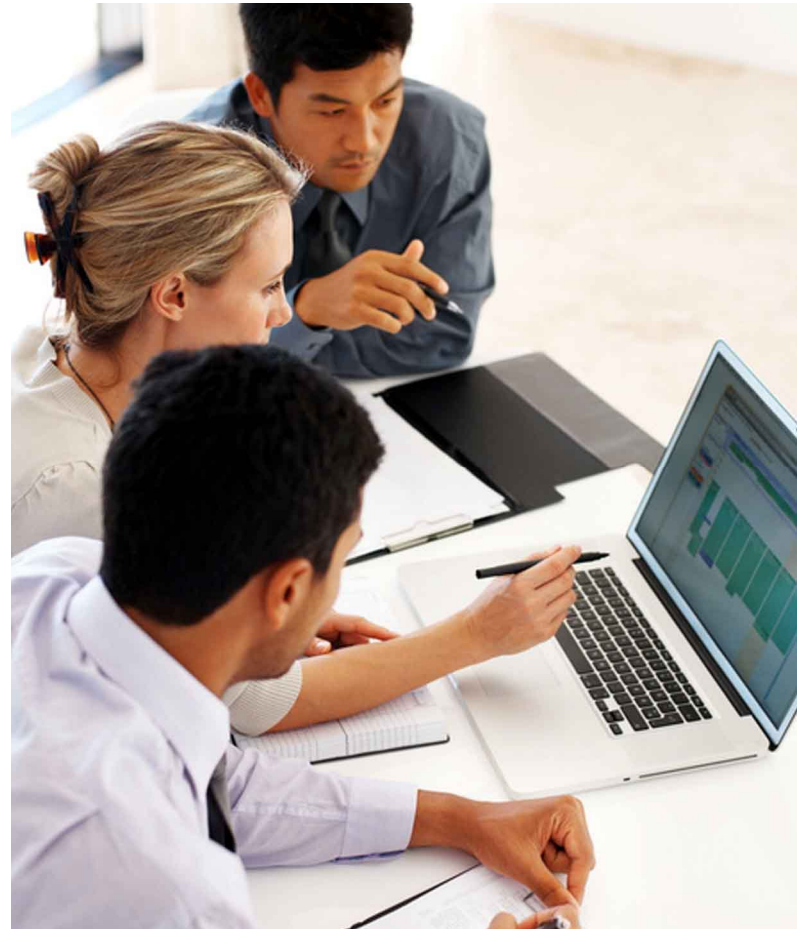
- Satisfies a previous Statement of Direction
- The z/VM Single System Image (VMSSI) feature replaces the functions provided by CSE:
  - Logon once in the cluster, with exceptions
  - Cross-system MESSAGE and QUERY commands
  - Shared spool
  - Shared source directory
- VMSSI has additional value such as autonomic minidisk cache management and a single point of maintenance
- XLINK shared disk support is **not** affected.



Change  
from SoD

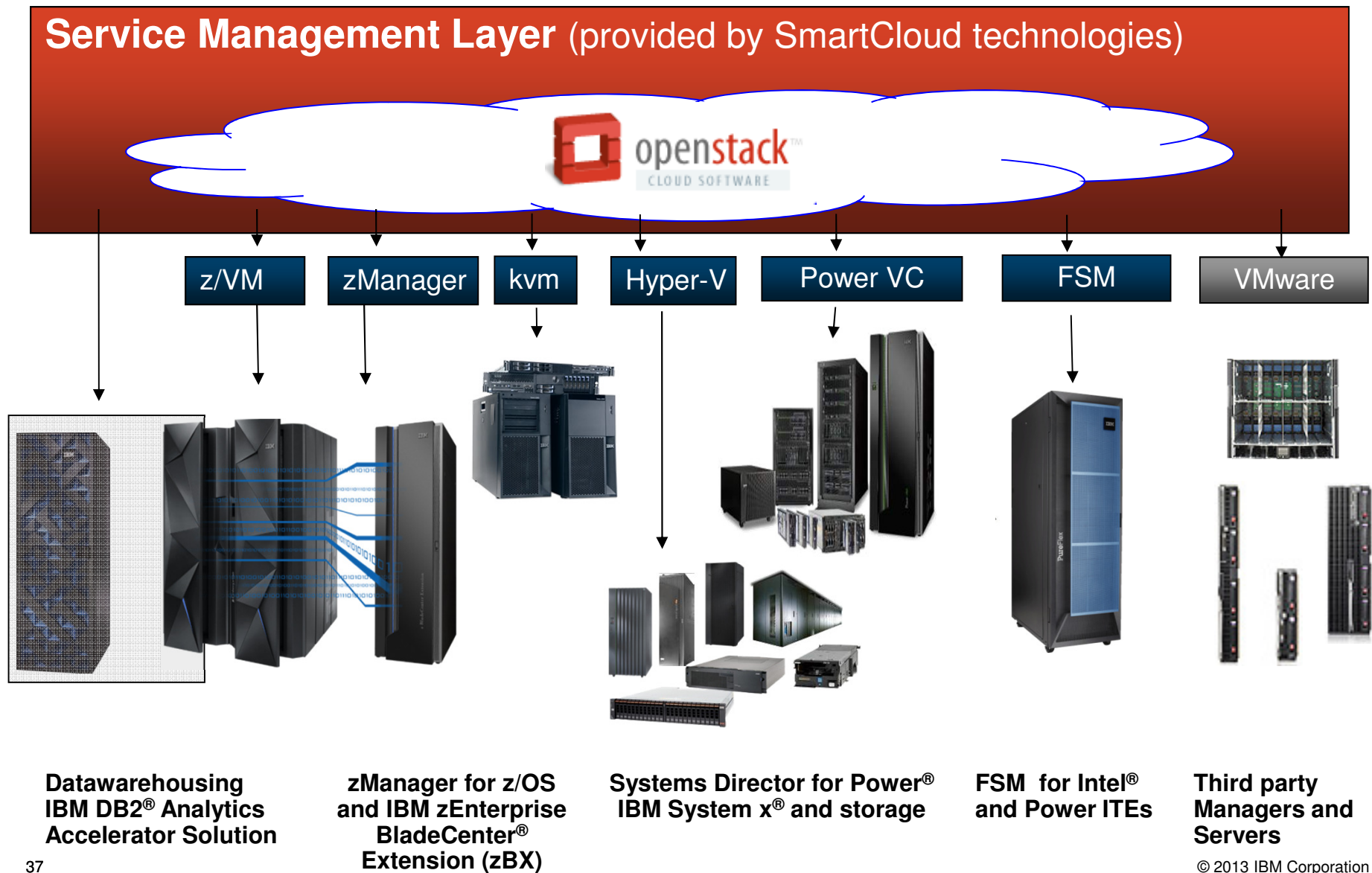
## z/VM 6.3 Withdraws support for TCP/IP Devices and Daemons

- Satisfies a previous Statement of Direction
- A220 HYPERchannel devices
- CLAW devices
- DHCP daemon
- LPSERVE (LPD)
  - RSCS LPD is provided at no charge
  - Does not affect LPR (client)

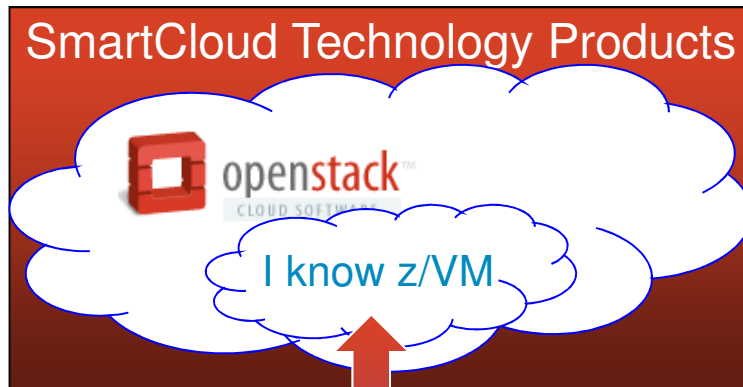




## Hybrid computing model integrated and enabled for Cloud



## The OpenStack Food Chain



### ▪ Top Half of the Solution:

- An IBM SmartCloud Technology product or other vendor product will include the OpenStack support.
- Portions of that OpenStack support will know z/VM (i.e. code that connects and understands how to talk to z/VM).

### ▪ Bottom Half of the Solution:

- Rest APIs are used to communicate with the OpenStack code from the top half.
- The xCAT Appliance utilizes new and existing Systems Management APIs (SMAPI) to interact with the z/VM system
- SMAPI can interact with additional optional products or features (e.g. a directory manager).



Product with OpenStack Support

z/VM 6.3 Product

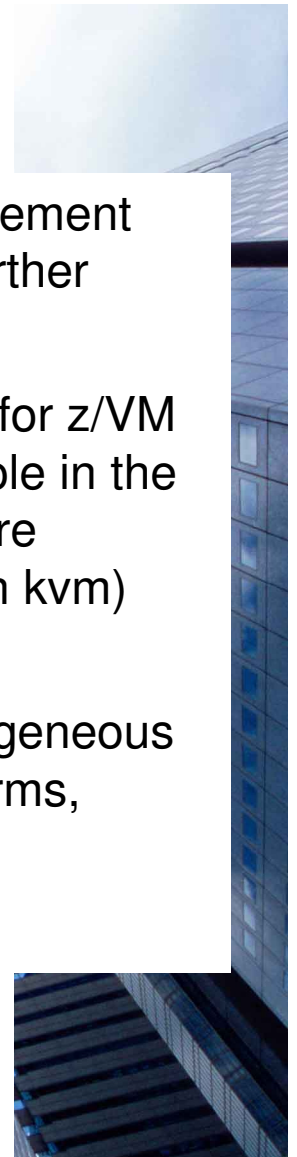
Optional Product or Feature

## Unified Resource Manager (zManager) and z/VM 6.3 Announcement

In light of IBM's cloud strategy and adoption of OpenStack, the management of z/VM environments in zManager is now stabilized and will not be further enhanced.

Accordingly, zManager will not provide systems management support for z/VM 6.3. However, zManager will continue to play a distinct and strategic role in the management of virtualized environments created by integrated firmware hypervisors (PR/SM™, PowerVM™, and System x hypervisor based on kvm) of zEnterprise.

Looking ahead, IBM's vision is to enable OpenStack to provide heterogeneous systems management across zEnterprise, z/VM and distributed platforms, which in turn can be exploited by IBM's future SmartCloud offerings.



## z/VM System Management – Related Products

- **Operations Manager for z/VM V1.4**
  - Facilitates automated operations
  - Monitor, view, and interact with consoles without logging on to service machines or Linux guests
  - Take actions based on service machine console messages and other system events
  - Schedule events for immediate execution or on a regular schedule
- **OMEGAMON® XE on z/VM and Linux V4.3**
  - Performance monitoring of z/VM and Linux guests
  - Part of the OMEGAMON and IBM Tivoli Monitoring infrastructure, including Tivoli Enterprise Portal
  - Uses IBM Performance Toolkit for VM as its data source
- **Backup and Restore Manager for z/VM V1.2**
  - Backup and restore file level data for CMS minidisks and Shared File System
  - Backup and restore images of Linux guests and/or z/VM volumes
    - Use Tivoli Storage Manager for file level backup and restore of Linux data
- **Tape Manager for z/VM V1.3**
  - Manage tapes: retention, access control, data security erase
  - Manage devices: share with other z/VM and non-z/VM systems
  - Manage mount requests for ATL, VTS, and manual mount devices
    - Supports IBM and Oracle STK libraries
- **Archive Manager for z/VM V1.1**
  - Users and administrators manage disk space more efficiently and effectively
  - Archive infrequently used or large files to tape or other disk
- **zSecure™ Manager for RACF z/VM V1.11.1**
  - Automate complex, time consuming z/VM security management tasks
  - Quickly identify and prevent problems in RACF
  - Create comprehensive audit trails



**All support  
z/VM 6.2  
and 6.3!**

## Other Considerations with z/VM 6.3

- You need to plan for Large Memory and for HiperDispatch. z/VM 6.3 changes some of the rules of thumb and planning guidelines from previous releases.
- DUMP Considerations
  - At time of publishing the calculations for dump space was not complete for the largest systems. This information has been made available on the z/VM Home Page
    - <http://www.vm.ibm.com/techinfo/> or <http://www.vm.ibm.com/service/zvmpladm.pdf>
  - Should learn DUMPLD2 which replaces DUMpload and has ability to segment a dump into multiple files.
- The size of CMS component grew significantly as a result of including an appliance server for xCAT, LOHCOST, and Stand-alone dump
  - Two additional install volumes
- The integrated xCAT does not have support for the Command Line Interfaces
  - Will need to use the download version if CLI is required
- If using z/VM 6.3 Upgrade in Place installation ensure required service is applied to z/VM 6.2 system being upgraded.



# Hardware Support



## Support for IBM zEnterprise EC12

- **Updates for z/VM 6.2, 6.1, and 5.4**
  - VM65007 CP
  - VM65131 IOCP
  - VM65046 Performance Toolkit for VM™
  - VM65047 HCD
  - VM64747 HCM (z196 support: 6.1 and 5.4 only)
  - VM65130 EREP
  - OA38418 OSA/SF for OSA-Express4S
  - PM49761 High Level Assembler (new instructions)
- **PSP Bucket**
  - Upgrade **2827DEVICE**
  - Subset **2827/ZVM**
  - Subset **2827/ZOS** for ICSF service to support EP11 when running as a guest

### Recent addition to the bucket for APAR VM65262

z/VM V5R4: PTF UM33877

z/VM V6R1: PTF UM33878

z/VM V6R2: PTF UM33879





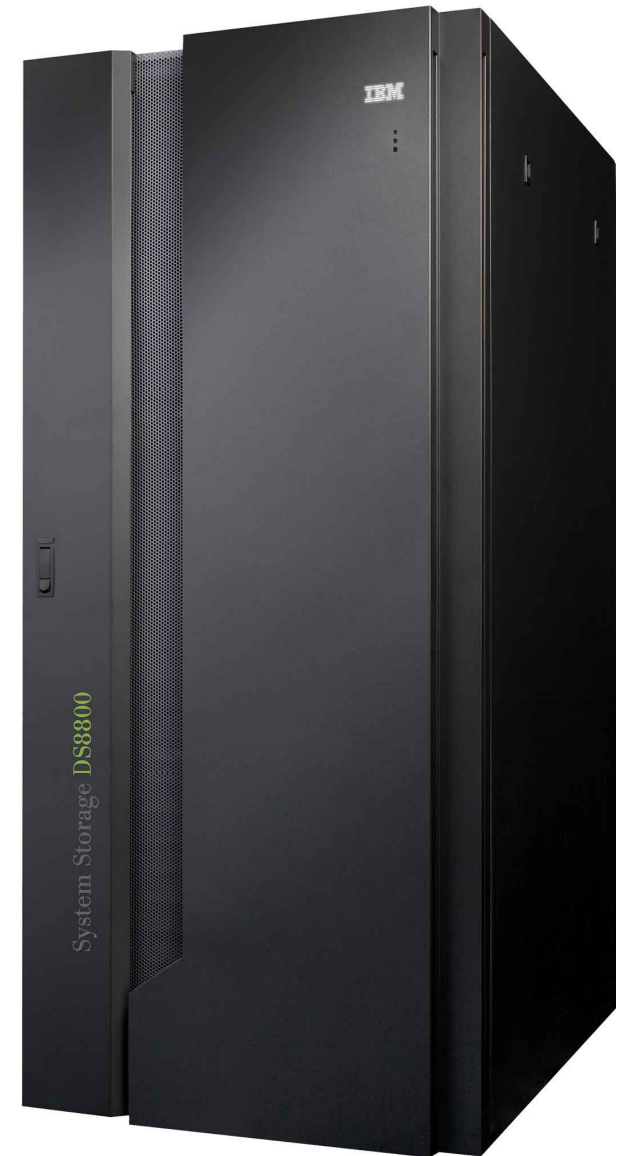
## Support for IBM zEnterprise BC12

- **Updates for z/VM 6.3, 6.2 and 5.4**
  - VM65239: VMHCD support
  - VM65236: VMHCM support
  - VM65279: EREP support
  - VM65278: IOCP support
  - VM65360: SYSEVENT QVS support
    - VM65356: SYSEVENT QVS support (pre-req to VM65360)
- **Update for z/VM 6.2 and in base of z/VM 6.3**
  - PM83966: TCP/IP support
- **PSP Bucket**
  - Upgrade: **2828DEVICE**
  - Subset: **2828/ZVM**



## z/VM Storage Support

- z/VM 6.3 supports
  - DS8000® Series (FCP or FICON®)
  - DS6000® Series (FICON)
  - XIV (FCP)
  - IBM San Volume Controller (FCP)
  - IBM Storwize® V7000 (FCP)
    - See [ibm.com/support/docview.wss?uid=ssg1S1003703#\\_zvm](http://ibm.com/support/docview.wss?uid=ssg1S1003703#_zvm)
  - IBM FlashSystem when behind an SVC (FCP)
  - As well as many of the older storage devices
- The IBM System Storage® Interoperation Center (SSIC) support page:
  - [ibm.com/systems/support/storage/ssic/interoperability.wss](http://ibm.com/systems/support/storage/ssic/interoperability.wss)





# Statements of Direction July 23, 2013

Subject to change or withdrawal without notice,  
representing IBM goals and objectives only.

## Security Evaluation of z/VM 6.3

IBM intends to evaluate z/VM V6.3 with the RACF Security Server feature, including labeled security, for conformance to the Operating System Protection Profile (OSPP) of the Common Criteria standard for IT security, ISO/IEC 15408, at Evaluation Assurance Level 4 (EAL4+).

- We continue the practice of taking every other release through certification.
- Evaluation is with inclusion of RACF Security Server optional feature.
- See <http://www.vm.ibm.com/security/> for current z/VM Security information.

## FIPS Certification of z/VM 6.3

IBM intends to pursue an evaluation of the Federal Information Processing Standard (FIPS) 140-2 using National Institute of Standards and Technology's (NIST) Cryptographic Module Validation Program (CMVP) for the System SSL implementation utilized by z/VM V6.3.

- Federal Information Protection Standard (FIPS) 140-2
  - Target z/VM 6.3 System SSL is FIPS 140-2 Validated\*
  - Enablement requirements for certificate database and servers
    - <http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2012.htm#1735>
- See <http://www.vm.ibm.com/security/> for current z/VM Security information.

*\*A Certification Mark of NIST, which does not imply product endorsement by NIST, the U.S. or Canadian Governments.*

## Support of the 10GbE RoCE Express Feature

In a future z/VM deliverable IBM plans to offer support for guest exploitation of the 10GbE RoCE Express feature (#0411) on the IBM zEnterprise EC12 and IBM zEnterprise BC12 systems. This is to allow guests to utilize Remote Direct Memory Access over Converged Ethernet (RoCE) for optimized networking.

- RoCE is high bandwidth, low latency link layer protocol
- Guest support for devices dedicated to z/VM guests that support RoCE
- Requires 10GbE RoCE Express feature on either the IBM zEC12 or IBM zBC12

## Support of the zEDC Express Feature

In a future z/VM deliverable IBM plans to offer z/VM support for guest exploitation of the IBM zEnterprise Data Compression (zEDC) Express feature (#0420) on the IBM zEnterprise EC12 and IBM zEnterprise BC12 systems.

- New data compression hardware feature to improve ability to do compression by offloading to zEDC
- Support is planned for guest usage
- Requires zEDC Express feature on either the IBM zEC12 or IBM zBC12



## Stabilization of z/VM 5.4 Support

The IBM zEnterprise EC12 and IBM zEnterprise BC12 are planned to be the last System z servers supported by z/VM V5.4 and the last System z servers that will support z/VM V5.4 running as a guest (second level). z/VM V5.4 will continue to be supported until December 31, 2014, or until the IBM System z9<sup>®</sup> Enterprise Class (z9 EC) and IBM System z9 Business Class (z9BC) are withdrawn from support, whichever is later. Refer to Withdrawal Announcement 912-144, (RFA56762) dated August 7, 2012.

- While support will continue to the later date of December 31, 2014 or until the z9 processors are withdrawn from future, support for new function and processors is being stabilized.
- z/VM 5.4 will not be supported on processors after the zEC12 and zBC12.
  - This includes running as a guest of a supported z/VM Version 6 release.
- Plan now to avoid a migration which would involve both hardware and software at the same time.

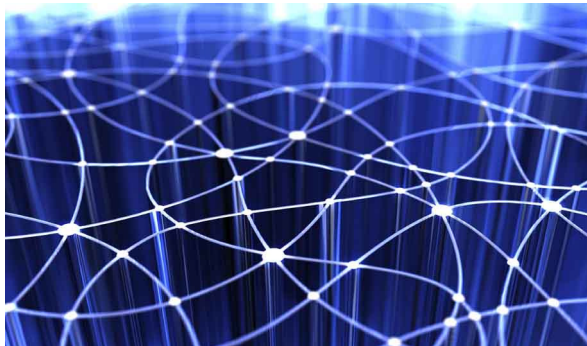
## Withdrawal of Support for Expanded Storage

z/VM 6.3 will be the last release to support expanded storage (XSTOR) as part of the paging configuration. With the enhanced memory management support added in z/VM V6.3, expanded storage is no longer recommended as part of the paging configuration. z/VM can run efficiently in a configuration using only central storage

- In z/VM 6.3, it is recommended to configure all processor memory as central storage.
  - Support remains to use expanded storage in z/VM 6.3, but is suggested for use only in special cases.

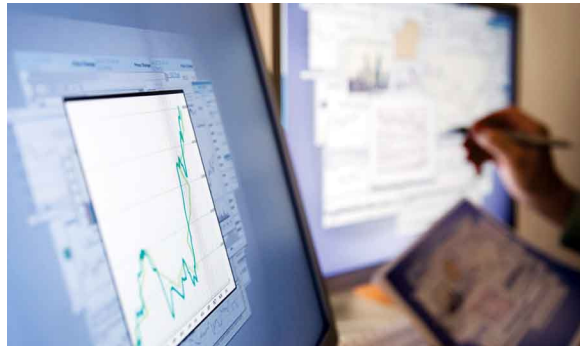


# Summary



## Leadership

z/VM continues to provide additional value to the platform as the strategic virtualization solution for System z.



## Innovation

z/VM 6.2 introduced horizontal scalability and guest mobility through Single System Image clustering and Live Guest Relocation with RAS in the forefront of the design.



## Growth

z/VM 6.3 increases the vertical scalability and efficiency to complement the horizontal scaling introduced in z/VM 6.2, because we know our customers' systems continue to grow.

**Thanks!!**

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