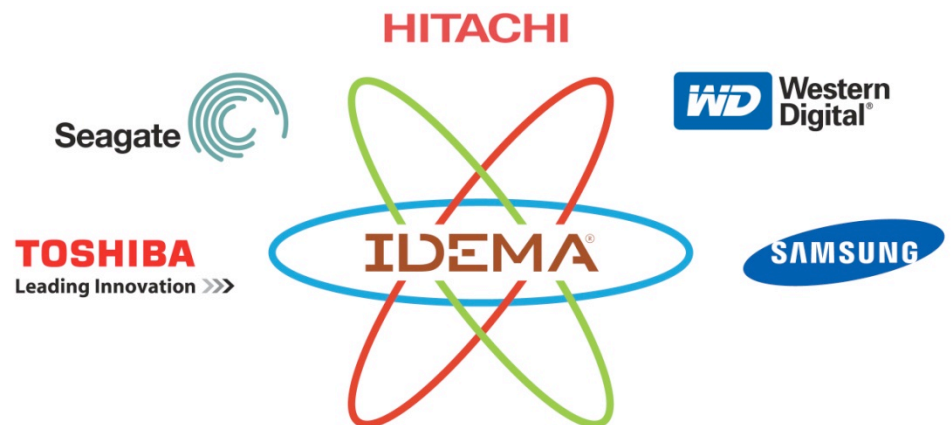


ADVANCED FORMAT Hard Disk Drives

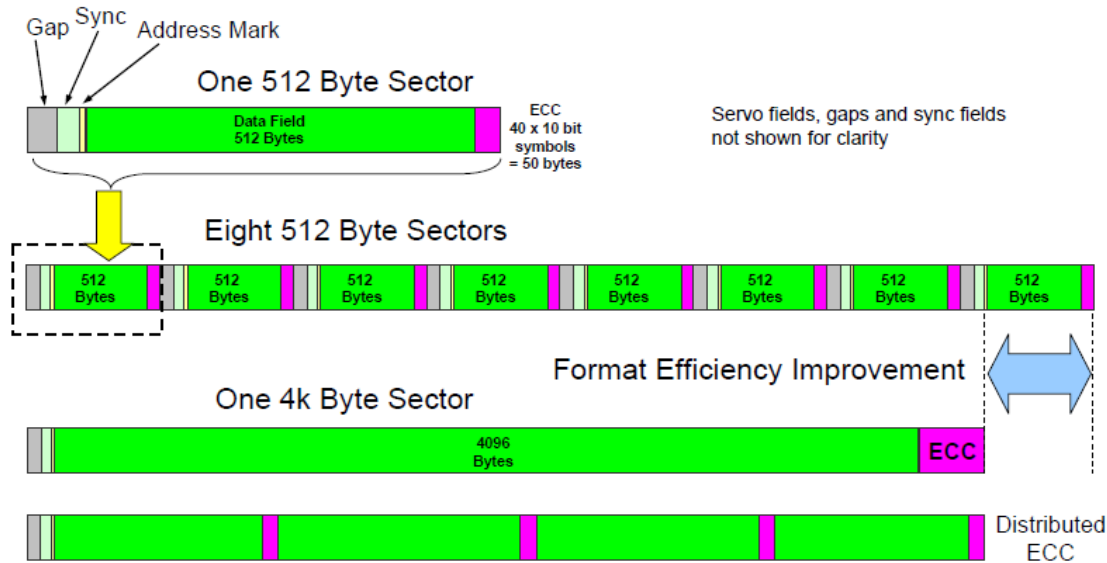


Sponsored by IDEMA

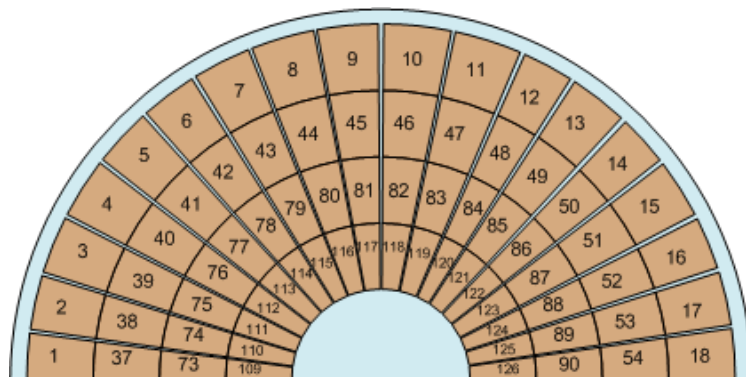


Advanced Format

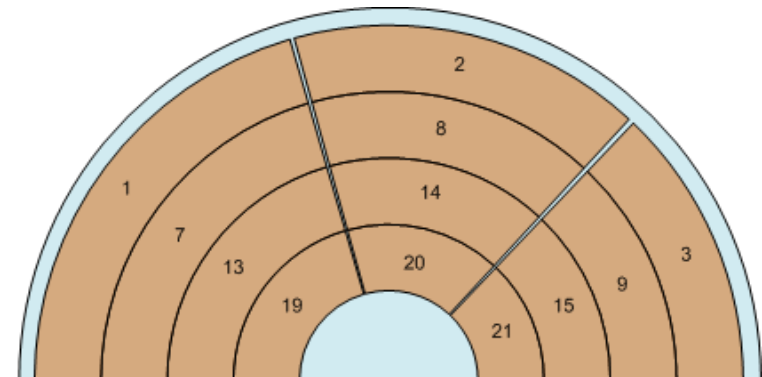
AF Technology – Longer Data Sectors



- *Format Efficiency*
- *More Robust ECC*



512-Byte Physical Sector

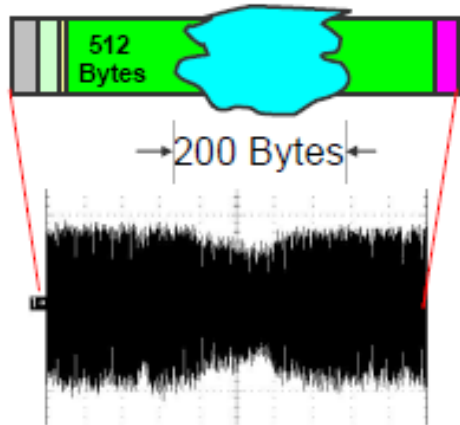


ADVANCED
AF
FORMAT **4K-Byte Physical Sector**

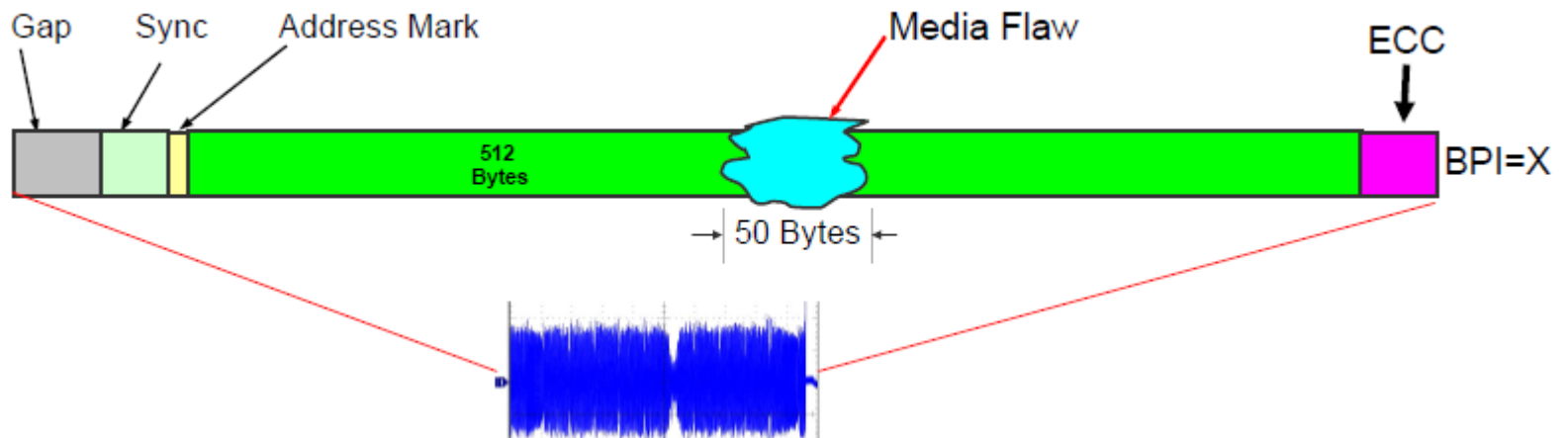
Advanced Format



AF Benefits -- Enhanced Error Correction



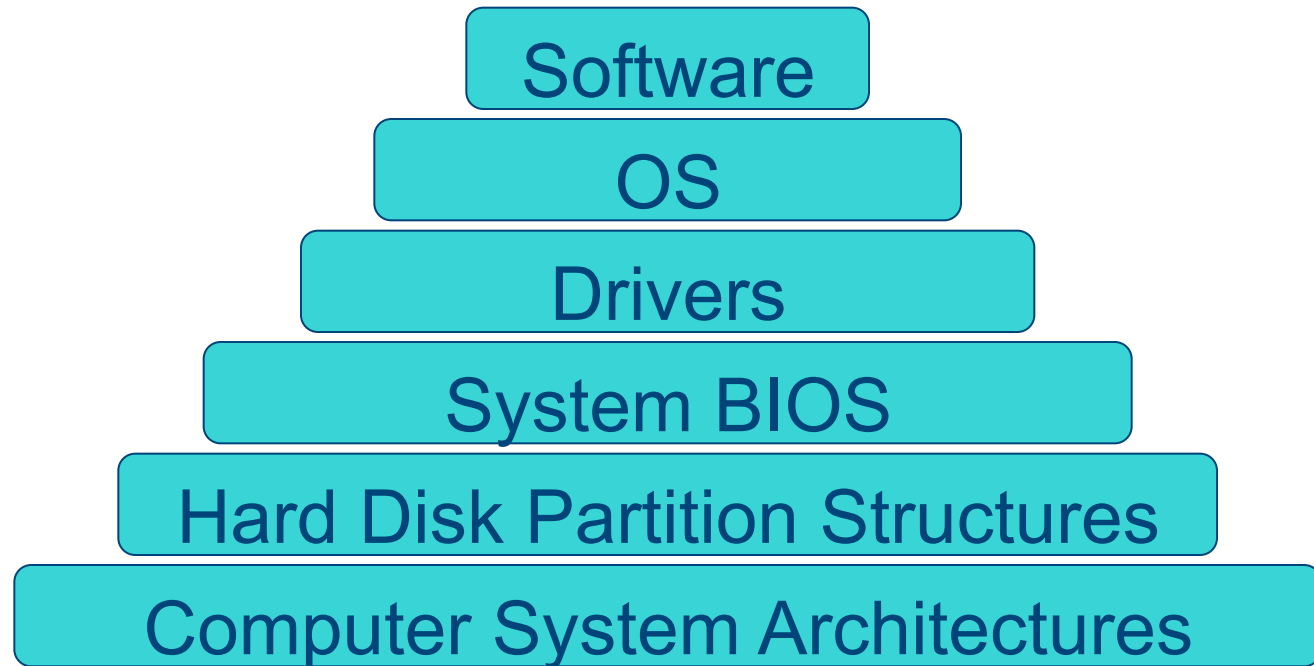
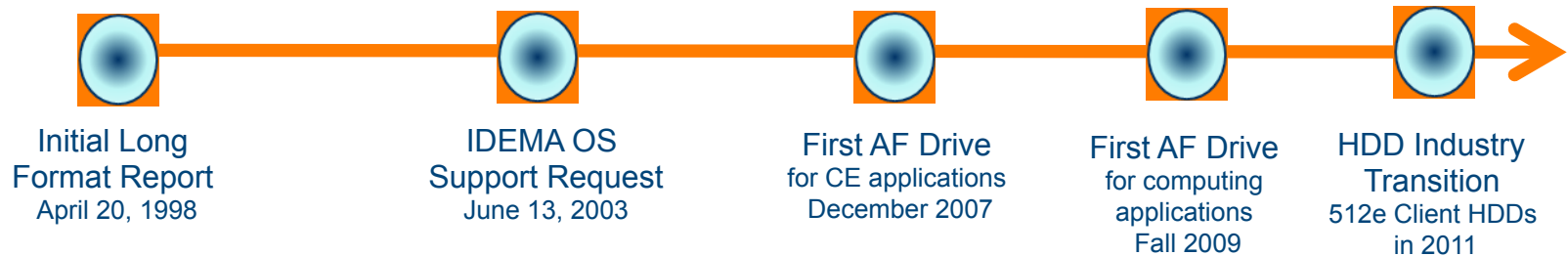
- *Allows for stronger error correction capabilities.*
- *Provides better data integrity at higher densities.*



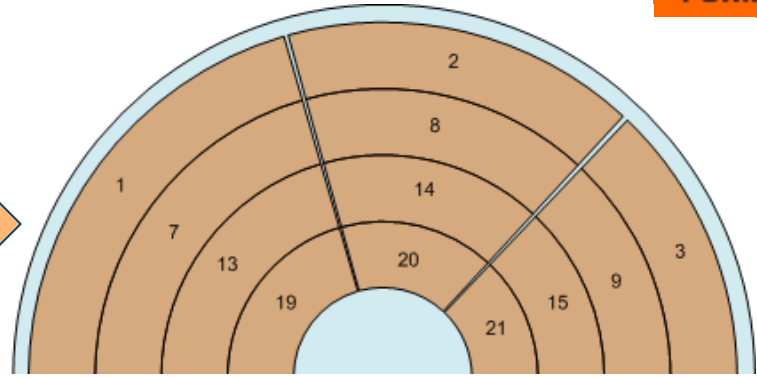
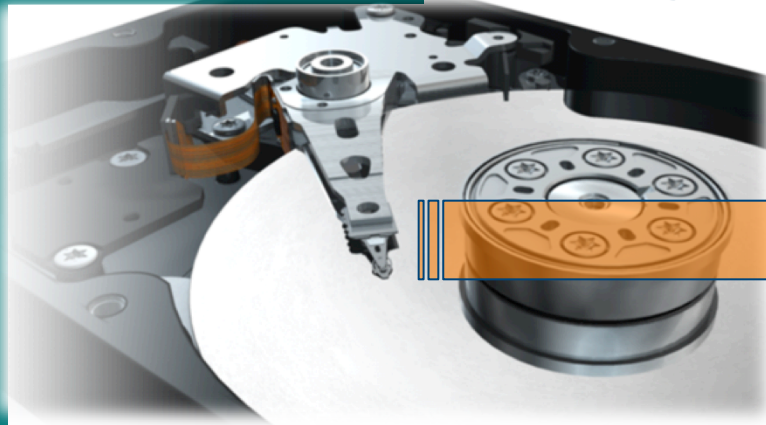
Why Now?



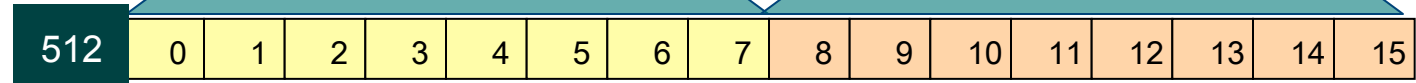
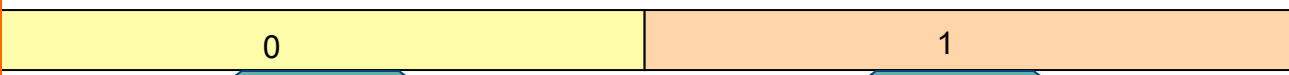
... It's been over 10 Years!



512 Byte Emulation (AF 512e)

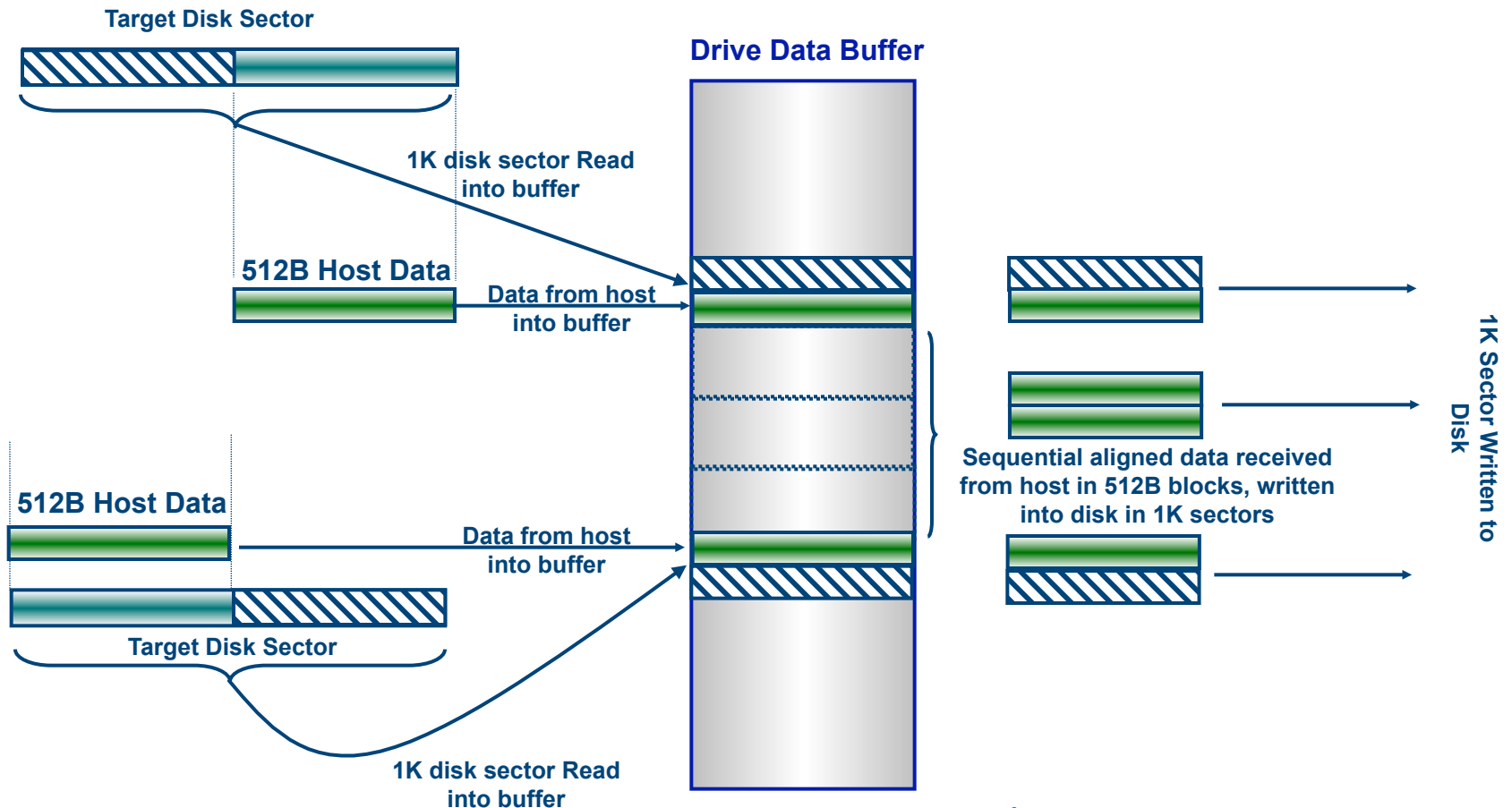


4K-Byte Physical Sector



- *Maintains 100% compatibility*
- *Invisible to host computer systems*
- *There is just one problem....*

Write Performance and AF 512e



** 1k sector size used for illustration purposes*

Alignment is the Key!



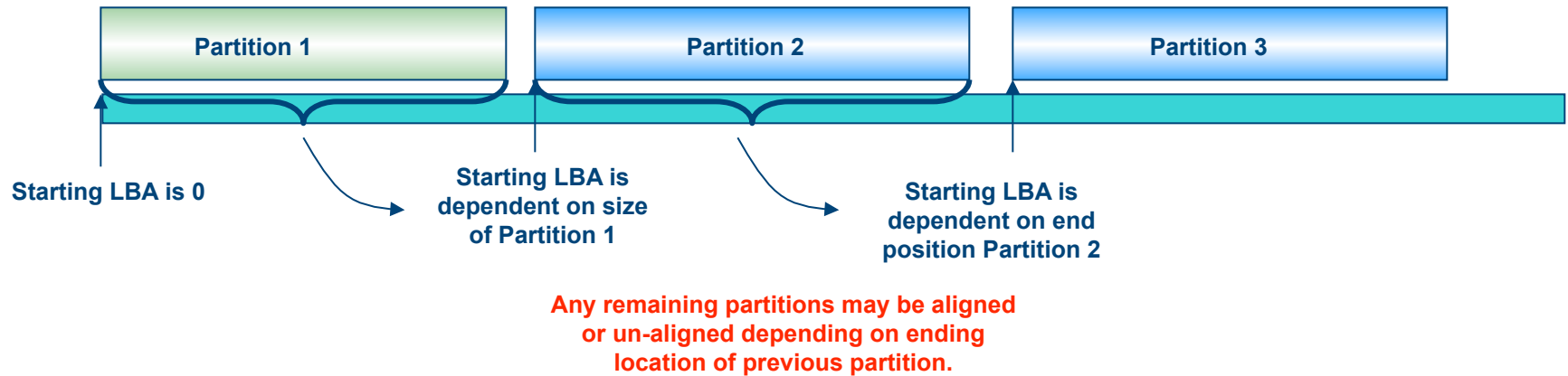
Aligned
(Alignment 0)



Not Aligned
(Alignment 1)

- *Not all operating systems or software applications use the same starting location for LBA 0!*
 - *Alignment 0 = First LBA 2,048*
 - *Alignment 1 = First LBA 63*
- *Windows XP (Alignment 1) uses one starting location, while Windows Vista and Windows 7 use another (Alignment 0).*
- *Multiple partition configurations and virtual environments make this issue more complex....*

Multi-Partition Alignment



The solution is to use software that is optimized for Advanced Format, or “AF Aware”.

Advanced Format Aware



Operating System Overview for Advanced Format

Windows XP	Windows Vista	Windows 7	MacOS	Linux
Not AF Aware	AF Aware, Not Fully Optimized	AF Aware and Optimized	AF Aware and Optimized	AF Aware and Optimized (check with your OS vendor)

Other software which can have an impact

- *HDD image duplicators, cloning utilities, any software which by-passes the OS and writes directly to the HDD...*
- *Any software system which generates significant write workloads with small (less than 4K) data payloads.*

Get Ready!



- *Embrace Advanced Format 512e – It's here, it's good, it's a done deal....*
- *Use an Advanced Format Optimized OS*
 - *Windows 7 with SP1*
- *If you can't – Consult your HDD supplier for recommendations on how to best manage*
- *Began preparing for Advanced Format 4Kn – 4K native launch on enterprise-class drives coming in 2012*
- *Make sure utilities and other core software packages are AF Optimized – Check with you SW vendors!*
- *Use the free resources available through IDEMA*
 - *www.idema.org/af*



Advanced Format



Are you ready for **ADVANCED FORMAT** technology?

THE HARD DISK DRIVE INDUSTRY IS TRANSITIONING TO LONGER DATA SECTORS.

IN JANUARY 2011, THE PHASE OVER FROM 512 BYTES/SECTOR TO 4096 BYTES WILL BEGIN.

We want to make sure you are ready.

Why do hard disk drives need **ADVANCED FORMAT** technology?

- Continued storage capacity growth
- Increased format efficiencies
- Stronger error correction capabilities
- Better data integrity at higher densities

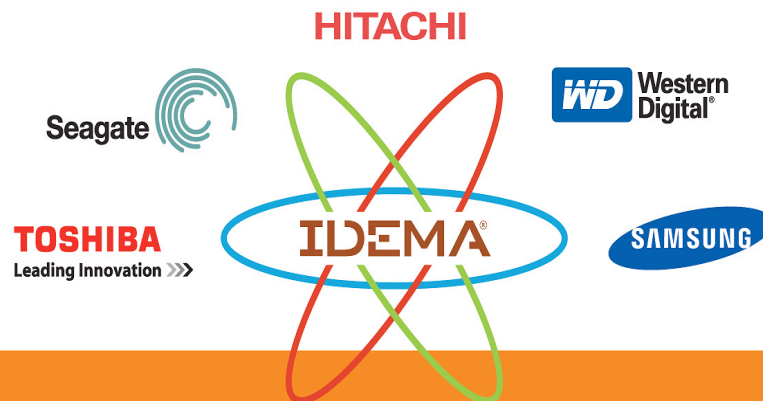
Why prepare for **ADVANCED FORMAT** hard drives?

- Optimize product performance
- Ensure compatibility
- Deliver positive user experience
- Avoid technical support calls

What is affected by **ADVANCED FORMAT**?

Direct disk access operations used in:

- Software applications
- Software drivers
- Back-up programs
- Disk replication solutions
- Imaging tools
- Test tools
- Integration utilities
- Manufacturing processes
- Database applications
- SoC and BIOSes
- Operating Systems
- And more



Get ready! Test your products today. Register for an AF Developer Kit at: www.idema.org/af