

A realistic image of the Earth as seen from space, showing the Americas and parts of Europe and Africa, set against a dark blue background with light rays.

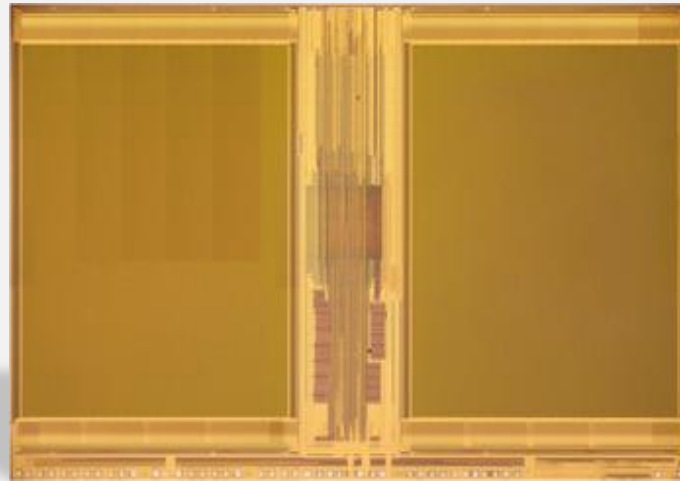
Solid-State Endurance
Your Data Will Be There in the Morning

Scott Stetzer, VP, Technical Marketing

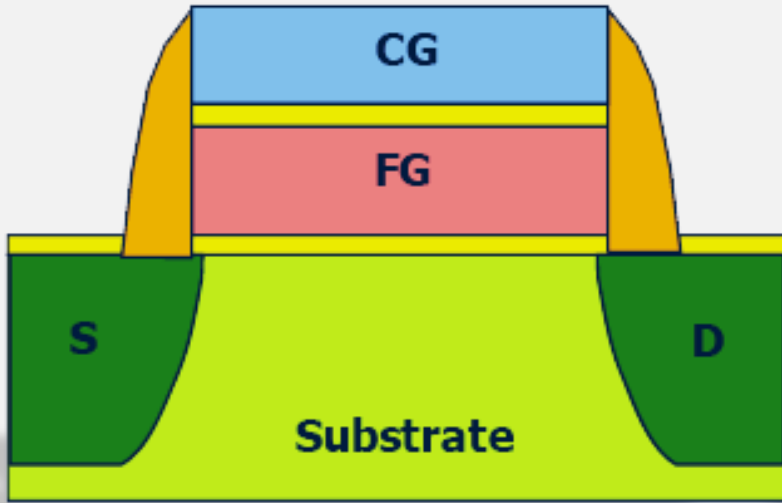


How long will my drive last?

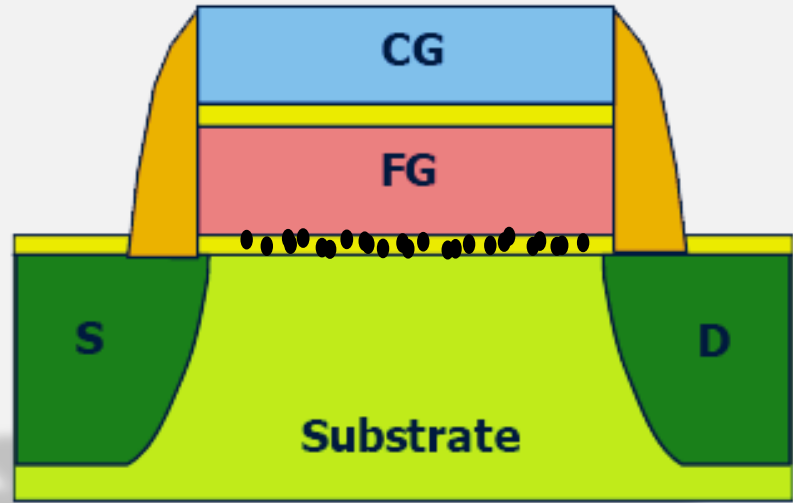
Flash gets all the press...



How Flash Fails

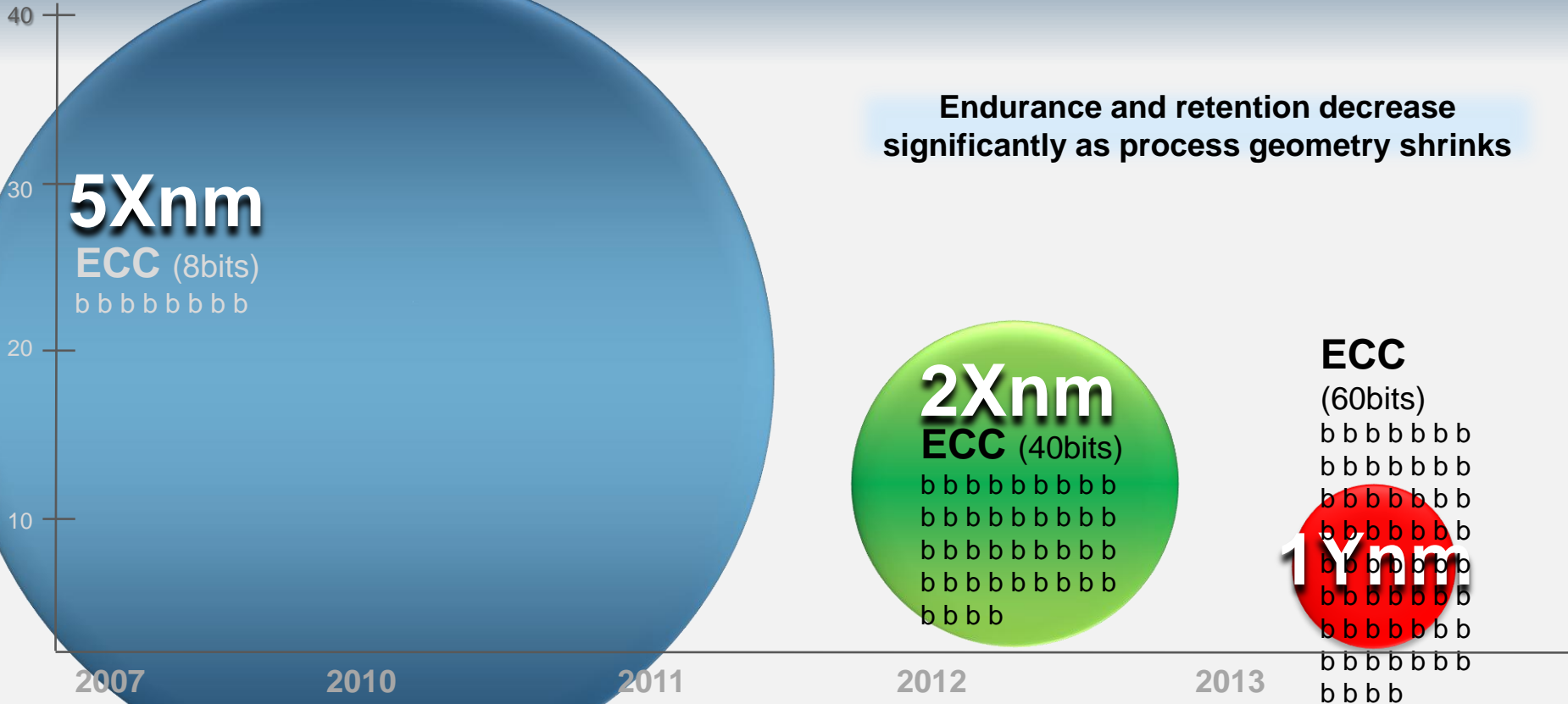


Fresh



P/E Cycled

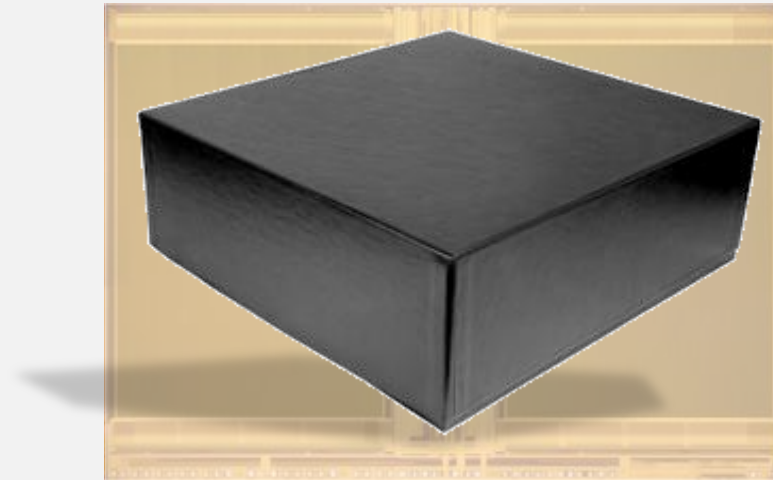
The Incredible Shrinking Cell



Endurance and retention decrease significantly as process geometry shrinks

*Source: Supplier datasheets

Flash is static

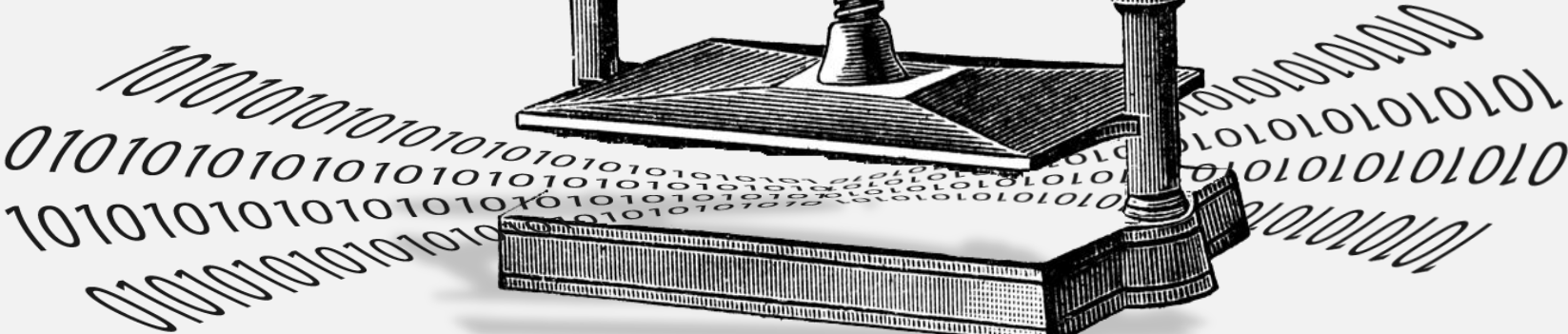
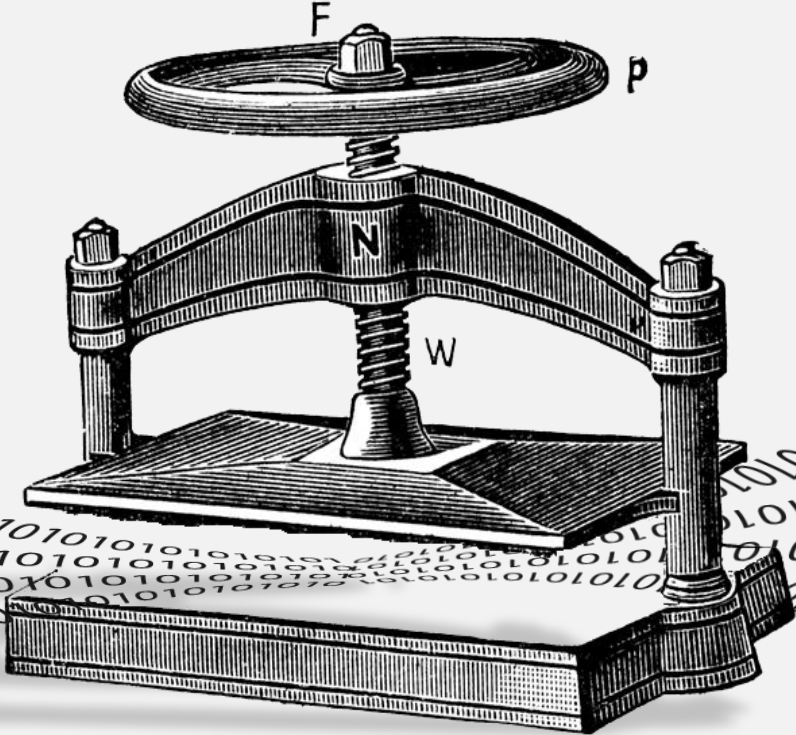


How do you make it last longer?

Solving the Endurance Challenge



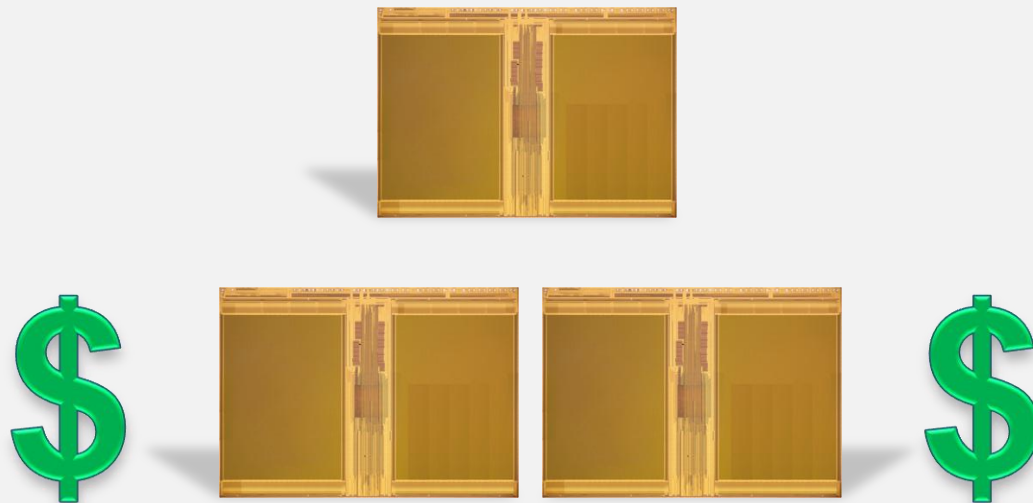
Compression



Solving the Endurance Challenge



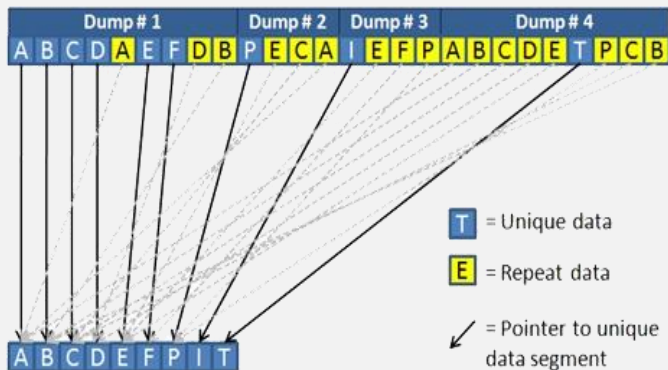
More Over Provisioning



Solving the Endurance Challenge



De-duplication



Throttling

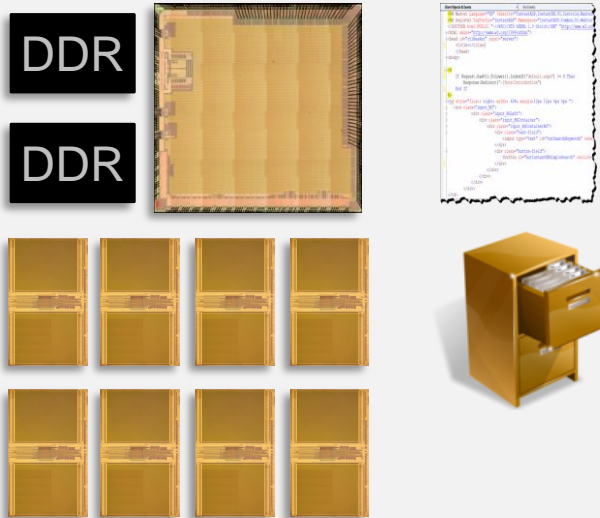


Treating the Symptoms...



A Better “Technology” Solution





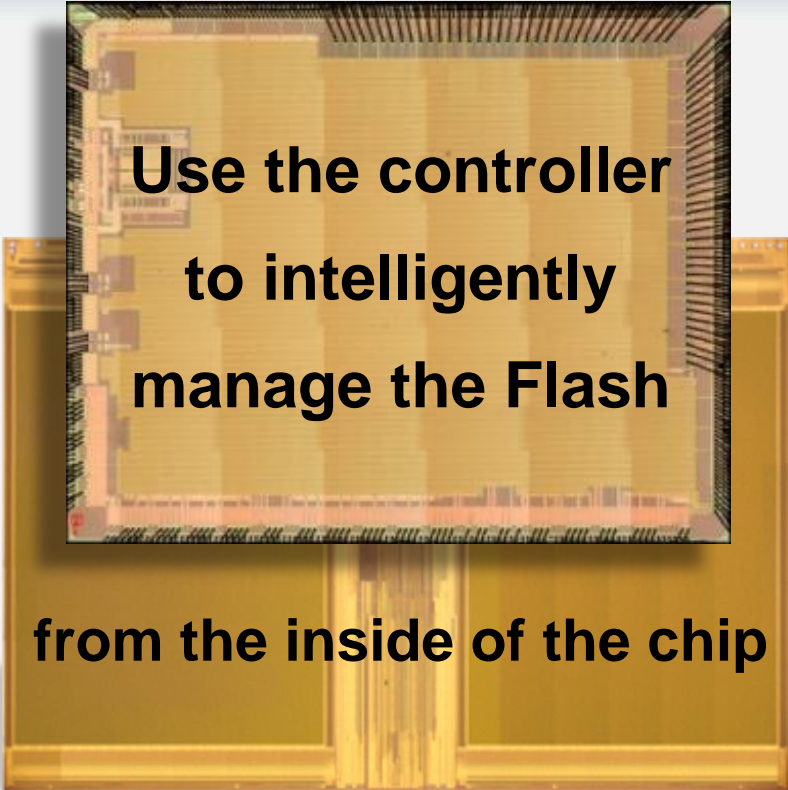
An SSD is not Flash alone

It's an intelligent system – using:

- Controller / CPU
- Memory
- Complex Software
- File Systems

Oh yeah... and Flash

A Better Solution

A photograph of a square microchip die, likely a controller, mounted on a gold-colored carrier. The die is yellowish-gold and has a complex pattern of fine lines and structures on its surface. A central rectangular area is highlighted with a black border, containing text.

**Use the controller
to intelligently
manage the Flash**

from the inside of the chip

Manage Cells from the Controller



The Managed Flash Advantage



**cMLC 3K
Cycles**

**CellCare
cMLC 40K
Cycles**

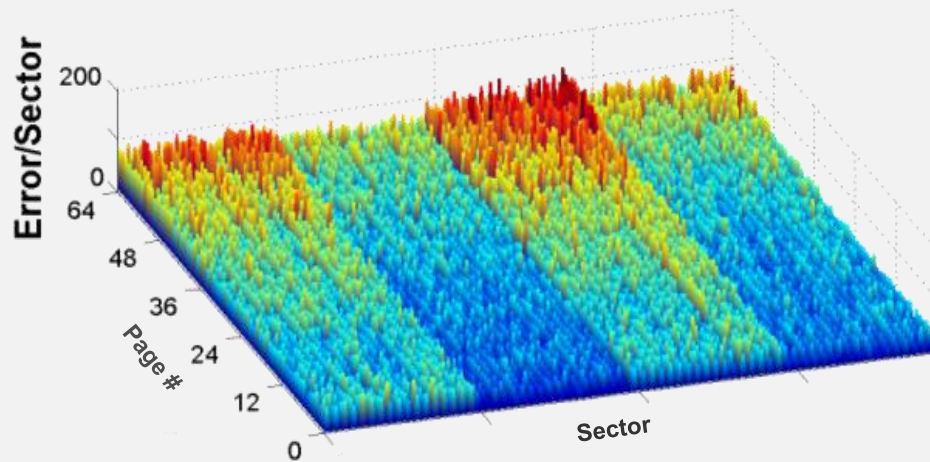
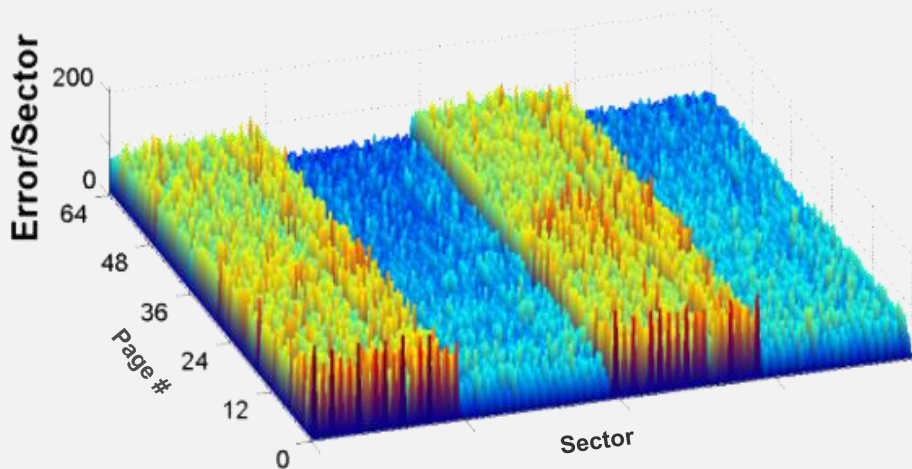
Measurable Results

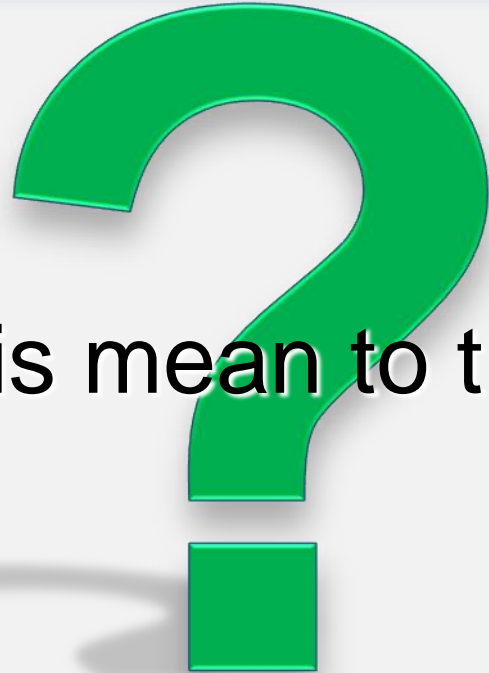


Unmanaged Flash

Managed (CellCare) Flash

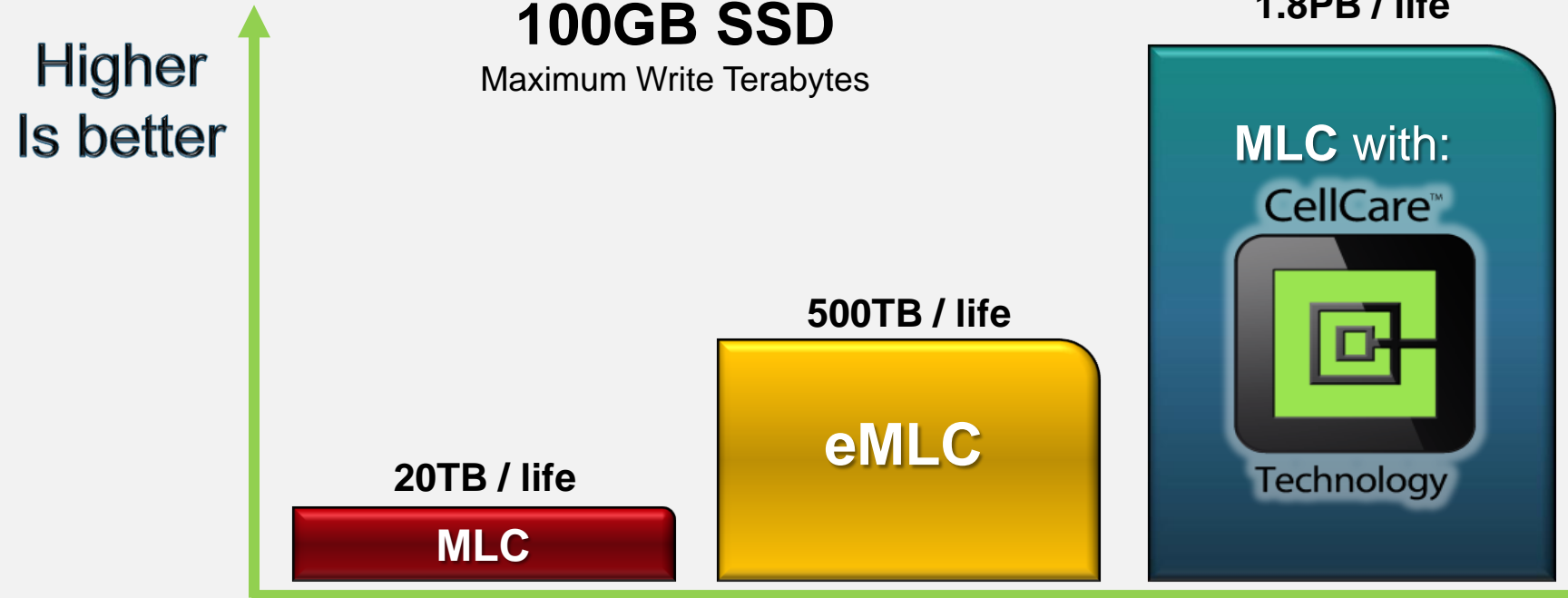
50k Cycles





What does this mean to the SSD user?

Understand SSD Endurance Value



100GB SSD
Maximum Write Terabytes

1.8PB / life

20TB / life

MLC

500TB / life

eMLC

MLC with:
CellCare™

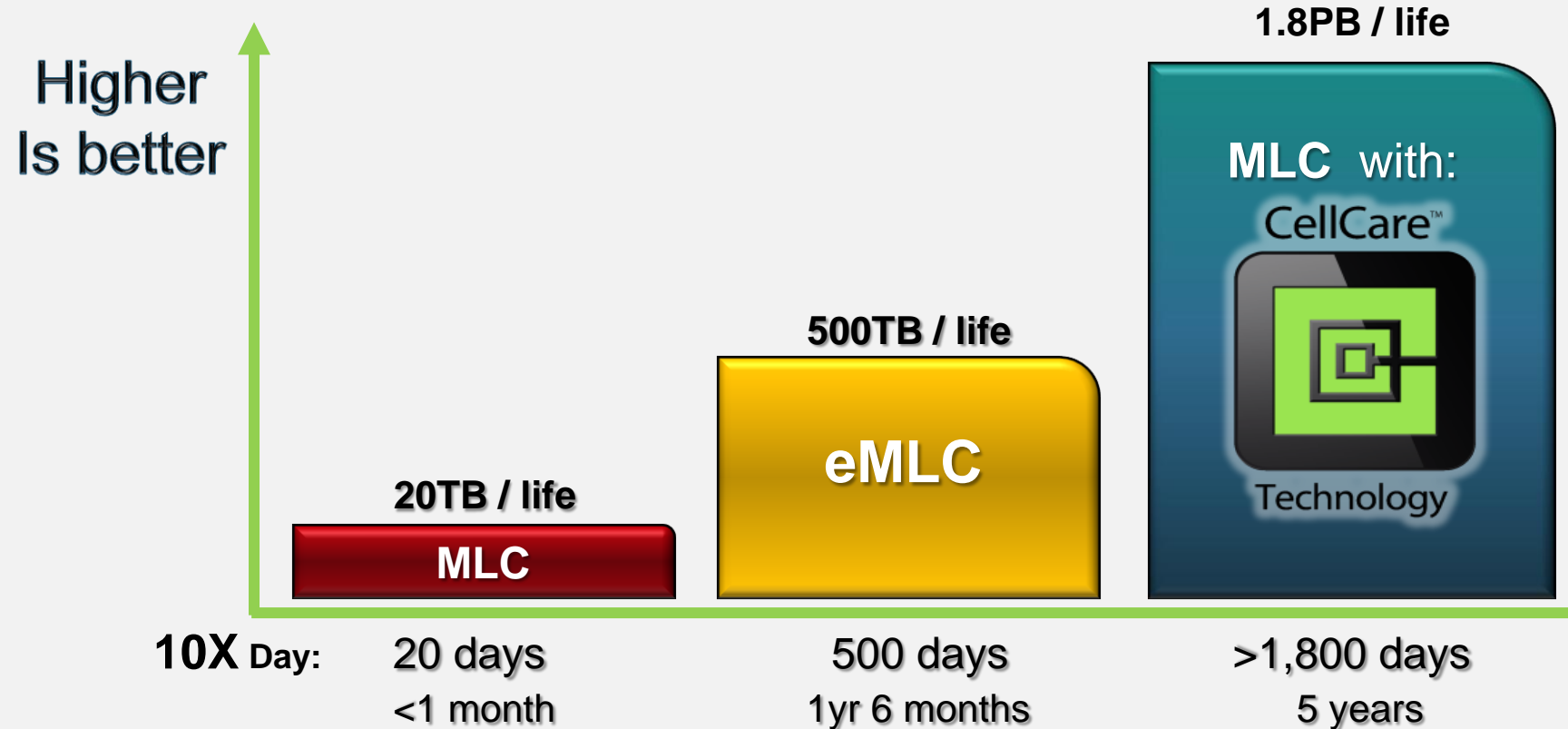
Technology

10x

Full Drive Writes per Day

100GB drive x10 = 1TB writing per day

Understand SSD Endurance Value



**Enterprise
HDD**

TCO Model

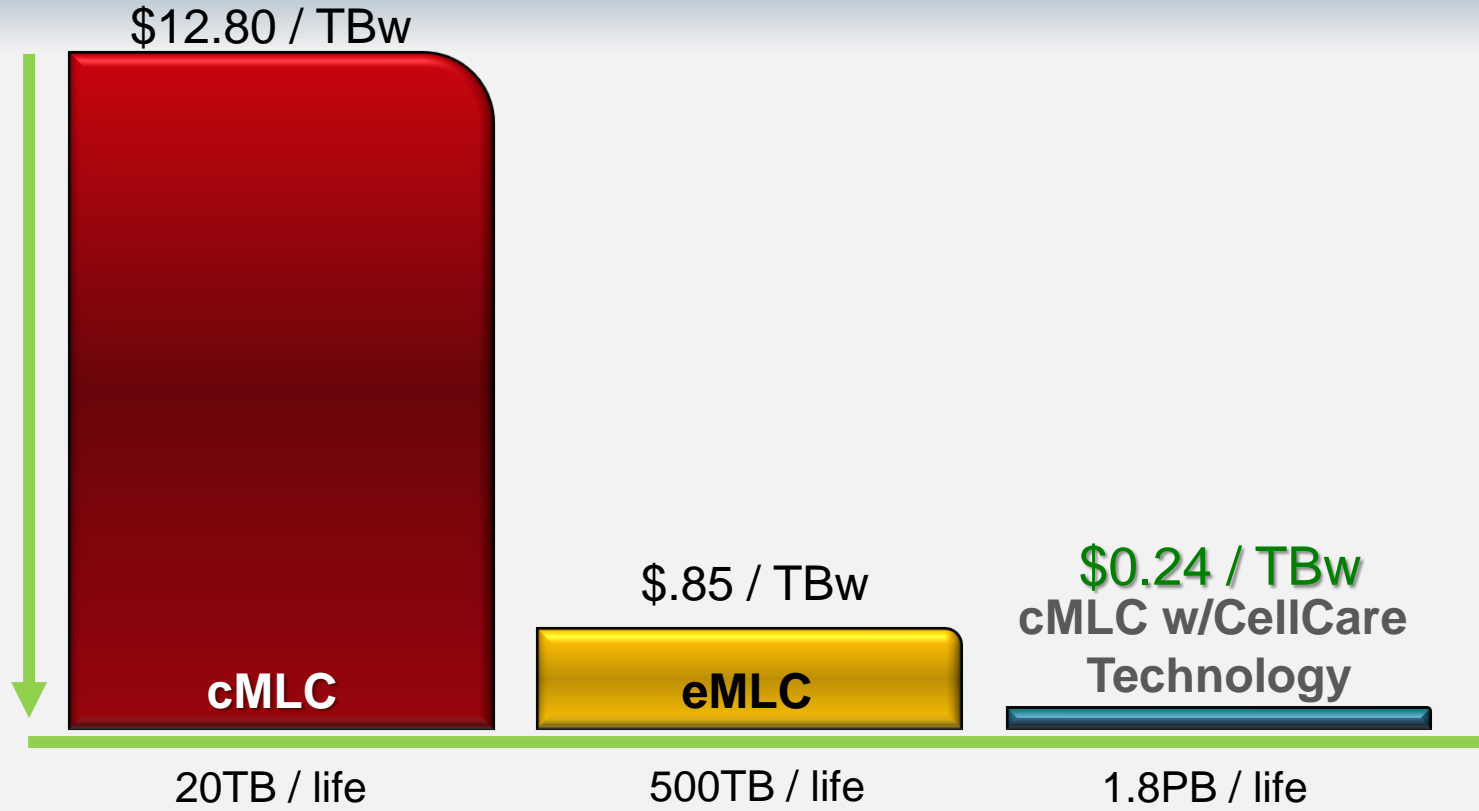
\$ / GB

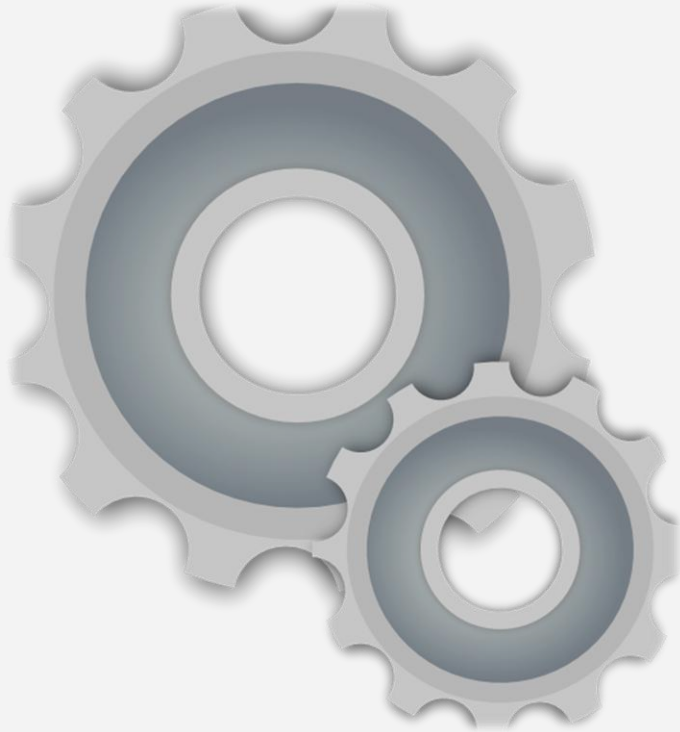
**Enterprise
SSD**

TCO Model

\$ / TBw

Cost for every Terabyte written...





 **Cost**

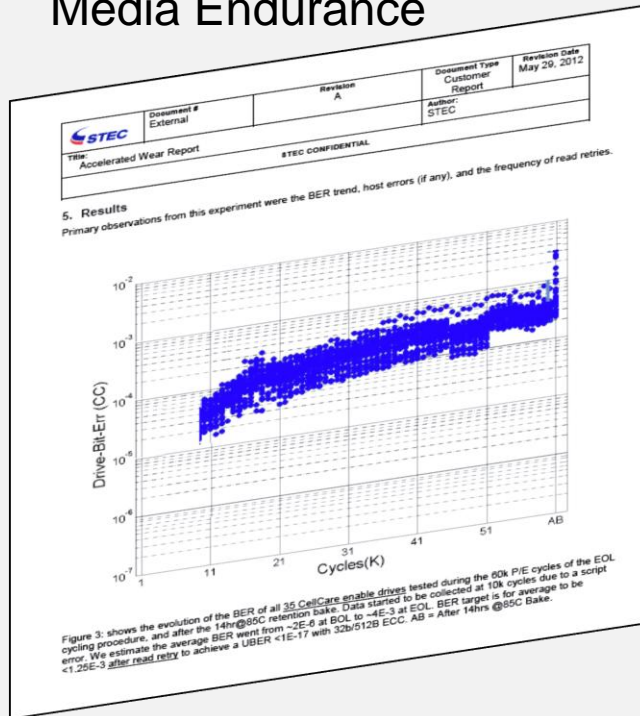
 **TCO**

PROVE IT

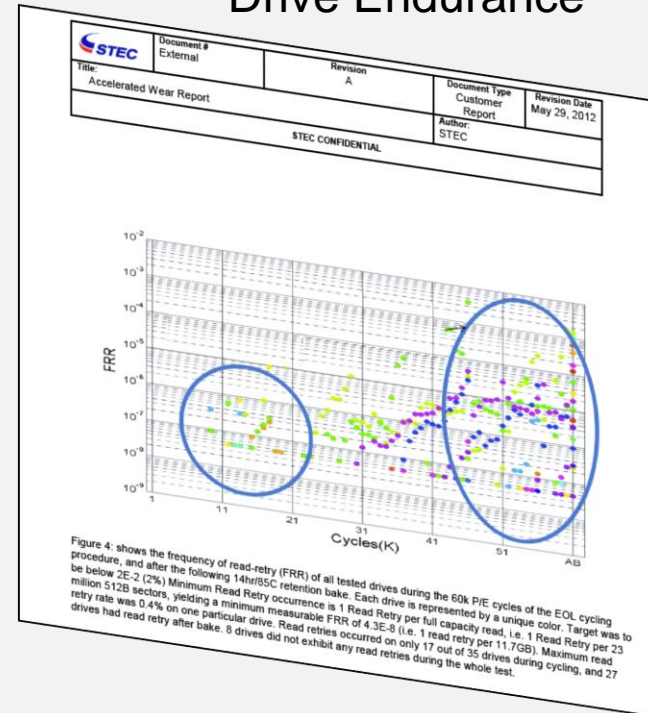
In God We Trust... Everyone else, bring data!



Media Endurance



Drive Endurance



Call to Action:

Disclose PBw capability
Prove It

Thank you



www.stec-inc.com

