Software RAID vs. Hardware RAID

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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

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