An Oracle White Paper
January 2013

Oracle VM Manager 3.2:
Quick Start Guide for Managing Oracle VM Server for SPARC
# Oracle VM Manager 3.2 – Quick Start Guide for Managing Oracle VM Server for SPARC

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Introduction

This quick start guide shows how to use a new feature in the Oracle VM 3.2 release: support for Oracle VM Server for SPARC (formerly called Logical Domains) from Oracle VM Manager. This new capability makes it possible to provide unified management for Oracle VM virtual environments whether they are running on x86 or SPARC. Customers will be able to use Oracle VM Manager to discover SPARC servers running Oracle VM Server for SPARC, and manage virtual machines.

The guide is designed to give the reader an overview of the concepts and activities needed to get a logical domain guest up and running with Oracle VM Manager. The goal is to help the reader become familiar enough with the product to successfully design and implement an Oracle VM environment, in particular for readers working with Oracle VM Server for SPARC getting started with Oracle VM Manager. This document does not discuss general procedures on how to set up and configure Oracle VM server pools or guests. Please refer to the Getting Started Guide embedded within the Oracle VM Manager user interface or the Oracle VM User's Guide available from Oracle Technology Network documentation for more detailed information about working with Oracle VM.

Introduction to Oracle VM Manager for SPARC Customers

In this release, Oracle VM Server for SPARC gains the ability to interoperate with Oracle VM Manager alongside Oracle VM Server for x86. This introduces several concepts that are briefly reviewed here.

Oracle VM Manager is a management tool for virtualization that provides a graphical interface for administering and applying policies to virtual machines, the servers they run on, and the network and storage services they depend on. Oracle VM Manager controls the virtualization environment, creating and monitoring Oracle VM servers and the virtual machines. The administrator uses the graphical interface to “discover” servers that will host virtual machines, and the resources they use.

Using Oracle VM Manager, multiple physical Oracle VM Server hosts are grouped into server pools. A Manager instance can manage multiple server pools, each of which can have up to 32 physical servers. This lets a single administrative console manage hundreds of physical servers and the virtual machines on them. The Manager assigns a server from the pool as a “master server”, and uses a relocatable IP address, called the virtual IP, to whichever server currently has that role. The Manager uses the master server to execute long-running tasks, such as importing virtual machine templates, rather than adding load to the Manager host. This improves scalability and user-interface responsiveness.

Oracle VM makes use of shared storage repositories to hold virtual machine disk images, files containing ISO images, and pre-configured virtual machine templates and assemblies. The administrator can import such pre-configured virtual machine images from network-accessible sources, and then create virtual machines from them. Every server in a given pool has access to a shared storage repository which can be a combination of NFS, Fibre Channel or iSCSI. For this release, the repository
must reside on NFS for SPARC servers. This allows guest VMs associated with a pool to start and run on any physical server within the pool.

Oracle VM Server for SPARC integrates with the Oracle VM Manager though an agent which is installed on the Oracle VM Server for SPARC control domain. This support has the following pre-requisites:

- SPARC servers supported by Oracle VM Server for SPARC 3.0 or later. Please review the release notes about the list of supported SPARC servers. The command “ldm –V” can be used from a control domain to see what version is installed. The control domain must be running Oracle Solaris 11.1 or later. Guest domains can be either Solaris 10 or Solaris 11. Oracle VM Agent will be installed in the control domain.

- Oracle VM Manager runs on 64-bit Oracle Linux 5.5 OS or later, and requires a separate server outside of the server pool. This can be either a physical server or a guest virtual machine of Oracle VM Server on an x86 host.

- Guest domain images will be stored on external shared NFS storage. The amount of NFS storage allocated for the storage repository depends on the number and size of guest domains that you want to deploy.

**Oracle VM Manager and Oracle Enterprise Manager**

Oracle Enterprise Manager is a comprehensive management product focused on infrastructure management. Oracle Enterprise Manager Ops Center provisions, services, and monitors Oracle x86 and SPARC hardware, firmware, switches, hardware fault analysis, My Oracle Support integration, BIOS configuration, the Oracle Solaris and Oracle Linux operating systems. It also provides sophisticated support for Oracle's virtualization technologies and, with Oracle Enterprise Manager Cloud Control 12c, complete cloud capability for private and public clouds. By comparison, Oracle VM Manager is a management backplane for the virtualization layer. Customers can choose between the products based on the functionality they need, and since Oracle Enterprise Manager can connect to and discover Oracle VM Manager instances, they can be combined to work together.

For this release, testing has not completed for SPARC systems on these integrations and thus it is currently not recommended that you use Oracle VM Manager 3.2.1 build with Oracle Enterprise Manager 12c or Oracle Enterprise Manager Ops Center 12c together. If you do try them together, do not use a production instance of Oracle Enterprise Manager.

**Prepare for Implementation**

The first phase focuses on what you need to get started, including basic hardware, operating system and application downloads, storage and networking.

To learn more about Oracle VM, please refer to the white papers at Oracle VM OTN page.
Important note for All Readers

Please note that the object names, locations and configuration examples are used as illustrations to convey concepts and should not be copied literally. The repository names, host names, IP addresses, network configurations and assignment of network roles are examples, and should not be construed as the way your particular environment should be configured.

What You Need to Get Started

To run this technology, you will need at least one SPARC server running Oracle VM Server for SPARC 3.0 with a Solaris 11.1 or later control domain, one separate x86 physical server for Oracle VM Manager 3.2.1 or an x86 desktop, and a single external storage unit serving NFS. Your actual configuration may have only one SPARC server or multiple pools with the maximum of thirty-two physical servers per pool, but you will still need a separate server or Oracle VM guest running on a separate x86 machine for Oracle VM Manager, and NFS storage that can be accessed by all physical servers in the server pool.

Figure 1: This picture shows three servers for the server pool, one x86 server for the Oracle VM Manager and a storage array

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Prepare Hardware

The Oracle VM Server for SPARC hypervisor resides in the server’s firmware, so it is important to run current versions of firmware. Please refer to the Release Notes to see the firmware version needed for your servers, and update the server if necessary before installing the logical domains manager software.

It is recommended that servers are configured exactly the same. This means the same processor types (such as SPARC T4 processors) and memory sizes, that PCI cards should occupy the same slots in all servers, that network cables from each subnet should be connected to the same ports on the servers and that firmware revisions should be the same on each physical server. This can reduce confusion later when installing and using the systems. Also ensure that you have access to the console via the ILOM (Integrated Lights Out Manager) service processor on each SPARC server.

Prepare Network Infrastructure

You will need to assign several IP addresses depending on your implementation. You can use a single network but will need separate addresses for each server’s control domain, the guests, the Oracle VM Manager, plus a relocatable IP address used for the server pool.

In a production implementation you may want to use multiple networks to separate traffic for virtual machine I/O, access to network storage, and management. Oracle VM Manager supports multiple subnets on different physical interfaces/VLANS. Typical implementations include separate networks for “public”, “storage” and “private/management” subnet. In this getting started tutorial we will use a single network to keep things simple.

Prepare Centralized External Storage

You will need to create and present (export) a directory via NFS for the storage repository. This file system is used for Oracle VM guest images as well as all storage related resources for the server pool. Shares should be set up to be root-writeable by the servers in the pool.
Oracle VM Manager 3.2 – Quick Start Guide for Managing Oracle VM Server for SPARC

Download Oracle VM Software

There are several parts to download:

- Oracle Solaris 11.1 or later, which includes pre-installed Oracle VM Server for SPARC 3.0 Logical Domains Manager. This software is installed on the SPARC server to create a control domain. Complete instructions on how to configure Oracle VM Server for SPARC are outside the scope of this document, which is focused on using it with Oracle VM Manager, but the minimal set of commands needed will be shown below.

- Oracle VM Agent 3.2.1 for SPARC. The Agent provides the interface between Oracle VM Server for SPARC and the Oracle VM Manager. This can be downloaded from Oracle Technology Network as described in the release announcement.

- Oracle Solaris 11.1 and Oracle Solaris 10 install images in CD-ROM or DVD “.iso” format for guest OS installation.

- Oracle VM Manager 3.2.1 installer ISO image. Oracle VM Manager is an Oracle Fusion Middleware application, based on the Oracle WebLogic Server application server and an Oracle or MySQL database. The Oracle VM Manager runs on 64-bit Oracle Linux 5.5 OS or later. The management repository resides in a MySQL or Oracle Database, which can be installed either on the same management server or a separate server. MySQL Database is bundled with Oracle VM Manager 3.2.1.

- Oracle Linux ISO image. This is needed for the physical server where Oracle VM Manager 3.2.1 will be installed. Although the process is not covered in this document, Oracle VM Manager 3.2.1 can be installed onto a VM guest running Oracle Linux somewhere on the network, but must be independent of your Oracle VM Servers.

Download Oracle VM Templates

At the time this is being written there are no Oracle VM Server for SPARC templates or assemblies published with pre-built Solaris images available for download. When they are made available, instructions will be provided on how to download Oracle Solaris templates for installation under Oracle VM.

In the meantime, Solaris guests can be installed from ISO images, or by using a network install based on Jumpstart (for Solaris 10) or Automated Installer (for Solaris 11). For ISO images, assemblies and templates, perform the following tasks once the download has completed:
• Copy or move the downloaded file to an internal web server that will be accessible from the Oracle VM Manager that will eventually be installed as part of this tutorial. The web server will be used by Oracle VM Manager to import the template in later steps.

• Unzip the file, if it is in .zip format.

Next Steps

The preparation phase should be completed once all of the above tasks have been accomplished. We will now move on to the next major phase of building the platform for our Oracle VM environment.

Build Oracle VM Server Platform

Oracle VM Server for SPARC software is pre-installed in Solaris 11.1 so it doesn’t need to be separately downloaded. The amount of pre-configuration work on the Oracle VM Servers should be minimal, since most configuration tasks are performed by the Oracle VM Server Agent or Manager instead of the logical domains CLI.

If you have an existing system with Solaris 11.1 installed and already running Oracle VM Server for SPARC 3.0, you can proceed directly to installing the ovs-agent as described below. Existing guest domains should be migrated to a different server.

Install Oracle Solaris 11 and Oracle VM Server Agent on Physical Servers

The tasks for installing Oracle Solaris 11 are outside the scope of the document. For reference, please consult the manual Installing Oracle Solaris 11 Systems. When installation is complete, you will have specified the system’s host name, time zone, language, network configuration for one interface, naming service, and designated an initial user account and password. The network should use the DefaultFixed network configuration profile, and the server hostname should be different from "localhost" and should resolve to an IP address different from 127.0.0.1.

The server must be in factory default configuration before installing the Oracle VM Agent. When installing the Oracle VM agent, the Oracle VM Agent setup tool will create and store an initial logical domains configuration appropriate for using the server with Oracle VM Manager.

If this server was previously used to host guest domains, the domains should be migrated to another server or stopped and unbound. Virtual device services should be removed, and the server reset to the factory default configuration. This will require shutting down the control domain and power-cycling the server. Once this process is complete, the server will be in the correct state to install the Oracle VM Server agent:

```bash
# ldm stop -a
# ldm unbind <domain>  # repeat for each guest domain
# ldm rm-vds primary-vds0
```
After Solaris has shutdown, login to the service processor, and perform a power cycle of the system to load the factory default configuration.

```bash
-> stop /SYS
-> start /SYS
```

At this time you have a single domain running on the SPARC server, owning all the server’s CPUs and RAM. In a manual Oracle VM Server for SPARC configuration, the administrator would now issue commands to reduce the control domain in size to free up CPUs and RAM for guest domains. The administrator would also define virtual disk, virtual network, and virtual console concentrator services. This effort is eliminated here because the Oracle VM Agent automatically reconfigures the control domain, saves a new configuration, and defines necessary services.

You can now install the Oracle VM Agent (“ovs-agent”) used to communicate with Oracle VM Manager. Download the ovs-agent tar file as directed by the instructions, and then install the agent as shown below. You will be prompted to enter a agent password, and then will be prompted to reboot the server to complete installation. Actual file names will be different.

```bash
# tar zxf ovs-ldoms-3.2.1.tar.gz
# cd ovs-ldoms-3.2.1
# ./install
Oracle VM Agent Release 3.2.1 Installer

- Installing Packages

  Packages to install: 6
  Create boot environment: No
  Create backup boot environment: No
  Services to change: 1

  DOWNLOAD         PKGS       FILES      XFER (MB)   SPEED
  Completed        6/6        226/226    1.6/1.6     0B/s

  PHASE            ITEMS
  Installing new actions  352/352
  Updating package state database  Done
  Updating image state  Done
  Creating fast lookup database  Done

- Configuring the OVS Agent
```
Network Configuration
Network Configuration OK
OVS Agent Configuration
*** ERROR: The Oracle VM agent password is not defined.
----------------------------------------------
Oracle VM Agent password

Enter a password for the Oracle VM agent (ovs-agent)
This password is used in Oracle VM manager to manage
and monitor this server and its guest VMs. You must
type it twice to ensure you know what it is and
didn’t make a mistake in typing.
Password:
Password (confirm):

OVS Agent Configuration OK
LDoms Manager Configuration
*** WARNING: The LDoms Manager is not configured for unauthenticated migration.
Configuring the domain manager
LDoms Manager Configuration OK
LDoms Configuration
*** ERROR: The vcc service is not configured on the primary domain.
*** ERROR: The vds service is not configured on the primary domain.
*** WARNING: The primary domain is configured with too many cpus for creating guest virtual
machines.
*** WARNING: The primary domain is configured with too much memory for creating guest virtual
machines.
*** WARNING: The primary domain is not configured with the recommended number of cpus (8).
*** WARNING: The primary domain is not configured with the recommended amount of memory (8GB).
*** WARNING: The ovm-initial configuration is not stored on the service processor.
Configuring the vcc service
Configuring the vds service
Configuring the primary domain
Saving the ovm-initial configuration on the service processor
LDoms Configuration OK
----------------------------------------------
LDoms Configuration

The LDoms configuration has been created and stored on the
service processor. To activate this configuration, you need
to reboot the system.
Do you want to reboot the system now?
1) Yes, reboot the system now
2) No, I will reboot the system later

Choice (1-2): 1
There is nothing else to configure on the Oracle VM Servers once the install has completed, with the system up and running. We will now install and configure Oracle VM Manager.

Install Oracle Linux on Management Server

Oracle Linux is needed for the physical server where Oracle VM Manager 3.2.1 will be installed. Although the process is not covered in this document, the Oracle VM Manager 3.2.1 can be installed onto a VM guest running Oracle Linux somewhere on the network, but must be independent of your Oracle VM servers. This tutorial assumes the Oracle Linux will be installed on a physical (bare metal) server.

Install Oracle VM Manager on Management Server

Oracle VM Manager will handle configuring resources on the Oracle VM Servers including adding the storage created during the steps in the last section, additional networks, etc. To install Oracle VM Manager, create and mount an 8-gigabyte or later file system named /u01 on the physical server where Oracle Linux was installed. Then mount the Oracle VM installer ISO that was downloaded earlier to /mnt. Next, run the createOracle.sh script to create necessary users, groups, IP filters and other settings.

```bash
# mount -o ro,loop /tmp/MyOracleVMinstaller.iso /mnt
# cd /mnt
# ./createOracle.sh

Adding group 'oinstall' with gid '54321' ...

Adding group 'dba'
```
Start the installer as root from /mnt once createOracle.sh has completed. The example below shows a simple installation which installs MySQL, Oracle WebLogic Server, Oracle Application Development Framework (ADF), Java, and Oracle VM Manager on the local management server. Filenames and messages may differ slightly.
The installer will ensure prerequisites are met before continuing and then prompt for a password that will be the default password used for all products being installed as well as the log in password for the Oracle VM Manager user interface after the installer has completed.

The installer will prompt the user to continue after it has verified the passwords and space requirements.

The actual install process will begin by displaying something like the following over the next few minutes. The entire install process can take 20 minutes or more.
Installing Java ...

Step 3 of 9 : Database schema ...
Creating database 'ovs' ...
Creating user 'ovs' for database 'ovs'...

Step 4 of 9 : WebLogic ...
Retrieving Oracle WebLogic Server 11g ...
Installing Oracle WebLogic Server 11g ...

Step 5 of 9 : ADF ...
Retrieving Oracle Application Development Framework (ADF) ...
Unzipping Oracle ADF ...
Installing Oracle ADF ...
Installing Oracle ADF Patch...

Step 6 of 9 : Oracle VM ...
Retrieving Oracle VM Manager Application ...
Extracting Oracle VM Manager Application ...
Installing Oracle VM Manager Core ...

Step 7 of 9 : Domain creation ...
Creating Oracle WebLogic Server domain ...
Starting Oracle WebLogic Server 11g ...
Configuring data source 'OVMDS' ...
Creating Oracle VM Manager user 'admin' ...

Step 8 of 9 : Deploy ...
Deploying Oracle VM Manager Core container ...
Deploying Oracle VM Manager UI Console ...
Deploying Oracle VM Manager Help ...
Granting ovm-admin role to user 'admin' ...
Set Log Rotation ...
Disabling HTTP and enabling HTTPS...

Step 9 of 9 : Oracle VM Manager Shell ...
Retrieving Oracle VM Manager Shell & API ...
Extracting Oracle VM Manager Shell & API ...
Installing Oracle VM Manager Shell & API ...

Retrieving Oracle VM Manager Upgrade tool ...
Extracting Oracle VM Manager Upgrade tool ...
Installing Oracle VM Manager Upgrade tool ...

Retrieving Oracle VM Manager CLI tool ...
Extracting Oracle VM Manager CLI tool ...
Installing Oracle VM Manager CLI tool ...
Copying Oracle VM Manager shell to '/usr/bin/ovm_shell.sh' ...
Installing ovm_admin.sh in '/u01/app/oracle/ovm-manager-3/bin' ...
Installing ovm_upgrade.sh in '/u01/app/oracle/ovm-manager-3/bin' ...
The following information will be displayed after the Oracle VM Manager installer has completed. The post-install message contains important information about the Oracle VM Manager and should be saved to a text file for future reference:

<table>
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<th>Installation Summary</th>
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<tbody>
<tr>
<td>Database configuration:</td>
</tr>
<tr>
<td>Database type</td>
</tr>
<tr>
<td>Database host name</td>
</tr>
<tr>
<td>Database name</td>
</tr>
<tr>
<td>Database listener port</td>
</tr>
<tr>
<td>Database user</td>
</tr>
</tbody>
</table>

| Weblogic Server configuration: |
| Administration username | weblogic |

| Oracle VM Manager configuration: |
| Username | admin |
| Core management port | 54321 |
| UUID | 0004fb0650100002f72ae7c96ce1dc6 |

Passwords:
There are no default passwords for any users. The passwords to use for Oracle VM Manager, Database, and Oracle WebLogic Server have been set by you during this installation. In the case of a default install, all passwords are the same.

Oracle VM Manager UI:
https://MyManager:7002/ovm/console
Log in with the user 'admin', and the password you set during the installation.
Please note that you need to install tightvnc-java on this computer to access a virtual machine's console.
For more information about Oracle Virtualization, please visit:
http://www.oracle.com/virtualization/
Oracle VM Manager installation complete.

Figure 2: Important post-installation information displayed by the Oracle VM Manager installer. Keep a copy of the information handy.

The final task is to install a Java serial console client, and if you will be installing x86 servers, install a VNC client. The download instructions for these packages are available from Oracle VM Installation and Upgrade Guide: Installing and Configuring Virtual Machine Console Utilities. This will allow you
to use Oracle VM Manager to launch x86 graphical console sessions as well as serial console on running Oracle VM guests.

```
# rpm -ivh tightvnc-java-1.3.9-4.noarch.rpm
# rpm -ivh jta-2.6-1.noarch.rpm
```

**Figure 3: Process for installing VNC client and Java serial console client.**

This particular figure shows TightVNC being installed, but the free RealVNC can be substituted and in some cases may have better mouse control. Also, Oracle Linux 6 comes with a variation of TightVNC called TigerVNC and should be used instead of TightVNC if the Oracle VM Manager is installed on Oracle Linux 6.

**Log Into Oracle VM Manager**

There is nothing else to configure at this point and you should be able to connect to the Oracle VM Manager user interface (UI) with any supported browser as shown in the figure below. The browser URL for the Oracle VM Manager UI is noted in the post-installation information you saved from above and should look something like the following:

```
https://MyManager:7002/ovm/console
```

Unlike prior versions of Oracle VM Manager, there is no longer a clear text “http” login; “https” is required. You will see messages about an untrusted site because this is an SSL connection to a web site without a signed certificate. Log into the Oracle VM Manager UI using “admin” and the password you set when you ran the installer for Oracle VM Manager.

**Using the Manager environment**

At this point you have an Oracle VM Manager environment and servers that can be configured to run SPARC and x86 servers and virtual machines. Rather than duplicate information, please refer to the Getting Started guide from Oracle VM Documentation. There are also differences in the implementation services for SPARC. In particular, note that storage must be on NFS, not on Fibre Channel or iSCSI. Note also that the virtual console is not accessed via vnc: instead there is a serial console icon to click on when a virtual machine is launched. Most of the other product aspects are similar, so the life-cycle of defining server pools, storage repositories, networks, and virtual machines are done the same ways.

Customers familiar with Oracle VM Server for SPARC should be aware of operational differences. Since the manager and agent software control the environment, avoid using “ldm” commands that alter logical domain configurations, though it is safe to use “ldm list” commands like “ldm list”, “ldm list-bindings”, “ldm list-services”. Inactive guest domains are not visible in an “ldm list” command, because the Manager defines the logical domain to the control domain only when it is started.
consoles can be accessed by local telnet from the control domain to the port bound to the guest, or by clicking on the serial console icon (displayed below) provided by the Manager GUI.

Summary

With this technology release, Oracle VM Server for SPARC customers can start using logical domains with the management capabilities and graphical user interface of Oracle VM Manager.