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How to

How new hard disk drives interact with old RAID controllers

- MG08ACA16TE on 3ware 9750-4i -

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Sustainability is a must, and it also pays off in the field of data storage, as the following example demonstrates. A scarcity of components on the one hand and an unlimited hunger for storage capacity on the other led the user of an older storage system to the following question: Would it be possible to upgrade a storage subsystem with a really old RAID controller, which still provides stable operation, using modern hard drives with higher capacities? In theory this should be possible for all systems with a 6GB/s SATA or SAS interface – in other words, those from about 2011 onwards.

But how does that work in terms of practical implementation?

The user in question first looked, unsuccessfully, for new hard drives for his systems with a '3ware 9750-4i' controller, which was about 10 years old. He quickly found that the new generation of hard drives with over 10TB were no longer compatible with the historical controller. He was disappointed, but decided he was not going to give up that easily.

And so the following request landed on the desk of Rainer Käse, Senior Manager of the Storage Products Division at Toshiba Electronics Europe (TEE): '... Can you confirm that the MG08 SATA hard drives from Toshiba are compatible with the 3ware controller?' Here, too, the initial response was negative: 'Of course not. Our new generation of hard drives are no longer tested for compatibility with controllers as old as that.' However, Rainer Käse's curiosity had been piqued. Why should the customer not simply test it himself? Therefore, Toshiba simply provided the customer with two sample 16TB (MG08ACA16TE) test models and, after a firmware update to Version 0103, it was confirmed that the MG08 SATA disks are compatible with the 3ware controller.

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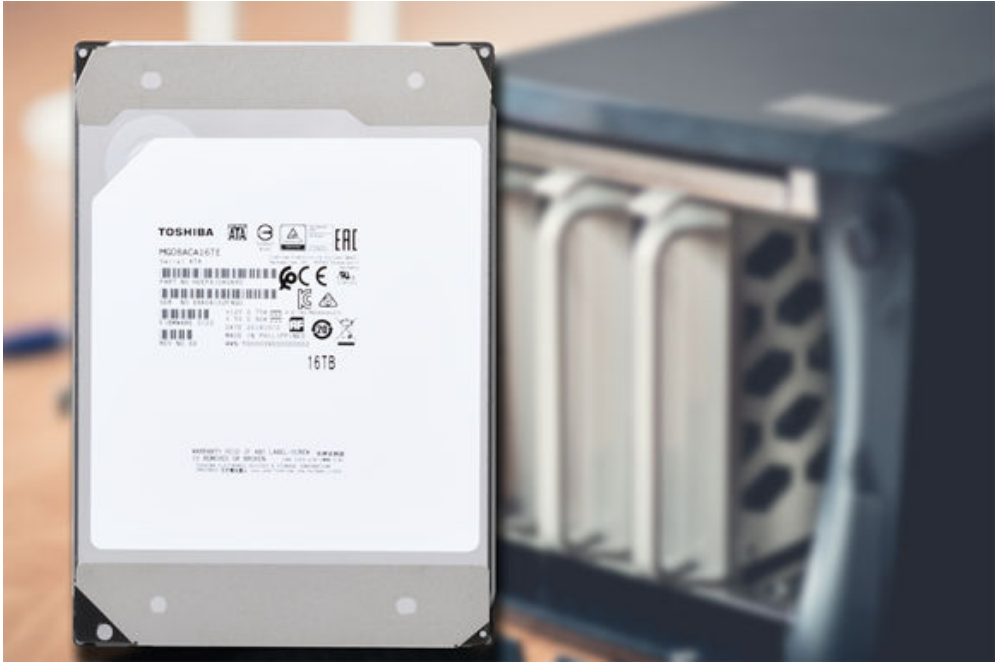

Make it work: MG08ACA16TE in on old RAID controller.
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The user writes:

"The Toshiba MG08ACA16TE is amazingly quiet in operation and generates extremely low vibrations in idle mode. During active access (writing) there is the familiar hard drive noise, but it is comparatively quiet and without hard vibrations being transferred to the housing, and the vibrations in read mode are lower still.

Using the firmware 0103 (provided by Toshiba Support with a manual after contacting them), these 16TB capacity hard drives based on sector size 512e can be used with the RAID controller 3ware 9750-4i for RAID1, and I have been actively using them now for two weeks (firmware 0102 caused problems, firmware 0103 appears to be OK).*

If each partition is aligned at the beginning at the limit of 2048 sectors each (1MB alignment), the alignment of the 512e matches the limits of the underlying 4k and you get maximum performance (with a difference of approximately 5 to 10%).

My summary:

Performance is good – in idle mode the hard drives can barely be heard, and they generate virtually no vibrations. During active write access the hard drives remain relatively quiet. It is absolutely recommendable for use as cold storage (archive) or for combined use (data tiering) of the front-end capacity range, for example for short stroking for performance, and use of the back-end capacity for cold storage (archive).

So far: Absolutely recommended! At last, a high capacity hard disk drive that works with 3ware 9750-4i! :-)"

Following this, Toshiba observed increased interest in the firmware 0103 for the MG08ACA16TE hard drive, which suggests that this is not an isolated case. Therefore, Toshiba plans to have the current 18TB (MG09ACA18TE) and, following market launch, the 20TB hard drives (MG10ACA20TE) tested in close cooperation with this user in future as well.

*The hard drives were installed at the end of September 2022.

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