

# IBM Wave for z/VM: An Introduction

## IBM Redbooks Solution Guide

IBM Wave provides a visualization format that represents virtual resources and their relationships. It provides a customizable graphical (Figure 1) or tabular view that helps administrators understand the status of the entire system or a subset (such as system, network, or storage topology) in a single view. The status of servers, networks and network devices, and storage is detected automatically by IBM Wave. Changes in resources and their relationships are monitored and reflected in displays. Many of the IBM Wave displays have advanced filters, tagging, layout, and layer selection to provide customized views.

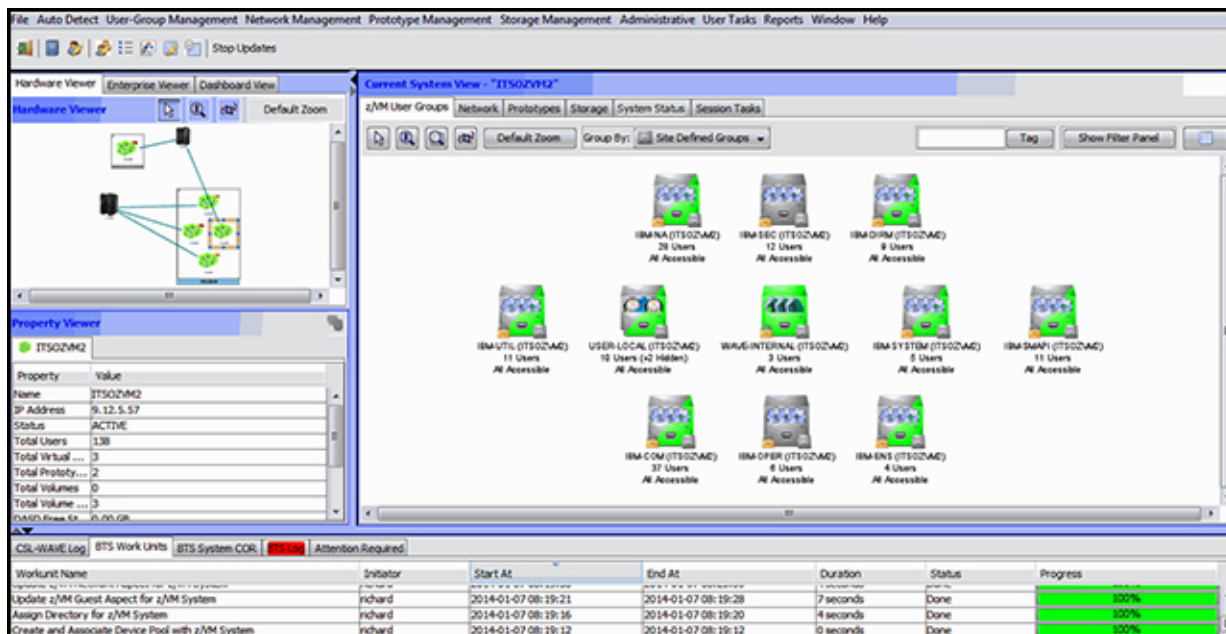


Figure 1. IBM Wave for z/VM graphical user interface

### Did you know?

IBM Wave is a management solution for z/VM® and Linux on System z® server farms. The software provides a management approach that is backed by an abstraction of the z/VM environment. IBM Wave management facilities target Linux on System z system programmers, project managers, and administrators, with special features that are included to assist operations teams and z/VM system programmers as well.

IBM Wave provides a rich GUI work environment with graphical views of all managed objects. The entire server farm can be viewed, including systems in SSI clusters and stand-alone LPARs. IBM Wave allows running of customized REXX EXECs as part of the cloning process. Linux shell scripts or REXX EXECs can be run against one or more systems, with the results of each displayed in the GUI.

IBM Wave allows for enhanced server farm administration. Using the GUI, virtual processors, memory, and other guest properties can be easily changed. Point and click and drag actions can be used to transfer guests between projects, groups, and account codes, and start Live Guest Relocation (LGR). Intelligent Active Notes (IANs) is a feature that can be used to attach special notes to any object. The notes can trigger automatic warnings that are based on a correlation between the IBM Wave action that is attempted and the text in the note.

## **Business value**

The main value proposition is the complete abstraction of the z/VM environment so that it is hidden from the Linux system administrator. IBM Wave allows for simplification technology that is geared towards automation and effortless management of even the most complex and large virtual server farm environments. This simplification allows the z/VM System Programming team to devote time to the important tasks of managing z/VM capacity and tuning. The IBM Wave user rarely needs to leave the GUI client for infrastructure activities, which reduces the amount time the user needs to use the 3270 "green screen" interface.

Multiple objects can be affected in a single action. Actions can be carried out against any number of selected objects. In native z/VM, these actions require separate commands to be run to start or stop a group of servers. In some cases, multiple systems commands must be run to complete a single action. Operating in native z/VM requires strong z/VM skills. IBM Wave GUI provides a more intuitive and easy to operate facility to manage servers in both single or multiple LPARs and the entire enterprise.

The z/VM interface is built on the standard 3270 green screen interface. Before IBM Wave, retrieving any information from the z/VM system could be done only by running commands and viewing the results on the 3270 interface. IBM Wave provides the user with a "single glance" technology that is based on smart ICONs and standard color usage. A graphical presentation of system topology greatly enhances the user's ability to detect anomalies.

System status monitoring to determine when attention is required is not directly supported in z/VM. The performance toolkit can be used to monitor system performance and get textual alerts at the system console. If a Linux on System z guest loses its IP connection, z/VM does not provide easy to recognize alerts. IBM Wave, however, displays views showing the usage of all resources in a dashboard format. It provides a table of anomalies that are detected across the system. The dashboards can be combined for all managed z/VMs on the enterprise for an overall aggregate view of the entire data center.

The management of complex environments that include multiple z/VM LPARs sharing directories in SSI clusters or as stand-alone z/VM environments require highly skilled z/VM system programmers. That need is lessened with the usage of IBM Wave because a single such instance can manage an unlimited number of central processor complexes (CPCs) and z/VM LPARs, which creates a central point for both management and monitoring.

## **Solution overview**

IBM Wave is a mainframe management and Linux on System z provisioning solution. The solution simplifies the control and usage of virtual Linux on System z servers running on IBM z/VM operating systems. IBM Wave provides a GUI environment that allows task management on one or multiple IBM System z Enterprise class servers. The servers can be on one or many z/VM instances (LPARs) running thousands of virtual Linux on System z servers on each LPAR.

The graphical user interface (GUI) displays the following items:

- Virtual Server environments
- Physical infrastructure
  - Physical servers (mainframes)
  - z/VM instances (LPARs)
  - Virtual Linux server objects
  - Virtual networks (Guest LANs and Virtual Switches)
  - Virtual server to virtual network connections
  - Storage volumes
  - Storage groups

The GUI allows all necessary procedures and functions that are needed to carry out routine management and provisioning tasks and special operations. Figure 2 highlights the various features.

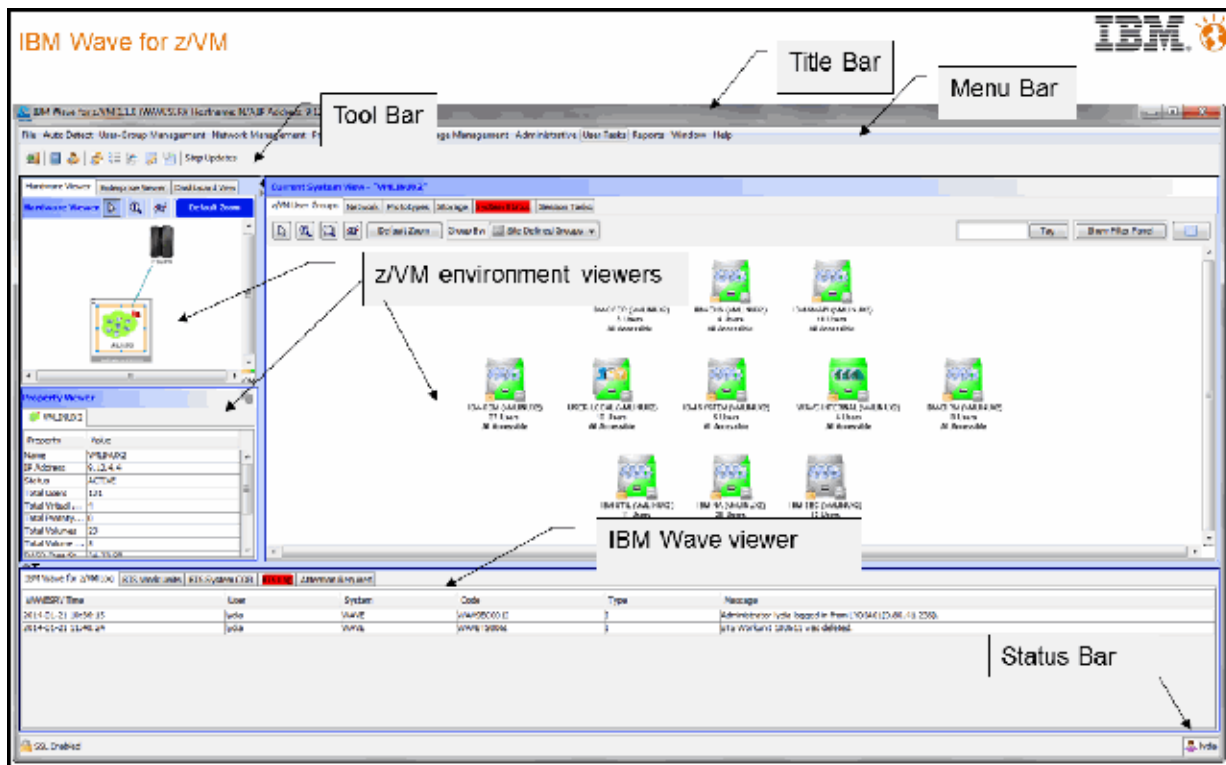


Figure 2. Description of the IBM Wave for z/VM GUI

The main objective of IBM Wave is to eliminate the learning curve that is needed to control the z/VM environment. Its graphical environment presents the System z architecture and z/VM infrastructure in a way so that the Linux administrators can manage their servers with the same skill set. Day to day operations and even large-scale virtual hardware and system configuration changes can be done without the help of the z/VM system programmers.

## Solution architecture

Figure 3 shows a picture of the application architecture.

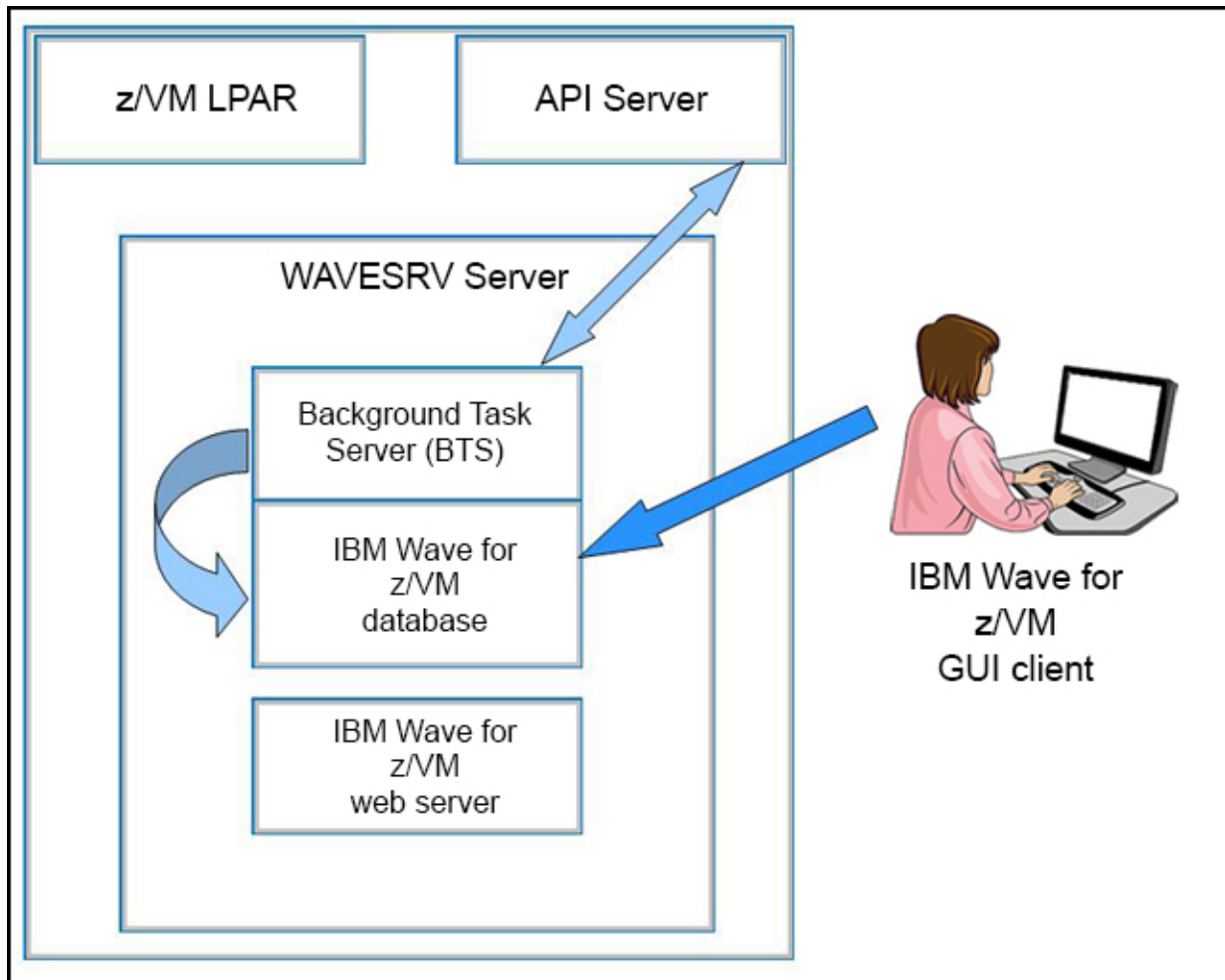


Figure 3. Application architecture

IBM Wave for z/VM implements a three-tier architecture:

- The GUI clients - Tier 1

The IBM Wave GUI clients control the running, attributes, and behavior of the Linux virtual servers and the rest of the managed z/VM resources per the scope and permissions of the IBM Wave user.

- The WAVESRV server - Tier 2

The WAVESRV server is a Linux server that runs the IBM Wave knowledge base, the IBM Wave BTS (Background Task Server), and a web server.

- The API - Tier 3

The API is the Target Virtualization Platform (TVP) and is a general reference to a mediation layer that provides the interface in to the managed environment.

The interactions between these components in the three-tier architecture facilitate all of the IBM Wave for z/VM features.

## Usage scenarios

One example of a usage scenario is "powering on" a new z/VM guest. After you create a new z/VM guest, the guest must be activated so that it can be used. Use the Activate action to activate all z/VM Guests inside a group. This process is analogous to powering on a physical server. You can do this action by right-clicking the icon that represents your guest and selecting **Activate** (see Figure 4).

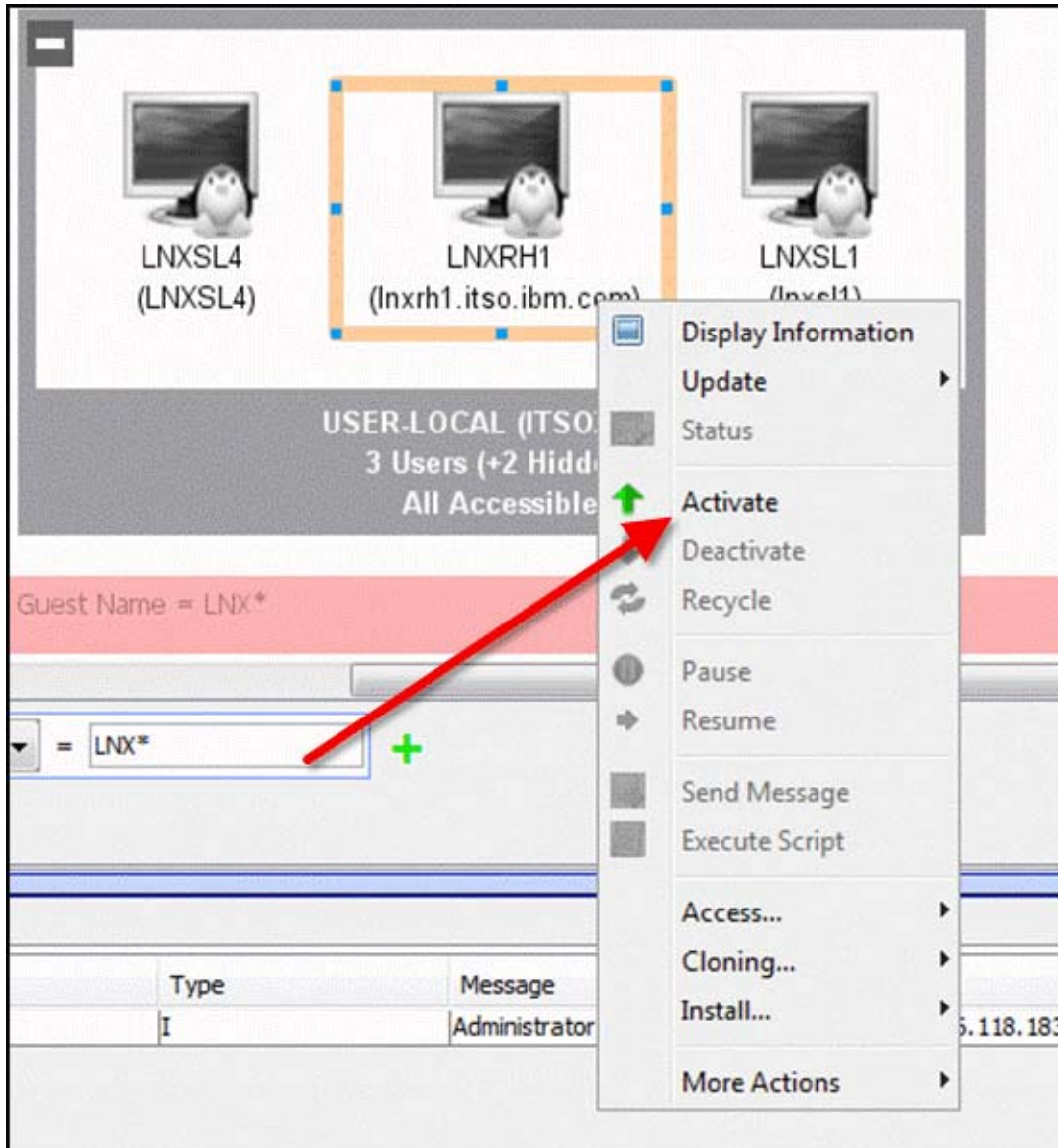


Figure 4. Activate the guest

Multiple guests can be activated simultaneously by highlighting more than one icon before you right-click and select **Activate**. Conversely, you can use the Deactivate action to deactivate all z/VM Guests inside a group.

## Supported platforms

Here are the z/VM prerequisites for the TVP for IBM Wave for z/VM :

- z/VM V5.4, V6.2, or higher with Systems Management API configured.
- A Directory Manager such as DIRMAINT must be installed and active.
- If performance monitoring for z/VM Systems uses the z/VM Performance Toolkit, it must be installed and configured correctly. This is an optional action but is recommended.
- IBM System z10® or later.

For every workstation running the IBM Wave for z/VM graphical user interface (GUI) client, the following items must be considered:

- Java 1.7 must be installed.
- Ensure access to the IP addresses of all managed z/VM systems and to the WAVESRV server.
- The GUI client is a Java WebStart application and can run on any platform supporting Java, such as MS Windows 7.
- Firefox or Internet Explorer must be used.
- PuTTY or equivalent telnet/SSH Client must be used.

Here are the prerequisites for the WAVESRV Linux guest:

- The Linux system where the IBM Wave for z/VM rpm is installed must be either SUSE Linux Enterprise Server 11 or Red Hat Enterprise Linux 6.
- The system can be a z/VM Guest or LPAR.
- The Linux system must also have Java SE Runtime 1.7 installed.
- For Linux on System z, the virtual machine must meet the following requirements:
  - o Have at least 1 GB of memory.
  - o Have a file system that is at least 6 GB.
  - o MySQL v12.22 or higher must be installed.
  - o Apache must be installed.

For every Linux on System z virtual machine that managed by IBM Wave for z/VM, the SSH, VMCP, and CMSFS (if you use SUSE Linux Enterprise Server) packages must be installed.

## Ordering information

Ordering information is show in Table 1.

Table 1. Ordering part numbers and feature codes

Program name	PID number	Charge unit description
IBM Wave for z/VM	5648-AE1 1.1	Per Value Unit
IBM Wave for z/VM S&S	5648-AE2 1.1	Per Value Unit

Customers can order through Shop z, which can be found at <https://www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp>.

## Related information

For more information, see the following documents:

- *IBM Wave for z/VM - Installation, Implementation and Exploitation*, SG24-8192  
<http://www.redbooks.ibm.com/abstracts/sg248192.html>
- IBM Wave for z/VM product page  
<http://www-03.ibm.com/systems/z/solutions/cloud/wave/index.html>
- IBM Offering Information page (announcement letters and sales manuals):  
[http://www.ibm.com/common/ssi/index.wss?request\\_locale=en](http://www.ibm.com/common/ssi/index.wss?request_locale=en)

On this page, enter IBM Wave for z/VM, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.

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