




# z/VM V6.4: A Customer Driven Release

October 6, 2017 Version 16

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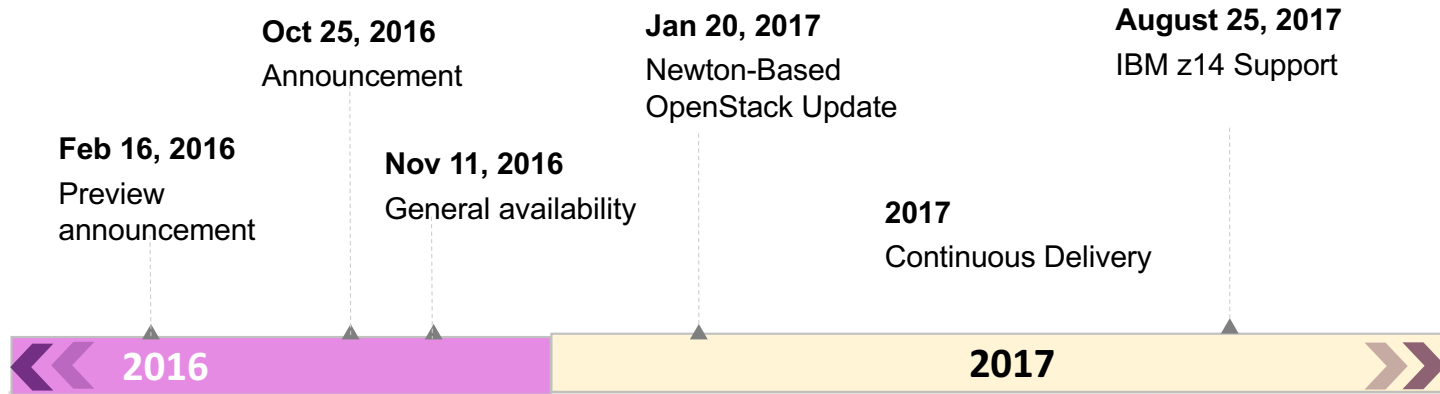
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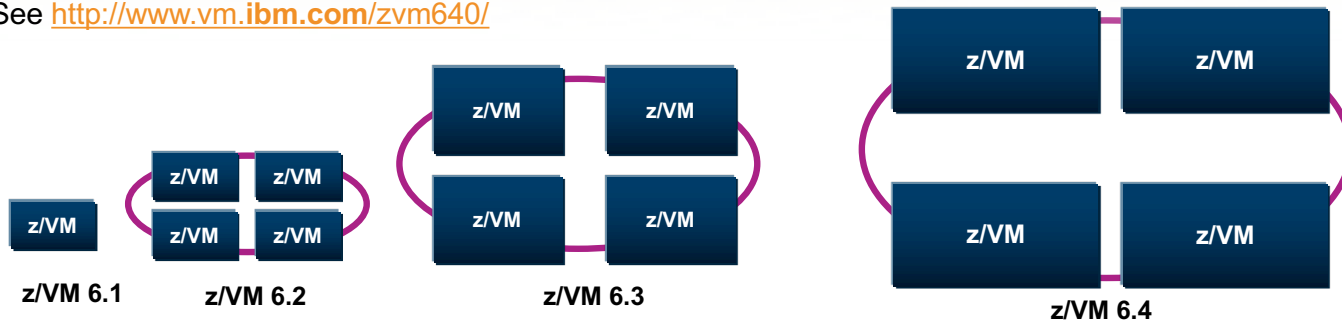


# z/VM Version 6 Release 4

Designed for Clients of Today and Tomorrow



See <http://www.vm.ibm.com/zvm640/>





# z/VM Continuous Delivery Release Model

*Under evaluation - We want your feedback!*

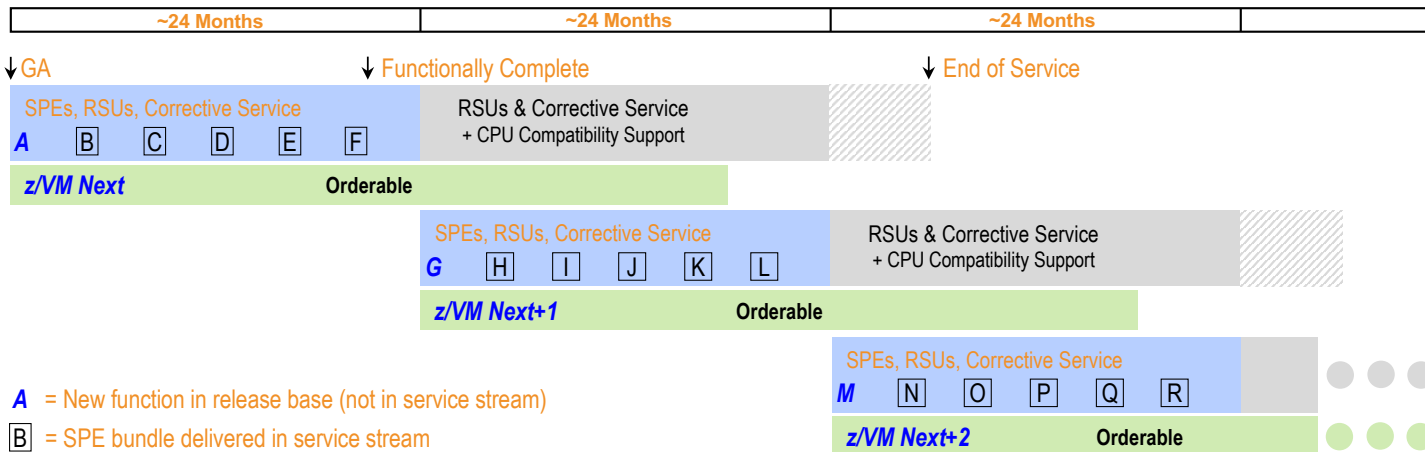
## 24-Month Release Cycle

z/VM V6.4



### Highlights:

Two releases of z/VM Next orderable at the same time | Releases in service for ~54 months  
 A new release is generated every ~24 months  
 Clients are encouraged to “stay current” and move to a new release ASAP  
 - Where applicable, product design decisions will favor the client who stays current  
 Clients can migrate from one “service only” release to another if required  
 Clients can run new release in test environment on prior release at any time





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## Service-Stream Deliverables

- See the blue marker in the upper right hand corner
- Where pertinent, PTF numbers, RSUs, or applicable releases are noted.



## z/VM Release Status Summary

z/VM Level	GA	End of Service	End of Marketing	Minimum Processor Level	Maximum Processor Level	Security Level
6.4	11/2016			IBM System z196 & z114 <sup>®</sup>	-	In progress
6.3	7/2013	12/2017 <sup>[1]</sup>	11/2016	IBM System z10 <sup>®</sup>	z14, z13s <sup>4</sup>	EAL 4+ OSPP-LS
6.2	12/2011	6/2017 <sup>[2]</sup>	7/2013	IBM System z10 <sup>®</sup>	z13	-
5.4	9/2008	12/2017 <sup>[3]</sup>	3/2012	IBM eServer zSeries 800& 900	zEC12	-

<sup>[1]</sup> Announced February 3, 2015

<sup>[2]</sup> Announced February 2, 2016

<sup>[3]</sup> Announced August 2, 2016

<sup>[4]</sup> Also LinuxONE corresponding machines



## IBM z/VM 6.4

- A release born from customer feedback
  - z Systems Business Leaders Council (zBLC)
  - SHARE dialogues
  - IBM internal T3s (Teach the Teacher)
- Prioritizations set by customers and adjusted by IBM resources and skills
- Two major areas:
  - Technical enhancements that continue to improve TCO and bring direct value
  - Improved quality of life for z/VM system programmers
- **New Architecture Level Set (ALS)**
  - z196 and z114 or newer
  - Drops z10 EC and BC support





## Value Areas of z/VM 6.4

- **Improves scaling and TCO in a single footprint**
  - More virtual machines in a single z/VM system
- **Improves the management for large diverse workloads**
  - Fair and accurate resource control
  - Guest exploitation of z Systems and LinuxONE hardware
- **Shortens road to installation and migration**
  - New customers
  - Existing customers
- **Adds capabilities for automation and system programmer effectiveness**
  - Scripting and automation frameworks
  - Problem determination
- **Enhances security framework**
- **Many other smaller enhancements to improve various aspects of supporting z/VM**
  - Network
  - Performance
  - Systems Management

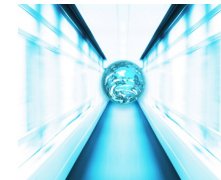






## TCO and Scaling Improvements

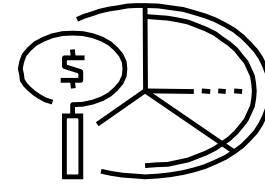
- z/VM continues to be able to **support more virtual machines in a single footprint** with reasonable service levels than any other solution
  - Major component to the TCO story
  - Capacity increases that do not result in additional support personnel
- Real memory support **increased from 1 TB to 2 TB** with same degree of overcommitment of real memory
  - Individual virtual machine limit remains at 1 TB
- **Dynamic SMT added** to change the number of active threads per core without a system outage
  - Potential capacity gains going from SMT-1 to SMT-2 (one to two threads per core) can now be achieved dynamically
  - Can go from SMT-2 to SMT-1 in rare case that it is not optimal for workload (response time concerns greater than capacity gains)
  - Requires running in SMT enabled, but can vary active threads per core





## TCO – z/VM Pricing

- New Sub-capacity pricing terms announced
  - July 17, 2017
  - Software Announcement [217-267](#)
- Pay for software at less than full machine capacity
  - Leaves room for native Linux logical partitions or KVM partitions
  - Planned capacity growth without immediate software impact
- Applies to
  - z/VM 6.3 and z/VM 6.4
  - z/VM priced features
  - z/VM based programs
    - IBM Wave for z/VM
    - Backup & Restore Manager
    - OMEGAMON XE on z/VM
    - zSecure
    - Tape Manager
    - Infrastructure Suite
    - Archive Manager
    - Operations Manager
- Requires
  - z/VM 6.3 or z/VM 6.4
  - Install and configure the z/VM Hypervisor Proxy in a Linux virtual machine in each logical partition involved
  - Use of IBM License Metric Tool (ILMT) to collect data monthly for audit purposes





## Increased Paging Capability

- **Memory overcommitment** helps keep TCO values low. Paging effectively allows for better overcommitment ratios.
  
- **z/VM paging to ECKD (DS8000)** improved significantly
  - Use of HyperPAV allows:
    - Greater paging bandwidth with parallel I/O
    - Fewer, but larger page volumes
  - Use of High Performance Ficon (zHPF)
    - More efficient I/O processing for z/VM system I/O
  
- z/VM system volume usage (including paging) with FCP SCSI attached FlashSystems Storage Servers
  - **Removes requirement for SAN Volume Controller** (SVC aka Spectrum Virtualize) as intermediary for z/VM volumes; lowers latency and removes an expense





## Performance Enhancement via Service

### ▪ **SCSI XIV Enhancements:**

- Improved performance for EDEVICES using XIV hardware through allowing multiple I/O commands to be issued concurrently. Particularly benefits EDEV paging I/O or shared volumes with minidisks
- APAR VM65929
  - PTF UM35080 (z/VM 6.4) closed March 9, 2017





## EAV Minidisk Enhancements via Service

- More data means larger disks
- Extended Address Volumes (EAV) minidisks will be able to reside anywhere on EAV volumes
- Benefits:
  - Fewer volumes to manage
  - Regain benefits of sharing minidisks with large volumes
- CP APAR VM65943
  - PTF UM35187 (z/VM 6.4) closed August 25, 2017
- CMS APAR VM65945
  - PTF UM35204 (z/VM 6.4) closed August 25, 2017
  - Planned availability of August 25, 2017
- ICKDSF APAR PI85943
  - PTF UI49579 closed August 25, 2017



## Processor Scalability Efficiency Improvement

- Improvements of processing for shared-exclusive spinlocks
  
- Benefits:
  - Improves n-way curve and efficiency in scheduler and dispatcher processing.
  - Some benefit is exclusive to z14 and Emperor II as new capability is exploited
  
- APAR VM65988
  - PTF UM35214 (z/VM 6.4) closed August 23, 2017
  - RSU: TBD



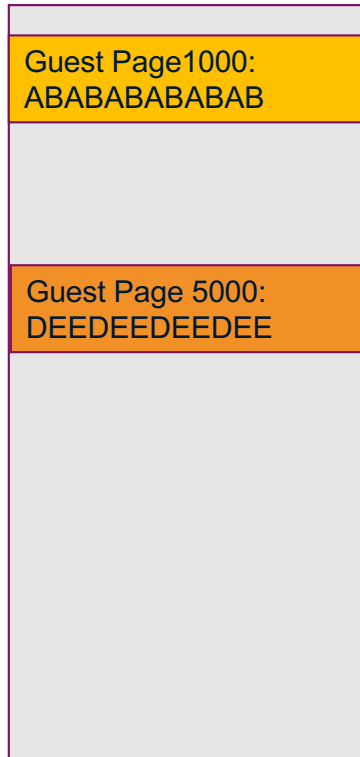
## Handling Diverse Workloads

- **Various algorithms changed** to remove large system effects and manage memory even more effectively
  - Better and more consistent performance
  
- **Scheduler changes** to further improve accuracy and fairness of access to resources across various configurations
  - Removes surplus share problem seen on earlier releases
  - Eliminates eligible list to avoid complexity of tuning
  
- **RAS improvements** for FCP SCSI Disk environments
  - SCSI driver has additional path recovery
  - Concurrent SVC code loads supported
  - And much more
  
- New ability to **free up paging disk space** used (KEEPSLOT = NO)
  - Helpful in environments where memory overcommitment is low
  - Reduces the disk paging space used in a z/VM environment by trading off potential for additional paging I/O.

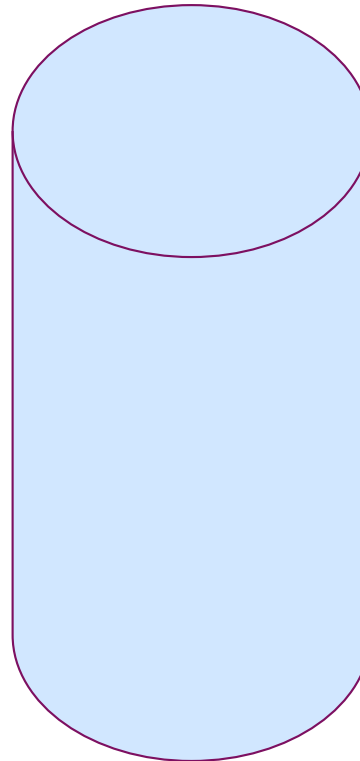




## KEEPSLOT - Background



Real Memory



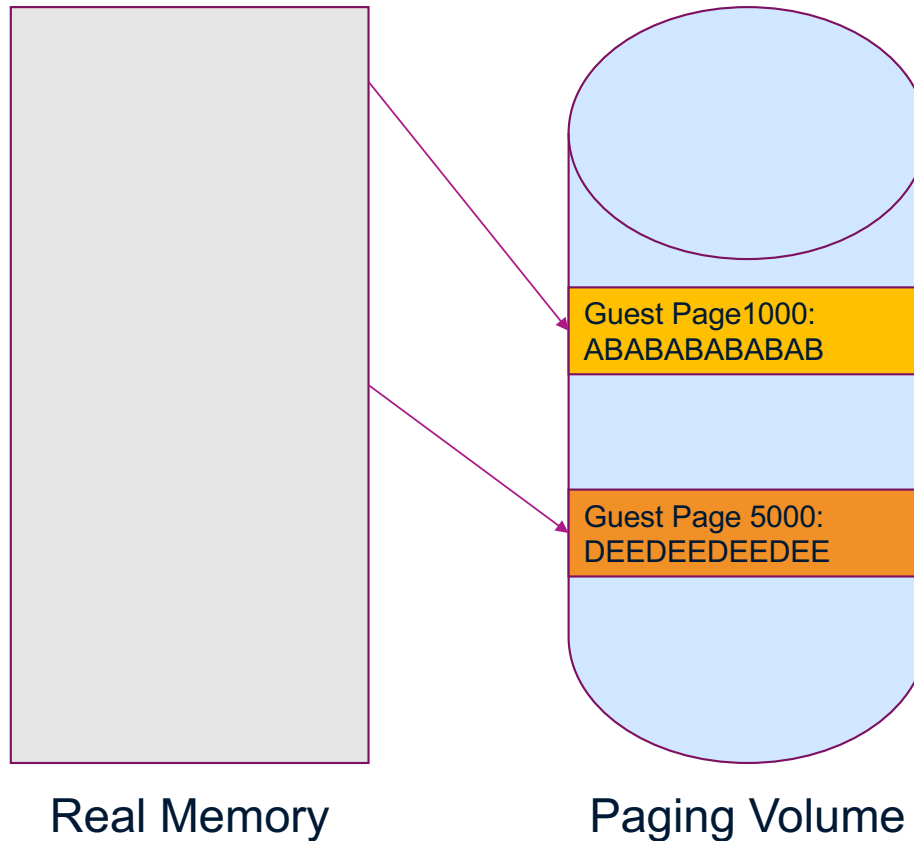
Paging Volume

z/VM determines  
it needs to page  
out Guest Pages  
1000 and 5000





## KEEPSLOT - Background

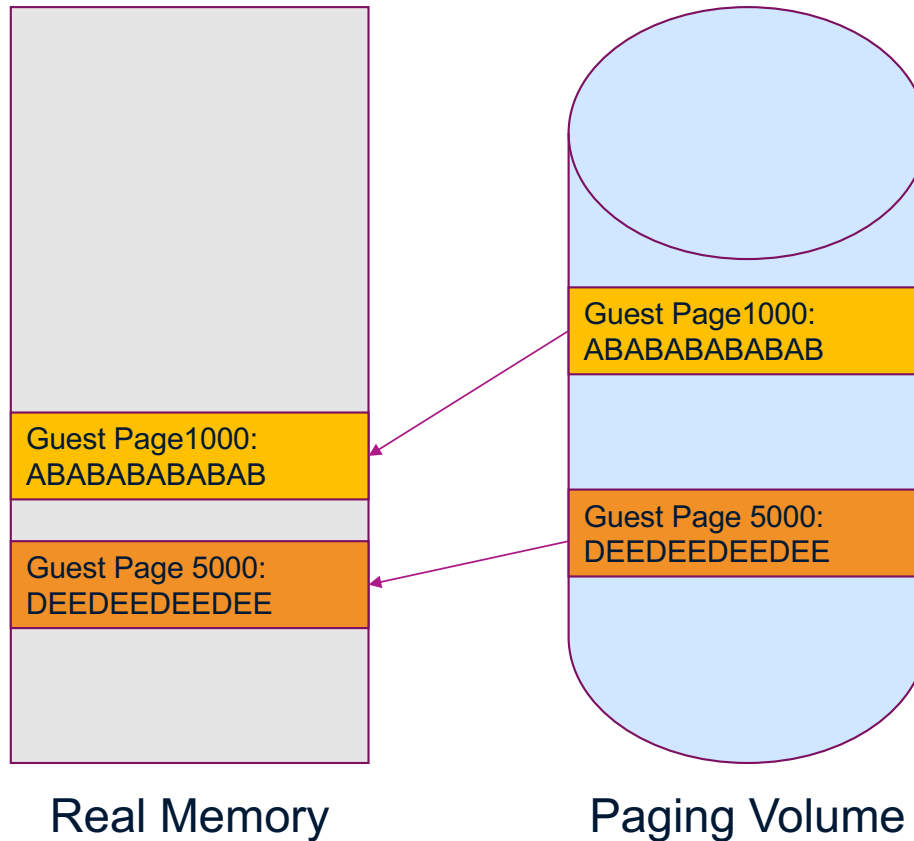


z/VM will select slots on a paging volume and write out the page.

(Actually it writes out a “set” of pages with this I/O).



## KEEPSLOT - Background

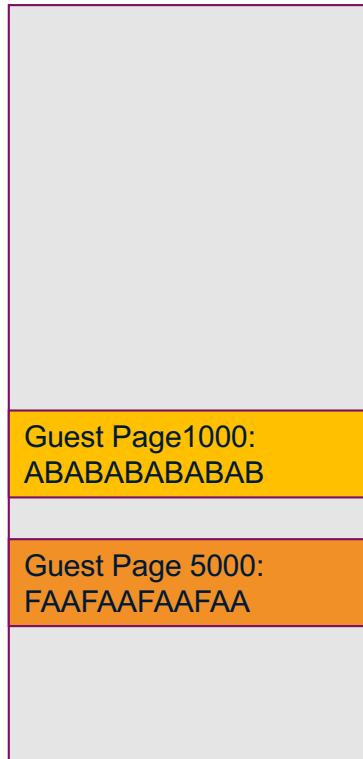


At some future time, the guest may reference the page that was paged out and z/VM page it back into real memory. But we leave the page in the disk slot as well.

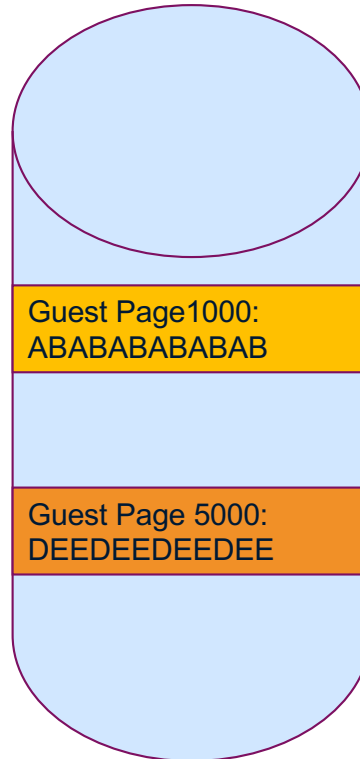
This means we actually have two copies of the guest pages at this time.



## KEEPSLOT - Background



Real Memory



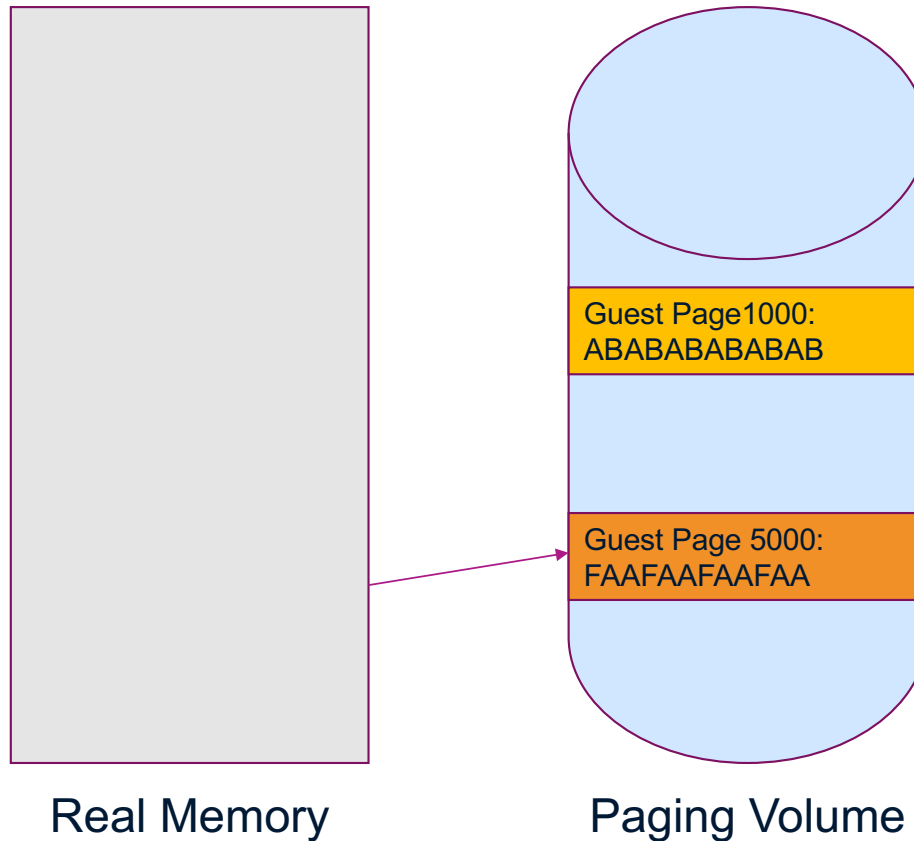
Paging Volume

Over time, lets assume that Page 5000 is changed.

Now the copy on disk doesn't match what's in memory.



## KEEPSLOT - Background



When we have to steal frames again, we do not need to write out page 1000 because that has not changed.

Page 5000 will be re-written because it changed since it was paged in.



## KEEPSLOT

- z/VM does not remove guest pages from disk when they are paged in (*"keeps the slots"*)
  - **Avoids the need to re-write pages** that have not changed
  
- **Downside - this can result in larger paging space requirements**
  - Especially after z/VM 6.3, where early writes were introduced
  
- z/VM 6.4 introduces a new **AGELIST** option to disable this
  - For environments where the overcommit level is low and large amounts of real memory are being used, you will want to consider disabling early writes and keeping disk slots
    - Command  
**SET AGELIST EARLYWRITES NO KEEPSLOT NO**
  
    - System configuration file:  
**STORAGE AGELIST EARLYWRITES NO KEEPSLOT NO**



## Greater Guest Efficiencies

- **Support for Guests to use Large Page (1 MB pages)**
  - Allows guests to use the Enhanced DAT (EDAT-1) architecture
  - Reduces the amount of memory used for guest DAT structures and pathlength to manage that memory
  - z/VM continues to manage on a 4KB basis, retaining the full benefit of overcommitment
  
- **Support for Guests to use Transactional Execution Facility (TX Facility)**
  - Guests now informed that TX facility is available for use in z/VM environment
  - TX facility provides instructions that are an efficient alternative for synchronization
  - Performance improvement in processor requirements
  - Requires guest to be at supported level
  
- **Support for Guests to use SIMD (Single Instruction Multiple Data)**
  - Guests now informed SIMD is available for use in z/VM environment
  - Performance improvement in processor requirements
  - Requires guest to be at supported level
  - Requires z13, z13s, or LinuxONE
  - Also available on z/VM 6.3 with PTF UM34752





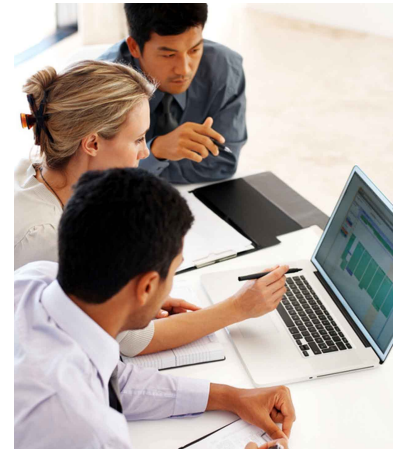
## Getting Up and Running

### ▪ Upgrade In Place – For existing z/VM 6.2 and 6.3 customers

- Allows moving to z/VM 6.4 from existing systems rather than a new install
- Support for vendor products, local mods, and backing out if necessary
- See Install Guide for details

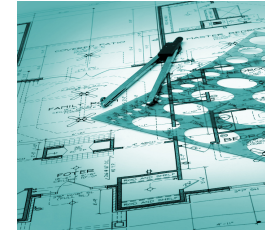
### ▪ Dynamic Partition Manager (DPM) – For new customers

- Support added to allow z/VM 6.4 logical partitions to be configured through new DPM interface rather than traditional PR/SM
- I/O configuration much easier than older IOCDS approach
- Limited to FCP SCSI only, no FICON at this time
  - No Single System Image Cluster or Live Guest Relocation
- Must be at recent level of DPM (Driver 27 Bundle S31)





## Frameworks for Automation



### ▪ CP Environment Variables

- Allows z/VM meta data to be managed in a structured way
  - Variables set by system programmers
  - Variables read by programs for scripting
- Replaces homegrown approaches for passing information around, and adds control to the environment
- One special variable can be set on the IPL screen
  - Example: set as to whether Production, Test DR, or Actual DR

### ▪ New information available on z/VM Shutdown processing

- Better determination of what is shutting down
- Allows more robust automation to gracefully shutdown the z/VM system and virtual machines

### ▪ Significant upgrade to CMS Pipelines

- Objective is to make available, with the product, many of the advances made to Pipelines since it was last updated in the product
- Lots of new function
- Avoids customers having to download and install on their own
- Renews commitment to this powerful programming environment of Pipelines





## Problem Determination Aids

- **New CP command to determine which PTFs or Local Mods are in the running z/VM system**
  - Data is also provided in the z/VM monitor data stream
  
- **New information on disk configurations**
  - CP QUERY commands extended for both ECKD and EDEVs
    - Serial numbers, geometry information, features, etc.
    - Some data provided as 'block of hex' for vendor specific interpretation
  - New IOEXPLOR exec to format new information and make readable
    - Applies to IBM devices
  
- **New command EXPLORE FCP allows for testing**
  - ADD: adds FCP subchannel and WWPN to list of devices to be tested
  - START: activates FCP subchannels and opens WWPN ports in list of SCSI devices to be tested
  - Aids in problem determination when setting up FCP devices





## Dump Processing Enhancements via Service

- Larger systems mean larger dumps
  
- Performance enhancement for hard abend and snap dumps to 3390 DASD
  - More intelligent channel programs
  - Decreases dump time significantly
    - 30 to 40% improvement in lab experiments
  
- Support includes creating smaller Snap dumps by not dumping PGMBKs (page tables) used for guests
  - Optionally can select to include them
  
- VM65989
  - PTF UM35132 (z/VM 6.4) – Closed May 31, 2017



## Networking Enhancements

### ▪ **SSI Distributed IUCV (APAR VM65872)**

- SSI configuration and administration improvements; Remove restrictions on distributed IUCV connections in an SSI cluster while allowing distributed IUCV policy to be changed dynamically
- Service available for z/VM 6.4 and z/VM 6.3 on Feb 27, 2017

### ▪ **Firewall-Friendly FTP Client Enhancement (APAR PI80912)**

- Updates the z/VM FTP client to improve interaction in configurations which require traversing firewalls.
- Adds new operands to LOCSITE
- Service available August 23, 2017

### ▪ **Directory Network Authorization (APARs VM65925, VM65926, VM65931)**

- Simplifies management and security
- New ability to control definition and authorization of NICDEFs in one place, the user directory
- Eliminates operational differences between PORTBASED and USERBASED VSwitches
- Service available August 4, 2017
  - Note: While applying service changes the default behavior, settings were added to change default back to previous behavior



## Enhanced Security Items

- **VLAN access security improvement**

- With an ESM, user access to the default VLAN ID not permitted unless permissions has been granted explicitly through the ESM

- **Default TLS protocol settings changed when using TLS/SSL Server**

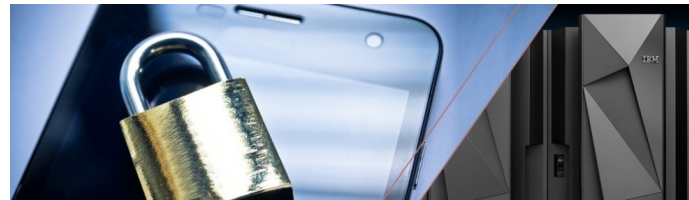
- TLS 1.2 and TLS 1.1 are enabled by default, older versions disabled by default

- **DirMaint to RACF Connector**

- Modernizes the Connector with a collection of functional enhancements
- Brings processing in line with modern z/VM practices
- Allows better passing of directory information to RACF
- Facilitates proper security policy in environment managed by IBM Wave for z/VM or OpenStack

- **RACF option: NoAddCreator**

- **RSCS TCPNJE traffic can be encrypted**





## Enhanced Security PTFs

### ▪ RACF Security Policy Enhancements:

- Functional RACF enhancements providing improved security and usability for security administrators and auditors
  - Read-Only Auditor (ROAUDIT) role
  - Query VMXEVENT Profiles
  - Control of XAUTOLOG..ON by default
- APAR VM65930
  - PTF UV61335 (z/VM 6.4) – closed March 17, 2017
- APAR VM65982
  - PTF UM35042 (z/VM 6.4) – closed March 22, 2017

### ▪ Crypto Express APVIRT for TLS/SSL Server:

- Enable connectivity from the TLS/SSL Server to crypto adapters for improved performance and reduced CPU overhead
- APAR PI72106
  - PTF UI45923 (z/VM 6.4) – closed March 29, 2017



# Complete Solution for Administration & Management of z/VM and LinuxONE

Integration with other platforms and solutions

- Alerts
- Log data



## IBM Infrastructure Suite for z/VM and Linux

**OMEGAMON XE on z/VM and Linux**

Performance monitoring of z/VM and Linux guests

**Spectrum Protect (formerly TSM)**

File Level backup and recovery for Linux Virtual Machines

**IBM Wave for z/VM**

Simple, intuitive, graphical z/VM administration and provisioning tool

**Operations Manager for z/VM**

Facilitate operational monitoring and automated operations, take action based on events

**Backup and Restore Manager for z/VM**

Image and file level backup and recovery of z/VM environment  
Image level backup and recovery of Linux

### Single PID

5698-IS2 OTC  
5698-IS1 Annual S&S

**Add Tape Manager for z/VM (5697-J08) for customers backing up from z/VM to tape**

Web site: <http://www.ibm.com/software/products/en/ibm-infrastructure-suite-for-zvm-and-linux>  
DeveloperWorks Wiki – videos, presentations, white papers: <http://ibm.biz/Bd4up3>



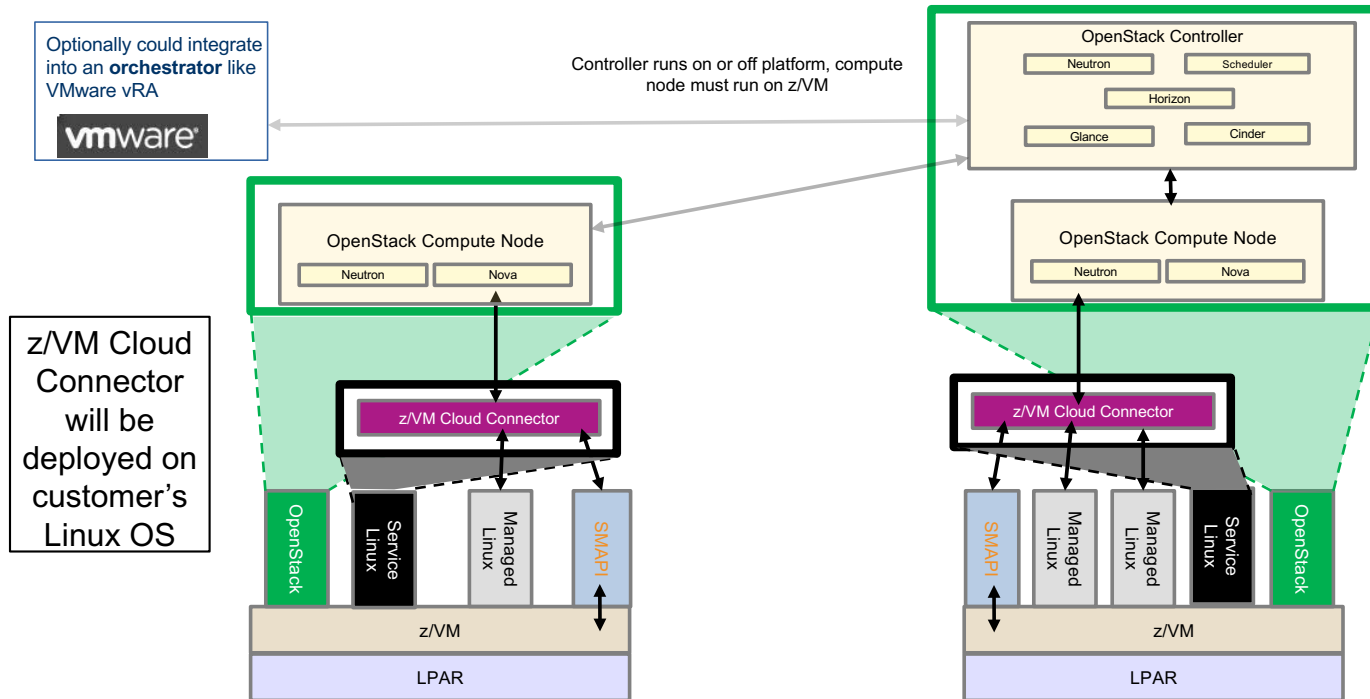
## z/VM Cloud Strategy Futures

Allow customers to enjoy a broader set of features, collectively provided by IBM and partner-based solutions as part of their vertically integrated Cloud offerings than we have been able to provide via the z/VM Cloud Management Appliance (CMA)

- Switch from an IBM-provided OpenStack and xCAT solution (CMA) to supporting partner-provided cloud solutions via the new z/VM Cloud Connector
- The new code will be shipped and serviced as part of z/VM ...
- ... but will be installed on a customer-provided Linux on z guest
- The code is being developed in open source and is enabled for 3rd party contributions: see <https://github.com/mfcloud/python-zvm-sdk>
- **CMA**
  - No additional new function
  - Will continue to supply defect and security fixes



# z/VM Cloud Connector enabling 3<sup>rd</sup> party OpenStack







## z/VM 6.4 Supported Hardware

- Following z Systems servers:
  - z14
  - z13
  - z13s
  - LinuxONE Emperor and Emperor II
  - LinuxONE Rockhopper
  - IBM zEnterprise EC12
  - IBM zEnterprise BC12
  - IBM zEnterprise 196
  - IBM zEnterprise 114
  
- Electronic and DVD install
  - No tapes



## IBM z14 Support

- To do a fresh z/VM 6.4 install on z14 requires new install media.
  - Available August 25, 2017
  - Look for “-01” suffix, (e.g. LCD7-7040-01 for 3390)
  - Must apply VM65942 immediately after installation
- Previous releases of z/VM cannot be installed onto the z14
  - z/VM 6.3 has toleration PTFs that can be applied to existing system prior to migration to z14
- See Preparation & Use for other hint and tips
  - SSI environment considerations
- See <http://www.vm.ibm.com/service/vmreqz14.html> for background.
- See [3906/ZVM subset of the 3906DEVICE PSP](#) bucket.





# Single System Image Considerations

- If running a mixed-release SSI cluster that includes z/VM 6.4 members
  - Apply VM65867 to z/VM 6.3 members
  - Correctly indicates supported architectures to guests
  
- Install VM65976 on **all** members of an SSI cluster before **any** member is run on a z14
  - z/VM 6.3 and 6.4
  - Allows live guest relocation between members on pre-z14 and members on z14 servers

IBM Systems > z Systems > z/VM >

### z/VM service required to run on the IBM z14

Last updated: July 17, 2017

**Note:** Installing z/VM V6.4 directly on the IBM z14 requires an image obtained from IBM on or after August 25, 2017. **Immediately after installing z/VM 6.4, APAR VM65942 must be applied.**

z/VM 630 is supported only when migrating an existing image from an older IBM z Systems server. The PTFs for APARs VM65942, VM65921 and VM65922 must be applied prior to moving the image to z14.

The table below provides you with a list of service required for z/VM V6.3 and V6.4 to run on the IBM z14 (driver 32).

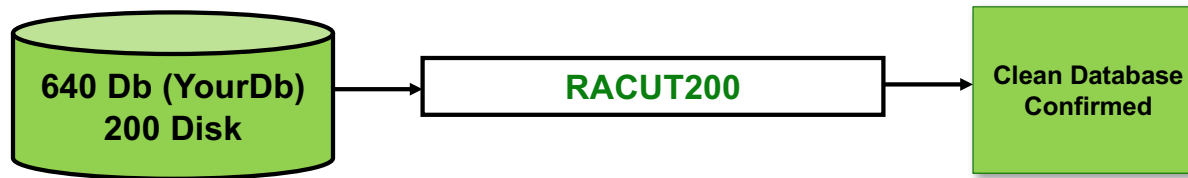
**Notes:**

- Refer to the matrix of Linux on z Systems distributions tested and supported for use on a z14. It is very important this information is reviewed before bringing up any Linux distribution as a guest of z/VM.
- Refer to the the 3906/ZVM subset of the 3906DEVICE bucket.
- Refer to the library page for updated documentation for this support.

z/VM service required to run on the IBM z14 (driver 32)		
APAR Number	z/VM Releases	Description
VM65942	z/VM V6.4 z/VM V6.3	Provides support that will enable guests to exploit function supported by z/VM on IBM z14 including guest exploitation for the Crypto Express6S and RoCE Express2 adaptors.
VM65976	z/VM V6.4 z/VM V6.3	Provides infrastructure support for ESA/390 compatibility mode within z/VM V6.2, V6.3 and V6.4, and must be installed on all members of an SSI cluster before any z/VM V6.3 or V6.4 member of the cluster is run on a z14 server.
VM65867	z/VM V6.3 z/VM V6.2	Required on all z/VM V6.2 and V6.3 systems in an SSI cluster that includes a z/VM V6.4 system.
PI73016	z/VM V6.4 z/VM V6.3	TCP/IP Stack and NETSTAT support for OSA-Express6S
VM65865	z/VM V6.4 z/VM V6.3	Dynamic I/O support for CL5 CHPIDs
VM65880	z/VM V6.4 z/VM V6.3	IOCP support for CL5 CHPIDs
PI62275 PI65715	z/VM V6.4 z/VM V6.3	HLASM support for z14
PI46151	z/VM V6.3 (in the base of z/VM V6.4)	ICKDSF support for z14
VM65843	z/VM V6.4 z/VM V6.3	HCD support for z14

## RACF Considerations

- **Validate the database before up-leveling RACF database template**
  - RACUT200 utility checks database integrity
  - Always run RACUT200 before issuing RACFCONV



- **Database best practices**
  - Have a procedure for database backups
  - Integrity-check your back-up databases
  - Automate around RACF initialization
- **Whitepaper - Validating and Repairing RACF Database Integrity on z/VM**
  - <https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=ZSW03366USEN&>
    - *Brian W. Hugenbruch, CISSP - IBM Z Security for Virtualization and Cloud*
  - More information available at <http://www.vm.ibm.com/security/>



## IBM z14 Enhancements & z/VM

- **Available August 25, 2017**
- **z/Architecture IPL support on z14**
  - Standalones changed to handle
  - ESA/390-compatibility mode for DAT-off ESA/390 guests
- **Support for Crypto Express6S**
  - Guest support
- **Support for RoCE Express2**
  - Guest support
- **Improved memory management support**
  - Potential performance improvement especially with SMT





## IBM z14 Exploitation

- **z/VM guest exploitation support for the Instruction Execution Protection Facility**
  - Increased isolation of data and instructions in memory
  - Planned availability of December 15, 2017
  
- **z/VM guest exploitation support for Guarded Storage Facility (reduces pauses in garbage collection)**
  - Improve consistency of performance for Java environments
  - Planned availability of December 15, 2017
  
- **z/VM support for encrypted z/VM paging**
  - Increased security characteristics
  - Planned availability of December 31, 2017





## Stay informed about New Closed Function PTFs

- Off z/VM Service Page <http://www.vm.ibm.com/service/> is new page for new function APARs
  - <http://www.vm.ibm.com/service/vmnfapar.html>
  
- Applies to z/VM operating system and related products:
  - Operations Manager for z/VM
  - Backup and Restore Manager for z/VM
  - OMEGAMON XE on z/VM and Linux
  - Etc.
  
- Subscribe to receive notifications automatically when new function APARs close
  
- Obtain lists of previously shipped new function APARs



## Stay informed about Future New Function

- New web page to subscribe to:
  - <http://www.vm.ibm.com/newfunction/>
  
- Lists enhancements IBM is pursuing and gives:
  - tentative dates for planning purposes
  - a high level view of impact and compatibility
  - interaction with ISV products, Linux, and hardware
  
- Allows clients to
  - express interest in being a sponsor user for the item
  - plan for upcoming new support
  - avoid surprises





# Subscribe to z/VM New Function APARs

www.vm.ibm.com/service/ Search United States [ change ]

IBM

Home Solutions Services Products Support & downloads My IBM

Welcome Tracy

IBM Systems > z Systems > z/VM >

**z/VM Support Resources**

**Interested in Continuous Delivery of function?**  
For continuous delivery of new function see the [New Function APARs](#) page.

**z/VM Service Resources**  
This page provides you with a list of VM-related support information and other online support resources.

- Important VM Service News
- z/VM Red Alert - Critical Issues
- Service Tips
- Using VMSES/E to find RSU Level or PTF/APAR Status
- Ordering and Installing Service for z/VM and related products
- RSU, Recommended Service Upgrade
- ESO: Products serviced by VM ESO with associated current levels
- z/VM SDO: (System Delivery Offering)



# Subscribe to z/VM New Function APARs

## New Function APARs for the z/VM Platform

In response to the customer requirement: Make it easier to know when New Function APARs (SPEs) have closed for the z/VM platform, we are providing two notification methods.

1. First, you can use the existing MyNotifications functions within the IBM Support Portal. You can request a subscription to APARs designated as New Function. You may have a subscription today for other notifications, and the ability to include the New Function APARs is an additional capability. You will be notified when the APAR closes (and before the PTF is available) to give you the information as early as possible. To start off go to the website: [IBM Support Portal subscription services](#). Enter z/VM in Product Lookup.
2. The other is a view of older New Function APARs and is available from a website in lists. There are two formats for the lists one year or five years. These are sorted by APAR close date with the most recent APARs appearing at the top of the file.

Sign in with IBM ID

To view the older New Function APARs see the table below. The files are available in two formats:

- o Browser-ready, web table (HTML). Save this file to your workstation then click it to display the information in a web page.
- o Comma-separated values (CSV). Save this file to your workstation, then import it into a spreadsheet program. The files uses semi-colons for delimiting items; you might need to indicate the use of this delimiter in your spreadsheet program.

The files are updated about every month. See the file content for the date of the most recent update.

File for download	for use with...
<a href="#">New function APARs for the past 12 months (HTML)</a>	Web browser
<a href="#">New function APARs for the past five years (HTML)</a>	Web browser
<a href="#">New function APARs for the past five years (CSV)</a>	Spreadsheet program



## Subscribe to z/VM New Function APARs

Subscribe to notifications

Product lookup:  [Browse for a product](#)

Product subscribed: ✓ z/VM family ✗ Unsubscribe

IBM Support >

### My Notifications

[Delivery preferences](#)



## Subscribe to z/VM New Function APARs

### Delivery preferences

Send notifications via e-mail  [Change your e-mail address](#)  
[Redacted]

E-mail frequency  Daily  
 Weekly  
(Flashes and security bulletins will be sent as soon as possible)

E-mail format  HTML  
 Plain text

---

Include machine translation of notifications (if available)  [Change your preferred language](#)



# Lists of Previously Shipped z/VM New Function APARs

## New Function APARs for the z/VM Platform

In response to the customer requirement: Make it easier to know when New Function APARS (SPEs) have closed for the z/VM platform, we are providing two notification methods.

1. First, you can use the existing MyNotifications functions within the IBM Support Portal. You can request a subscription to APARs designated as New Function. You may have a subscription today for other notifications, and the ability to include the New Function APARs is an additional capability. You will be notified when the APAR closes (and before the PTF is available) to give you the information as early as possible. To start off go to the website: [IBM Support Portal subscription services](#). Enter z/VM in Product Lookup.
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## Statements of Direction

July 23, 2013

January 14, 2015

February 16, 2016

October 25, 2016

July 17, 2017

- Subset of IBM Statements of General Direction that are most important to the z/VM environment. See announcement materials for additional statements.
- Subject to change or withdrawal without notice, representing IBM goals and objectives only.



## Removal of ESA/390 Architecture Mode

January 14, 2015

**The IBM z13 will be the last z Systems server to support running an operating system in ESA/390 architecture mode;** all future systems will only support operating systems running in z/Architecture mode. This applies to operating systems running native on PR/SM as well as operating systems running as second level guests. IBM operating systems that run in ESA/390 mode are either no longer in service or only currently available with extended service contracts, and they will not be usable on systems beyond IBM z13. However, all 24-bit and 31-bit problem-state application programs originally written to run on the ESA/390 architecture will be unaffected by this change.

- While a hardware statement, there are potentially changes required for z/VM.
- Note implication of older operating systems.
- **Satisfied with z14 support on z/VM 6.3 and z/VM 6.4**



## Stabilization of z/VM Support for z196 Processor Family

October 25, 2016 Announcement

### **Stabilization of z/VM support for the IBM zEnterprise 196 (z196) family:**

z/VM V6.4 is the last z/VM release planned to support the IBM Enterprise 196 (z196) or IBM zEnterprise 114 (z114) family of servers. Either an IBM zEnterprise EC12 (zEC12) or an IBM zEnterprise BC12 (zBC12) is planned as the required minimum level of server for future z/VM releases. Refer to the IBM Support Portal for the most current support lifecycle information for z/VM.





## Removal of Support for IEEE 802.3 Ethernet Frame Types

October 25, 2016 Announcement

### **Removal of support for IEEE 802.3 Ethernet frame types:**

z/VM V6.4 is planned to be the last z/VM release to support IEEE 802.3 Ethernet frame types. All future z/VM releases are planned to support DIX Version 2 (DIX V2) exclusively. This includes the z/VM Virtual Switch (VSwitch) and the z/VM TCP/IP server.



## Removal of Support for the IMAP Server

October 25, 2016 Announcement

### **Removal of support for the IMAP server**

z/VM V6.4 is planned to be the last z/VM release to support IMAP.



## Removal of Support for Certain TCP/IP Functions

October 25, 2016 Announcement

### Removal of support for certain TCP/IP functions

z/VM V6.4 is planned to be the last z/VM release to support the Graphics Data Display Manager Interface for X Window System (GDDMXD/VM).



## **Install to 3390 Model 3 DASD**

October 25, 2016 Announcement

### **Install to 3390 Model 3 DASD**

z/VM V6.4 will be the last release to allow installation using Model 3 3390 DASD (Direct Access Storage Device) volumes. Future z/VM releases will support 3390 installation using only model 9 or model 27 DASD. Installation onto SCSI volumes will not be affected.



## **FIPS Certification of z/VM V6.4**

October 25, 2016 Announcement

### **FIPS Certification of z/VM V6.4**

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 V6.4.

## **Security Evaluation of z/VM V6.4**

October 25, 2016 Announcement

### **Security Evaluation of z/VM V6.4**

IBM intends to evaluate z/VM V6.4 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+).



## **Removal of support for virtual machines with dedicated processors**

October 25, 2016 Announcement

### **Removal of support for virtual machines with dedicated processors**

z/VM 6.4 is planned to be the last z/VM release to support dedication of logical to virtual processors via the CP DEDICATE command or with the DEDICATE option on the CPU user directory statement. z/VM running in a logical partition with dedicated processors will continue to be supported.



## **Removal of IBM Wave support for second extended filesystem (Ext2)**

October 25, 2016 Announcement

### **Removal of IBM Wave support for second extended filesystem (Ext2)**

In a future deliverable, IBM intends to remove IBM Wave support for the administration of Linux guest file systems that use Ext2.

## **Removal of IBM Wave support for SLES 10**

October 25, 2016 Announcement

### **Removal of IBM Wave support for SLES 10**

In a future deliverable, IBM intends to remove IBM Wave support for the administration of guests that are running the SUSE Linux Enterprise Server (SLES) 10 Linux distribution.



## Stabilization of z/VM V6.3 support

July 17, 2017

### Stabilization of z/VM V6.3 support

IBM z14 is planned to be the last IBM Z high-end server and z13s is planned to be the last midrange IBM Z server supported by z/VM V6.3 and the last IBM Z servers that will be supported when z/VM V6.3 is running as a guest (second level). z/VM V6.3 will continue to be supported until December 31, 2017, as announced in Withdrawal Announcement 915-025, dated February 3, 2015.

- Hardware support is restricted as above even with extended support contracts for z/VM V6.3





## Future z/VM Release Guest Support

July 17, 2017

### **Future z/VM release guest support:**

z/VM V6.4 will be the last z/VM release supported as a guest of z/VM V6.2 or older releases.

- This does not mean that z/VM 6.2 is still supported outside a support contract extension.
- This does not mean that z/VM 6.3 is going to be supported beyond Dec 31, 2017
- This is a warning that if you will not be able to simply migrate to a future release of z/VM by running it second level on z/VM 6.2 or older releases, and then swap to first level after the migration.



## Disk-only Support for z/VM Dumps

July 17, 2017

### Disk-only support for z/VM dumps

z/VM V6.4 will be the last z/VM release to support tape as a media option for stand-alone, hardabend, and snap dumps. Subsequent releases will support dumps to ECKD DASD or FCP SCSI disks only.



## Dynamic Partition Manager support of ECKD

July 17, 2017

### **Dynamic Partition Manager support of ECKD**

IBM intends to deliver support for adding and configuring ECKD FICON disks to partitions create in Dynamic Partition Manager (DPM) mode for Linux running in LPAR, under KVM on z, and under z/VM 6.4



## Completed Statements of Direction

Statement of Direction	From Announce Letter
z/VM Support for Single Instruction Multiple Data (SIMD)	January 2015
Enhanced RACF® password encryption algorithm for z/VM	January 2015
KVM Offering for z Systems	January 2015
GDPS/PPRC Multiplatform Resiliency Capability	January 2015
Security Evaluation of z/VM 6.3	July 2013
FIPS 140-2 Validation of z/VM 6.3	July 2013
Support of 10 GbE RoCE Express Feature	July 2013
Support of zEDC Express Feature	July 2013
Stabilization of z/VM 5.4 Support	July 2013

- Requires support from hardware and/or guests operating systems as appropriate
- Refer to [www.vm.ibm.com](http://www.vm.ibm.com) or [www.vm.ibm.com/security](http://www.vm.ibm.com/security) for more information



## Completed Statements of Direction

Statement of Direction	From Announce Letter
Product Delivery of z/VM on DVD/Electronic Only	January 2015
Dynamically Managed Thread Activation Levels	February 2016
Stabilization of z/VM Support for the z10 Server Family	February 2016
Removal of Support for Expanded Storage	January 2015
Withdrawal of Support for Expanded Storage	July 2013
Stabilization of z/VM 6.2 Support	January 2015

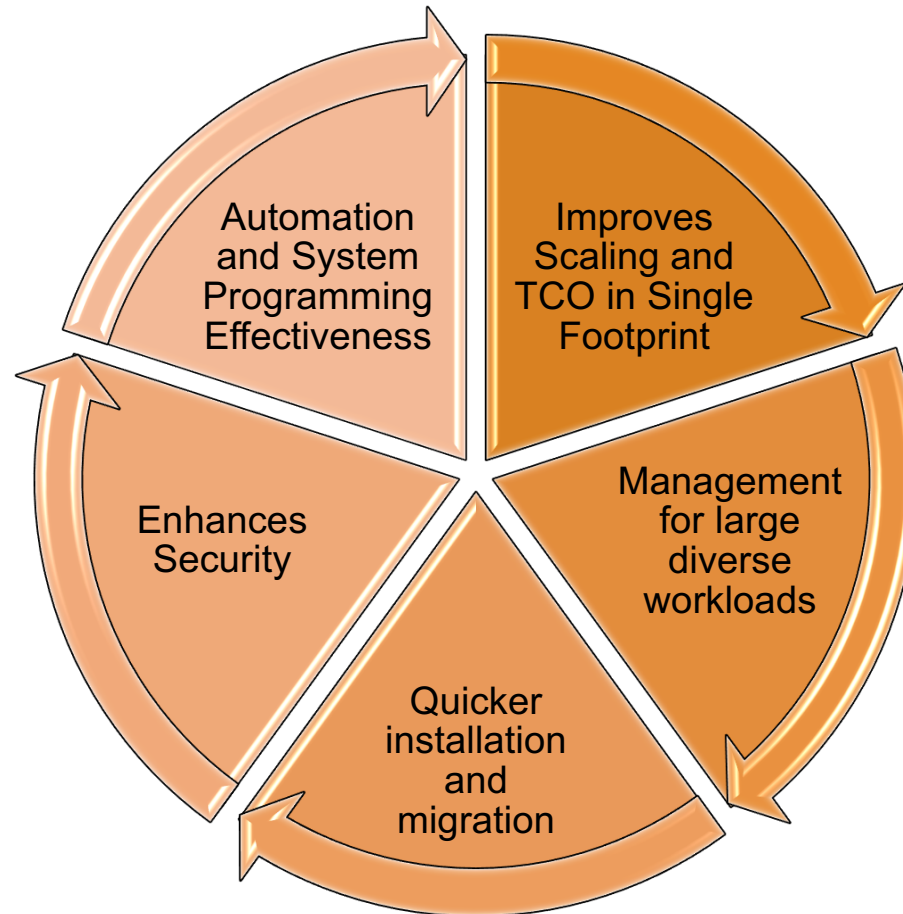
- Requires support from hardware and/or guests operating systems as appropriate
- Refer to [www.vm.ibm.com](http://www.vm.ibm.com) or [www.vm.ibm.com/security](http://www.vm.ibm.com/security) for more information



## Summary



## z/VM 6.4





## Summary - Checklist

### ▪ Before you go to z/VM 6.4

- Check service for z/VM Upgrade in Place if you plan to use it
- Check for formation of eligible list
- If planning to use additional memory, plan for additional dump and paging space
- Acquire a z196, z114 or newer machine
- Check for queues on paging devices
- Download and run VMREVIEW utility
- Validate RACF DB before and after uplevel
- Collect Monwrite performance data

### ▪ When you bring up z/VM 6.4

- Configure expanded storage as central storage
- To prepare for Dynamic SMT, enable multithreading with 1 thread per core
- Check Relocation Domain considerations
- Collect Monwrite performance data

### ▪ To exploit capabilities with z/VM 6.4

- Ensure guest configured to use large page as appropriate
- If memory rich, consider using KEEPSLOT
- Enable HyperPAV for paging if appropriate
- Enable zHPF for paging
- Investigate uses for environment variables
- Collect Monwrite performance data







## For More Information ...

- **IBM z14 Technical Guide:**  
<http://www.redbooks.ibm.com/redpieces/abstracts/sg248451.html?Open>
- **z Systems Security Portal (IBM ResourceLink) :**  
[http://www-03.ibm.com/systems/z/solutions/security\\_subintegrity.html](http://www-03.ibm.com/systems/z/solutions/security_subintegrity.html)
- **z/VM Security:**  
<http://www.vm.ibm.com/security>

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