iDRAC Service Module-iDRAC CPU Hard Reset

This White Paper provides information about the usage and troubleshooting of iDRAC CPU Hard Reset feature in iDRAC Service Module v2.3 or later.

Dell Engineering
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A Dell Technical White Paper
## Revisions

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td>July 2016</td>
<td>Initial release</td>
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Executive summary

The iDRAC Hard Reset is a method where the administrator is able to hard reset the iDRAC CPU without rebooting the host. This typically shall be used when all the iDRAC interfaces are frozen and user has no option of reaching iDRAC remotely.

Currently you can perform an iDRAC CPU hard reset operation using the following mechanisms:

- Press the i button on the server for 15 seconds
- A/C power cycle

Both the above methods require the user or administrator to:

- Stop or migrate the workloads from the target server
- Shut down the Host OS
- Physically visit the server to reset the iDRAC or A/C power cycle
- Boot up the server and bring back the migrated workloads

All of the above overheads can be avoided by using iDRAC Service Module 2.3.0 or later which has the feature to reset iDRAC remotely without impacting the Host OS setup or the jobs running on it.

The Dell Integrated Remote Access Controller (iDRAC) Service Module is a lightweight systems management application installed on a physical Host operating system (OS) of a managed server. iDRAC Service Module works as a system management application for Dell’s Out of Band (OOB) system management processor which is the Integrated Dell Remote Access Controller (iDRAC). Installing iDRAC Service Module v2.3 or later allows the administrator to reset the iDRAC remotely even when iDRAC is unresponsive.

Prerequisites for performing iDRAC Hard Reset

- iDRAC Service Module 2.3.0 or later should be installed on the server Operating System.
- The latest system BIOS.
- The latest system CPLD.

Supported Dell Servers or Platforms

- The iDRAC Hard Reset is supported on all the Dell 13G PowerEdge servers (except R930) with the supported BIOS and CPLD versions.

Supported Operating Systems

- The iDRAC hard reset is supported on all OSs which iSM 2.3 supports. For more information on the supported operating systems, refer the iDRAC Service Module installation guide for v2.3.0.

What this feature is

- This is equivalent to physically walking to the server and performing an A/C power cycle or pressing the i button on the server.
- Performing this action does not reboot the OS.

What this feature is NOT

- This is not the same as iDRAC soft reset such as the iDRAC reset option in iDRAC GUI or the racadm command to reset iDRAC: i.e., racadm racreset
This caters to a scenario where even the KCS interface in iDRAC is unresponsive and there is no way to connect to iDRAC using any of the iDRAC supported interfaces like GUI, RACADM, WSMAN, SSH.

1 iDRAC Hard Reset on Windows Operating Systems

iDRAC Service Module provides the following interfaces through which iDRAC can be reset.

1. **WMI method**
   a. This can be invoked either locally by logging into the OS using a remote desktop session or remotely using the Windows Management Instrumentation (WMI) remote commands.

2. **PowerShell cmdlet**
   a. This can be invoked either locally by logging into the OS using a remote desktop session or remotely using PowerShell remote commands.

3. **A program menu short cut**
   a. This can be executed by logging into the OS using remote desktop session and selecting the iDRAC reset option from the program menu.

1.1 iDRAC Reset using the WMI method

To reset the iDRAC using WMI method, the procedure is as follows:

- Install iDRAC Service Module on the Host OS
- Open an administrative command prompt
- Execute the local WinRM command: `winrm i iDRACHardReset wmi/root/cimv2/dcim/DCIM_iSMService?InstanceID="ISMExportedFunctions"`  
  (OR) Use the remote WinRM command:  


1.2 iDRAC Reset using the Windows PowerShell

**Pre-requisites**

- Requires Microsoft .NET framework 64-bit version 2.x or later.
- The execution policy for running powershell scripts should be set to one of the following:
  - Set-ExecutionPolicy AllSigned
  - Set-ExecutionPolicy Unrestricted

iDRAC Service Module provides a PowerShell cmdlet to reset the iDRAC. To use PowerShell for resetting iDRAC;

- Open a Windows PowerShell session as an administrator.
- Type `Invoke-iDRACHardReset`.
  This cmdlet shall display the result of the operation in textual format as well.

If you want to reset the iDRAC through a script or without a confirmation message; then the **–force** option can be used which does not ask for a confirmation and resets the iDRAC.

The cmdlet: `Invoke-iDRACHardReset –force`
Example Message displayed upon successful iDRAC reset operation

The iDRAC Hard Reset operation is performed by system OS user test-domain\Administrator from the operating system (OS) on Wed Apr 13 18:31:20 2016.

Using Invoke-iDRACHardReset command from a remote PowerShell session.
- Launch a PowerShell session on the management station.
- Enable remote PowerShell using “Enable PS-Remoting” cmdlet.
- The pre-requisite for PS-Remoting is WinRM configuration as a listener.
- For details on how to configure PS-Remoting; refer: https://technet.microsoft.com/en-us/magazine/hf700227.aspx

1.3 iDRAC Reset using the Program Menu shortcut
iDRAC Service Module also provides a shortcut in the program menu of the Microsoft Windows OS. You can select this option to reset iDRAC. After selecting the shortcut, a message is displayed, asking you to confirm the iDRAC reset. If you want to proceed with the operation press ‘Y’ or ‘y’, then the iDRAC shall be reset and a message is displayed about the status of the operation.

2 iDRAC reset on Linux Operating Systems
On all iSM supported Linux OS-es; iSM provides an executable command which can be executed by logging into the OS using SSH or equivalent.

The command:
- $ /opt/dell/srvadmin/iSM/bin/Invoke-iDRACHardReset (OR)
- $ /opt/dell/srvadmin/iSM/bin/Invoke-iDRACHardReset -f

You have an option to specify the force option along with the command which does not wait for user confirmation and proceeds with the iDRAC reset action.

Limitations
On RHEL-7 and SLES-11 SP2 versions; the IPMI driver becomes unresponsive after the iDRAC reset. Administrators have to unload and reload the IPMI driver module. However, on RHEL-7.1 and higher versions; this IPMI issue has been addressed and a patch can be downloaded for the same from the RedHat site.

The issue is observed on Linux kernel version prior to 3.15. An update is available in the following operating systems with Linux kernel version 3.15 or later:
- RHEL-6.6
- RHEL-7.1
- SLES-11 SP4
- SLES-12 SP1

Steps to reload the IPMI driver in case kernel version is less than 3.15:
1. modprobe -r ipmi_si => If the removal fails, then all applications (such as iDRAC Service Module and OpenManage Server Administrator) using the ipmi_si need to be stopped and the operation should be retried.
2. modprobe ipmi_si

Alternatively, the administrator can also restart the Host OS to resolve the issue.
3 iDRAC reset on ESXi Operating Systems

On all iDRAC Service Module supported ESXi OS-es; iSM 2.3 supports a CMPI method provider which shall enable customers to perform the iDRAC reset remotely using WinRM remote commands.

Unlike Windows (except WMI) and Linux OS-es; ESXi does not prompt the user for a confirmation before resetting the iDRAC.
The command:


The result of the operation is displayed as an integer value, similar to Windows, which indicates success or failure of the operation.

Limitations

On ESXi 6.0 U1 and ESXi 6.0 U2 versions of ESXi; the IPMI driver becomes unresponsive after the iDRAC reset. Users shall unload and reload the IPMI module in order to bring back IPMI to a working state. After performing an iDRAC Hard Reset operation on certain VMware ESXi operating systems, the IPMI driver (ipmi_si_drv) may become unresponsive because of an existing issue in the IPMI driver. If the IPMI driver becomes unresponsive, reload the IPMI driver (ipmi_si_drv).

The issue is observed on all iDRAC Service Module v2.3 supported ESXi versions.

Steps to reload the ipmi_si_drv.

1. `/etc/init.d/sfcbd-watchdog stop`
2. `esxcfg-module -u ipmi_si_drv` => unload ipmi_si_drv
3. `esxcfg-module ipmi_si_drv` => load ipmi_si_drv
4. `/etc/init.d/sfcbd-watchdog start`

Alternatively, the administrator can also restart the Host OS to resolve the issue.

After iDRAC is operational after the reset; iDRAC Service Module shall regain the lost communication with iDRAC. An audit message shall be logged to the Lifecycle Log in iDRAC and to the OS logs about the operation.

NOTE: If system management mode is not enabled on the host OS, then iDRAC hard reset fails.

4 Frequently asked questions

1. How do I know iDRAC is reset?
   An audit log is created in the host OS log, indicating the result of iDRAC hard reset operation.

2. How do I know if my system supports iDRAC hard reset?
   The iDRAC Hard Reset is supported on all the Dell 13G PowerEdge servers (except R930) with the specified supported BIOS and CPLD versions.

3. Can I reset the iDRAC when ISM service is not running on the host OS?
   Yes, iDRAC hard reset can be performed on the host OS where iDRAC Service Module is not running.

4. How do I audit the iDRAC reset from iDRAC interfaces?
iDRAC Service Module restarts communication with iDRAC once iDRAC is up after the iDRAC reset operation. Post this, the iDRAC reset successful message is logged into the iDRAC Lifecycle Log along with timestamp.

5. Why the iDRAC reset operation fail with insufficient privileges?
   Only administrator/root user is allowed to perform this operation.

6. Why am I not able to perform the iDRAC hard reset although ISM is installed on the host OS?
   The iDRAC hard reset might have been disabled in iDRAC in the Service Module page.

RACADM command to enable/disable iDRAC hard reset:
   a. racadm set idrac.servicemodule.iDRACHardReset Disabled/Enabled

### 6 Error Handling

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<tr>
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<th>Result Code</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>iDRAC has been reset successfully</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>The BIOS version is not supported</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>The Platform is not supported</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Access is denied</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>iDRAC hard reset failed</td>
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