



Effective Support for 512 byte Emulation in 4 K Sector Drives

The Customer Viewpoint.

Topics of discussion.

- Cautionary statement.
- Why is 512 byte emulation necessary?
- What are the major problems need to be worked?
- What are the end user expectations?
- What does this all mean?

Cautionary Statement - If we are not fixing something the customer deems necessary, then we should be asking ourselves what is the purpose of this exercise.

- What customer problem are we trying to fix?
 - Is it capacity?
 - For many standard business customers the answer is a no.
 - Large capacity is not necessary at the business desktop level because many have started keeping data files on servers - secure, protected and backed up.
 - Is it performance?
 - Unless the performance benefit is substantial, I doubt customers will take notice.
 - Is it cost?
 - How much cost savings versus pain of the work?
 - Is it reliability?
 - Can anyone articulate it in a way the customer can understand and perceive the benefit?

4K Logical Block versus 512 byte emulation

– Why is emulation even necessary?

- A straight transition to 4K Logical sectors is impossible with the exception of closed/tightly controlled system environments.
 - Even these will have to deal with service contract issues for years.
- For most systems, 4K Logical will break too many customer environments.
 - BIOS is not ready.
 - Lots of applications and tools are not ready.
 - How does the industry get the word out of the changes coming?

4K Logical Block versus 512 byte emulation

– Why is emulation even necessary? Cont.

- Most consumers of drives have been using 512 byte drives for years.
 - They may not even be aware of drive sector formats, but everything they have has been working for years and will get upset when their favorite applications and tools do not operate properly.
- Most typical business end users aren't aware of sector sizes either.
 - But specialized positions such as IT departments understand the significance. For these people the problem becomes image deployment to their users. These specialists use many different methods, tools and scripts to deploy the image and 4K will have an impact.

4K with 512 byte emulation is required.

- Okay, so this brings up the real problem, proper alignment of the OS so there is less read/modify/write activity.
 - Because MS Vista already has support, legacy OS 4K alignment is the bigger issue with customers.
 - Creates a ongoing support issue unless the performance difference is not detectable.
 - How much can be hidden with alignment?
- Is 512 emulation only a temporary solution?
 - How long will emulation support be required?

Customer problems to solve – Software

- Customer / Retail Imaging utilities
 - Ghost, etc.
 - OS alignment needed.
- Tools used during development and creation of images
 - WinPE – for a legacy OS such as XP, this will be a problem.
 - An upgrade is needed to fix this for business customers.
- Image Restore utilities
 - OS alignment tools needed.
- Linux
 - Is this being worked and verified?
- Which is the bigger burden, upgrading to the latest OS or tackling changing all the tools applications?

Customer problems to solve - Hardware

- Stand alone image machines (Datablaster, etc)
 - Do image scaling and only transfer required data.
 - OS alignment changes needed.

Customer problems to solve - Network

- Network download/image
 - Business customer IT departments use various methods and tools to lay down the images for their end users.
 - Many business customers are reluctant to update their OS quickly.
 - Valid thinking : Everything works, why take the risk of breaking something?
 - Legacy OS alignment tools needed.

Customer problems to solve - Performance

- The customer cannot perceive the difference.
 - Vista – As long as the drive reports proper alignment values, this should be not an issue.
 - Legacy OS support
 - Reads should be no issue.
 - Writes are the problem
 - For cached writes, if aligned, can hide some but not all read/modify/write accesses.
 - Goal should be to somehow reduce <4K writes.
 - For cached writes, if non-aligned, if the size or volume of the file transfer is large this will be exposed.
 - For non-cached writes, this is a huge headache.
 - Customers will not tolerate this.
 - Alignment tools are needed.
 - How do we communicate to customers that some applications may be inadequate?

End User Expectations.

- General Compatibility
 - Applications have to work.
 - Who works and covers the cost of the service issues as they arise?
- Performance Guideline Suggestions
 - Customers usually don't perceive 10% or less difference in standard benchmark applications.
 - But a word of warning - They do notice slow responding applications
 - They also notice slower boot times
 - What benchmark tools should be used?
 - Industry standard benchmark measurement applications
 - Many are well known and used by our customers already
 - Who is working with these companies?
 - Boot times need to be re-measured
 - Other methods?

What does this all mean?

- Who is responsible to make sure all work is completed?
 - Everyone
 - Samples, samples, samples...at least a year before release to find all the holes and issues.
- Are there other and possibly equal or better solutions available?