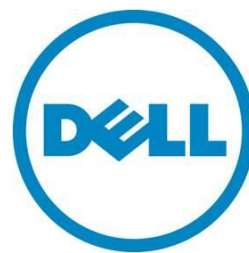

Simplifying the Replacement of a Failed Motherboard

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Introduction

The motherboard is the one part of a host system that most customers do not want to fail. Motherboard failures cost money and time, especially when considering productivity. DELL has created the Backup and Restore solution to help simplify and reduce the impact of replacing a failed motherboard. This licensed DELL feature provides the ability to apply a backup file to a system, thereby restoring it to working condition while maintaining its identity, licenses certificates, and operating parameters. The user need only set up the system as desired, and perform a server profile backup to preserve the state in a backup file. Upon successful completion of a server profile backup, the data can be preserved for that future replacement. Dell recommends that you perform the backup operation for every system profile you think you might want to restore at some point.

Before you begin

Ensure that your system meets the following requirements:

Dell PowerEdge 11th generation servers

- iDRAC Enterprise with Lifecycle Controller revision 1.5 or higher
- Dell vFlash

Dell PowerEdge 12th generation servers or custom system based on 12th generation servers

- iDRAC Enterprise with Lifecycle Controller 2 revision 1.0 or higher
- SD Card required for USC based usage

Backing up an image for future motherboard replacement

A backup image of the current motherboard settings and configuration should be captured by using the WSMAN BackupImage() method of the LC service or the local Lifecycle Controller GUI Platform Export option. The user specifies a device or network share to save the backup file to (including any credentials needed to access the network share) via the WSMAN interface. The local LC GUI interface is limited to using the vFlash media that must be placed in the service location marked with a wrench symbol on the host system. To secure the data in the file, the user specifies a new passphrase for encrypting portions of the backup file. After parameter validation the backup begins and server profile data is written to a selected storage device or network share. Feedback on progress for backup file generation and writing is provided as the job runs.

System components covered by backup include all components supported by Lifecycle Controller firmware change management and comprehensive configuration capabilities. These components include:

RAID Storage configuration, specifically, virtual disk configuration is included in the backup file. If storage encryption is local only (Local Key Management (LKM)), the LKM passphrase is NOT included in the backup file and must be provided after performing a Restore, Replace or Clone action.

Backup file encryption will be seeded by a combination of user-supplied passphrase and iDRAC firmware-supplied seed. The user can choose to provide no passphrase, in which case the encrypted portions of the backup file will be encrypted with an iDRAC firmware seed and default passphrase.

What is backed up?

The backup file will contain the following readable and encrypted data:

Readable data

- System identification information (System model, service tag)
- Date and time the backup was taken
- Currently known hardware inventory information
- Firmware version information for each component

Encrypted data

- Component configuration information
- Component usernames, passwords, certificates, and licenses

Binary data

- Component firmware images necessary to re-flash components
- Dell-provided executables
- Signature

What is not backed up?

- Operating system and data stored on hard disks or virtual disks
- vFlash partition content
- Lifecycle Log
- Dell Diagnostics
- Dell Driver Pack

new motherboard firmware settings to match the settings of the original motherboard. These steps are manual, error prone and lead to long field service repair time.

Using Restore to restore motherboard firmware and settings

A typical motherboard replacement

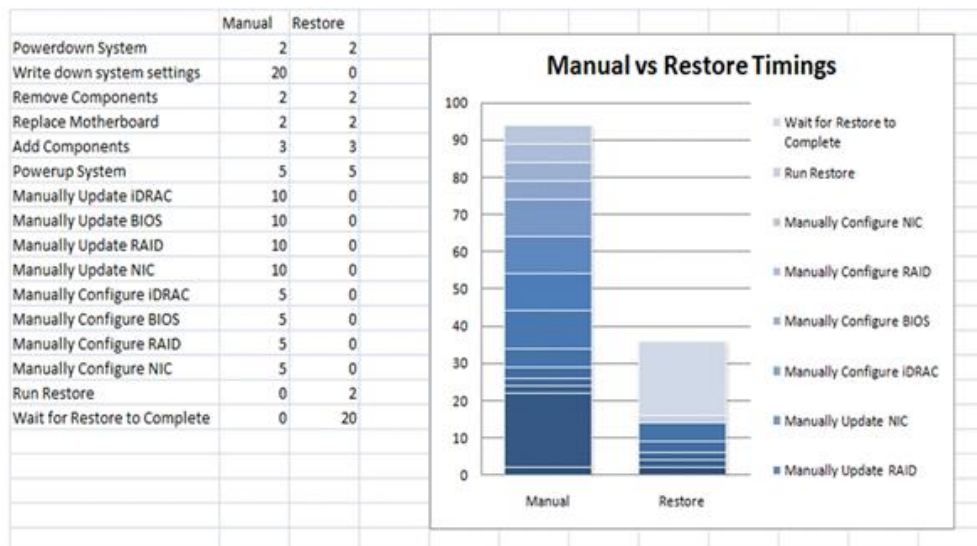
In some catastrophic events of hardware failure, the motherboard of a Dell server needs to be replaced. When a motherboard is removed, the following embedded software is impacted:

- 1) All bios and firmware are lost and need to be re-installed.
- 2) All bios and firmware settings are lost and need to be reconfigured.
- 3) iDRAC needs to be re-installed and all settings need to be re-configured.

Simplifying the Replacement of a Failed Motherboard

The replacement of a computer motherboard in a system chassis is a tedious and time consuming operation. The technician needs to remove the damaged motherboard, set the new motherboard in place, and install the same BIOS the customer was running. The technician then needs to configure the With the new method of using Backup and Restore for motherboard replacement, the whole restore process is automatic, the time needed to reset the configuration is shortened considerably, and the risk of manual error is eliminated. The Backup and Restore process-enabled motherboard has the capability to pick up an image file from vFlash, network, or USB drive via the Unified Server Configurator, and to restore all firmware and settings on a motherboard without the intervention of the host operating system (see Figure 1.)

Figure 1. Manual vs. Restore process comparison



Timing comparison of manual and BnR motherboard replacement.

Detailed walkthrough of Restore

The most time consuming portion of replacing a motherboard is updating the firmware levels and configuration settings on the new motherboard to match those of the old/damaged motherboard. If done manually, this process is extremely tedious and is susceptible to human error. By using Dell's Restore software, this process is handled automatically and in far less time.

What is restored?

- Service Tag (Motherboard replacement only)
- Component firmware
- Component configuration data

Simplifying the Replacement of a Failed Motherboard

- Component usernames, passwords, certificates, and licenses
- USC

What is not restored?

- PSU Firmware
- OS or customer data stored on the hard disks or virtual disks
- vFlash partition content
- Lifecycle Log
- Dell Diagnostics

How does Restore work?

Once the old motherboard has been replaced and all of the components from the old system are in place, the restore process can begin. It is important to note that all the components (adaptors) from the old system must be in exactly the same place on the new MB as they were on the old. With the backup image of the old motherboard in place (most likely on the vFlash card), and the restore process initiated, Restore will power down the system. Restore will next install the USC (Unified Server Configurator) that was present on the old motherboard, prepare the system for firmware and configuration updates, and then power on the system.

The Restore software displays a set of tasks that will detail what's being done to the system. The firmware will be restored from the backup image for BIOS, RAID, iDRAC, and NICs. Once a device's firmware has been restored, the configuration settings for that device will be applied. The iDRAC license will also be restored. The service tag from the old motherboard will be installed on the new motherboard. The system might reboot multiple times during this process. Once the entire process is completed, the system will restart the iDRAC and the host. The system is now in the same state as the old motherboard and all this is accomplished in very little time.

Conclusion

In the event of a host system motherboard failure, restoring the system to its original state in the shortest amount of time with the highest level of accuracy is critical. With the licensed Dell Backup and Restore features, restoring a downed system is quick, easy, hands-off, and accurate. Using this automated restore process eliminates the possibility of human error and saves the technician a significant amount of time.

The Restore process reduces downtime and human error during recovery, thereby increasing productivity and saving time and money.

More Information

For more information regarding backup and restore system profile, see the articles located at <http://www.dell.com/techcenter/lc>.