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Provisioning Linux guests and Oracle Database in an IBM Private Cloud Environment on Oracle on IBM System z

Session 11642

August 9, 2012

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IBM Oracle International Competency Center

SHARE in Anaheim 2012

Topics

- Types of Cloud Environments
- Cloud Projects at IBM Oracle International Competency Centre
  - Power systems - lessons to be learned
- Readiness of Oracle on Linux on IBM System x for Cloud deployments
- IBM Cloud Stratgey
- Planned Projects
- Questions

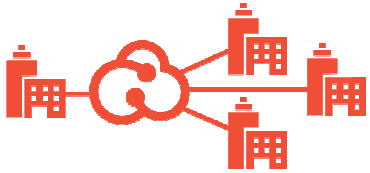
Businesses are choosing a variety of cloud models to meet their unique needs and priorities

Private cloud

On or off premises cloud infrastructure operated solely for an organization and managed by the organization or a third party

Hybrid IT

Traditional IT and clouds (public and/or private) that remain separate but are bound together by technology that enables data and application portability



Public cloud

Available to the general public or a large industry group and owned by an organization selling cloud services.

Traditional IT

Appliances, pre-integrated systems and standard hardware, software and networking.

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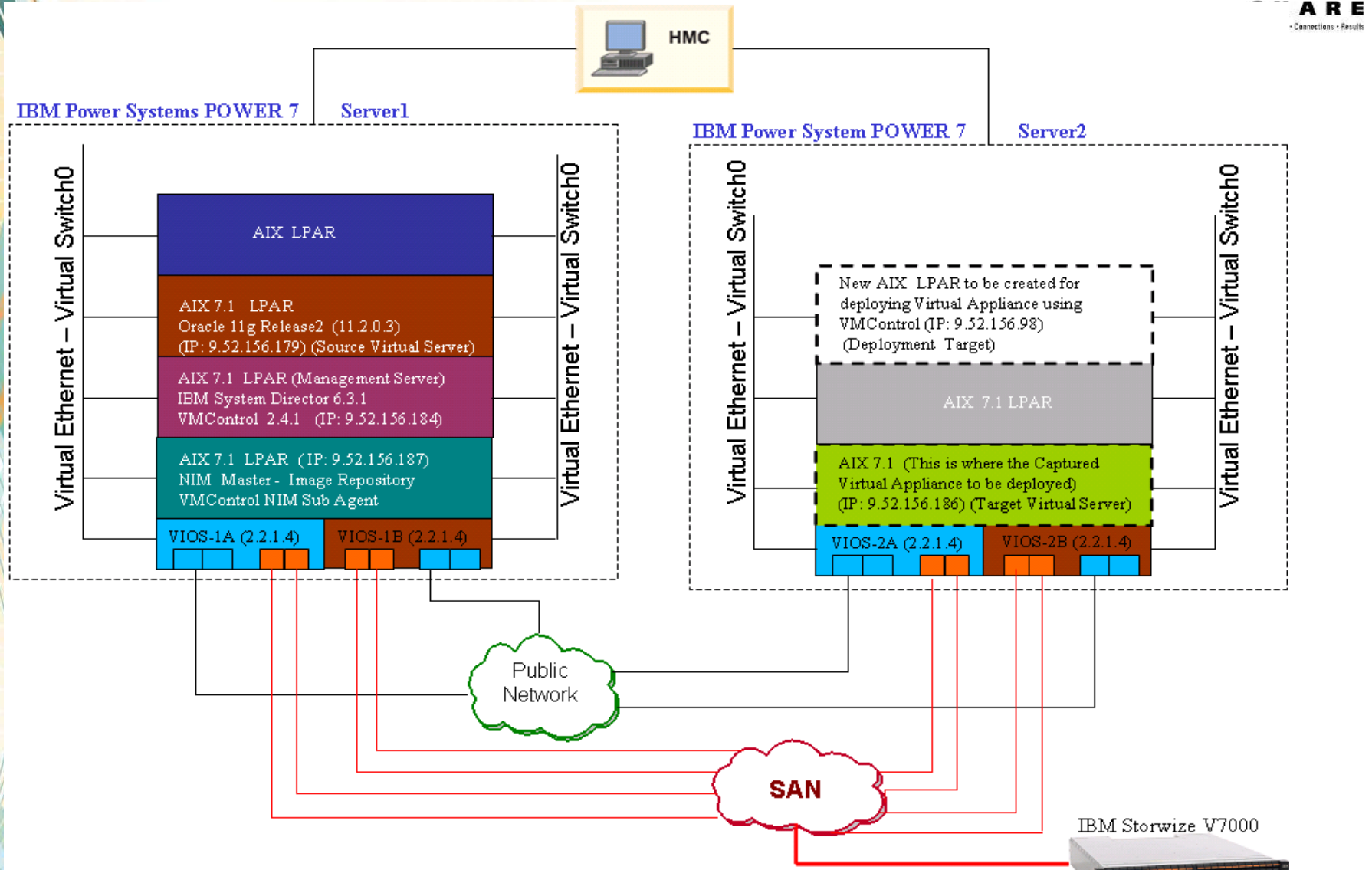
Experiences with Cloud and Oracle in 1H 2012

- **1H2012 with Power Systems**
  - **Learn how to install and use System Director and VM Control**
  - **Deploy an AIX image with Oracle binaries on an LPAR using NIM Server**
  - **Understand the issues and the choices**
- **Follow on for 2H 2012 and 2013**
  - **Add ICON tool to the existing set up (Image Construction and Composition Tool)**
  - **Expand to using Oracle Real Application Clusters (RAC) and an application such as E-Business Suite**
  - **Use Tivoli Solutions**
  - **Integrate with PureFlex HW**

IBM Cloud Software to use with Oracle

- **IBM System Director**
  - **VM Control**
  - **ICON tool**
  - **Smart Cloud Entry**
- **Tivoli Provisioning Manager (TPM)**
- **Tivoli System Automation Manager (TSAM)**


HMC
IBM Power Systems POWER 7
Server1
IBM Power System POWER 7
Server2
Virtual Ethernet – Virtual Switch0
Virtual Ethernet – Virtual Switch0
AIX LPAR
AIX 7.1 LPAR
Oracle 11g Release2 (11.2.0.3)
(IP: 9.52.156.179) (Source Virtual Server)
AIX 7.1 LPAR (Management Server)
IBM System Director 6.3.1
VMControl 2.4.1 (IP: 9.52.156.184)
AIX 7.1 LPAR (IP: 9.52.156.187)
NIM Master - Image Repository
VMControl NIM Sub Agent
VIOS-1A (2.2.1.4)
VIOS-1B (2.2.1.4)
Virtual Ethernet – Virtual Switch0
Virtual Ethernet – Virtual Switch0
New AIX LPAR to be created for
deploying Virtual Appliance using
VMControl (IP: 9.52.156.98)
(Deployment Target)
AIX 7.1 LPAR
AIX 7.1 (This is where the Captured
Virtual Appliance to be deployed)
(IP: 9.52.156.186) (Target Virtual Server)
VIOS-2A (2.2.1.4)
VIOS-2B (2.2.1.4)
Public
Network
SAN
IBM Storwize V7000

Lessons learned in 1H 2012

- **Choices and issues**
  - **How will you handle security – level of access needed to copy and deploy – could involve several organizations (network and storage)**
  - **License implications for deploying Oracle code**
  - **Deploying an existing database or creating a new one on the target**
  - **Ensure copied (cloned) target system will be supported by Oracle**
  - **Automating the infrastructure set up for Oracle Real Application Clusters is complex, (High availability and Disaster Recovery) – Will it be supported environment**
  - **Is the install process for applications enabled for automation**
  - **Do you have the latest version of the automation software**
- **It takes time to set up the environment for Cloud**

Oracle on Linux on z Readiness for Cloud

- **Well prepared to execute on Linux on IBM System z**
  - **Standardized the Linux set up needed for Oracle on each distro**
    - **rpmchecker script to run to make sure all rpms are available for Linux readiness**
      - **(Oracle needs more than a minimum install)**
    - **Cluster verify script available for checking RAC readiness**
    - **Build a working Linux image to be deployed quickly**
      - **RHEL 5, SLES11, and soon RHEL 6**
      - **Update for each service pack level**
  - **Current copy of Oracle binaries**
    - **11.2.0.3 is a complete replacement for 11.2.0.2**
    - **Add the quarterly Patch Set Updates to be current (11.2.0.3.3 as of July)**
  - **Oracle provides a silent install process to automate the creation of databases**
    - **Prepare template and execute**

Oracle on Linux on z Readiness for Cloud

- **Silent Install**
  - **First run Cluster Verify Script to check readniess of set up for Grid**
    - **(CRS – cluster Ready Services)**
  - **Execute runInstaller command with options**
    - **runInstaller --silent -force -responseFile /home/oracle/grid.rsp**
  - **Response File Sample**
    - **# Specify the hostname of the system as set during the install.**
    - **ORACLE_HOSTNAME=pazxxt18.us.oracle.com**
    - **# Specify the location which holds the inventory files.**
    - **INVENTORY_LOCATION=/oracle/oraInventory**
    - **# Specify the languages in which the components will be installed.**
    - **SELECTED_LANGUAGES=en**
    - **# CRS_CONFIG - To configure Grid Infrastructure for cluster**
    - **oracle.install.option=CRS_CONFIG**
    - **# Specify the complete path of the Oracle Base.**
    - **ORACLE_BASE=/oracle/BASE**
    - **# Specify the complete path of the Oracle Home.**
    - **ORACLE_HOME=/oracle/GRID**

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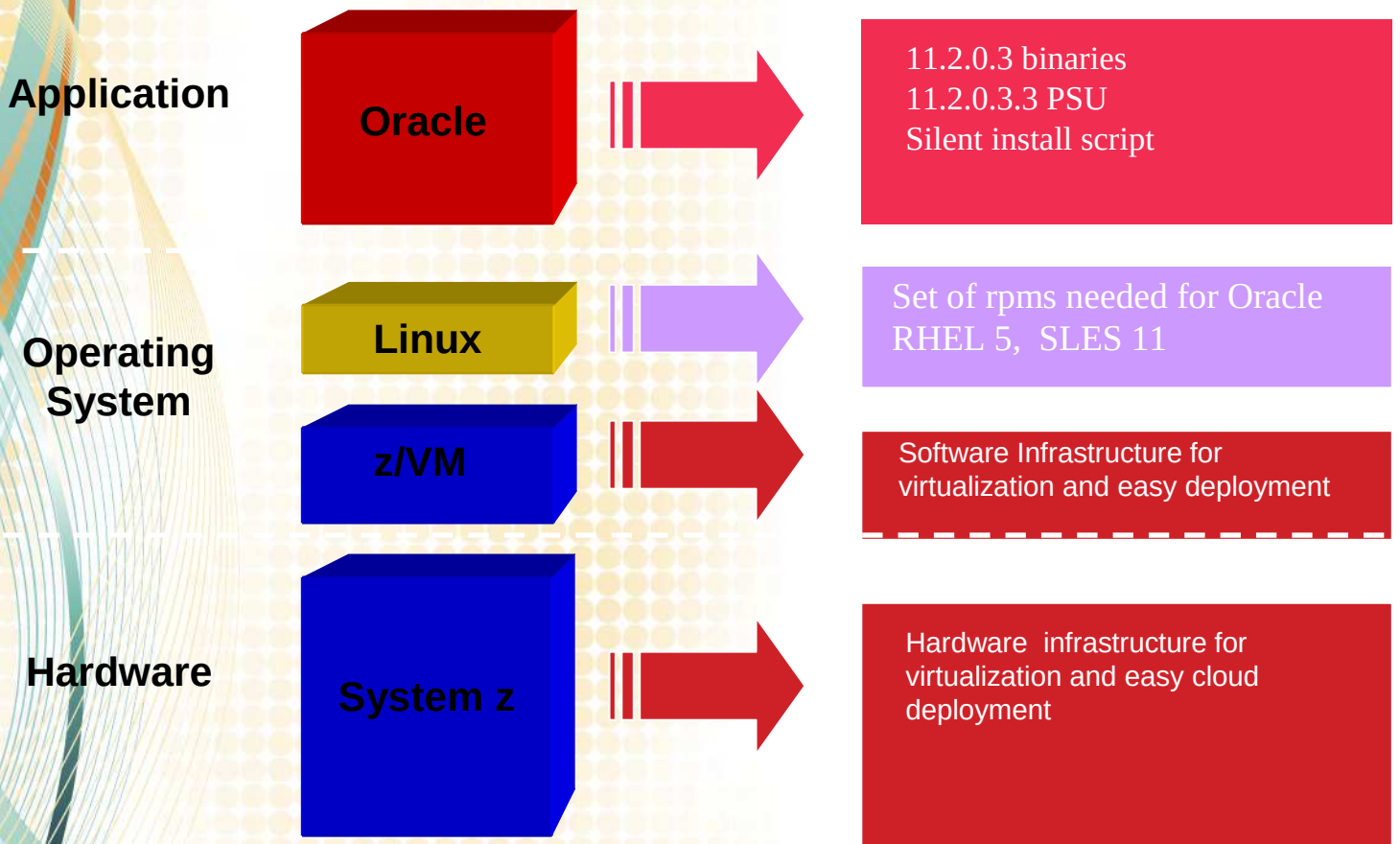
Building Blocks of Cloud for Oracle on Linux for System z



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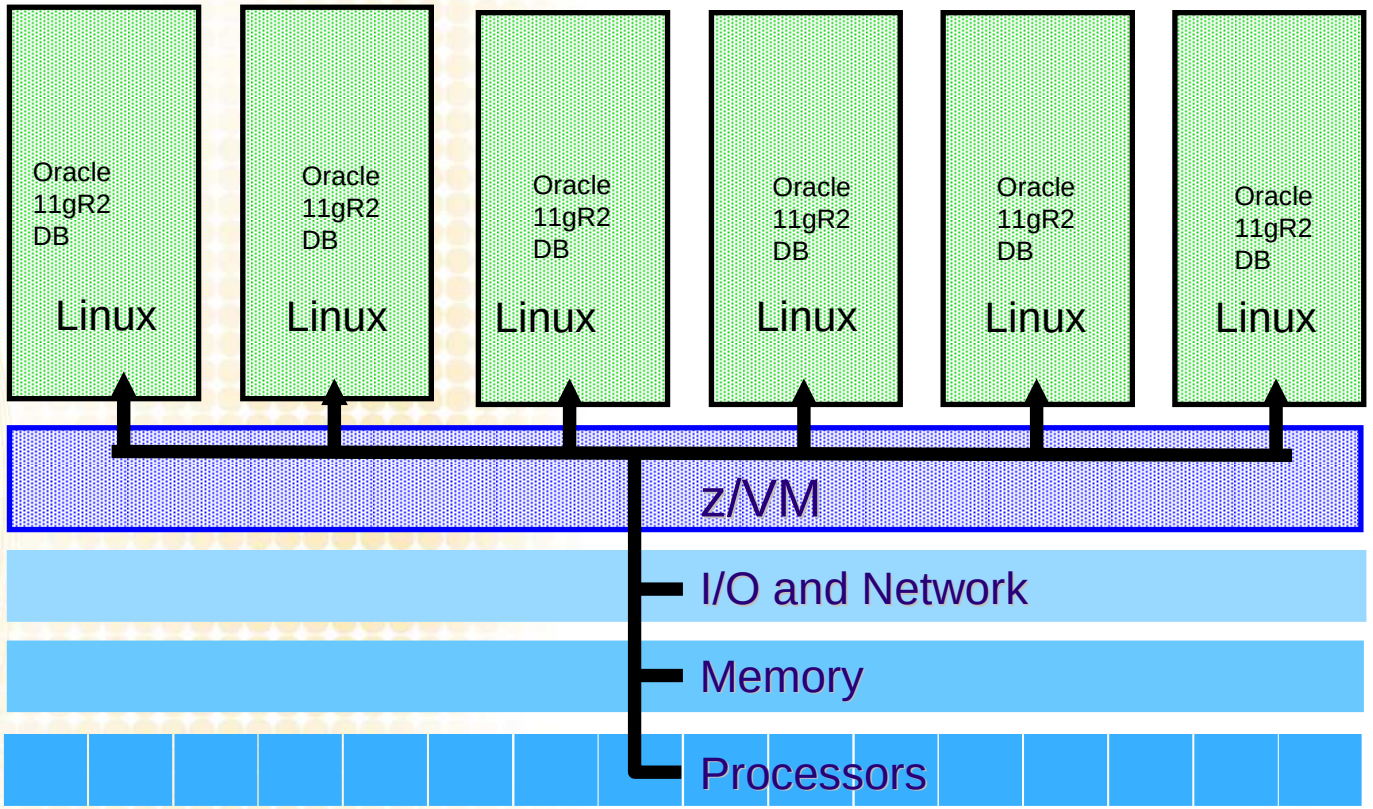
Virtual Machine Partitioning

Efficiently Exploiting the Entire Mainframe Complex

A *Virtual Machine* simulates the existence of a dedicated real machine, including processor functions, storage, and input/output resources. Challenge create 20 Linux guests with same 11gR2 database



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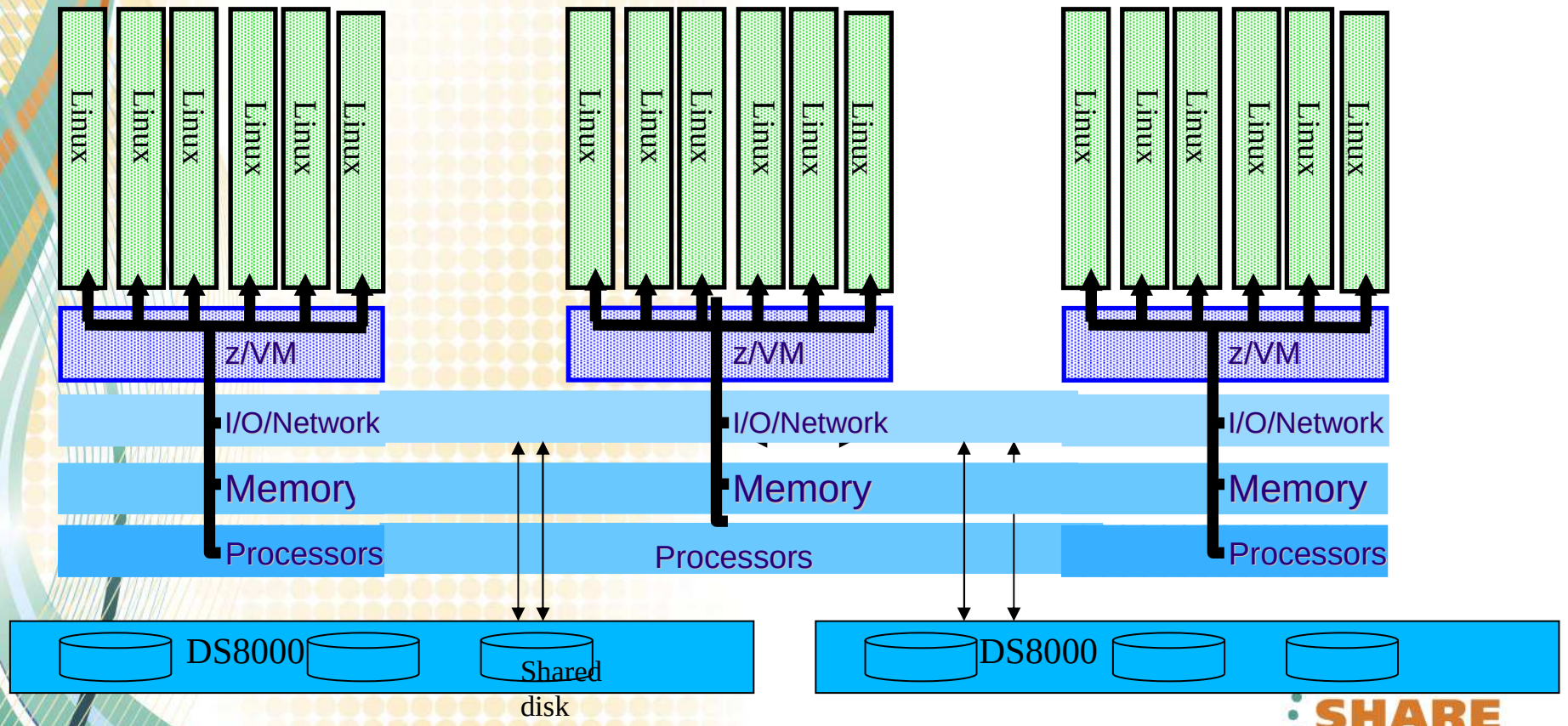
Virtual Machine Partitioning at Oracle for DB

For a large system you would have several z/VM LPARs on one System z
Oracle Development set up is 3 z/VMs



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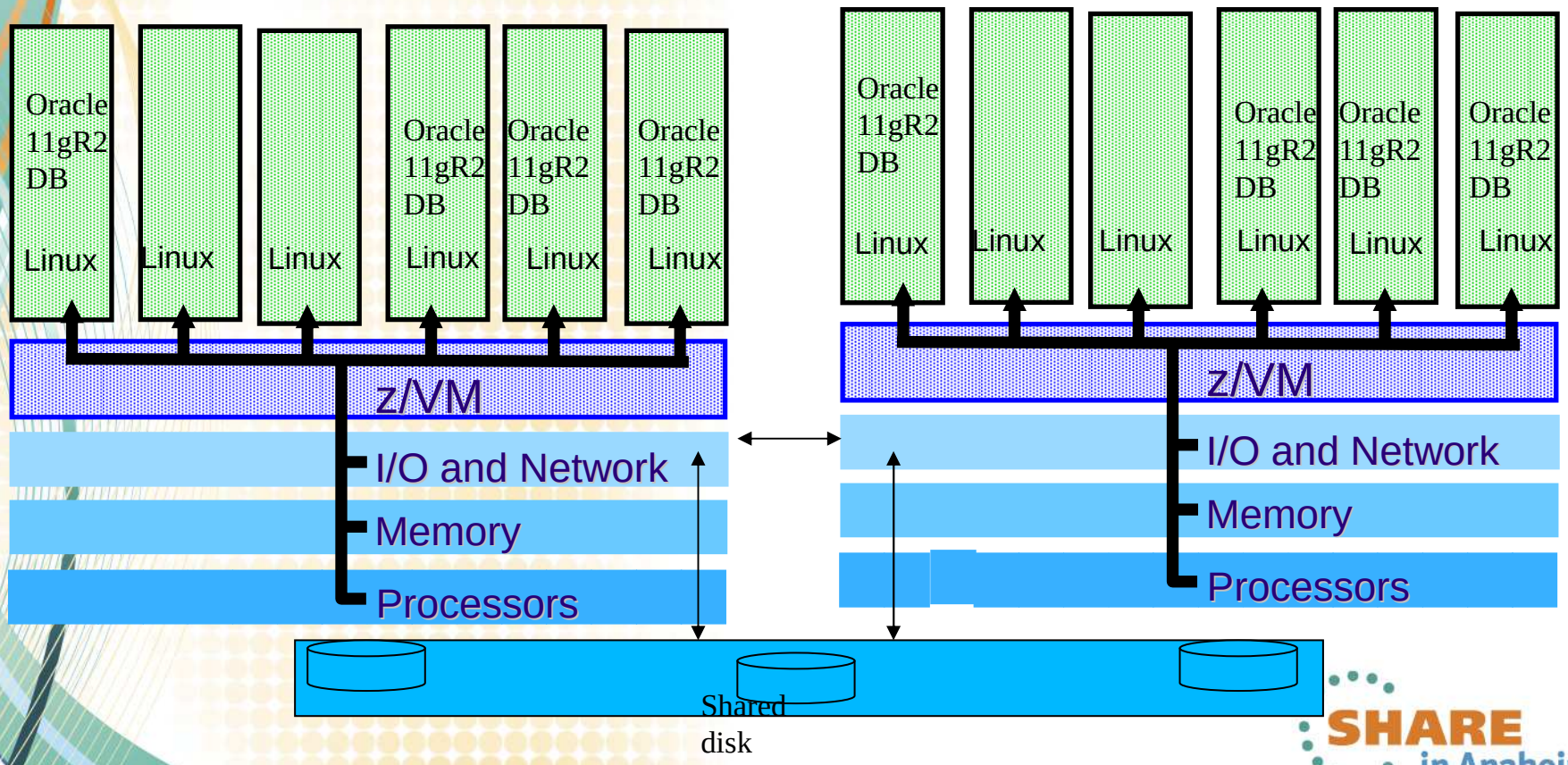
Virtual Machine Partitioning

Efficiently Exploiting the Entire Mainframe Complex

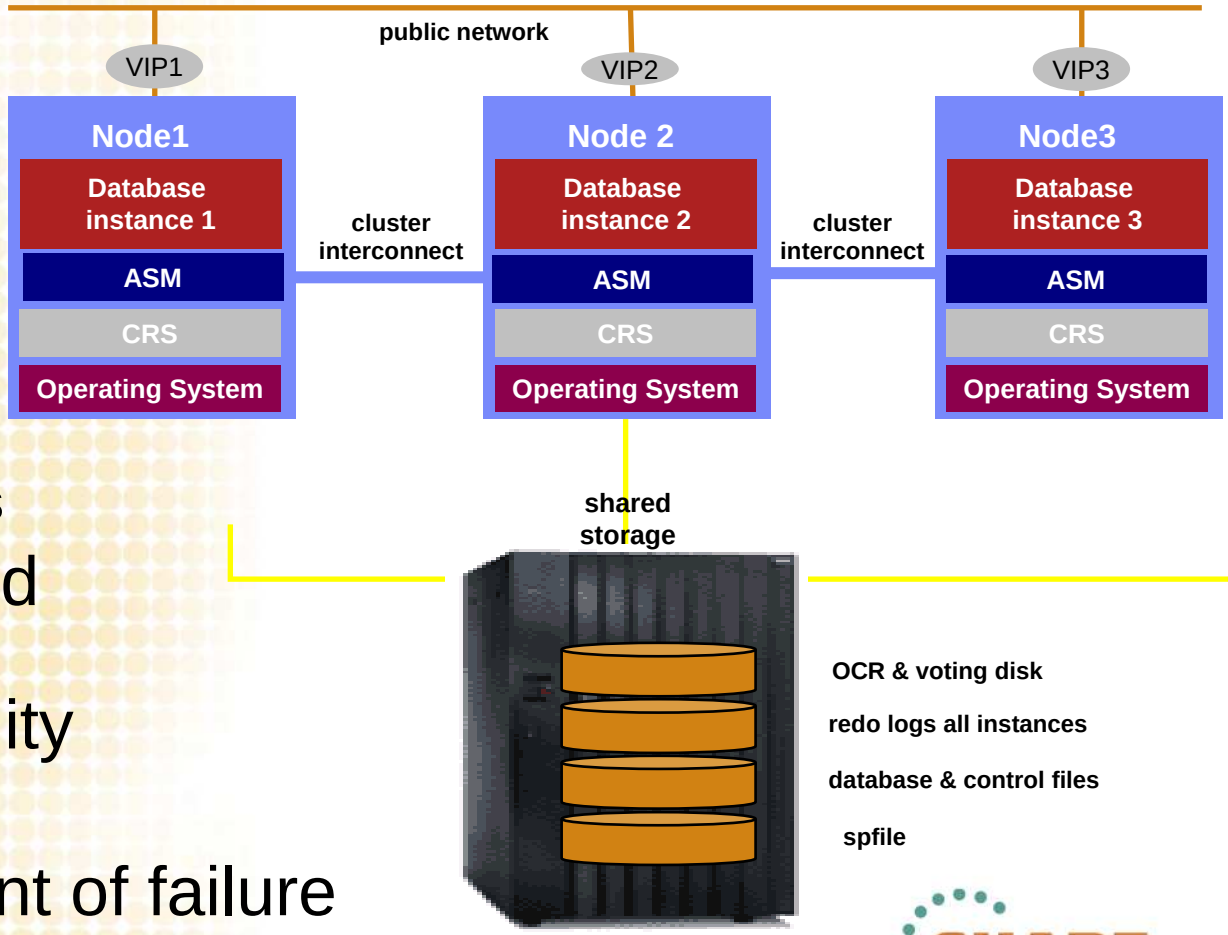
Set up can be several z/VMs in one z196 or several z196s each with one or more z/VM. Is there a Disaster Recovery need.



Oracle on Linux on z Readiness for Cloud

- **Papers already published**
  - **IBM Redpaper Installing Oracle 11gR2 RAC on Linux on System z, REDP-4788** http://www.redbooks.ibm.com/abstracts/redp4788.html?Openhttp://www.redbooks.ibm.com/abstracts/redp4788.html?Open
  - **IBM Redpaper Silent Installation Experiences with Oracle Database 11gR2 Real Application Clusters on Linux on System z** http://www.redbooks.ibm.com/redpapers/pdfs/redp9131.pdf
  - **IBM Redbook Experiences with Oracle Solutions on Linux for IBM System z** http://www.redbooks.ibm.com/abstracts/sg247634.html?Open
  - **IBM Redpaper Deploying a Cloud on IBM System z** http://www.redbooks.ibm.com/abstracts/redp4711.html?Open
  - **Oracle notes on My Oracle Support (support.oracle.com)**
  - **Note 1306465.1 - Getting Started - 11gR2 Grid Infrastructure, ASM and DB (IBM Linux on System z)**
    - **Points to many more notes**

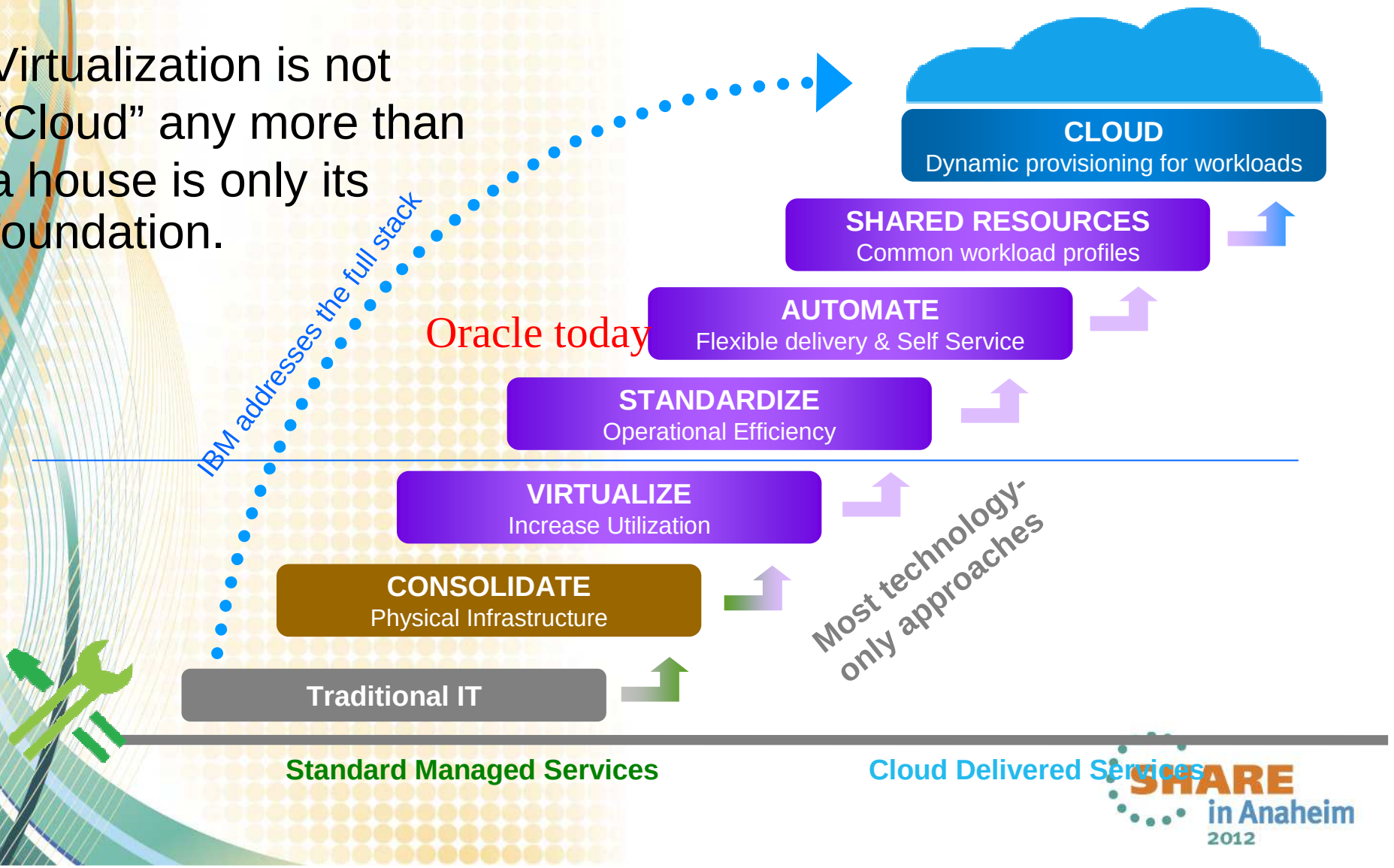
Oracle 11gR2 RAC overview (complex setup)



- Two main objectives
  - Scalability and performance
  - High availability
  -
  - No single point of failure
  - Private Network (GNS)

Cloud computing is a natural progression from infrastructure transformation…

- Virtualization is not "Cloud" any more than a house is only its foundation.



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System z Cloud Blueprint

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Integrate	Automate	Orchestrate
Infrastructure, Virtualization, Consolidation & Management	**Standardization (simplify), Automation & Manage better**	***"Orchestrate" Service Lifecycle Management Optimize***
• z/VM • Linux on System z • Oracle Database	• Tivoli Provisioning Manager	• Tivoli Service Automation Manager

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IBM® zEnterprise™ Starter Edition for Cloud

Cloud Technology

Tivoli Provisioning Manager Version 7.2.0.2
License PID: 5608-TPM

- RVU License and SW S&S12 Months - D0I32LL
- RVU Annual SW S&S Annual Renewal - E0BI5LL

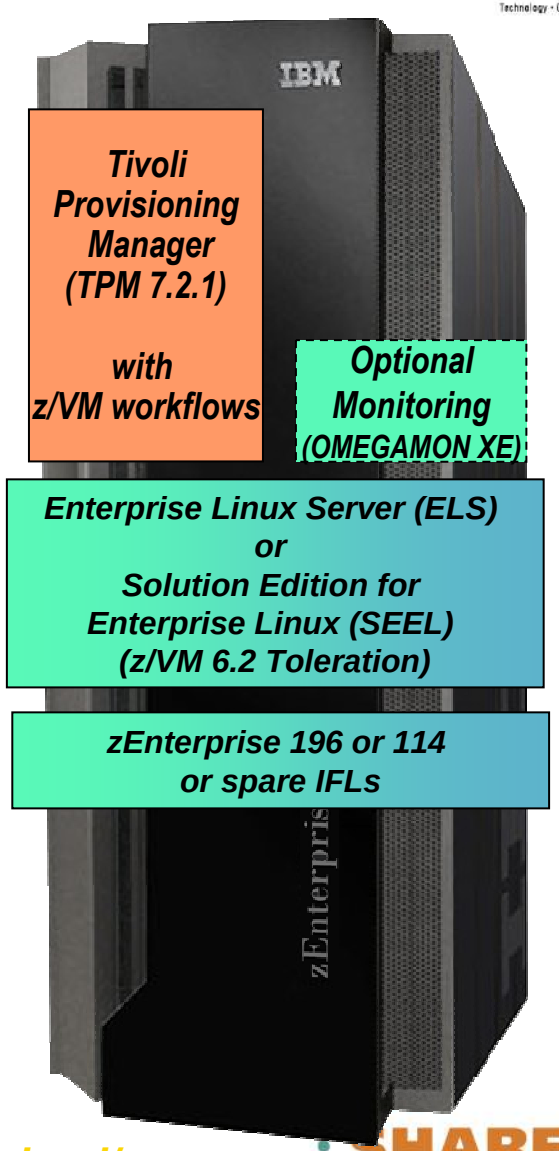
Monitoring (optional)

Tivoli OMEGAMON XE on z/VM and Linux Version 4.2
License PID: 5698-A36
S&S PID: 5608-S73

Implementation

Install using z/VM workflows for TPM
or engage
IBM STG Lab Services

- IBM Services to implement cloud using workflows



Easy to get started!

Learn More: *http://www-03.ibm.com/systems/z/solutions/cloud/*

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IBM® System z Solution Edition for Cloud Computing

Cloud Technology

Tivoli Service Automation Manager Version 7.2.2
License PID:

- RVU License and SW S&S12 Months -
- RVU Annual SW S&S Annual Renewal -

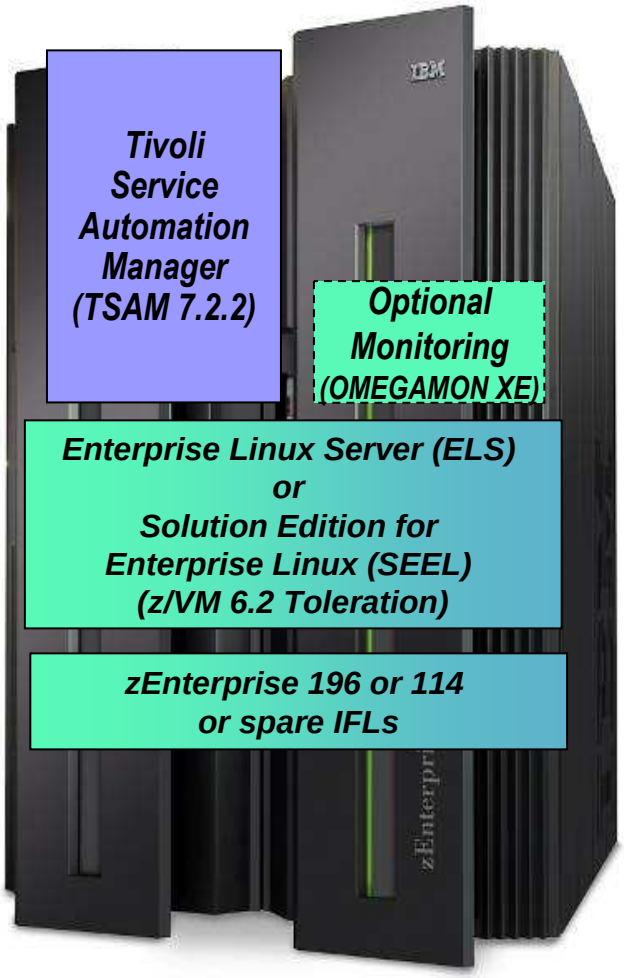
Monitoring (optional)

Tivoli OMEGAMON XE on z/VM and Linux Version
License PID: 5698-A36
S&S PID: 5608-S73

Implementation

IBM Lab Services - STG & SWG

- Install configuration:
  - H/W system (LPAR creation, security
  - Base zVM & Linux distro
  - Tivoli Components
- Develop test scenario for service automation & management via TSAM
- Optional: Planning Workshop for Cloud Environment



Learn More: http://www.ibm.com/systems/z/solutions/editions/cloud/index.html

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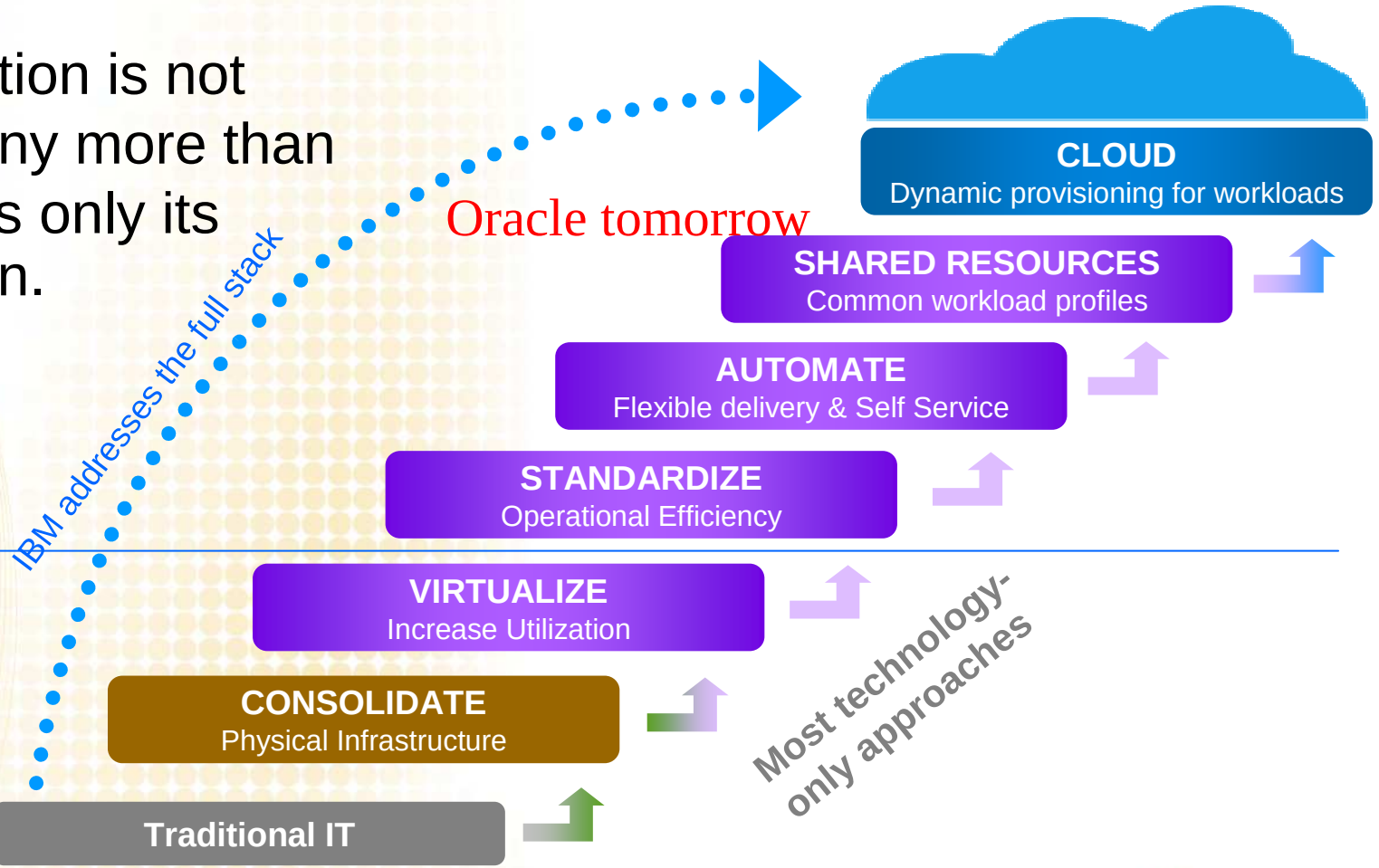

Plan for 2H 2012 and 2013

- **Review the issues and choices**
- **Continue to work on all IBM platforms to find the best practices**
- **Set up a proof of concept project in France using Tivoli Provisioning Manager to take the deployment to the next step in automation for Linux on z.**
- **Deliver white papers or redbook chapters on sample implementations of Cloud infrastructure for Oracle on Linux on IBM System z**

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System z Social Media

- System z official Twitter handle:
  - @ibm_system_z
- Top Facebook pages related to System z:
  - Systemz Mainframe
  - IBM System z on Campus
  - IBM Mainframe Professionals
  - Millennial Mainframer
- Top LinkedIn Groups related to System z:
  - Mainframe Experts Network
  - Mainframe
  - IBM Mainframe
  - System z Advocates
  - Cloud Mainframe Computing
- YouTube
  - IBM System z

- Leading Blogs related to System z:
  - Evangelizing Mainframe (Destination z blog)
  - Mainframe Performance Topics
  - Common Sense
  - Enterprise Class Innovation: System z perspectives
  - Mainframe
  - MainframeZone
  - Smarter Computing Blog
  - Millennial Mainframer

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