

Application Note

Barracuda ES Workload Management

Seagate® Application Notes promote greater understanding of specific features incorporated in Seagate hard drives. This Application Note examines the Workload Management feature included in the Barracuda ES family of high-capacity enterprise drives.

Description:

Workload Management (WLM) is an optimized monitoring and management tool that tracks hard drive temperature and activity in business-critical environments.

Advantages:

- Ensures business-critical drives do not overheat when workload spikes, enabling higher reliability and longer life
- Helps maximize drive reliability in high-density server and storage environments
- Unavailable in desktop-class drives (due to less demanding workloads)

Key Component:

- Read After Write (RAW)

Challenge:

Heat Reduces Drive Reliability

Desktop-class drives are optimized for less demanding (single-user, low-load server and consumer electronics) duties, and in such environments need only deliver about half the peak IOPS of an enterprise-class drive.

However, the *bursty* nature of enterprise applications stresses the IOPS capability of desktop drives, forcing them to work longer to execute drive commands; this results in more sustained time at elevated temperatures, a primary cause of drive failure.

Solution:

Workload Management Reduces Drive Heat

Workload Management (WLM) is designed to monitor and manage key drive components and activity levels, dynamically regulating drive activity in order to minimize failures caused by operation outside of the drive's thermal envelope. Reducing drive heat also ensures lower system operating temperatures.

Workload Management achieves these goals through its incorporation of Read After Write (RAW) functionality, described below. Note that WLM is enabled by default; no user action or configuration is necessary.

Feature Profile: Read After Write (RAW)

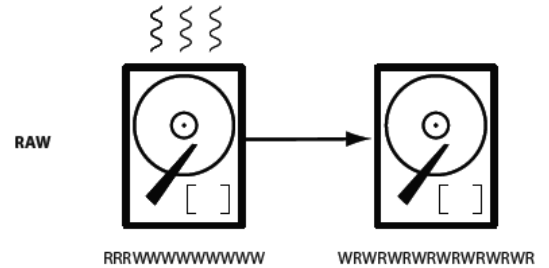
When a drive's temperature exceeds a specific threshold, the drive will perform read after write. This enables the write element to cool down, and reduces drive temperature before performing a seek operation. As an added benefit, reading after writing verifies the data that has just been written.

RAW is enabled if the drive's temperature is less than 18°C* or greater than 58°C*. A write command will be converted to a write-verify, which follows the error recovery path for writes and reads.

If the write portion of the Write-Verify command fails, the drive performs write recovery and posts a write error if unsuccessful. Should the Verify portion of the Write-Verify fail, the Write-Verify is retried. If the Verify still fails, a Write error is reported to the host as a 03/0C00/11.

For More Information

To learn more about Workload Management, as well as many other enterprise-specific features included in the Barracuda ES family of high-capacity hard drives, visit http://www.seagate.com/products/enterprise/barracuda_es.html.



*Default setpoints, subject to change.

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