



DELL CUSTOMIZED VMWARE ESXI 6.5 UPGRADE SCENARIOS

ABSTRACT

This document provides few points to consider when users plan to migrate from their existing Dell customized VMware ESXi versions to ESXi 6.5 and make use of UEFI secureboot feature.

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INTRODUCTION

VMware recently announced [vSphere 6.5](#) release. Dell supports direct upgrade to ESXi 6.5 from both ESXi 6.0 Update 2 and ESXi 5.5 Update 3. This white paper talks about some of the best practices to be considered before upgrading to ESXi 6.5 in terms of UEFI secureboot.

AUDIENCE AND SCOPE

This document is relevant for all users who have plan to migrate to Dell customized version of VMware ESXi 6.5.

UPGRADE FROM OLDER VERSIONS OF DELL CUSTOMIZED ESXI TO ESXI 6.5

The upgrade from 6.0 Update 2 and 5.5 Update 3 to 6.5 is a straight forward task using various utilities provided by VMware. Post upgrade, you may notice that there are some new drivers in ESXi 6.5 and some of the driver versions from 6.0 Update 2 gets retained post upgrade of 6.5. Take a look at the blog posted in [Dell tech center to know the new drivers introduced in ESXi 6.5](#) which also calls out the driver differences comparing 6.0.x branch. The 6.0 Update 2 driver versions retained in ESXi 6.5 and is loaded to vmkernel would be supported for ESXi 6.5.

UPGRADE CAVEATS FOR SECUREBOOT

Users who plan to upgrade from earlier versions of ESXi to ESXi 6.5 and enable UEFI Secureboot, should read the below prior to upgrade. The recommendation and procedure for those who plan to enable UEFI secureboot post upgrade are as follows:

1. By default UEFI secureboot option would be disabled in system BIOS. If it is enabled, disable secureboot in system BIOS by traversing to **BIOS Setup Page** → **System Security**.
2. Boot into ESXi 6.5 which is upgraded from previous versions of ESXi.
3. Login to ESXi shell and run the program `./usr/lib/secureboot/bin/secureBoot.py -c`. This program checks compatibility of all installed or upgraded VIBs to see if it can support secureboot.
 - If there are incompatible VIBs, those would be listed in the command output. A careful assessment is required to see if those secureboot incompatible VIBs are required in your environment before deciding to remove it. Some of the VIBs may be providing drivers, hence it requires a thorough assessment before you remove them. Secureboot can be enabled only if the incompatible VIBs are removed.
4. In the subsequent sections, we cover two specific scenarios of customers upgrading from Dell customized 6.0 Update 2 A03 and 5.5 A07 versions to Dell customized ESXi 6.5 A00.

UEFI SECUREBOOT COMPATIBILITY – DELL CUSTOMIZED 6.0 UPDATE 2 TO 6.5

Dell's latest 6.0 Update 2 revision is [A03](#). As indicated in the previous sections, upgrade from 6.0 Update 2 to 6.5 is a straight forward task in case you don't plan to enable secureboot in your environment.

If a user who want to make use of UEFI secureboot in ESXi 6.5 post upgrade, make sure that you read the following before attempting to enable secureboot. If secureboot is enabled in system BIOS, booting into ESXi 6.5 A00 image post upgrade from 6.0 Update 2 A03 results in the below failure.

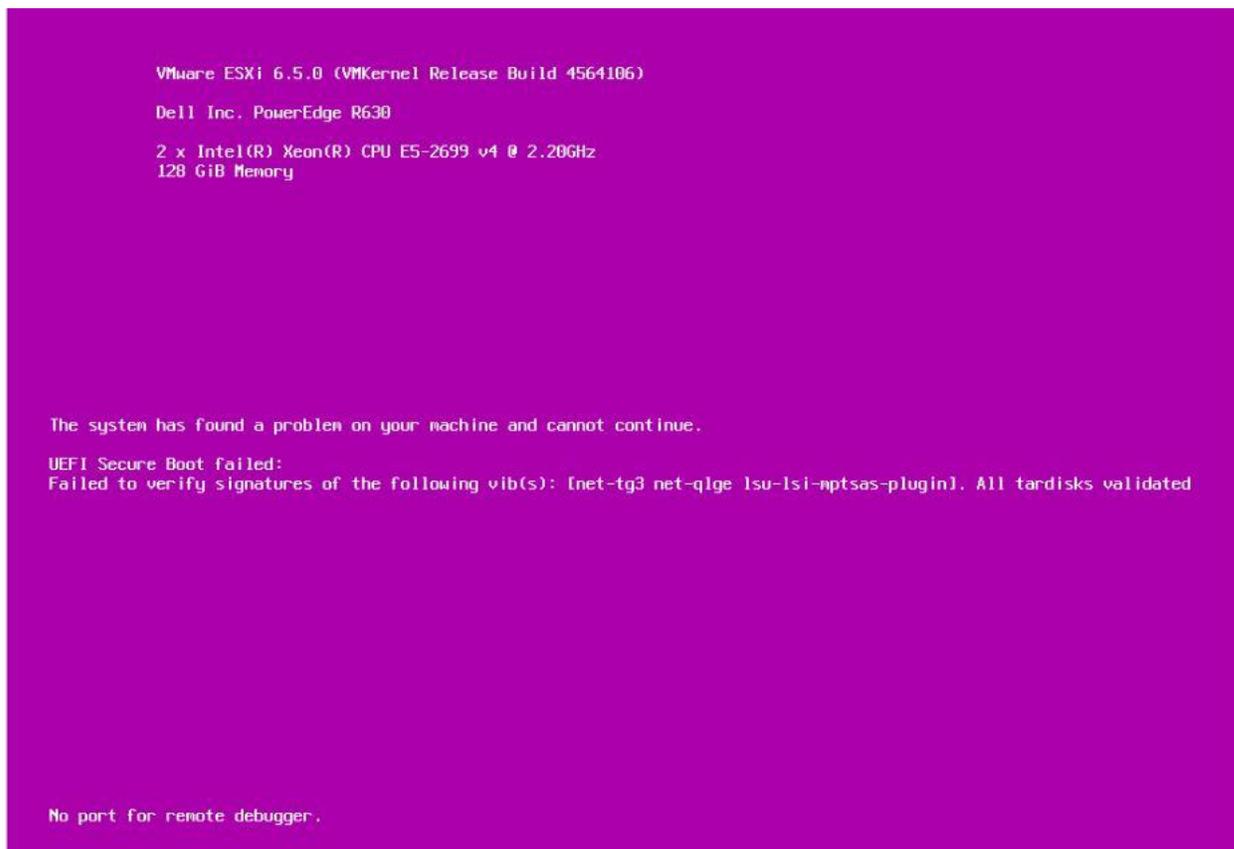


Figure 1 : PSOD when upgraded from 6.0 Update 2 A03 to 6.5 A00 with secureboot enabled

If you have already encountered above PSOD, perform the following steps to recover from it.

1. Reboot the server and traverse into **System BIOS → Security Settings**. Disable **'Secureboot'** option. Save the changes and exit from BIOS
2. Boot into ESXi 6.5.

NOTE: if ESXi boots into 6.0 Update 2 again (if booted from altbootbank), you may reboot and press 'SHIFT+R' option while ESXi boot and select ESXi 6.5 to make sure that we boot into the bootbank itself. There may be a chance to boot into altbootbank as the last boot of ESXi 6.5 ended up in a signature mismatch PSOD.

1. Execute the command `"/usr/lib/secureboot/bin/secureBoot.py -c'` to see the incompatible VIB list(s). Assess the functionality provided by each one of them and take a decision to remove/retain depending upon your requirement.

For this specific upgrade scenario usecase, the VIBs which are incompatible for enabling UEFI secureboot are **net-tg3**, **net-qlge** and **lsu-lsi-mptsas-plugin**. Let's take a look at the individual VIBs, the functionalities they provide and the impact for removing the same.

1. **net-tg3** is a driver VIB which provides tg3 driver. This driver was used for Broadcom 1 Gbps network devices, but from ESXi 6.5, VMware introduced a native driver named as '**ntg3**'. Hence **net-tg3** is not really needed for ESXi 6.5.
2. **net-qlge** provides a driver named '**qlge**'. This is a driver supported for Dell's 11th generation of PowerEdge servers and is not supported for ESXi 6.5. Hence this VIB can be removed as well without any functionality loss.
3. **lsu-lsi-mptsas-plugin** VIB provides a storelib library and a plugin used for management purposes. However you may remove this VIB without any functionality impact as it's not used for ESXi 6.5. Refer to *VMware KB 2147606* addressing this scenario.
4. In general these VIBs can be removed together using '**esxcli software vib remove -n net-tg3 -n net-qlge -n lsu-lsi-mptsas-plugin**'. Gracefully reboot the system to get these drivers removed from the filesystem.

UEFI SECUREBOOT COMPATIBILITY – DELL CUSTOMIZED 5.5 UPDATE 3 TO DELL CUSTOMIZED 6.5

Dell's latest revision of 5.5 Update 3 is [A07](#). If you plan to make use of 'UEFI secureboot' post upgrade of ESXi 6.5 from 5.5 Update 3, it's advised to read the below before enabling secureboot. If secureboot is enabled in system BIOS, booting into ESXi 6.5 A00 image post upgrade from 5.5 Update 3 A07 results in the below failure.

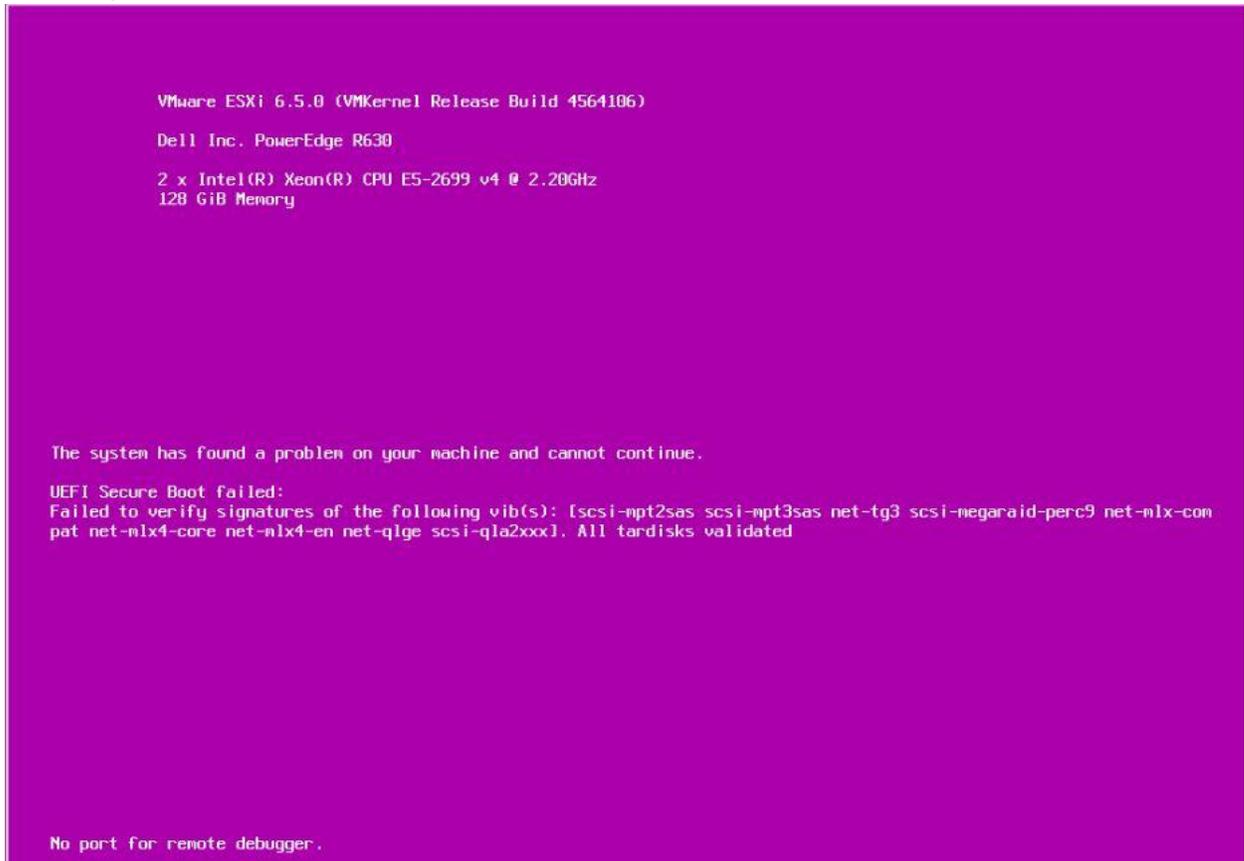


Figure 2 : PSOD when upgraded from 5.5 Update 3 to 6.5 with secureboot enabled

To recover from this PSOD, Perform the steps mentioned in the previous section – “**UEFI Secureboot Compatibility – Dell customized 6.0 Update 2 to 6.5**”.

Once you identify the VIBs which are incompatible for ESXi 6.5 post upgrade from 5.5 Update 3, make sure that it's not needed for your hardware configurations. For example, if you upgrade from A07 version of 5.5 Update 3 to 6.5 A00, the VIBs which are incompatible for UEFI secureboot are **scsi-mpt2sas**, **scsi-mpt3sas**, **net-tg3**, **scsi-megaraid-perc9**, **net-mlx-compat**, **net-mlx4-core**, **net-mlx4-en**, **net-qlge** and **scsi-qla2xxx**. Let's take a look at the individual VIBs, the functionalities they provide and the impact for removing the same below.

1. **Scsi-mpt2sas**

- This is a driver VIB which provides 'mpt2sas' driver which is used to initialize *LSI Logic / Symbios Logic Dell 6Gbps SAS HBA Adapter* controller in ESXi 6.5. So if you do have this peripheral in your hardware configuration, removing this VIB will make the peripheral unusable in ESXi 6.5.

2. **Scsi-mpt3sas**

- This is a driver VIB provides 'mpt3sas' driver which enables support for AVAGO MPT Fusion based SAS3 (SAS 12.0 Gb/s) Controller(s). Dell don't support this device and hence this driver can be safely removed.

3. **net-tg3**, **net-qlge** driver VIBs are not required for ESXi 6.5 as per the explanation in the previous section.

4. Mellanox drivers such as **net-mlx-compat**, **net-mlx4-en** and **net-mlx4-core** are replaced by **nmlx4_en**, **nmlx4_core** in ESXi 6.5. However if you have any configurations with Mellanox controllers, the recommendation would be to check the drivers used for initializing the mellanox controllers before removing these driver VIBs.

5. **scsi-megaraid-perc9** provides megaraid_perc9 driver which is not supported and required for ESXi 6.5.

6. **Scsi-qla2xxx** provides qla2xxx driver which is unsupported in ESXi 6.5.

You may remove all the above mentioned software bundles using 'esxcli software vib remove -n <VIB ID>'. Refer the previous section on removing the VIBs together.

CONCLUSION

This upgrade guide covers few recommendations on enabling UEFI secureboot specific to relevant upgrade scenarios to ESXi 6.5. Prior to enable UEFI secureboot on an upgraded system, it's recommended to go through this white paper and understand the caveats. These caveats are not applicable for a fresh install of Dell customized VMware ESXi 6.5 as it contains all compatible VIBs for UEFI secureboot.

REFERENCES

- [VMware KB 2147606](#)
- [VMware ESXi 6.5 Security Guide](#)
- [Dell Release of VMware vSphere 2016](#)
- [Dell PowerEdge Servers Certified for VMware ESXi 6.5](#)
- [VMware ESXi Secureboot for Dell PowerEdge Servers](#)
- [Native Driver support in Dell Customized VMware ESXi 6.5](#)
- Video Blog - [To enable UEFI Secure Boot on VMware ESXi 6.5.x for Dell's 13th generation of PowerEdge server](#)