Software RAID vs. Hardware RAID

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Alan Poston
A Brief History Of RAID

• RAID has been around since 1970s
• 1989 Berkeley Paper was a “Taxonomy”
• 1989 witnessed the first RAID-5 in software
• 1990s saw many Hardware RAID-3, 5s
  • LSI, 3ware, MaxStrat, Highpoint, Intel
• 1990s also saw the introduction of RAIDFrame
• MDRAID came along in 2001
• Many RAID1, 10 implementations in Volume Managers
Software RAID examples

- RAIDframe allowed for early introduction of new RAID levels and concepts (research tool)
- MDRAID quickly followed and has more developers, Linux open source
- ZFS
- Drobo BeyondRAID
- MDRAID has matured into more than a homebrew test platform
Software RAID advantages

- Lower Cost
- More flexible platform
- Multi-Core CPUs are common and more than capable of sustaining RAID operations
- Preserves platform investment while radically changing RAID operations
- Combines with other Storage features such as deduplication, caching, encryption, etc.
Hardware RAID advantages

• Isolated DRAM, often battery backup
• Isolated, but limited flash or NVRAM
• At release, performance matches the best software RAID, but by end of life...
• Vendor support
• Some advanced features like synchronous cache (almost always proprietary)
• Often easier to configure and operate (Web based GUI, etc)
Software versus Hardware

- Software RAID has the advantage of flexibility
- Software RAID can take advantage of CPU
- Software RAID can be integrated with other storage software (encryption, de-dup, etc)
- Software RAID can easily be updated
- Hardware is vendor supported
- Software RAID is less expensive
- Hardware RAID is performance isolated, memory isolated
RAID Futures and non RAID Futures

- Parity Declustered RAID (ok, present, not future)
- Erasure Codes
- Network Striping
- Triplication (again, not a future)
- Flash integration / Shingled Drives
- Log Structured Disks
- Lots of futures / present options, this isn’t going to be RAID 6 anymore
Conclusions and THANKS!

• The key is ADAPTABILITY!

• Software RAID is the clear choice for the last 2 to 3 years, cost, performance and flexibility are the key deciding factors.

• Questions?
Thank You

alan_poston@xyratex.com