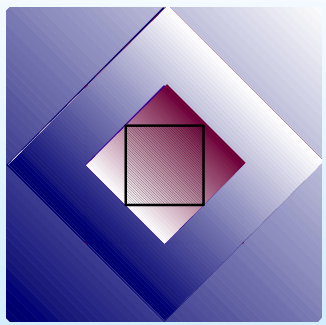
# *iSCSI – a SCSI over TCP mapping*

## *IETF – 50 – New Format*

Barry Reinhold

Julian Satran

IBM Research Lab in Haifa



# *New Formats*

- Format considerations
  - Do not expand header
  - Read Header in maximum 2 steps
  - Do not use unchecked data length
- Format versions
  - Format 1
    - 1-Lengths always double checked (parity)
    - Any header length
  - Format 2
    - Header Length has to used unchecked
    - Headers total limited a 255 – 4-byte words

# *New Format-1*

| QL | Data or Additional Header Length | |
|---|---|---|
| BHS | | |
| DQ | Data Length | |
| Type | Length | AHS field |
| AHS fields | | |
| Type | Length | AHS field |
| Digest | | |

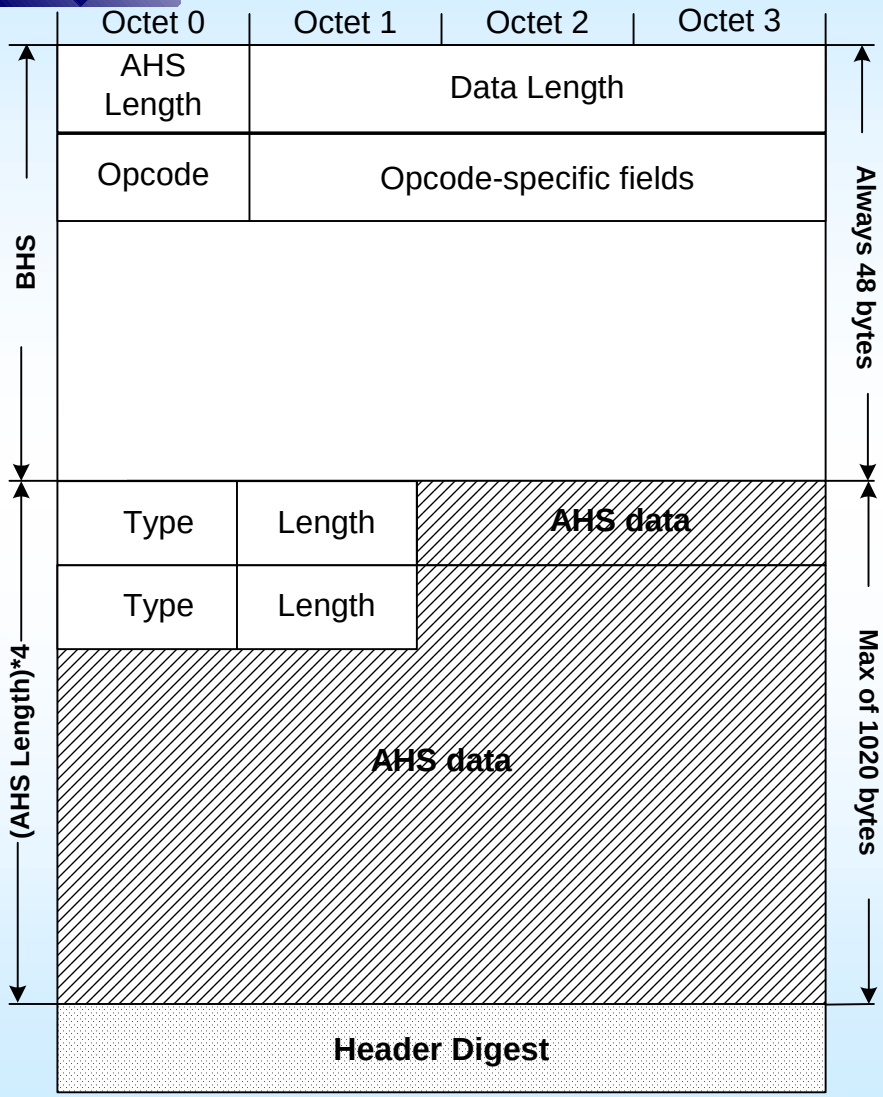
# *New Format-1 coding*

- QL
  - B7&6-0 Only data, 1 Only AHS, 2 Both
    - B5-4 Reserved
    - B3-0 Parity
- DQ
  - B7-4 Reserved
  - B3-0 Parity

# *New Format-2*

| AHS T-length | Data Length | |
|---|---|---|
| BHS | | |
| Type | Length | AHS field |
| AHS fields | | |
| Type | Length | AHS Field |
| Digest | | |

# iSCSI PDU Header




## Notes

1. AHS_length is given in 4 byte words allowing a maximum size of 1020 bytes for all combined AHSes.

2. Data Length is measured in bytes, allowing a maximum of 16 Mbytes of data in a single iSCSI PDU.

3. The AHS_length field is used before the header is checked against the digest. If the AHS field is corrupt it can cause blocking on the TCP stream.

4. The length of an individual ANS is limited to 1020 bytes. AHSes are word aligned through the use of padding.

# AHS Format

Fields in Additional Header Segment

1. AHS_type - First field in AHS, always starts on a 32 bit word boundary, 1 byte in length.
   The type field identifies how to interpret the AHS data field. It is broken into sub fields as follows:
   - bit 0 (MSB): Drop bit - If set this PDU must be dropped if the receiver does not understand how to interpret the AHS.
   - bit 1 : reserved - Set to zero by transmitter, and ignored by receiver.
   -bits 2-7: AHS_type - The value contained in this field indicates how the bits in the AHS_data field are to be used. The field is enumerated, and can take on any value from 0 to 63. Values from 0-62 are reserved for assignment by iSCSI. An enumerated value of 63 indicates that the AHS_data field contains information not defined by iSCSI. In this case the first N bytes of the AHS_data field shall contain an OUI. Size and layout TBD. [ 3 byte IEEE OUI in 6 byte space?]
2. AHS_length - Second field in AHS, 1 byte in length, starting after the AHS_type field.
   The AHS_length field contains the number of 4 byte words allocated for the complete AHS. This number includes the word containing the AHS_type and AHS_length field itself. Hence the smallest possible AHS has a AHS_length of 1. The largest value is 255 words or 1020 bytes.
3. AHS_data- Third field in AHS, between 2-1018 bytes in length, starts after AHS_length field. The information contained in this field is dependent on the value contained in the AHS_type field. AHS formats defined by this document are given in section TBD.

## Example AHSes

Possible format for ADDCDB

| AHS_type 0 | AHS_type 1 | AHS_type 2-7 | AHS_length | AHS_data |
|---|---|---|---|---|
| 1 | 0 | 000001 (ADDCDB) | 0x02 (allocated space in 4 byte words) | Actual number of bytes of data (0x04) |

| AHS_data |
|---|
| ADDCDB payload (4 bytes) |

Possible format for Small Integer

| AHS_type 0 | AHS_type 1 | AHS_type 2-7 | AHS_length | AHS_data |
|---|---|---|---|---|
| 0 | 0 | 000101 (FCP_CRN) | 0x01 (allocated space in 4 byte words) | 0x008c |

Example format of an AHS containing an IEEE OUI

| AHS_type 0 | AHS_type 1 | AHS_type 2-7 | AHS_length | AHS_data |
|---|---|---|---|---|
| 0 | 0 | 111111 (not iSCSI) | 0x03 (allocated space in 4 byte words) | 0x0000 |

| AHS_data |
|---|
| 0x0001ac4f (organizational OUI) |

| AHS_data |
|---|
| Information encoded as defined by OUI 0x01ac4f (4 bytes) |

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by Mark Parisi
www.offthemark.com
I JUST LOVE HAPPY ENDINGS
TITANIC
MarkParisi@aol.com
www.offthemark.com