



Agentless In-Band System Update With Dell OpenManage Essentials

This Dell technical white paper describes how OpenManage Essentials enables you to manage in-band system updates on target servers that do not have the Dell OpenManage Server Administrator (OMSA) agent installed.

Dell Engineering
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Revisions

Date	Description
9/1/14	Initial release
9/15/15	Updates with the OpenManage Essentials version 2.1 release

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Table of contents

- Revisions..... 2
- Executive summary 5
- 1 Introduction..... 7
- 2 Pre-requisites 8
- 3 Discovering the server using WMI/SSH 9
- 4 Initiating firmware and driver inventory..... 10
 - 4.1 Creating the firmware and driver inventory task from the Remote Tasks portal 10
 - 4.2 Creating the firmware and driver inventory from the System Update portal 22
- 5 Performing system update..... 25
 - 5.1 Linux system update as a “sudo” user 26
 - 5.2 Scheduled Firmware & Driver Inventory collection task after update..... 27
- 6 Difference between managing a server with or without OMSA..... 28
- 7 Updating the inventory collector component in OpenManage Essentials 29
- A Additional resources (optional) 31

Table of figures

- Figure 1: Discovery Wizard configuration..... 9
- Figure 2: Discovery of a server using WMI/SSH protocol..... **Error! Bookmark not defined.**
- Figure 3: Remote Task – Firmware & Driver Inventory Task - launch point 10
- Figure 4: Firmware & Driver Inventory Task – Task Name..... 11
- Figure 5: Firmware & Driver Inventory Task – Filter devices based on the operating system..... 12
- Figure 6: Firmware & Driver Inventory Task – Select the Operating System..... 13
- Figure 7: Firmware and Inventory task – Show OMSA based targets. 15
- Figure 8: Firmware & Driver Inventory Task – Select Target 16
- Figure 9: Firmware & Driver Inventory task – Select a query..... 17
- Figure 10 Firmware & Driver Inventory task – Enable All option for OMSA based targets..... 18
- Figure 11: Firmware & Driver Inventory Task –Set schedule..... 19
- Figure 12: Firmware & Driver Inventory Task – Run now 20
- Figure 13: Firmware & Driver Inventory Task – Credentials..... 21
- Figure 14: System Update Portal – Non inventoried Systems..... 22
- Figure 15: System update portal – Select the servers 22



Figure 16: System update portal – Run inventory23

Figure 17: System update portal – Firmware & Driver inventory wizard24

Figure 18: System update portal – Non-Complaint Systems tab25

Figure 19: System update portal – Linux server select packages26

Figure 20: System update portal – Linux sudo.....26

Figure 21: Scheduled F/w & Driver inventory Task27

Figure 22: Dell Solutions tab showing Inventory Collector Component29

Figure 23: Active Update link for Inventory Collector entry **Error! Bookmark not defined.**



Executive summary

To update the Dell server hardware through in-band method, Dell OpenManage Essentials extensively depended on the Dell OpenManage Server Administrator (OMSA) agent installed on the target server. From OpenManage Essentials version 2.0 onwards, this dependency on OMSA has been reduced, enabling you to update the Dell server hardware even if no agent is installed on the target server.

As an extension to the existing [Update Dell Server Hardware with Dell OpenManage Essentials](#) white paper, this white paper describes how you can use OpenManage Essentials to manage and update the Dell server hardware using the in-band method on target servers that do not have any agent installed.

This white paper briefly describes the pre-requisites, limitations, filtering and choosing the right set of target devices, and the difference between managing a target that has OMSA installed and a target that does not have OMSA installed.

The agentless in-band system update feature introduced in OpenManage Essentials involves the following:

- Discovery/inventory of a server using the default protocol supported by the operating system – WMI for Microsoft Windows; SSH for Linux
- Collection of firmware/driver inventory using the OpenManage Essentials utilities
- Update of the driver/firmware
- Update of the version information based on success or failure

WMI and SSH are the default protocols supported by Windows and Linux respectively. Discovering servers that do not have any Dell agent installed, using these protocols provides the information required to classify the devices, including a certain amount of inventory details. This feature has been enhanced and includes support for Community Enterprise Operating System (Cent OS) as well, from OpenManage Essentials 2.0 onwards.

OpenManage Essentials version 2.0 onwards addresses the system update part which was not available earlier for WMI/SSH-based discovery of a target server that did not have any Dell agent installed. The following are the changes that have made this possible:

- OpenManage Essentials includes/uses an inventory collector binary which is a Dell proprietary tool for collecting driver and firmware version information
- Deployment of Dell Update Packages (DUPs) on the target systems now involves the DUP proprietary commands instead of OMSA wrapper commands



To maintain the best use of OMSA's presence on the target, OpenManage Essentials will use OMSA if it is installed on the target system. As a result, targets that already have OMSA installed are filtered out by default from the selection for agentless in-band system update. With Dell OpenManage Essentials version 2.1, targets that have OMSA installed, are available for selection when you choose the **Show OMSA based devices** option.

OpenManage Essentials integrates the latest version of the inventory collector component that is available within timeline of the OpenManage Essentials release. However, newer versions of the inventory collector component may be available at a later time. Newer versions of the inventory collection provide support for new devices or to resolve issues. OpenManage Essentials version 2.1 allows you to update to newer versions of the inventory collector component as and when it is available through in the **Dell Solutions** tab.



1 Introduction

The purpose of this white paper is to provide necessary information related to performing in-band system update on target servers that do not have OMSA installed.

The following sections are described in detail:

- Pre-requisites
- Discovering the server using WMI/SSH protocol
- Initiating firmware & driver inventory from the Remote Tasks portal
- Initiating firmware & driver inventory from the System Update portal
- Performing system update from System Update portal
- Sudo users in Linux
- Differences between OMSA-based system update and agentless system update
- Updating the inventory collector component in Dell OpenManage Essentials



2 Pre-requisites

The following are the pre-requisites or requirements for performing an agentless in-band system update:

- The target server should be discovered using WMI (or) SSH protocol
 - In-band discovery of a target server that does not have a Dell agent is supported only through WMI/SSH protocols
 - SNMP-based discovery of a target server that does not have a Dell agent will classify the device as unknown
 - Target servers running Microsoft Windows must be discovered using WMI protocol
 - Target servers running supported Linux distributions must be discovered using SSH protocol

Note: On Linux platforms, OMSA can be installed without inventory collector component. In this case, the OMSA agent will expose all inventory information except software inventory via SNMP interface. For these servers with Linux platforms, where OMSA is installed without inventory collector component, the device can be discovered with SNMP as well as from SSH.

- The target server should be discovered and classified as a server
 - Agentless in-band system update is applicable only for servers
 - Agentless in-band system update is not applicable for unknown devices.
- The target server may or may not have OMSA installed
- The user should have administrator rights on the target device
- For target servers running Linux, sudo user credentials are not supported / not preferred



3 Discovering the server using WMI/SSH

Discovery of a server using WMI or SSH protocol is already supported in OpenManage Essentials. In OpenManage Essentials version 2.0, a new guided discovery wizard has been introduced, which helps you to easily decide the protocol to choose based on the device/target type you want to discover.

Note: You can choose the guided discovery wizard or standard discovery wizard by accessing **Preferences→ Discovery Settings**.

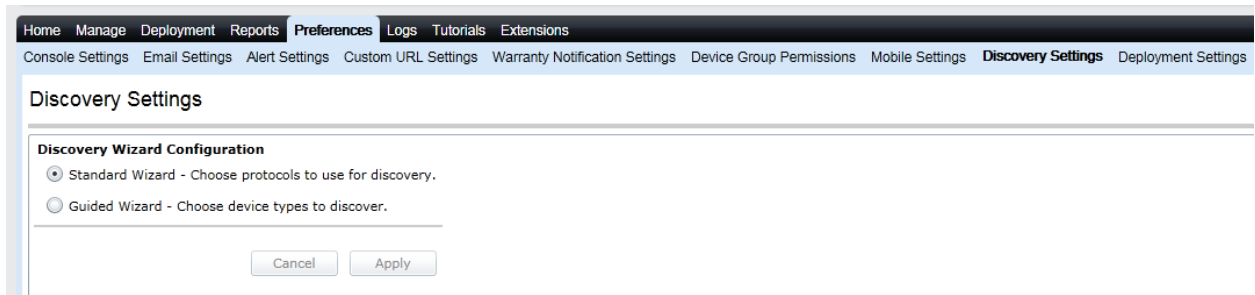


Figure 1 Discovery wizard configuration

Steps to discover a server using WMI/SSH protocol:

1. Launch Discovery wizard from **Manage → Add Discovery Range**.
2. Enter the IP address / hostname and click **Add**.
3. Click **Next**.
4. In **Device Type** filtering, select the corresponding protocol - WMI/SSH.

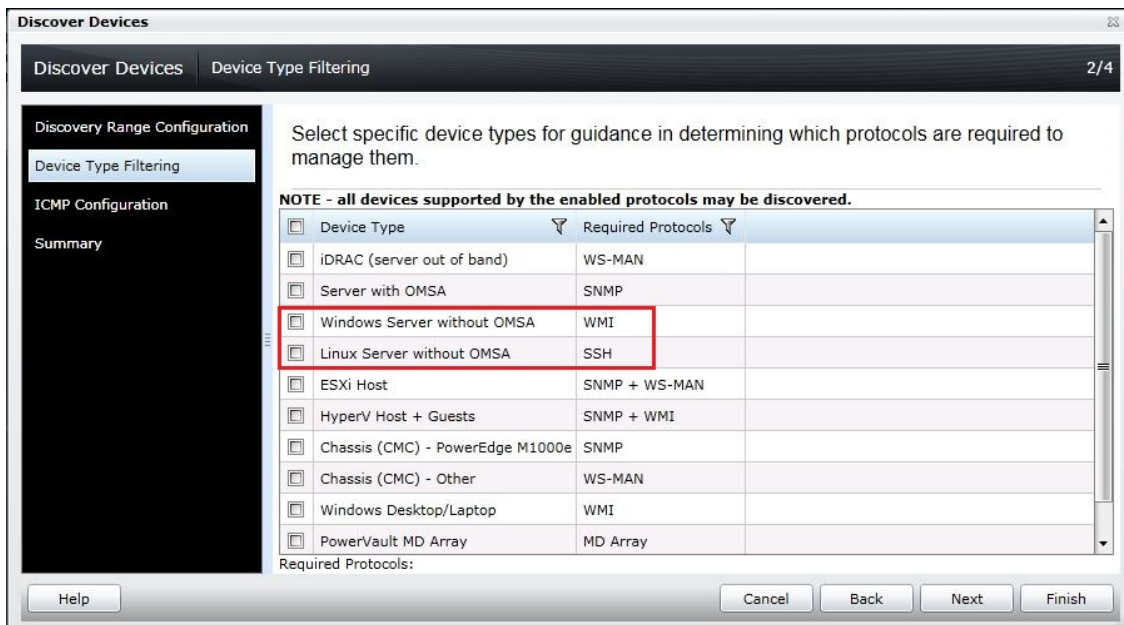


Figure 2 Discovery of a server using WMI/SSH protocol

5. Enter the credentials and click **Finish**.

4 Initiating firmware and driver inventory

Firmware and driver inventory has been designed as a remote task considering following scenarios:

1. Should be independent of discovery/inventory cycle since it might increase the time to discover/inventory the system
2. Should be able to run whenever needed
3. Should be able to schedule for a later time
4. Should be able to have a recurrent schedule
5. Should be able to use different credentials than discovery/inventory

The firmware and driver inventory task can be created in following ways:

- From the Remote Tasks portal
- From the System Update portal

4.1 Creating the firmware and driver inventory task from the Remote Tasks portal

1. Click **Manage**→ **Remote Tasks**→ **Create F/W & Driver Inventory Task**.

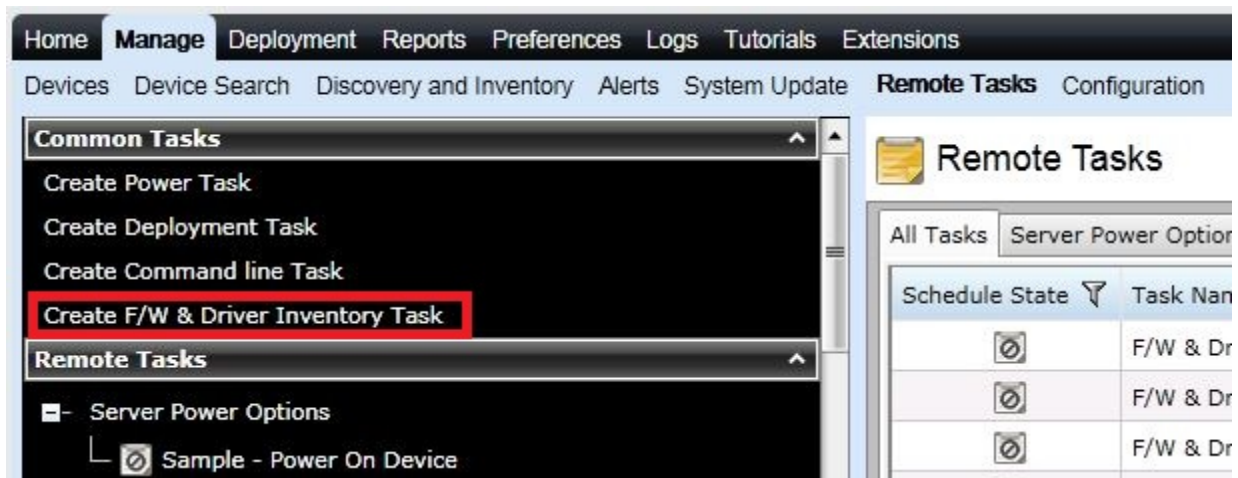


Figure 3 Remote Task – Firmware & Driver Inventory Task - launch point

2. The **Create Firmware & Driver Inventory Task** wizard will open with a default name for the task. If required you can modify the name.

Create a Firmware & Driver Inventory Task

General Task Target Schedule and Credentials

Task Name F/W & Driver Inventory Task - 9/14/2015 11:11:38 AM

Note: This task will deploy a inventory collection component on the target devices. The component will be removed after the task is completed.

☒ Filter devices based on Operating system

Select the Operating System

☒ Windows
☐ Linux
☐ 64-bit System

☐ Show OMSA based targets

Future Software Inventory Data Controlled by:

☒ OMSA based inventory
☐ F/W and Driver task based inventory*

Help Cancel Next Finish

Figure 4 Firmware & Driver Inventory Task – Task Name

3. The wizard provides an option to filter the servers based on the operating system type. The highlighted check box shown in Figure 5 can be used to enable/disable the filtering.

Create a Firmware & Driver Inventory Task

General | Task Target | Schedule and Credentials

Task Name F/W & Driver Inventory Task - 9/14/2015 11:11:38 AM

Note: This task will deploy a inventory collection component on the target devices. The component will be removed after the task is completed.

☒ Filter devices based on Operating system

Select the Operating System

☒ Windows
☐ Linux
☐ 64-bit System

☐ Show OMSA based targets

Future Software Inventory Data Controlled by:

☒ OMSA based inventory
☐ F/W and Driver task based inventory*

Help Cancel Next Finish

Figure 5 Firmware & Driver Inventory Task – Filter devices based on the operating system

4. You can also group/filter the servers based on the following operating system types:

- Windows – 32 bit
- Windows – 64 bit
- Linux – 32 bit
- Linux – 64 bit

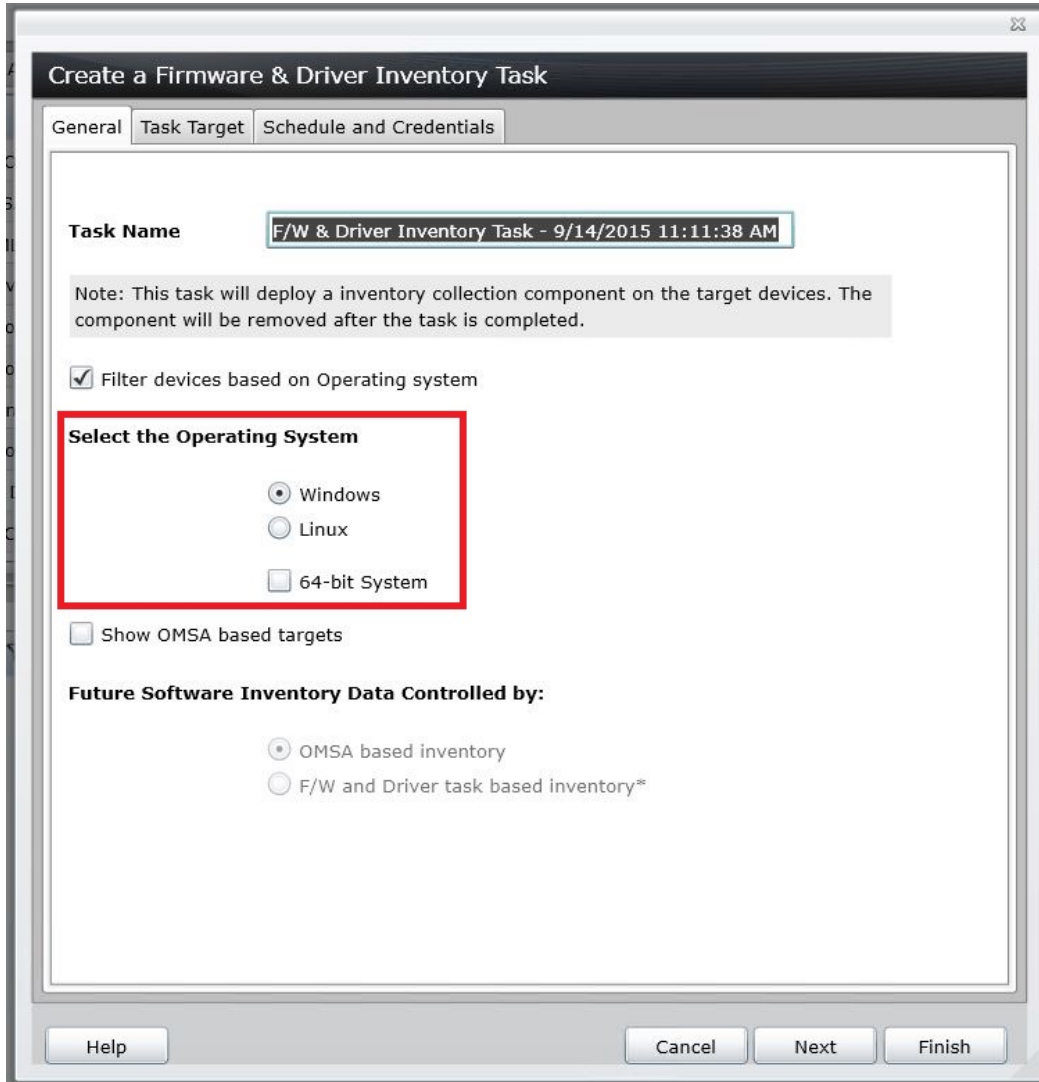


Figure 6 Firmware & Driver Inventory Task – Select the Operating System

You can also configure the task wizard to display OMSA-based targets which will not be shown by default. This is a new addition in OpenManage Essentials version 2.1 which was necessary because of problems faced by users in the past, where OMSA was unable to provide the latest inventory details after performing a system update from OpenManage Essentials. In some cases, users had to restart OMSA services (or) the managed node itself to get the correct inventory details. The show OMSA based targets option is useful in these scenarios.

Create a Firmware & Driver Inventory Task

General Task Target Schedule and Credentials

Task Name F/W & Driver Inventory Task - 9/14/2015 11:57:23 AM

Note: This task will deploy a inventory collection component on the target devices. The component will be removed after the task is completed.

☒ Filter devices based on Operating system

Select the Operating System

☒ Windows
☐ Linux
☐ 64-bit System

☒ Show OMSA based targets

Future Software Inventory Data Controlled by:

☐ OMSA based inventory
☒ F/W and Driver task based inventory*

*Select this option only if you want to always use the F/W Driver inventory task to collect software inventory, even though OMSA is present on the device.

[Note] If you want to revert to the OMSA inventory, you must either select "OMSA based inventory" option and then run the F/W Driver inventory task or delete the device and rediscover it again.

Help Cancel Next Finish

Figure 7 Firmware and Inventory task – Show OMSA based targets

The future software inventory option controls the decision of following:

1. After performing a system update, which inventory should be triggered to collect software inventory?
2. On any inventory cycle (scheduled/user initiated), should the data from OMSA be considered for software inventory?

Based on the selection & execution of the task, software inventory will be controlled by either OMSA or the Firmware & Driver inventory collection task.

Future software inventory - selection	Inventory after system update task		Scheduled/user created inventory	
	Inventory type	Software inventory data updated by	Inventory type	Software inventory data updated by
OMSA based	OMSA – full inventory	OMSA	OMSA – full inventory	OMSA
F/W and driver inventory task based	OMSA – full inventory + F/W and driver inventory	F/W and driver inventory	OMSA full inventory	No update with regular inventory cycle User has to schedule the F/W inventory task

Important points:

- i. This selection is applicable only for target servers that have OMSA installed. For target servers that do not have OMSA installed, by default, the F/W and Driver inventory collection task runs after the system update.
- ii. If both the server and iDRAC of the server are discovered using the preferred protocols, the iDRAC software inventory takes precedence for the components found in both the in-band and out-of-band inventory. Driver components which are not included in the out-of-band inventory are taken from the in-band inventory.

Note: The selection is preserved only **after the successful completion** of the F/W inventory collection task. Therefore, if you make modifications, you must ensure that the F/W inventory task runs once again to preserve the preference.



5. On **Task Target**, you can select the servers from the list as shown in Figure 8.

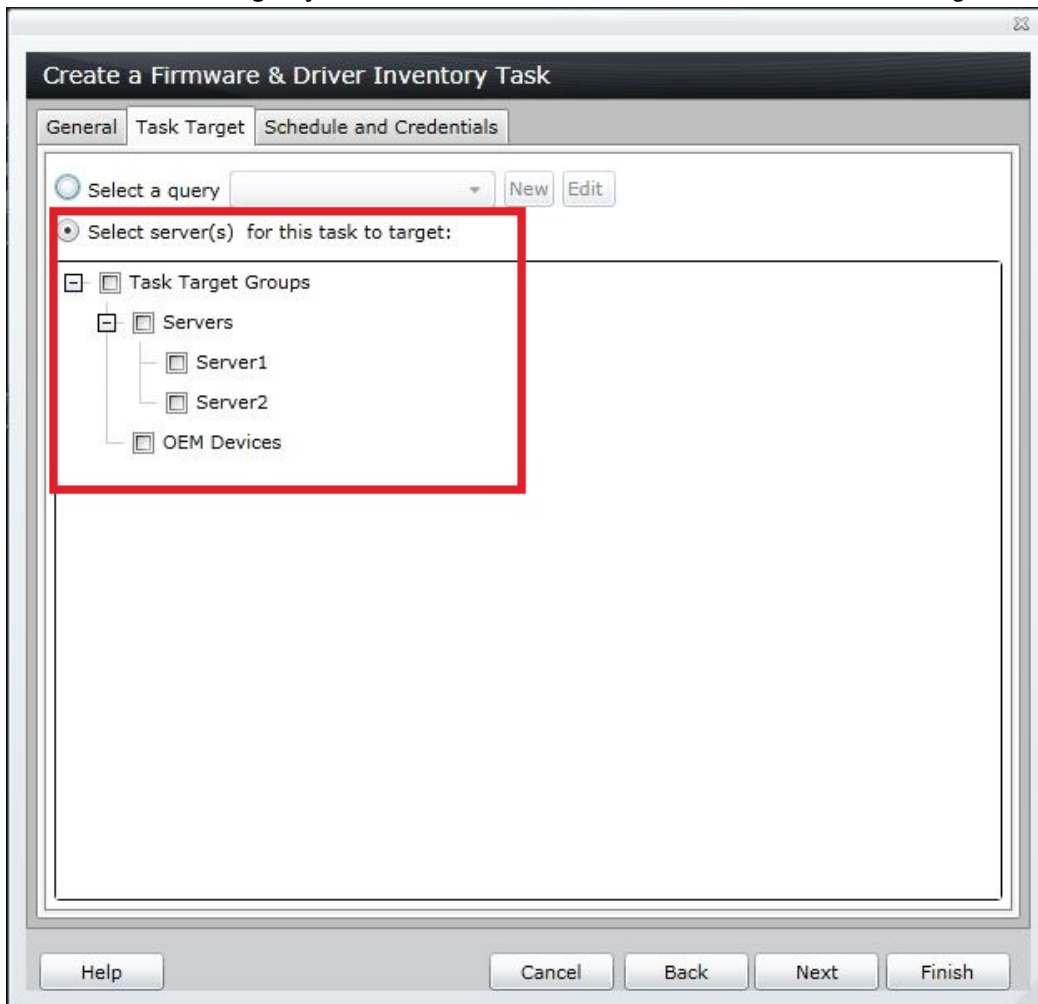


Figure 8 Firmware & Driver Inventory Task – Select Target

6. If required, you can also select the devices from a query.

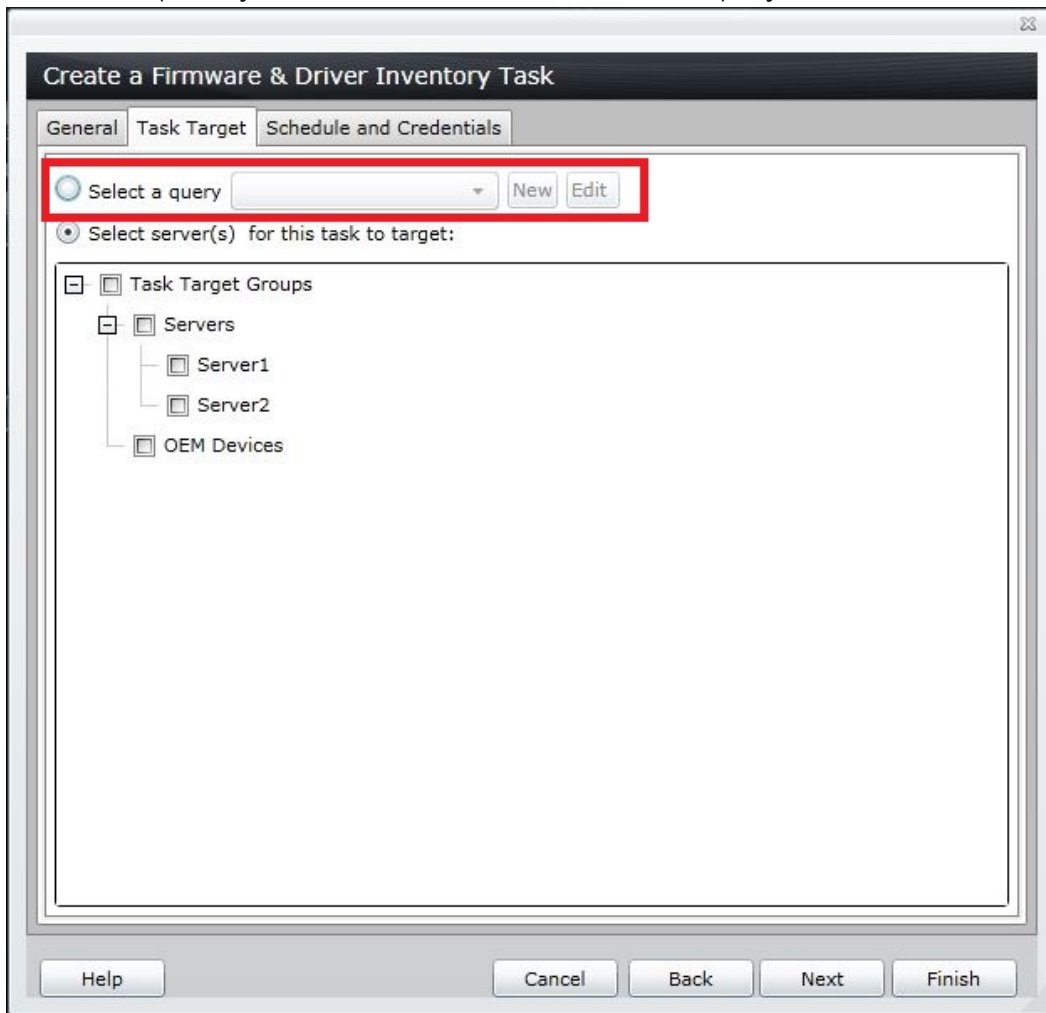


Figure 9 Firmware & Driver Inventory task – Select a query

7. If OMSA based targets are chosen for the task, by default, those targets will be disabled. To be able to select those targets, you must select the **Enable All** option.

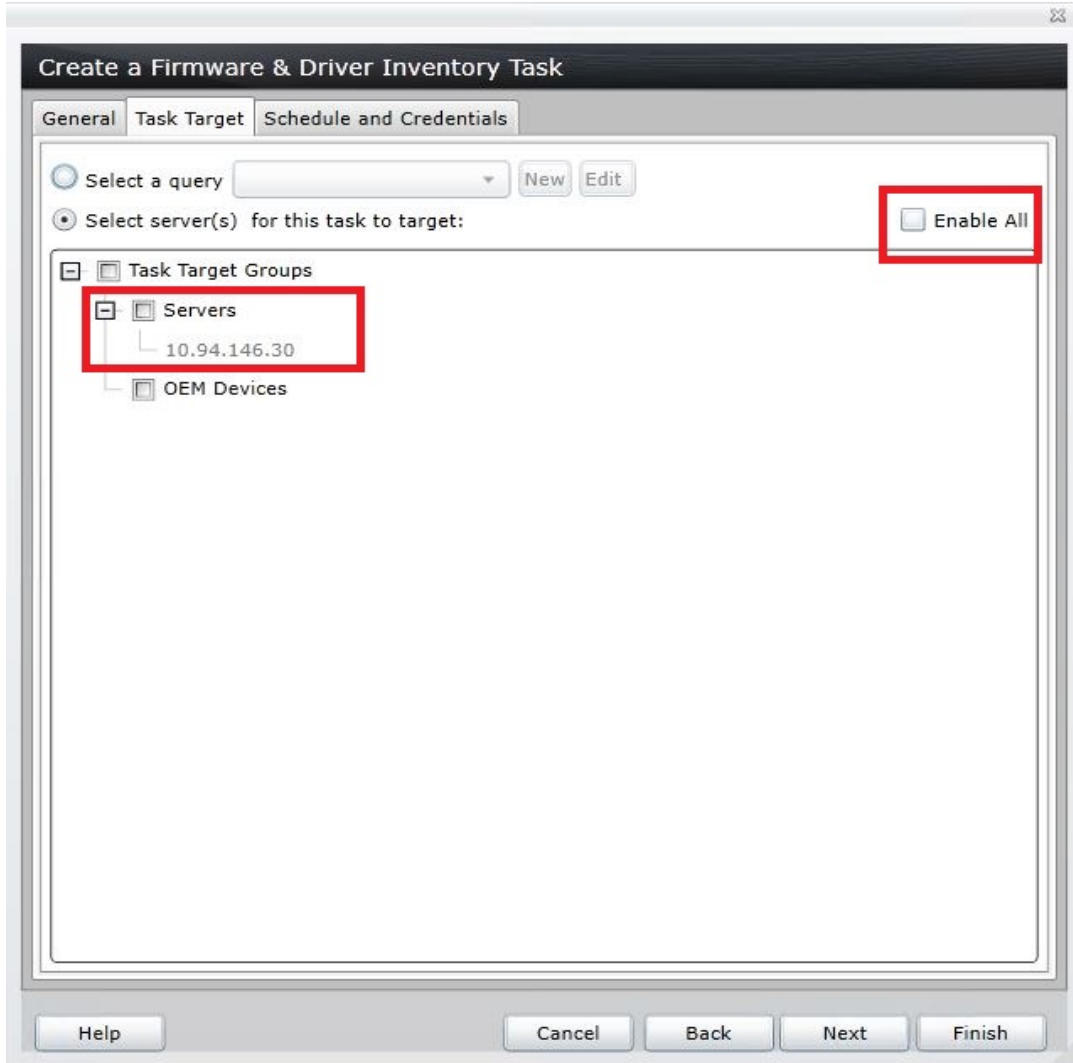


Figure 10 Firmware & Driver Inventory task – Enable All option for OMSA based targets

8. In **Schedule and Credentials**, by default, a schedule is selected as shown in Figure 11.

Create a Firmware & Driver Inventory Task

General Task Target **Schedule and Credentials**

Set schedule: ☒ Activate Schedule

☐ Run now

☒ Set schedule 8/26/2014 11:26 AM (UTC+05:30)

☐ Run Once

☐ Periodic

Enter credentials of the remote target(s)

<domain>\<user name> or localhost\<user name>

User Name:

Password:

Help Cancel Back Finish

Figure 11 Firmware & Driver Inventory Task –Set schedule

9. You can also choose the **Run now** button to initiate the task immediately as shown in Figure 12.

Create a Firmware & Driver Inventory Task

General Task Target Schedule and Credentials

Set schedule:

☒ Run now

☐ Set schedule 8/26/2014 11:26 AM (UTC+05:30)

☐ Run Once

☐ Periodic

☒ Activate Schedule

Enter credentials of the remote target(s)

<domain>\<user name> or localhost\<user name>

User Name:

Password:

Help Cancel Back Finish

Figure 12 Firmware & Driver Inventory Task – Run now

10. Type the credentials in the highlighted section shown in Figure 13.

Create a Firmware & Driver Inventory Task

General Task Target Schedule and Credentials

Set schedule: ☒ Activate Schedule

☐ Run now

☒ Set schedule 8/26/2014 11:26 AM (UTC+05:30)

☐ Run Once

☐ Periodic

Enter credentials of the remote target(s)

<domain>\<user name> or localhost\<user name>

User Name:

Password:

Help Cancel Back Finish

Figure 13 Firmware & Driver Inventory Task – Credentials

11. Click **Finish** to create the task.

4.2 Creating the firmware and driver inventory from the System Update portal

1. Click **Manage** → **System Update** → **Non-Inventoried Systems** tab.

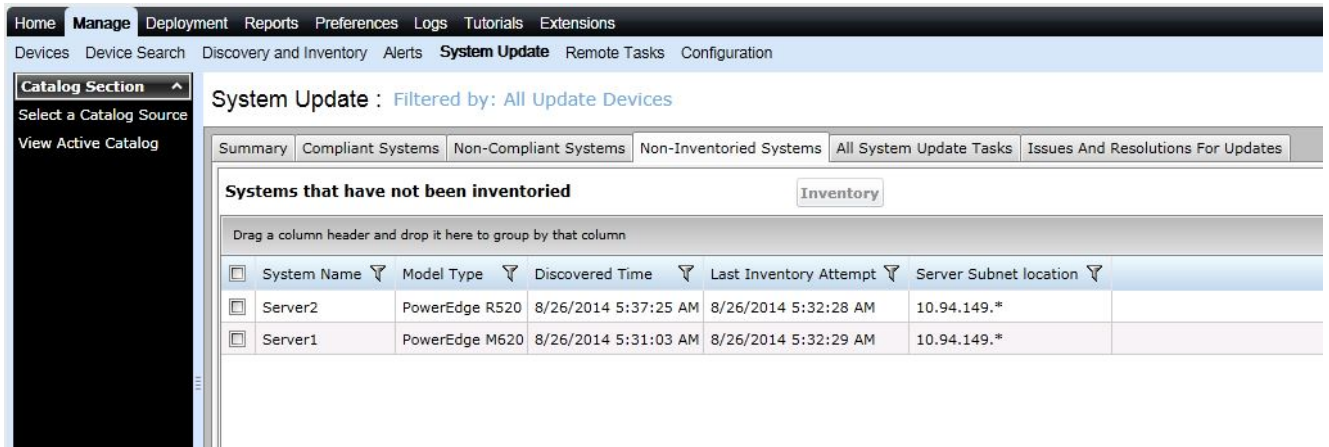


Figure 14 System Update Portal – Non inventoried Systems

2. From the list of servers that are displayed, select the server(s) and click **Inventory**.

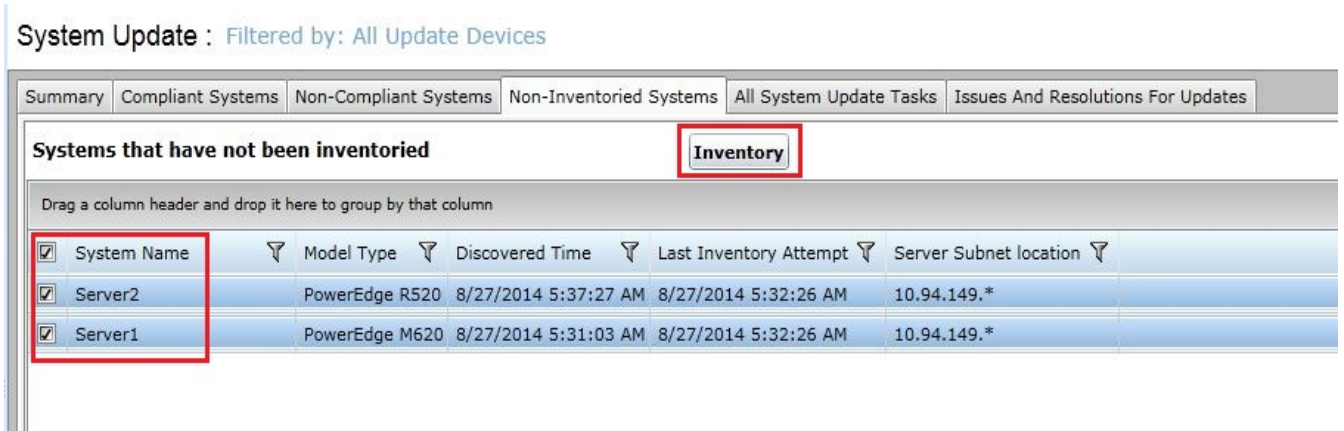


Figure 15 System update portal – Select the servers

3. If the device you have selected does not have OMSA installed, and is discovered using WMI/SSH, the Firmware and software inventory wizard will be displayed.

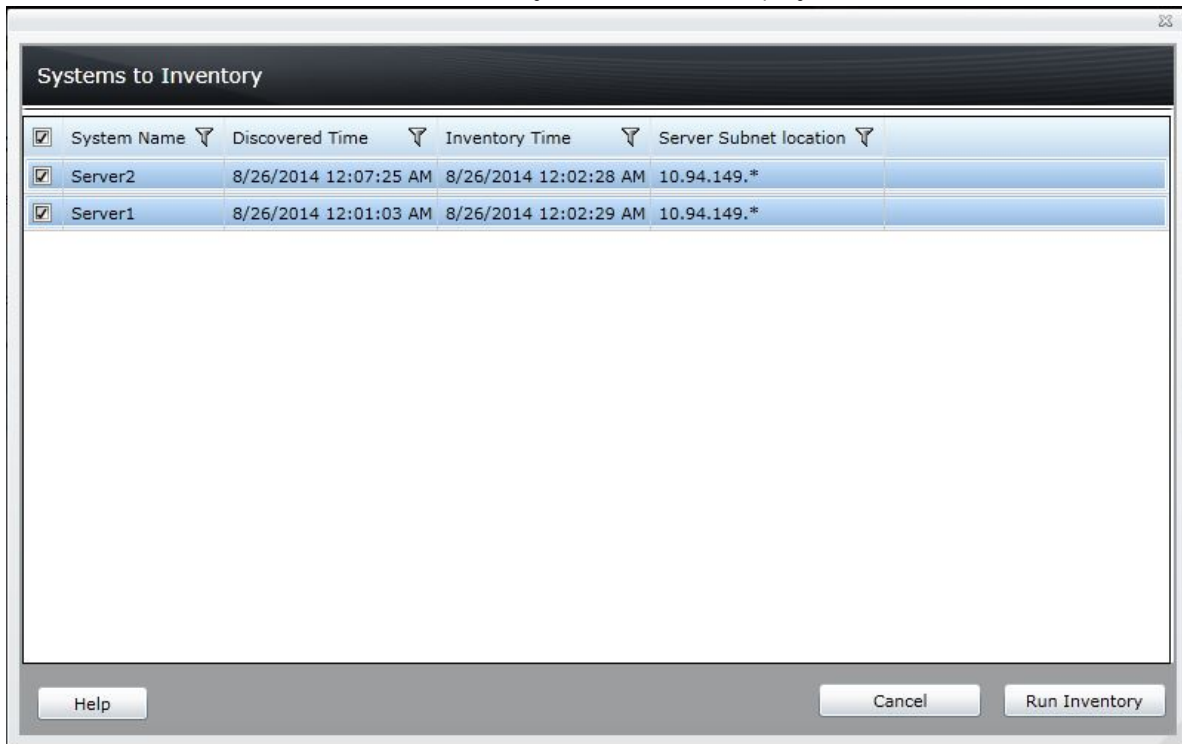


Figure 16 System update portal – Run inventory

- Once you click **Run Inventory**, the **Create Firmware & Driver Inventory Task** wizard will be displayed. The servers which you selected in the previous step are pre-selected in the wizard. The **Run now** option is selected as well. To run the task, type the credentials, and click **Finish**.

The screenshot shows a wizard window titled "Create a Firmware & Driver Inventory Task". It has three tabs: "General", "Task Target", and "Schedule and Credentials", with the third tab being active. The "Set schedule:" section has a checkbox for "Activate Schedule" which is unchecked. Below it are four radio button options: "Run now" (selected), "Set schedule" (with a date/time field showing "8/26/2014 11:30 AM" and a time zone of "(UTC+05:30)"), "Run Once", and "Periodic". The "Enter credentials of the remote target(s)" section contains a placeholder text "<domain>\<user name> or localhost\<user name>" and two input fields labeled "User Name:" and "Password:". At the bottom are buttons for "Help", "Cancel", "Back", and "Finish".

Figure 17 System update portal – Firmware & Driver inventory wizard

If you want to change the name of the task, you can go to the **General** tab and make the modifications.

If you want to make modifications to the target servers, you can do so in the **Task Target** tab.

Note: If you select/clear the **Filter device based on Operating System** option, all the targets which are pre-selected will be cleared. To complete creating the task, you have to select the devices again.

5 Performing system update

After the firmware and driver inventory is collected from the target, it will be moved from the **Non-Inventoried Systems** tab to either the **Complaint Systems** or **Non Complaint Systems** tab based on whether the system is at par with the hardware baseline or not.

When the system is not at par with the hardware baseline, it will be listed under **Non Complaint Systems**. From there on, you can select in-band system update and proceed further for system update.

The screenshot shows the Dell OpenManage Essentials System Update portal. The top navigation bar includes Home, Manage, Deployment, Reports, Preferences, Logs, Tutorials, and Extensions. The left sidebar has a 'Catalog Section' dropdown and a 'View Active Catalog' link. The main content area is titled 'System Update : Filtered by: All Update Devices'. Below this, there are tabs for Summary, Compliant Systems, Non-Compliant Systems, Non-Inventoried Systems, All System Update Tasks, and Issues And Resolutions For Updates. The 'Non-Compliant Systems' tab is active. It shows a table of systems with columns: System Name, Model Type, Operating System, Service Tag, Update Method, Discovered Time, and Inventory Time. Two systems are listed: Server1 (PowerEdge M620, Microsoft Windows Server 2008 R2 Enterprise x64 Edition, 5K6ZWX1, In-band) and Server2 (PowerEdge R520, Microsoft Windows Server 2012 R2 Datacenter x64 Edition, 8CR56Z1, In-band). Below the table, there is a section 'Select Updates to Apply:' with a table of updates. The updates table has columns: System Name, Importance, Update Method, Component, Type, Installed Version, Upgrade/Downgrade, and Available Version. Four updates are listed for Server1: [0156] Broadcom BCM57810 NetXtreme II 10 GigE #156 (Firmware, 7.6.15, Upgrade), BIOS (BIOS, 1.6.1, Upgrade), iDRAC (Firmware, 1.50.50.00, Upgrade), and PERC H710P Mini Controller 0 (Firmware, 21.2.1-0000, Upgrade). An 'Apply Selected Updates' button is at the bottom right.

System Name	Model Type	Operating System	Service Tag	Update Method	Discovered Time	Inventory Time
Server1	PowerEdge M620	Microsoft Windows Server 2008 R2 Enterprise x64 Edition	5K6ZWX1	In-band	8/28/2014 5:31:04 AM	8/28/2014 5:32:35 AM
Server2	PowerEdge R520	Microsoft Windows Server 2012 R2 Datacenter x64 Edition	8CR56Z1	In-band	8/28/2014 5:37:24 AM	8/28/2014 5:32:34 AM

System Name	Importance	Update Method	Component	Type	Installed Version	Upgrade/Downgrade	Available Version
Server1	Recommended	In-band	[0156] Broadcom BCM57810 NetXtreme II 10 GigE #156	Firmware	7.6.15	Upgrade	7.8.53
Server1	Recommended	In-band	BIOS	BIOS	1.6.1	Upgrade	2.2.10
Server1	Recommended	In-band	iDRAC	Firmware	1.50.50.00	Upgrade	1.57.57
Server1	Recommended	In-band	PERC H710P Mini Controller 0	Firmware	21.2.1-0000	Upgrade	21.3.0-0009

Figure 18 System update portal – Non-Complaint Systems tab

5.1 Linux system update as a “sudo” user

For the Linux servers displayed in the **System Update** portal, OpenManage Essentials provides the option of using “sudo” credentials for updating the firmware/drivers.

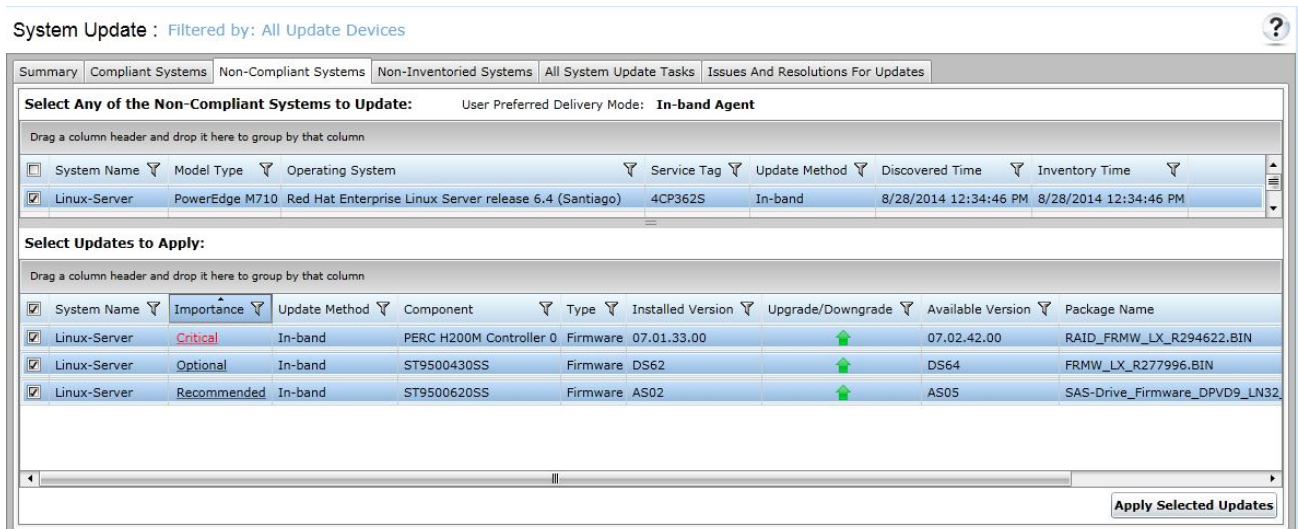


Figure 19 System update portal – Linux server select packages

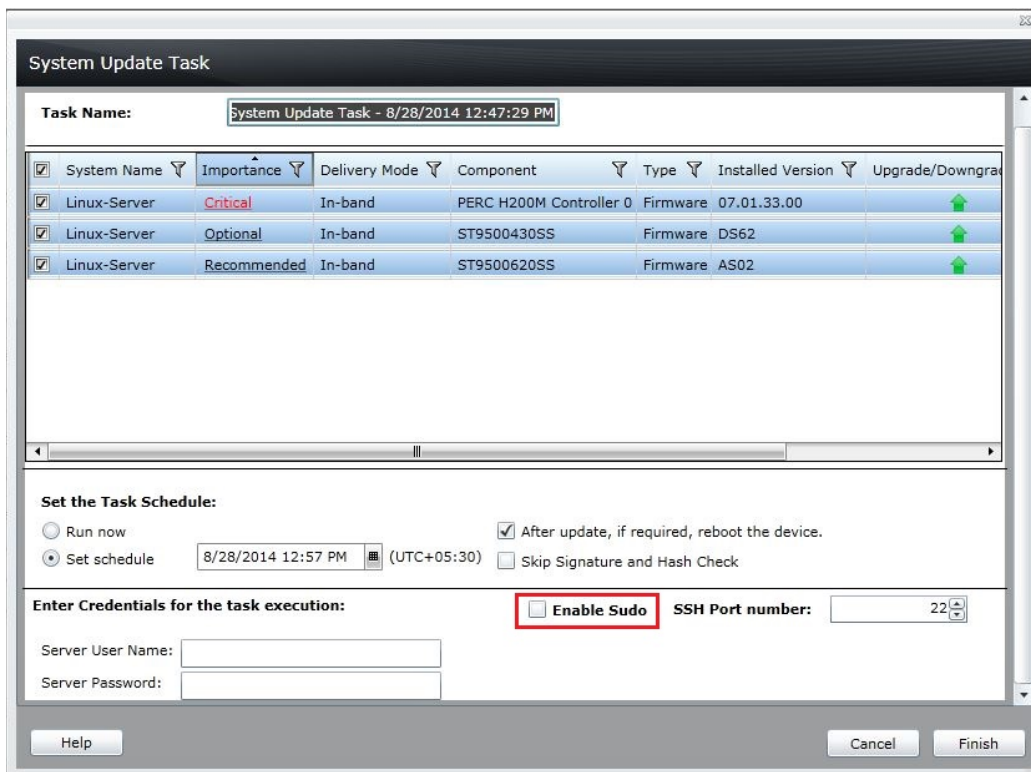


Figure 20 System update portal – Linux sudo

Even though the firmware and driver inventory collection task does not provide any option for “sudo” users, you can still use sudo option to update the server.

Note: When you update a target server that does not have a Dell agent, it is recommended not to use sudo credentials because you have to give NOPASSWD, EXECUTE permissions for the binaries which are copied and executed under the /tmp directory. If you still have to use sudo users, ensure that you have other security measures/mitigations in place if you have to update the server that does not have OMSA installed as a sudo user, edit the sudoers file using the visudo command, and add the following:

For target servers running a 32-bit operating system:

```
Cmnd_Alias OMEUPDATE = /bin/tar,/opt/dell/srvadmin/bin/omexec,  
/tmp/LinuxPreInstallPackage/runbada,/tmp/LinuxPreInstallPackage/omexec,  
/tmp/invcol.bin  
<sudo_username> ALL=OMEUPDATE,NOPASSWD:OMEUPDATE
```

For target servers running a 64-bit operating system:

```
Cmnd_Alias OMEUPDATE = /bin/tar,/opt/dell/srvadmin/bin/omexec,  
/tmp/LinuxPreInstallPackage64/runbada,/tmp/LinuxPreInstallPackage64/omexec,  
/tmp/invcol64.bin  
<sudo_username> ALL=OMEUPDATE,NOPASSWD:OMEUPDATE.
```

5.2 Scheduled Firmware & Driver Inventory collection task after update

When OMSA is installed on the target server, OpenManage Essentials refreshes the inventory details of the target 20 minutes after all the updates are applied,

Similarly, when the system update is applied on a target server that does not have OMSA installed, OpenManage Essentials runs the “firmware and driver inventory collection” task on the target server using the credentials provided for the task. This system task is scheduled to run 20 minutes after the update task is completed.

These system tasks will not have any entry as a “Task” in the task portal; instead they will be represented in the **Task Execution History**.

Task Status						
Task Name	Task State	% Completed	Start Time	End Time		
Scheduled F/W & Driver Inventory-10.94.102.77	Complete	<div><div></div></div> 100%	8/4/2014 11:13:46 AM	8/4/2014 11:17:03 AM		
System Update Task - 8/4/2014 10:50:53 AM - OMSA	Complete	<div><div></div></div> 100%	8/4/2014 10:51:16 AM	8/4/2014 10:53:45 AM		

Figure 21 Scheduled F/W& Driver inventory Task



6 Difference between managing a server with or without OMSA

The following table provides information about the differences between managing a server with/without OMSA using OpenManage Essentials.

Feature	Server with OMSA	Server without OMSA
Discovery protocol	SNMP / WMI / SSH	WMI / SSH
Overall health	Defined	Unknown
Eventing	Supported	Not supported
Software inventory	Supported	Supported from OpenManage Essentials version 2.0 onwards Need to run the "F/W & Driver inventory task"
System update	Supported	Supported from OpenManage Essentials version 2.0 onwards



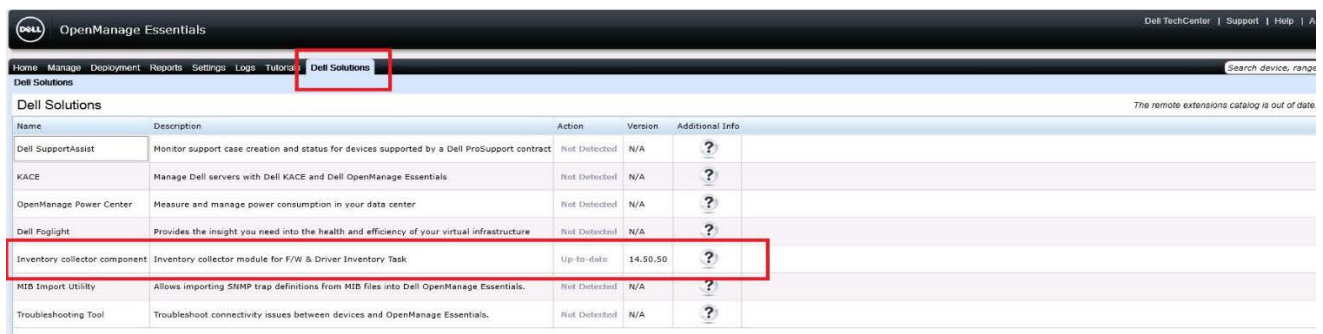
7 Updating the inventory collector component in OpenManage Essentials

OpenManage Essentials integrates the latest version of inventory collector component that is available within the timeline of the OpenManage Essentials release. At times the inventory collector component needs to be updated either to support new devices or to resolve issues. OpenManage Essentials version 2.1 addresses this issue by introducing update capability in the **Dell Solutions** tab.

The **Dell Solutions** tab lists the “Inventory collector component” and indicates whether the current version of the component is of the latest version or not. Similar to any other OpenManage Essentials versions, these components version are checked when you open OpenManage Essentials or the **Dell Solutions** tab.

Note: Functionality of **Dell Solutions** tab dependent on the availability of the OpenManage Essentials catalog from the Dell site. Therefore, you must ensure that you have proper proxy settings/connectivity to the OpenManage Essentials catalog from the Dell site.

If the OpenManage Essentials catalog is not reachable, the following error message is displayed within the top-right of the Dell Solutions tab: “The remove extensions catalog is out of date.”



Name	Description	Action	Version	Additional Info
Dell SupportAssist	Monitor support case creation and status for devices supported by a Dell ProSupport contract	Not Detected	N/A	?
KACE	Manage Dell servers with Dell KACE and Dell OpenManage Essentials	Not Detected	N/A	?
OpenManage Power Center	Measure and manage power consumption in your data center	Not Detected	N/A	?
Dell Foglight	Provides the insight you need into the health and efficiency of your virtual infrastructure	Not Detected	N/A	?
Inventory collector component	Inventory collector module for F/W & Driver Inventory Task	Up-to-date	14.50.50	?
MIB Import Utility	Allows importing SNMP trap definitions from MIB files into Dell OpenManage Essentials.	Not Detected	N/A	?
Troubleshooting Tool	Troubleshoot connectivity issues between devices and OpenManage Essentials.	Not Detected	N/A	?

Figure 22 Dell Solutions tab showing Inventory Collector Component

When a newer version of the inventory collector component is available, OpenManage Essentials, the Action column displays an **Update** link. When you click the **Update** link, OpenManage Essentials downloads all components of the inventory collector that are available online and replaces the components in the local repository.










 OpenManage Essentials					
Home Manage Deployment Reports Settings Logs Tutorials Dell Solutions					
Dell Solutions					
Dell Solutions					
Name	Description	Action	Version	Additional Info	
Dell SupportAssist	Monitor support case creation and status for devices supported by a Dell ProSupport contract	Not Detected	N/A		
KACE	Manage Dell servers with Dell KACE and Dell OpenManage Essentials	Not Detected	N/A		
OpenManage Power Center	Measure and manage power consumption in your data center	Not Detected	N/A		
Dell Foglight	Provides the insight you need into the health and efficiency of your virtual infrastructure	Not Detected	N/A		
Inventory collector component	Inventory collector module for F/w & driver inventory task	Update	14.50.50 		
MIB Import Utility	Allows importing SNMP trap definitions from MIB files into Dell OpenManage Essentials.	Not Detected	N/A		
Troubleshooting Tool	Troubleshoot connectivity issues between devices and OpenManage Essentials.	Not Detected	N/A		

Figure 23 Update link for inventory collector component

Note: The update inventory collector operation is not reversible. If you want to revert to the version of the inventory collector component that was originally integrated with OpenManage Essentials, you must either repair or reinstall OpenManage Essentials.

Note: Updating the inventory collector component is optional. It is recommended to update the collector component only if you face problems with current version of inventory collector or you want to add new support.

A Additional resources (optional)

Support.dell.com is focused on meeting your needs with proven services and support.

DellTechCenter.com is an IT Community where you can connect with Dell Customers and Dell employees for the purpose of sharing knowledge, best practices, and information about Dell products and installations.

For more information on Dell OpenManage Essentials:

- Dell OpenManage Essentials Wiki:
<http://en.community.dell.com/techcenter/systems-management/w/wiki/1989.openmanage-essentials.aspx>

