         Internet Small Computer Systems Interface (iSCSI) SAM
                   draft-ietf-storm-iscsi-sam-03.txt

Abstract

   Internet Small Computer Systems Interface (iSCSI) is a SCSI
   transport protocol that maps the SCSI family of protocols onto
   TCP/IP. RFC 3720 defines the iSCSI protocol. The current
   iSCSI protocol (RFC 3720 and RFC 5048) is based on the SAM-2
   version of the SCSI family of protocols). This document
   defines additions and changes to the iSCSI protocol to enabled
   additional features that were added to the SCSI family of
   protocols through SAM-3, SAM-4, and SAM-5.

   This document updates RFC 3720 and RFC 5048 and the text in
   this document supersedes the text in RFC 3720 and RFC 5048
   when the two differ.

Status of this Memo

   This Internet-Draft is submitted to IETF in full conformance with
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Table of Contents

1.   Introduction

   The original [RFC3720] was built based on the SAM-2 model for
   SCSI.   Several new features and capabilities have been added to
   the SCSI Architecture Model in the intervening years (SAM5 is now
   the current version of the SCSI Architecture Model).   This
   document is not a complete revision of [RFC3720].   Instead, this
   document is intended as a companion document to [RFC3720] and
   [RFC5048].

   The text in this document, however, updates and supersedes the
   text in [RFC3720] and [RFC5048] whenever there is any conflict.

2.   Definitions, Acronyms, and Document Summary

2.1   Definitions

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in
   this document are to be interpreted as described in [RFC2119].

2.2   Acronyms

   SAM4   SCSI Architecture Model - 4
   SAM5   SCSI Architecture Model - 5
   SAM   SAM4 or SAM5

2.3   New Semantics

   This document specifies new iSCSI semantics.   This section
   summarizes the contents of the document.

      Section 3: The mapping of iSCSI objects to SAM5 objects
                 The iSCSI node may contain both initiator and
                 target capabilities.

      Section 4: The protocol used to negotiate the use of the new
                 capabilities described in this document.

      Section 5: New Command operations
                 The PRI field for SCSI command priority has been
                 added to the SCSI command PDU (see 5.1.1).
                 The Status Qualifier field has been added to the
                 SCSI response PDU (see 5.2.1).
                 Sense data may be returned (via autosense) for any
                 SCSI status, not just CHECK CONDITION (see 5.2.2).

      Section 6: New Task Management Functions
                 Four new task management functions (QUERY TASK,
                 QUERY TASK SET, I_T NEXUS RESET, and QUERY
                 ASYNCHRONOUS EVENT have been added (see 6.2).

                    A new "function succeeded" response has been added
                    (see 6.3.1).

        Section 7: New Negotiation key
                    A new negotiation key has been added to enable the
                    use of the new features in section 5 and section 6.

3.   Terminology Mapping

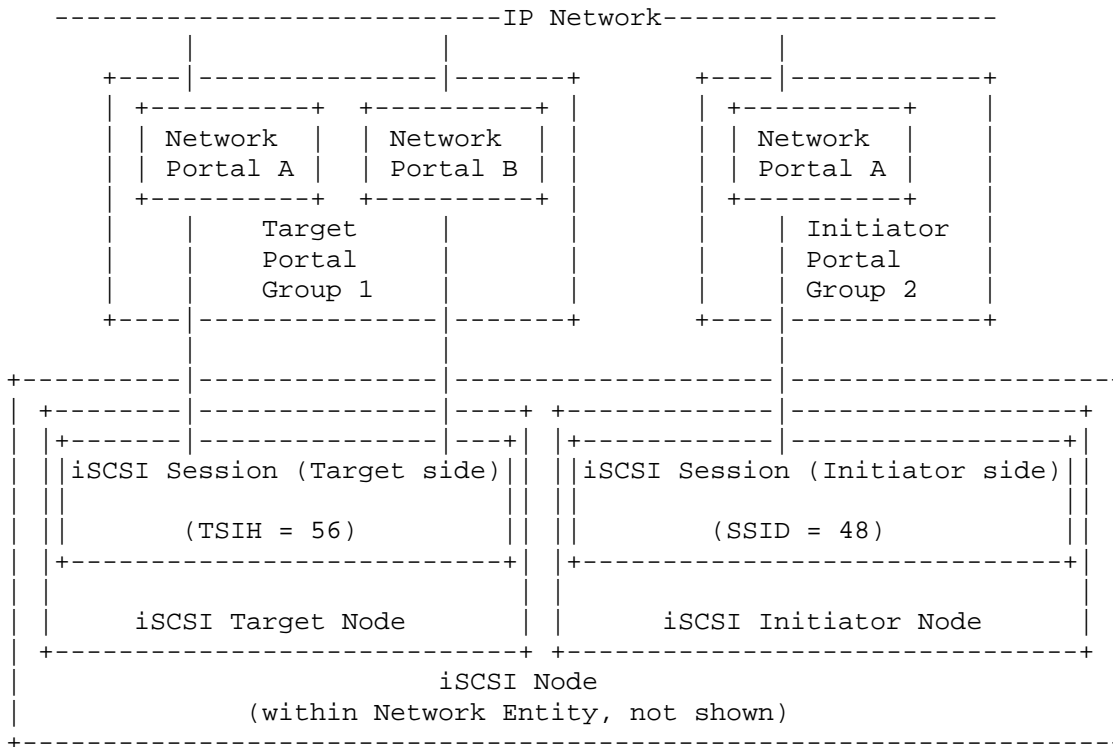   The iSCSI model (defined in [RFC3720]) uses different terminology
    than the SCSI Architecture Model. In some cases, iSCSI uses
    multiple terms to describe what in the SCSI Architecture Model is
    described with a single term. The iSCSI terms and SAM terms are
    not necessarily equivalent, but rather, the iSCSI terms represent
    examples of the objects or classes described in SAM as follows:

```
+-----------------------------+-----------------------------+
| RFCxxx Terminology          | SAM Terminology             |
+-----------------------------+-----------------------------+
| Network Entity              | none                        |
+-----------------------------+-----------------------------+
| iSCSI Node                  | SCSI Device                 |
+-----------------------------+-----------------------------+
| iSCSI Name                  | SCSI Device Name            |
+-----------------------------+-----------------------------+
| iSCSI Node Name             | SCSI Device Name            |
+-----------------------------+-----------------------------+
| iSCSI Initiator Node        | SCSI Initiator Device       |
+-----------------------------+-----------------------------+
| iSCSI Initiator Name        | SCSI Device Name            |
+-----------------------------+-----------------------------+
| iSCSI Initiator Port Name   | SCSI Initiator Port Name    |
|   iSCSI Node Name + ',i,' + |                             |
|   ISID                      |                             |
+-----------------------------+-----------------------------+
| iSCSI Target Node           | SCSI Target Device          |
+-----------------------------+-----------------------------+
| iSCSI Target Name           | SCSI Device Name            |
+-----------------------------+-----------------------------+
| iSCSI Target Port Name      | SCSI Target Port Name       |
|   iSCSI Node Name + ',t,' + |                             |
|   Target Portal Group Tag   |                             |
+-----------------------------+-----------------------------+
| iSCSI Target Portal Group   | SCSI Target Port            |
+-----------------------------+-----------------------------+
| iSCSI Initiator Node +      | SCSI Initiator Port         |
|   active ISID               |                             |
+-----------------------------+-----------------------------+
| iSCSI Initiator Name +      | I_T Nexus                   |
|   ',i,' + ISID, iSCSI Target|                             |
|   Name + ',t,' + Portal     |                             |
|   Group Tag                 |                             |
+-----------------------------+-----------------------------+
| Target Portal Group Tag     | Relative Port ID            |
+-----------------------------+-----------------------------+


   -------------------------------------------------------
   RFC EDITORS NOTE: The above reference (in row 1) to [RFCxxx]
   should reference this RFC, and this note should be removed.
   -------------------------------------------------------
```

   The following diagram shows an example of a combination target
   device and initiator device. Such a configuration may exist in a
   target device that implements a SCSI Copy Manager. This example
   shows how a session that shares Network Portals within a Portal
   Group may be established (see Target Portal Group 1). In
   addition, this example shows the Initiator using a different
   Portal Group than the Target Portal Group, but the Initiator
   Portal group sharing Network Portal A with the Target Portal
   Group.

```
       --------------------------IP Network--------------------
            |              |          |
       +----|--------------|-------+      +----|-----------+
       | +---------+  +---------+ |      | +---------+    |
       | | Network |  | Network | |      | | Network |    |
       | | Portal A|  | Portal B| |      | | Portal A|    |
       | +---------+  +---------+ |      | +---------+    |
       |      |    Target        |      |      | Initiator|
       |      |    Portal        |      |      | Portal   |
       |      |    Group 1       |      |      | Group 2  |
       +----|--------------|-------+      +----|-----------+
            |              |                   |
  +----------|--------------|-------------------|-------------------+
  | +--------|--------------|----+ +------------|----------------+ |
  | |+-------|--------------|---+| |+-----------|---------------+| |
  | ||iSCSI Session (Target side)|| ||iSCSI Session (Initiator side)|| |
  | ||                          || ||                          || |
  | ||       (TSIH = 56)        || ||       (SSID = 48)        || |
  | |+--------------------------+| |+--------------------------+| |
  | |                           | |                           | |
  | |     iSCSI Target Node     | |     iSCSI Initiator Node  | |
  | +---------------------------+ +---------------------------+ |
  |                       iSCSI Node                           |
  |               (within Network Entity, not shown)           |
  +------------------------------------------------------------+
```

4.   Negotiation of New Feature Use

   The iSCSIProtocolLevel operational text key (see 7.1.1)
   containing a value of "2" or higher MUST be negotiated to enable
   the use of features described in this RFC.

   Note that an operational value of "2" or higher for this key on
   an iSCSI session does not influence the SCSI level features in
   any way on that I_T nexus. An operational value of "2" or higher
   for this key permits the iSCSI-related features defined in this
   document to be used on all connections on this iSCSI session.
   SCSI level hand-shakes (e.g. commands, mode pages) eventually
   determine the existence or lack of various SAM features available
   for the I_T nexus between the two SCSI end points).   To
   summarize, negotiation of this key to "2" or higher is a
   necessary but not a sufficient condition of SAM-4 compliant
   feature usage at the SCSI protocol level.

   For example, an iSCSI implementation may negotiate this new key
   to "2" but respond to the new task management functions (see 6.2)
   with a "Task management function not supported" (which indicates
   a SCSI error that prevents the function from being performed).
   In contrast, if the key is negotiated to "2", an iSCSI
   implementation MUST NOT reject a task management function request
   PDU that requests one of the new task management functions (such
   a reject would report an iSCSI protocol error).

5.   SCSI Commands

5.1   SCSI Command Additions

   The format of the SCSI Command PDU is:

```
 Byte/      0         |        1         |        2         |        3         |
    /                 |                  |                  |                  |
   |0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|
    +--------------+--------------+--------------+--------------+
  0|.|I| 0x01       |F|R|W|. .|ATTR | PRI   | Reserved          |
    +--------------+--------------+--------------+--------------+
  4|TotalAHSLength | DataSegmentLength                          |
    +--------------+--------------+--------------+--------------+
  8| Logical Unit Number (LUN)                                  |
    +                                                           +
 12|                                                            |
    +--------------+--------------+--------------+--------------+
 16| Initiator Task Tag                                         |
    +--------------+--------------+--------------+--------------+
 20| Expected Data Transfer Length                              |
    +--------------+--------------+--------------+--------------+
 24| CmdSN                                                      |
    +--------------+--------------+--------------+--------------+
 28| ExpStatSN                                                  |
    +--------------+--------------+--------------+--------------+
 32/ SCSI Command Descriptor Block (CDB)                        /
  +/                                                            /
    +--------------+--------------+--------------+--------------+
 48/ AHS (Optional)                                            /
    +--------------+--------------+--------------+--------------+
  x/ Header Digest (Optional)                                  /
    +--------------+--------------+--------------+--------------+
  y/ (DataSegment, Command Data) (Optional)                    /
  +/                                                            /
    +--------------+--------------+--------------+--------------+
  z/ Data Digest (Optional)                                    /
    +--------------+--------------+--------------+--------------+
```

5.1.1 Command Priority (byte 2)

   The Command Priority (PRI) specifies the relative scheduling
   importance of this task in relation to other SIMPLE tasks already
   in the task set (see [SAM4]).

   Section 10, iSCSI PDU Formats of [RFC3720], requires that senders
   set this field to zero. A sender MUST NOT set this field to a
   value other than zero unless the iSCSIProtocolLevel text key
   defined in section 7.1.1 has been negotiated on the session with
   a value of "2" or higher.

This field MUST be ignored by iSCSI targets unless the
iSCSIProtocolLevel text key with a value of "2" or higher as
defined in section 7.1.1 was negotiated on the session.

5.2   SCSI Response Additions

The format of the SCSI Response PDU is:

```
Byte/       0        |        1        |        2        |        3        |
  /                  |                 |                 |                 |
  |0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|
  +--------------+--------------+--------------+--------------+
 0|.|.|  0x21     |1|. . .|o|u|O|U|.| Response      | Status       |
  +--------------+--------------+--------------+--------------+
 4|TotalAHSLength | DataSegmentLength                              |
  +--------------+--------------+--------------+--------------+
 8| Status Qualifier            | Reserved                         |
  +--------------+--------------+--------------+--------------+
12| Reserved                                                       |
  +--------------+--------------+--------------+--------------+
16| Initiator Task Tag                                             |
  +--------------+--------------+--------------+--------------+
20| SNACK Tag or Reserved                                         |
  +--------------+--------------+--------------+--------------+
24| StatSN                                                        |
  +--------------+--------------+--------------+--------------+
28| ExpCmdSN                                                      |
  +--------------+--------------+--------------+--------------+
32| MaxCmdSN                                                      |
  +--------------+--------------+--------------+--------------+
36| ExpDataSN or Reserved                                        |
  +--------------+--------------+--------------+--------------+
40| Bidirectional Read Residual Count or Reserved                |
  +--------------+--------------+--------------+--------------+
44| Residual Count or Reserved                                   |
  +--------------+--------------+--------------+--------------+
48| Header-Digest (Optional)                                     |
  +--------------+--------------+--------------+--------------+
  / Data Segment (Optional)                                      /
 +/                                                              /
  +--------------+--------------+--------------+--------------+
  | Data-Digest (Optional)                                      |
  +--------------+--------------+--------------+--------------+
```

5.2.1 Status Qualifier

   The Status Qualifier provides additional status information (see
   [SAM4]).

   As defined in Section 10, iSCSI PDU Formats of [RFC3720],
   compliant senders already set this field to zero. Compliant
   senders MUST NOT set this field to a value other than zero unless
   the iSCSIProtocolLevel text key with a value of "2" or higher as
   defined in section 7.1.1 was negotiated on the session.

   This field MUST be ignored by receivers unless the
   iSCSIProtocolLevel text key with a value of "2" or higher as
   defined in section 7.1.1 was negotiated on the session.

5.2.2 Data Segment – Sense and Response Data Segment

   Section 10.4.7 of [RFC3720] specifies that iSCSI targets MUST
   support and enable autosense. If Status is CHECK CONDITION
   (0x02), then the Data Segment MUST contain sense data for the
   failed command. While [RFC3720] does not make any statements
   about the state of the Data Segment when the Status is not CHECK
   CONDITION (0x02)(i.e., the Data Segment is not prohibited from
   containing sense data when the Status is not CHECK CONDITION),
   negotiation of the iSCSIProtocolLevel text key with a value of
   "2" or higher as defined in section 7.1.1 explicitly indicates
   that the Data Segment MAY contain sense data at any time, no
   matter what value is set in the Status field.

6.   Task Management Functions

6.1   Existing Task Management Functions

   Section 10.5 of [RFC3720] defines the semantics used to request
   SCSI Task Management Functions be performed. The following task
   management functions are defined:

      1 – ABORT TASK
      2 – ABORT TASK SET
      3 – CLEAR ACA
      4 – CLEAR TASK SET
      5 – LOGICAL UNIT RESET
      6 – TARGET WARM RESET
      7 – TARGET COLD RESET
      8 – TASK REASSIGN

6.2   Task Management Function Additions

   Additional task Management function codes are listed below. For
   a more detailed description of SCSI task management, see [SAM5].

9 - QUERY TASK - determines if the task identified by the
Referenced Task Tag field is present in the task set.

10 - QUERY TASK SET - determine if any task is present in the
task set.

11 - I_T NEXUS RESET - perform an I_T nexus loss function for
the I_T nexus of each logical unit accessible through the I_T
Nexus on which the task management function was received.

12 - QUERY ASYNCHRONOUS EVENT - determine if there is a unit
attention condition or a deferred error pending for the I_T_L
nexus on which the task management function was received.

These task management function requests MUST NOT be sent unless
the iSCSIProtocolLevel text key with a value of "2" or higher as
defined in section 7.1.1 was negotiated on the session.

Any compliant initiator that sends any of the new task management
functions defined in this section MUST also support all new task
management function responses (see 6.3.1).

For all of the task management functions detailed in this
section, the Task Management function response MUST be returned
as detailed in section 6.3 Task Management Function Response.

The iSCSI target MUST ensure that no responses for the tasks
covered by a task management function are sent to the iSCSI
initiator after the Task Management response except for a task
covered by a TASK REASSIGN, QUERY TASK, or QUERY TASK SET.

If a QUERY TASK is issued for a task created by an immediate
command then RefCmdSN MUST be that of the Task Management request
itself (i.e., CmdSN and RefCmdSN are equal); otherwise RefCmdSN
MUST be set to the CmdSN of the task to be queried (lower than
CmdSN).

At the target a QUERY TASK function MUST NOT be executed on a
Task Management request; such a request MUST result in Task
Management response of "Function rejected".

For the I_T NEXUS RESET function, the target device MUST respond
to the function as defined in [SAM4]. Each logical unit
accessible via the receiving I_T NEXUS MUST behave as dictated by
the I_T nexus loss function in [SAM4] for the I_T nexus on which
the task management function was received. The target device
MUST drop all connections in the session over which this function
is recevied. Independent of the DefaultTime2Wait and
DefaultTime2Retain value applicable to the session over which
this function is received, the target device MUST consider each
participating connection in the session to have immediately timed
out, leading to FREE state. The resulting timeouts cause the

   session timeout event defined in [RFC3720], which in turn
   triggers the I_T nexus loss notification to the SCSI layer as
   described in [RFC3720].

6.2.1 LUN field

   This field is required for functions that address a specific LU
   (i.e., ABORT TASK, CLEAR TASK SET, ABORT TASK SET, CLEAR ACA,
   LOGICAL UNIT RESET, QUERY TASK, QUERY TASK SET, and QUERY
   ASYNCHRONOUS EVENT) and is reserved in all others.

6.2.2 Referenced Task Tag

   The Initiator Task Tag of the task to be aborted for the ABORT
   TASK function, reassigned for the TASK REASSIGN function, or
   queried for the QUERY TASK function. For all other functions
   this field MUST be set to the reserved value 0xffffffff.

6.2.3 RefCmdSN

   If a QUERY TASK is issued for a task created by an immediate
   command then RefCmdSN MUST be that of the Task Management request
   itself (i.e., CmdSN and RefCmdSN are equal).

   For a QUERY TASK of a task created by non-immediate command
   RefCmdSN MUST be set to the CmdSN of the task identified by the
   Referenced Task Tag field. Targets must use this field as
   described in section 10.6.1 of [RFC3720] when the task identified
   by the Referenced Task Tag field is not in the task set.

6.3   Task Management Function Responses

```
  Byte/      0         |        1        |        2        |        3         |
    /        |         |                 |                 |                  |
   |0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|0 1 2 3 4 5 6 7|
   +--------------+--------------+--------------+--------------+
 0|.|.| 0x22      |1| Reserved   | Response     | Reserved     |
   +--------------+--------------+--------------+--------------+
 4|TotalAHSLength | DataSegmentLength                          |
   +--------------+--------------+--------------+--------------+
 8| Additional Response Information              | Reserved     |
   +--------------+--------------+--------------+--------------+
12| Reserved                                                    |
   +--------------+--------------+--------------+--------------+
16| Initiator Task Tag                                          |
   +--------------+--------------+--------------+--------------+
20| Reserved                                                    |
   +--------------+--------------+--------------+--------------+
24| StatSN                                                      |
   +--------------+--------------+--------------+--------------+
28| ExpCmdSN                                                    |
   +--------------+--------------+--------------+--------------+
32| MaxCmdSN                                                    |
   +--------------+--------------+--------------+--------------+
36/ Reserved                                                    /
 +/                                                             /
   +--------------+--------------+--------------+--------------+
48| Header-Digest (Optional)                                    |
   +--------------+--------------+--------------+--------------+
```

   Section 10.6 of [RFC3720] defines the semantics used for
   responses to SCSI Task Management Functions. The following
   responses are defined in [RFC3720]:

      0 - Function Complete.
      1 - Task does not exist.
      2 - LUN does not exist.
      3 - Task still allegiant.
      4 - Task allegiance reassignment not supported.
      5 - Task management function not supported.
      6 - Function authorization failed.
      255 - Function rejected.

   Responses to new task management functions (see 6.3.1) are listed
   below. In addition, a new task Management response is listed
   below. For a more detailed description of SCSI task management
   responses, see [SAM5].

   For the functions QUERY TASK, QUERY TASK SET, I_T NEXUS RESET,
   and QUERY ASYNCHRONOUS EVENT, the target performs the requested
   Task Management function and sends a Task Management response
   back to the initiator.

6.3.1 Task Management Function Response Additions

   The new response is listed below:

      7 - Function succeeded.

   In symbolic terms Response value 7 maps to the SCSI service
   response of FUNCTION SUCCEEDED.

   The task management function response of function succeeded MUST
   be supported by an initiator that sends any of the new task
   management functions (see 6.2).

   For the QUERY TASK function, if the specified task is in the task
   set, then the target returns a Response value of Function
   succeeded and additional response information is returned as
   specified in [SAM5]. If the specified task is not in the task
   set, then the target returns a Response value of Function
   complete.

   For the QUERY TASK SET function, if there is any command present
   in the task set from the specified I_T_L nexus, then the target
   returns a Response value of Function succeeded. If there are no
   commands present in the task set from the specified I_T_L nexus,
   then the target returns a Response value of Function complete.

   For the I_T NEXUS RESET function, after completion of the events
   described in section 6.2 for this function, the target returns a
   Response value of Function complete. However, because the target
   drops all connections, the Service Response (defined by [SAM4])
   for this SCSI task management function may not be reliably
   delivered to the issuing initiator port.

   For the QUERY ASYNCHRONOUS EVENT, if there is a unit attention
   condition or deferred error pending for the specified I_T_L
   nexus, then the target returns a Response value of Function
   succeeded and additional response information is returned as
   specified in [SAM5]. If there is no unit attention or deferred
   error pending for the specified I_T_L nexus then the target
   returns a Response value of Function complete.

6.4   Task Management Requests Affecting Multiple Tasks

   Section 4.1 of [RFC5048] defines the notion of "affected tasks"
   in multi-task abort scenarios. This section adds to the list
   include in that section by defining the tasks affected by the I_T
   NEXUS RESET function.

      I_T NEXUS RESET: All outstanding tasks received on the I_T
         nexus on which the function request was received for all
         logical units accessible to the I_T nexus.

Section 4.1.2 of [RFC5048] and section 4.1.3 of [RFC5048]
identify semantics for task management functions that involve
multi-task abort operations. If an iSCSI implementation supports
the I_T NEXUS RESET function, it MUST also support the protocol
behavior as defined in those sections and follow the sequence of
actions as described in those sections when processing the I_T
NEXUS RESET function.

7.   Login/Text Operational Text Keys

7.1   New Operational Text Keys

7.1.1 iSCSIProtocolLevel

   Use: LO
   Irrelevant when: SessionType = Discovery
   Senders: Initiator and Target
   Scope: SW

   iSCSIProtocolLevel=<numerical-value-from-0-to-65535>

   Default is 1.
   Result function is Minimum.

   This key is used to negotiate the use of iSCSI features that
   require different levels of protocol support for proper
   operation. This key is negotiated on the iSCSI session once the
   session is in full feature phase.

   Negotiation of the iSCSIProtocolLevel key to a value claimed by
   an RFC indicates that both negotiating parties are compliant to
   the RFC in question, and agree to support the corresponding
   semantics on that iSCSI session. An operational value of iSCSI
   ProtocolLevel = "x" on an iSCSI session requires that the iSCSI
   protocol semantics on that iSCSI session be a logical superset of
   the capabilities in all RFCs that have claimed values of an
   iSCSIProtocolLevel less than "x".

   An iSCSIProtocolLevel key negotiated to "2" or higher is required
   to enable use of features defined in this RFC.

   An iSCSIProtocolLevel key negotiated to "0" indicates that the
   implementation does not claim a specific iSCSI protocol level.

   If the negotiation answer is ignored by the acceptor, or the
   answer from the remote iSCSI end point is key=NotUnderstood, then
   the features defined in this RFC, and the features defined in any
   RFC requiring a key value greater than "2" MUST NOT be used.

8.   Security Considerations

   At the time of writing this document does not introduce any new
   security considerations other than those described in [RFC3720].
   Consequently, all the iSCSI-related security text in [RFC3723] is
   also directly applicable to this document.

9.   IANA Considerations

   This document modifies or creates a number of iSCSI-related
   registries. The following iSCSI-related registries are modified:

   1. iSCSI Task Management Functions Codes

      Name of the existing registry: "iSCSI TMF Codes"

      Additional entries:

      9, QUERY TASK, [RFCxxx]

      10, QUERY TASK SET, [RFCxxx]

      11, I_T NEXUS RESET, [RFCxxx]

      12, QUERY ASYNCHRONOUS EVENT, [RFCxxx]

      RFC EDITORS NOTE: The above reference to [RFCxxx] should
      reference this RFC, and this note should be removed.
      ----

   2. iSCSI Login/Text Keys

      Name of the existing registry: "iSCSI Text Keys"

      Fields to record in the registry: Assigned value and its
      associated RFC reference:

      iSCSIProtocolLevel,[RFCxxx]

      RFC EDITORS NOTE: The above references to [RFCxxx] should
      reference this RFC, and this note should be removed.

   This document creates the following iSCSI-related registries for
   IANA to manage.

   3. iSCSI Protocol Level

      Name of new registry: "iSCSI Protocol Level"

      Namespace details: Numerical values from 0 to 65535

Information that must be provided to assign a new value: An
IESG-approved specification defining the semantics and
interoperability requirements of the proposed new value and
the fields to be recorded in the registry.

Assignment policy:

If the requested value is not already assigned, it may be
assigned to the requester.

1 and 3-65535: range reserved by IANA for assignment in this
registry.

Fields to record in the registry: Assigned value, and its
associated RFC reference.

0, [RFCxxx]

2, [RFCxxx]

RFC EDITORS NOTE: The above references to [RFCxxx] should
reference this RFC, and this note should be removed.

Allocation Policy:

Standards Action ([IANA])

4. iSCSI Task Management Response Codes

Name of new registry: "iSCSI TMF Response Codes"

Namespace details: Numerical values that can fit in 8 bits.

Information that must be provided to assign a new value: An
IESG-approved specification defining the semantics and
interoperability requirements of the proposed new value and
the fields to be recorded in the registry.

Assignment policy:

If the requested value is not already assigned, it may be
assigned to the requester.

8-254: Range reserved by iANA for assignment in this registry.

Fields to record in the registry: Assigned value, Operation
Name, and its associated RFC reference.

0x0, Function complete, [RFC3720]

        0x1, Task does not exist, [RFC3720]

        0x2, LUN does not exist, [RFC3720]

        0x3, Task still allegiant, [RFC3720]

        0x4, Task allegiance reassignment not supported, [RFC3720]

        0x5, Task management function not supported, [RFC3720]

        0x6, Function authorization failed, [RFC3720]

        0x7, Function succeeded, [RFCxxx]

        255, Function rejected, [RFC3720]

        RFC EDITORS NOTE: The above reference to [RFCxxx] should
        reference this RFC, and this note should be removed.

        Allocation Policy:

        Standards Action ([IANA])

10.   References

10.1 Normative References

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   [SAM4]   ISO/IEC 14776-414, SCSI Architecture Model - 4 (SAM-
                4).

   [SAM5]   T10/2104D rev r05, SCSI Architecture Model – 5 (SAM-
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10.2 Additional Reference Sources

   For more information on the SCSI Architecture Model, contact the
   T10 group at http://www.t10.org.

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      RFC EDITORS NOTE: The above reference to [RFCxxx] should
      reference this RFC, and this note should be removed.

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