

16466: Advanced z/VM Systems Management with IBM Wave for z/VM

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IBM Corporation - WW IBM Wave Tiger Team Lead



March 3rd (3:15PM, Metropolitan A)



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Agenda

- IBM Wave for z/VM
- Functionality
- Benefits
- Fit in Portfolio
- Test Drive Environment
- JumpStart Services
- IBM Wave Tiger Team
- Features and Architectural Overview
- Live Demo







What is IBM Wave for z/VM?

IBM recently acquired CSL International, and with that its flagship product CSL Wave, now known as IBM Wave for z/VM v1.1 (IBM Wave). In this session we will discuss IBM Wave and how one can leverage it to simplify the administration of z/VM and Linux on z environments, and drive more productivity.



IBM Wave for z/VM

Empowered Virtualization Management

5648-AE1 1.1. IBM Wave for z/VM 5648-AE2 1.1. IBM Wave for z/VM S&S

IBM Wave enables the management of the entire Enterprise and its multiple z/VM guests across LPARs and CECs. Using the Enterprise Viewer and IBM Wave functions such as Projects and Grouping, one can cross manage multiple instances by custom attributes to match specific business needs!

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Why Organizations need IBM Wave



- Reductions in budgets means IT needs to leverage existing staff to do more with less. 70-80% of IT spend goes to operations alone.
- Managers and administrators benefit from having tools offering self service, with easier and simpler administration
- z/VM[®] managers find they need fast and accurate insight into changes in their environment
- Administrators need to eliminate the continual maintenance, and increased management complexity of writing and maintaining home grown solutions and scripts
- Managers need to train staff new to z/VM to perform complex tasks quickly and easily
- Linux® administrators need to manage a powerful mainframe environment without significant z/VM skills

70 - 80% of IT budgets are spent on ongoing operations and maintenance costs

Robert Frances Group, "Data Center Optimization Planning – Dashboard Metrics," December 2012

"IBM Wave is a virtualization management tool for administrators that could reduce the administration and management of IBM z/VM and Linux virtual servers up to 85 to 95 percent."

Robert Frances Group 2014





IBM Wave for z/VM V1.1 (IBM Wave)



- IBM Wave is a new virtualization management product for z/VM® and Linux® virtual servers that uses visualization to dramatically automate and simplify administrative and management tasks
- Enterprise Linux Server (ELS) and the Enterprise Cloud System (ECS) solutions are also available with IBM Wave for z/VM
- IBM Infrastructure Suite for z/VM and Linux V1.1
- New! Jumpstart Services to help customers get started with IBM Wave
- Read the announcement <u>here!</u>
 - http://www-01.ibm.com/common/ssi/cgibin/ssialias?subtype=ca&infotype=an&supplier=897&letternum=ENUS21 4-027
- General availability February 28th, 2014

Supported IBM System z[®] processors: IBM System z10[®] Enterprise Class (z10 EC[™]), IBM System z10 Business Class[™] (z10 BC[™]) and later

Supported z/VM versions/releases:

- z/VM 6.3
- z/VM 6.2
- z/VM 5 4

IBM.

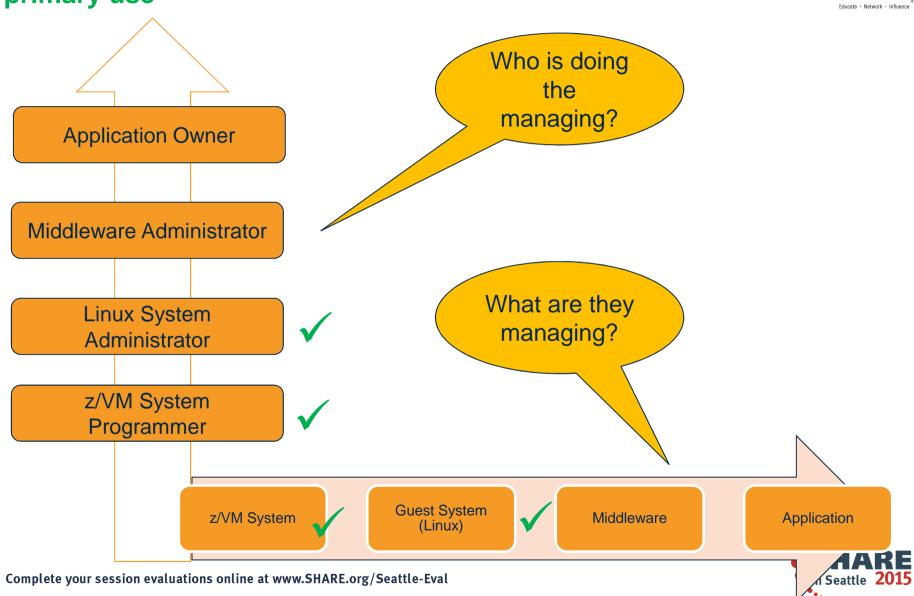


IBN	// Wave for z/VM
	IBM Wave homepage on your site! ave version: 1.1.0
	Launch IBM Wave v1.1.0
	Launch z/VM API Testing Application
	Administration and Customization Guide
	User Guide and Reference

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Dimensions of Systems Management & IBM Wave for z/VM primary use



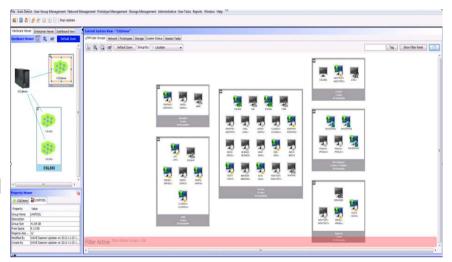


IBM Wave for z/VM



Helps Simplify and Automate Virtualization Management For z/VM and Linux virtual servers

- Automate, simplify management and monitor virtual servers and resources-all from a single dashboard
- Perform complex virtualization tasks in a fraction of the time compared to manual execution
- Provision virtual resources (Servers, Network, Storage) to accelerate the transformation to cloud infrastructure
- Supports advanced z/VM® management capabilities such as Live Guest Relocation with a few clicks
- Delegate responsibility and provide more self service capabilities to the appropriate teams



A simple, intuitive virtualization management tool providing management, provisioning, and automation for a z/VM environment supporting Linux® virtual servers

IBM Wave - Intelligent Management for Virtualized Environments



Advanced Visualization



- Shorten the learning curve needed to manage your Linux and z/V M environment
- Organize and simplify administration of virtual Linux servers;; automate and simplify management steps
- View servers and storage utilization graphically; view resource status at a glance
- Use graphical or tabular displays with layered drill down; customize and filter views
- Attach virtual notes to resources for monitoring and hadditional policy based management
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Simplified Monitoring



- Monitor z/VM system status through an innovative and interactive UI
- Monitor performance of CPU, paging devices, spool disks and more;
- Use agentless and lightweight resource discovery for an accurate and current view
- Use advanced filters, tagging, layout and layer selection to manage in a meaningful way
- Complements IBM OMEGAMON®
 XE used for in-depth performance
 monitoring and historical views

Resource Management



- Manage your system from a single workstation
- Assign and delegate administrative access using role based assignments
- Provision, clone, and activate virtual servers. Define and control virtual network and storage devices
- Perform complex management tasks such as live guest relocation using a few keystrokes
- Execute complex scripts with a single mouse click

IBM Wave Simplified Monitoring





Agentless Resource Discovery

- Discover, manage and monitor z/VM resources and their relationships across multiple LPARs and CECs
- Identify resource and relationship changes; reflect current environment in the user interface

Monitoring

- Allows the state of resources to be observed; icons show additional content for the resources
- Use graphical and tabular displays with layered drill down to hone in on only the resources you need to view
- Perform ongoing monitoring of changes that occur after initial auto-detection

Reporting

- Automatically generate charts like pie charts to report on utilization and more
- All table-based views can be exported to a CSV file for import into other applications

Integration

- Use Automatic Guest Classification (AGC) to integrate with existing provisioning process
- LDAP/Active Directory Support for Authentication and Authorization



IBM Wave Intelligent Visualization Quickly Understand the Status of System Resources



Get a current and accurate view of your managed environment

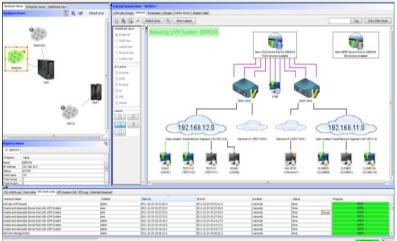
- Network Topology
 - Centralized view of the entire network topology per z/VM System, view Virtual LANS (VLANS)
 - Annotate network topology view to identify external resources routers, switches, etc
- Linux Servers
 - View performance gauges for all z/VM systems from one screen:
 - See resource consumption by guest or type
 - CPU, Virtual to Real, Paging, Spool
- Storage
 - Visual representation of all storage resources (ECKD™ and FCP-SCSI)

The definition of the definiti

Visualize and control virtual resources

- Views can be graphical or easily switched to tabular mode
- View relationships between resources easily and graphically
- View the entire environment graphically and easily zoom in
- Advanced filters, tagging, layout and layer based views for every display

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Performance Resource Monitoring

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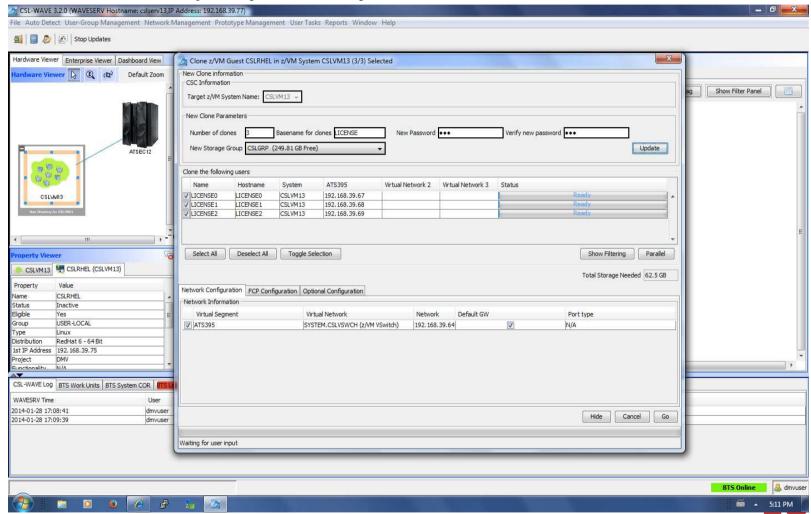
At a Glance Status of all z/VM instances



Simplify Systems Management Tasks



Provision resources quickly and easily





FCP/SCSI Support



- IBM Wave DOES SUPPORT FCP/SCSI environments
 - IBM Wave always supported FCP/SCSI environments.
 - IBM is very committed in enhancing IBM Wave's support for FCP/SCSI-only environments.
 - New and important functionality was made available on IBM Wave FCP/SCSI-only environments, released in early July under the FixPack 5 (FP5).
 - IBM will keep investing on IBM Wave to continue to develop its capabilities not just on FCP/SCSI-only environments, but across the entire product.
- IBM Wave absolutely supports FCP/SCSI!



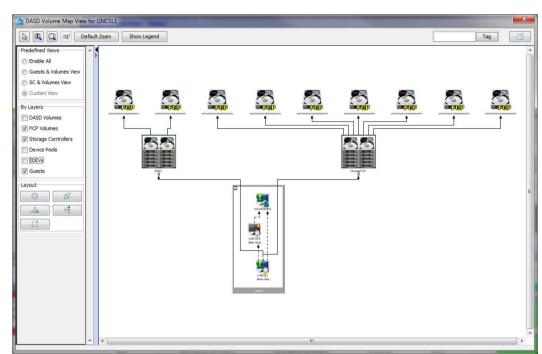
FCP/SCSI-only environments at GA level (Feb 28th 2014)

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- Specifically for direct attached SCSI disks:
 - Visualize disks
 - Add disks to guest
 - Create partitions
 - Create/extend LVM volume group and logical volume
 - Create/resize new file system

At GA in February:

 The IBM Wave installation itself was possible, requiring one to manually create the IBM Wave service machines prior to installing the IBM Wave RPM. Note that IBM Wave utilizes EDEVs for its own disk space.



Recent Enhancements In IBM Wave ...



	S M A K E		
Benefits	IBM Wave Enhancement		
Easier to customize IBM Wave	 Use your LDAP configuration with IBM Wave Use Exits for site-specific configuration 		
More extensive support for distros, files	 Bare Metal Install for SLES10, 11 and RHEL5, 6 + Layer 2 Network support Ext4 File System Support (RHEL6 only) 		
Improved storage support	 Enhanced storage support for FCP SCSI-only environments using EDEVs Richer EDEV support- Create Guest, Clone, Manage Storage, Duplicate Definitions, etc. management SAN (FCP/SCSI) support for direct attached FCP devices for SLE11 SP3, RHEL6 guests Management from a central point of control - the IBM Wave Graphical User Interface 		
Easier to get started with cloud Manage z/VM across the enterprise	■ Enhanced Cross System Cloning		
Easier configuration, serviceability and support	 LDAP configuration checker Improved Autodetect First Failure Data Capture 		
Strengthened security and audit capabilities	 Verisign authenticated code signing certificates Mixed case password support Additional audit records generated 17 		

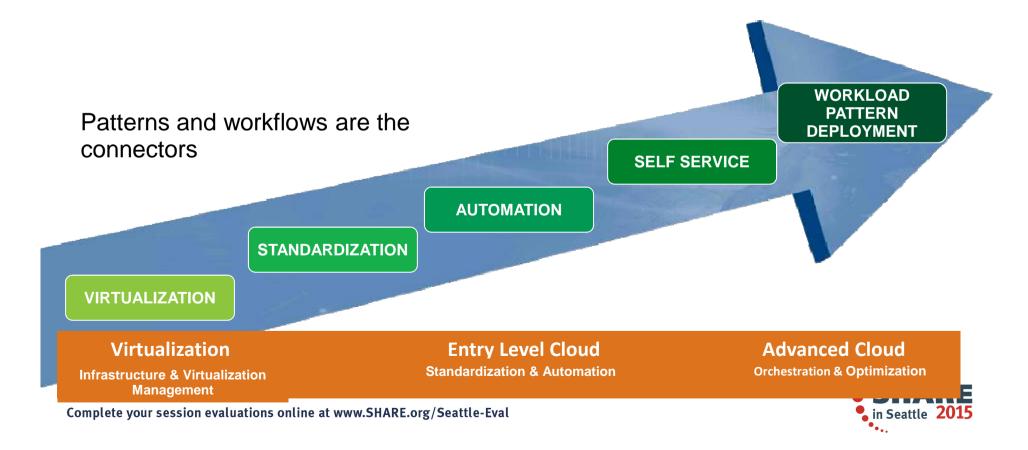
Benefits	IBM Wave for z/VM Capabilities	
✓ Gain efficiencies in virtualization management	■ IBM Wave provides a high level view of performance, storage usage, networks at a glance with built-in reporting	ARE etwork - Influence
✓ Work with a current, accurate and complete view of your managed z/VM environment	 By providing an up to date, accurate view of the IT environment through its "agentless discovery" organizations can plan, change and optimize their virtualized resources accurately IBM Wave enables automation of management tasks and can incorporate scripts. 	
 ✓ Simplify administrative, operations and systems functions ✓ Enable improved self service to reduce costs 	 Optimize z/VM capabilities by simplifying and automating management tasks that could otherwise take hours and require significant z/VM knowledge, (includes complicated tasks as LGR, Server Cloning, Storage provisioning, etc.). 	
 ✓ Respond quickly to changing business needs ✓ Reduce errors with appropriate delegation 	 Make common management tasks accessible to more user roles Easily delegate administrative capabilities to the appropriate users Enforce segregation policies at the individual administrator as well as the group level Set scope and permissions to match business requirements 	
Complete your session evaluations online at v	www.SHARE.org/Seattle-Eval in Seattle	2015

Benefits	IBM Wave for z/VM Capabilities	
✓ Improve service levels	 Offers easy, convenient access to performance and management information –at a glance 	
✓ Easily respond to changing requirements.	 Helps you quickly and easily administer and provision resources like servers, storage, user accounts. 	
✓ Reduce time spent on administrative efforts	 Tag resources with meaningful notes to help enforce installation defined rules. 	
✓ Easily manage virtualized environments	 Lets you provision new servers (bare metal installations) and easily clone Linux virtual servers and other resources 	
✓ Simplify and accelerate your journey to cloud	Scripts allow customization of a golden master.	
	■ Support early virtualization steps needed to get to a private cloud.	
✓ Create audit trails of IBM Wave users' activities	List tasks and status requested by the users with respect to their scope.	
activities	Log each operation that changes the system including logon and logoff to provide an audit trail. The logs may be then routed to a centralized logging mechanism for further filtering or processing.	
✓ Simplify your administration	■ IBM Wave automates a sequence of VM commands, reducing steps needed to complete common administrative and management tasks—and improve consistency.	
✓ Extend the reach of your existing IT staff	■ IBM Wave helps your team manage additional servers even if you do not have a deep expert skills bench available.	
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Cloud Computing – Based on Virtualization and Standardization

Helps facilitate better integration between infrastructure – system admins – and middleware/applications - developers/architects





Virtualization and Cloud Portfolio for Linux on z Systems

Virtualization	
Infrastructure &	
irtualization Managemen	t

Entry Level Cloud

Standardization & Automation

Advanced Cloud

Orchestration & Optimization

zEnterprise: zEC12, zBC12

- Massively scalable
- Characterized by great economics / efficiencies
- Highly secure / available

z/VM 6.3

- Support more virtual servers than any other platform in a single footprint
- Integrated OpenStack support

Linux on z Systems

 Distributions available from RedHat and SUSE

IBM Wave for z/VM

• A tool that simplifies the management and administration of the z/VM and Linux on z Systems environment via an intuitive graphical user interface

Cloud Manager with OpenStack

- A simple, entry level cloud management stack
- Based on OpenStack
- Formerly known as SmartCloud Entry

Cloud Management Suite for System z

- Builds on functionality of Cloud Manager with OpenStack and adds runbook automation and middleware pattern support for workload deployment
- Includes SmartCloud Orchestrator
- Also includes Tivoli Storage Manager and OMEGAMON XE on z/VM and Linux

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Service Lifecycle Management

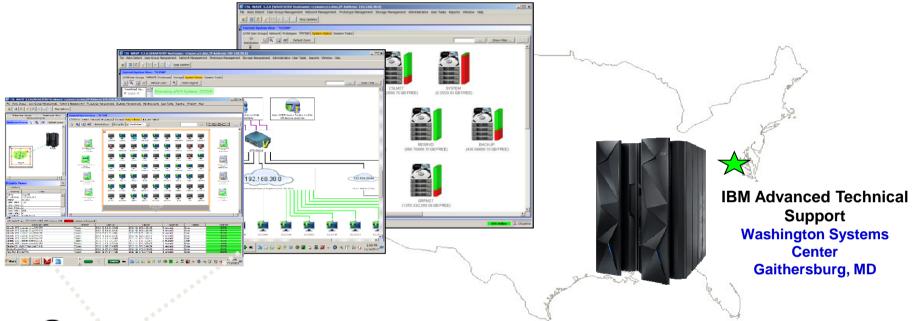
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Differentiation

Standardization



Learn More with IBM Wave Client Hands on Experience





Hands on IBM Wave Environment now available

- Client hands-on experience using IBM Wave on a IBM zEnterprise EC12 (zEC12)
- Secure remote access from client site to zEC12 in Gaithersburg, MD
- Accessible 24 hours a day, 7 days a week (except for occasional planned outages)
- Guided exercises provide hands on experience with IBM Wave
- Contact your representative to get started today





STG Lab Services – IBM Wave Jumpstart Services for zEnterprise

- This Jumpstart service can help to accelerate your IBM Wave implementation.
- This service offering provides planning, installation, and usage assistance.
- We tailor the installation to your environment and provide skills transfer by reviewing common use cases of the interface with your support staff.

Key Features:

- ■This service helps accelerate the implementation and ROI with IBM Wave
- •Assistance in planning the implementation by those who have implemented and used for several years
- Provide recommendations on integration and configuration in your environment
- ■Demonstrate how to implement custom REXX[™] Execs with IBM Wave to extend functionality
- •Integration with your AD for authentication
- Demonstration and review of common IBM Wave use cases with your staff in a workshop setting
- Demonstrate how to enable existing Linux servers to be managed by IBM Wave
- ■The Jumpstart is usually typically complete in one week depending upon the size of the deployment

Target Audiences:

- zEnterprise z/VM and Linux Administrators
- Existing and First in Enterprise customers
- Organization who want augment the z Systems support staff with less experienced IT professionals

Business Drivers:

- Reduced staff z/VM experience requirements
- Increased IT staff productivity
- Reduce systems management costs

Contact:

<u>stgls@us.ibm.com</u> for questions specific to this service.

Our z Systems experts have years of experience in working with IBM Wave



Washington Systems Center – WW IBM Wave for z/VM TIGER TEAM







IBM Wave for z/VM Features and Architectural Overview



IBM System z Tiger Team: News







Feature overview - Automation and simplification

- View the entire server farm laid out graphically
- Ordered Activation/Deactivation of servers
- Execution of customer's REXX as part of the cloning process to allow local z/VM customization
- Run Linux shell scripts against dynamically grouped/filtered servers, as IBM Wave for z/VM background tasks, listing the results for each selected server - All via the GUI
- Run REXX EXECs against any virtual object with customized parameters and results listing - All via the GUI
- WAVECLI A CLI for IBM Wave for z/VM actions that can be utilized from Linux shell scripts or Windows Batch files
- Access z/Linux guests directly from the GUI using SSH, 3270 or CLC
 hostnames or IP addresses to remember, simply right-click on the server and select the desired access





Feature overview - Provisioning

- Sophisticated guests cloning including Cross System Clone (across LPARs and CPCs)
- Ability to customize the first boot of a cloned server (before TCP/IP is initialized)
- Simple creating and manipulation of Vswitches and Guest LANs
- Connect/disconnect guests to Vswitches or Guest LANs via the GUI
- Storage management and provisioning at the z/VM and Linux levels (including LVM support)
- Automatic handling of Real or Dedicated devices via IBM Wave for z/VM's user defined Device Pool





Feature overview – Auto-detection

- Agentless technology
- Automatic initial detection of all virtual server farms components (servers, prototypes, networks, network devices and storage)
- Ongoing monitoring of changes made outside of IBM Wave for z/VM after the initial auto-detection





Feature overview – Network support

- Centralized, layer based view of the entire network topology per z/VM system
- Define and control all network devices such as VSwitches and guest LANs
- Manipulation of servers-to-network connect/disconnect using GUI
- Support for VLAN usage
- Management of VSwitches with protocol layer 2 or 3
- Customize network topology view with external resources such as routers, LPARs etc.





in Seattle 2015

IBM Wave Requirements

Client

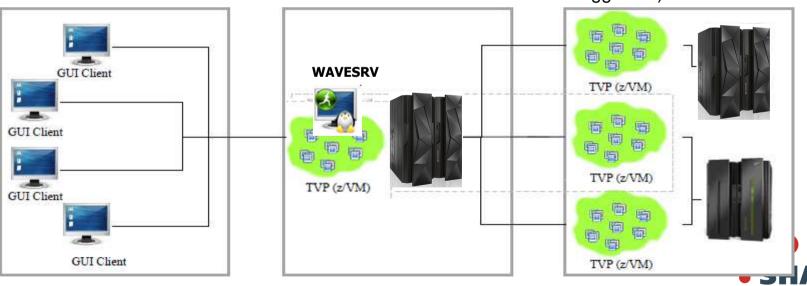
- Windows 7 Workstation
- Internet Explorer or Firefox
- Java Runtime 1.7 with Web Start Support
- PuTTY or equivalent telnet/SSH client

WAVESRV

- z/VM Guest or LPAR
- RHEL 6 or SLES 11
- MySQL V12.22 or higher
- Java SE Runtime 1.7
- Apache

TVP

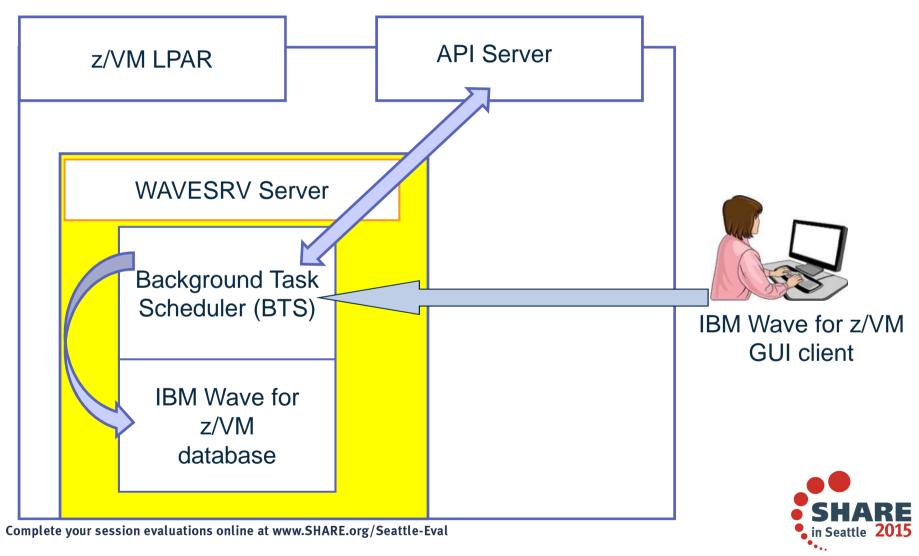
- IBM System z10® or later
- z/VM V5.4, V6.2 or higher with Systems Management API configured
- IBM Directory Maintenance for z/VM (DirMaint[™]) or equivalent
- Performance Toolkit for VM[™] (Perfkit, optional but suggested)



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IBM Wave for z/VM: Tier 2 - WAVESRV server





IBM Wave for z/VM WAVESRV server foundation

Background Task Scheduler (BTS)

Employs Work Unit processing architecture for BTS worker threads

Knowledge Base

Keeps track of the managed system components and their associated metadata

Common Output Repository (COR)

Stores output generated by each BTS work unit

Message Brokers

- Efficiently moves messages across all system components

Security Enforcer

Controls the scope and permission of every user action

Device Management

Simple and automatic control of all virtual and real/dedicated devices



IBM Wave for z/VM Target Virtualization Platform (TVP)

- IBM Wave utilizes the SMAPI interface in order to mediate requests from the BTS and the GUI Client.
- Specific functions executed on the z/VM System using the following Service Machines:

WAVEWRKS

 The Short Service Machine executes various compiled REXX EXECs to interact with the z/VM environment

WAVEWRKL

 The Long Service Machine provides an additional thread of execution to run longer scripts or executes some directory manager commands

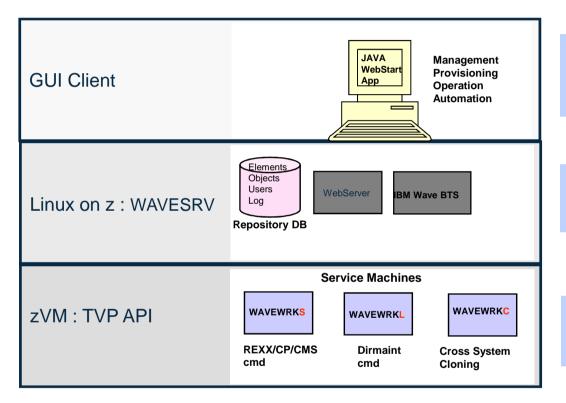
WAVEWRKC

- This Cross-System Cloning Service Machine is used to stream minidisks from a source z/VM system to a target z/VM system during cloning actions.
- As part of the auto-detection process when adding a new z/VM System to IBM Wave management, these 3 service machines are created and started on the z/VM System automatically.

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IBM Wave Operational Model



Scope

- Physical Servers
- z/VM instances, Virtual Linux Server Objects
- Virtual Networks (Guest LANs/VSwitches)
- Virtual-servers-to-Virtual Networks Connections
- Storage Volumes/Groups
- Elements
- Objects
- Users
- Log
- WAVEWRKS REXX executables, CP/CMS commands
- WAVEWRKL Directory Manager commands
- WAVEWRKC Cross System Clone feature



Planning and Design



- Sizing
 - 1GB RAM
 - Filesystems:
 - /boot 100MB (approx. 100 Cyls)
 - / 2GB (approx. 3000 Cyls)
 - /var 3GB (approx. 4500 Cyls)
- Sizing the log space areas
 - By default, logs are stored in /var
 - configure the /var filesystem as a logical volume under LVM so it can be extended when needed
- Location of WAVESRV server

The server is implemented as a virtual server within a z/VM LPAR.





Sample directory entry for the WAVESRV virtual server

```
USER WAVESRV < Password Here > 1G 2G GC
CPU 00
IPL CMS
MACHINE ESA 4
OPTION OUICKDSP
CONSOLE 0009 3215
NICDEF 0800 TYPE QDIO LAN SYSTEM <GLAN/VSWITCH Name here>
SPOOL 000C 3505 A
SPOOL 000D 3525 A
SPOOL 000E 1403 A
LINK MAINT 0190 0190 RR
LINK MAINT 019D 019D RR
LINK MAINT 019E 019E RR
MDISK 0191 3390 1 3 < DASD Volume Name here > - This is a CMS minidisk
MDISK 0150 3390 1 3000 < DASD Volume Name here > - This minidisk will be used for
"/"
MDISK 0151 3390 1 4500 < DASD Volume Name here > - This minidisk will be used for
"/var"
MDISK 0152 3390 1 200 < DASD Volume Name here> - This minidisk will be used for
swap
*************************
```





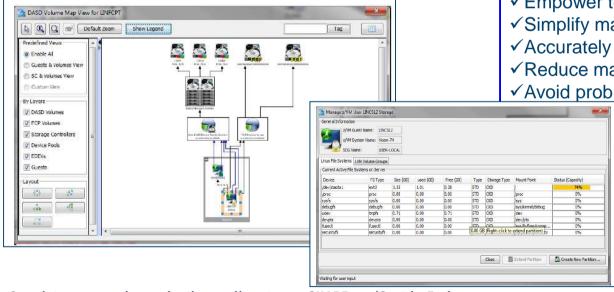
IBM Wave Systems Management Task Example:

"Add Disk Space To A Virtual Server"

Without IBM Wave

- Find requested disk space
- Create disk definition
- 3. Activate definition
- Connect storage to virtual server
- Mount device
- Create a File System

View Storage at a Glance



With IBM Wave

- Open the "Add Storage" form
- 2. Fill the storage capacity requested
- 3. Press the "Go" button

Benefits:

- ✓ Reduce reliance on scarce skills
- ✓ Respond faster to IT customer needs
- ✓ Reduce costs
- √ Empower team to do more independently
- √Simplify management
- ✓ Accurately depict current environment
- ✓ Reduce manual procedure errors
- ✓ Avoid problematic situations downstream



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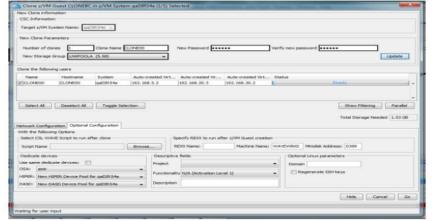
IBM Wave Systems Management Task Example:

"Clone a Virtual Machine"

Without IBM Wave

- 1. Determine if required resources exist
- 2. Create clone VM definition
- 3. Define clone VM resources
- 4. Create copies of private VM resources (server)
- 5. Create copies of private VM resources (disk)
- 6. Customize clone VM
- 7. Authorize clone VM access / VSwitch Access
- 8. Add clone to management groups
- 9. Activate clone
- 10. Configure the network
- 11. Run middleware configuration scripts
- 12. Monitor and report on cloning operation.

Clone a Linux Virtual Server



Complete your session evaluations online at www.5makt.org/Seattle-tval

With IBM Wave

- 1. Open the "Clone" form
- 2. Fill in the needed information
- 3. Press the "Go" Button

Benefits:

- ✓ Reduce time for a highly complex task
- √ Reduce costs
- √ Reduce reliance on scarce skills
- √ Improve speed to clone
- √ Simplify management
- ✓ Reduce errors associated with manual procedures
- ✓ No need to monitor every step of the process





IBM Wave Systems Management Task Example:

"Live Guest Relocation"

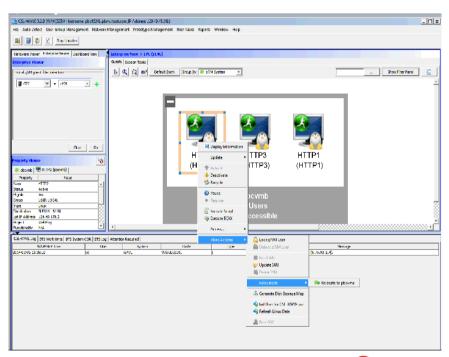
Without IBM Wave

• Using manual control program commands

Task	Task Steps	
Log into both z/VM instances	Login PBCVMA Login PBCVMB	
Find out which instance has the running guest	q HTTP2 in PBCVMA q HTTP2 in PBCVMB	
Verify the guest can be moved	vmrelo test HTTP2 to PBCVMB	
Move the guest	vmrelo move HTTP2 to PBCVMB	
Log out of both z/VM instances	Logoff PBCVMA Logoff PBCVMB	

With IBM Wave

- Using the GUI's Drag-and-Drop techniques
- Or Execute via menu selection







Saving Time with IBM Wave for z/VM

- Clone from Guest as often an one would like to create a new virtual server. Developers could do this on an hourly basis, but more likely every few days, depending on the job
- Activate/Deactivate Guest turn guests on and off. A restart may be necessary to check the application, or possibly to stop a job from completing so another action could be taken
- Add Virtual Switch creating virtual LANS and switches might be performed depending on the needs of the developer and what they are looking to accomplish. This may be part of a one-time setup.
- Execute Scripts for Guest could be on a near continual basis. Creating a new guest may likely require a script to run. More guests, more scripts
- Monitor z/VM continual process. This is already part of the application so this dashboard will be accessed often. Additional guests generate additional monitoring activity and are added to the monitoring pool automatically - no manual intervention is needed
- Live Guest Relocation will be used most often when patching z/VM and as a low-level failover. One could invoke the failover manually rather than utilize another tool for policybased automated failover.



IBM Wave for z/VM Tested Productivity Savings*



IBM Wave is designed to help automate and improve the productivity of many administrative tasks. Tests were run on a zEnterprise processor both with and without the IBM Wave interface**.

Tasks	Manual Times in seconds	With IBM Wave Times in seconds	Reduction in time
Clone a Guest Linux Server	576	29	95%
Activate/deactivate a guest	65	10	85%
Add a virtual switch	88	20	77%
Execute scripts for a guest	96	18	81%
Monitor z/VM	30	13	58%
Live guest migration	95	13	87%

^{*}These are sample task timings conducted by the IBM Competitive Project Office. Manual test times assumed a base knowledge of z/VM and assume no additional scripting. Individual test results may vary.

Complete your session evaluations online at www.SHARE.org/Seattle-Eval

^{**}Tests used a zEnterprise 196.model 2817-H10 running z/VM 6.3 with 6 cores shared by LPARS in the test. Each z/VM has 128G of memory.

Enterprise Linux Server features IBM Wave for z/VM



Enterprise Linux Server includes IBM zEnterprise® hardware, hardware maintenance, IBM virtualization and management software components and software support & subscription.

Hardware options

- -IBM zEnterprise server
- -32 GB memory
- -Connectivity
- -S&S

Virtualization software

- -IBM z/VM Version 6
- -z/VM basic features:
 - Dirmaint[™], RACF[®], Performance Toolkit for VM[™], RSCS
- -NEW! IBM Wave for z/VM included
- -3-5 years S&S
- Note: Linux ordered from Red Hat or SUSE

Enterprise Linux Server

Includes IFLs, memory, I/O adapters, z/VM software including 3-to-5 years of S&S, and maintenance

Solution Edition for Enterprise Linux

Acquire incremental Linux CPUs (IFLs), memory, z/VM software and 3-5 years of subscription and support, and maintenance.

 $^{\rm 1}$ 28-32 GB memory on zBC12, 24 GB memory per core up to 5 IFLs on z114. Complete your session evaluations online at www.SHARE.org/Seattle-Eval





Complete Solution for administration and management of the z/VM and Linux on z Systems environment





IBM Infrastructure Suite

Linux on z Systems

OMEGAMON XE on z/VM and Linux

Tivoli Storage Manager

Performance monitoring of z/VM and Linux guest

File Level backup and recovery for Linux Virtual Machines

<u>z/VM</u>

Wave for z/VM

Simple, intuitive, graphical z/VM management tool

Operations Manager for z/VM

Backup and Restore Manager for z/VM

Facilitate automated operations, take action based on events

Backup and restore full z/VM environment



Gain the Competitive Edge



Enterprise Cloud System (Pre-configured and integrated system) 5 H A R E

Server:

- IBM zEnterprise[®] EC12 or IBM zEnterprise BC12 (zEC12, zBC12)
- Storage:
- IBM DS8870 or Storwize® V7000
- Software:
- z/VM[®] 6.3 with following features:
 - Directory Maintenance (DirMaint[™]) Feature
 - Resource Access Control Facility (RACF®)
 - Performance Toolkit for VM[™] Feature
 - Single System Image (SSI) Feature
 - (Requires ECKD DASD)
- IBM Wave for z/VM
- Cloud Management Suite:
 - OMEGAMON® XE on z/VM and Linux
 - Tivoli Storage Manager
 - SmartCloud Orchestrator
- Operations Manager for z/VM
- Backup and Restore Manager for z/VM

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Complete your session evaluations online at www.SHARE.org/Sea

Top Reasons Why you Need IBM Wave

IBM Wave

- Does you company need to simplify advanced virtualization functions?
 - Do you need to accelerate the productivity of less experienced staff?
- Would you like the convenience of reporting capabilities without having to navigate to another product?
- Would it be convenient to easily visualize configuration and status of virtual guests?
- Do you ever need to limit authority to effect resource changes to certain staff?
- Could you use automatic notifications to alert staff from performing certain operations during critical periods?
- Would you like to be able to perform easy drag and drop connections, like connecting z/VM to a virtual network?
- Can you group and filter virtual resources and manage them in a way that is meaningful to your users?
- Would you like to perform complex tasks like LGR in seconds?
- Would you like to simplify the capturing and cloning of virtual Linux guests in a few clicks? Would you like to be able to customize cloning and add scripts?

Would you like to do all of this with one product?

Complete your session evaluations online at www.SHARE.org/Seattle-Eval

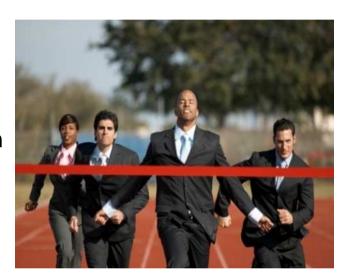




Summary - IBM Wave for z/VM can:



- Simplify the administrative and management of virtualized servers all from a single dashboard
- ✓ Reduce the time it takes to perform complex virtualization management tasks
- Extend the reach of existing skills to manage even the most complex tasks like live guest relocation
- Improve the quality and consistency of operations with a current and accurate view of your system using IBM Wave discovery
- Reduce risk of errors by delegating management scope to the appropriate teams
- ✓ Accelerate virtualization steps like virtual server cloning and provisioning to make the transformation to cloud easier







IBM Wave for z/VM - Live Demo



IBM-NA (CSLVM17) 28 Users All Accessible



IBM-SEC (CSLVM17) 12 Users All Accessible



IBM-DIRM (CSLVM17) 6 Users All Accessible



IBM-UTIL (CSLVM17) 11 Users All Accessible



USER-LOCAL (CSLVM17) 9 Users (+1 Hidden) All Accessible



WAVE-INTERNAL (CSLVM17) 4 Users All Accessible



IBM-SYSTEM (CSLVM17) 5 Users All Accessible



IBM-SMAPI (CSLVM17) 11 Users All Accessible



IBM-COM (CSLVM17) 37 Users All Accessible



IBM-OPER (CSLVM17) 6 Users All Accessible



IBM-ENS (CSLVM17) 4 Users All Accessible



IBM System z Tiger Team: News











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