Revision 0: original version, discussed at July 19-20 SRP working group meeting in Colorado Springs.

Revision 1: incorporates changes from July 19-20 SRP working group meeting.

5.1 Overview of SRP operation

5.1.1 RDMA channel establishment and login

SRP initiator ports login with SRP target ports when a new RDMA channel is established for use with SRP. The login process associates an RDMA channel with a specific SRP initiator port and SRP target port (i.e. an I_T nexus) and negotiates parameters that govern the use of that RDMA channel for its lifetime.

SRP initiator ports and SRP target ports shall be determined by their role during RDMA channel establishment. An entity that requests RDMA channel establishment as a client consumer (see 4.2) shall be an SRP initiator port. An entity that accepts RDMA channel establishment as a server consumer (see 4.2) shall be an SRP target port.

Login occurs during RDMA channel establishment. An SRP initiator port shall provide an SRP_LOGIN_REQ request (see 6.2) as the login data when establishing a new RDMA channel. If an SRP target port accepts a new RDMA channel it shall provide an SRP_LOGIN_RSP response as the accept data. If an SRP target port does not accept a new RDMA channel it shall provide an SRP_LOGIN_REJ response as the reject data parameter when rejecting the new RDMA channel.

The SRP_LOGIN_REQ request contains an SRP initiator port identifier and an SRP target port identifier. An SRP target port shall not accept a new RDMA channel unless its target port identifier matches the value in the SRP_LOGIN_REQ request. If an SRP target port accepts a new RDMA channel, it shall treat all communication on that channel as being with the initiator port identifier specified in the SRP_LOGIN_REQ request.

It is the SRP initiator port's responsibility to specify a server address that directs RDMA channel establishment to a server where the specified SRP target port may be accessed (see 6.2). It is the server agent's responsibiliy to direct RDMA channel establishment to a server consumer that is the specified SRP target port. Addtional information on locating a server consumer matching a specified SRP target port identifier may be found in Annex C for SRP initiator ports and SRP target ports that use Infiniband™.

5.1.2 RDMA channel disconnection

Prior to requesting that an RDMA channel be disconnected, an SRP initiator port may send an SRP_I_LOGOUT request to notify the SRP target port of the disconnection (see 6.5).

After requesting that an RDMA channel be disconnected or after being notified that an RDMA channel has been disconnected, an SRP initiator port shall:

   a) Discard any SRP target request that is outstanding on that RDMA channel, without returning a response;
   b) Not send any further messages on that RDMA channel;
   c) Discard any subsequent messages received on that RDMA channel; and
   d) For any outstanding SCSI tasks that were contained in SRP_CMD requests sent on that RDMA channel, indicate to the application client that the task as terminated with a service delivery system failure.

Prior to requesting that an RDMA channel be disconnected, an SRP target port should send an SRP_T_LOGOUT request to notify the SRP initiator port of the disconnection (see 6.6).

After requesting that an RDMA channel be disconnected or after being notified that an RDMA channel has been disconnected, an SRP target port shall:

    a) Abort all outstanding SCSI tasks that were contained in SRP_CMD requests received on that RDMA channel, without returning a response;

    b) Discard any other SRP initiator requests that are outstanding on that RDMA channel, without returning a response;

    c) Not send any further messages on that RDMA channel; and

    d) Discard any subsequent messages received on that RDMA channel.

5.1.3   Single RDMA channel operation

An SRP initiator port may specify single RDMA channel operation during login. If an SRP target port accepts such a login, it shall:

    a) Attempt to send an SRP_T_LOGOUT request on any established RDMA channel that specified the same SRP initiator port identifier. The reason code shall indicate that the channel was disconnected due to a MULTI-CHANNEL ACTION code in a new SRP_LOGIN_REQ;

    b) Request disconnection of any established RDMA channel that specified the same SRP initiator port identifier (see 5.1.2); and

    c) Reject any other RDMA channel establishment requests it has received that specified the same SRP initiator port identifier and that the SRP target port has not yet accepted.

Following acceptance of a login specifying single RDMA channel operation that single RDMA channel shall be used for all communication between the specified SRP initiator port and SRP target port. Subsequent logins specifying other modes of operation, if accepted, may allow communication using multiple RDMA channels.

5.1.4   Multiple independent RDMA channel operation

An SRP initiator port may specify multiple independent RDMA channel operation during login. An SRP target port shall not accept such a login if doing so would require disconnecting an established RDMA channel with the same SRP initiator port.

Following acceptance of a login specifying multiple independent RDMA channel operation one or more RDMA channels may be used for communication between the same SRP initiator port and the same SRP target port. All such channels are associated with the single I_T nexus defined by the SRP initiator port identifoer and the SRP target port identifier.

When multiple independent RDMA channels are used operation of each SRP request is confined to a single RDMA channel. The sender of an SRP request chooses an RDMA channel to use for sending the SRP request. The sender of an SRP response shall use the same RDMA channel as the SRP request for sending the SRP response. All RDMA operations associated with the SRP request shall also use the same RDMA channel as the SRP request.

While each SRP request is confined to a single RDMA channel, SCSI tasks and task management functions may be conveyed on independent RDMA channels associated with the same I_T nexus. SCSI tasks and task management functions may interact as specified by SAM-2, SPC-2 and other SCSI command standards. E.g. a SCSI task sent on one RDMA channel may be aborted by an ABORT TASK sent on a different RDMA channel associated with the same I_T nexus, and reservations obtained or released on any RDMA channel apply to SCSI tasks sent on all RDMA channels that are associated with the same I_T nexus.

An RDMA communication service may or may not provide any ordering relationship between SRP requests, SRP responses and RDMA operations that use different RDMA channels. If ordering is important for a sequence of SRP requests, they should be sent using the same RDMA channel.