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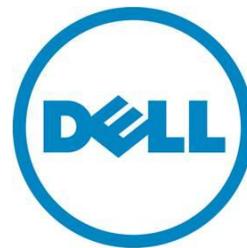
# How to Build Inventory Reports

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*This Dell technical white paper provides information about hardware and firmware Inventory build details.*

Senthil ARUNACHALAM

Sanjay Rao



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## Executive summary

This white paper is intended for administrators who want to understand hardware and software inventory details and make decisions on current firmware and hardware inventory.

## Introduction

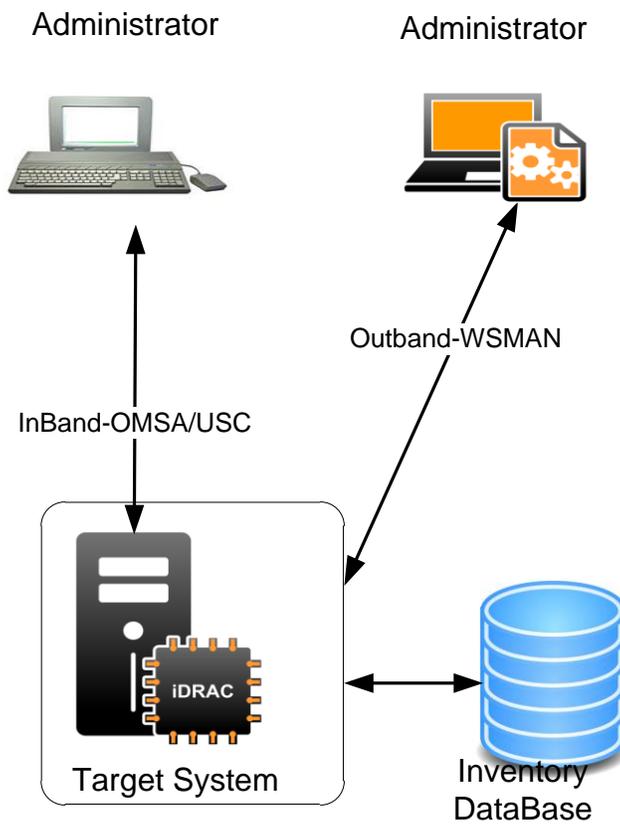
Key server management decisions are made based on the system's software and hardware inventory. The system administrator can query for the current software and hardware inventory and compare that with the latest hardware/firmware versions to decide if an upgrade is required. Upgraded hardware/firmware is recommended for enhanced performance as well as to include bug fixes from previous releases.

Dell PowerEdge™ servers equipped with Integrated Dell Remote Access Controller (iDRAC) provide a secure, simple, scriptable, and standards-based remote management capability through Web Service for Management (WSMAN) to list the firmware and hardware inventory. Dell in-band tools and consoles also provide firmware and hardware inventory details. This white paper focuses on various attributes that are returned as part of Dell's hardware and firmware inventory from both in-band and out-of-band methods.

## Inventory collection

System inventory is classified as hardware and firmware inventory. Use the firmware inventory details to determine the current firmware levels and help determine when to update inventory or rolled it back to a previous level. Hardware inventory provides hardware configuration information about each piece of hardware.

Figure 1. Outline of system inventory process



Gather systems inventory using in-band and out-of-band methods. Dell supports both in-band and out-of-band tools for collecting system inventory. Common in-band tools are Lifecycle Controller (LC), OpenManage™ Server Administrator (OMSA), OpenManage™ Essentials, and Dell Repository Manager. Common out-of-band tools are Chassis Management Console (CMC), Dell Management Console (DMC), System Center Configuration Manager (SCCM), and Web Service for Management (WSMAN) command-line scripts.

### Firmware inventory report

Software inventory provides detailed information about firmware levels of various components on the system. These firmware versions help you determine when to update firmware.

Table 1 shows the in-band inventory collection for firmware updates. Use the Dell Repository Manager application for reporting this inventory collection. Dell Repository Manager lets you efficiently manage these system updates. When Dell recommends new firmware updates, you can refresh Dell Repository Manager and compare the current versions with the newly recommended firmware levels and decide if a firmware update is required.

**Table 1. In-band component update**

Component name	Version	Baseline version	Status
Idrac	3.30	3.30	Compliant
Bios	6.0.2	6.0.7	Older than baseline
DellLifeCycleController	1.5.0.6	1.5.0.7	Older than baseline
DellOS DriverPack	6.5.3	6.5.13	Newer than baseline

Table 2 shows the inventory collection for the out-of-band method. The firmware inventory lists both current and previous installed firmware versions. The current version is the version currently running on a particular device. The previous version listed in the firmware inventory is the previous version of the firmware that was installed on the device. The previous version of the firmware is cached by Lifecycle Controller and you can use it to roll back.

**Table 2. Out-of-band component update**

Component name	Current	Previous
Idrac	3.30	3.20
Bios	6.0.2	6.0.4
DellLifeCycleController	1.5.0.6	1.5.0.5
DellOS DriverPack	6.5.3	6.5.13

For more information, refer to the *Lifecycle Controller Remote Firmware Update Scripting* white paper for software inventory collection located here:

<http://en.community.dell.com/techcenter/systems-management/w/wiki/scripting-the-dell-lifecycle-controller.aspx>

## Hardware Inventory Report

Hardware inventory reporting is a much broader discipline and adds different dimensions of reporting, such as: hardware components, configuration values, and asset management. The goal of hardware reporting is to have a complete, up-to-date, and accurate view of all components including: NIC, RAID, BIOS, System, CPU Memory, and asset management information.

This section shows a hardware components output sample. All the components have key attribute for unique identification. Component attributes listing varies for each component.

**Table 3. Hardware component output**

Hardware Component	Properties	Values
System		
	FQDD	System.Embedded.1
	AssetTag	DellEvents
	BoardPartNumber	032Y84X02
	MaxCPUSockets	2
	MaxCPUSockets	24
	FQDD	System.Embedded.1
	ServiceTag	7654321
	BoardSerialNumber	CN13740920003M
	SystemGeneration	12G Modular
	MaxDIMMSlots	6
Memory		
	Model	DDR3 DIMM
	PartNumber	HMT325R7BFR8A-H9
	SerialNumber	341709A4
	FQDD	DIMM.Socket.A1
	Manufacturer	Hynix Semiconductor
	Speed	1333
	CurrentOperatingSpeed	1067
	Size	2048
CPU		
	CPUFamily	B3
	Manufacturer	Intel
	MaxClockSpeed	3600
	Model	Genuine Intel(R) CPU @ 1.80GHz
	FQDD	CPU.Socket.1
RAID Controller		
	FQDD	RAID.Integrated.1-1
	DeviceCardManufacturer	DELL
	PatrolReadState	1
	PrimaryStatus	1
	ProductName	PERC H310 Mini
	SASAddress	5842B2B072129100
Physical Disk		
	FQDD	Disk.Bay.1:Enclosure.Internal.0-0:RAID.Integrated.1-1
	FreeSizeInBytes	146815733248
	Manufacturer	Dell™
	ManufacturingDay	4
	ManufacturingYear	2011
	Model	HUC151414CSS600
	SerialNumber	PLVZWUME

Hardware Component	Properties	Values
	SizeInBytes	146815733248
	HotSpareStatus	0

Table 4. BIOS and NIC output

BIOS	AttributeDisplay name	Value	Possible values
	FQDD	BIOS.Setup.1-1	N/A
	BootMode	BiosMode	BiosMode/UEFIMode
	Boot Sequence Retry	Enabled	Enabled/Disabled
	Serial Debug Output	Enabled	Enabled/Disabled
	ProcCores	All	All,1,2,4,6
	Embedded SATA	AHCI Mode	ATA Mode, AHCI Mode, RAID Mode, Off
	BIOS Boot Sequence Device	Floppy.USBFront.1-1	Floppy.USBFront.1-1, Optical.USBFront.2-1, HardDisk.List.1-1, NIC.Integrated.1-1-1
	UEFI Boot Sequence Device	NIC.Integrated.1-1-1	NIC.Integrated.1-1-1, NIC.Integrated.1-2-1
	Serial Communication	Off	Off, On
NIC	AttributeDisplay Name	Value	Possible Values
	FQDD	NIC.Integrated.1-1-1	N/A
	TCP/IP Parameters via DHCP	Disabled	Disabled, Enabled
	IP Autoconfiguration	Enabled	Disabled, Enabled
	iSCSI Parameters via DHCP	Disabled	Disabled, Enabled
	CHAP Authentication	Disabled	Disabled, Enabled
	Boot to iSCSI Target	Enabled	Disabled, Enabled , One Time Disabled
	IP Version	IPv4	IPv4, IPv6
	NIC Mode	Enabled	Enabled,Disabled
	iSCSI Offload Mode	Disabled	Enabled,Disabled
	FCoE Offload Mode	Disabled	Enabled,Disabled
	Legacy Boot Protocol	PXE	PXE, iBFT

Find Hardware Inventory scripts here:

<http://en.community.dell.com/techcenter/systems-management/w/wiki/scripting-the-dell-lifecycle-controller.aspx>

## Warranty information

Product warranty information is accessible at the Dell support site by providing the system tag. The warranty information lets you address the warranty expiration of managed assets by either choosing to refresh the assets or FRU information.

Table 5. Sample warranty information

Provider	Start Date	End Date	Daysleft
Dell	9/17/2005	9/18/2005	1

## Field replaceable units

Use the Field Replaceable Units (FRU) information to replace any defective parts installed on the server. FRU information is found on the Dell support site by providing a part number.

Table 6. Sample FRU information

Device Name	ManuFacterer	Serial Number	Part Number
DIMM_A1	Hynix Semi Conductor	341709A4	HMT325R7BFR8A-H9
Idrac7	DELL	CN7016319U00EIOCYK8N	0CYK8N

## Use cases

### How is the FQDD attribute used?

The Fully Qualified Device Descriptor (FQDD) is the unique identifier for the component. This identifier correlates a particular component with different components. Table 7 shows the information for the physical disk, virtual disk, and the enclosure managed by same controller.

Table 7. Table for FQDD association

Device FQDD	Associated Devices FQDD
RAID.Integrated.1-1	Disk.Direct.0:RAID.Integrated.1-1
	Disk.Virtual.0:RAID.Integrated.1-1
	Enclosure.Internal.01 :RAID.Integrated.1-1

### How do I know physical disk size, status, and raid status?

The sample physical disk component inventory in Table 8 shows the size and status of physical disk and RAID.

Table 8. Sample physical disk

PhysicalDisk	SizeInBytes	146815733248
	PrimaryStatus	1
	Raid status	1

The *PrimaryStatus* provides the high level status value intended to align with the Red, Yellow, Green type representation status. It's a high level disk health status. Its numerical values {0, 1, 2} are mapped with the status values of {Unknown, OK, Degraded}. The collected report shows that the disk health is ok.

*RAID Status* provides the status of RAID and has one of following values {0, 1, 2, 3, 4}, which are mapped with the status values of {Unknown, Online, foreign, Online}. The collected report says that RAID status is *Ready*.

### How do I find the Boot sequence?

Table 9 shows a sample BIOS hardware inventory for the BootMode and BIOSBootSequence attributes, which shows that BootMode is BiosMode and it is part of the BIOS boot sequence.

Table 9. Sample BIOS hardware inventory

BIOS			
	BootMode	BiosMode	BiosMode
	BIOS Boot Sequence Device	Floppy.USBFront.1-1	Floppy.USBFront.1-1, Optical.USBFront.2-1, HardDisk.List.1-1, NIC.Integrated.1-1-1

### How do I find system warranty?

From the system inventory, note the service tag value, and then enter that service tag value in Dell Support site for collecting warranty information. Navigate to that Website here:

[http://support.dell.com/support/topics/global.aspx/support/warranty/warranty\\_information?c=us&l=en&s=gen](http://support.dell.com/support/topics/global.aspx/support/warranty/warranty_information?c=us&l=en&s=gen)

Table 10. Sample system inventory for ServiceTag

System		
	ServiceTag	7654321

### How do I replace a faulty system board?

You can find the board part number and board serial number in the system component hardware inventory. Enter those values in *Parts and upgrades* section at the Dell support site. Replacement part details are displayed on the page. You can navigate to the Dell Support site here:

[http://support.dell.com/support/topics/global.aspx/support/warranty/warranty\\_information?c=us&l=en&s=gen](http://support.dell.com/support/topics/global.aspx/support/warranty/warranty_information?c=us&l=en&s=gen)

Table 11. Sample System Inventory for BoardPartNumber

System		
	BoardPartNumber	032Y84X02
	BoardSerialNumber	CN1374092O003M

**How can I figure out the latest firmware update available for component?**

If the installed version is lower than the recommended baseline version, then a new update is available for the component. Table 12 shows that the installed version needs updating.

**Table 12. Sample BIOS firmware versions inventory**

Bios	6.0.2	6.0.7	Older than baseline
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**How do I find the correct firmware version for a rollback?**

If you have installed two or more versions of firmware on your server, you can roll back to a previous version. The component inventory report displays these versions, as in Table 12.

**How do I know the RAM size and maximum number of DIMM slots in server?**

The hardware inventory report shows the memory and RAM for the server shown in Table 13. You can also find the MaxDIMMSlots attribute, shown in Table 14.

**Table 13. Sample memory inventory**

Memory	Size	2048
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**Table 14. Sample system inventory attribute MaxDIMMSlots**

System	MaxDIMMSlots	6
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**How do I know if the iSCSI boot host software uses authentication?**

If the CHAP Authentication is *enabled*, then CHAPID and CHAP secret attributes are activated for the configuration. The CHAPID and CHAP password are configurable.

**Table 15. Sample NIC inventory for CHAP authentication**

NIC	CHAP Authentication	Enabled
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**How do I change the iSCSI boot host software to acquire a static or DHCP IP address?**

If the attribute TcplpViaDHCP is *enabled*, then the IP Address is obtained through DHCP. Otherwise, it is acquired through a static IP address.

**Table 16. Sample NIC Inventory for TcplpViaDHCP**

NIC	TcplpViaDHCP	Enabled
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**How do I know if a system boots through an iSCSI target or BIOS listed devices?**

In the NIC Hardware Inventory report, if the attribute *IscsiTgtBoot* is *enabled*, then the system boots through iSCSI target. If it is *disabled*, then the system boots through other bootable devices. If the option is *OneTimeDisabled*, then the system does not boot through the iSCSI target for only one time.

**Table 17. Sample NIC Inventory for IscsiTgtBoot**

NIC	IscsiTgtBoot	Enabled
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## Summary

This document has shown you how to build an inventory for firmware updates, for asset management (warranty and FRU), and for hardware components. For more information about inventory profiles and scripts, refer to the relevant articles at the following site:

- <http://www.dell.com/techcenter>