

Using HP Insight Control for Linux to Manage HP ProLiant DL785 G6 Servers running Oracle VM



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Abstract

This white paper summarizes the installation and configuration of HP Insight Control for Linux (IC-Linux) to manage, in conjunction with Oracle VM Manager, an Oracle VM environment deployed on HP ProLiant DL785 G6 servers. IC-Linux manages the physical server environment and Oracle VM Manager manages the virtualization environment.

Oracle VM is server virtualization software that fully supports both Oracle and non-Oracle applications. Oracle has announced certification of key Oracle products, including Oracle Database, Oracle Fusion Middleware, Oracle Applications, and Oracle Real Application Clusters with Oracle VM.

In this tested configuration of management software, IC-Linux handles physical server deployment, firmware management, performance and health monitoring. Oracle VM Manager can install and manage the virtual machines and their applications on the HP ProLiant DL785 G6 servers running Oracle VM. This IC-Linux configuration requires a pilot software download from HP.

This tested configuration and pilot software is intended for customers who want to evaluate an Oracle VM virtualization environment on HP ProLiant DL785 G6 servers and use the IC-Linux management software. These customers might have multiple Oracle databases and applications that are currently deployed on multiple physical servers, and want to reduce server sprawl and lower costs by consolidating these workloads onto a single HP ProLiant DL785 G6 server running Oracle VM.

Note

The pilot software is supported on a best commercial effort basis by HP and is not recommended for production deployment.

Audience

The audience for this white paper is IT managers and Linux system administrators who have ProLiant DL785 G6 servers deployed with Oracle VM in their IT environment and who want to use HP Insight Control for Linux as part of their management solution.

Overview

The tested configuration includes a central management server (for example, an HP DL380 server) running Red Hat Enterprise Linux with HP Insight Control for Linux and Oracle VM Manager. You can use HP Insight Control for Linux to deploy Oracle VM on each DL785 G6 server, and to manage and monitor these physical servers after OS deployment. Oracle VM Manager installs and manages the virtual machines and their applications on the DL785 G6 servers running Oracle VM, such as Oracle database templates (virtual appliances), Oracle application templates, and base Oracle Enterprise Linux operating systems.

This configuration requires the following HP products:

- HP Insight Control for Linux (IC-Linux) management suite
- Oracle VM 2.2, including Oracle VM Manager and Oracle VM Server
- HP ProLiant DL785 G6 managed servers
- HP ProLiant Central Management Server

- HP StorageWorks Enterprise Virtual Array 4400 or HP StorageWorks MSA2000

The following sections describe these components.

HP Insight Control for Linux (HP IC-Linux) management suite

HP Insight Control for Linux (IC-Linux) is an integrated management solution for multi-system Linux environments of industry-standard HP ProLiant servers with productivity for administrators in both Enterprise and Cluster environments.

HP IC-Linux integrates a robust feature set of the best of open source and HP technologies for discovery, provisioning, server deployment, integrated firmware management, health and performance management, remote management, integrated virtualization, and power management. Open source software, such as Nagios®, is fully integrated and auto-configured for immediate user productivity. Lifecycle management is complemented by multi-system scaling, power management, and direct-to-the-hardware control. HP Insight Control for Linux is backed by HP Linux expertise and global HP support.

HP offers a download to enable HP IC-Linux to interact with Oracle VM. The download consists of the following:

- A Kickstart file that enables IC-Linux to deploy Oracle VM Servers on the DL785 G6 server.
- DMTF WBEM providers that enable IC-Linux to gather key server data and the list of virtual guests deployed on the server.

Oracle VM 2.2

Oracle VM is virtualization software, consisting of Oracle VM Manager and Oracle VM Server, that provides simple installation, fast deployment, and efficient management of virtual machines hosted on Oracle VM Server based systems.

Oracle VM Manager is an integrated graphical management console that enables you to create and manage virtual server pools. Virtual machine creation enables you to deploy virtual machines from Oracle VM Templates and ISO Images. Basic virtual machine control functions include power on and off, console access, configure and reconfigure, deploy, live migration, clone, save as template, pause and unpause, suspend, resume, delete, and reset. You can also enable high availability across resource pools to automatically reduce or eliminate virtual server outages that can cause application downtime.

Oracle VM Server installs directly on the HP ProLiant DL785 G6 and provides the environment for hosting guest virtual machines. You can create, configure, and manage the virtual machines from the Oracle VM Server command line or from the Oracle VM Manager.

HP ProLiant DL785 G6

The HP ProLiant DL785 G6 is an 8-socket x86 server, supporting up to eight (8) six-core AMD Opteron processors, 512GB of memory, eleven (11) PCI-e I/O slots or an optional I/O backplane with seven (7) PCI-e and two (2) HTx I/O slots.

With this highly expandable feature set, the HP ProLiant DL785 G6 is an ideal choice for growing enterprise-class database, consolidation, and virtualization environments seeking to improve server utilization and reduce server and virtualization sprawl, while continuing to leverage familiar and easy to use HP ProLiant management tools and options.

Some of the benefits of this server include:

- Management features such as the HP Integrated Lights-Out 2 (iLO 2)

- Reliability features, such as redundant power supplies and fans, ASR, pre-failure warranty, ensure the HP ProLiant DL785 G6 is well suited to support an enterprise class environment

For more information on the HP ProLiant DL785 G6 servers, see the following website:

<http://www.hp.com/servers/dl785>

HP ProLiant Server

For information on the HP ProLiant servers, see the following website:

<http://www.hp.com/go/proliant>

HP StorageWorks EVA4400 and MSA2000

The HP StorageWorks 4400 Enterprise Virtual Array is an enterprise class virtual storage array with built in virtualization. It is designed to improve capacity utilization and be easy to manage, which lowers the cost of ownership compared to traditional arrays.

For more information on the HP StorageWorks EVA4400, see the following website:

<http://www.hp.com/go/EVA4400>

The HP StorageWorks MSA2000 is a high-performance storage solution that combines outstanding performance with high reliability, availability, flexibility, and manageability. This configuration supports the MSA2012fc and MSA2212fc.

For more information on the HP StorageWorks MSA2000, see the following website:

<http://www.hp.com/go/MSA2000>

Tested configuration

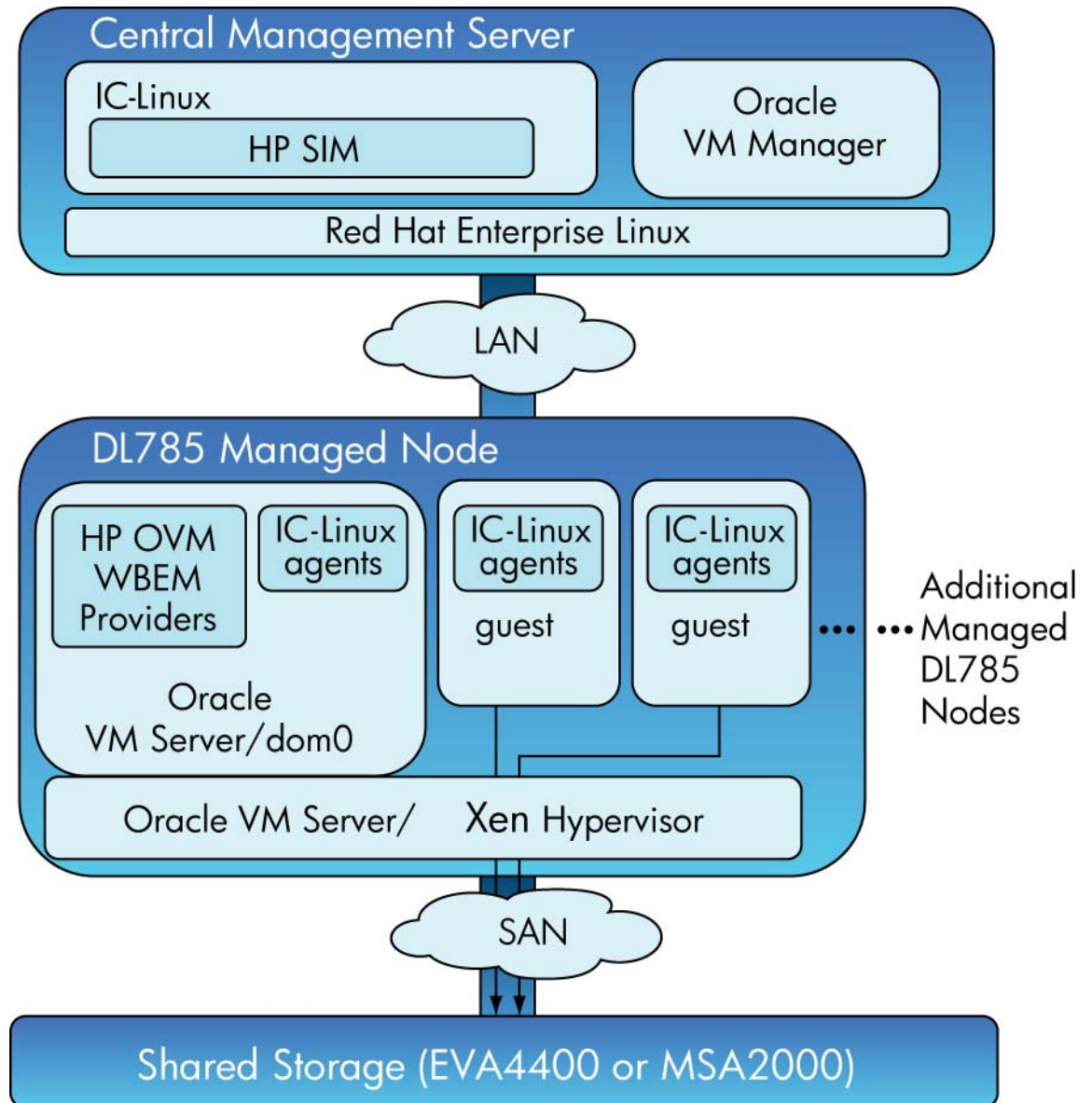
This IC-Linux environment has been tested with the specific hardware, software, and versions listed in this White Paper.

Note

This is not a supported HP product, but rather a tested configuration. For additional support information, see the [Support](#) section.

Figure 1 shows the configuration for HP IC-Linux and Oracle VM on HP ProLiant DL785 G6 servers.

Figure 1. Configuration with Oracle VM and HP IC-Linux for HP ProLiant DL785 G6



The following are the main components of this configuration:

- Central Management Server (CMS)

The Central Management Server (CMS) is an HP ProLiant system that runs HP IC-Linux and Oracle VM Manager. HP IC-Linux performs Oracle VM Server deployment, firmware management, power management, host and guest performance monitoring, and other IC-Linux functions to manage the HP ProLiant Server. HP IC-Linux also deploys the monitoring agents that enable performance and health management of the managed servers and their guests.

HP IC-Linux supports CMS operation on HP ProLiant Blade-, Rack-, and Scalable servers (BL-, DL-, and SL-series servers). Systems supported include HP BladeSystems (c7000 and c3000), HP Rack servers (DL1000, DL785, DL500s, DL300s, DL180s, and DL160s), and Scalable servers (SL6000). See the [HP Insight Control for LinuxV6.0 Support Matrix](#) for specifics on platform support.

The Oracle VM Manager installs the virtual machines, controls them (for example, power on and off, pause, and delete), manages the Oracle VM Templates for use in installation, and provides high availability services for the virtual machines. Oracle VM Manager uses an agent on the managed host Oracle VM Server to enable the virtual guest functions it provides. The agent is included in the OVM Server installation; it is not deployed by OVM Manager.

- DL785 G6 managed node servers

For this configuration, the DL785 G6 managed systems must have a WBEM provider (agent) deployed for the IC-Linux CMS to gather server identification information and the list of virtual guests it is hosting. HP IC-Linux also uses SSH services to perform remote actions initiated by the IC-Linux user. IC-Linux connects directly to the DL785 G6 iLO interface to gather server health information and perform management functions.

- Shared storage

In this configuration, the EVA4400 or MSA2000 provides shared storage for guests across the pool of HP ProLiant DL785 G6 servers.

Hardware requirements

- An HP ProLiant server for the CMS (See the [HP Insight Control for LinuxV6.0 Support Matrix](#) for specifics on platform support.)
- One or more HP ProLiant DL785 G6 servers to host the VM guests
- HP storage array for VM guest storage

Note

Multiple HP ProLiant DL785 G6 servers are required to enable Oracle VM High Availability features.

Installing software

The software installation for the tested configuration in Figure 1 consists of the following steps:

1. Install software on the Central Management Server.
2. Install IC-Linux on the CMS.
3. Install Oracle VM Manager on the CMS.
4. Install the HP OVM Tools on the CMS.
5. Install Oracle VM Server on the virtual machine hosts.
6. Create an Oracle virtual machine on the DL785 G6 virtual machine hosts.
7. Set up IC-Linux management of the Oracle VM Server hosts

The following sections describe each of these steps.

Installing RedHat Enterprise Linux on the CMS

Install RedHat Enterprise Linux 5.2 or 5.3 on the CMS. For complete installation instructions, see the [RedHat Enterprise 5 Installation Guide](#).

Installing IC-Linux on the CMS

HP Insight Control for Linux v6.0 (IC-Linux v6.0) or higher must be used for this solution. HP IC-Linux is available for trial use or purchase from the following website:

<http://www.hp.com/go/ic-linux>

- HP IC-Linux v6.0 with 1-license for a single ProLiant system (464423-B22)
- HP IC-Linux v6.0 licenses for multiple ProLiant systems (464425-B22) (Note: You need multiple licenses if you have multiple HP ProLiant DL 785 G6 managed nodes.)
- HP IC-Linux for multi-year sales to a single customer of more than 100 units (535528-B21). (Note: May provide better price discounting.)
- HP IC-Linux Media kit for the previous part numbers (464422-B22). (Note: This media kit can also be downloaded for free off the website.)

For information about supported Linux versions, see <http://www.hp.com/go/ic-linux>.

To install HP IC-Linux 6.0 on the CMS, follow these steps:

1. Download the IC-Linux ISO file from the Software Downloads section of the following website:

<http://www.hp.com/go/ic-linux>

2. As root, mount the IC-Linux ISO file

(`HP_Insight_Control_for_Linux_V6.00_TC208_11001.iso`) as follows:

```
# mount -o loop HP_Insight_Control_for_Linux_V6.00_TC208_11001.iso /mnt
```

3. Run the installation script as follows:

```
# cd /mnt/HP  
# ./install.sh
```

Caution

If there is already a DHCP server on your network, do not configure HPSIM CMS as another DHCP server. This might cause network disruption.

4. After the installation script completes, unmount the ISO file as follows:

```
# cd /  
# umount /mnt
```

For more information on installing IC-Linux, see the HP IC-Linux Version 6.0 [Installation Guide](#).

To uninstall HP IC-Linux 6.0 on the CMS, follow these steps:

1. Uninstall the HP OVM Tools, if they are already installed, as follows:

```
# rpm -e hp-ovm-tools
```

2. Uninstall IC-Linux following the steps in the HP IC-Linux Version 6.0 [User Guide](#).

Installing Oracle VM Manager 2.2 on the CMS

To install Oracle VM Manager 2.2 on the CMS, follow these steps:

1. Download the Oracle VM Manager 2.2.0 software to the CMS from the following Oracle website:

<http://edelivery.oracle.com/oraclevm>

2. Unzip the downloaded ZIP file as follows:

```
# unzip V18419-01.zip
```

You can download the unzip software from the following location:

<http://public-yum.oracle.com/repo/EnterpriseLinux/EL5/3/base/i386/unzip-5.52-3.el5.i386.rpm>

3. As root mount the ISO file extracted from the ZIP file (OracleVM-Manager-2.2.0.iso) as follows:

```
# mount -o loop OracleVM-Manager-2.2.0.iso /mnt
```

4. Run the installation script as follows:

```
# cd /mnt
# ./runInstaller.sh
```

Note:

During installation, enter **Y** to configure SSL (HTTPS) when prompted to use HTTPS access.

5. After the installation script completes, unmount the ISO file as follows:

```
# cd /
# umount /mnt
```

6. Verify the installation is successful by visiting <https://servername:4443/OVS> to access the Oracle VM Manager.

For more information on installing Oracle VM Manager, see the [Oracle VM Manager Installation Guide Release 2.2](#).

Installing the HP OVM Tools on the CMS

To install the HP OVM Tools on the CMS, follow these steps:

1. Download the HP OVM Tools rpm file (hp-ovm-tools-version.noarch.rpm) from the following website:

<https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=HPOVMTool>

2. Install the HP OVM Tools RPM as follows:

```
# rpm -Uvh hp-ovm-tools*.rpm
```

3. The HP OVM Tools rpm file (hp-ovm-tools-version.noarch.rpm) adds two menus to **Tools→Integrated Consoles** in the CMS web interface that enable you launch Oracle VM Manager. These two menus use port 4443 and https to access Oracle VM Manager.

Installing Oracle VM Server on virtual machine hosts

To install Oracle VM Server on each HP ProLiant DL785 G6, follow these steps:

1. Download the Oracle VM Server 2.2.x software to the CMS from the following Oracle website:

<http://edelivery.oracle.com/oraclevm>

2. Unzip the downloaded ZIP file as follows:

```
# unzip V18336-01.zip
```

You can download the unzip software from the following location:

<http://public-yum.oracle.com/repo/Enterpriselinux/EL5/3/base/i386/unzip-5.52-3.el5.i386.rpm>

3. Create an Oracle VM Server repository from the HP SIM GUI by selecting **Options**→**ICE-Linux**→**Manage Repository**→**New**.
4. Select **Custom OS** and click **Next**.
5. Enter the Custom OS Configuration as follows:

Item type:	Custom OS
Name	<input type="text" value="ovm22"/>
Description	<input type="text" value="Oracle OVM Server 2.2"/>
Vendor	<input type="text" value="Oracle"/>
Version	<input type="text" value="2.2"/>
Architecture	<input type="text" value="i386"/>
Item location:	Local
Note:	The kernel name and RAM disk name entered here should be only the file name, with no path information.
Kernel name	<input type="text"/>
	(The kernel name will default to 'vmlinuz' if left blank)
RAM disk name	<input type="text"/>
	(The RAM disk name will default to 'initrd.img' if left blank)

Important:

The Custom OS Name can be ovm22.

6. Click **Save**. The summary information displays as follows:

Item name	ovm22 has been updated.
Path on disk:	/opt/repository/custom/ovm22
Path via HTTP:	/CustomOS/ovm22
Boot target path on disk:	/opt/repository/boot/ovm22Boot
Kernel name	
RAM disk name	
Notice:	You may now upload the operating system, kernel, and RAM disk images if you have not done so yet.

The following directories are created:

- o /opt/repository/custom/ovm22
 - o /opt/repository/boot/ovm22Boot
 - o /opt/repository/instconfig/custom/ovm22
7. As root mount the ISO file extracted from the ZIP file (OracleVM-Server-2.2.x.iso) as follows:

```
# mount -o loop OracleVM-Server-2.2.x.iso /mnt
```

8. Copy the Oracle VM Server distribution files to the /opt/repository/custom/ovm22 directory as follows:

```
# cp -R /mnt/* /opt/repository/custom/ovm22
```

9. Copy the boot files to the `/opt/repository/boot/ovm22Boot` directory as follows:

```
# cp /mnt/images/pxeboot/initrd.img /mnt/images/pxeboot/vmlinz
/opt/repository/boot/ovm22Boot
```

10. Unmount the ISO file as follows:

```
# umount /mnt
```

11. Copy the sample Kickstart template file to the Custom OS IC-Linux repository. For example:

```
# cp /opt/repository/contrib/ovs-tools/ovm-22-sample-iclx6.cfg \
/opt/repository/instconfig/custom/ovm22/install_conf
```

12. Make sure the `/opt/repository/instconfig/custom/ovm22/install_conf` file has execute permissions. Then, edit it and follow these steps:

- a) If you want to set a default Oracle VM Agent (`ovs-agent`) password for the Oracle VM Server, replace `<OVSAGENTPASSWORD>` with the password you want to set. The Oracle VM Manager requests this password when you add the server to an Oracle VM server pool. For more information, see the [Oracle VM Manager Users Guide Release 2.2](#).
- b) Replace `<ROOTPASSWORD>` with the password for the root user for the Oracle VM server to be deployed.

13. Select **Deploy**→**Operating System**→**Custom or Other...**

14. Verify that the server or servers in the target list are the server to which you want to install an OS.

If the target list is incorrect, click **Add Targets** or **Remove Target**, as needed.

If the target list is empty, follow these steps:

- a) Select **Collection**.
- b) Select **All Servers** from the drop-down menu.
- c) Click **View Contents** to display a list of servers from which you can select.
- d) Click **Apply** when you have selected the servers you want.

When the target list is correct, click **Next**>.

15. Apply an IC-Linux license if a license is not already applied to one or more targets.

16. Select the OS to install and click **Next**>. For example, `ovm22`.

17. Start the installation by clicking either **Run Now** (to launch the OS installation operation immediately) or **Schedule** (to schedule the OS installation to occur at some time in the future).

18. Wait until all installation tasks complete.

For more information on creating custom OS repositories and adding an operating system to them, and on using the IC-Linux remote installation process, see the HP IC-Linux Version 6.0 [User Guide](#).

Setting up IC-Linux management of the Oracle VM Server hosts

To set up IC-Linux management of the Oracle VM Server hosts, follow these steps:

1. Add all licenses to the CMS. Select **Deploy**→**License Manager**→**Add Licenses**.
2. Assign licenses to each HP ProLiant DL758 G6 server. Select **Deploy**→**License Manager**→**Manage Licenses**.
3. Run the discovery process to identify the Oracle VM Server hosts. Select **Options**→**Discovery**.

4. For each Oracle VM Server host, select the host from the CMS, then select **Configure**→**Configure and repair agents** to enable SSH connections.
5. For each Oracle VM Server host, select the host from the CMS, then install the Nagios agents. Select **Options**→**ICE-Linux**→**Configure Management Services**.
6. Monitor the Oracle VM Server using Nagios.

For more information on setting up IC-Linux management of the Oracle VM Server hosts, see the HP IC-Linux Version 6.0 [User Guide](#).

Configuring SAN shared storage

When the Oracle VM Server is installed, it is installed on a local drive. To support many of the features of Oracle VM, you need to create the Oracle VM storage repository on shared storage that is available to all servers in a server pool. For the HP ProLiant DL785 G6, this whitepaper only addresses the following Oracle VM SAN Shared Storage options:

- Shared storage using OCFS2 on SAN
- Shared storage using a partition (multi-path device)

If you use OCFS2, a SAN virtual disk is imported as a single storage device to all servers in the pool. Then, an OCFS2 cluster file system is configured across all servers in the pool to expose the Oracle VM repository to each server in the pool.

If you use a multi-path device, multiple virtual disks are exposed to servers in the server pool. OCFS2 is still configured on the first virtual disk of each server in the pool as in the first option. However, you can attach the additional virtual disks to individual virtual machines for additional storage.

Configuring SAN shared storage using OCFS2

Before configuring SAN shared storage, ensure the FibreChannel cards in each server are in the same zone as the storage so the EVA or MSA storage can see them. Also, create and present a SAN virtual disk to all the servers in the pool so the virtual disk is shared among them.

To configure SAN shared storage using OCFS2, follow these steps:

1. Ensure that the virtual disk (for example, `/dev/sda`) is seen by each server in the pool, as follows:

```
# cat /proc/partitions
104    0    143338560 cciss/c0d0
104    1         104391 cciss/c0d0p1
104    2         3148740 cciss/c0d0p2
104    3    139026510 cciss/c0d0p3
104    4             1 cciss/c0d0p4
104    5         1052226 cciss/c0d0p5
      8      0    209715200 sda
```

2. On one server in the pool, create a partition on the virtual disk with the `fdisk` or `parted` utilities and ensure that the partition (for example, `/dev/sda1`) is seen by each individual server as follows:

```
# cat /proc/partitions
104    0    143338560 cciss/c0d0
104    1         104391 cciss/c0d0p1
104    2         3148740 cciss/c0d0p2
104    3    139026510 cciss/c0d0p3
104    4             1 cciss/c0d0p4
104    5         1052226 cciss/c0d0p5
```

```
8      0      209715200 sda
8      1      195310206 sda1
```

3. On the server selected in step 2, create an OCFS2 file system on the virtual disk. For example:

```
# mkfs.ocfs2 -Tdatafiles -N8 /dev/sda1
```

4. Remove the default local repository from each server in the pool. For example, the following command returns the repository name and UUID on a server:

```
# /opt/ovs-agent-2.3/utils/repos.py --list
```

Copy the UUID and use it to delete the local repository. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --delete UUID
```

5. Create the shared repository on the server you will use as the Oracle VM Server Pool Master. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --new /dev/sda1
```

Note:

Create the repository only on the Oracle VM Server Pool Master.

6. Set the repository as the cluster root. For example, the following command returns a list of the storage repositories including the UUID for each one:

```
# /opt/ovs-agent-2.3/utils/repos.py --list
```

Copy the UUID and use it to set the repository as the cluster root. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --r UUID
```

Note:

Do not mount the remote virtual disk locally on any server.

When these steps are complete, there must only be one repository on the Oracle VM Server Pool Master and no repositories present on the rest of the servers in the pool.

Configuring shared storage using a partition

Before configuring SAN shared storage, ensure the FibreChannel cards in each server are in the same zone as the storage so the EVA or MSA storage can see them. Also, create and present as many SAN virtual disks as needed to all the servers in the pool so the virtual disk is shared among them. For this multipath configuration, make sure you pointing the two ports on each FibreChannel card to same virtual disks.

To configure shared storage using a partition, follow these steps:

1. Make sure the `device-mapper-multipath` package is installed on each server.
2. Edit `/etc/multipath.conf` file on each server as follows:
 - o Comment out the default blacklist for all devices as follows:

```
# blacklist {
#     devnode "*"
# }
```

- o Add the following for 4x00, EVA6x00, and EVA8x00 virtual disks:

```
Device
{
vendor "(COMPAQ|HP)"
product "HSV1[01]1|HSV2[01]0|HSV300|HSV4[05]0"
getuid_callout "/sbin/scsi_id -g -u -s /block/%n"
prio_callout "/sbin/mpath_prio_alua /dev/%n"
hardware_handler "0"
path_selector "round-robin 0"
path_grouping_policy group_by_prio
failback immediate
rr_weight uniform
no_path_retry 18
rr_min_io 100
path_checker tur
}
```

- o Add the following for MSA2012fc, MSA2212fc, and MSA2012i virtual disks:

```
Device
{
vendor "HP"
product "MSA2[02]12fc|MSA2012i"
getuid_callout "/sbin/scsi_id -g -u -s /block/%n"
hardware_handler "0"
path_selector "round-robin 0"
path_grouping_policy multibus
failback immediate
rr_weight uniform
no_path_retry 18
rr_min_io 100
path_checker tur
}
```

3. Ensure that dm_multipath is loaded on each server as follows:

```
# lsmod | grep dm_multipath
```

If it is not loaded, enter the following:

```
# modprobe dm_multipath
# service multipathd restart
```

4. Ensure that the multipath daemon is configured to start on boot on each server as follows:

```
# chkconfig multipathd on
```

5. Verify that multipath is configured on each server as follows:

```
# dmsetup ls
# multipath -l
```

If successful, an entry similar to the following is listed under /dev/mpath:

```
mpath0 mpath1 mpath2
```

Entering `ls -l` on the directory displays the following:

```
lrwxrwxrwx 1 root root 7 Nov 10 18:12 mpath0 -> ../dm-0
lrwxrwxrwx 1 root root 7 Nov 10 18:12 mpath1 -> ../dm-1
lrwxrwxrwx 1 root root 7 Nov 10 18:12 mpath2 -> ../dm-2
```

- Verify that the virtual disks (for example, the 253 major numbered devices) are seen in each individual server as follows:

```
# cat /proc/partitions
104      0 143338560 cciss/c0d0
104      1 142279641 cciss/c0d0p1
104      2   1052257 cciss/c0d0p2
  8       0 209715200 sda
  8      16 209715200 sdb
  8      32 314572800 sdc
  8      48 209715200 sdd
  8      64 209715200 sde
  8      80 314572800 sdf
253      0 209715200 dm-0
253      1 209715200 dm-1
253      2 314572800 dm-2
```

- On one server in the pool, create a partition on the virtual disk with the *fdisk* or *parted* utilities and restart *multipathd* to ensure that the partition appears in the local file system as follows:

```
# cat /proc/partitions
104      0 143338560 cciss/c0d0
104      1 142279641 cciss/c0d0p1
104      2   1052257 cciss/c0d0p2
  8       0 209715200 sda
  8       1  97659103 sda1
  8      16 209715200 sdb
  8      32 314572800 sdc
  8      48 209715200 sdd
  8      49  97659103 sdd1
  8      64 209715200 sde
  8      80 314572800 sdf
253      0 209715200 dm-0
253      1 209715200 dm-1
253      2 314572800 dm-2
253      3  97659103 dm-3
```

The `/dev/mpath` directory contains the following:

```
lrwxrwxrwx 1 root root 7 Nov 16 12:35 mpath0 -> ../dm-0
lrwxrwxrwx 1 root root 7 Nov 16
```

- On the server selected in step 7, create an OCFS2 file system on the virtual disk using the one server in the pool. For example:

```
# mkfs.ocfs2 -Tdatafiles -N8 /dev/mpath/mpath0p1
```

- Remove the default local repository from each server in the pool. For example, the following command returns the repository name and UUID on a server:

```
# /opt/ovs-agent-2.3/utils/repos.py --list
```

Copy the UUID and use it to delete the local repository. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --delete UUID
```

- Create the shared repository on the server you will use as the Oracle VM Server Pool Master. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --new /dev/mpath/mpath0p1
```

Note:

Create the repository only on the Oracle VM Server Pool Master.

11. Set the repository as the cluster root. For example, the following command returns a list of the storage repositories including the UUID for each one:

```
# /opt/ovs-agent-2.3/utils/repos.py --list
```

Copy the UUID and use it to set the repository as the cluster root. For example:

```
# /opt/ovs-agent-2.3/utils/repos.py --r UUID
```

Note:

Do not mount the remote virtual disk locally on any server.

When these steps are complete, there must only be one repository on the Oracle VM Server Pool Master and no repositories present on the rest of the servers in the pool.

Completing shared storage configuration with Oracle VM Manager

Use Oracle VM Manager to create the server pool and add all the other servers to the pool. Be sure to use the server where the repository was created as the Server Pool Master. As each server is added, Oracle VM Manager updates the cluster configuration and mounts the repository on the server.

Troubleshooting

When a configuration command issued on a shared volume group fails, the failure might be caused by any node sharing the volume group or might be caused by several nodes.

Known issues

Not using HTTPS access for Oracle VM Manager

Problem:

During Oracle VM Manager installation, you entered **N** when prompted to use HTTPS access. This uses HTTP to access Oracle VM Manager and port 8888 to listen, and affects the operation of the IC-Linux Oracle VM Manager console launch menu.

Workaround:

To change the access protocol and port number, follow these steps:

1. Enter the following commands:

```
/opt/mx/bin/mxtool -r -t "OVM Manager"  
/opt/mx/bin/mxtool -r -t "OVM MgrExt"
```

2. Edit the `https://%s:4443/OVS` entry in the `/opt/repository/contrib/ovs-tools/OVManager.xml` file and change the protocol and port number to `http` and `8888`, respectively. Do not edit `%s` as this represents the server name.
3. Enter the following command:

```
/opt/mx/bin/mxtool -a -f OVManager.xml
```


4. Log in to the CMS web interface.

Select **Tools**→**Integrated Consoles**→**OVM Manager** to verify that the link works.

No MAC addresses registered for system

Problem:

During the installation, deployment, or capture of IC-Linux, the **Configure System to Boot from Network** step fails with the following message:

```
There are no MAC addresses registered for this system.
```

Workaround:

Bare metal boot the system as follows:

1. Determine the target system MAC address from DHCP.
2. Delete the corresponding PXE configuration file located in `/opt/repository/boot/pxelinux.cfg/` on the CMS. The file name format is `01-MAC-address`, where `MAC-address` is dash-separated MAC address.
3. PXE boot the target server as follows:
 - a. Connect to the target system iLO using either an ActiveX or Java enabled browser.
 - b. Connect to the remote console.
 - c. At the end of BIOS pre-boot, press `<ALT>+F12` to boot the system from the network.
4. Wait until the target system boots. Then, wait for the IC-Linux RAM Disk to shut itself down. This can take several minutes.

Re-run the failed task.

Support

Oracle VM is supported by Oracle.

HP ProLiant DL785 G6, RHEL AP, and HP EVA and MSA storage is supported by HP.

IC-Linux is supported by HP.

The downloadable software (Kickstart file and DMTF WBEM provider) that enables IC-Linux to manage HP ProLiant DL785 G6 servers running Oracle VM is supported by HP on a best commercial effort response only. Contact HP using the Oracle VM Forum at <http://communitylinux.org/forum/>.

For production environments, HP strongly recommends you contact your HP Sales Representative or HP Channel Partner for a custom support contract.

For more information

For more information on Oracle VM, see the following website:

- <http://www.oracle.com/us/technologies/virtualization/index.htm>

For more information on the HP ProLiant DL785 G6, see the following website:

- <http://www.hp.com/servers/dl785>

For more information on the EVA4400, see the following website:

- <http://www.hp.com/go/EVA4400>

For more information on the MSA2000, see the following website:

- <http://www.hp.com/go/MSA2000>

For more information on Linux on ProLiant servers, see the following websites:

- <http://www.hp.com/go/proliantlinux>
- <http://www.hp.com/go/linux>

For more information on IC-Linux, see the following websites:

- <http://www.hp.com/go/ic-linux>
- <http://www.hp.com/go/insightcontrol>

Providing feedback to HP

HP welcomes your input. Please give us comments about this white paper, or suggestions for the tested configuration for the management of Oracle VM on HP ProLiant DL785 G6 servers or related documentation, through our technical documentation feedback website:

<http://docs.hp.com/en/feedback.html>