FCP-2 PR Comment
Resets & Serial Access Devices

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Topics

- Background
- How we found the problem
- Testing Status
- Existing Standards
- Future Standards
VERITAS is an cross-platform APPLICATION vendor

- With a strong interest in NOT having interface specific code……
- And two SAN Integration Labs…..

To quote one of our lab engineers:

“All this Login and Logout stuff happens at a level way below us”

Backup applications are now time critical

- Data transfer process fills the available window
- No time for even one rewind/reposition cycle
How we found the problem

_backup application on server copying from disk to compressed tape on a SAN switch

Plug another disk drive into a vacant port – Backup dies!!! Why?

- HBA registered for state change notification
- New fabric f/w sent unexpected code to HBA
- Part of Recovery Process was for HBA to re PLOGI with all devices
- Tape had FCP-2 firmware, PLOGI reset mode pages, cleared reservations as well as killing tasks
  - Commands retried, but write to media could not continue because block size, & compression mode change requires rewind to load point
How we found the problem

- HBA behavior is probably ONLY option using FCP definitions!
  - Therefore significant issue in mixed FCP & FCP-2 systems

- And its even worse if the tape drive lets the write continue……..
  - Backup may work if the HBA can relogin and reissue commands inside the app retry window…
  - but Restore will almost certainly fail!
And then we tried…..

Our standard unplug/replug test on this FCP-2 tape drive
  • Didn’t work – replug reset mode pages, reservations as per FCP-2
  • Backup app couldn’t recover

Testing a new FCP-2 compliant FC-SCSI bridge
  • Unplug and Replug meant that the drive seen as a new device
  • OS could not find the tape drive again without a Server reboot
Testing Status

See web page:
- http://support.veritas.com/menu_ddProduct_BEWNT.htm
- Follow compatibility lists, Shared Storage Option for Win2000

10 vendors, with 15 loop & 22 fabric configurations for each vendor
- All work with Backup app after unplug & replug
- Can even change ports & Backup app & OS find drive and operation continues without rewind

Above testing performed on 3 different OS – NT, Win2K, Netware. Same results
Testing Status

5 new FCP-2 compliant devices (2 HBAs, 1 bridge, 2 libraries) break our backup apps

- And fail about once every 100 hours for a reason we cannot determine at the moment
Existing Standards

One table in an existing document defines all FC-level port logouts and logins (Implicit Port, Explicit Port & Process), as forms of Target Reset

- Document is T11 FC-PLDA TR
- Definition not changed in T11 FC-FLA TR
- T11 FC-TAPE TR makes “forward reference” to FCP-2
  - FCP-2 Table essentially same as PLDA Table

FC-PH defines loss of light as Implicit Logout, and PLOGI as Implicit Logout before Login

- Therefore FCP-2 devices cannot be hot plugged in same way as FCP devices (or all other SCSI devices)
Postulates

That the current FCP-2 definition is a “hair trigger”
- Almost impossible to certify that configurations will not run into problems
- 3rd party devices can be the trigger

That an anti-layering approach of physical interface definitions having such a major impact on the operation of the SCSI command layer is no longer acceptable
- Or will not be in the near future!!
- Command reissue is not a problem – done by the same code as handles the Login/Logouts – it’s the “state” information change (reserve/release, mode pages etc.)
Future Standards

Will iSCSI & SRP have physical layer actions with equivalent impact on SCSI tasks?

• If so the IS Manager is going to be most unhappy!!!!
  • Unplug & Replug in a different place is a way of life in LANs

Trend to more “state” information held by Targets:

• Bridge command set?
• Disk Arrays (do vendor unique pages get reset too???)
Summary

- Cannot fix the past......
- But cannot carry PLDA approach forward either
- Immediate issue is tapes....
- Sensible to fix @ this point in FCP-2
  - As a change more compatible with future directions
  - Target reset still exists (with explicit actions)
  - Implicit actions have no impact on command layer

Therefore VERITAS asks T10 to not accept the recommendation of the Technical Editor to reject our PR Comment