Managing Devices via IPMI in OpenManage Essentials

This Dell Technical White Paper provides information about how to manage devices using IPMI protocol.

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Executive summary

The objective of this white paper is to make the reader understand how IPMI protocol can be used to monitor and manage devices. Whenever there is an environment where operating systems are not installed on the server or the server is switched off, IPMI protocol can be used to manage the server/RAC. IPMI protocol talks directly to the server through the RAC and it does not require an operating system to be installed on the server.

Introduction

The only way to monitor a server which is not reachable (i.e. does not have an operating system installed or is turned off) is through IPMI. WSMAN or IPMI protocol can be used to monitor 11G and 12G servers. The 8G, 9G or 10G Dell servers can be monitored and managed only using IPMI protocol, when the server is unreachable. IPMI protocol talks directly to the server instead of the RAC, so this is the closest that we can get to a server which is not reachable.

Dell OpenManage Essentials 1.2 support IPMI 1.5 and IPMI 2.0.

To enable IPMI discovery of a server, the IPMI over LAN should be enabled in the RAC.

How to enable IPMI over LAN

To enable IPMI over LAN:

1. Login to the RAC.
2. Navigate to iDRac Settings > Network/Security. (Note: This may be different for different versions of RAC consoles, they may have this setting in slightly different place)
4. Make sure that the “Enable IPMI over LAN check box is selected”
Figure 1. To enable IPMI over LAN on iDRAC

Using IPMI to manage an environment

- Health status of the server can be monitored using IPMI protocol
  Whether the server has an operating system or not, or when the server is turned off and the RAC is reachable, IPMI protocol can be used to monitor the server. When operating system is present SNMP and WMI protocols will get preference in OME as they collect more inventory data.

- OpenManage Essentials 1.2 is capable of receiving IPMI traps called Platform Event Traps which are generated from the iDRAC
  The iDRAC can be configured to send IPMI traps, in case of any abrupt behavior is shown by the server, to OpenManage Essentials 1.2. Using these traps, the server can be monitored if anything goes wrong. More information about configuring iDRAC to send Platform Event traps can be found at http://support.dell.com/support/edocs/software/smdrac3/idrac/idrac21modular/en/ug/html/chap05.htm

- OpenManage Essentials 1.2 is capable of running IPMI command line tasks on the target server even if it does not have an operating system installed
  There are built-in tasks, such as powering on the server, which use IPMI protocol to talk to the server. There are other IPMI command line tasks, such as SEL, chassis status, etc., which can be run on the server using remote tasks feature of OpenManage Essentials 1.2.

To create an IPMI Command Line task:

- Discover and inventory the device. Make sure the RAC device information table is populated for the device in OME’s device tree and IPMI over LAN is enabled on the RAC. (Navigate to Page 6 to see how to enable IPMI over LAN on a RAC)
Managing Devices via IPMI in OpenManage Essentials

- Navigate to Manage > Remote tasks and click on Create “Command Line task”
- In the window that opens, provide a task name (By default, the task name will be Command Line Task - date in mm/dd/yyyy format and time in H:mm:ss am/pm format)
- Type in the command that needs to be run on the device like SEL, CHASSIS POWER STATUS, etc.
- Click “Next” and select the device or device group where the command needs to be run
- Click “Next” and provide the schedule and credentials for the command to run. Select “Run now” if the command needs to be run at that moment.

![Figure 2. Window to create a command line task](image)

- Dell PowerEdge C servers can be discovered and inventoried using IPMI protocol

These servers get classified under PowerEdge C Servers group in the device tree with unknown health status. In the discovery and inventory portal, these devices are marked as PowerEdge C Servers in the bar graph. The tables populated by discovery and inventory of Dell PowerEdge C servers using IPMI protocol include:

  - Device Summary
  - Software Agent information
  - NIC information
  - RAC device information
  - Firmware information
• Correlation with IPMI protocol is supported

OpenManage Essentials 1.2 supports correlation of server and RAC when the server is discovered using SNMP or WMI protocols and the RAC is discovered and inventoried using IPMI protocol.

Correlation means correlating the inventory and discovery data received from server and RAC using various protocols. When OpenManage Essentials 1.2 discovers and inventories a server and its RAC, the inventory and discovery data received from both of them are correlated and put under the same device name in the device tree. This device name is always the server name in the device tree after correlation. The correlated device entry is shown under server group and RAC group, both owing to the fact that they contain data from server and RAC.

Protocols to discover and inventory a RAC

Table 1. Protocols used for discovery and inventory of a RAC

<table>
<thead>
<tr>
<th>Tables Populated using SNMP</th>
<th>Tables populated using IPMI</th>
<th>Tables populated using WSMAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Summary</td>
<td>Device Summary</td>
<td>Device Summary</td>
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<tr>
<td>Software Agent Information</td>
<td>OS Information</td>
<td>Software Agent Information</td>
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<tr>
<td>NIC Information</td>
<td>Software Agent Information</td>
<td>NIC Information</td>
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<tr>
<td>RAC Device Information</td>
<td>NIC Information</td>
<td>RAC Device Information</td>
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<tr>
<td>Firmware Information</td>
<td>RAC Device Information</td>
<td>Processor Information</td>
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<tr>
<td>Contact Information</td>
<td>Firmware Information</td>
<td>Memory Device Information</td>
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<td>Embedded Device Information</td>
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<td>Controller Information</td>
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<td>Enclosure Information</td>
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</tbody>
</table>
Using IPMI to manage HP iLO and IBM IMM

Using OpenManage Essentials 1.2, users can monitor health status and retrieve device information via HP iLO (Integrated Lights-Out) or IBM IMM (Integrated Management Module) using IPMI protocol.

Enter the IP address/range/hostname of these devices in the discovery range wizard and enable IPMI protocol (disable SNMP protocol). The discovery task will identify the device and classify it under “All Devices -> OOB Unclassified Devices -> IPMI Unclassified Devices”.

Following information will be retrieved and displayed under “Details” tab for each device as shown in Figure 4:
**Device Information**: Device name, Device Model, Service Tag/Serial Number, Asset Tag
**Software Agent Information**: Health status of the agent
Additionally **NIC Information, RAC Device Information** and **Firmware Information** is also available.

Users can also group these devices based on (Device) Model name that allows them to run IPMI and Power Control tasks.
Conclusion or Summary

IPMI protocol can be used to manage servers in an environment where the server is not reachable. A server can be unreachable when there is no operating system installed on it or it is turned OFF. IPMI protocol is used to discover the RAC and then we can use it to manage the server. Various tasks like turning ON the server remotely, retrieving SEL logs and retrieving chassis power status, etc can be run on the target using OpenManage Essentials.