Framing

- Add formal iSCSI interface to framing

  – Marker, SCTP, and SCTP-like chunking for TCP

- Move existing marker description to an appendix as an example

- WARP group will write a draft on using SCTP-like chunking for iSCSI without RDMA

  – Needed prior to Minneapolis - the sooner, the better

Error Recovery

- Terminology Conventions
  - "Reference Number" and "RN" are used only for SCSI
    - iSCSI uses "Sequence Number" and "SN" instead
  - "AER" is used only for SCSI
    - iSCSI asynchronous events are now called "Asynchronous Messages" - iSCSI uses these to implement AER

- If SCSI has disabled AER, iSCSI does not send the corresponding Asynch Messages

- CmdSN (formerly CmdRN) is mandatory in all situations (including single connection sessions)

Error Recovery (2)

- Support for (new) SCSI Command Ref Number
  - Use byte #2 in iSCSI header (currently Reserved)
  - Not ideal, but matches level of FCP support
  - Check where mode page is to negotiate this
    - If transport-specific, iSCSI to use a text key instead
- Remove DataSN (formerly DataRN) functionality
- Add significant connection recovery writeup
  - Details, procedure, examples

Error Recovery (3)

- Ping/NOP
  - Add description of intended use
    - Ping indicates that corresponding protocol is alive
  - NOP responses are not permitted to request responses

- Abort WARNING
  - Immediate Delivery of Aborts and the like
  - When multiple TCP connections are in use, Abort, Clear Task Set, etc. may bypass command(s) to be aborted/cleared on other TCP connections
  - Use Ordered Delivery instead when this is a concern.

CRC

- Use separate CRCs on header and data
  - Same CRC algorithm on header and data
  - One CRC covers both fixed header and optional extensions

- CRC Algorithms - sense of room
  - CRC-32 is the obvious first/default choice.
  - There is some interest in investigating both weaker (Adler-32) and stronger (CRC-64) CRCs (CRC-64 may not be appropriate for header)

- MUST implement CRCs
  - Open issue: whether CRC use is negotiable
  - Default: Use CRCs

Limiting the amount of data per CRC

- At most one data CRC per PDU
  - SHOULD enforce limit by fragmenting into Multiple Data PDUs
- Julian will find reference on 8-9k limit for CRC-32

Security

- IPsec and TLS are for security

  - Only reason for digests is data integrity (i.e., CRCs)

- Open issue: How does iSCSI negotiate or detect presence of lower level security?

- Open issue: What is minimum security required to be used (authentication/integrity) by IETF?

  - David Black will follow up on this issue

  - Leave SRP and Kerberos login authentication in iSCSI draft pending resolution of this issue.

Naming

- Use UTF-8 instead of ASCII for text strings in iSCSI login and text commands, naming, discovery, etc.

- Encode binary values in UTF-8 rather than adding type/length support

- The i18n police thank you :-).

- Localization of iSCSI text is forbidden (on wire)
  - Keys/values are invariate byte strings