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To: T10 Committee Membership

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Subject: SRP Operation Overview

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

## 4.1 Overview of SRP operation

## 4.1.1 RDMA channel establishment and login

SRP initiators login with SRP targets 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\_T nexus) and negotiates paramters that govern the use of that RDMA channel for its lifetime.

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

Login occurs during RDMA channel establishment. An SRP initiator port shall provide an SRP\_LOGIN\_REQ request as the **Login Data** parameter 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** parameter when accepting the new RDMA channel. 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 as well as other information. 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 initiator's responsibility to direct RDMA channel establishment to a **Server Address** where the specified SRP target port may be accessed. It is the server agent's responsibility to direct RDMA channel establishment to a server consumer that is the specified SRP target port. See x.x. Additional information on locating a server consumer matching a specified SRP target port identifier may be found in the annex describing the use of SRP on a specific RDMA communication service.

## 4.1.2 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) Abort all outstanding SRP requests (including all outstanding SCSI commands) on any RDMA channel that specified the same SRP initiator port identifier;
- b) Attempt to send an SRP\_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;
- c) Disconnect any established RDMA channel that specified the same SRP initiator port identifier; and
- d) Reject any previously received RDMA channel establishment requests that specified the same SRP initiator port identifier and that the SRP target port has not yet accepted.
  - EDITOR'S NOTE 1 Do we need to specify any ordering among these actions? In particular, is it important that the target abort outstanding commands before accepting the new channel?

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Following acceptance of a login specifying single RDMA channel operation a single RDMA channel is used for all communication between the SRP initiator port and the SRP target port (the I\_T nexus). Subsequent logins specifying other modes of operation, if accepted, may allow communication using multiple RDMA channels.

EDITOR'S NOTE 2 - Should there be a description here of how commands work? E.g. messages for request and response with RDMA data transfers in the middle? A statement that operation on a single channel is well ordered.

## 4.1.3 Multiple independent RDMA channel operation

An SRP initiator port may specify multiple independent RDMA channel operation during login. Acceptance of such a login by an SRP target may or may not affect any established RDMA channel.

NOTE 1 - The intended behavior is that acceptance of such a login has no affect on established RDMA channels. However, target resource limitations may lead to some affect.

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 (the same I T nexus).

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 may choose an RDMA channel to use when sending the SRP request. The sender of an SRP response shall use the same RDMA channel as the SRP request when sending the SRP response. All RDMA operations associated with the SRP 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 by those requests on RDMA channels associated with the same I\_T nexus. Such tasks and task management functions may interact as specified by SAM-2, SPC-2 and other SCSI command standards. For example, a SCSI task sent on one RDMA channel may be aborted by an ABORT TASK sent on a different RDMA channel. Reservations obtained or released on any RDMA channel apply to SCSI tasks sent on all RDMA channels that specified the same SRP initiator port identifier and SRP target port identifier during login.

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 request, they should be sent using the same RDMA channel.