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Oracle VM 3: Application-Driven Virtualization

Introduction

Virtualization has experienced tremendous growth in the datacenter over the past few years. Recent Gartner estimates show that as of mid-2011, at least 40 percent of x86 architecture workloads have been virtualized. This accounts for nearly 11 million servers worldwide.

Virtualization's impact on the IT industry has been dramatic and will continue to be the most change-driving catalyst for infrastructure and operations software as organizations look for ways to cut costs, better utilize assets, and reduce implementation/management time and complexity. However, to achieve all this, a virtualization solution must be *application-driven*.

A combination of hardware, virtualization, middleware, database and packaged applications, when combined with integrated management across all layers, comprises the best building blocks for streamlined operations and maximum agility in the datacenter. It also creates the underpinnings for the future in cloud-based deployments. Only Oracle's integrated stack represents a virtualization offering that is application-driven and can enable deployment of complete solutions as opposed to just servers and operating systems.

This whitepaper will discuss why application-driven virtualization, as exemplified by Oracle VM 3, is transforming the deployment of packaged applications, custom applications, databases, and middleware workloads, as well as why it is essential to truly efficient cloud deployments.

Application-Driven Virtualization

Information Technology (IT) needs are evolving rapidly as datacenters transform into service centers that deliver applications on demand and respond to changing customer requirements with speed and agility. Things simply must work together, and happen faster, in order to satisfy an increasing appetite for information and services. Users are less accepting of traditional *build-it-yourself* philosophies, with many now demanding resources just-in-time. As a result, there is a need for greater optimization and efficiency in how software and solutions that power datacenters are deployed and managed. These trends are pushing IT departments to find better ways to integrate, provision, deploy, and manage systems at a faster pace without straining already burdened budgets.

Virtualization is a key technology used in datacenters to optimize resources. As IT needs continue to evolve, virtualization can no longer be regarded as an isolated technology to solve a single problem. Many companies started the optimization journey by using server virtualization to consolidate systems and reduce capital expenditure (CAPEX). With IT staff now tasked to deliver on-demand services, datacenter virtualization requirements have gone beyond simple consolidation and CAPEX reduction.

Indeed, virtualization at the operating system level is no longer sufficient. With users looking for a cloud experience, simply provisioning and delivering an operating environment falls short of their goals. IT organizations must rapidly deliver services, such as infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS). As a result, virtualization solutions need to mature and facilitate flexibility, agility, and speed in deploying complete application stacks to support the new service-based charter. Virtualization solutions need to be application-driven and enable:

- Easier deployment and management of business critical applications
- Rapid and automated provisioning of the entire application stack inside the virtual machine
- Integrated management of the complete stack including the VM and the applications running inside the VM

Unveiling Oracle VM 3

Oracle VM 3 is the latest release of Oracle's server virtualization solution. As customers focus on delivering complete solutions, they are looking to virtualization to help them transform the datacenter—moving beyond server consolidation to improving application deployment and management. This is a fundamental tenet of Oracle VM 3.

Oracle VM 3 is a free server virtualization and management solution that makes enterprise applications easier to deploy, manage, and support. Backed worldwide by affordable enterprise-quality support for both Oracle and non-Oracle environments, Oracle VM facilitates the deployment and operation of your enterprise applications. Oracle VM is the only fully certified platform for all Oracle software. Deployed and tested in real world enterprise datacenters, Oracle VM is proven to reduce operations and support costs while simultaneously increasing IT efficiency and agility.

- Oracle VM 3 is suitable for all datacenter workloads and features new policy-based management capabilities, advanced storage management via the Storage Connect plug-in API, centralized network configuration management, improved ease-of-use and Open Virtualization Format (OVF) support.
- With the centralization of storage management alongside of logical network configuration and management, Oracle VM 3 allows administrators to streamline and automate end-to-end virtual machine provisioning for a significant reduction in time and overhead, simplifying IT processes and reducing costs.
- Oracle VM 3 helps customers deploy enterprise software in a rapid, repeatable, and error-free manner with immediate availability of over 90 Oracle VM Templates for Oracle applications, middleware, and databases.
- Oracle VM 3 is four times more scalable than the latest VMware offering, supporting up to 128 virtual CPUs per virtual machine.
- With zero license fees, affordable support fees and unlimited vRAM usage, Oracle VM 3 significantly lowers the cost of virtual infrastructure, especially when compared to VMware

Most Scalable x86 Server Virtualization

Oracle VM is designed to virtualize business-critical database and applications workloads—both for packaged and custom-built applications. It supports up to 128 Virtual CPUs (vCPUs) per guest VM compared to other products like VMware vSphere 5.0 that supports a maximum of 32 vCPUs per guest VM. Also, Oracle VM 3 can support up to 2TB of physical memory per host. This means that Oracle VM 3 has the scalability to support large enterprise application workloads with higher efficiency and low overhead.

Lower Cost

Oracle VM can dramatically lower the cost of virtual infrastructure, especially when compared to VMware's vSphere 5 product license and support costs. Check out the Oracle VM vs. VMware Cost Calculator available on oracle.com/virtualization Web page and do the math for your own configurations. You will see significant cost savings by using Oracle VM.

Suitable for All Datacenter Workloads

With Oracle VM 3 it is easier than ever to support virtualization across your entire datacenter based on its broad feature set:

- **Centralized management of all functionality.** With Oracle VM 3, all configuration and management operations—including discovery, configuration, and management of servers, networks and storage—are performed centrally from the Oracle VM 3 Manager graphical user interface (GUI), providing efficient operation of large scale data centers
- **Support for the leading enterprise operating systems.** This support includes Linux, Windows, and Solaris.

- **Highly affordable for large-scale deployment.** With Oracle VM 3, you only pay for support and not for software licenses making it extremely affordable to enforce “virtualization by default” policies where every new server build must be a VM rather than a physical server. This type of policy helps standardize operations, maximize hardware utilization, and minimize power-consumption.
- **Works in non-Oracle environments.** While all Oracle products are developed and tested in virtualized environments using Oracle VM, and are thus engineered to work together, there is nothing in Oracle VM to prevent it from serving as an excellent virtualization platform for software from any vendor. As long as the software—from any vendor—is itself supported on an operating system version supported by Oracle VM, then it is fully supported by Oracle.
- **Unique features.** Oracle VM 3 also has unique features that bring value not available anywhere else and that benefit applications from any vendor.
- **Oracle VM Templates.** These Templates can be created to package any application as a set of virtual machines to use as a template for rapid application deployment.
- **Dynamic Resource Scheduling.** This scheduling is based not only on CPU load, but also on network load. It allows you to move your virtual machines based on the intensity of the network load to assure that virtual machine networking is not “starved” because a neighbor VM is consuming all the network resources

Transform the Way You Deploy and Manage Applications

Leveraging Oracle VM, Oracle solutions make it easy for you to rapidly provision and deploy enterprise software.

Oracle VM Templates

Oracle VM Templates provide the ability to rapidly and easily deploy pre-built, pre-configured, pre-patched guest virtual machines. The guest VM can contain a complete Oracle software solution along with the operating system and related software infrastructure. Already configured for production, Oracle VM Templates can save users days or weeks learning to install and configure a sophisticated product such as Siebel CRM or Oracle Enterprise Manager Grid Control. Instead, users can simply download and start the VM to begin using it right away.

An up-to-date list of available Oracle VM Templates can be found here:

<http://www.oracle.com/technetwork/server-storage/vm/templates-101937.html>

You can also create your own Oracle VM Templates for custom or third party applications.

Oracle Virtual Assembly Builder

Combined with Oracle VM, Oracle Virtual Assembly Builder helps organizations quickly create and configure entire multi-tier application topologies and provision them onto virtualized resources. It enables IT organizations to take multi-tier enterprise applications—for example, a Web server,

application server, and database—and package them into self-contained, single-purpose virtual machines called software appliances. Going further, Oracle Virtual Assembly Builder structures the process of combining these appliances into cohesive, reusable units known as assemblies.

A centralized library of appliances and assemblies simplifies license management and provides the gold images that are an important foundation of successful service delivery. Patch management and license management can be easily coordinated since there is a record of what operating systems and applications are in use. Oracle leverages the Open Virtualization Format (OVF) standard as a format to deliver these virtual appliances and assemblies.

Integrated Management for the Complete Virtual Environment

Managing a virtual environment with separate tools for the virtual machine and the applications running inside it can be challenging and disconnected. Oracle's virtualization solutions and integrated management facilities change the equation. Indeed, Oracle is the only vendor in the marketplace today that offers combined management capabilities that span applications, plus a supporting infrastructure for physical, virtual, and private cloud computing environments. Organizations can take advantage of a unique applications-to-disk approach to physical and virtual systems management to administer the full stack and gain better application performance and reliability while reducing complexity.

Oracle Enterprise Manager provides a single integrated console that administrators can use to monitor, manage, provision, and patch the entire Oracle software stack. Monitoring, management, and life cycle management capabilities for Oracle solutions and a wide variety of third-party technologies are available to help simplify administration across the enterprise.

Engineered for Oracle

Oracle VM 3 is tested, optimized and integrated with Oracle hardware and software. It can virtualize the complete applications to disk solution. Highlights include:

- Support for integration with Oracle Enterprise Manager and Oracle Exalogic Optimized for Oracle Database, Oracle Fusion Middleware, and Oracle Applications workloads
- Best practice configurations for Oracle software with over 90 Oracle VM Templates available today
- Pre-installed on Oracle's Sun x86 servers
- Storage Connect plug-ins for Sun ZFS storage and Pillar storage

Certified for Use with All Oracle Software

Oracle performs real-world testing on its broad portfolio of products with Oracle VM to ensure reliability and streamlined support. Oracle VM is the only certified x86 virtualization solution with all Oracle Software. Please consult Support Note 464754.1 on the My Oracle Support Website at <https://support.oracle.com/> for information on product versions certified.

Customer Support: One Call Worldwide

Oracle knows how to best deploy virtualization solutions. With deep know-how in deploying, managing and optimizing every layer of the hardware and software stack, Oracle Customer Services deliver a single point of contact for the entire virtualized applications to disk stack, along with the tools and expert knowledge needed to help companies improve performance, increase availability, and reduce implementation and deployment times.

Conclusion

Successful businesses are defined by efficiency, service, and speed. IT is a critical component of these organizations' competitive advantage. By using application-driven virtualization, organizations can transform application deployment and management. Virtualizing with Oracle VM 3 and taking advantage of the unique applications to disk integration that only Oracle can offer, businesses can reduce their total cost of ownership, increase IT flexibility, and achieve greater business agility.

Appendix 1: References

For more information, visit the Web resources listed in Table 1.

TABLE 1. WEB RESOURCES FOR FURTHER INFORMATION	
WEB RESOURCE DESCRIPTION	WEB RESOURCE URL
Oracle Virtualization	http://www.oracle.com/virtualization
Download Oracle VM	http://edelivery.oracle.com/oraclevm
Oracle VM Templates	http://www.oracle.com/technetwork/server-storage/vm/templates-101937.html
Oracle VM Pricing Guide	http://www.oracle.com/us/corporate/pricing/els-pricelist-070592.pdf
Oracle Virtualization Blog	http://blogs.oracle.com/virtualization/
Follow Oracle Virtualization on Twitter	http://twitter.com/ORCL_Virtualize
Join Oracle Virtualization on Facebook	http://facebook.com/OracleVirtualization
Oracle Solaris	http://www.oracle.com/solaris
Oracle Linux	http://www.oracle.com/linux
Sun Servers	http://www.oracle.com/servers
Sun Storage	http://www.oracle.com/storage
Sun Networking	http://www.oracle.com/us/products/servers-storage/networking/
Oracle Enterprise Manager	http://www.oracle.com/us/products/enterprise-manager/
Oracle Enterprise Manager Ops Center	http://www.oracle.com/us/products/enterprise-manager/opscenter/



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Authors: Monica Kumar, Susan Roberts, Chris
Kawalek

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200

oracle.com



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Hardware and Software, Engineered to Work Together