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 invariable byte strings