



Oracle Cloud Provisioning with IBM Wave and Oracle 12c Cloud Control on IBM z Systems

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Session Number: 17360



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Agenda

Why Cloud Computing ?

z Systems Cloud Blueprint

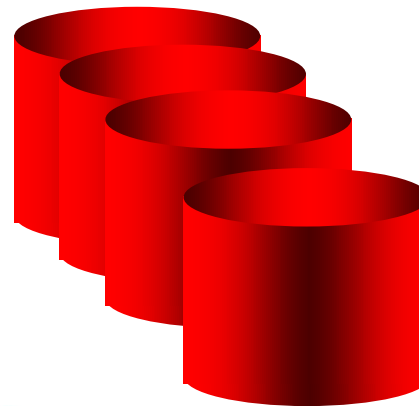
Oracle Databases in a Cloud environment

A demo of provisioning Oracle Databases using
IBM Wave

A demo of provisioning Oracle Databases using
Oracle EM12C

Oracle Databases on z Systems

- Oracle Databases on z Systems work same way as they work on any other platform.
 - The same source code is ported to all the supported platforms.
 - It installs and is administered to the same way as it is on Linux on Intel.
 - The differences are in configuring Linux and z/VM.
 - From a DBA perspective, once they get an IP address, userid and pw for Linux they are good to go.



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SHARE
in Orlando **2015**



Many enterprises are running Oracle on z Systems



Various sizes and deployments

- From z9 to z13
- Small, Medium, Large customers

Across all Industries

- Finance
- Healthcare
- Insurance
- Retail
- Education
-

Across Gov. agencies

- State
- Federal
- Defense

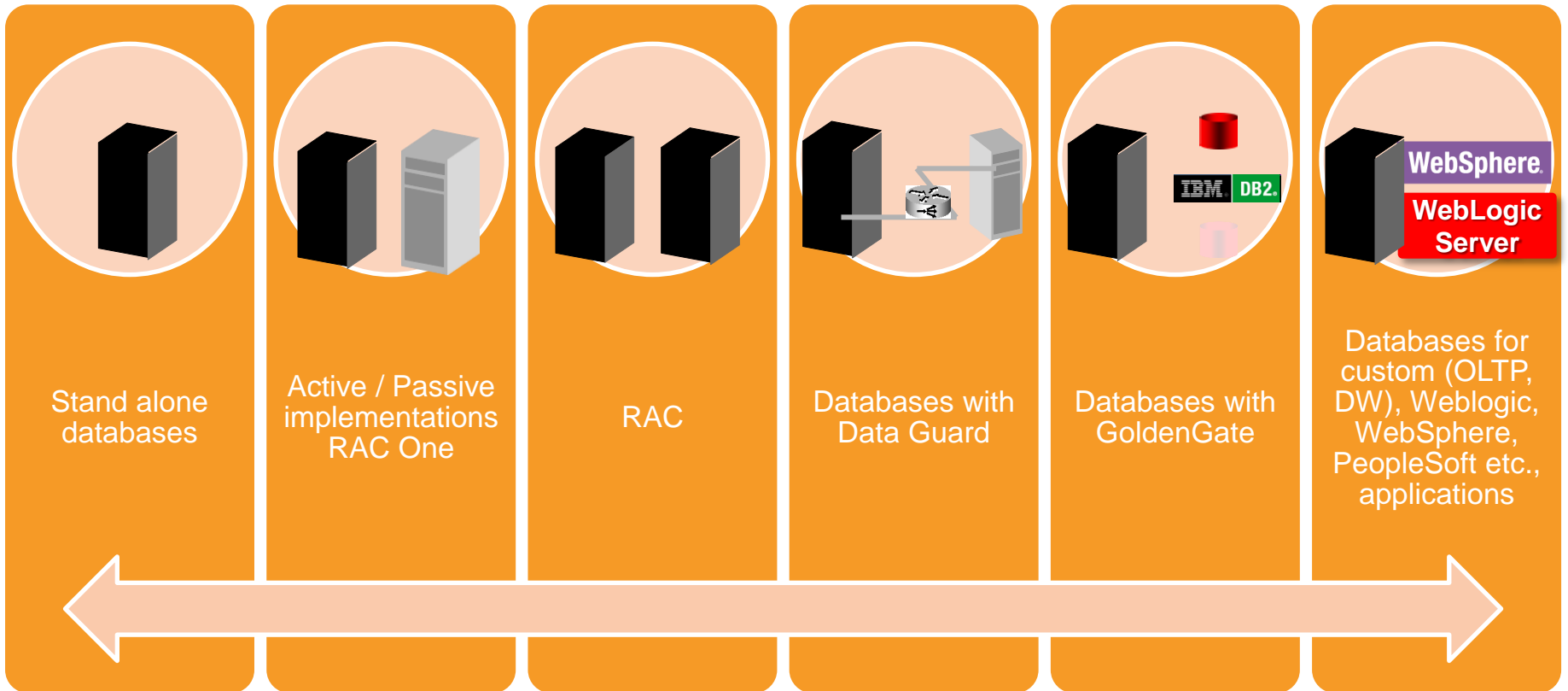


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Customer choices for Oracle Databases on z Systems



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Oracle stand alone databases on z Systems

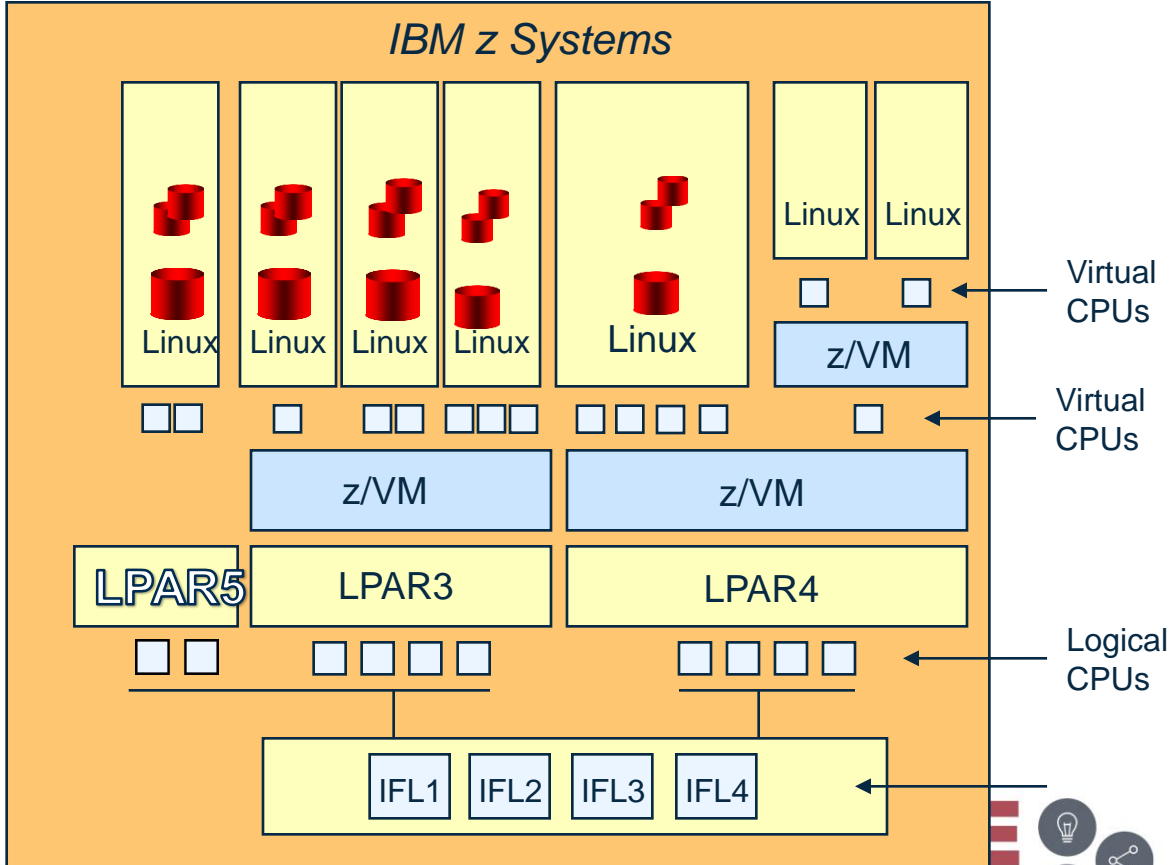
Linux on its own LPAR

Production on its own z/VM LPAR

Prod, Dev, Test all in one z/VM LPAR

Linux LPAR with one or more Databases

One or more Databases under z/VM LPAR



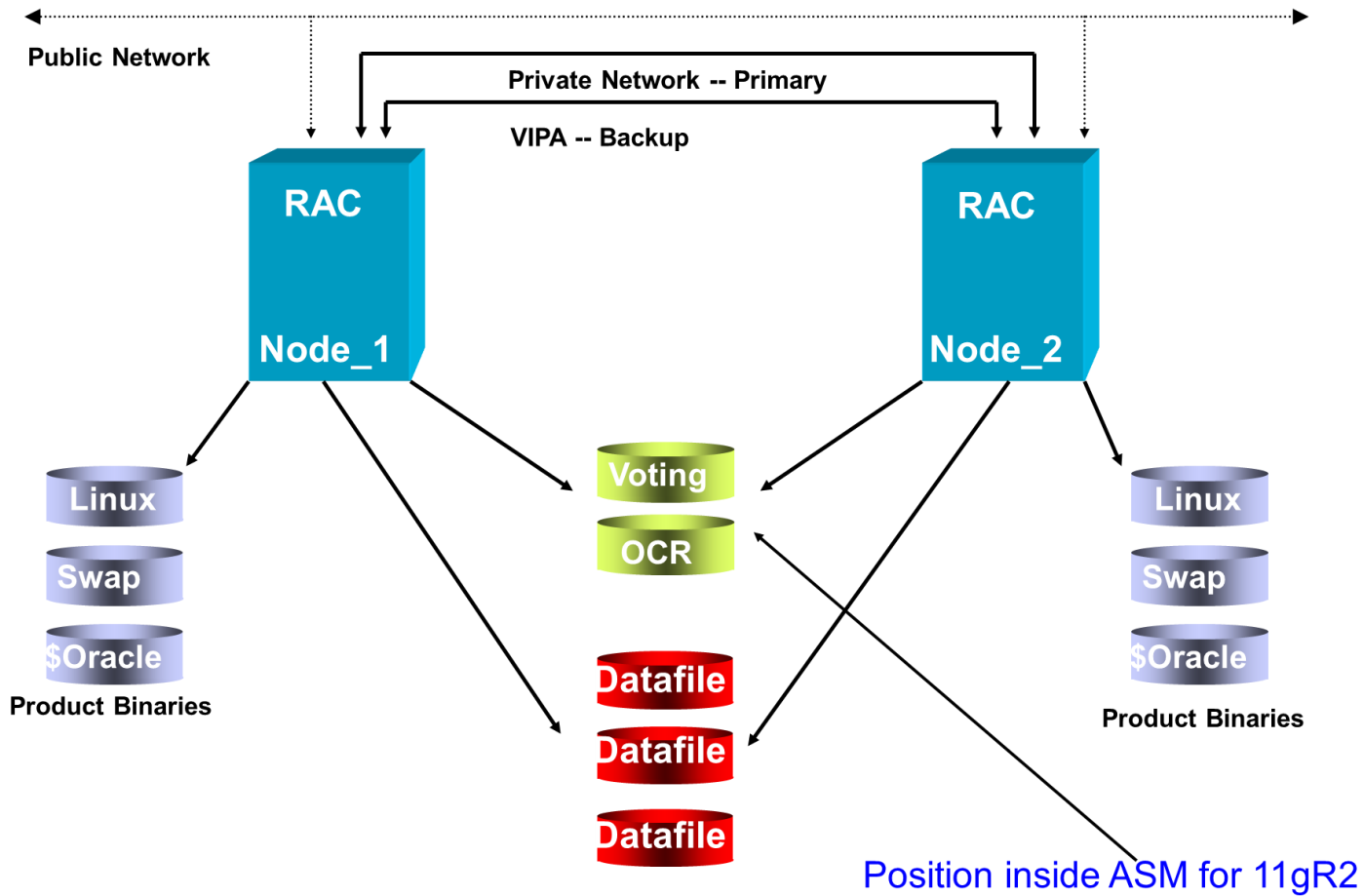
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Steps for installing Oracle database binaries – just stand alone (minimum 15 steps)

- You need a Linux Guest
- Requires specific rpms for Oracle
- Create the user ids, groups – oracle, grid
- Customize the kernel parameters
- Huge Page setup
- Network setup
- Swap disks
- Disk / san storage setup (binary / data)
- Multipathing / udev rules setup
- Directories for binaries, data
- Authorization
- Binary down load
- Installation
- Oracle Agent installation

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Overview of Major RAC Components – more complexity



IT Challenges – multiple environments

- Wide range of customers
 - *Internal and External*
- Heterogeneous hardware environments
 - *Legacy, Distributed*
- Many environments
 - Development, Q/A, Production
 - Hosted, Hosting, Disaster Recovery
- Multiple OS, Databases and products to support
- Storage complexities
 - *SAN, FLASH, Legacy*
- Geographically distributed locations
- Complicated procurement process
- Ever increasing infrastructure requirements
- Tedious provisioning processes
- Security issues
- Maintenance requirements
 - *Patches, Upgrades, Security*
- Changing technologies
 - *Cloud, Big Data.....*

No Big Deal....



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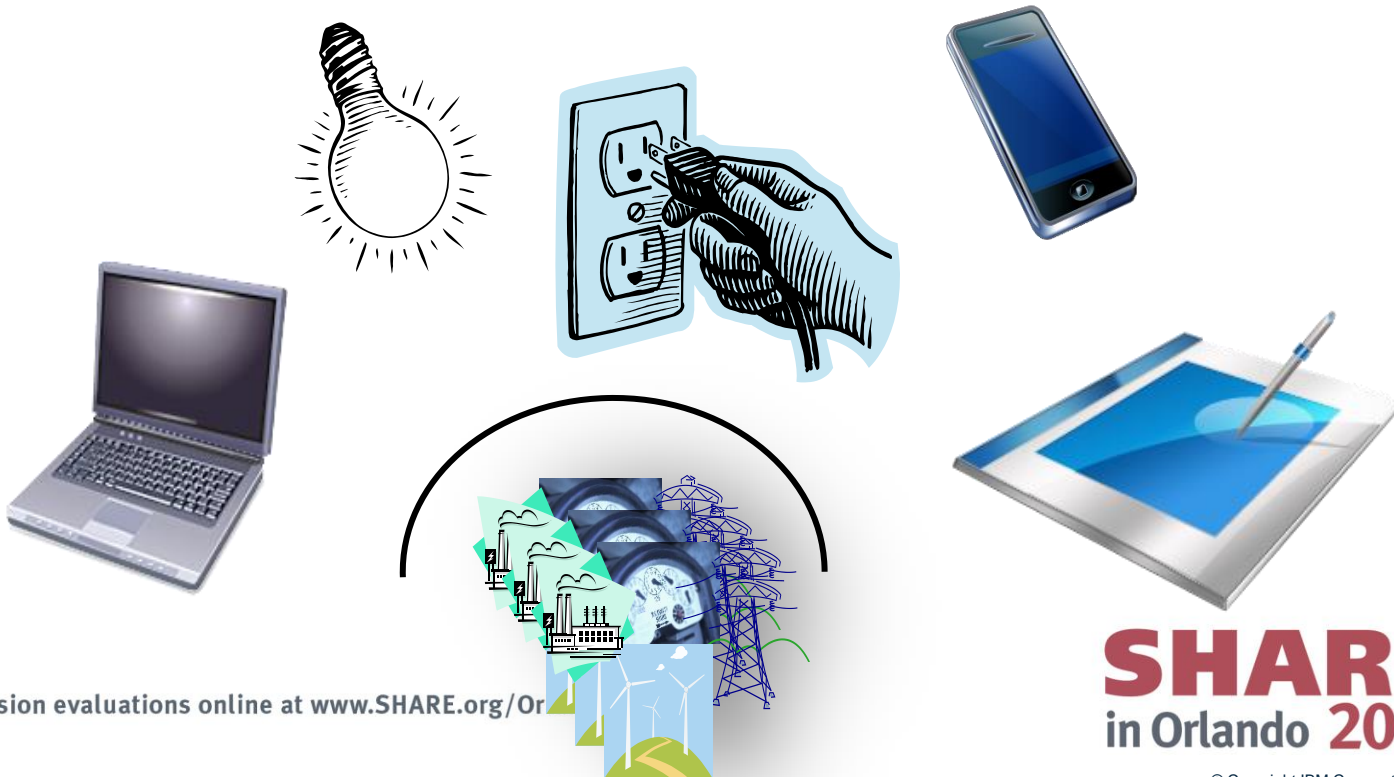
Real example – the electrical grid

Most of us walk into a room and look for outlets

> plug in and use



- Nobody carries their own power generator
- Simple, available, relatively low-cost, utility
- You know what to expect, you know what you expect



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... translated into the current IT world ...PROVISIONING .

The application team requests a new environment with Oracle database “*now*” and ...



IT team



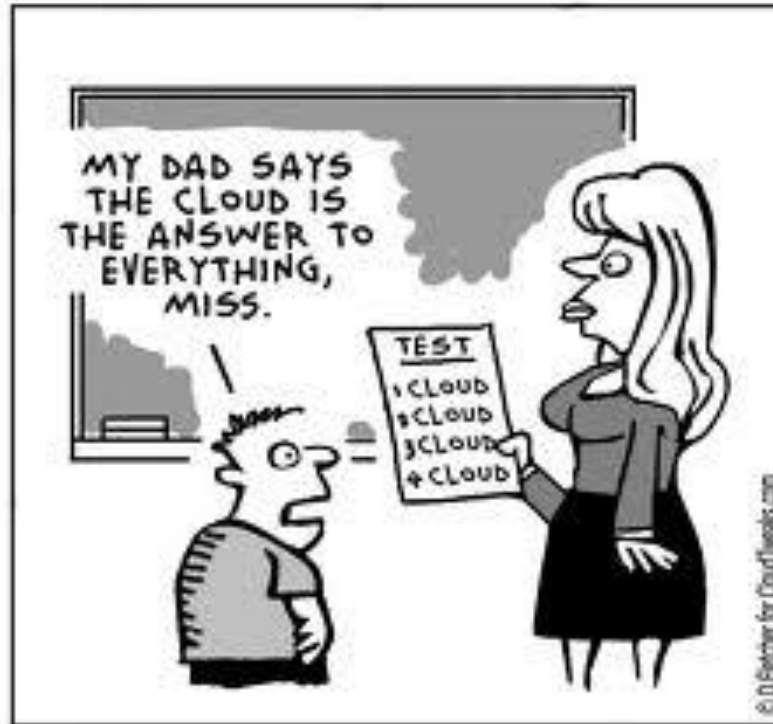
- Find available hardware
- Create the virtual machine
- “Connect” the infrastructure
 - Storage and network
- Setup for virtual machine install
- Install and patch Linux and parameters
- Customize OS for Oracle database
- Install Oracle software

... ..

- **“Pay no attention to the man behind the curtain”**



And



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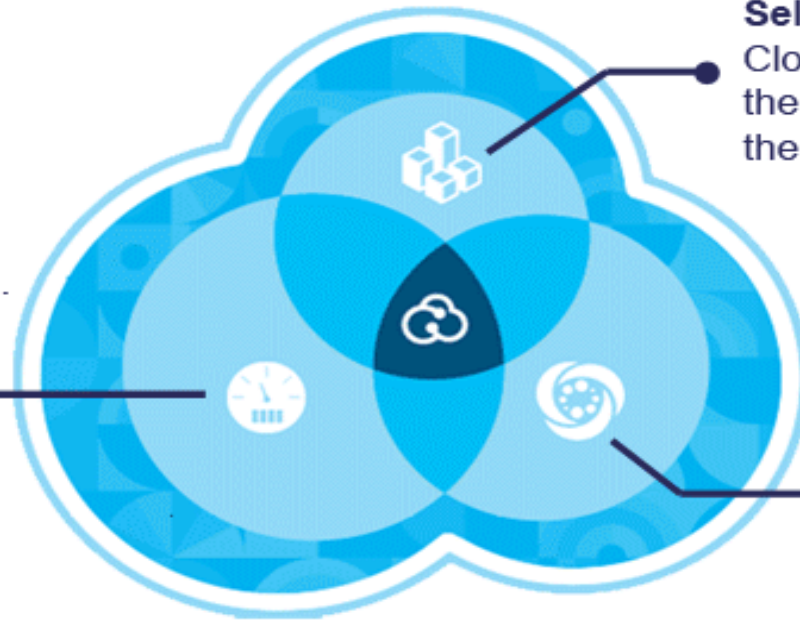
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Cloud is not the solution; it enables the solution

- The enabled solution should allow...

Pay for Use

Cloud computing provides metered service usage, so you only pay for what you use.



Self Service

Cloud computing provides all the IT resources you need with the self-service access.

Elastic Resources

Cloud computing allows users to scale up or down quickly.

Three business imperatives fueling cloud adoption

Speed

Organizations must quickly, continuously improve the applications and services they deliver.

Empowerment

People want to serve themselves - they want intuitive access to business apps and application development environments.

Economics

Use-based payment models. Faster development. Adding capacity when it is needed, but not before.

z Systems Cloud Blueprint

The steps in the cloud journey offer different levels of capability for each customer IT environment.

Orchestrate

Advanced Cloud

Orchestration
&
Optimization

Automate

Entry Level Cloud

Standardization
&
Automation

Integrate

Virtualization

Infrastructure
&
Virtualization
Management

This is where z Systems drives differentiation!

Infrastructure Scalability:

- Consolidate more workloads per core

Virtualization Management:

- More virtual servers in a single footprint

Security:

- Highest security rating for tenant isolation

Reliability & Availability:

- Unparalleled in the industry

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Virtualization and Cloud Portfolio for Linux on z Systems



Virtualization Infrastructure & Virtualization Management

Servers: z13, 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

IBM Wave for z/VM

- A graphical interface tool that simplifies the management and administration of z/VM and Linux environments

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Differentiation

Entry Level Cloud Standardization & Automation

xCAT

- Shipped with z/VM 6.3
- Allows customers to set up a rudimentary cloud environment, without acquiring any additional product
- Based on open source code
- Not designed for upward integration to IBM Cloud suite

IBM Cloud Manager with OpenStack

- A simple, entry level cloud management stack
- Based on OpenStack
- Managed from/to Linux on z
- First tier in the IBM Cloud suite of cloud management products



Standardization

Advanced Cloud Orchestration & Optimization

Cloud Orchestrator

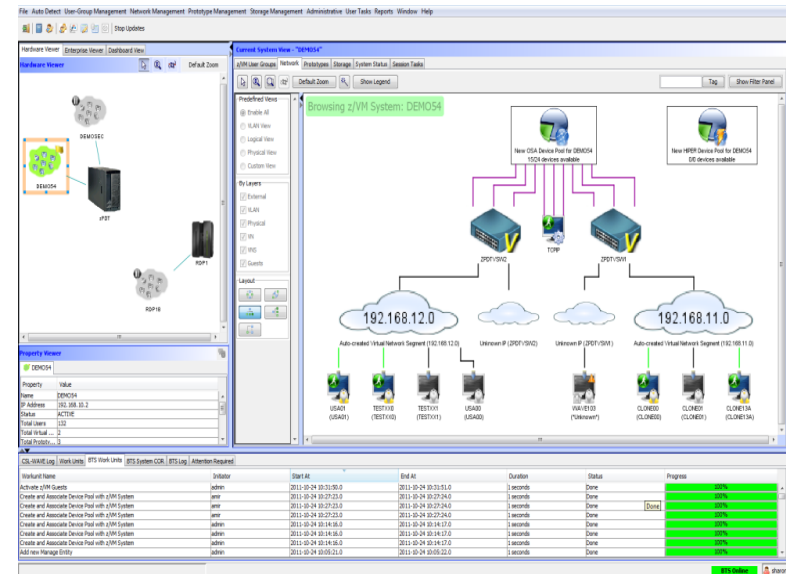
- Based on OpenStack
- Builds on functionality of **Cloud Manager with OpenStack**
- Adds runbook automation and middleware pattern support for workload deployment



IBM Wave for z/VM (IBM Wave) Overview

IBM Wave simplifies and helps automate management and administration of z/VM and Linux virtual servers, jumpstarting the steps needed to get to cloud. With its content rich interface IBM Wave extends the reach of your staff and lets you manage z/VM and Linux intuitively and cost effectively, reducing reliance on deep expert skills.

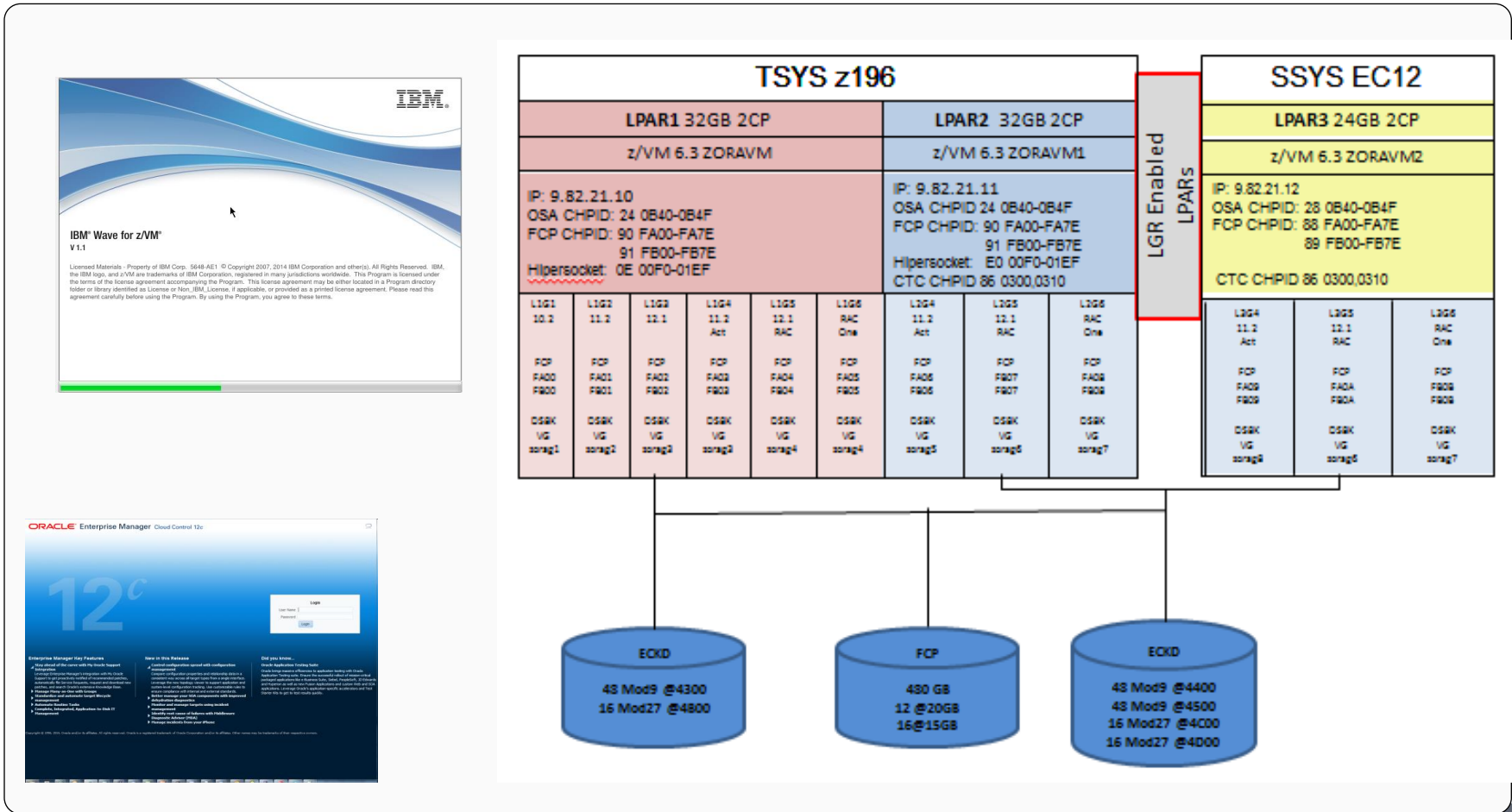
- Monitors and manages virtual servers and resources from a single interface
- Simplifies and automates administration and management tasks
- Provisions virtual resources (Guests, Network, Storage)
- Supports advanced z/VM capabilities such as Single System Image and Live Guest Relocation
- Allows delegation of administrative capabilities to the appropriate teams



A simple, intuitive graphical management, provisioning, and automation tool to help you fully leverage the power of System z virtualization on z/VM.

Lab environment overview

- IBM Wave runs on LPAR1



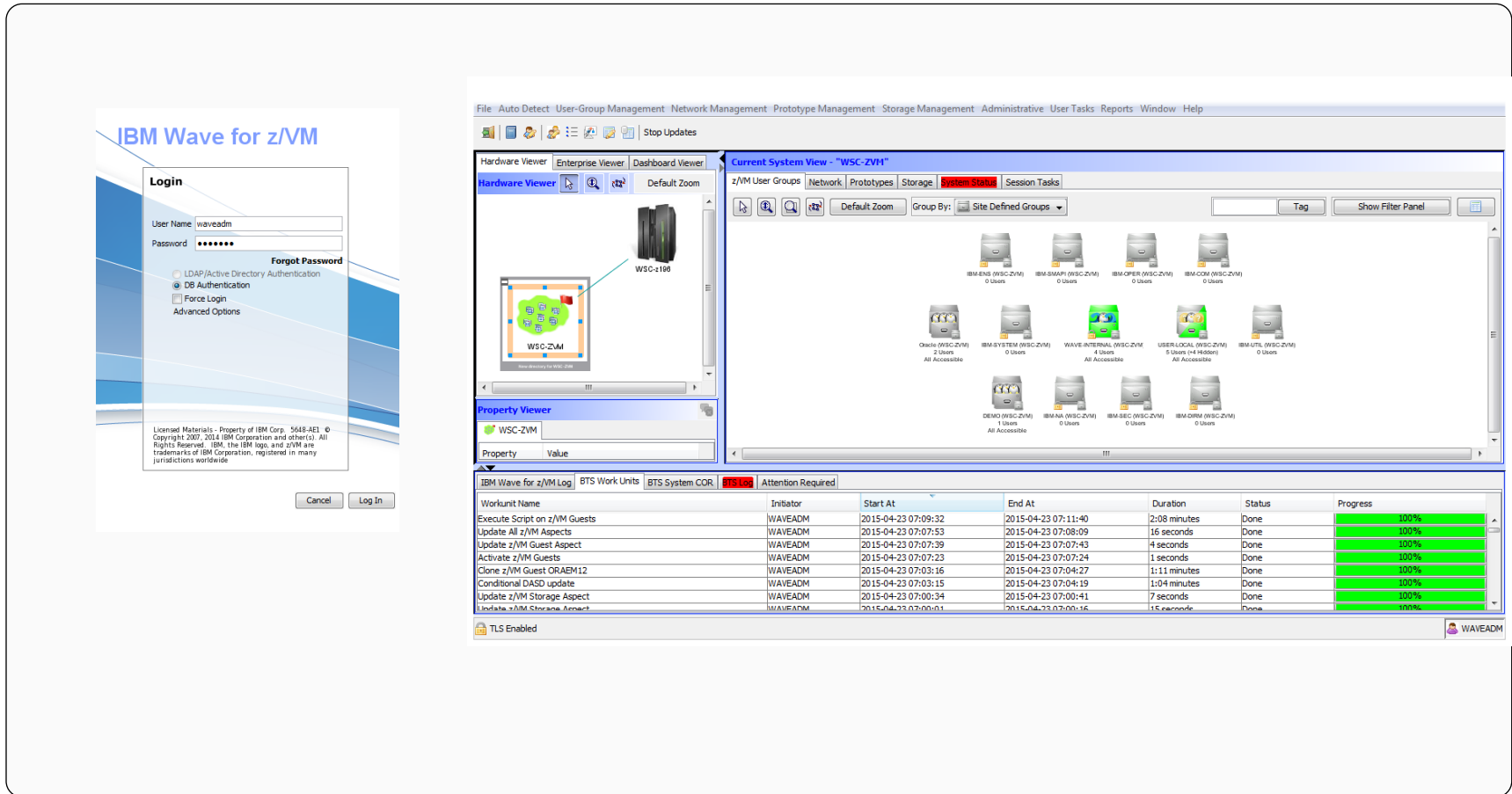
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Wave operations tour

- Wave login and walk around the shore



The screenshot displays the IBM Wave for z/VM interface. On the left is the login screen with fields for User Name (waveadm) and Password, and options for authentication (LDAP, DB, Force Login). The main window shows the 'Current System View - "/>

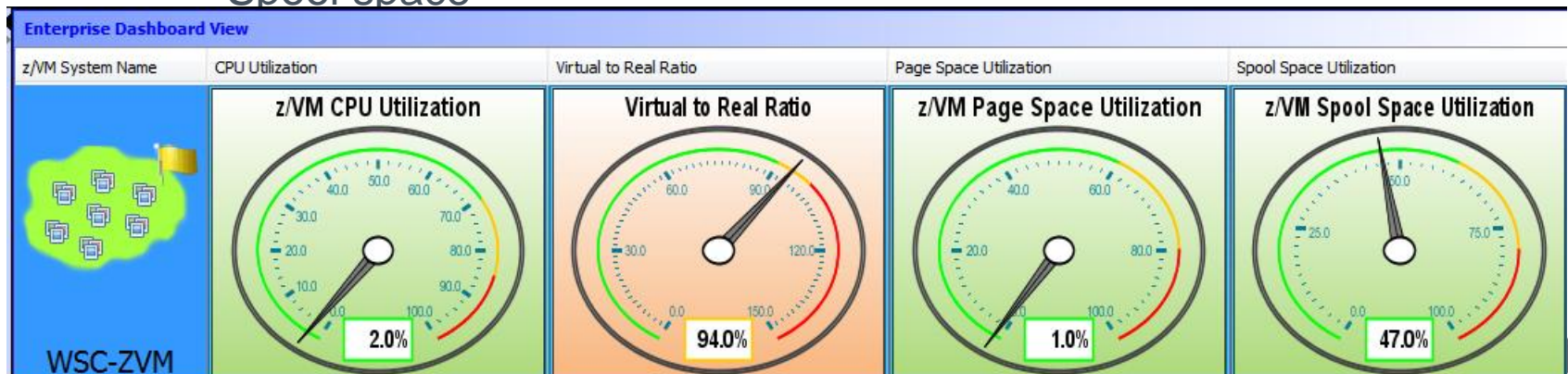
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Wave demonstration

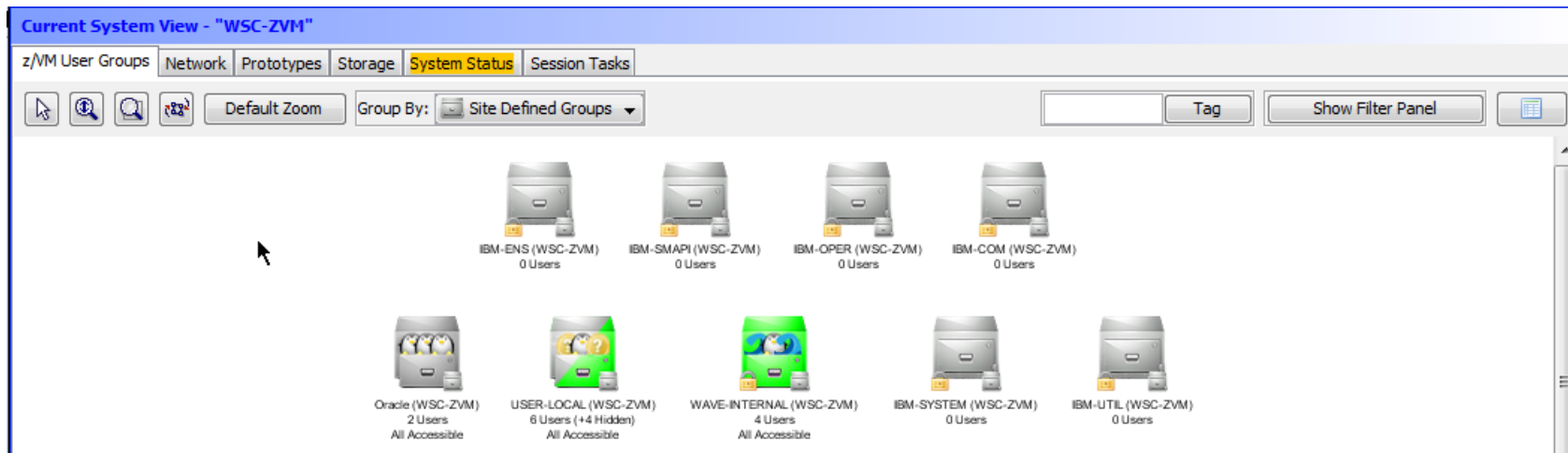
- Logon to Wave
- Hardware viewer
- For Oracle environment, some of the things to keep an eye are CPU, memory and obviously the page space
- Dashboard viewer (Dynamic, snapshot – no static info)
 - CPU utilization
 - Memory real to virtual
 - Page space
 - Spool space



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Wave demonstration

- z/VM User Groups
- Network
- Prototypes
- Storage
 - distribution
 - groups
 - volumes



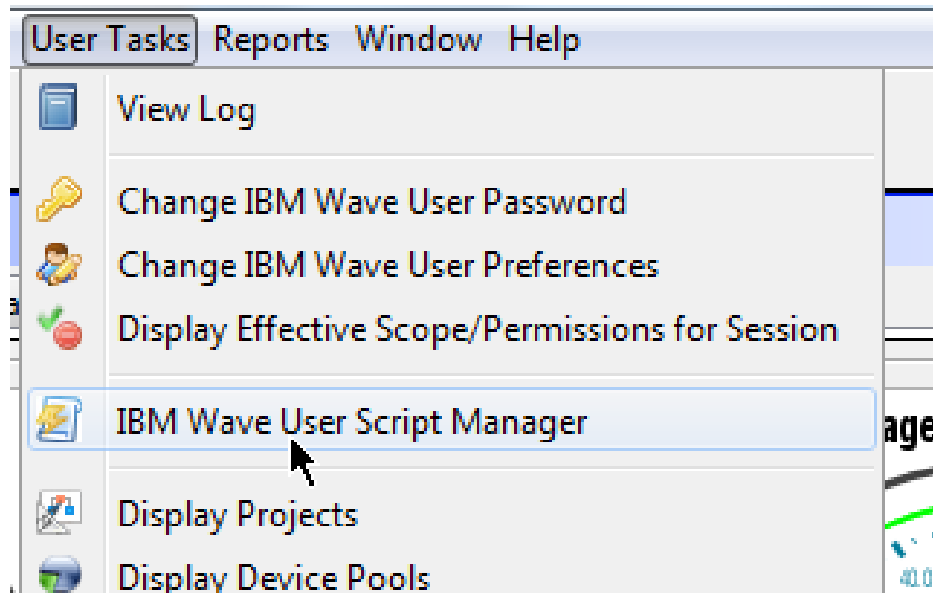
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Wave demonstration

- User tasks



Oracle Stand alone Database provisioning

- Clone a Linux Guest



- Create a Oracle Database on that Linux Guest

Cloning a Linux Guest (/aaS)

- You need a template / prototype
- Nothing but a basic catalog of Linux guests
 - T-shirt sizes -- small, medium, large, xtra Large
 - Service level -- Bronze, Silver, Gold, Platinum
- Create a prototype from a running Linux guest
- Clone from that prototype
- /aaS ----- Infrastructure as a Service

- Let us see how a Linux guest is cloned in Wave

Step1 create a prototype (ORAGOLD)

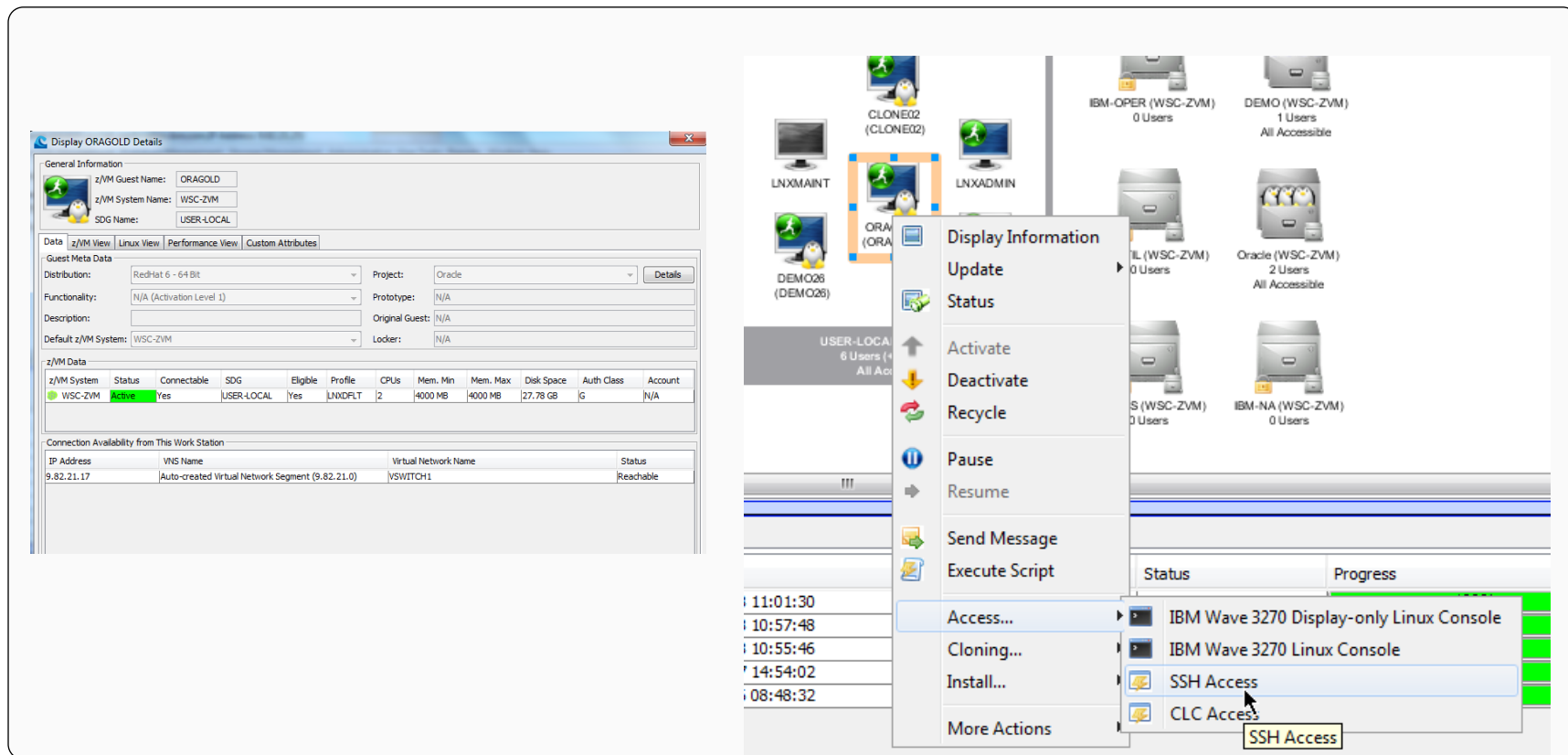
- Install Linux on a z/VM guest

- Customize the Linux guest for installing Oracle Database

- **Convert the Linux guest as prototype**
- **And this is our Golden Image**

Look at the customized Linux Guest ORAGOLD in Wave

- Data, zVM, Linux and performance View
- SSH Access



The screenshot displays the IBM Wave console interface. On the left, a window titled "Display ORAGOLD Details" shows the configuration for the z/VM system ORAGOLD. The "General Information" section includes fields for z/VM Guest Name (ORAGOLD), z/VM System Name (WSC-ZVM), and SDG Name (USER-LOCAL). Below this, there are tabs for "Data", "z/VM View", "Linux View", "Performance View", and "Custom Attributes". The "Guest Meta Data" section shows "Distribution" as Redhat 6 - 64 Bit and "Project" as Oracle. The "z/VM Data" table lists the system as WSC-ZVM, Active, with 2 CPUs and 4000 MB memory. A "Connection Availability" table shows the IP address 9.82.21.17 and status as Reachable.

On the right, a grid of virtual machines is visible, including CLONE02 (CLONE02), LNXADMIN, LNXMAINT, DEMO26 (DEMO26), IBM-OPER (WSC-ZVM), DEMO (WSC-ZVM), Oracle (WSC-ZVM), and IBM-NA (WSC-ZVM). A context menu is open over the ORAGOLD icon, listing actions such as "Display Information", "Update", "Status", "Activate", "Deactivate", "Recycle", "Pause", "Resume", "Send Message", "Execute Script", "Access...", "Cloning...", "Install...", and "More Actions". The "Access..." option is expanded, showing "IBM Wave 3270 Display-only Linux Console", "IBM Wave 3270 Linux Console", "SSH Access", and "CLC Access". The "SSH Access" option is highlighted with a mouse cursor and a yellow box.

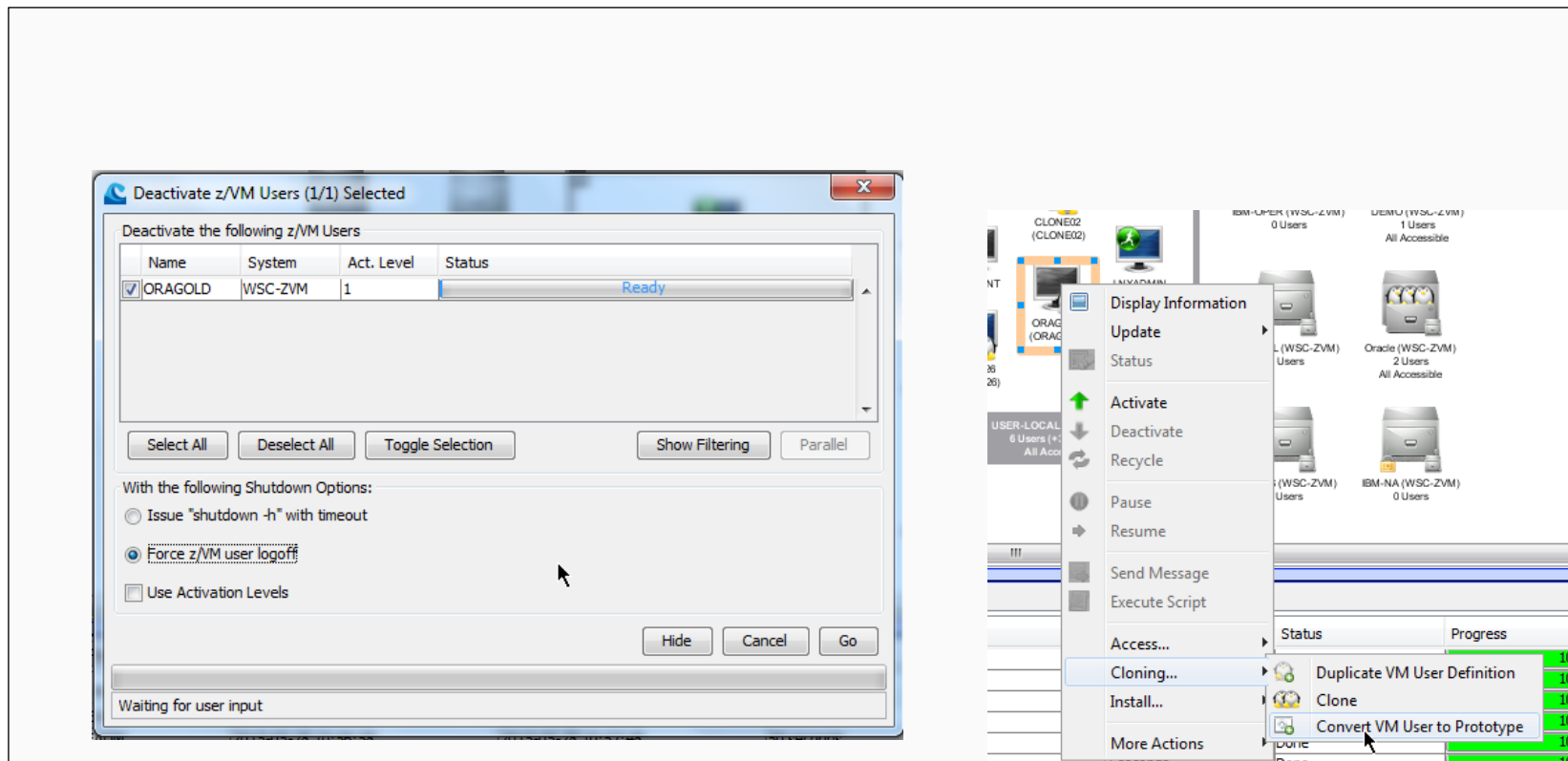
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Create the prototype ORAGOLD

- Deactivate ORAGOLD
- Convert to prototype



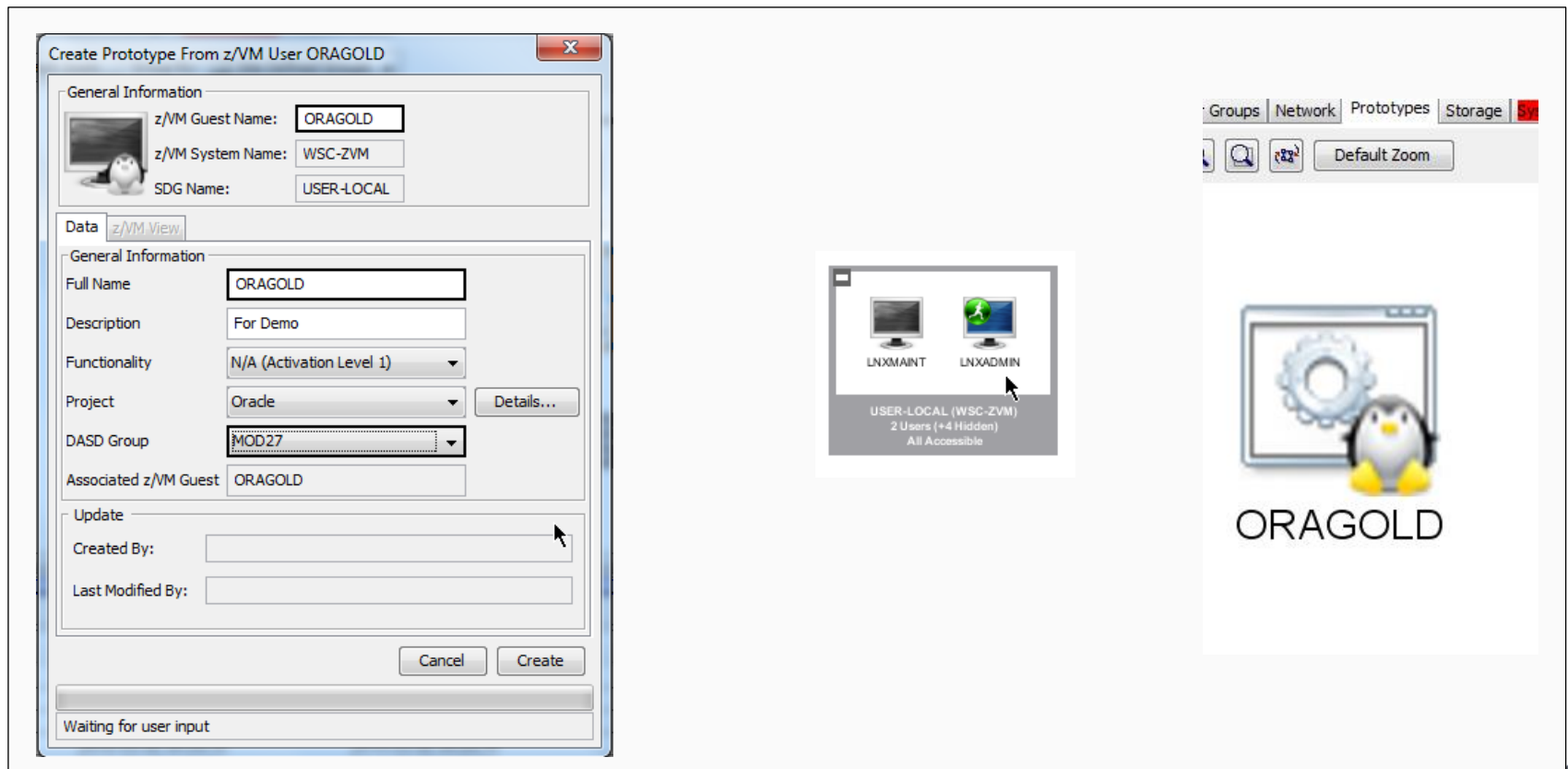
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Create the prototype ORAGOLD

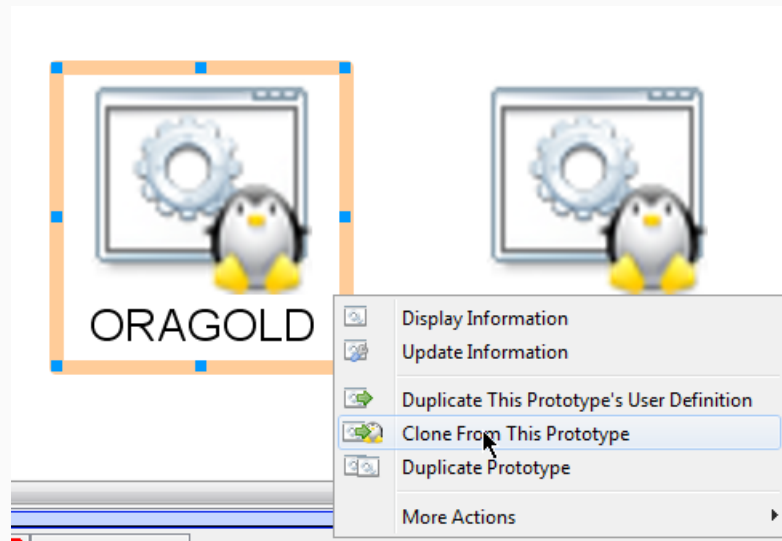
- Select the DASD Group
- Converted to prototype



The image shows two screenshots from a management console. The left screenshot is a dialog box titled "Create Prototype From z/VM User ORAGOLD". It has two tabs: "General Information" and "Data z/VM View". The "General Information" tab is active, showing fields for "z/VM Guest Name" (ORAGOLD), "z/VM System Name" (WSC-ZVM), and "SDG Name" (USER-LOCAL). The "Data z/VM View" tab is also visible, showing "Full Name" (ORAGOLD), "Description" (For Demo), "Functionality" (N/A (Activation Level 1)), "Project" (Orade), "DASD Group" (MOD27), and "Associated z/VM Guest" (ORAGOLD). There are "Cancel" and "Create" buttons at the bottom. The right screenshot shows a management console interface with tabs for "Groups", "Network", "Prototypes", and "Storage". A "Default Zoom" button is visible. Below the tabs, there are two icons for "LNXMAINT" and "LNXADMIN". Below these icons, it says "USER-LOCAL (WSC-ZVM)", "2 Users (+4 Hidden)", and "All Accessible". At the bottom, there is a large icon of a penguin with a gear, and the text "ORAGOLD".

Clone a Linux guest from the prototype ORAGOLD

- Select clone from this prototype



Clone a Linux guest from the prototype ORAGOLD

- provide the name, password and choose storage group

New Clone information

CSC Information

Target z/VM System Name:

New Clone Parameters

Number of clones Clone Name New Password Verify new password

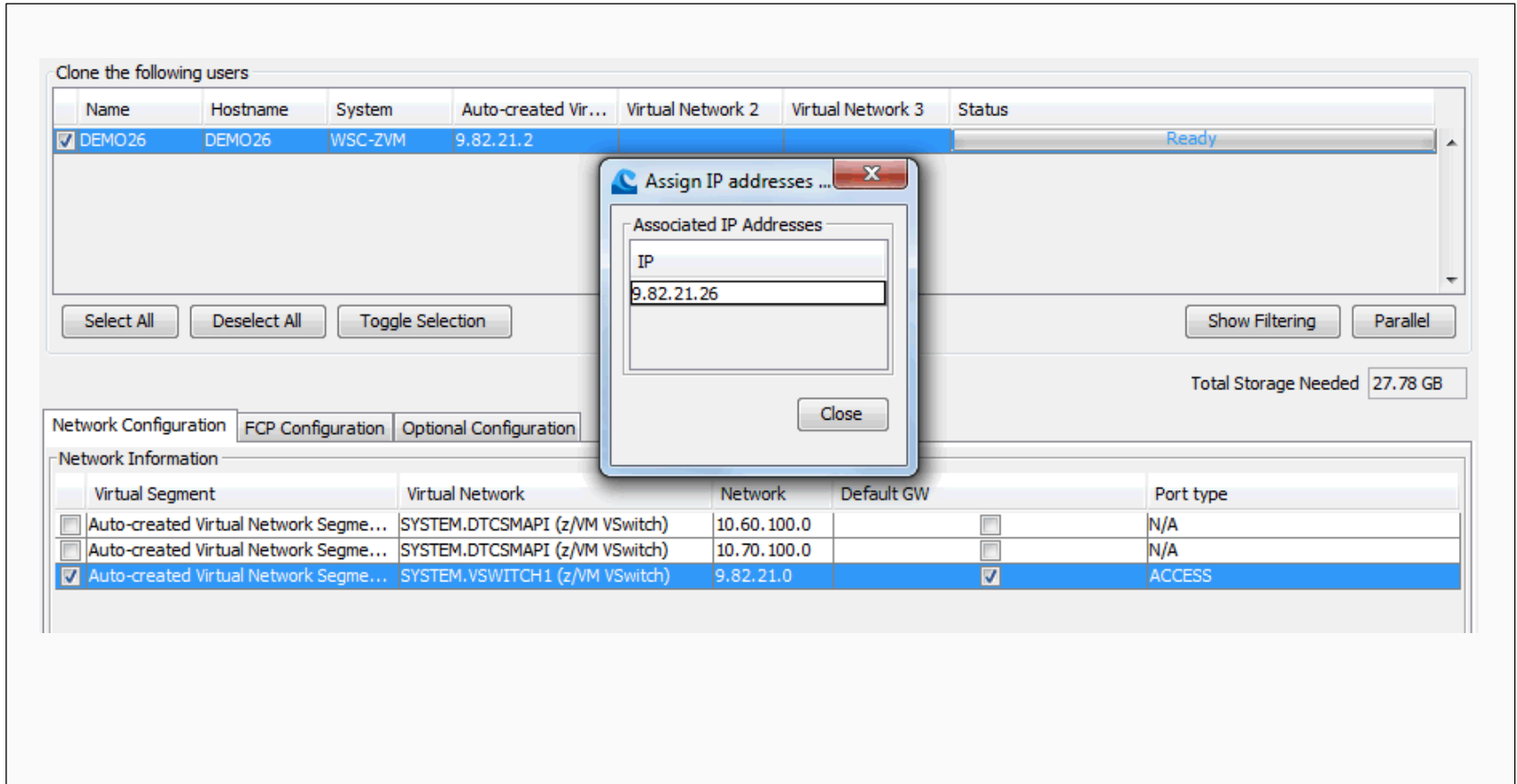
New Storage Group

Clone the following users

	Name	Hostname	System	Auto-created Vir...	Virtual Network 2	Virtual Network 3	Status
<input checked="" type="checkbox"/>	DEMO26	DEMO26	WSC-ZVM	9.82.21.2			Ready

Clone a Linux guest from the prototype ORAGOLD

- Choose ACCESS and specify the ip address



Clone the following users

Name	Hostname	System	Auto-created Vir...	Virtual Network 2	Virtual Network 3	Status
<input checked="" type="checkbox"/>	DEMO26	DEMO26	WSC-ZVM	9.82.21.2		Ready

Select All Deselect All Toggle Selection Show Filtering Parallel Total Storage Needed 27.78 GB

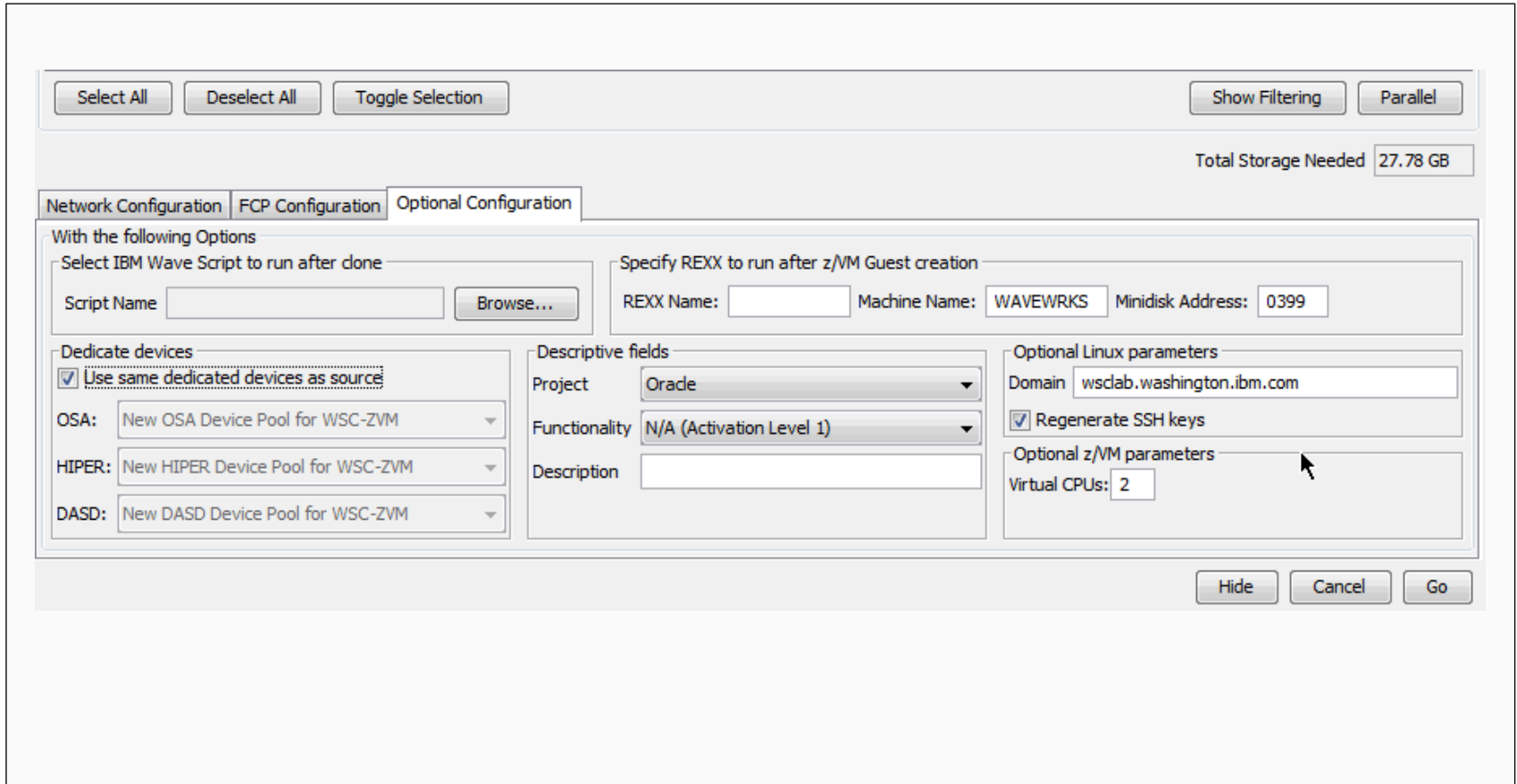
Network Configuration FCP Configuration Optional Configuration

Network Information

Virtual Segment	Virtual Network	Network	Default GW	Port type
<input type="checkbox"/>	Auto-created Virtual Network Segme...	SYSTEM.DTCSMAPI (z/VM VSwitch)	10.60.100.0	<input type="checkbox"/> N/A
<input type="checkbox"/>	Auto-created Virtual Network Segme...	SYSTEM.DTCSMAPI (z/VM VSwitch)	10.70.100.0	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/>	Auto-created Virtual Network Segme...	SYSTEM.VSWITCH1 (z/VM VSwitch)	9.82.21.0	<input checked="" type="checkbox"/> ACCESS

Clone a Linux guest from the prototype ORAGOLD

- Specify the domain and dedicate devices



Select All Deselect All Toggle Selection Show Filtering Parallel

Total Storage Needed 27.78 GB

Network Configuration FCP Configuration Optional Configuration

With the following Options

Select IBM Wave Script to run after done

Script Name Browse...

Specify REXX to run after z/VM Guest creation

REXX Name: Machine Name: WAVEWRKS Minidisk Address: 0399

Dedicate devices

Use same dedicated devices as source

OSA: New OSA Device Pool for WSC-ZVM

HIPER: New HIPER Device Pool for WSC-ZVM

DASD: New DASD Device Pool for WSC-ZVM

Descriptive fields

Project Orade

Functionality N/A (Activation Level 1)

Description

Optional Linux parameters

Domain wsclab.washington.ibm.com

Regenerate SSH keys

Optional z/VM parameters

Virtual CPUs: 2

Hide Cancel Go

Clone a Linux guest from the prototype ORAGOLD

- Press GO and then close

Target z/VM System Name:

New Clone Parameters

Number of clones: Clone Name: New Password: Verify new password:

New Storage Group:

Clone the following users

Name	Hostname	System	Auto-created Vir...	Virtual Network 2	Virtual Network 3	Status
<input checked="" type="checkbox"/> DEMO26	DEMO26	WSC-ZVM	9.82.21.26			Done - Workunit Submitted

Total Storage Needed:

Network Configuration | FCP Configuration | **Optional Configuration**

With the following Options

Select IBM Wave Script to run after done

Script Name:

Specify REXX to run after z/VM Guest creation

REXX Name: Machine Name: Miniskid Address:

Dedicate devices

Use same dedicated devices as source

OSA:

HIPER:

DASD:

Descriptive fields

Project:

Functionality:

Description:

Optional Linux parameters

Domain:

Regenerate SSH keys

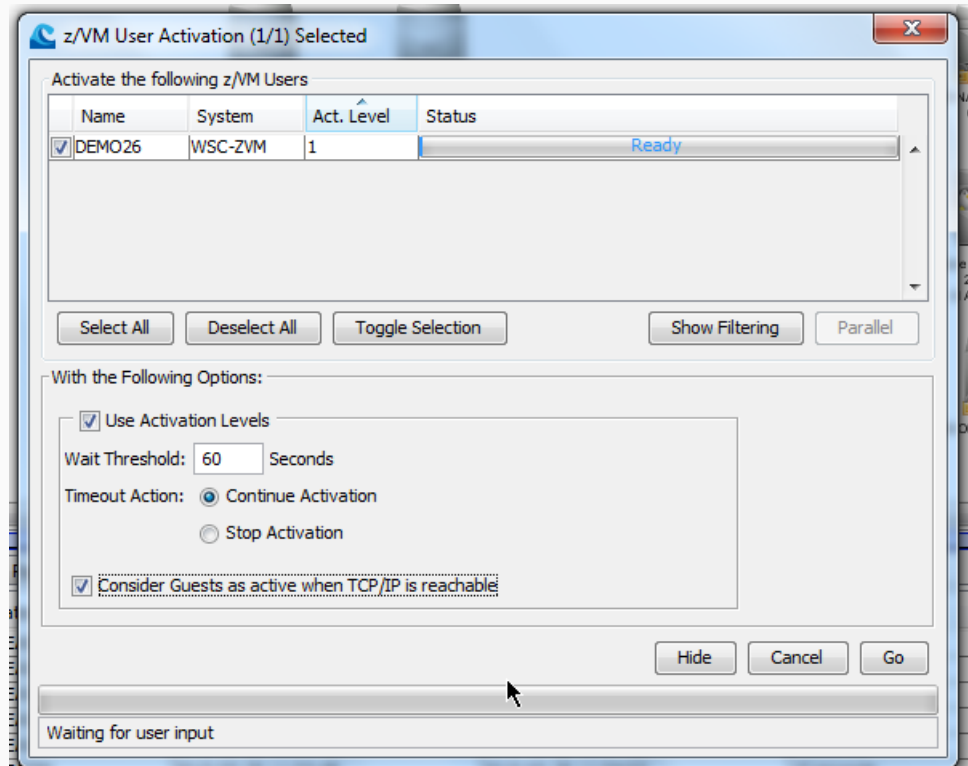
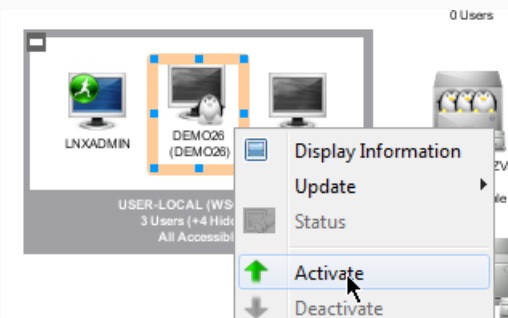
Optional z/VM parameters

Virtual CPUs:

Comple

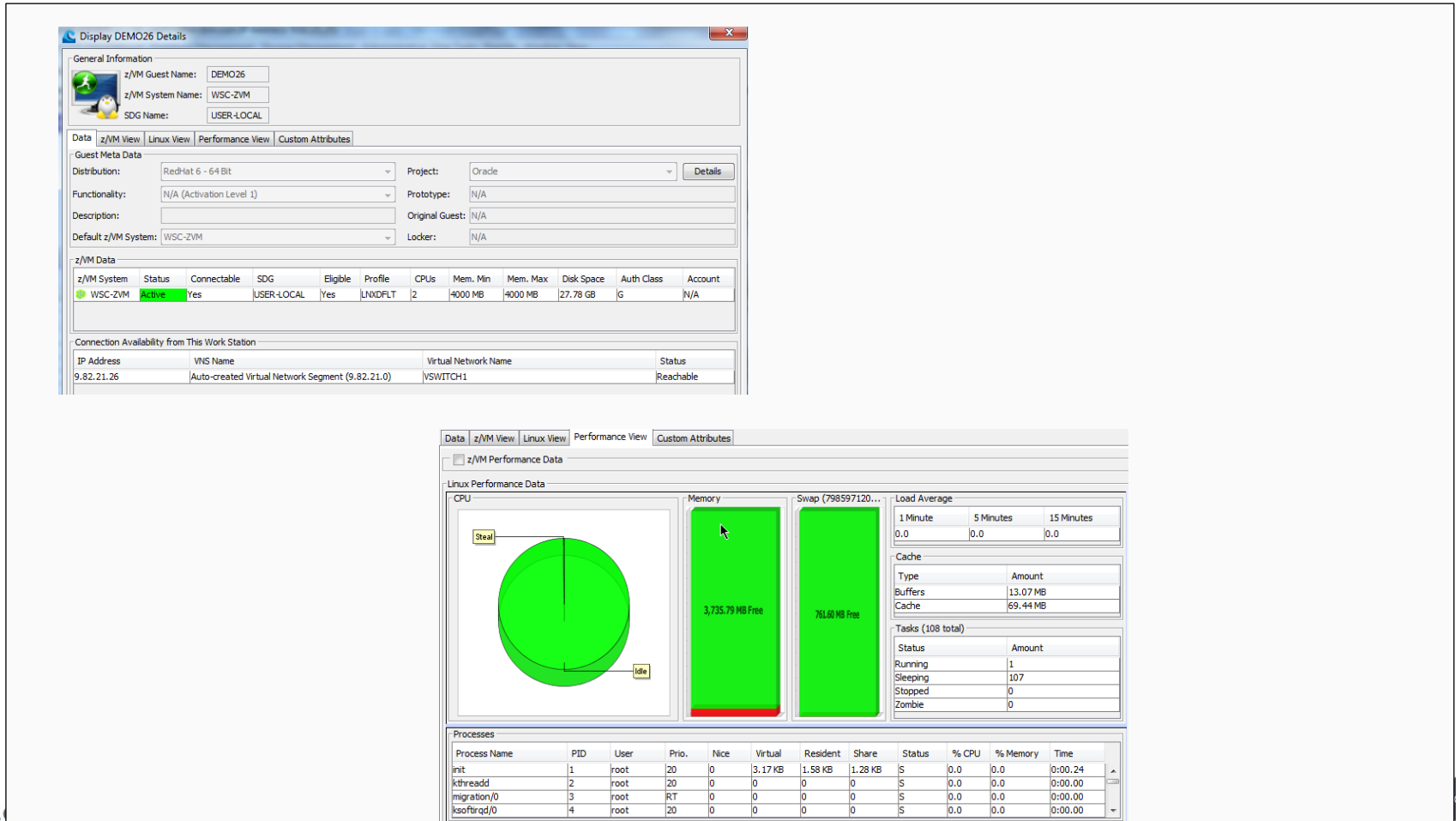
Clone a Linux guest from the prototype ORAGOLD

- See the cloning action and when done activate



Clone a Linux guest from the prototype ORAGOLD

- Now demo26 is up and active



The screenshot displays the vSphere vCenter interface for a virtual machine named DEMO26. The 'Display DEMO26 Details' window is open, showing general information and performance data.

General Information:

- z/VM Guest Name: DEMO26
- z/VM System Name: WSC-ZVM
- SDG Name: USER-LOCAL

Data | z/VM View | Linux View | Performance View | Custom Attributes

Guest Meta Data:

- Distribution: RedHat 6 - 64 Bit
- Project: Oracle
- Functionality: N/A (Activation Level 1)
- Prototype: N/A
- Description:
- Original Guest: N/A
- Default z/VM System: WSC-ZVM
- Locker: N/A

z/VM Data:

z/VM System	Status	Connectable	SDG	Eligible	Profile	CPUs	Mem. Min	Mem. Max	Disk Space	Auth Class	Account
WSC-ZVM	Active	Yes	USER-LOCAL	Yes	LNXDFLT	2	4000 MB	4000 MB	27.78 GB	G	N/A

Connection Availability from This Work Station:

IP Address	VNS Name	Virtual Network Name	Status
9.82.21.26	Auto-created Virtual Network Segment (9.82.21.0)	VSWITCH1	Reachable

z/VM Performance Data:

Linux Performance Data:

- CPU:** Steal (0.0%), Idle (100.0%)
- Memory:** 3,735.79 MB Free
- Swap (798597120...):** 761.80 MB Free
- Load Average:** 1 Minute: 0.0, 5 Minutes: 0.0, 15 Minutes: 0.0
- Cache:** Type: Buffers (13.07 MB), Cache (69.44 MB)
- Tasks (108 total):** Status: Running (1), Sleeping (107), Stopped (0), Zombie (0)

Processes:

Process Name	PID	User	Prio.	Nice	Virtual	Resident	Share	Status	% CPU	% Memory	Time
init	1	root	20	0	3.17 KB	1.58 KB	1.28 KB	S	0.0	0.0	0:00.24
ktthread	2	root	20	0	0	0	0	S	0.0	0.0	0:00.00
migration/0	3	root	RT	0	0	0	0	S	0.0	0.0	0:00.00
isoftrigd/0	4	root	20	0	0	0	0	S	0.0	0.0	0:00.00

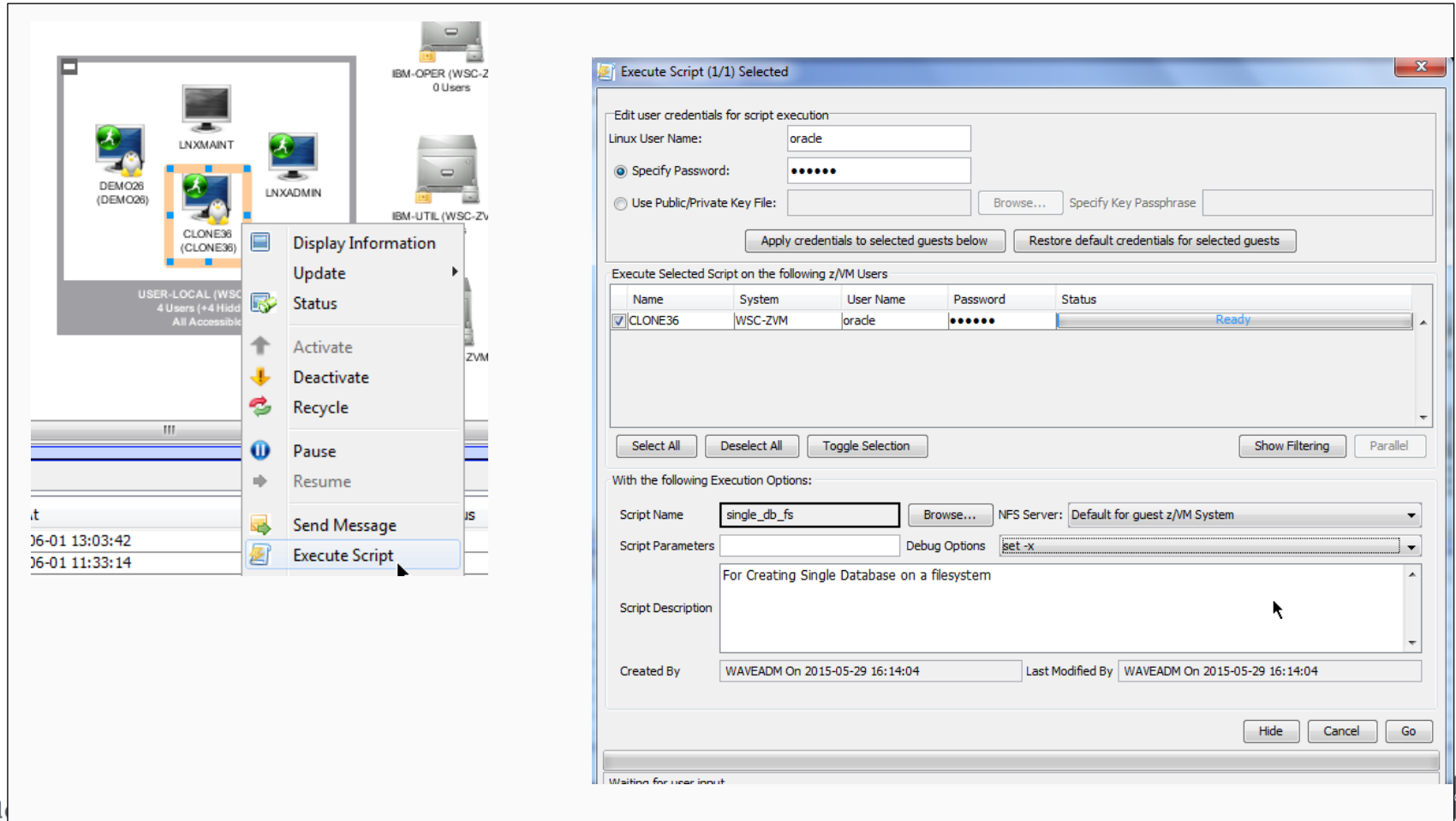
Provision Oracle Database (*DBaaS*)

- Provision a Stand alone Database on the cloned, platformed guest using silent install scripts

- *DBaaS* ----- Infrastructure as a Service
- Let us see how a Oracle DB is provisioned in Wave
- Execute db install script
- It takes around 10 minutes to create the Oracle Databases
- Agent installation
- Database installation
- Database creation

Standalone Database provisioning

- As oracle user execute single_db_fs script



The screenshot shows a virtual machine management interface. On the left, a context menu is open for a VM named 'CLONE36 (CLONE36)'. The menu items include: Display Information, Update, Status, Activate, Deactivate, Recycle, Pause, Resume, Send Message, and Execute Script. The 'Execute Script' option is highlighted. On the right, the 'Execute Script (1/1) Selected' dialog box is open. It contains the following fields and options:

- Edit user credentials for script execution:**
 - Linux User Name: oracle
 - Specify Password: [masked]
 - Use Public/Private Key File: [empty]
 - Buttons: Apply credentials to selected guests below, Restore default credentials for selected guests
- Execute Selected Script on the following z/VM Users:**

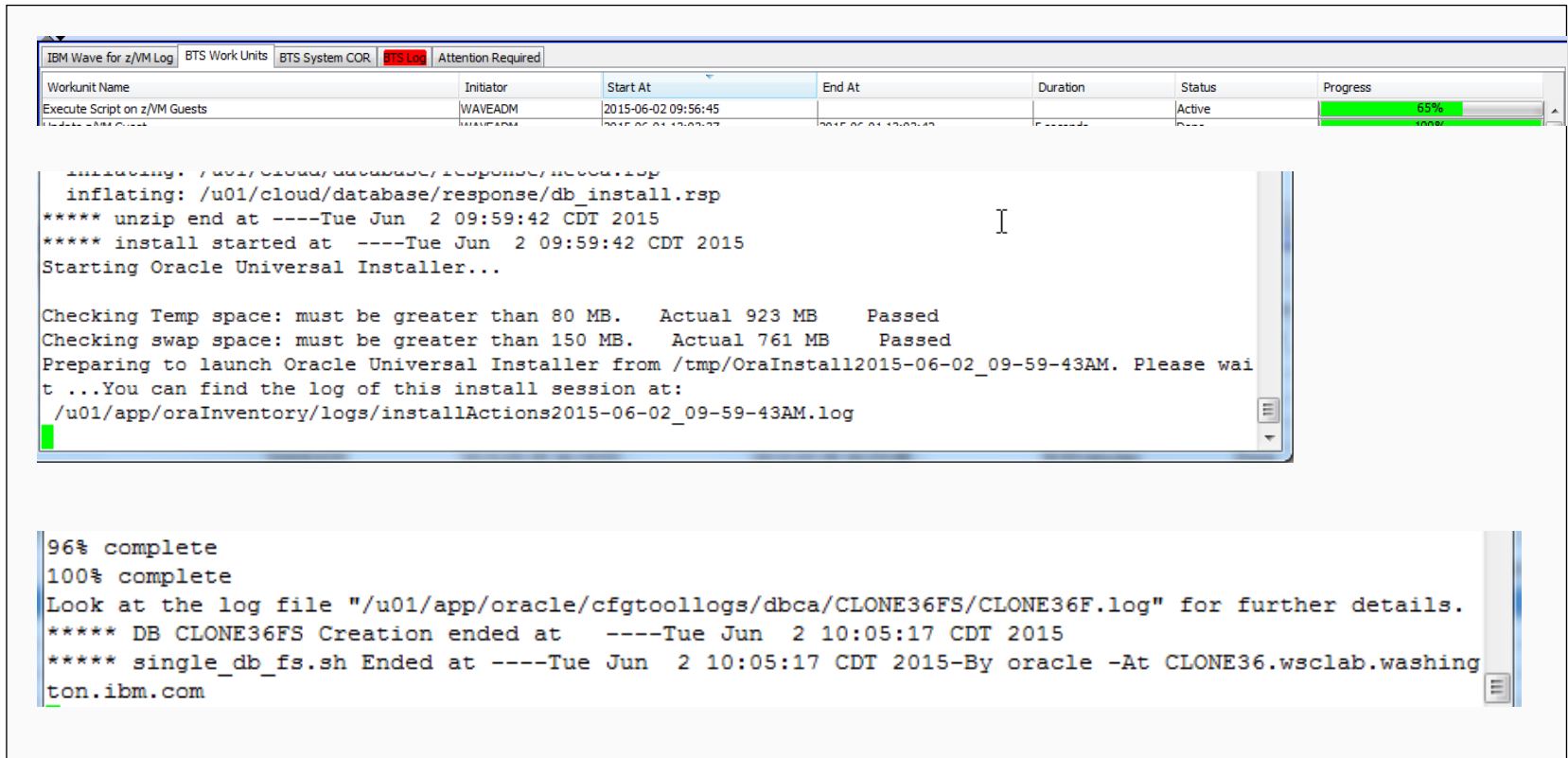
Name	System	User Name	Password	Status
<input checked="" type="checkbox"/> CLONE36	WSC-ZVM	oracle	[masked]	Ready

Buttons: Select All, Deselect All, Toggle Selection, Show Filtering, Parallel
- With the following Execution Options:**
 - Script Name: single_db_fs
 - NFS Server: Default for guest z/VM System
 - Script Parameters: [empty]
 - Debug Options: set -x
 - Script Description: For Creating Single Database on a filesystem
 - Created By: WAVEADM On 2015-05-29 16:14:04
 - Last Modified By: WAVEADM On 2015-05-29 16:14:04
 - Buttons: Hide, Cancel, Go

Comple

Standalone Database provisioning

- It takes around 9 minutes
- Agent, db binary and database creation (guestname + fs)



The screenshot shows the IBM Wave console interface. At the top, there are tabs for 'IBM Wave for z/VM Log', 'BTS Work Units', 'BTS System COR', 'BTS Log', and 'Attention Required'. Below the tabs is a table with columns: Workunit Name, Initiator, Start At, End At, Duration, Status, and Progress. The table shows one entry: 'Execute Script on z/VM Guests' initiated by 'WAVEADM' on '2015-06-02 09:56:45', with a status of 'Active' and a progress bar at 65%.

```
inflating: /u01/cloud/database/response/ncdu.rsp
inflating: /u01/cloud/database/response/db_install.rsp
**** unzip end at ----Tue Jun 2 09:59:42 CDT 2015
**** install started at ----Tue Jun 2 09:59:42 CDT 2015
Starting Oracle Universal Installer...

Checking Temp space: must be greater than 80 MB.   Actual 923 MB   Passed
Checking swap space: must be greater than 150 MB.   Actual 761 MB   Passed
Preparing to launch Oracle Universal Installer from /tmp/OraInstall2015-06-02_09-59-43AM. Please wait
...You can find the log of this install session at:
/u01/app/oraInventory/logs/installActions2015-06-02_09-59-43AM.log

96% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/CLONE36FS/CLONE36F.log" for further details.
**** DB CLONE36FS Creation ended at ----Tue Jun 2 10:05:17 CDT 2015
**** single_db_fs.sh Ended at ----Tue Jun 2 10:05:17 CDT 2015-By oracle -At CLONE36.wsclab.washing
ton.ibm.com
```

Standalone Database provisioning

- sqlplus
- Oracle EM12c exposure

```

[oracle@CLONE36 cloud]$ vi /home/oracle/.bash_profile
[oracle@CLONE36 cloud]$ su - oracle
Password:
[oracle@CLONE36 ~]$ sqlplus /'as sysdba'

SQL*Plus: Release 11.2.0.4.0 Production on Tue Jun 2 11:32:56 2015

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Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
    
```

DEMO26FS	Database Instance	↑
DEMO26FS_sys	Database System	↑

Databases Page Refreshed Jun 2, 2015 10:30:41 AM CDT ↻

Performance ▾ Availability ▾ Security ▾ Schema ▾ Maintenance ▾

View Database Load Map Search List

Search

Find Name

View ▾

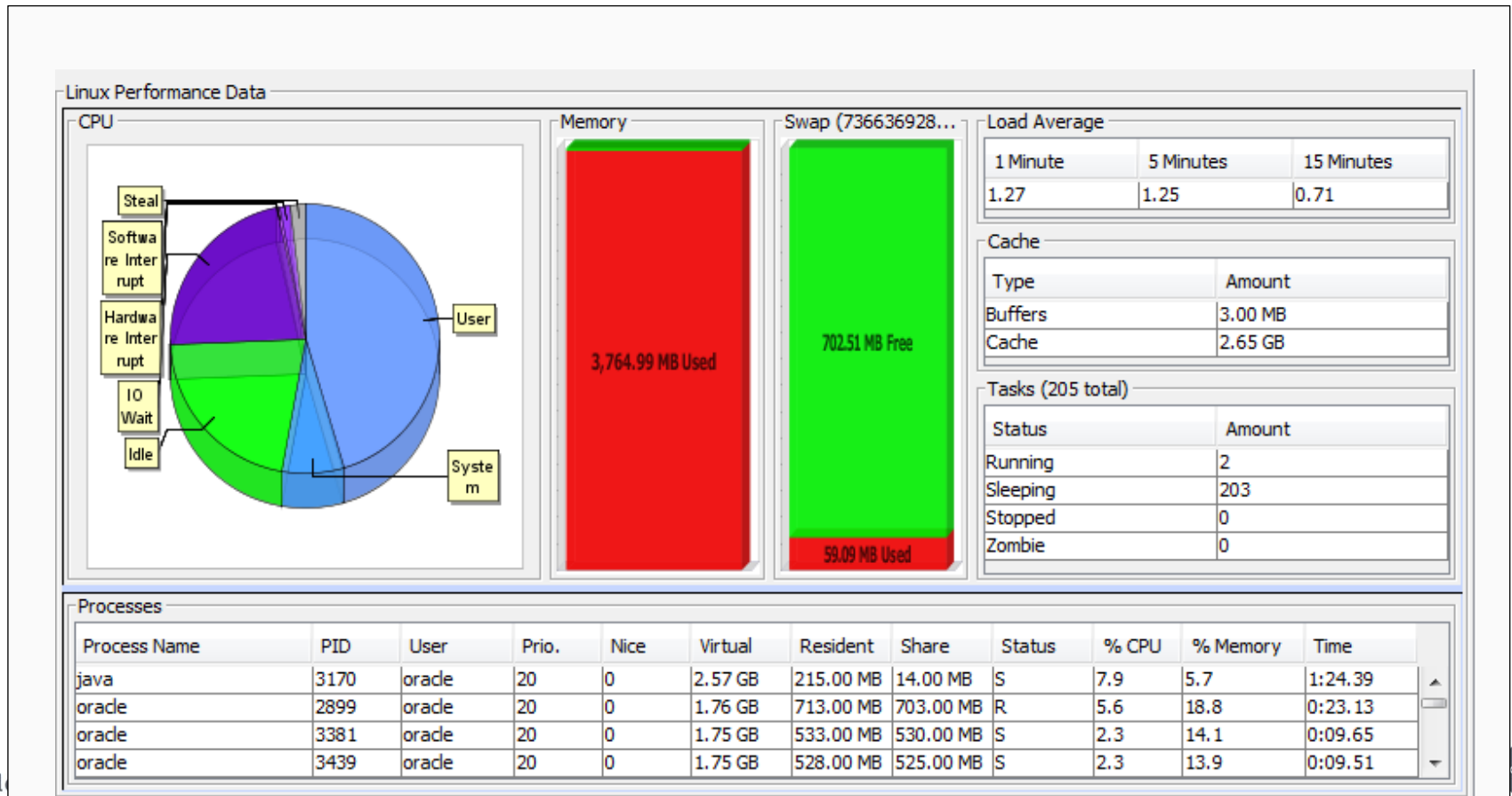
Name	Type	Status	Target Version	Incidents	Average Compliance Score	Member Status Summary
asmdb	Database Instance	🔴	11.2.0.4.0	0 1 1	n/a	0 0 0 0
db000000	Database Instance	🔴	11.2.0.4.0	0 0 0	n/a	0 0 0 0
DEMO26FS	Database Instance	🟢	11.2.0.4.0	0 0 0	n/a	0 0 0 0

Comple



Wave Oracle Use cases (Swingbench)

- 4 GB memory
- 2 Virtual CPU

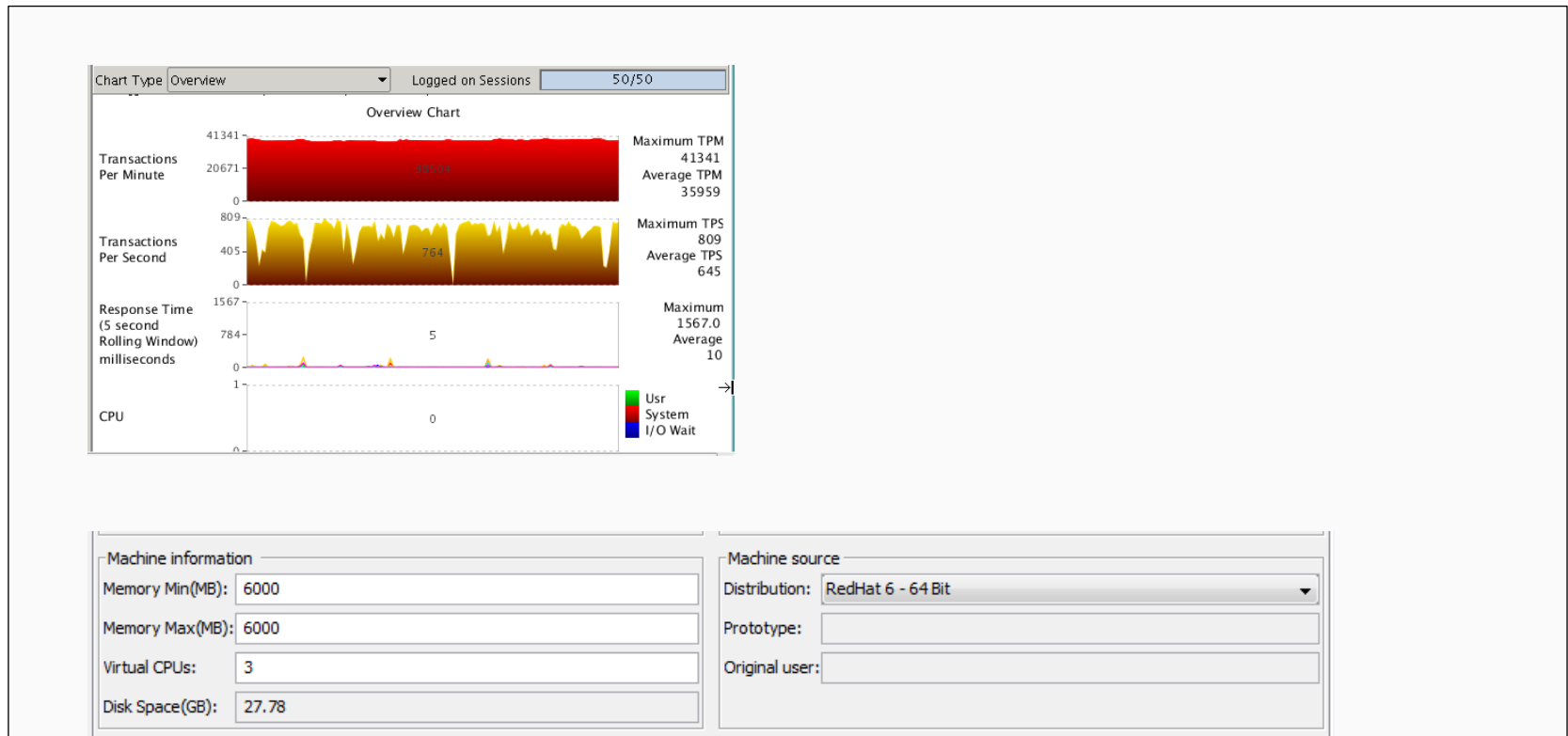


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Wave Oracle Use cases (Swingbench)

- Increase memory
- Increase Virtual CPU



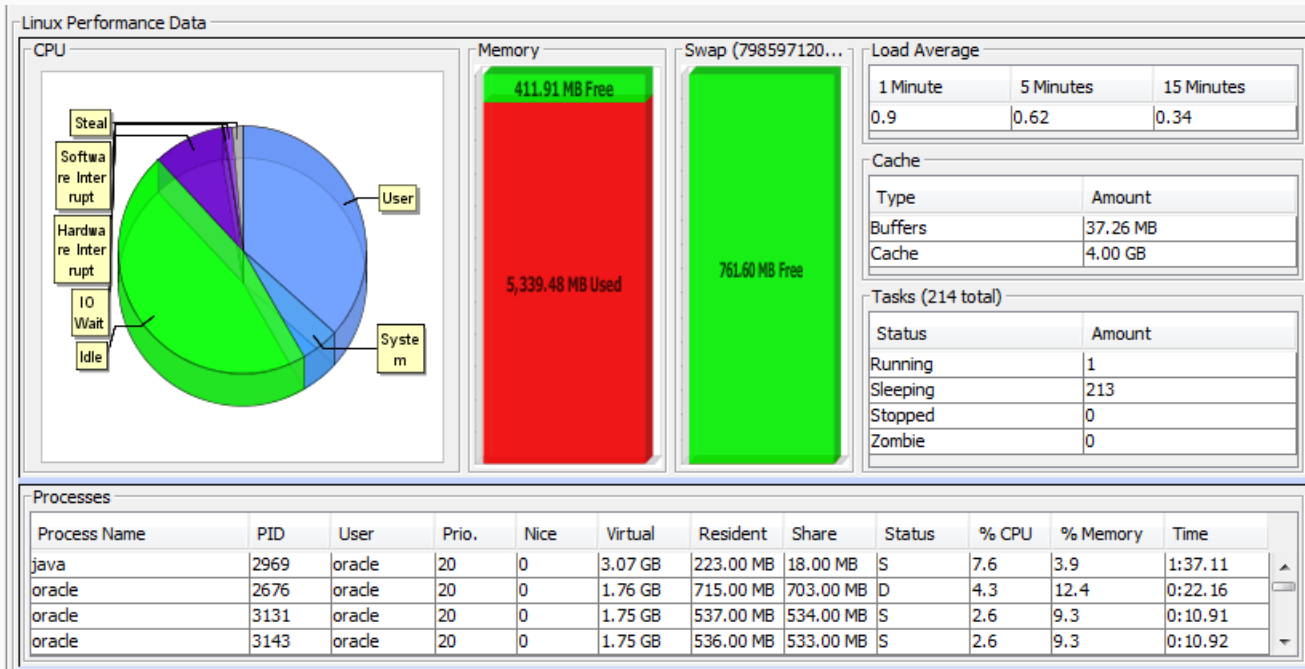
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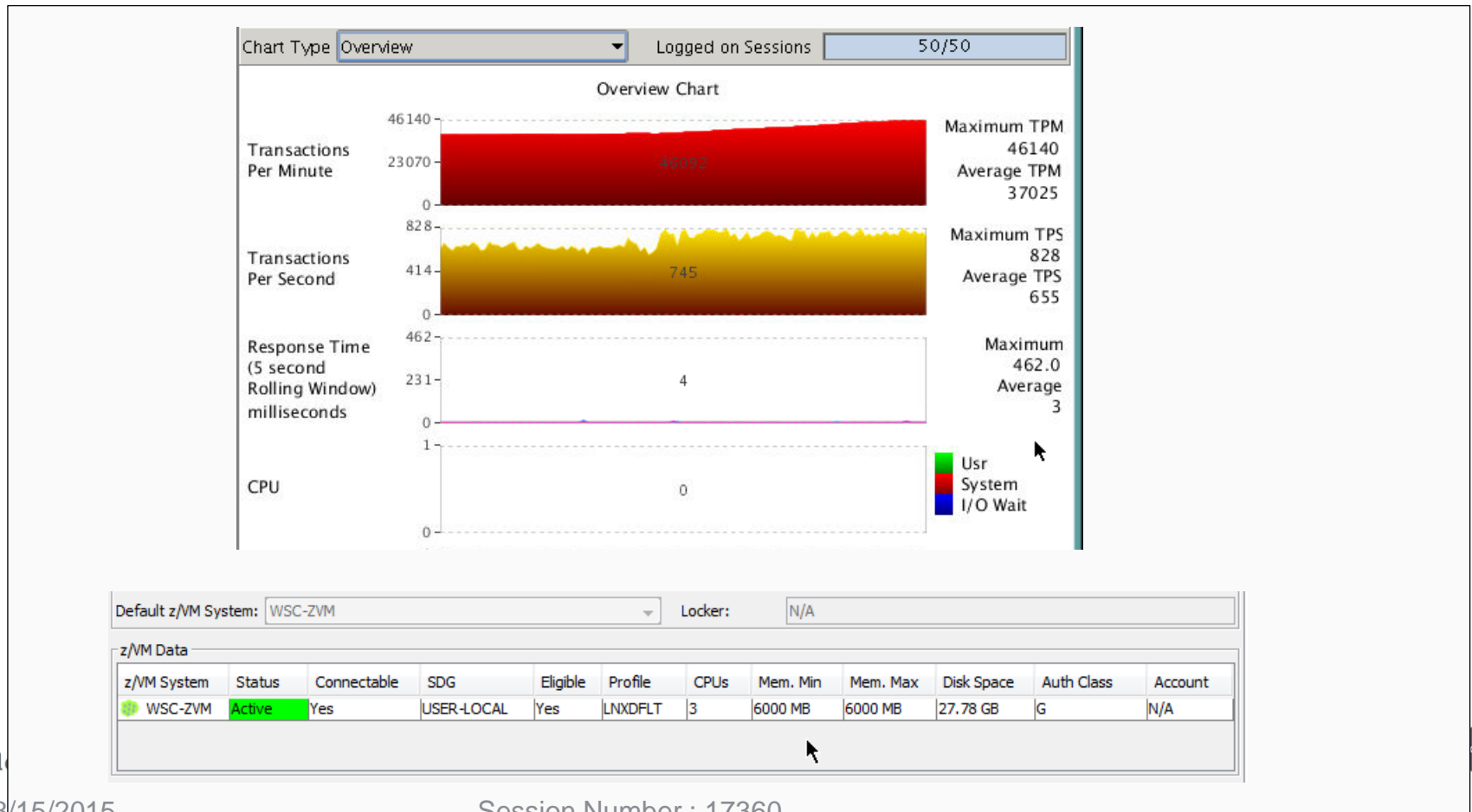
Wave Oracle Use cases (Swingbench)

- Increased memory
- Increased Virtual CPU



Wave Oracle Use cases (Swingbench)

- Increased memory
- Increased Virtual CPU



Compl

Demo Objectives

- Used IBM Wave installed on a System z to demonstrate

**How easy to provision
Infrastructure as a Service (*IaaS*)
Platform as a Service (*PaaS*)**

**How easy to provision Oracle Databases
Database as a Service (*DBaaS*)**

Steps for reusable and deployable provisions

- Install Linux on a z/VM guest
- Customize the Linux guest for creating Oracle Grid Infrastructure
- Create a prototype from the Linux guest
- Clone a Linux guest from that prototype
- Provision a Grid Infrastructure (RACOne) on the cloned guest using silent install scripts
- Install Agent,
• Install Database binary
• Create a RAC One Database

This Gold prototype can be “Cloned” as many requests. IaaS and PaaS



**One time operation
Create required silent
installation scripts in
Wave**

Build Oracle GI Platform (*PaaS*)

- Provision a Grid Infrastructure (one node RAC) on the cloned guest using silent install scripts

- *PaaS* ----- Infrastructure as a Service
- Let us see how a Oracle GI Platform is created in Wave
- Execute RAC_ONE script
- It takes around 10 minutes to create the GI platform
- Grid SW silent installation
- Grid configuration (OCR, VOTING)
- DATAVG disk group creation

Provision Oracle Database (*DBaaS*)

- Provision a RAC One Database on the cloned, platformed guest using silent install scripts

- *DBaaS* ----- Infrastructure as a Service
- Let us see how a Oracle DB is provisioned in Wave
- Execute dbinstall script
- It takes around 10 minutes to create the GI platform
- Agent installation
- Database installation
- Database creation

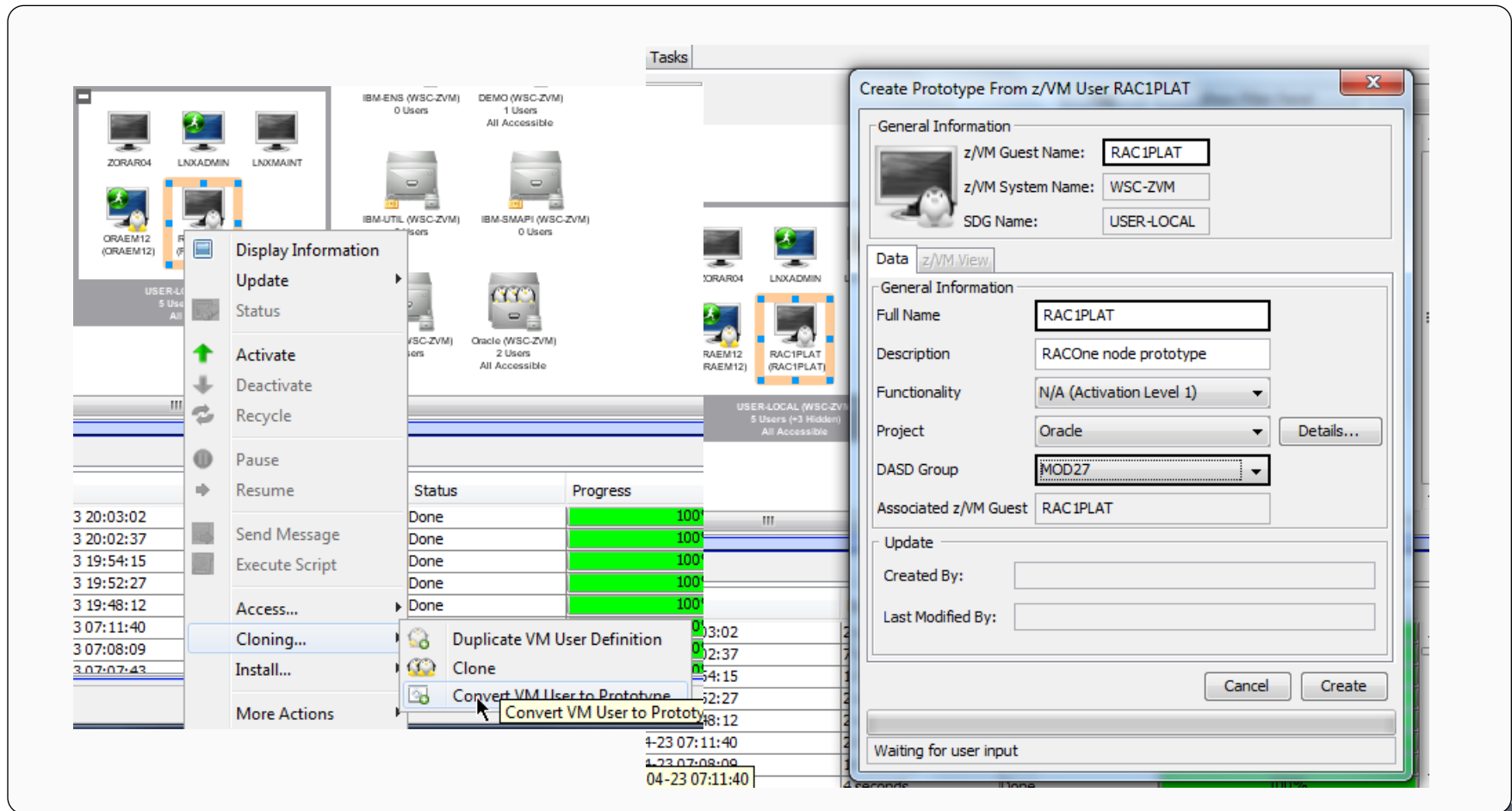
Step1 create a prototype (ORAGOLD)

- Install Linux on a z/VM guest
- Customize the Linux guest for creating Oracle Grid Infrastructure
- **Create a prototype from the Linux guest**



Create the prototype RAC1PLAT

- Convert the customized RAC1PLAT to a prototype



The screenshot displays the IBM Tivoli Provisioning Manager interface. On the left, a list of users is shown, with 'RAC1PLAT' selected. A context menu is open over 'RAC1PLAT', and the 'Convert VM User to Prototype' option is highlighted. The main area shows a grid of VMs, including 'RAC1PLAT (RAC1PLAT)'. A dialog box titled 'Create Prototype From z/VM User RAC1PLAT' is open, showing the following configuration:

Create Prototype From z/VM User RAC1PLAT

General Information

- z/VM Guest Name: RAC1PLAT
- z/VM System Name: WSC-ZVM
- SDG Name: USER-LOCAL

Data z/VM View

General Information

- Full Name: RAC1PLAT
- Description: RACOne node prototype
- Functionality: N/A (Activation Level 1)
- Project: Oracle
- DASD Group: MOD27
- Associated z/VM Guest: RAC1PLAT

Update

- Created By:
- Last Modified By:

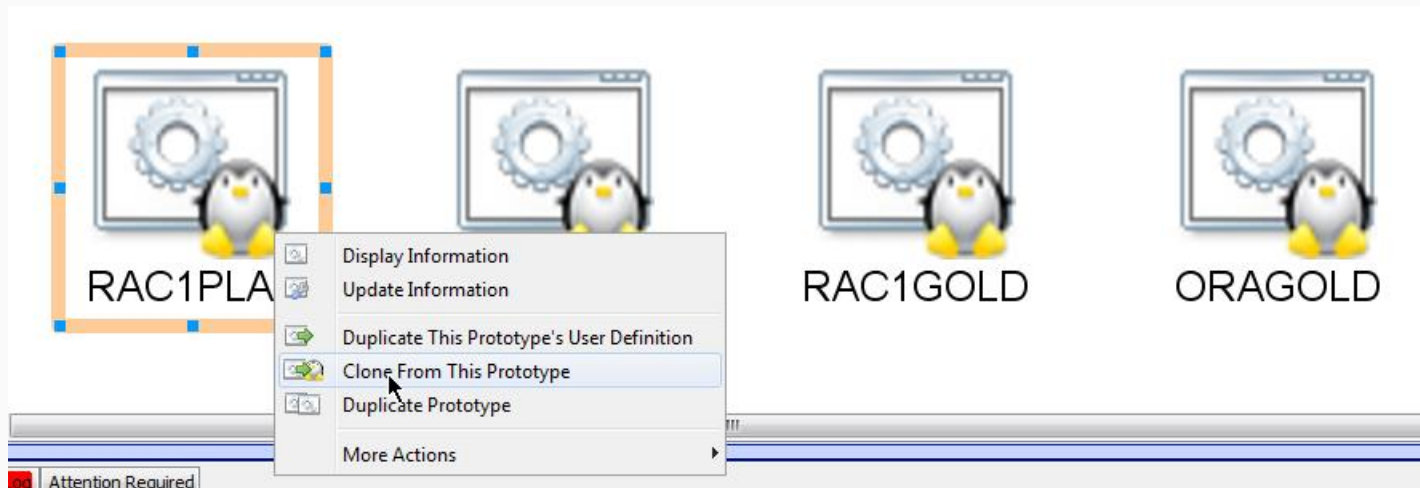
Buttons: Cancel, Create

Status and Progress Table:

Status	Progress
Done	100%
Done	100%
Done	100%
Done	100%
Done	100%

Create a clone from the prototype

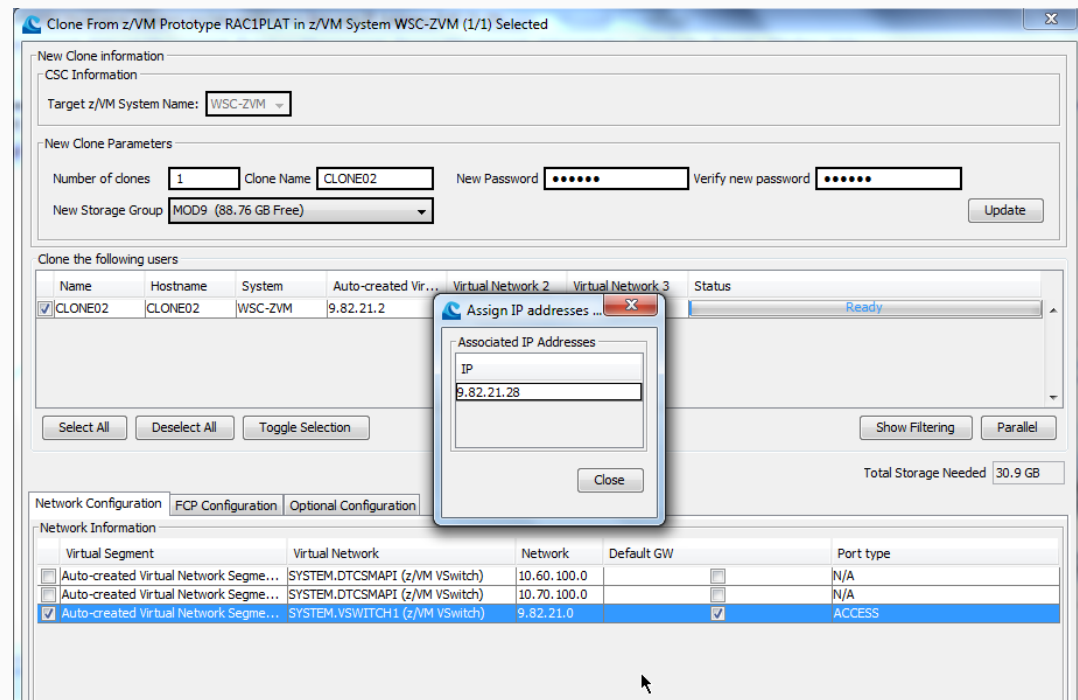
- Choose a prototype and clone



Clone RAC1PLAT as CLONE02

- Customize the clone

- Choose the name
 - CLONE02
- Network selection
- Domain name
- Storage selection
 - Mod9
- IP address
 - 9.82.21.28
- Press GO
- Wait till the disk
- Space is setup

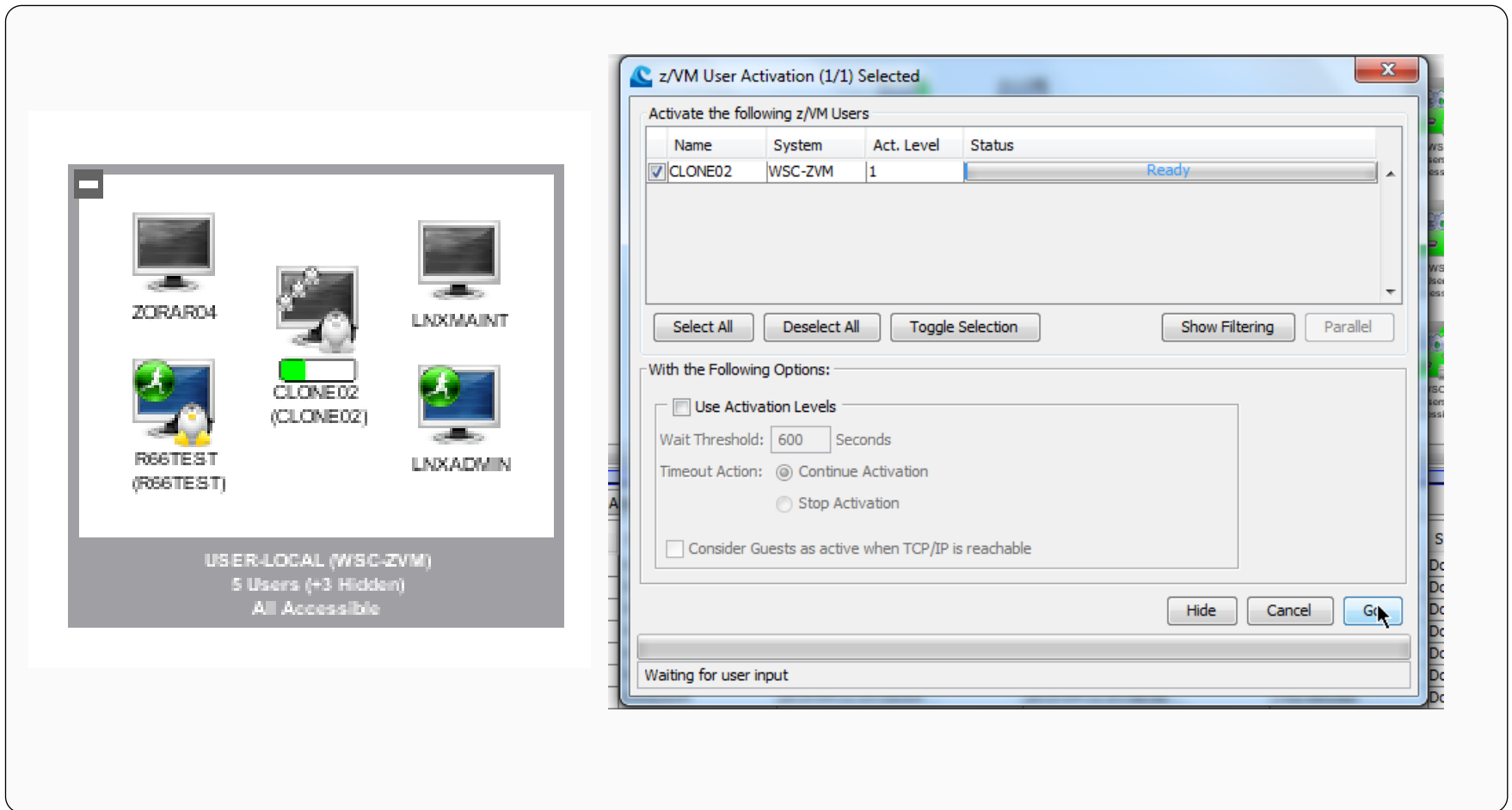


Activities performed during cloning

- Disks are formatted and copied
- Linux is cloned
- ASM disks udev rules are setup
- Oracle userids, Linux configuration as per prototype are created

CLONE02 guest is getting cloned

- Once the clone is created, activate



The image shows two screenshots from a z/VM environment. On the left is a window titled 'USER-LOCAL (WSC-ZVM)' showing a list of users: ZORAR04, LNXMAINT, R66TEST (R66TEST), CLONE02 (CLONE02), and LNXADMIN. On the right is the 'z/VM User Activation (1/1) Selected' dialog box. It contains a table with the following data:

Name	System	Act. Level	Status
<input checked="" type="checkbox"/> CLONE02	WSC-ZVM	1	Ready

Below the table are buttons for 'Select All', 'Deselect All', 'Toggle Selection', 'Show Filtering', and 'Parallel'. Under 'With the Following Options:', there are checkboxes for 'Use Activation Levels' and 'Consider Guests as active when TCP/IP is reachable'. The 'Wait Threshold' is set to 600 seconds, and the 'Timeout Action' is set to 'Continue Activation'. At the bottom right are 'Hide', 'Cancel', and 'Go' buttons. A status bar at the bottom of the dialog says 'Waiting for user input'.

Check the CLONE02 guest

- Mount the script disks, SSH Validation

```
[root@CLONE02 dload]# cp /u01/cloud/fstab /etc/fstab  
cp: overwrite `/etc/fstab'? y  
[root@CLONE02 dload]# mount /dload  
[root@CLONE02 dload]# su - grid  
[grid@CLONE02 ~]$ /u01/cloud/sshUserSetup.sh -user grid -hosts clone02
```

Step3 Provision the Grid Infrastructure

- Install Linux on a z/VM guest
- Customize the Linux guest for creating Oracle Grid Infrastructure
- Create a prototype from the Linux guest
- Create a clone from the prototype
- **Provision a Grid Infrastructure (one node RAC) on the cloned guest using silent install scripts**

This Gold prototype can be “Cloned” as many requests. IaaS and PaaS



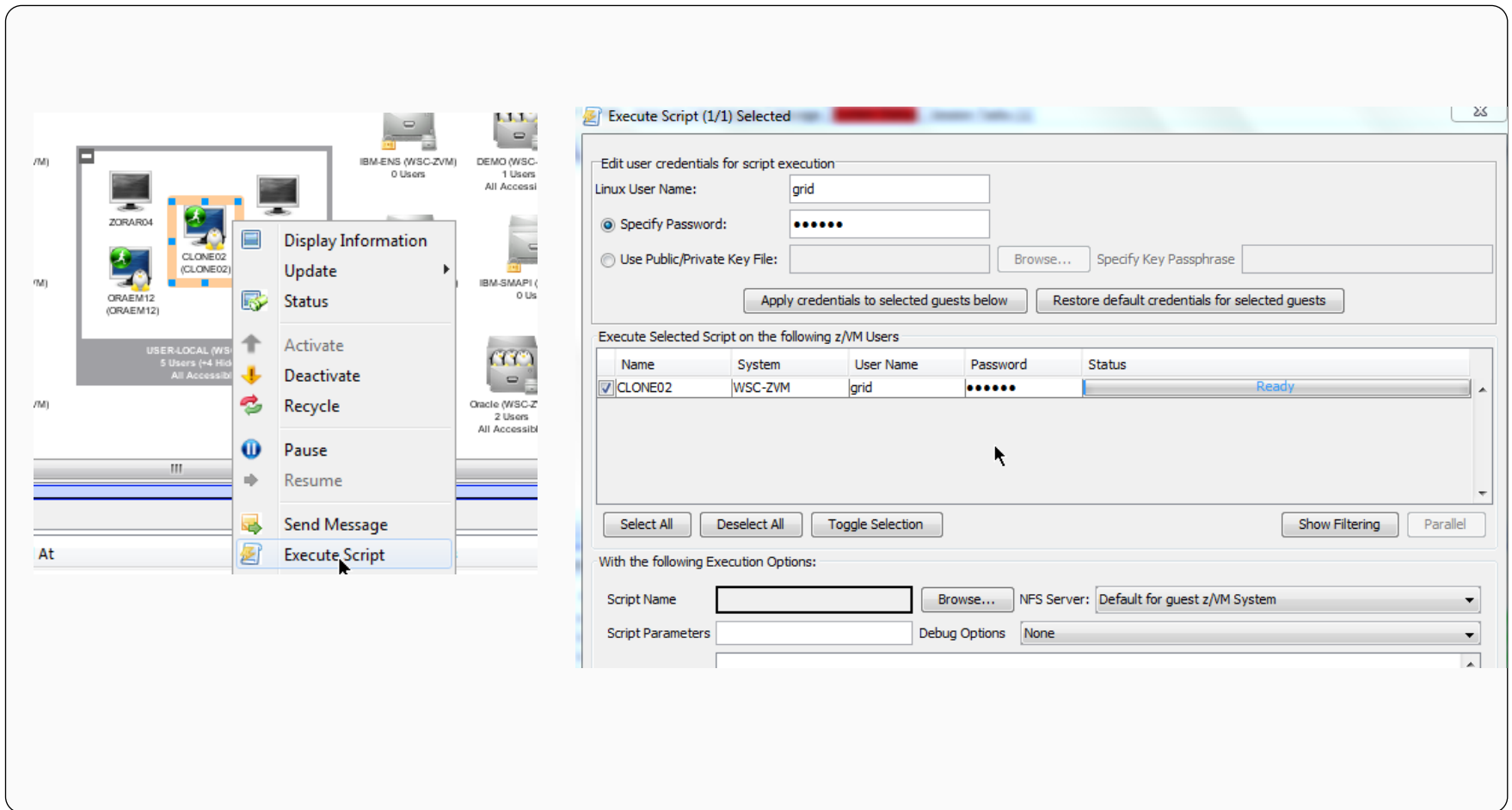
**One time operation
Create required silent
installation scripts in
Wave**

Activities performed by RAC_ONE script

- Grid infrastructure to support RAC One installation
- Grid installation
- Grid configuration
- ASM disks creation

Build the Grid Infrastructure on CLONE02

- Use the Wave script manager



The screenshot shows the Wave script manager interface. On the left, a grid of virtual machines is displayed, with a context menu open over the 'CLONE02 (CLONE02)' guest. The 'Execute Script' option is selected. On the right, the 'Execute Script (1/1) Selected' dialog box is open, showing the configuration for script execution on the selected guest.

Edit user credentials for script execution

Linux User Name:

Specify Password:

Use Public/Private Key File: Specify Key Passphrase

Execute Selected Script on the following z/VM Users

Name	System	User Name	Password	Status
<input checked="" type="checkbox"/> CLONE02	WSC-ZVM	grid	*****	Ready

With the following Execution Options:

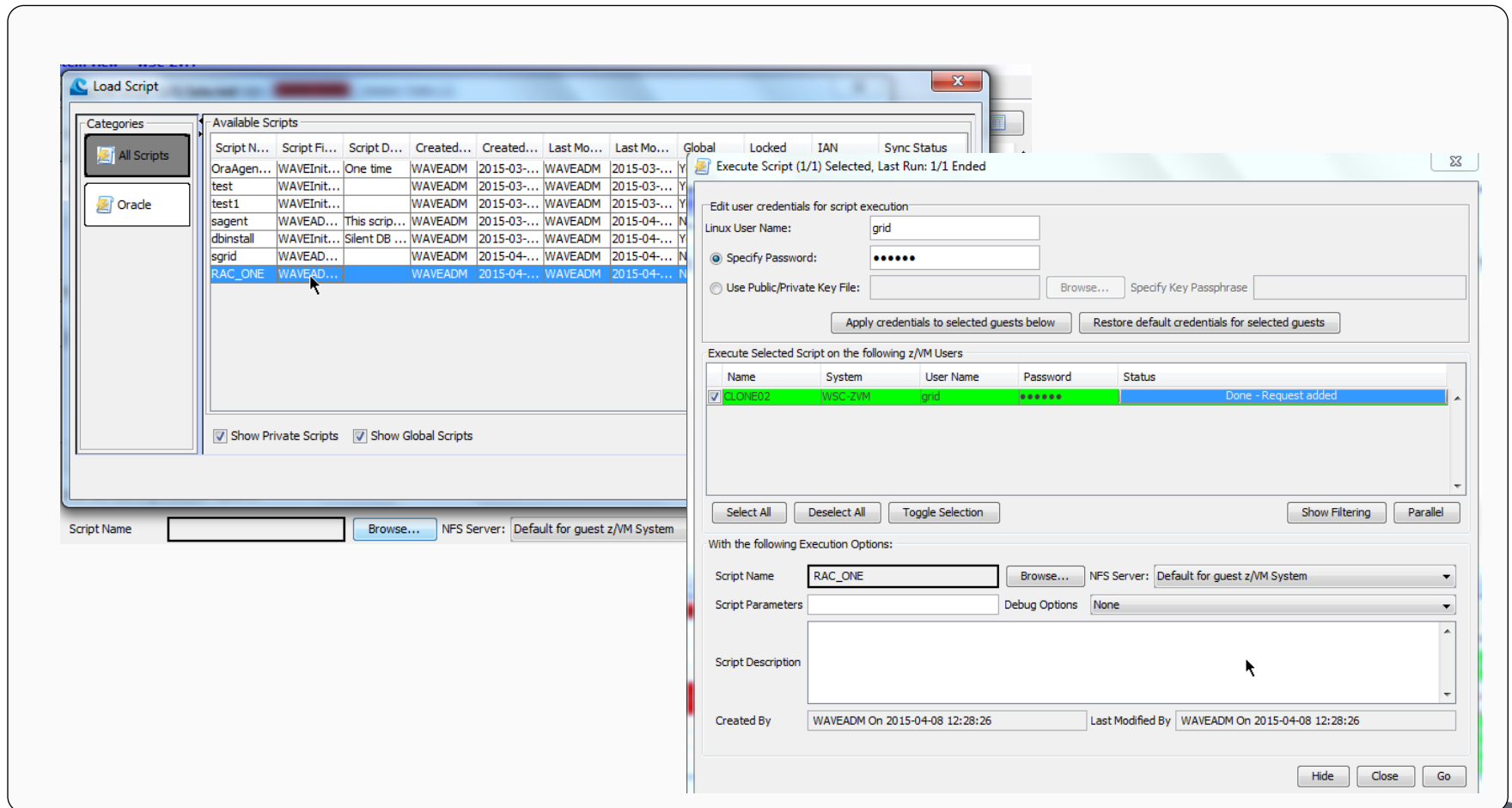
Script Name NFS Server:

Script Parameters Debug Options

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RAC_ONE script execution

- Select RAC_ONE silent install grid



The screenshot shows the 'Load Script' dialog box with the 'Available Scripts' table. The 'RAC_ONE' script is selected. The 'Execute Script' dialog is open, showing the following details:

Execute Selected Script on the following z/VM Users

Name	System	User Name	Password	Status
CLONE02	WSP-ZVM	grid	*****	Done - Request added

With the following Execution Options:

Script Name: RAC_ONE
Script Parameters:
Script Description:
Created By: WAVEADM On 2015-04-08 12:28:26
Last Modified By: WAVEADM On 2015-04-08 12:28:26

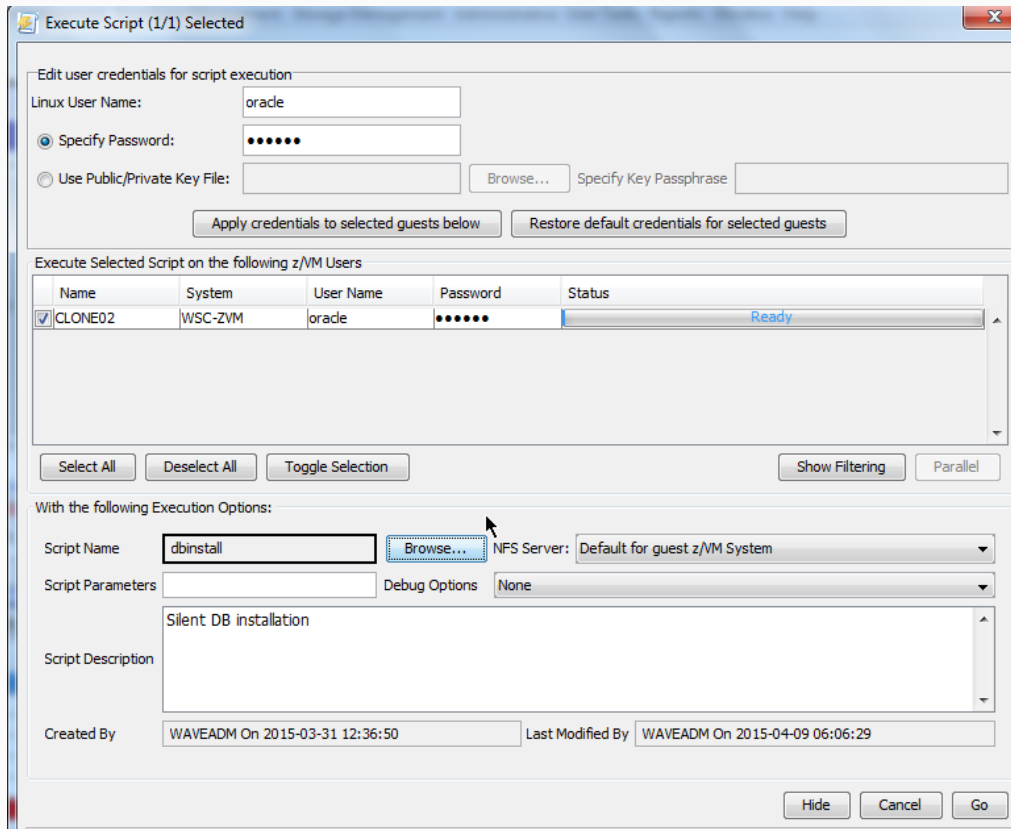
Database as a Service (DBaaS)

- Now the RAC One Grid Infrastructure is created

Provision a Oracle Database on a cloned Linux Guest Database as a Service (DBaaS)

Database as a Service (DBaaS)

- Execute the dbinstall script in Wave



Execute Script (1/1) Selected

Edit user credentials for script execution

Linux User Name: oracle

Specify Password:

Use Public/Private Key File: Browse... Specify Key Passphrase

Execute Selected Script on the following z/VM Users

Name	System	User Name	Password	Status
<input checked="" type="checkbox"/> CLONE02	WSC-ZVM	oracle	Ready

With the following Execution Options:

Script Name: dbinstall NFS Server: Default for guest z/VM System

Script Parameters: Debug Options: None

Script Description: Silent DB installation

Created By: WAVEADM On 2015-03-31 12:36:50 Last Modified By: WAVEADM On 2015-04-09 06:06:29

Activities performed by dbinstall script

- Agent installation
- Database installation
- Database creation

Check if the cluster is running with its services

- /u01/app/grid/11.2/bin/crsctl status res -t

Cluster Resources

```
ora.LISTENER_SCAN1.lsnr
  1          ONLINE  ONLINE          clone02
ora.LISTENER_SCAN2.lsnr
  1          ONLINE  ONLINE          clone02
ora.LISTENER_SCAN3.lsnr
  1          ONLINE  ONLINE          clone02
ora.clone02.vip
  1          ONLINE  ONLINE          clone02
ora.cvu
  1          ONLINE  ONLINE          clone02
ora.oc4j
  1          OFFLINE OFFLINE
ora.rac1db.db
  1          ONLINE  ONLINE          clone02          Open
ora.scan1.vip
  1          ONLINE  ONLINE          clone02
```

Database as a Service (DBaaS)

- Now let us use EM12

**Provision an Oracle Database on Linux Guest ORAEM12
Cloned in Wave from ORAGOLD prototype**

**Using Oracle EM Cloud Control 12C, Database as a Service
(DBaaS) will be provisioned**

Use EM12C to provision a Database

- In a System z environment, Oracle Enterprise Manager can be used to deploy
 - Database as a Service
 - Apply patches to Oracle Databases
 - Monitor Oracle Database instances
- The Databases can be installed and configured as
 - Single Instance
 - RAC One
 - RAC
- The following Demo on Oracle Enterprise Manager will show how a Oracle Database can be provisioned on an z Systems infrastructure provisioned using IBM Wave

Use EM12C to provision a Database

- Make sure that the agents are running
- Database Provisioning and select Launch in the Deployment procedure
 - Select provision and patching option
 - Launch deployment procedure.
- Select SW only installation option for Oracle Database and add hosts
 - Select Oracle designated platform name, “IBM: Linux on System z”
 - Select Oracle server Version number
 - Select Deploy software only
- Setup Hosts
 - Provision Oracle Database: Specify OS users
 - Select Override Preferred Credentials.
- Specify OS groups
 - Enter:
 - Inventory Group
 - Database Administrator
 - Database Operator

Use EM12C to provision a Database

- Deploy Software
 - Select Configure
- Specify the source Database location
 - Select desired name
- Specify oracle home location
 - Define a tmp with at least 2.5 GB
- Start the provision job
- Monitor the job
 - Provisioning tool monitors activity.

Summary

- System Administrator wants to create and manage the infrastructure and platforms
- DBAs are interested in provisioning, managing and maintaining the databases
- Considering that we demonstrated the following:
 - Use WAVE to build a infrastructure and Platform (IaaS and PaaS)
 - Use WAVE to provision Oracle Database
 - Demonstrate Oracle EM12c to provision Oracle Databases

References

IBM Redbooks

- [IBM Wave for z/VM: An Introduction](#)
- [IBM Wave for z/VM Installation, Implementation, and Exploitation](#)

IBM White Paper

- [Oracle Database deployment using IBM Wave for z/VM](#)

Oracle documentation and manuals

Thanks....



- To many of my IBM colleagues from who I got lot of slides and help to build this demo

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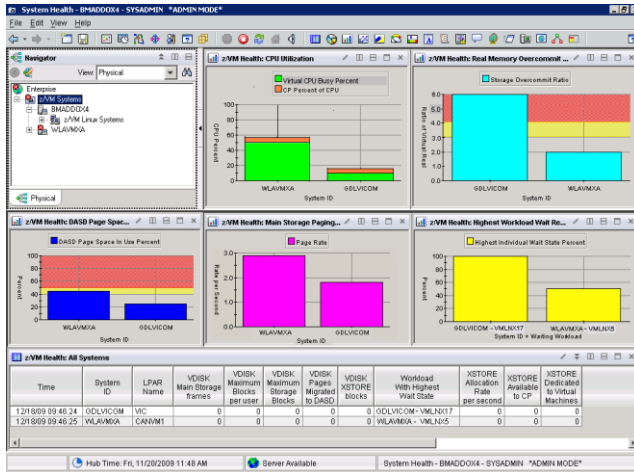
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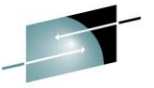
Bringing z/VM and Linux monitoring into the Enterprise View

Enterprise-Ready Cloud Monitoring



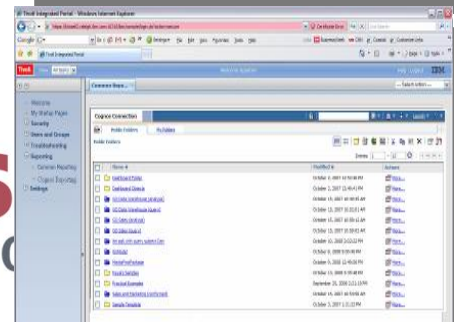
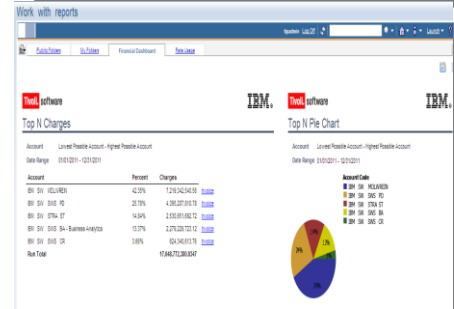
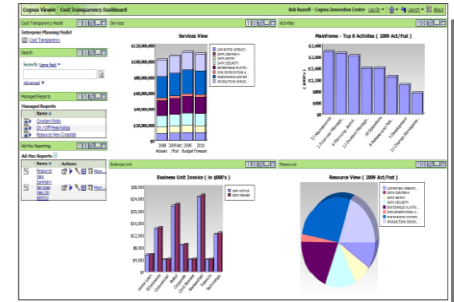
Increased Performance & Availability

- Provides insight into the health and performance of z/VM and Linux
 - Rich collections of attributes monitor thresholds for z/VM and Linux best practices.
 - Reflex automation provides timely resolution and/or notification.
 - Lightweight visibility to the z/VM hypervisor, Linux OS, and Linux Log data in one tool.
 - Deep integration with Cloud and Smarter Infrastructure Suite integrating z/VM and Linux data to the Enterprise view (Cross platform workflow management).
 - Persistent Historical views allows management of real and virtual resources across peak periods and downtimes for clear view of resource usage and constraints.



IBM SCCM Key Capabilities

- **Usage Reporting** – collection of data directly from the Cloud infrastructure using hypervisor and OS collectors, gather data on cpu, memory, network, storage, VMs.
- **Rating / Pricing Models** – support for flexible rating of usage information to apply different pricing models to report costs of services consumed. Support of tiered pricing.
- **Financial Modelling** – what-if modelling allowing the analysis of existing costs, and how these can be changed with different billing models.
- **Multi-tenant Reporting** – supporting service providers, allowing the aggregate customer reporting of usage and cost to feed billing systems. (By customer, by project/account, by VM)
- **Cognos Reporting** – powerful and flexible reporting engine shipped with many template reports which can be used out of the box or easily customised to needs. Interactive reports allowing powerful graphing and drill down capabilities.
- **Executive Dashboards** – to provide easily consumable management level information in graphic and dashboard format.
- **Enterprise Collectors** – for collection of application specific usage data for applications such as ERP, SAP, DB's application servers, Email, network flow collector etc. (requires Enterprise Edition).



Use IBM SmartCloud Cost Management Collectors on Any System

Partial
List

Goal:

**ANY
usage
file
from ANY
system!**

Mainframe

- Jobs Processed
- Steps Processed
- CPU Time
- Equation Time
- ...

CICS/IMS

- Elapsed Time
- CPU Time
- Transactions
- Input Messages
- ...

Storage

- Space Allocated
- Space Used
- Space Wasted
- Migrated Datasets
- ...

Unix/Linux

- CPU – ucpu, scpu
- Seat Time
- Images Activated
- Software Packages
- ...

Windows

- Elapsed Time
- CPU Time
- Kernal CPU Time
- User CPU Time
- ...

Other OSs

- POWERVM
- VMware
- z/VM
- KVM
- ...

E-Mail Systems

- Microsoft Exchange
- Lotus Notes
- Sendmail

Databases

- DB2
- Oracle
- SQL Server
- Sybase
- ...

Internet

- WebSphere HTTP
- Apache
- Microsoft IIS
- ...

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pCL522
Software Licensing in a Virtualized Environment
Jay Kruemcke

Schedule:
1st Session: Wednesday 9:00-10:15 Bellini 2106
1st Repeat: Thursday 1:00-2:15 Titian 2201 A
2nd Repeat: No repeat

Abstract:
Understand how software vendors charge for virtualized er

@ IBMtechU



pCL522
Software Licensing in a Virtualized Environment
Jay Kruemcke

1 & 2 Good | 3 Neutral | 4 & 5 Poor

Value of the Session:

1 ✓	2 😊	3 😐	4 😞	5 😡	N/A
-----	-----	-----	-----	-----	-----

Presentation & Content:

1 ✓	2 😊	3 😐	4 😞	5 😡	N/A
-----	-----	-----	-----	-----	-----

Effectiveness of the speaker(s):

1 ✓	2 😊	3 😐	4 😞	5 😡	N/A
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Overall session rating:

1 ✓	2 😊	3 😐	4 😞	5 😡	N/A
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