Discovery and Inventory of Dell Devices using OpenManage Essentials

R Rajiv Nair

Ashish Suyal

Dell | Product Group Enterprise



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 Iogo, OpenManage, PowerVault, PowerConnect, Dell EqualLogic, and PowerEdge are trademarks of Dell Inc. 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.

November 2013 | Rev 2.0

Contents

Executive Summary
Introduction
Scope
Discovery and Inventory5
Prerequisites
Steps for Discovery and Inventory
Discovery Range Configuration7
ICMP Configuration9
SNMP and WMI Configuration
Storage Configuration
WS-Man Credentials 10
SSH Configuation
IPMI Configuration
Discovery Range Action 11
Summary Screen
Discovery and Inventory Portal
All Devices Tree
Device Inventory Details 15
Device Search
Learn More

Tables

Table 1.	Protocol and Credentials
Table 2.	Inventory Details

Figures

Figure 1.	Discovery Range Wizard	7
Figure 2.	.csv File	8
Figure 3.	Specifying an IP Range	8
Figure 4.	ICMP Configuration Screen	9
Figure 5.	SNMP and WMI Configuration Screens	10
Figure 6.	Discovery Range Action Screen	11
Figure 7.	Summary Screen	12
Figure 8.	Discovery and Inventory Portal Page	13
Figure 9.	Device Tree Screen	14

Figure 10.	Device Details	15
Figure 11.	Device Search Screen	16

Executive Summary

A fundamental element of any Device Management is discovery and inventory of the devices an organization is looking to manage. Discovery needs to be non-invasive, easy to administer, efficient, thorough, accurate, broad in scope and responsive to network changes.

Discovery is a process for identifying all Dell hardware devices in your network, such as Dell PowerEdge[™] servers, Dell EqualLogic[™] storage, Dell PowerConnect[™] switches, etc. It is an unobtrusive way of searching out all networked devices and providing an analysis of each device, including its software, memory, components, serial number, etc. The Inventory Report provides detailed information on all discovered devices such as device health, available memory, and installed software.

Introduction

OpenManage[™] Essentials (OME) is a hardware management application that provides a comprehensive view of Dell systems, devices, and components in the enterprise's network. OpenManage Essentials is a web-based and one-to-many systems management application. For Dell systems and other devices and components, a user can discover and inventory the systems, monitor the systems' health, and perform system updates.

Scope

The purpose of this document is to help a user with the necessary steps to perform discovery and inventory of Dell devices. These are the high-level areas covered:

- Steps to perform discovery and inventory.
- Providing a holistic view of the datacenter.
- Searching specific devices.

Discovery and Inventory

Discovery and inventory aids understanding of what hardware and software are installed across an organization and is the most basic step to effective systems management. Areas such as license compliance, health monitoring, security and upgrades, and migrations all require the networked hardware to be available to the System Administrator on a single console to help ease the process. OpenManage Essentials provides these capabilities to initialize the discovery and inventory process and perform required actions on these devices.

Prerequisites

These are the prerequisites for performing discovery and inventory:

Credentials: The discovery process in OME communicates to the devices using the following supported protocols:

Protocols	Required credentials
SNMP	SNMP Community string
WMI	Windows Administrator credentials
IPMI	IPMI operator credentials.
WS-Man	WS-Man Administrator credentials
Dell/EMC Array	EMC credentials
SSH	SSH Administrator credentials

Table 1.Protocol and Credentials

Setting up the systems to be managed: There are a few settings to be performed in Managed Node to make it discoverable over the network. Refer to the white paper *Make your Environment Manageable with Dell OpenManage Essentials* for more information.

OpenManage Server Administrator (OMSA): OMSA should be installed on all the systems that are required to be managed with OME.

Steps for Discovery and Inventory

After the above prerequisites are met, the discovery and inventory process can take place. The steps can be summarized as follows:

- Discovery Range Configuration
- ICMP Configuration
- SNMP Configuration
- WMI Configuration
- Storage Configuration
- WS-Man Credentials
- SSH Credentials
- IPMI Configuration
- Discovery Range Action
- Summary Screen

Discovery Range Configuration

First, specify device IP ranges in the environment to perform discovery and inventory.

- 1. Navigate to Manage →Discovery and Inventory→Discovery Ranges→Discovery Range Summary.
- 2. Right-click Include Ranges and select Add Discovery Range.

Figure 1. Discovery Range Wizard

DER OPENMANAGE ESSENTIALS	T Help T About T
Home Manage Reports Prefer Discover Pevices 20 Devices Devices	

Below are some sample IP ranges that can be used as an IP range for Discovery.

IP Range	193.109.112.*
	193.104.20-40.*
	192.168.*.*
	192.168.2-51.3-91
	193.109.112.45-99
Hostname	WIN-17L2JS8
Single IP	193.109.112.99

Additionally, an Import functionality provided in OpenManage Essentials helps with importing a Discovery Range which is defined within a .csv file format, as shown in Figure 2. The maximum numbers of devices that can be imported using this method is 500.

Name	Туре	Data
1750-win-r03-03	Host (A)	10.94.172.180
1750-win-r04-02	Host (A)	10.94.172.184
1850-win-r04-05	Host (A)	10.94.172.179
2650-win-r01-04	Host (A)	10.94.172.193
2800-W2K3	Host (A)	10.94.168.32
2850-win-r01-03	Host (A)	10.94.161.71
2900-win-r03-07	Host (A)	10.94.161.72
2970-esx	Host (A)	10.94.168.203
4600-WIN-R04-14	Host (A)	10.94.172.168

Figure 2. .csv File

The following example demonstrates adding a Discovery Range using SNMP or WMI protocol with the Add Discovery Range Wizard.

- i. Enter the Discovery Range.
- ii. Provide the Range Name (optional)
- iii. Click Add.

Repeat steps i to iii if required.

iv. Click Next to proceed.

Figure 3. Specifying an IP Range

Discover Devices						23
Discovery Range Configurat	tion Discovery Rang	e Configuration				1/10
Discovery Range Configuration	Specify IP addres	ss, range, or host na	ame.			
ICMP Configuration	Enter an IP address or a	a range. The first octet ca	annot be zero. Speci	ify a range (for examp	le, 12-115) or 1	wildcard(*) in
SNMP Configuration	the last two octets.					
WMI Configuration	IP address / range:	10 . 94	. 178 . 89	Name : Printer		
Storage Configuration	O Host name:			i	ii	
WS-Man Configuration	Subnet mask:	255 . 255	. 255 . 0			
SSH Configuration				Add	Remove	Import
IPMI Configuration	IP Range / Host Name	Discovery Range Name	Subnet Mask		_	
Discovery Range Action	10.94.168.*	Range_Server	255.255.255.0			
Summary						
					iV	
Help				Cancel	Next	Finish

ICMP Configuration

- i. Set **Ping Timeout** for pinging the device on the network.
- ii. Specify the number of attempts to be tried.
- iii. Click Next to proceed.

Figure 4.	ICMP	Configuration	Screen
-----------	------	---------------	--------

Discover Devices		23
Discovery Range Configuratio	n ICMP Configuration	2/10
Discovery Range Configuration ICMP Configuration SNMP Configuration WMI Configuration Storage Configuration WS-Man Configuration SSH Configuration IPMI Configuration Discovery Range Action Summary	You may configure the ICMP parameters.	?
Help	Cancel Back Next	Finish

SNMP and WMI Configuration

SNMP Configuration Screen

- 1. Select the check box to use SNMP protocol for discovery.
- 2. Enter the Community Name.
- 3. Click Next to proceed.

WMI Configuration Screen

- 1. Select the check box to use WMI discovery.
- 2. Provide Windows credentials.
- 3. Click Next to proceed.

Figure 5. SNMP and WMI Configuration Screens

Discover Devices	Discover Devices		35
Discovery Range Configuration SNMP Configuration	3/10 Discovery Ra	nge Configuration WHI Configuration	4/10
Discovery Range Configuration Specify the SNMP settings for discovery. ICMP Configuration Image Configuration SIMP Configuration Image Configuration WMI Configuration Image Configuration Strange Configuration Image Configuration WMI Configuration Image Configuration Strange Configuration Image Configuration Summary Image Configuration Strange Configuration Image Configuration Summary Image Configuration Strange Configuration Image Configuration Summary Image Configuration	Discovery Rang ICVP Configura SNPD Configura SNPD Configura Strange Config WHI Configura Strange Config WHI Configura Strange Config WHI Configura Strange Configura Strange Configura	a Configuration tion tion tion tion toright of the user name to authenticate and connect to remote devices. i If you choose to configure the WMI parameters, then specify the domain as part of the user name to authenticate and connect to remote devices. i If you choose to configure the WMI parameters, then specify the domain as part of the user name to authenticate and connect to remote devices. i If you choose to configure the WMI parameters, then specify the domain as part of the user name to authenticate and connect to remote devices. I found in User name: [localhost'administrator Password: I found is a specify the domain as part of I found in the user name to authenticate and connect to remote devices. I found is a specify the domain as part of I found is a specify the doma	<u>3</u>
Help	Cancel Dack Next Finish Help	Cencel Jack Next Fi	inish

Storage Configuration

This screen is only used to set the options to discover PowerVault Modular Disks or Dell | EMC Devices. Any required credentials for EMC devices are entered here.

WS-Man Credentials

This screen is used to set the options to configure WS-Man parameters for discovering ESXi-installed devices or iDRAC

SSH Configuation

This screen is used to set the options to configure Linux and ESXi.

IPMI Configuration

This screen is used to set the options to configure IPMI credentials for discovering DRAC or iDRAC devices.

Discovery Range Action

Select one of the radio buttons as necessary.

Figure 6. Discovery Range Action Screen

Discover	Devices
----------	---------

Discovery Range Configuration Discovery Range Action 9/10										
Discovery Range Configuration ICMP Configuration SNMP Configuration WMI Configuration Storage Configuration WS-Man Configuration SSH Configuration IPMI Configuration Discovery Range Action Summary	 Specify to initiate discovery, inventory, or both Do not perform discovery or inventory. Perform only discovery. Perform both discovery and inventory. 									
Help	Cancel Back Next Finish									

23

Summary Screen

This screen displays a consolidated list that summarizes the options selected from the first screen. After reviewing the summary, you can modify the settings or complete the process.

- Click Back to navigate to previous screens (sequentially).
- Click Finish to complete the range configuration.
- Select the required label to jump directly to a specific screen.

On clicking Finish, the range will be added to the Include Range list.

Discover Devices			23
Discovery Range Configuration	Summary		10/10
Discovery Range Configuration	Review your inputs and clic	k Finish to continue or click Back	to change your inputs.
ICMP Configuration	Attribute	Value	
SNMP Configuration	SNMP Discovery	Enabled	
WMI Configuration	Include Range	10.94.178.89/255.255.255.0	
Storage Configuration	Include Range	10.93.168.*/255.255.255.0	
WS-Man Configuration	SNMP Get Community	public	
SSH Configuration	SNMP Set Community		
	SNMP Timeout (seconds)	4	
IPMI Configuration	Number of SNMP Retry attempts	2	
Discovery Range Action	WSMAN Timeout	15	
Summary	WSMAN Retries	4	
	Action to be taken	Perform both Discovery and Inventory.	
	ICMP Timeout (milliseconds)	400	
	Number of ICMP Retry attempts	1	
	WMI Discovery	Enabled	
	WMI User Name	localhost\administrator	i
Help		Canc	el Back Finish

Figure 7. Summary Screen

Discovery and Inventory Portal

The Discovery and Inventory Portal screen provides a single point of access to most details of discovered/inventoried devices at any given point of time. To view the portal, navigate to Manage→Discovery and Inventory→Discovery Ranges→Discovery Ranges→Include Ranges. Using this screen, a System Administrator can monitor the progress of the Discovery Inventory process.



Figure 8. Discovery and Inventory Portal Page

The screen is divided into five sub-screens:

- Discovery Ranges: The range of IPs added through the wizard.
- Task Status: The progress of the Discovery process of an IP. The status changes from Running to Completed.
- **Discovered vs. Inventoried Devices:** A graphical representation of discovered and inventoried devices to help visually separate the devices.
- Last Discovery and Inventory: Details from the last discovery and inventory task run.
- Dashboard: Classified devices with critical and warning health status.

All Devices Tree

Once the discovery and inventory process is completed, the System Administrator can obtain a detailed view of all the devices using the Device Tree screen.

To view the Device Tree, navigate to the Manage \rightarrow Devices tab and select the All Devices node to view the devices classified under specific nodes as per the device category. The icon corresponding to each device shows the current health status.

This screen gives a glance of all discovered and-inventoried devices, the type and health of device, and the health of each device (green: normal, yellow: warning and red: critical).

Dell TechCenter Support Help About Administrator 2 1 🏠 14											
Home Manage Reports Prefer	rences Logs Tuto	rials Extensions									
Devices Device Search Discove	ery and Inventory	Alerts System Updat	e Remote Tasks								
== 😧 All Devices	All Devices							893	C ?		
- 🖉 Clients								222	<u> </u>		
- 🖉 HA Clusters	Details Alerts No	n-Compliant Systems							×		
— ⊘ КVМ	Viewing 89 Device	s									
🛨 😨 Microsoft Virtualization	Drag a column header and drop it here to group by that column										
🖬 - 😰 Modular Systems	Health Status V	Connection Status V	Device Name	Service Tag 🝸	Device Type 🝸	Model V	Discovered On	Inventoried On	Statuse		
- A Network Devices		() On	esx41-r900.dmc-ad.com	3RVGT1S	Server	PowerEdge R900	10/18/2012 10:57:18 PM	10/18/2012 11:58:41 PM	10/19/2		
- 🖉 OOB Unclassified Devic		() On	idrac-3tfr22s.dmc-ad.com	3TER225	Server	PowerEdge R410	10/18/2012 11:00:52 PM	10/18/2012 11:57:48 PM	10/19/2		
- 🖉 Power Devices		() On	idrac-4fs822s.dmc-ad.com	4F58225	Server	PowerEdge R410	10/18/2012 11:01:40 PM	10/18/2012 11:57:38 PM	10/19/2		
- 🖉 Printers	ă	() On	idrac-7zol12s dmc-ad com	77PI 125	Server	rono Logo (Chio	10/18/2012 10:59:00 PM	10/18/2012 11:57:54 PM	10/19/2		
- 😰 RAC		() On	idrac-9tfr22c dmc-ad.com	0TED 225	Server		10/18/2012 10:03:00 PM	10/18/2012 11:57:48 PM	10/19/2		
- 😰 Servers			idrae 0.04270a data ad asat	01110225	Server		10/18/2012 11:01:12 PM	10/10/2012 11:57:40 PM	10/10/2		
+- 🖉 Storage Devices			lurac-syn872s.unc-au.com	9116725	Server	D 51 0545	10/18/2012 10:58:55 PM	10/18/2012 11:58:00 PM	10/19/2		
🖬 - 🛷 Unknown		On On	issuetotest.dmc-ad.com	BTH8/25	Server	PowerEdge R515	10/18/2012 11:00:57 PM	10/18/2012 11:57:37 PM	10/19/2		
🖬 😨 VMware ESX Servers		On On	ome-sbs2011.dmc-ad.com	3525V15	Server	PowerEdge R905	10/18/2012 10:58:11 PM	10/18/2012 11:58:17 PM	10/19/2		
		On On	PE1950-1	CZXSQ1S	Server	PowerEdge 1950	10/18/2012 10:58:37 PM	10/18/2012 11:58:08 PM	10/19/2		
	83	On On	pe1950-k1.dmc-ad.com	62YSQ1S	Server	PowerEdge 1950	10/18/2012 10:58:12 PM	10/18/2012 11:58:04 PM	10/19/2		
	8	(i) On	prasadauto.dmc-ad.com	8N3SV1S	Server	PowerEdge R905	10/18/2012 10:59:03 PM	10/18/2012 11:58:31 PM	10/19/2		
	O	🕲 On	r905-lab2.dmc-ad.com	248JP15	Server	PowerEdge 2970	10/18/2012 10:59:26 PM	10/18/2012 11:57:36 PM	10/19/2		
	0	🎱 On	RAC_DHQ35BS	DHQ35BS	Server		10/18/2012 11:01:26 PM	10/18/2012 11:57:46 PM	10/19/2		
	8	🕑 On	RAC_JRB922S	JRB922S	Server		10/18/2012 10:59:49 PM	10/18/2012 11:57:14 PM	10/19/2		
	3	🕲 On	t620-959rc2s.dmc-ad.com	959RC2S	Server	PowerEdge T620	10/18/2012 11:01:02 PM	10/18/2012 11:58:43 PM	10/19/2		
	2	🍅 On	win-7vs29vdx407.dmc-ad.com	5T2LT1S	Server	PowerEdge M605	10/18/2012 10:59:47 PM	10/18/2012 11:57:37 PM	10/19/2		



Device Inventory Details

To see a detailed inventory of a particular device, select the device and view the details in the right pane.

DELL OPENMANAGE ESSENTIALS	5							Dell	TechCenter Support	Help A	bout Adr 🔞	ninistrator 21 <u> 1</u> 4
Home Manage Reports Preferences Logs Tut	orials Extension	s Lindate Remote	Tasks			_			_			
Contract Devices	esx41-r900.di	mc-ad.com	10363							8	n Q	C ?
- Ø HA Clusters	Details Alerts Ha	ardware Logs										×
– ⊘ KVM ■- ③ Microsoft Virtuslization Servers Device Summary										^		
Modular Systems	Health Status	Connection Status	Device Na	me	Device Type	Model	Service Tag	Asset Tag	Express Service Code	Location		Revisi
	8	🅑 On	esx41-r90	0.dmc-ad.com	Server	PowerEdge R900	3RVGT1S	N/A	8215786000	Please set	the value	N/A
■	🔯 os 1	Informati	on									
■- 🐼 RAC	OS Name O	S Total Physical Me	emory(MB)	OS Locale O	S Revision				Service Pack Version			
Servers	VMware ESX 2	91		N/A 4	1.0 GA (build	-260247) Kernel 2.	5.18-164.ESX ((x86_64)	N/A			
Construction of the second secon	esx41-r900.dmc-ad.com esx41-r900.dmc-ad.com esx41-r900.dmc-ad.com Software Agent Information											
- 8 PE1950-1	Agent Global Sta	atus Agent Name			Agen	t Version	Agent Descrip	tion				
- 😰 pe1950-k1.dmc-ad.com	8	Server Admi	nistrator		6.5.0		Management	software fo	r Dell systems.			
- 🔞 prasadauto.dmc-ad.com	1	Server Admi	nistrator (S	torage Manage	ment) 3.5.0		Configuration	and monite	oring of disk storage dev	ices.		
— 😰 r905-lab2.dmc-ad.com		Inventory Co	ollector Age	nt	6.5.0		Provides infor	mation abo	ut devices running on th	e local syste	em	
— 😰 t620-959rc2s.dmc-ad.com		Dell Remote	Access Con	troller 5	1.60	(Build "11.03.03")	This system c	omponent	provides a complete set	of remote m	nanagemen	t functi
- 2 win-7vs29vdx407.dmc-ad.com		(missing nar	ne agent id	28]	N/A		N/A					
— 😺 winpe2950.dmc-ad.com		1										

Figure 10. Device Details

The inventory details table includes all the details displayed depending on the discovery protocol used. The following table shows all possible inventory headers captured and displayed by OME.

Table 2. Inventory Details

Device Summary	Physical Disk
OS information	Virtual Disk
S/w Agent Information	Contact
Nic Info.	S/w Inv.
Rac Info.	Trusted Platform Module
iDrac	FRU
Processor Info.	Acquisition Info
Memory Device Info.	Depreciation Info.
Firmware Info.	Extended Warranty
Power Supply	Ownership Info.
Embedded Device	Outsource Info.
Controller Device	Virtual Machine Guest Info.
Enclosure Info	Virtual Machine Guest Nic Info.

Device Search

If there are many devices under the tree, managing them might be difficult. Searching manually for a particular device for monitoring can be a tedious process. To overcome this situation, OME includes a Device Search option:

- 1. Navigate to the Manage \rightarrow Device Search tab and provide a name for the new search query.
- 2. Select the desired options from the Where drop-down menu.
- 3. Select any supporting sub-criteria.
- 4. Provide a part of the device name.
- 5. Click Run Query.
- 6. The result displays in the lower pane.

Déll a	OPENMANAGE ESS	ENTIALS						Dell TechCenter	Support H	elp About Adn	ninistrator 21 A 14
Home Manage R	anarte Dreferances	Logs Tutorials Extension	ac.		_		-				
Devices Device Se	arch Discovery and	Inventory Alerts System	n Update Remote Tas	sks							
											2
Device Search											
O Run Existing Que	ery	• Dele	ete Query								<u></u>
Create New Que	ry MyQuery_1	Enter a ne	ew query name								
Where	Device Name		-	Is		•					
AND	- Agent Name			Is		•					
	Asset Tag										
	Device Model				=						
Query Results Clea	ar Device Name										
Drag a column head	ler and dro										
	IP Address										
Health Status q	Connect MAC Address		æ	iag ų s	ASSECTED U	Levice Model (Device Type (System	n Revisi	ion Number q			
	OS Name	urer									
	OS Revision										
	Power Status										
	Service Tag					L,					
	System Revisi	ion Number									
								Dell TechCenter	Support H	lelp About Adr	ninistrator
	OPENMANAGE ESS	ENTIALS								2	21 🛕 14
_				_			_				
Home Manage R	eports Preferences	Logs Tutorials Extension	ns								
Devices Device Se	earch Discovery and	I Inventory Alerts Syster	n Update Remote las	SKS							
Device Search											?
					$= \forall I$						
Run Existing Qu	ery	▼ Dele	ate Query		V						
 Create New Que 	MyQuery_10/19/2	2012 1:30:54 AM Enter a ne	ew query name		¥			iv			
Where	Device Name		•	Contain			lidrad				
	Device Nume			Contains	,			-			
AND	▼ Device Name		▼	Ends Wi	th						
				Is						V Run Ouerv	Save Ouerv
				Starts W	/ith		J				
Ouery Results - (11	devices returned)	ear			=				vi	45	
									VI	V	
Urag a column head	er and drop it nere to grou	p by utat column	00 H							5 . H . I . 7	
Health Status V	Connection Status V	Name V	US Name	¥ د معمد د	US Revision		¥.	Service Tag ¥	Asset Tag ¥	Device Model V	Device
	On Off	idrae-1234567.dmc-ad.com	VMware ESX 4.1.0 build	a-800380	NA			1LMJ82S	NA	PowerEdge R810	Server
(V)		idrac-2v2it1s.dmc-ad.com	VMware ESX 4.1.0 built	a-800380	NA	(uners) Karral 2 6 10 274 alf (-05 -51)		2021115	NA	PowerEdge M605	Server
V	() Off	idrac-4fe822e.dmc-ad.com	NA NA	ix Server	nelease 5.7 (1	ikariga) kemel 2.6.18-274.el5 (X86_64)		NA	NA	NA	Junclace
		idrac-4rso22s.umc-ad.com	V/Mware ESV		4.0.0 Update	3 (huild-308348) Kernel 2 6 18-104 ECV (v	86 64	4558225	NA	DowarEdge D410	Septer
U	U On	iurac-4158225.0mc-ad.com	viniware ESX		4.0.0 opdate	o (uunu-osoosao) kernei 2.0.18-194.ESX (X	.00_04)	4138223	N/A	FowerEdge K410	Server

Figure 11. Device Search Screen

Learn More

Visit <u>http://en.community.dell.com</u> for more information on Dell's Management Software.