

CoreSnapshot White Paper

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1. Introduction

Apacer's Double-barreled Solution has proved a popular remote device management (RDM) system for industrial manufacturers around the world. And in 2020, it was followed up by the Double-barreled Solution: Cloud Edition (DBS:CE), allowing it to run as a plug-in inside the RDM systems offered by third-party technology partners.

One important feature of DBS:CE is the technology known as CoreSnapshot. Although this was briefly explained in the DBS:CE White Paper that Apacer released in 2020, requests soon came in for a deeper look at this technology and how it functions. This white paper is designed to answer those questions and explain CoreSnapshot in greater detail.

2. The Backup Process

The CoreSnapshot process is based around Apacer's custom firmware. When a user chooses to activate CoreSnapshot on a system, the firmware will configure the available SSD so that it is evenly divided into two discrete portions: the User Area and the Backup Area. The Backup Area is a 1:1 identical replica of the User Area, including both the OS (if present) and all user data. Whenever the host tells the controller to write data to the User Area, the exact same data will be written to the Backup Area. Since this happens in the background, most users will not be aware of the process as it is happening.

At some point in the system's lifetime, the user will need to decide when to take a backup snapshot. This decision is entirely at the user's discretion. However, this snapshot can only be taken once. Once the user does decide to take a backup snapshot, the contents of the Backup Area will be frozen permanently. Even if more data is written to the User Area after the snapshot is taken, the Backup Area will no longer be updated or modified in any way.

3. The Recovery Process

When it comes to the recovery process, there are two options: In-band Recovery and Out-of-band Recovery.

3.1 In-band Recovery

In the vast majority of situations, users running CoreSnapshot will choose to trigger the recovery process using In-band Recovery. In this case, the recovery function will be triggered via Apacer's Double-barreled Solution: Cloud Edition software. When the recovery command is transmitted to the SSD's controller, it will quickly redesignate the Backup Area as the current User Area, while the previous User Area will be ignored. The entire process takes just a few seconds, and is illustrated in Figure 1-1, below.

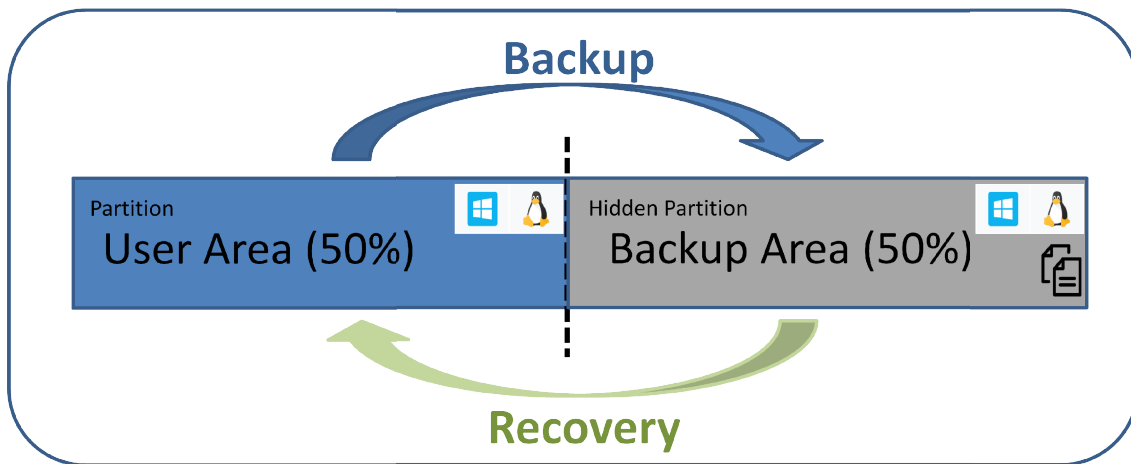


Figure 1-2: CoreSnapshot User Area and Backup Area

After the process is complete, the user can reboot the system and the SSD will have been restored to the exact state the User Area was in when the backup snapshot was taken, including an OS (if present) and all user data.

3.2 Out-of-band Recovery

Although the In-band Recovery process is made extremely simple thanks to DBS:CE, there may be some atypical situations in which users choose the Out-of-band Recovery process instead. An example would be a natural disaster, where power supply is no longer reliable and the entire system has crashed. In this situation, a user could connect the LAN port of an OOB recovery module to the GPIO pin head on the SSD. The recovery command can be sent this way instead, and the recovery process will be identical to that described in the previous section.

Although most users will never need to use the OOB recovery process, it's good to know that this alternative method is there in case of an emergency. A comparison of these two methods can be seen in Figure 1-2, below.

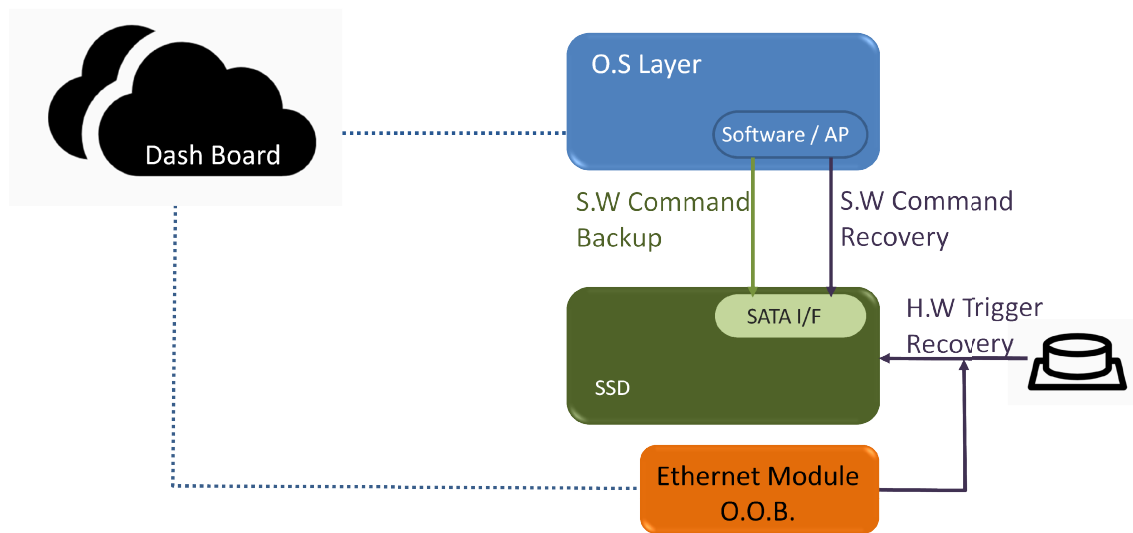


Figure 1-2: CoreSnapshot Recovery Triggering Options

4. Conclusion

Operators of automated factories and other complex networks have already seen the benefits of Apacer's Double-barreled Solution: Cloud Edition. Its ability to suggest suitable SSDs and then monitor them remotely through their entire lifetimes has made the operation of these networks more efficient and more cost-effective. Now, with the unveiling of Apacer's CoreSnapshot backup and recovery technology, operators and engineers will find their jobs even easier. CoreSnapshot will allow them to recover an SSD in its entirety in just a few seconds, reducing downtime and maximizing output. Even unexpected circumstances like natural disasters are covered, thanks to the Out-of-band recovery process. CoreSnapshot really makes Apacer's Double-barreled Solution: Cloud Edition stand out among remote management systems.

Revision History

Revision	Description	Date
1.0	Official release	11/4/2020

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