Benefits of Server Power Control Options in OpenManage Essentials

This Dell Technical White Paper explains the benefits and best practices when using server power control options in OpenManage Essentials.

Sean Kim
Dell Enterprise Product Group
Benefits of Server Power Control Options in OpenManage Essentials

This document is for informational purposes only and may contain typographical errors and technical inaccuracies. The content is provided as is, without express or implied warranties of any kind.

© 2013 Dell Inc. All rights reserved. Dell and its affiliates cannot be responsible for errors or omissions in typography or photography. Dell, the Dell logo, and PowerEdge are trademarks of Dell Inc. Intel and Xeon are registered trademarks of Intel Corporation in the U.S. and other countries. Microsoft, Windows, and Windows Server are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims proprietary interest in the marks and names of others.

February 2013 | Version 1.0
Contents

Introduction .................................................................................................................. 5
Dell Remote Access Controller ...................................................................................... 5
Enable IPMI Over LAN ................................................................................................. 6
DRAC5 and iDRAC6 ..................................................................................................... 6
Enabling IPMI Over LAN Using the Dell Remote Access Configuration Utility for iDRAC7 ........................................................................................................... 8
Enabling IPMI Over LAN Using the Remote Access Controller ........................................ 10
Web Console Interface ............................................................................................. 10
To Access the Remote Access Controller Web Console: ................................................ 10
Enabling IPMI Over LAN Using Web Console for DRAC5 .............................................. 11
Enabling IPMI Over LAN Using Web Console for iDRAC6 .............................................. 12
Enabling IPMI Over LAN Using Web Console for iDRAC7 .............................................. 13
Creating a Server Power Task .................................................................................... 14
In-bound Server Power Tasks ..................................................................................... 18
Out-of-bound Server Power Tasks .............................................................................. 18
Power Task by Command Line Task ........................................................................ 19
Summary .................................................................................................................... 24
Additional resources ................................................................................................. 25

Tables

Table 1. Device Capability Matrix ............................................................................... 22
Table 2. Device Capability Matrix with Enable All Option Selected ............................... 23

Figures

Figure 1. DRAC5 Remote Access Setup ............................................................................. 6
Figure 2. iDRAC6 Remote Access Setup ............................................................................. 6
Figure 3. DRAC5 Remote Access Configuration Utility .................................................... 7
Figure 4. iDRAC6 Configuration Utility ............................................................................ 7
Figure 5. Power-on Self-test (POST) menu ...................................................................... 8
Figure 6. UEFI System Setup .......................................................................................... 8
Figure 7. iDRAC7 Settings ............................................................................................. 9
Figure 8. iDRAC7 Network Settings ................................................................................ 9
Figure 9. DRAC5 Login Screen ....................................................................................... 11
Figure 10. DRAC5 Web Interface IPMI LAN Settings ....................................................... 11
Figure 11. iDRAC6 Login Screen ................................................................................... 12
Figure 12. iDRAC6 Web Interface IPMI Settings ......................................................... 12
Figure 13. iDRAC7 Login Screen .............................................................................. 13
Figure 14. iDRAC7 Web Interface IPMI Setting ........................................................ 13
Figure 15. Create Power Task in Remote Tasks ....................................................... 14
Figure 16. Clone a Pre-canned Sample Task ............................................................. 14
Figure 17. Cloned Task Name .................................................................................. 14
Figure 18. Edit the Cloned Task .............................................................................. 14
Figure 19. Create a Power Task Wizard ................................................................. 15
Figure 20. Power Task Target ................................................................................ 16
Figure 21. Select Devices by Query .......................................................................... 16
Figure 22. Power Task “Run Once” Schedule ........................................................... 17
Figure 23. Power Task “Periodic” Schedule ............................................................. 17
Figure 24. In-band Power Task Credentials ............................................................. 18
Figure 25. Out-of-band power task credentials ...................................................... 19
Figure 26. RACADM Command Line Task - serveraction ......................................... 20
Figure 27. Command Line Task Schedule and Credentials ....................................... 21
Introduction

OpenManage Essentials (OME) includes the ability to create your own command line tasks to target an individual or a group of servers. This can be a command line script, Remote Server Administrator command, Remote Access Controller Admin (RACADM), or Intelligent Platform Management Interface (IPMI) task. Tasks to deploy OpenManage Server Administrator (OMSA) to Dell servers are included as well as tasks to manage servers using power options.

In the current information technology based market, remote power management plays an important role in managing data centers. On one end of the spectrum, many businesses rely heavily on the up-time of their servers. Down-time of these servers can be disastrous and can lead to loss of productivity and loss of customers, which in turn, leads to loss of revenue.

On the other end of the spectrum, many businesses are impacted by the increasing consumption of energy by their growing data centers and the associated costs, which have forced them to take measures to reduce energy consumption for financial reasons. Some companies are taking similar energy saving initiatives to promote environmental responsibility.

In this whitepaper, we will discuss the server power options available in OpenManage Essentials. The benefits of using the server power options to perform traditional remote server administration tasks. And how manage energy consumption for financial benefits and to promote environmental responsibility.

Dell Remote Access Controller

Dell Remote Access Controller or DRAC is an interface card that provides out-of-band management capabilities on a Dell server. Out-of-band management, sometimes referred to as lights-out-management (LOM) involves the use of a dedicated management channel for device maintenance. It allows a system administrator to monitor and manage servers remotely regardless of whether the machine is powered on, or if an operating system is installed or functional, as long as the server has power and network connectivity. The DRAC interfaces with baseboard management controller (BMC) chips on the IPMI 2.0 standard, which allows use of IPMI out-of-band interfaces such as IPMI Over LAN. By contrast, in-band management is based on software (for example, OpenManage Server Administrator (OMSA)) that must be installed on the remote system being managed and only works after the operating system has been booted.

The latest version is iDRAC, i stands for integrated, as the hardware is often integrated as part of the motherboard. Two options of iDRAC are Express and Enterprise. There are differences in the capabilities of the two options of the iDRAC, however in this document we will only reference IPMI Over LAN, where there are no differences when using either Express or Enterprise.

More information can be found for the differences of iDRAC Express and iDRAC Enterprise in the iDRAC user guide, which is referenced at the end of this document.
Enable IPMI Over LAN

You must enable IPMI Over LAN on your Dell Remote Access Controller device in order to manage your Dell server using OME’s power options via the out-of-band method.

Details on configuring the Remote Access Controller are limited in this document. More information on configuring the Dell Remote Access Controller can be found in the user guides referenced at the end of this document.

Enabling IPMI Over LAN Using the Dell Remote Access Configuration Utility for DRAC5 and iDRAC6

1. Turn on or restart your system.
2. Press <Ctrl>-<E> when prompted during POST.
   
   If your operating system begins to load before you press <Ctrl>-<E>, allow the system to finish booting, and then restart your system and try again.

3. Highlight IPMI Over LAN using the <Left Arrow> and <Right Arrow>. Press the spacebar to select On.
4. Configure the LAN parameters and user credentials accordingly.

5. When you have finished configuring the Remote Access Controller, press <Esc> to display the Exit menu, then select Save Changes and Exit.

The system will automatically reboot.
Enabling IPMI Over LAN Using the Dell Remote Access Configuration Utility for iDRAC7

1. Turn on the managed system and press <F2> during Power-on Self-test.

   Figure 5. Power-on Self-test (POST) menu

   ![Power-on Self-test (POST) menu]

2. On the System Setup Main Menu page, click iDRAC Settings.

   Figure 6. UEFI System Setup

   ![UEFI System Setup]

3. On the iDRAC Settings page, click Network.
4. On the Network page, enable IPMI Over LAN under IPMI SETTINGS.
   a. For Enable IPMI Over LAN, select Enabled.
   b. For Channel Privilege Limit, select Administrator, Operator, or User.
   c. For the Encryption Key, enter the encryption key using 0 to 40 hexadecimal characters (without any spaces). The default value is all zeros.

5. Configure the LAN parameters and user credentials accordingly.

6. Return to the System Setup Main Menu page and click Finish.
   The network information is saved and the system reboots.
Enabling IPMI Over LAN Using the Remote Access Controller

Web Console Interface

The following sections contain instructions for accessing and enabling IPMI over LAN using the Remote Access Controller Web console for DRAC5, iDRAC6, and iDRAC 7.

To Access the Remote Access Controller Web Console:

1. In a supported Web browser, type the following in the address field and press <Enter>.
   
   https://< RAC IP address>:<port_number>

2. Enter the applicable port number if the default port number (443) has been changed.
   
   NOTE: When using https, the default port 443 is understood and is not required.

3. On the login screen, enter the correct credentials and press <Enter>, or click OK, or Submit.
   
   NOTE: The user name and password for local users are case sensitive.

4. For iDRAC6 and iDRAC7, in Domain, select This iDRAC for logging in as an iDRAC6 user, or select any of the available domains for logging in as an Active Directory user.
   
   - Active Directory names can be entered in any of the forms <username>,
     <domain\<username>, <domain>/<username>, or <user>@<domain>.
   
   - Active Directory names are not case sensitive, for example, dell.com\john_doe, or JOHN_DOE@DELL.COM
   
   - In Password, type your iDRAC user password or Active Directory user password. Passwords are case sensitive.

5. After you are logged on to the Web interface, enable IPMI Over LAN and configure the settings as highlighted below.
   
   NOTE: The console may look different depending on the firmware version installed on the RAC.
Benefits of Server Power Control Options in OpenManage Essentials

Enabling IPMI Over LAN Using Web Console for DRAC5

1. Log in to the console.

   Figure 9. DRAC5 Login Screen

   ![DRAC5 Login Screen](image1)

2. Click Remote Access in the left pane, and then click the Configuration tab.

3. Click Network on the Configuration tab, scroll down to IPMI LAN Settings and select Enable IPMI Over LAN. Complete the rest of the values as appropriate.

   Figure 10. DRAC5 Web Interface IPMI LAN Settings

   ![DRAC5 Web Interface IPMI LAN Settings](image2)
Enabling IPMI Over LAN Using Web Console for iDRAC6

1. Log in to the console.

   Figure 11. iDRAC6 Login Screen

2. Click iDRAC Settings in the left pane, then click the Network/Security tab.

3. Click Network on the Network/Security tab, scroll down to IPMI Settings and select Enable IPMI Over LAN. Complete the rest of the values as appropriate.

   Figure 12. iDRAC6 Web Interface IPMI Settings
Enabling IPMI Over LAN Using Web Console for iDRAC7

1. Log in to the console.

   ![iDRAC7 Login Screen](image)

   **Figure 13. iDRAC7 Login Screen**

2. Click **iDRAC Settings** → **Network** in the left pane.

3. On the **Network** tab, scroll down to **IPMI LAN Settings** and select **Enable IPMI Over LAN**. Complete the rest of the values as appropriate.

   ![iDRAC7 Web Interface IPMI Setting](image)

   **Figure 14. iDRAC7 Web Interface IPMI Setting**
Creating a Server Power Task

1. In OME, go to Manage → Remote Tasks, and then click Create Power Task in the Common Tasks menu, in the left pane.

Figure 15. Create Power Task in Remote Tasks

Alternatively, you can clone a pre-canned Sample task in the Remote Tasks menu, and then edit the cloned task.

Figure 16. Clone a Pre-canned Sample Task

Figure 17. Cloned Task Name

Figure 18. Edit the Cloned Task
2. Enter a **Task Name** and select a server power task type:
   - *Reboot* — Reboots the system without powering off
   - *Power Cycle* — Powers off, then reboots the system
   - *Power Off* — Powers off the system
   - *Power On* — Powers on the system
   - *Shutdown OS first* — Gracefully shut down the operating system before executing a power task.

   **Figure 19. Create a Power Task Wizard**

3. Click *Next*.
4. Select an applicable target, and then click *Next*.

   Power task targets can be selected either by a query or by selecting device(s) and/or device group(s) from the device tree under the **Task Target** tab.

   Depending on the type of power task selected, devices may not be selectable (grayed-out) in the device tree.
Using the **Enable All** option can override the selectability of the targets, however some prerequisites of the task being ran must be met.

Review the Device Capability Matrix at the end of this document for supported Operating Systems for each remote task type.

**Figure 20. Power Task Target**

![Power Task Target](image1.png)

**Figure 21. Select Devices by Query**

![Select Devices by Query](image2.png)

5. Choose a schedule method and provide credentials, and then click **Finish**.
   - **Run Now** — Runs the task immediately after clicking the **Finish** button.
   - **Set schedule** — Runs the task at a specific date and time or periodically.
     - **Run Once** — Select a specific date and time by clicking the calendar button next to the date and time shown.
     - **Periodically** — Specify **Hourly**, **Daily**, **Weekly**, or **Monthly** and specify the range of recurrence.

Deselect **Activate Schedule** to disable the schedule to enable at a later time.
Benefits of Server Power Control Options in OpenManage Essentials

Figure 22. Power Task “Run Once” Schedule

Figure 23. Power Task “Periodic” Schedule
In-bound Server Power Tasks

Credentials with administrator privileges to the server are required to run a Reboot, Power Cycle, or Power Off tasks (in-band).

- In-band tasks must be run against a device classified under the Servers device group.
- In-band tasks may not run successfully for all devices classified under the Servers device group due to the server’s operating system and/or configuration.

Figure 24. In-band Power Task Credentials

Out-of-bound Server Power Tasks

Credentials with administrator level access to the RAC device is required to run a Power On task (out-of-band). A Power On task can use a server or a RAC device as a target, however the following prerequisites must be met:

- IPMI Over LAN must be enabled on the RAC device.
- The RAC device must be reachable by the OME management system.
- IPMI credentials are required when creating the Power On task.
- When using a server target to perform a Power On task, the RAC IP information must be retrieved and displayed in the inventory page.

When creating a Power On task, the server or RAC device may not be selectable in the task target device tree when:

- Using IPMI, only the server is discovered and not its’ RAC device.
- The RAC device is discovered using another applicable protocol other than IPMI.

Using the Enable All option can override the selectability of the targets, however some prerequisites of the task being run must be met.

Review the Device Capability Matrix at the end of this document for supported Operating System for each remote task type.
Power Task by Command Line Task

RACADM is a scriptable utility that can retrieve and configure RAC properties locally and remotely and configure multiple RACs in batch mode. We will focus on the RACADM serveraction. The serveraction command executes a managed system reset or power-on/off/cycle.

Power tasks can be performed by creating and running a RACADM command line task.

1. In OME, go to Manage → Remote Tasks, and then click Common Tasks → Create Command line Task in the left-pane.
2. Select RACADM Command Line.
   
   RACADM is implicit when selecting the RACADM command line option and is not required in the command.

3. Enter serveraction followed by a subcommand in the command field.
   
   Example: serveraction powerdown

serveraction subcommand options include:

- **powerdown** — Powers down the managed system.
- **powerup** — Powers up the managed system.
- **powercycle** — Issues a power-cycle operation on the managed system. This action is similar to pressing the power button on the system's front panel to power down and then power up the system.
- **powerstatus** — Displays the current power status of the server (ON, or OFF)
- **hardreset** — Performs a reset (reboot) operation on the managed system.

4. Select **Output to file** option to capture the output to a log file. If you select this option, you must enter the path name and file name of the log file. This option is disabled by default.
Figure 26. RACADM Command Line Task - serveraction

5. RACADM command line tasks are performed using the out-of-band method and is run using the RAC device. Therefore, by default, only devices under the RAC device group will be selectable. Using the **Enable All** option can override the selectability of the targets in the servers device group, however some prerequisites of the task being ran must be met:

   - IPMI Over LAN must be enabled on the RAC device.
   - The RAC device must be reachable by the OME management system.
   - IPMI credentials are required when creating any RACADM command line task.
   - When using a server as a target to run a RACADM serveraction command, the RAC IP information, must be retrieved and displayed in the inventory page.

6. Set the schedule, enter applicable credentials to the RAC device, and then click **Finish**.
Figure 27. Command Line Task Schedule and Credentials
Table 1. Device Capability Matrix

<table>
<thead>
<tr>
<th>Remote Task Type</th>
<th>All Servers (except ESXi &amp; XEN) With Server Administrator and Discovered Using SNMP/WMI [a]</th>
<th>Windows-based Servers without Server Administrator and discovered using WMI [a]</th>
<th>Linux-based Servers without Server Administrator and discovered using SSH [a]</th>
<th>DRAC/iDRAC discovered using IPMI [b]</th>
<th>DRAC/iDRAC discovered using SNMP/WS-Man [b]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reboot / Power Cycle</td>
<td>Supported</td>
<td>Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Power Off</td>
<td>Supported</td>
<td>Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Power On</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Remote Server Administrator Command Line</td>
<td>Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>IPMI Command</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>RACADM Command</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Supported</td>
</tr>
</tbody>
</table>

[a] DRAC/iDRAC is not discovered.

[b] Server operating system is not discovered.

Device capabilities for a server or DRAC/iDRAC device are populated during discovery and are leveraged by remote tasks to determine applicable targets for each task type. The capability is populated based on the following parameters:

- Protocol used to discover the server and DRAC/iDRAC. For example, IPMI, SNMP.
- If Server Administrator is installed on the server.
- Settings enabled on the DRAC/iDRAC

Selecting the Enable All check box allows you to override device capability and allows all the available devices for selection as task targets.
The device capability matrix below provides information about the type of remote tasks supported on devices when the device capabilities are overridden.

### Table 2. Device Capability Matrix with Enable All Option Selected

<table>
<thead>
<tr>
<th>Device Support →</th>
<th>All Servers (except ESXi &amp; XEN) With Server Administrator and Discovered Using SNMP/WMI [a]</th>
<th>Windows-based Servers without Server Administrator and discovered using WMI [a]</th>
<th>Linux-based Servers without Server Administrator and discovered using SSH [a]</th>
<th>DRAC/iDRAC discovered using IPMI [b]</th>
<th>DRAC/iDRAC discovered using SNMP/WS-Man [b]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reboot / Power Cycle</td>
<td>Supported</td>
<td>Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Power Off</td>
<td>Supported</td>
<td>Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>Power On</td>
<td>Supported [c]</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Supported [d]</td>
</tr>
<tr>
<td>Remote Server Administrator Command Line</td>
<td>Supported [c]</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported [d]</td>
</tr>
<tr>
<td>IPMI Command</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Not Supported</td>
</tr>
<tr>
<td>RACADM Commands</td>
<td>Supported [e]</td>
<td>Not Supported</td>
<td>Not Supported</td>
<td>Supported</td>
<td>Supported</td>
</tr>
</tbody>
</table>

[a] DRAC/iDRAC is not discovered.

[b] Server operating system is not discovered.

[c] Supported if:
- DRAC/iDRAC information is retrieved and displayed in the inventory page.
- IPMI over LAN is enabled on the DRAC/iDRAC device.
- You select Enable All in the Tasks Target tab.

[d] Supported if:
- IPMI over LAN is enabled on the DRAC/iDRAC device.
- You select Enable All in the Tasks Target tab.

[e] Supported if:
- DRAC/iDRAC information is retrieved and displayed in the inventory page.
- You select Enable All in the Tasks Target tab.
Summary

Server power capabilities in OpenManage Essentials can be used for traditional remote server management purposes such as performing a reboot or a power cycle task on a server for maintenance or if the system is non-responsive. However, the functions are most powerful when the tasks are scheduled to run periodically.

Scheduling the tasks to run periodically can automate the process of power cycling systems during maintenance hours to ensure optimal up-time. The tasks can also be scheduled to power down and power up a server or groups of servers during a specified date and time, when the servers are not being used, to reduce power consumption for financial benefits and to reduce environmental impact from consumption of energy by your datacenter.
Benefits of Server Power Control Options in OpenManage Essentials

Additional resources

Visit www.dell.com/ome or www.delltechcenter.com/ome for more information on Dell OpenManage Essentials.

Visit Dell.com/PowerEdge for more information on Dell’s enterprise-class servers.

Guides:

- Dell Remote Access Controller
  - Generation 9 - DRAC5
  - Generation 10 & 11 - iDRAC6
  - Generation 12 - iDRAC7

- Using iDRAC with Windows Active Directory
  - iDRAC6
  - iDRAC7

- RACADM User Guide