

z/VM Platform Update: Ever Onward

Version 24 – see <http://www.vm.ibm.com/library/presentations/index.htm> for latest version.

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Abstract

z/VM 7.1 is the first release in a new release cadence. This session starts with a high-level tour of the overall continuous delivery strategy and release cadence; and then begins a tour of five value areas and the recent enhancements in each of those areas. You will hear about things such as encrypted paging, greater scalability, and RAS enhancements. This presentation focuses on the business value of z/VM and its enhancements and other planning information. There is a companion presentation called “Leveraging the Newest Capability in z/VM” which goes into implementation details for the enhancements discussed here.

Agenda

- New delivery strategy
 - Two year cadence
 - Continuous delivery
 - Communication

- Overview of z/VM Version 7 Release 1

- Survey of enhancements in various areas
 - Scaling and TCO
 - Managing diverse workloads
 - Security
 - Resiliency and RAS
 - System Management improvements

- Other Highlights and News

Release Cadence and Continuous Delivery

Greater Predictability for Release Schedules and Function

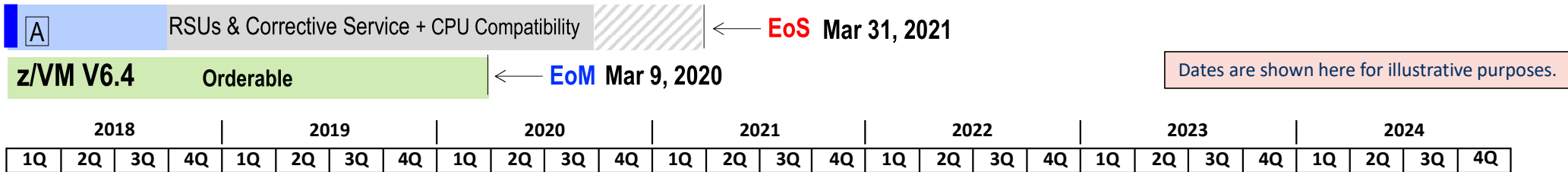
- z/VM has gone to a two-year cadence on new releases.
 - Every two years in 3rd quarter of even years
 - Releases remain orderable for approximately 18 months after GA of the next release
 - Releases stay in service for approximately 4.5 years
 - Last 6 months of a release life cycle overlaps with the next two releases
 - Releases will be primarily a roll up of function released in the service stream as new function APARs (Small Programming Enhancements)

- Continuous Delivery Strategy
 - Most new function will be delivered as a new function APAR to the most current release of z/VM
 - Heavy dependence on the sponsor user program
 - A set of new function APARs will likely be grouped together and released within a few weeks of each other to help facilitate IBM and client testing
 - Plans for new function will be published on the z/VM home page

z/VM Release Cycle Cadence

- z/VM Release GAs: Every two years in 3rd Quarter of even years
- Releases remain orderable 18 months after GA of next release
- Last 6 months of release life cycle overlaps next two releases
- In service, roughly 4.5 years.

Announce **EoM** ↓ ↓ Announce **EoS**

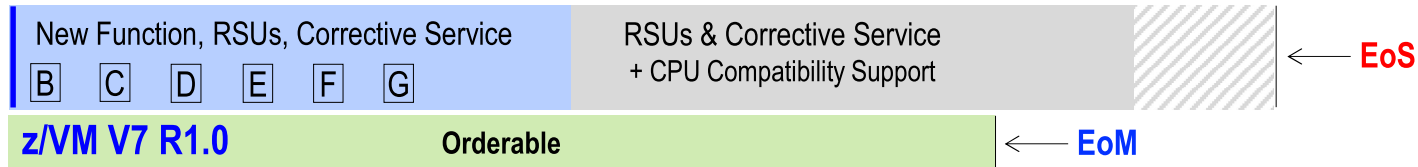


Dates are shown here for illustrative purposes.

↓GA Sept 21, 2018

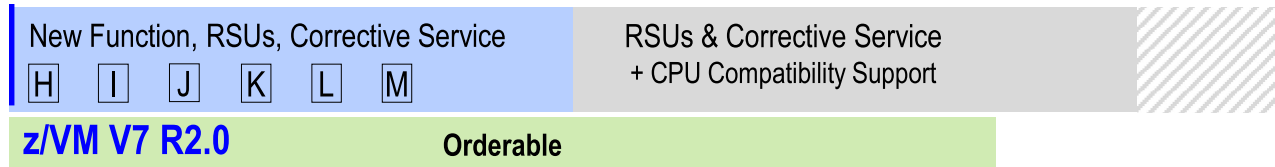
Announce **EoM** ↓

↓Announce **EoS**



↓GA

| = New function in release base
X = Potential New Function bundle delivered in service stream



z/VM Continuous Delivery Page

- Gives an overview of new function that is under consideration. Allows clients to:
 - Express interest in being a sponsor user for an item.
 - Plan for new support coming out in the future.
 - Understand the value, benefit, and impact of new enhancements.
- <http://www.vm.ibm.com/newfunction/>
- Subscribe for updates via “Notify me” link on left navigation bar.

The screenshot shows the IBM z/VM Continuous Delivery News page. The left navigation bar includes links for z/VM, News, About z/VM, Events calendar, Products and features, Downloads, Technical resources, Library, How to buy, Install, Service, Education, Site map, Site search, Printer-friendly, **Notify me** (circled in red), and Contact z/VM. The main content area features a 'z/VM Continuous Delivery News' header, a 'Change Summary' box with a list of updates, an 'Important news' section dated April 24, 2018, and an 'Introduction' section. At the bottom, there is a table titled 'Small Product Enhancement (SPE) Information'.

Small Product Enhancement (SPE) Information	
Name	The simple name of the project.
Description	A brief summary of what changes, who it effects, and why you would care.
Status	Along with the current status, this will give indication of key changes since the last iteration of this page.
Target availability	Depending on the project, where it is in the cycle, and other factors, this will list TBD, a quarter, a month, or, in cases where it has become available, a date. This is not a commitment and as more is learned about the work and priorities the target availability date will likely be adjusted.

z/VM Continuous Delivery Page

- Each item has information as seen in this example.
- The “Target availability” may also be listed as TBD or less granular such as a quarter or month.
- Since this is work in progress, the target availability dates can move multiple times and in different directions.

Encrypted Paging	
Name	Encrypted Paging
Description	Encrypted Paging will improve system security for z/VM 6.4 by exploiting z14 hardware to encrypt guest page data. Ciphering will occur as data moves from active memory onto a paging volume owned by CP (ECKD, SCSI, or native FBA). This will make customer data defensible from attack or breach of volumes, even in cases where a system administrator has unintended access to those volumes.
Status	Available December 11, 2017
Target availability	December 15, 2017
Compatibility	No known incompatibilities.
Enablement	Apply PTFs, re-IPL z/VM, SET ENCRYPT command within CP.
Effect	For the workloads studied, total CPU/tx did not increase more than 5% when compared back to an EP disabled configuration. Compared to a z13, the z14 with EP enabled performed better. As paging rate increases, the total amount of CPU used on EP will increase. Detailed performance report
ISV impact	Some monitor changes are needed. If you have a performance product, please see your vendor.
Linux or hardware interaction	z14 required
Release(s)	z/VM 6.4
Service details	See below for the IBM service information.
APAR	VM65993
PTF	UM35257
RSU	TBD

Navigating Continuous Delivery Page


- Near top of page are two tables with hyperlinks and some summary information
 - New function in progress
 - Available new function
- A floating navigation triangle will take you back to the top of the page from any where.

If you have an ISV product for ESM and/or Directory Management, please see your vendor for appropriate updates.

No Linux or hardware interaction.

z/VM 6.4		
CP	RACF	DirMaint
VM65925	VM65931	VM65926
UM35189	UV61339	UV61338
1702		

FTP Client
Firewall Friendly FTP Client



New function in progress	Target date	Last updated
4TB Main Memory Support *	TBD	May 29, 2018
80 Logical Processor Support	July 2019	June 5, 2019
Active Drain for PAGE Volumes *	TBD	April 23, 2019
Automatic STANDBY Memory for Guests *	4Q 2019	April 23, 2019
Centralized Service Management	3Q 2020	February 20, 2019
CPU Measurement Facility Host Sampler Exploitation	TBD	May 13, 2019
Dynamic Crypto	3Q 2019	May 13, 2019
Dynamic Memory Downgrade	TBD	December 11, 2018
EAV Paging	July 2019	June 5, 2019
Fast Minidisk Erase *	3Q 2019	June 5, 2019
Group Memory Limiting *	TBD	July 23, 2018
MSS Multi-Target PPRC Exploitation *	3Q 2020	July 23, 2018
Multifactor Authentication for z/VM *	TBD	April 9, 2018
SSI Eight Member Clusters	TBD	June 21, 2018
TLS / SSL Client Certificate Verification *	4Q 2019	December 11, 2018
ZHPM Application *	TBD	March 8, 2018

* Denotes the z/VM team is seeking Sponsor Users. See New Function APAR for more information.

z/VM Version 7 Release 1 Overview

z/VM 7.1

- GA announce August 7, 2018
 - Preview announce April 10, 2018
 - GA September 21, 2018

- Single System Image and Live Guest Relocation included in the base
 - In z/VM 6.4 was the VMSSI priced feature

- New Architecture Level Set of zEC12, zBC12, or newer processor families

- Includes SPEs shipped for z/VM 6.4, including:
 - Virtual Switch Enhanced Load Balancing, DS8K z-Thin Provisioning, Encrypted Paging, etc.

- Additionally, includes:
 - Dump scalability improvements
 - Foundation work for future SPEs

z/VM Releases

Release	Prodlid	GA	EOM	EOS	Notes
z/VM 7.1	5741-A09	Sept 9, 2018	TBD	TBD	Start of 2 Year Cadence ¹
z/VM 6.4	5741-A07	Nov 11, 2016	Mar 9, 2020	Mar 31, 2021	
z/VM 6.3	5741-A07	July 26, 2013	Nov 11, 2016	Dec 31, 2017	

Release ³	z15 & LinuxONE III	z14 & LinuxONE II	z13 & LinuxONE Emperor	z13s & LinuxONE Rockhopper	ZEC12	ZBC12	z196	z114	z10 EC	z10 BC
z/VM 7.1	Yes	Yes	Yes	Yes	Yes	Yes				
z/VM 6.4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
z/VM 6.3 ²		Some ⁴	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- z/VM GA every 2 years with in service for ~4.5 years.
- z/VM 6.3 no longer supported but referenced what machines were supported when it was.
- Service may be required for support of various servers.
- There was support for the enterprise class z14 and Emperor, but not for ZR1 and LR1 (Rockhopper).

z/VM Release Status Summary

z/VM Level	GA	End of Service	End of Marketing	Minimum Processor Level	Maximum Processor Level	Security Level
7.1	9/2018			zEC12 & zBC12		
6.4	11/2016			z196 & z114 [®]	-	Common Criteria Complete FIPS 140-2 Complete

z/VM 7.1 References

- z/VM 7.1 Introduction Video
 - <https://www.youtube.com/watch?v=drhhFFyyja4&feature=youtu.be>
- Videos explaining two-year cadence and continuous delivery
 - MP4 version <http://www.vm.ibm.com/devpages/bitner/presentations/intro71.mp4>
 - WMV version <http://www.vm.ibm.com/devpages/bitner/presentations/intro71.wmv>
- z/VM 7.1 Resources Page
 - <http://www.vm.ibm.com/zvm710/>
- z/VM 7.1 General Information Manual
 - http://www.vm.ibm.com/library/hcpa0_v7.pdf
- Client agility improved with continuous delivery & IBM z/VM
 - <https://www.ibm.com/blogs/systems/client-agility-improved-continuous-delivery-ibm-zvm/>

Focused Value Areas of Enhancements

Focused Value Areas

- Improved Scaling and TCO
 - More virtual machines in a single z/VM system
 - Lower costs of running a system

- Improved resource management for large diverse workloads
 - Fair and accurate resource control
 - Guest exploitation of IBM Z and LinuxONE hardware

- Enhanced Security
 - Protecting data
 - Policy management

- Improved Resiliency and RAS
 - Scripting and automation frameworks
 - Problem determination

- Improved System Management
 - Including things that make a system programmer happy



Improved Scaling and TCO

IBM z14 ZR1 and LinuxONE Rockhopper II

May 2018

- Available May 29, 2018
 - See <http://www.vm.ibm.com/service/vmreqz14.html> for background.
 - Besides the previous z14 service, you'll need at least VM65639
 - Page includes a file (VMREQMR1 SERVICE) you can download to check for valid service with command:
SERVICE ALL STATUS LIST VMREQMR1 SERVICE
 - See also [3907/ZVM subset of the 3907DEVICE PSP](#) bucket.
- Just like the larger z14 and LinuxONE machines, please remember to rebuild stand alone utilities (Formerly ESA/390-based will not work on z14 and new LinuxONE).
 - See <http://www.vm.ibm.com/service/redalert/index.html#SAPLZ14>
- As with the other z14 machines, Security performance enhancements:
 - Crypto Express6S feature
 - CPACF no-charge feature
- Up to 30 configurable cores and 8TB
- 19-inch frame



IBM z15 and LinuxONE III

- Support availability September 23, 2019 with z/VM 6.4 and z/VM 7.1
 - See <http://www.vm.ibm.com/service/vmreqz15.html> for details

- z/VM 6.4 and 7.1 PTFs include support for:
 - Synchronous execution support for on-chip data compression
 - Enhanced Vector and Vector packed decimal
 - Crypto Express7S adapter and cryptographic enhancements
 - OSA-Express7S
 - FICON Express16SA adapter

- z/VM 7.1 PTF support for System Recovery Boost
 - General purpose processors running at subcapacity can be boosted to full capacity for a limited time during z/VM system initialization, system shutdown processing, and system abend processing.
 - Primarily benefits z/VSE and z/TPF guest environments



80 Logical Processor Support

August 2019

- Increases the number of logical processors that z/VM will support to from 64 to 80 logical processors

- Benefits:
 - Allows for greater scalability
 - Increases number of cores that SMT-1 can have from 32 to 40

- Requirements
 - z13 and newer processor families for greater than 32 logical processors
 - z14 and newer processor families for greater than 64 logical processors

Component	APAR	PTF	RSU
CP	VM66265	z/VM 7.1 UM35474	TBD
Stand Alone Dump	VM66296	z/VM 7.1 UM35499	TBD
Performance Toolkit	VM66292	z/VM 7.1 UM35501	TBD

EAV Paging Support

June 2019

- Support for Extended Address Volumes (EAV) for z/VM paging space.
- Allows use of ECKD (3390) paging volumes to be up to ~812GB with EAV
 - Previous limit was ~45 GB
- Benefits:
 - Can use fewer volumes to meet the page space requirements
 - Increases the total page space possible when using ECKD paging space
 - Will be helpful when increasing the amount of virtual memory used in conjunction with future increases in real memory supported

Component	APAR	PTF	RSU
CP	VM66263	z/VM 7.1 UM35475	1902
CMS (CPFMTXA)	VM66297	z/VM 7.1 UM35483	1902
Performance Toolkit	VM66293	z/VM 7.1 UM35484	1902

Resource Pool Member Limit Removed

June 2019

- The limit of 1000 members of an individual resource pool (RESPOOL or CPUPOOL) is removed.
 - New limit is the logged on user limit (MAXUSERS setting)
- Benefits:
 - As systems get larger, more virtual machines per z/VM system, can continue to use resource pools to the full advantage.
 - Having a large pool, all virtual machines, you have another way to control resource access.

Component	APAR	PTF	RSU
CP	VM65786	z/VM 6.4 UM35384 z/VM 7.1 UM35385	TBD

Improved Resource Management of Diverse Workloads

Virtual Switch Priority Queuing

May 2019

- Introduces multiple priority levels for transmissions on a Virtual Switch
- Allows virtual switch management communication (IVL) to operate at highest priority to ensure better management
- Three optional user priority levels allow:
 - Different SLAs for different groups of guests
 - Combining different priority workloads onto fewer, or a single, VSwitch
 - Eliminating need for separate heartbeat network in some clustering solutions

Component	APAR	PTF	RSU
CP	VM66219	z/VM 7.1 UM35465	1902
TCP/IP	PH04703	z/VM 7.1 UI62768	1902
DirMaint	VM66223	z/VM 7.1 UV99352	1902

Dynamic Memory Downgrade

Target TBD

- Allows for real memory to be removed from a running z/VM system
- Complements the existing ability to add memory to a system
- Benefits:
 - Add and remove memory for workload shifts and other load balancing
 - Assist in DR scenarios
- Requires z14, LinuxONE Emperor II, or LinuxONE Rockhopper II

Component	APAR	PTF	RSU
CP	VM66173	TBD	TBD

Enhanced Security

Security Enhancements

Base z/VM 7.1

- Improvements
 - Ability to use an ESM to control who can use which Systems Management APIs (SMAPI) against which targets (VM66167)
 - Many virtual machines now configured to better match common security policies.
 - Set up to be autolog only or logon-by only
 - Affects new installs
 - Accessing CP disks (CPACCESS) subset of commands that ignored Link controls in ESM have been corrected

- Benefits:
 - Focus security policy coming from the ESM
 - Better positioned to meet security policy
 - Fewer surprises based on security policy

Elliptic Curve Cryptography Support

December 2018

- z/VM TLS/SSL Server enhanced with enablement of Elliptic Curve Cryptography (ECC) cipher suites
- ECC Ciphers provide a more secure mechanism for asymmetric encryption than standard RSA or DSS algorithms.
- Performance Report available
 - <http://www.vm.ibm.com/perf/reports/zvm/html/4q8qk.html>

Component	APAR	PTF	RSU
TCP/IP	PI99184	z/VM 7.1 UI60128	1901

RACF for z/VM 7.1 FixPack 1 – Usability Enhancements

June 2019

#	Description of the functional enhancement
1	Query RACF Database Template Level So sysprog or security admin can determine if a forthcoming APAR will require a database update or RACFCONV.
2	Halt RACFVM initialization when server detects a down-level database More immediate presentation of problem details, to enable sysprog to fix with minimum fuss
3	Remove contradictory information from RACFPERM Correction to bring help text in line with functional behavior.
4	Improve error messages when A-disk can't be written by RAC EXEC Check A-disk accessibility before executing RACF commands, so an environment error isn't mistaken for a security problem.
5	Improve consistency of SETROPTS error messages Addition of warning messages around invalid parameter use.
6	Enable RACFVM to accept SMSG from the current system operator Eliminate assumptions that OPERATOR is always the current OPERATOR
7	Message fixes for ROAUDIT Correction to bring certain RACF messages in-line with functional behavior.

Component	APAR	PTF	RSU
RACF	VM66278	z/VM 7.1 UV99353	TBD

Multifactor Authentication for z/VM

Target 2Q 2020

Multifactor Authentication support enables a system administrator to logon to the hypervisor with one or several authentication credentials without requiring a traditional password or password phrase

Combination of:

- A new product (IBM Z Multifactor Authentication) running in a Linux on IBM Z guest
- z/VM with an External Security Manager
- TCP/IP communication from ESM to MFA (may require TLS server configuration)
- CP updates (apply the PTF for APAR VM66324)

- <https://www.vm.ibm.com/newfunction/#mfa>

CMS Pipelines – SSL Support

Target 2Q 2020

- Enhance existing CMS applications to use secure TCP/IP connections
 - Using z/VM System SSL to inherit the settings defined
 - Continue to use existing applications and comply with company security policy
- Integrate CMS applications and CMS-based data with cloud-based services
 - Interface with enterprise applications when replaced by web services
 - Exploit new web services for use in CMS applications
- Implicit SSL – application transparent secure “tunnel”
 - Suitable for HTTPS client (including RESTful services)
 - Trivial change to make a pipeline-based client application use SSL
- Explicit SSL – application protocol determined SSL (aka STARTTLS) *
 - Suitable for FTP and LDAP with secure connections
- New built-in stage to exchange data through FTP with secure connection *
 - Read file from FTP server into the pipeline for further processing
 - Write the data from the pipeline into a file on an FTP server
- Upward compatible enhancements to
 - `tcpclient` stage
 - `tcpdata` stage
- Possible Use Cases
 - store CMS data in cloud databases
 - post messages in a Slack channel
 - manage CMS files with GitHub
 - get data from Internet to use in CMS
- New built-in stage `ftp`
 - streamline transfer of data via FTP
 - process and transfer data without the need to store temporary files

* Extra deliverables because of sponsor user feedback

Improved Resiliency and RAS

Enhanced Dump Processing

Base z/VM 7.1

- Improvements
 - Reduce size of both snap dump and hard abend dumps
 - Reduce time to take and process dumps

- No longer dump Frame Table and Page Tables by default unless it is an abend code where those are helpful for problem determination

- New options to override defaults on what data is dumped

- Dump size reduction varies, examples often show 20% the size of the former dumps

Reduce CPU Required for Dump Processing

September 2018

- Further improves performance of dump processing from a processor requirement perspective.
 - Applies to snap dump and hard abend processing

Component	APAR	PTF	RSU
CP	VM66176	z/VM 7.1 UM35352	1901

RSCS Query Service Levels

November 2018

- New command option that shows the service level for each of the RSCS parts
 - Highest level PTF that is applied to each part

Component	APAR	PTF	RSU
RSCS	VM66174	z/VM 7.1 UV99342	1901

Dynamic Crypto

September 2019

- Enables dynamic changes to AP Cryptographic environments
 - Addition and removal of crypto hardware
 - Maintenance and repair when needed
 - Less disruption to the z/VM guests

- Additional information via QUERY commands

Component	APAR	PTF	RSU
CP	VM66266	z/VM 7.1 UM35531	TBD
CP ¹	VM66206	z/VM 6.4 UM35448 z/VM 7.1 UM35449	TBD

¹ – This PTF needs to be on all members in an SSI cluster regardless of whether the dynamic crypto PTF is on that member.

Improved System Management

Automatic Standby Memory for Guests

TBD

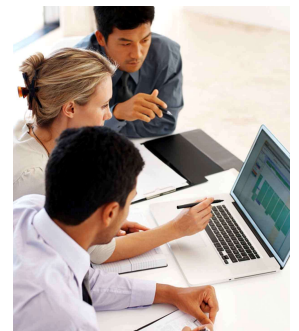
- Allow for easier management of virtual machine memory
 - When the maximum memory of a virtual machine is increased, no longer need to issue a new DEFINE STORAGE command in order to increase “Standby” memory
- Does require new option on the original DEFINE STORAGE command

Component	APAR	PTF	RSU
CP	VM66173	TBD	TBD

z/VM and Dynamic Partition Manager

September 2018

- Dynamic Partition Manager (DPM)
 - z/VM 6.4 and z/VM 7.1 Supported
 - I/O configuration much easier than older IOCDs approach
 - FICON ECKD Support – available September 2018
 - FICON CTCA Support – known requirement.
 - Required to permit Single System Image cluster and Live Guest Relocation

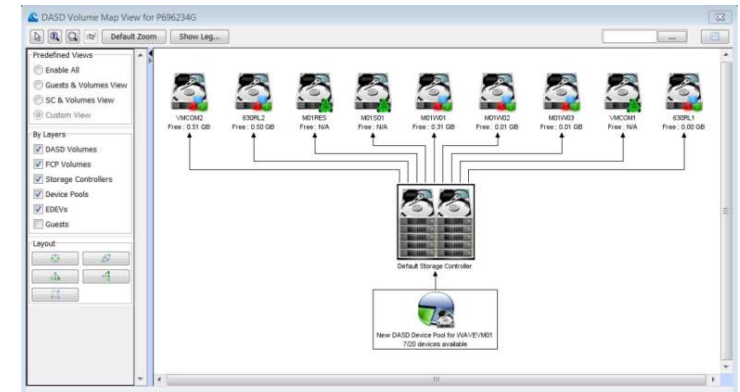
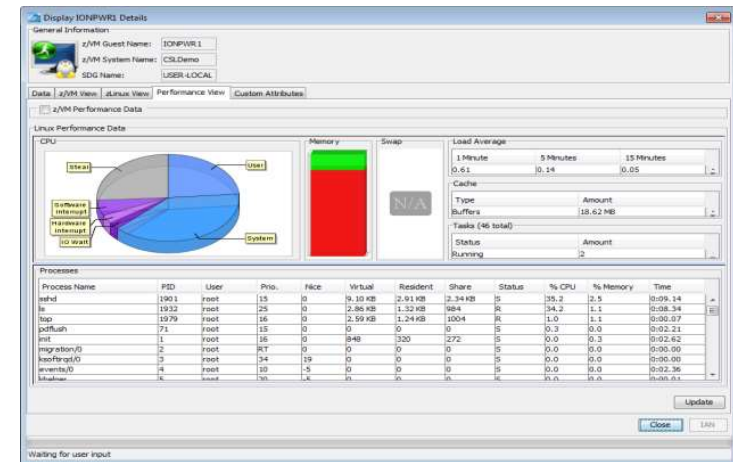


IBM Wave for z/VM

- Current level is IBM Wave V 1.2
 - Continuous Delivery via Fix Pack process
 - [New announcement letter](#) ENUS219-413

- Fix Pack 13 available September 2019
 - IBM z15 and LinuxONE III support
 - Improved security with default certification validation
 - Additional documentation for security customization
 - Upgrade WebSphere Liberty

- Fix Pack 14 available December 2019
 - Linux repository certificate support
 - Support for RACF passphrases
 - Additional Security updates - see IBM Z Security Portal



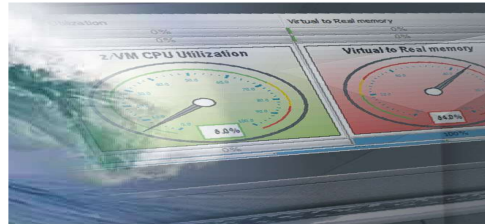
Extend the Reach of Skills with IBM Wave for z/VM

Intelligent Visualization



- Shorten the learning curve needed to manage complex environments
- Organize and simplify management of z/VM and virtual Linux servers
- View servers and storage utilization graphically; understand the status of system resources with Intelligent icons
- Reduce unnecessary steps using highly customizable views
- Graphical or tabular displays with layered drill down

Simplified Monitoring



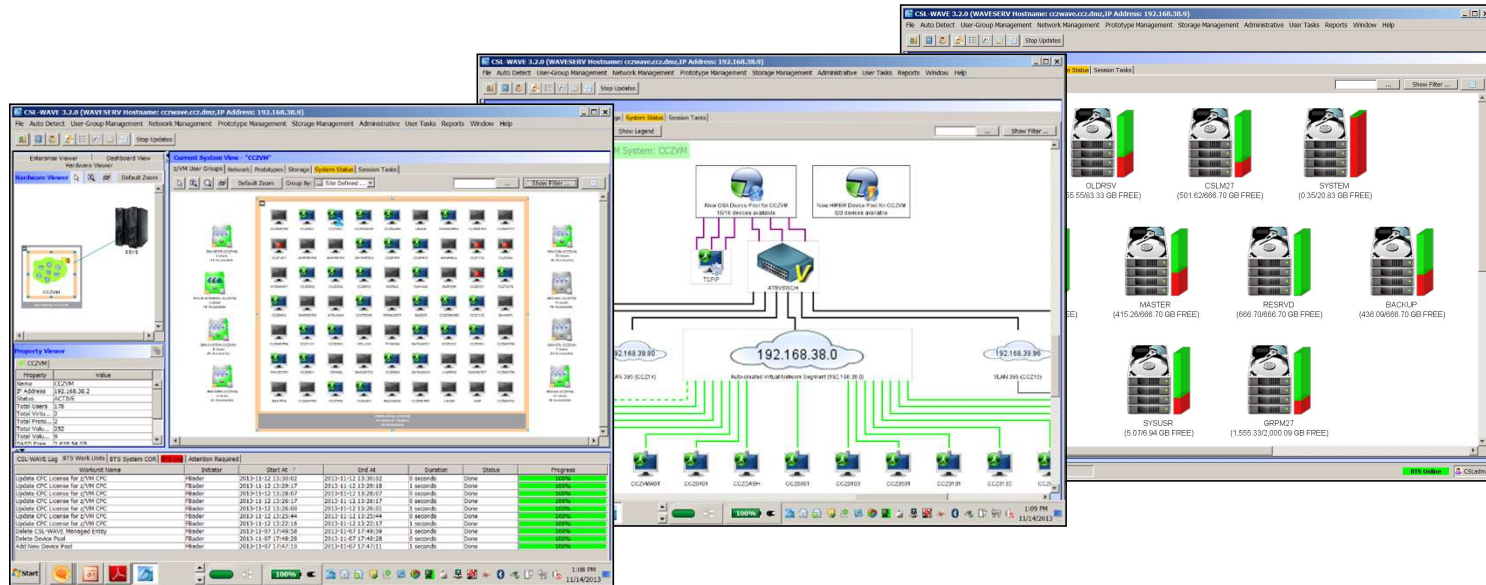
- Monitor the status of z/VM systems through an innovative interface
- Monitor performance of CPU, paging devices, spool disks and more;
- Use agentless discovery to detect an accurate view of your environment
- Use advanced filters, tagging, layout and layer selection to make monitoring and management more meaningful
- Complements IBM OMEGAMON® XE used for in-depth performance monitoring

Unified Management



- Manage your system from a single point of control
- Assign and delegate administrative access with role based assignments
- Provision, clone, and activate virtual resources . Define and control virtual network and storage devices
- Perform management tasks such as live guest relocation
- Annotate resources for additional policy based management
- Execute complex scripts with a single mouse click

IBM Wave Test Drive



Hands on IBM Wave Environment

- Hands-on experience using IBM Wave through a set of structured use scenarios
- RHEL and SLES Linux on IBM Z server images used to illustrate server deployment functions

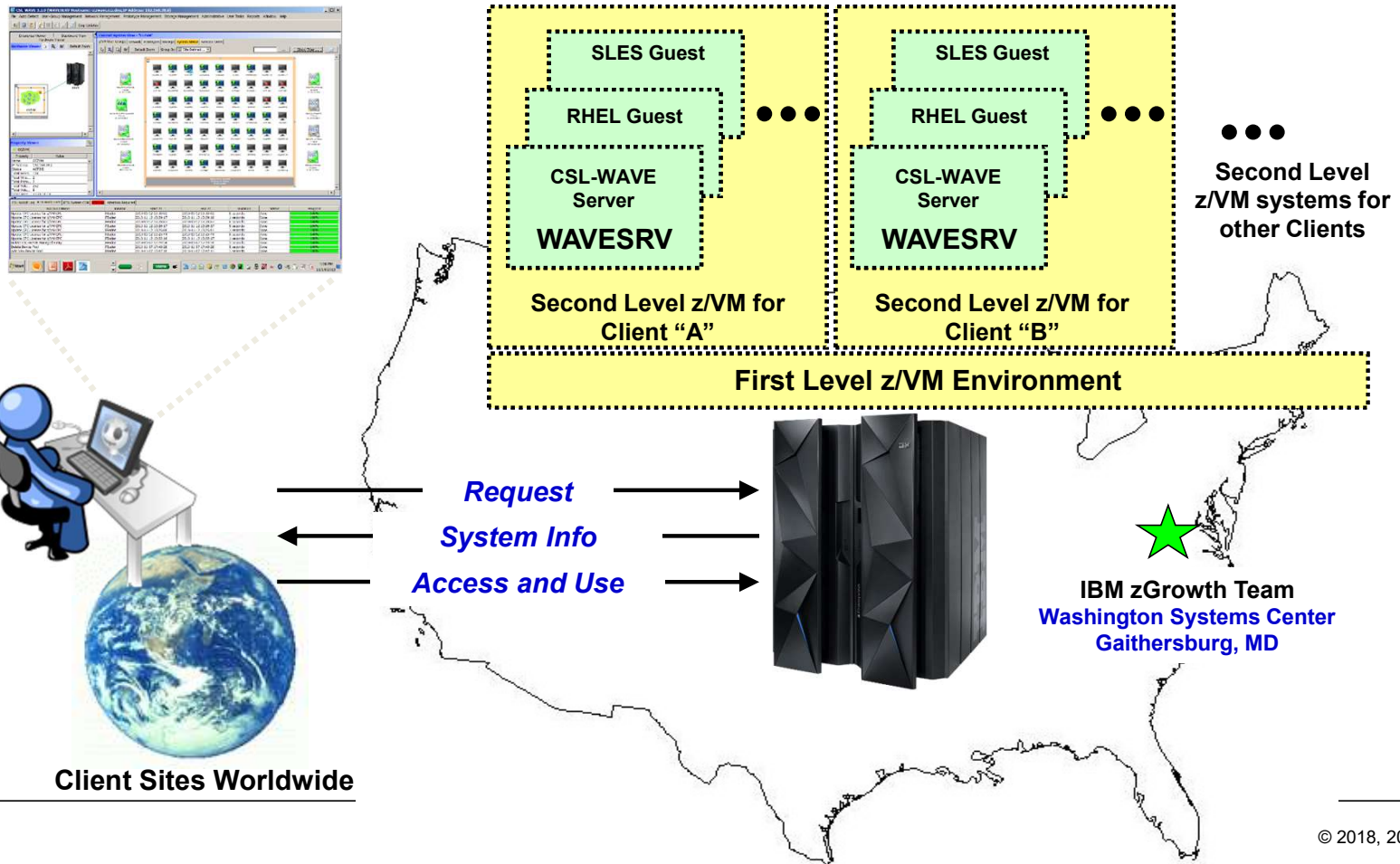
Duration and Access

- Secure, remote access over the Internet to IBM systems in Gaithersburg, MD from client site
- Guided exercises provide hands on experience with IBM Wave
- Two weeks of 24x7 access at no charge to qualified IBM clients, and more time if needed

Now Available

- Contact Paul Novak (pwnovak@us.ibm.com) or e-mail [IBM Wave Test Drive](#) get started

Test Drive Environment



z/VM Cloud Strategy Futures

February 2018

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 serviced as part of z/VM but will be installed on a customer-provided Linux on IBM Z guest
- The code is being developed in open source and is enabled for 3rd party contributions
- Available as open source or from IBM Fix Central
- See <http://www.vm.ibm.com/sysman/cloudcon.html> for a lot more details on Cloud Connector
- CMA
 - No additional new function
 - Will continue to supply defect and security fixes to the z/VM 6.4 release

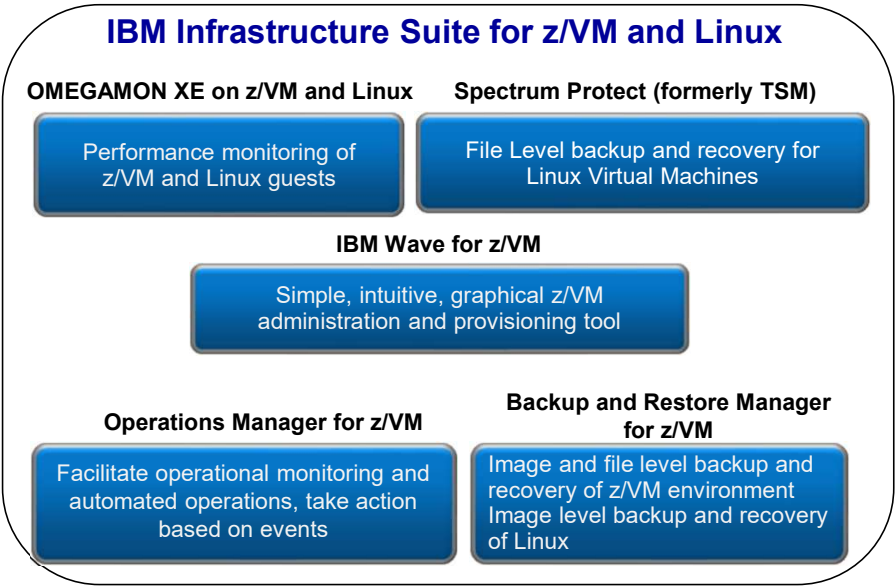
Complete Solution for Administration & Management of z/VM and LinuxONE

Integration with other platforms and solutions

- Alerts
- Log data



Single PID
 5698-IS2 OTC
 5698-IS1 Annual S&S



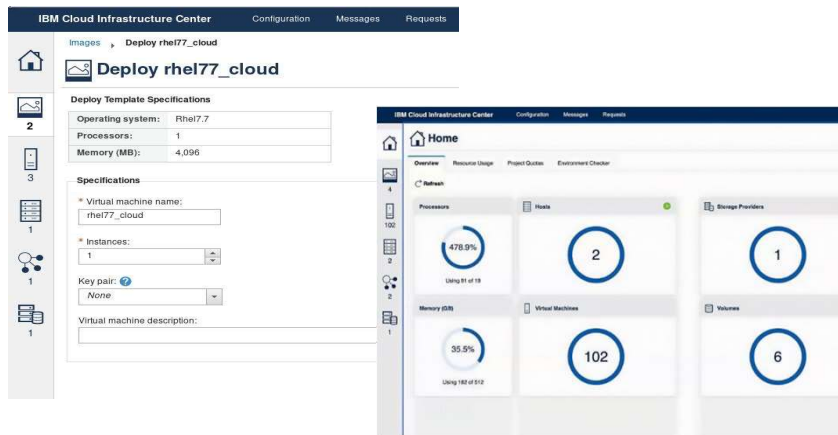
Add Tape Manager for z/VM (5697-J08) for customers backing up from z/VM to tape

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>

IBM Cloud Infrastructure Center

A new IBM Z and LinuxONE on premises software offering

Empower how you deploy and manage Infrastructure as a Service (IaaS).



- [Marketplace](#) at [ibm.com](#)
- [Announcement](#)
- [Shopz](#) (“Linux on z-Standalone products” catalog)
- [mySupport](#) IBM Support Portal
- [Documentation](#) at IBM Knowledge Center

Comprehensive cloud management

Improves administrator productivity and simplifies the lifecycle management of Linux virtual machines and related resource on IBM Z and LinuxONE

z/VM-based software-defined infrastructure

Infrastructure mgmt of z/VM-based virtual machines for compute, network, and storage resources.

Integration with multicloud automation tooling

VMware vRealize Automation/Orchestration can consume Cloud Infrastructure Center via OpenStack compatible RESTful APIs to connect, provision, orchestrate Linux-based virtual machine instances for IBM Z and LinuxONE

Contact:

Stev Glodowski - Cloud Infrastructure Center Offering Manager
stev.glodowski@de.ibm.com

Extending VMware to manage z/VM

TBD

- z/VM Development is exploring this enhancement candidate

- Use only documented VMware vCenter extension interfaces
 - VMware is designed to be extended
 - **NO** code changes to VMware
 - Shipped with z/VM, dynamically invoked by VMware as normal for VMware
 - Supported/Serviced/Upgraded via normal z/VM processes independent of VMware development (i.e. on IBM's schedule and discretion)

- Flexibility of extension interfaces
 - Allows ability to provide support for most IBM Z and z/VM capabilities to a VMware environment
 - Allows ability to support other VMware solutions
 - Requires explicitly deciding what to implement from all the possibilities

z/VM Library Web Page Updates - <http://www.vm.ibm.com/library/>

The screenshot shows the 'z/VM Library Overview' page. At the top, there is a breadcrumb 'z/VM > Library >' and a main heading 'z/VM Library Overview'. Below the heading is a horizontal navigation bar with six tabs: 'Overview', 'z/VM 6.x PDFs', 'z/VM 7.1 PDFs', 'z/VM Related PDFs', 'Indexed PDFs', and 'Presentations'. The 'Overview' tab is currently selected. To the left of the main content area is a vertical sidebar with links for 'z/VM', 'News', 'About z/VM', and 'Events calendar'. The main content area contains text including 'Last Updated: 9 July 2019', an update notice about 'z/VM Presentations', and information about accessing PDF files. A blue callout box on the right side of the page points to the horizontal tabs and lists them: '6 Horizontal Tabs', '➤ Overview', '➤ z/VM Version 6', '➤ z/VM Version 7', '➤ Related', '➤ Indexed PDFs', and '➤ Presentations'.

z/VM Library Web Page Updates - Overview

- Includes following categories of links:
 - z/VM product information
 - Knowledge Center links
 - Linux on IBM Z documentation
 - White papers, consultant results, performance reports
 - Data sheets, brochures
 - Reference guides

Overview	z/VM 6.x PDFs	z/VM 7.1 PDFs	z/VM Related PDFs	Indexed PDFs
Service		Linux on IBM Z documentation		
Education		Linux on IBM Z Resources		
Site map		IBM Knowledge Center - Linux on Z and LinuxONE		
Site search		Development Stream Documentation for Linux on Z and LinuxONE		
Printer-friendly		White papers, consultant reports, performance reports		
Notify me		→ z/VM Performance Report		
Contact z/VM		→ Consultant reports for z/VM		
		IBM Mainframe White Papers		
		PDF The Value of z/VM: Security and Integrity (April 2005)		
Related links:		Data sheets, brochures		
z/VM KnowledgeCenter		→ IBM Mainframe Data Sheets and Brochures		
IBM Redbooks				
Resources for IBM Z		PDF z/VM 6.4 Data Sheet		

z/VM Library Web Page Updates – z/VM PDF Files

z/VM 7.1 PDF files

Overview z/VM 6.x PDFs **z/VM 7.1 PDFs** z/VM Related PDFs Indexed PDFs

Designed based on sponsor user feedback.

z/VM

News

About z/VM

Events calendar

Products and features

Downloads

Technical resources

Library

Last Updated: 10 December 2018

Update: Revised publications are now available for newly released December 2018 z/VM 7.1 New Function APARs.

The table below contains the documentation for z/VM 7.1 in PDF format. The table can be sorted by the column headers or you can filter the results in the table by using the input box below.

Filter:

Category	Title		Order #	Latest Content	Last Update
Application Programming	z/VM: Language Environment User's Guide		SC24-6293-00	7.1 - 2018 3Q GA	September 2018
Application Programming	z/VM: CMS Application Development Guide		SC24-6256-00	7.1 - 2018 3Q GA	September 2018
Application Programming	z/VM: CMS Callable Services Reference		SC24-6259-00	7.1 - 2018 3Q GA	September 2018

z/VM Library Web Page Updates – z/VM PDF Files

z/VM 7.1 PDF files

Overview z/VM 6.x PDFs **z/VM 7.1 PDFs** z/VM Related PDFs Indexed PDFs

z/VM

News

About z/VM

Events calendar

Products and features

Downloads

Technical resources

Library

Last Updated: 10 December 2018

Update: Revised publications are now available for new

The table below contains the documentation for z/VM 7.1. You can filter the results in the table by using the input box below.

- ❖ Includes all editions of books
- ❖ Sort on columns
- ❖ View in browser
- ❖ Download with meaningful name (e.g. zVM 710 CP Planning and Administration SC24-6271-00.pdf)
- ❖ Filter ability

Filter:

Category	Title		Order #	Latest Content	Last Update
Application Programming	z/VM: Language Environment User's Guide		SC24-6293-00	7.1 - 2018 3Q GA	September 2018
Application Programming	z/VM: CMS Application Development Guide		SC24-6256-00	7.1 - 2018 3Q GA	September 2018
Application Programming	z/VM: CMS Callable Services Reference		SC24-6259-00	7.1 - 2018 3Q GA	September 2018

z/VM Library Web Page Updates – z/VM PDF Files

Filter on any text in the table

Filter:

Category	Title		Order #	Latest Content	Last Update
Customization and Tuning	z/VM: Performance		SC24-6301-00	7.1 - 2018 3Q GA	September 2018
Customization and Tuning	z/VM: Performance		SC24-6301-01	7.1 - 2018 4Q NFA	December 2018
PerfKit for z/VM	z/VM: Performance Toolkit Reference		SC24-6303-00	7.1 - 2018 3Q GA	September 2018
PerfKit for z/VM	z/VM: Performance Toolkit Guide		SC24-6302-00	7.1 - 2018 3Q GA	September 2018

z/VM Library Web Page Updates – Indexed PDF Files



[z/VM 7.1 PDFs](#)

[z/VM Related PDFs](#)

Indexed PDFs

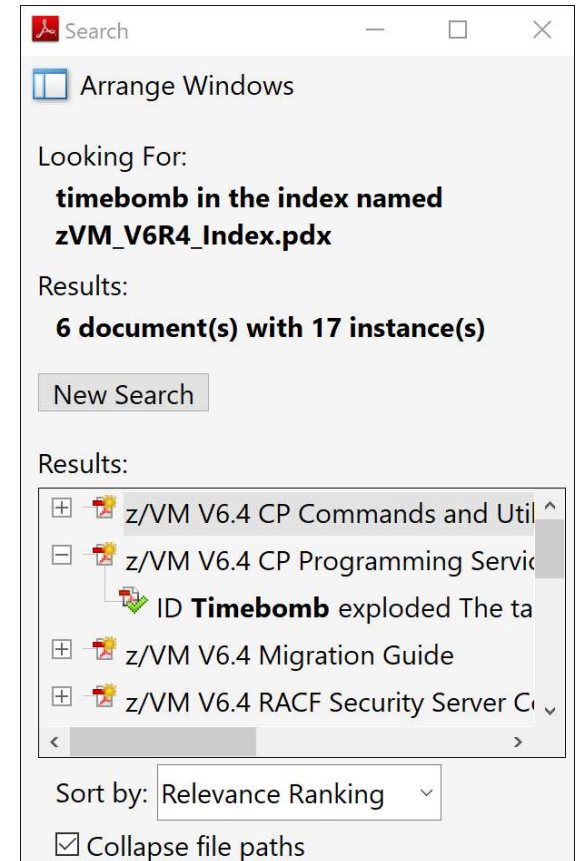
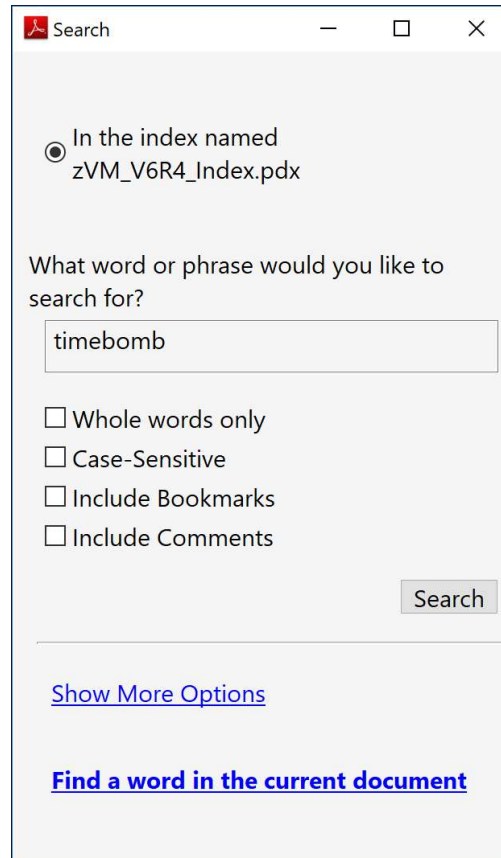
1. Download the zip file and extract to a folder.
2. Open the “Open Me First File”

+ Instructions on how to use the indexed PDF collection

Filename	Description	Size (MB)	Latest Content
2019 1Q zVM710 Collection.zip	 z/VM 7.1 2019 1Q indexed PDF collection - This collection includes all z/VM 7.1 and related publications including any changes to publications as part of the New Function APARs released in 4th Quarter 2018. New Function APARs in this collection include: <ul style="list-style-type: none"> • Support for the IBM Adapter for NVMe (APAR: VM66180) • Elliptic Curve Cryptography (APAR: PI99184) • Query RSCS service level (APAR: VM66174) 	344.9	7.1 - 2018 4Q NFA
2018 3Q zVM710 GA Collection.zip	 z/VM 7.1 2018 3Q GA indexed PDF collection - This collection includes all z/VM 7.1 and related publications that were published when the version became generally available (GA). z/VM 7.1 includes all previously released New Function APARs.	345.7	7.1 - 2018 3Q GA

z/VM Adobe Indexed PDF Collection

- Opening the .PDX file allows searching entire z/VM Library



Other Highlights

z/VM RSU News

- z/VM 6.4 RSU 1901 available on June 28, 2019
 - Includes a RACF template change
 - Please remember to validate your RACF database prior to applying (and afterwards)
 - White paper on validating and repairing the database is available:
<https://www.ibm.com/downloads/cas/LVOL5P8Q>

- For additional planning information, see <http://www.vm.ibm.com/service/rsu/rsuplan.html>

New Support Community

- IBM Service Request Tool replaced July 27, 2019
 - Summer 2019 – IBM Z software products
 - Future date – IBM Z hardware

- What happened
 - Existing service requests will automatically be moved to the new Support Community
 - Existing SRs/PMRs will be converted to “Cases”
 - Case numbers in format of TS123456789

- What to do
 - Familiarize yourself with the new environment
 - <http://ibm.biz/Zsupport>

z/VM Service Changes with GDPR

- Global Data Privacy Regulation (GDPR) has far reaching implications including on how you send documentation for z/VM problem records and how we retrieve, use, and control them.
- Date for complete enforcement has been extended, but we are encouraging everyone to not wait until it is enforced.
- z/VM-centric information: <http://www.vm.ibm.com/service/vmgdpr.html>
- In addition to general information, if you are going to send data from z/VM itself, you'll need to:
 - Install and configure the z/VM SSL server using the TCP/IP Planning and Customization book, SC24-6238, Chapter 16: Configuring the SSL Server
 - Get the required ECuRep DigiCert Certificates into GSKKYMANN and test connection.
<http://www.vm.ibm.com/related/tcpip/tcpipdig.html>
 - Customer firewall changes may be required. Consult with firewall administrators to identify any changes.

z/VM Sponsor Users

- Customers input and feedback on individual enhancements

- Examples of value add:
 - Feedback on how to handle IPL when dynamic memory downgrade configuration settings do not make sense with real memory on the system
 - Testing of EAV minidisk support with non-IBM DASD
 - Feedback on NICDEF Security Enhancements switch to go back to old default behavior
 - Feedback on VSwitch load balancing enhancement:
 - Urgency
 - Degree of wasted bandwidth at the time and improvement required

- http://www.vm.ibm.com/sponsor_user/



“I helped build z/VM”
- Sponsor User

Become a Sponsor User

- Look for items that interest you and you'd work to make a reality with IBM
 - New web page to subscribe to:
 - <http://www.vm.ibm.com/newfunction/>
 - Request For Enhancements (RFE) that you submit
 - Other dialogues with IBM

- Express interest in being a sponsor user for an item
 - Link on the continuous delivery page
 - Email to Kerry Wilson (kerryw@us.ibm.com)

- Requirements
 - Program is free
 - Must have an IBMID
 - Must sign Feedback Program Agreement (FPA)
 - Commit to work with IBM on the candidate items

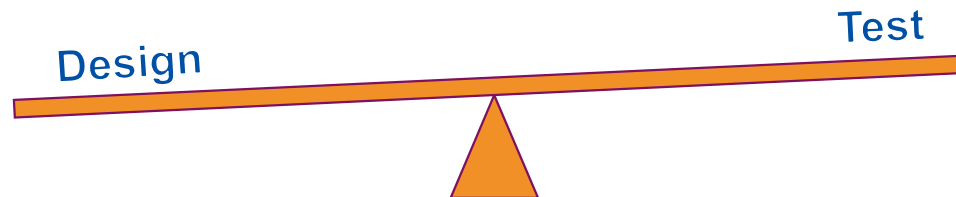
Life of a Sponsor User

Design-Heavy

- Paperwork (really online web-work) for approval
- Initial meeting to discuss the pain points / opportunity
- Follow up meetings to discuss design and feedback on externals
 - ~Monthly
- Demo of early code on IBM systems
- Delivery of drivers for client testing

Testing-Heavy

- Paperwork (really online web-work) for approval
- Initial meeting to discuss the pain points / opportunity
- Follow up meetings to discuss design and feedback (no externals)
 - 1 or 2
- Delivery of drivers for client testing
 - Various hardware
 - Various ISV products



Sponsor Users Wanted:

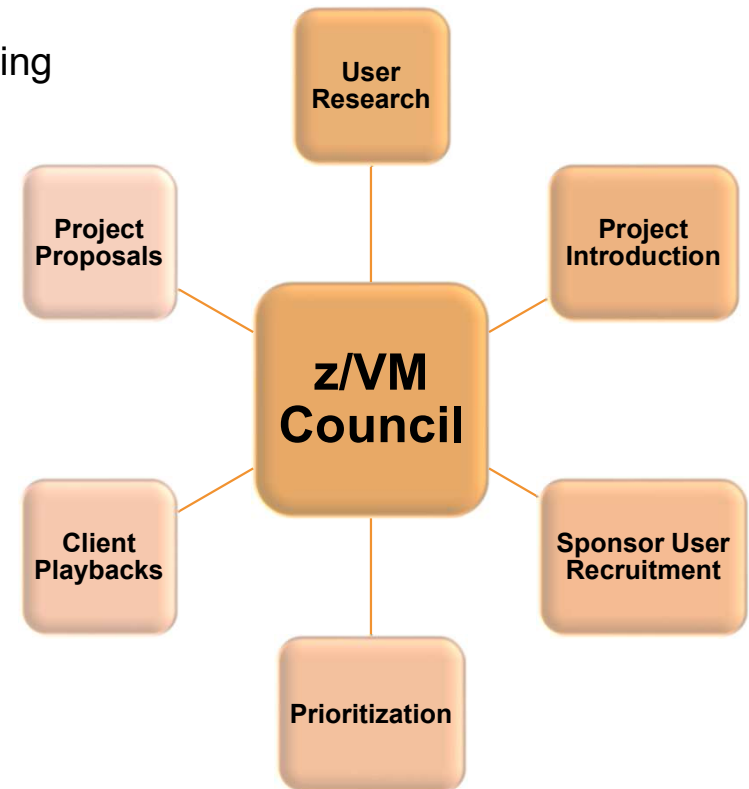
Specifically looking for sponsor users for:

- 4TB Main Memory Evaluation
- Active Drain for Page Volumes
- EDEVICE Path Management
- Group Memory Limiting
- MSS Multi-Target PPRC Exploitation
- Multifactor Authentication



z/VM Council – Client Communication and Collaboration

- z/VM-centric community started in June 2018
 - Meeting about once a month via telephone and web conferencing
 - User research
 - Propose, define, and prioritize new project proposals
 - Sponsor User Recruitment and Playbacks
 - Other collaboration done via membership web site
- Membership Requirements
 - IBM Z Feedback Program Agreement (FPA)
 - Regular participation
 - Sponsor User for at least one project per year
 - Homework assignments
- Additional details:
 - http://www.vm.ibm.com/sponsor_user/zvm_council.html
 - Contact: Kerry Wilson – kerryw@us.ibm.com



Statements of Direction

July 23, 2013

January 14, 2015

February 16, 2016

October 25, 2016

July 17, 2017

August 7, 2018

- 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.

Current Statements of Direction for z/VM

Statement of Direction	From Announce Letter
Security and FIPS 140-2 Evaluations of z/VM 6.4	October 2016
DPM Support of ECKD	July 2017
Stabilization of z/VM support for the IBM EC12 and BC12 server family	August 2018
Discontinuance of support for separately ordered EREP licensed product	August 2018

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.

Satisfied with z/VM 7.1

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.

Satisfied with z/VM 7.1

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.

Satisfied with z/VM 7.1

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).

Satisfied with z/VM 7.1

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.

Satisfied with z/VM 7.1

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.

Satisfied

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+).

Satisfied

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.

Satisfied

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

Satisfied

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.

Satisfied with z/VM 7.1

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.

Satisfied with z/VM 7.1

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

Satisfied

z/VM New Function Portal

August 7, 2018

z/VM New Function Portal

The [z/VM Continuous Delivery News](#) web page will be the primary vehicle used by IBM to describe new functions that are planned for z/VM. It is the recommended way to keep track of future development and support plans for the z/VM product. z/VM clients should consider subscribing to this page. Instructions are included on the [VM Site File Change Notification](#) web page.

Satisfied

Stabilization of z/VM Support for the IBM EC12 and BC12 server family

August 7, 2018

Stabilization of z/VM Support for the IBM EC12 and BC12 server family

z/VM V7.1 is the last z/VM release that is planned to support the EC12 or BC12 family of servers. Consequently, either an IBM z13® or an IBM z13s® will be the required minimum level of server for future z/VM releases. See the [IBM Support Portal](#) for the most current z/VM support lifecycle information.

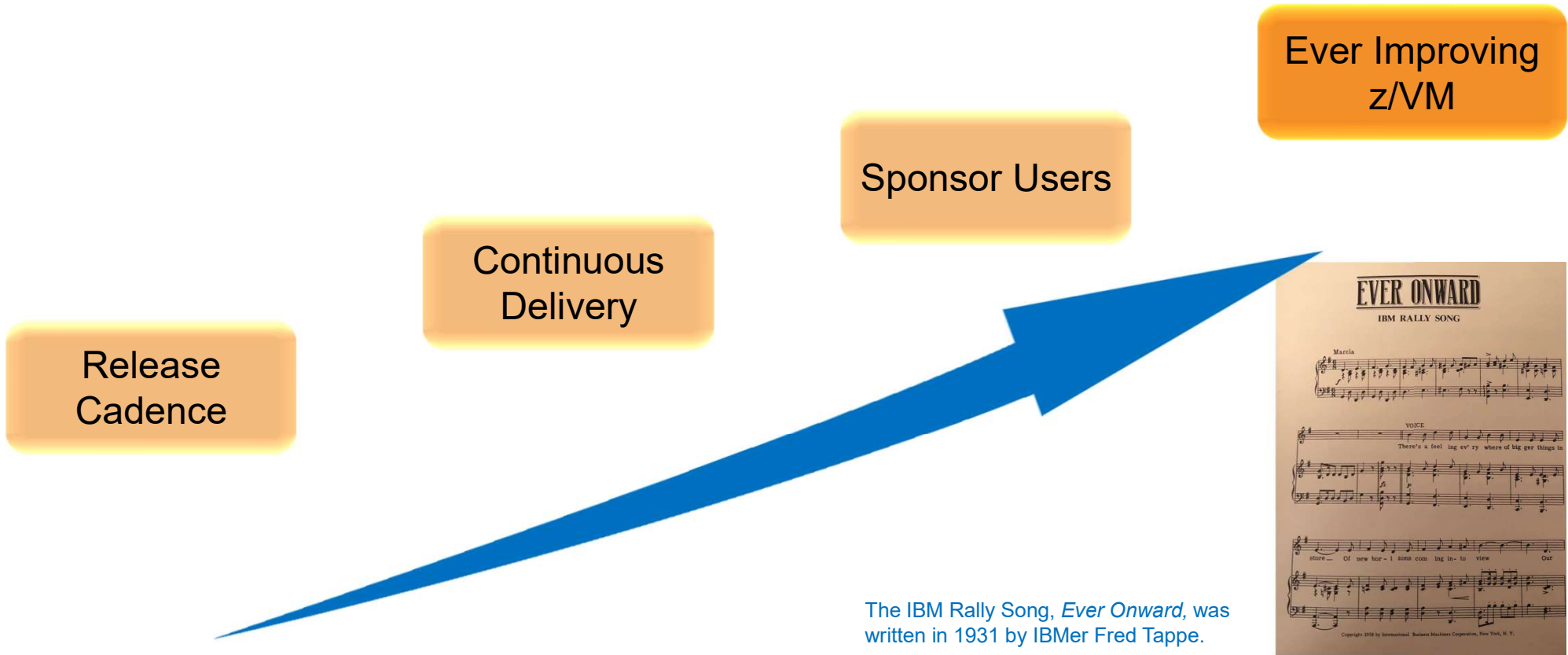
Discontinuance of support for separately ordered EREP licensed product

August 7, 2018

Discontinuance of support for separately ordered EREP licensed product
z/VM V7.1 is planned to be the last z/VM release to support EREP as a separately orderable and serviceable IBM licensed product. EREP functionality will continue to be delivered as part of the z/VM offering.

Summary

z/VM – Ever Onward



The IBM Rally Song, *Ever Onward*, was written in 1931 by IBMer Fred Tappe.