Improve Operational Efficiency Through OME Server Drift Management

Summary

As they say “drift happens” … Ideally, firmware versions and configuration settings such as for iDRAC and system BIOS set up across a server environment should remain consistent. Configuration drift refers to the phenomenon where server(s) configurations ‘drift’ toward an inconsistent state.

This Direct from Development (DfD) tech note describes how capabilities in Dell’s OpenManage Enterprise server management appliance facilitates the simplification of drift management, gives visibility of problems while at the same time reduces the time and effort to resolve.

Authors

Mark Maclean
Technical Marketing Engineering

Manoj Malhotra
OME Product Manager

Introduction

The failure to ensure a consistent server firmware version and configuration settings or not to detect unauthorized changes increases the risk of operational problems, security breaches, and even server outages.

Why does this happen? – This situation can have many causes, including poor processes, routine hardware upgrades and replacements, or even attacks from external threats.

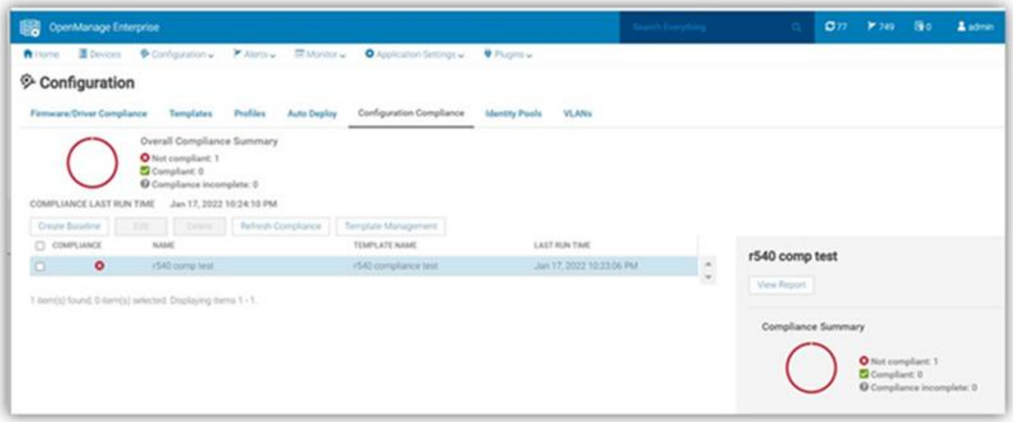
What is the scope of the impact? – Any number of firmware versions or configuration settings. For example, in a secure environment many elements such as iDRAC user accounts / USB ports / server boot order may be areas of key interest.

Dell’s OpenManage Enterprise management console (“OME” for short), provides compliance features that detect, highlight, and remediate issues, with simple processes for both firmware versions and configuration settings. OME also provides easy-to-create baseline configurations, using the intuitive server configuration templates/firmware catalogs, to streamline the capture/creation of required values, analyze multiple servers, and then apply the desired state.

To perform any tasks in OME, you must have the correct role-based user privileges and scope-based operational access to the devices.

Managing configuration settings

Let’s look at configuration settings first. This is based on the iDRAC’s “server configuration profile” concept. A compliance template captures the server BIOS, iDRAC, and components’ configuration settings. A template can consist of hundreds of firmware settings, including iDRAC, BIOS, PERC RAID, NICs, and FC HBA configurations.



Overall Compliance Summary

- Not compliant: 1
- Compliant: 0
- Compliance incomplete: 0

COMPLIANCE LAST RUN TIME Jan 17, 2022 10:24:10 PM

□	COMPLIANCE	NAME	TEMPLATE NAME	LAST RUN TIME
□	☒	r540 comp test	r540 compliance test	Jan 17, 2022 10:23:06 PM

1 item(s) found, 0 item(s) selected. Displaying items 1 - 1.

r540 comp test

Compliance Summary

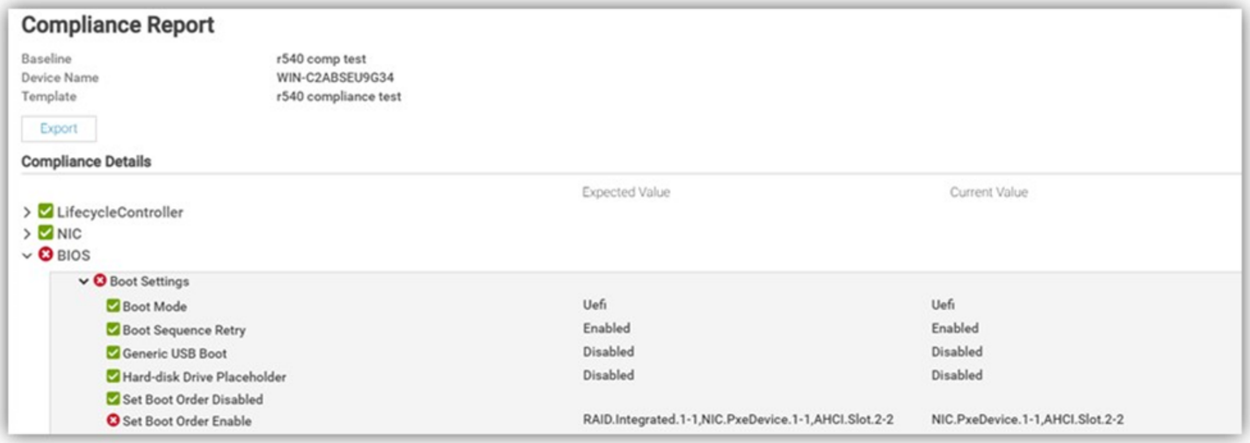
- Not compliant: 1
- Compliant: 0
- Compliance incomplete: 0

Figure 1: Configuration compliance status of server against configuration baseline

The OpenManage Enterprise Advanced license must be enabled on each server's iDRAC to use this configuration compliance solution.

There are four basic steps to ensure configuration compliance:

1. Create a compliance template to capture all required server configuration settings.
2. Associate the compliance template to one or more servers to create a baseline group.
3. Compare the template with the actual settings for each server and report.
4. Remediate non-compliant servers with a single-click. Customers can create a compliance template from an existing deployment template, either by using OME to extract it from a "reference" server or by importing an existing template from a file. Each server associated with the baseline has its own itemized compliance status.



Compliance Report

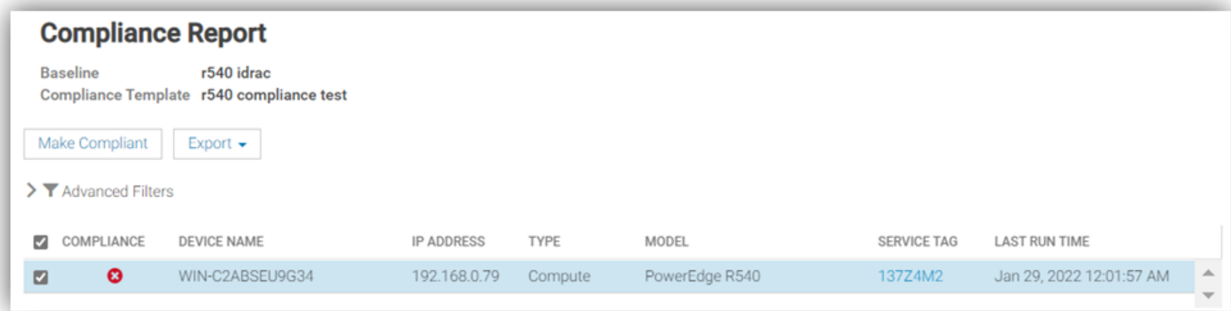
Baseline r540 comp test
Device Name WIN-C2ABSEU9G34
Template r540 compliance test

Compliance Details

	Expected Value	Current Value
> ☑ LifecycleController		
> ☑ NIC		
⌄ ☒ BIOS		
⌄ ☒ Boot Settings		
☑ Boot Mode	Uefi	Uefi
☑ Boot Sequence Retry	Enabled	Enabled
☑ Generic USB Boot	Disabled	Disabled
☑ Hard-disk Drive Placeholder	Disabled	Disabled
☑ Set Boot Order Disabled		
☒ Set Boot Order Enable	RAID.Integrated.1-1,NIC.PxeDevice.1-1,AHCI.Slot.2-2	NIC.PxeDevice.1-1,AHCI.Slot.2-2

Figure 2. Drill down view of "Compliance Report" screen that shows a compliance failure

When servers appear on the non-compliant list, remediation is simple to accomplish. A "one-click" compliance using the "Make compliant" button can be started immediately or scheduled. **Note**: a server reboot may be required to make the selected devices compliant.



Compliance Report

Baseline r540 idrac
Compliance Template r540 compliance test

☑	COMPLIANCE	DEVICE NAME	IP ADDRESS	TYPE	MODEL	SERVICE TAG	LAST RUN TIME
☑	⊗	WIN-C2ABSEU9G34	192.168.0.79	Compute	PowerEdge R540	137Z4M2	Jan 29, 2022 12:01:57 AM

Figure 3. One-click "Make Compliant" button

After this baseline is created, more servers can be added to the baseline at any time, and the corresponding server template can be amended, cloned, or exported to another instance of OME.

Finally, in "Reports" there is a pre-defined "Devices Per Configuration Baseline" report, which details the servers associated with each configuration baseline and each device's compliance status. Using the reporting mechanism, the report can be downloaded or emailed. (In an upcoming release, OME will automate the process of report scheduling and emailing.)

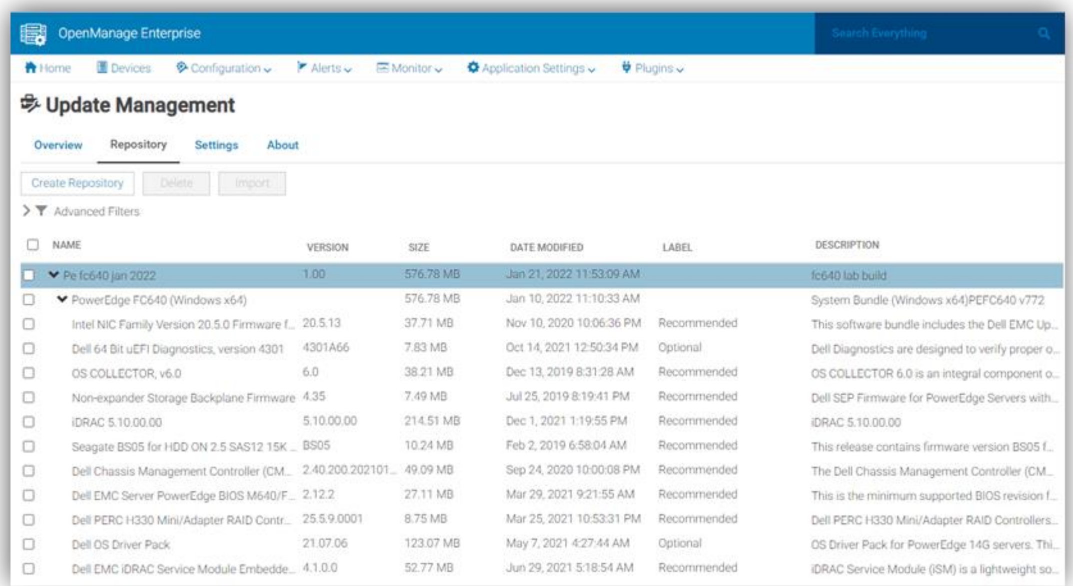
Managing firmware versions

In the modern server there are many components that have firmware, such as system BIOS, iDRAC, NICs, PERC, and hard drives. OME can inventory, report, and update firmware versions. If managing firmware versions is required to deliver consistency across a fleet of servers, this can be achieved by using the "Firmware and Driver Compliance" element of OME.

Managing firmware version compliance, including firmware updating, does ***not*** require an OpenManage Enterprise Advanced license.

There are four steps to perform this compliance:

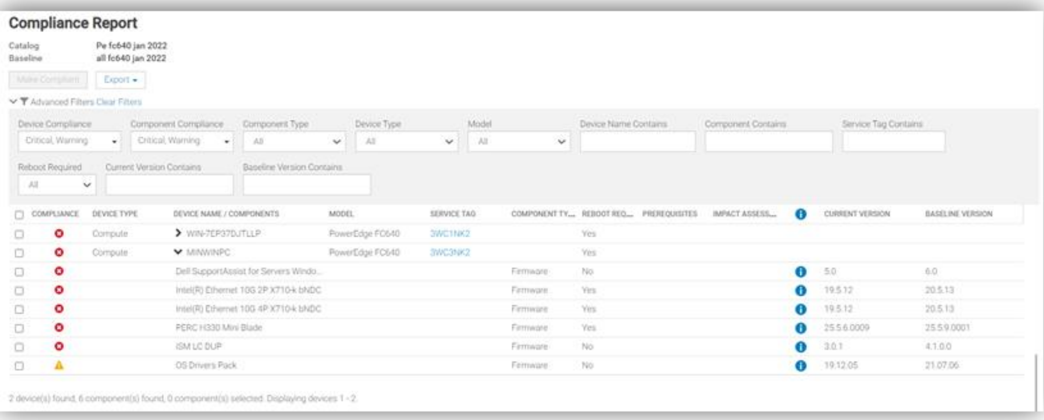
1. Build a list of firmware versions to be scrutinized against the servers that require checking. This required server firmware "build" can be created from a default catalog of firmware versions (use OME to download the latest one from Dell Support). You can also build a custom catalog from repository manager or by using the Update Manager plugin for OME that is available with OME 3.5 or higher.
2. Select the servers to be compared for compliance to create a baseline group.
3. OME compares the catalog against the installed firmware then reports the overall and itemized compliance status of each server in the baseline.
4. Remediate non-compliant servers with a single click.



Update Management

NAME	VERSION	SIZE	DATE MODIFIED	LABEL	DESCRIPTION
Pe fc640 jan 2022	1.00	576.78 MB	Jan 21, 2022 11:53:09 AM		fc640 lab build
PowerEdge FC640 (Windows x64)		576.78 MB	Jan 10, 2022 11:10:33 AM		System Bundle (Windows x64)PEFC640 v772
Intel NIC Family Version 20.5.0 Firmware f...	20.5.13	37.71 MB	Nov 10, 2020 10:06:36 PM	Recommended	This software bundle includes the Dell EMC Up...
Dell 64 Bit uEFI Diagnostics, version 4301	4301A66	7.83 MB	Oct 14, 2021 12:50:34 PM	Optional	Dell Diagnostics are designed to verify proper o...
OS COLLECTOR, v6.0	6.0	38.21 MB	Dec 13, 2019 8:31:28 AM	Recommended	OS COLLECTOR 6.0 is an integral component o...
Non-expander Storage Backplane Firmware	4.35	7.49 MB	Jul 25, 2019 8:19:41 PM	Recommended	Dell SEP Firmware for PowerEdge Servers with...
iDRAC 5.10.00.00	5.10.00.00	214.51 MB	Dec 1, 2021 1:19:55 PM	Recommended	iDRAC 5.10.00.00
Seagate BS05 for HDD ON 2.5 SAS12 15K ...	BS05	10.24 MB	Feb 2, 2019 6:58:04 AM	Recommended	This release contains firmware version BS05 f...
Dell Chassis Management Controller (CM...	2.40.200.202101...	49.09 MB	Sep 24, 2020 10:00:08 PM	Recommended	The Dell Chassis Management Controller (CM...
Dell EMC Server PowerEdge BIOS M640/F...	2.12.2	27.11 MB	Mar 29, 2021 9:21:55 AM	Recommended	This is the minimum supported BIOS revision f...
Dell PERC H330 Mini/Adapter RAID Contr...	25.5.9.0001	8.75 MB	Mar 25, 2021 10:53:31 PM	Recommended	Dell PERC H330 Mini/Adapter RAID Controllers...
Dell OS Driver Pack	21.07.06	123.07 MB	May 7, 2021 4:27:44 AM	Optional	OS Driver Pack for PowerEdge 14G servers. Thi...
Dell EMC iDRAC Service Module Embedde...	4.1.0.0	52.77 MB	Jun 29, 2021 5:18:54 AM	Recommended	iDRAC Service Module (iSM) is a lightweight so...

Figure 4. View of firmware versions created in "custom" catalog by Update Manager plugin



Compliance Report

Catalog Pe fc640 jan 2022
Baseline all fc640 jan 2022

Device Compliance: Critical, Warning
Component Compliance: Critical, Warning
Component Type: All
Device Type: All
Model: All
Device Name Contains:
Component Contains:
Service Tag Contains:
Reboot Required: All
Current Version Contains:
Baseline Version Contains:

COMPLIANCE	DEVICE TYPE	DEVICE NAME / COMPONENTS	MODEL	SERVICE TAG	COMPONENT TY...	REBOOT REQ...	PREREQUISITES	IMPACT ASSESS...	ⓘ	CURRENT VERSION	BASELINE VERSION
⊗	Compute	WIN-7EP37DJTLLP	PowerEdge FC640	3WC1NK2		Yes					
⊗	Compute	MINWINPC	PowerEdge FC640	3WC3NK2		Yes					
⊗		Dell SupportAssist for Servers Windo...			Firmware	No			ⓘ	5.0	6.0
⊗		Intel(R) Ethernet 10G 2P X710-k bNDC			Firmware	Yes			ⓘ	19.5.12	20.5.13
⊗		Intel(R) Ethernet 10G 4P X710-k bNDC			Firmware	Yes			ⓘ	19.5.12	20.5.13
⊗		PERC H330 Mini Blade			Firmware	Yes			ⓘ	25.5.6.0009	25.5.9.0001
⊗		iSM LC DUP			Firmware	No			ⓘ	3.0.1	4.1.0.0
⚠		OS Drivers Pack			Firmware	No			ⓘ	19.12.05	21.07.06

2 device(s) found, 6 component(s) found, 0 component(s) selected. Displaying devices 1 - 2

Figure 5. Drill down view of Compliance Report in case of firmware compliance failures

When servers appear as non-compliant, remediation is simple to accomplish. A "one-click" compliance task can be started immediately or scheduled by the "Make compliant" button. **Note**: a server reboot may be required to make the selected devices compliant.

Again, in "Reports" there are pre-defined reports named "Firmware Compliance per Device Report"/"Firmware Compliance Per Component Report". These reports detail the server's firmware versions and status. Using the reporting mechanism, these can be downloaded or emailed.

As we mentioned earlier, firmware version compliance, including firmware updating does not require an OpenManage Enterprise Advanced license. In addition, driver compliance and updates are available for servers running Microsoft Windows 2016, 2019, or 2022.

Conclusion

Configuration and firmware compliance increases control while decreasing drift related issues and risk. Dell OpenManage Enterprise not only brings advanced feature rich server management to PowerEdge customers -- it also brings the power of automation to reduce effort, decrease time to resolution, and reduce management costs.

References

For additional details see:

- Firmware Baseline Video
- Support for OpenManage Enterprise
- Dell Technologies Developer Portal
- Systems Management community

Learn more about PowerEdge servers

Contact us for feedback and requests

Follow us for PowerEdge news

DELL Technologies