By the Book: Open Source Reference Implementations for Key SNIA Terminology

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Motivations

- This journey began in a Data Protection BoF
- Then a desire to draw from the SNIA Dictionary
  - The best dictionary of its kind
  - Mildly dated thanks to years of authority
- Then DPCO Governing Committee participation
Challenges

- Balance Vendor Authority with Vendor Neutrality
  - Vendors produce many de facto standards
- Industry authority beyond SNIA projects
  - SNIA produces open standards
- License the results for maximum adoption
Perfect Example: SNIA NDMPv4

- Network Data Management Protocol
- www.snia.org/ndmp
- Vendor originated
- Open standard
- Permissively-licensed v4 implementation (of 5)
- Freely available
Open Standards are Everywhere

- VendorNAS 2.0!
  - NFS!
  - iSCSI!
- FibreChannel!
Open Standards are Everywhere

- VendorNAS 2.0!
  - RFC 1813!
  - RFC 3720!
  - RFC 3643!
- Shifts the discussion to Standards Conformance of Reference(able) Implementations
Open Source is Everywhere

- Majority of non-Microsoft storage platforms
  - FreeBSD
  - Illumos
  - GNU/Linux
- POSIX environments
- *Enterprise-proven reference implementations*
Vendor Motivations

- Validated standards compliance should be synonymous with standards delivery
- Either failing to comply with a standards or extending a non-extensible standard is failure
- Not a desirable point of distinction
- Shared code is usually interoperable code
By the Book…

- RAID 0, 1, 5, 6
  - FreeBSD `graid(8)`
  - GNU/Linux `mdadm(8)`
- RaidZ
  - Illumos, FreeBSD, GNU/Linux `zpool(8)`
  - Replication, rebuild, latency, throughput…
By the Book…

- iSCSI
  - FreeBSD CTL
  - Illumos SCSI Target Mode Framework
  - GNU/Linux open-iscsi
- NFSd
  - Virtually every Unix distribution, by definition
By the Book…

- FibreChannel
  - FreeBSD, Illumos and GNU/Linux Drivers
- Various Erasure Coding Implementations
- Most Networking Protocols
- Increasingly Web Content Accessibility Guidelines (WCAG) for Applications
My Work: Replication Taxonomy

- File
  - rsync(8)
  - unison(8)
- Block
  - OpenZFS send
- Object...
My Work: Replication Taxonomy

- Understand the problem before addressing it
- Block vs. File vs. Object
- Active vs. Passive
- Asynchronous vs. Synchronous
- Point-in-time vs. Batch
- Primary-Backup vs. Multi-Primary...
Eyes on the Prize

- SNIA Linear Tape File System (LTFS)
- SNIA NDMP
- SNIA Swordfish
  - snia.org/forums/smi/swordfish
  - swordfishmockups.com
- Watch for the DPCO Data Protection WP
Calls to Action

- NDMP, OpenZFS, bhyve Hypervisor are all vendor contribution
- Ever-present motivations to upstream, broad “thaw” regarding actually doing it
- Identify what standards-based technologies outside or inside your core functionality may qualify for upstreaming.
Discuss

Thank You!

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