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To: T10 Committee Membership  
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Subject: SRP Buffer Descriptor Formats

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At present SRP defines two buffer descriptor formats, direct and indirect. Both are specifically designed to work with Infiniband™ and VI, and perform data transfers on the same RDMA channel used to transfer commands and status.

However, if a proposal such as 01-085r1 were adopted, we would need additional information to perform a data transfer, specifically some identification of the RDMA data channel(s) to use for data transfer. There is ongoing discussion whether a scatter/gather data transfer should be obliged to use a single RDMA channel group for all segments of the data transfer or might be allowed to use a separate RDMA channel group for each segment. I believe there are sound arguments in favor of both modes of operation.

Another issue, discussed at the June 19-20 SRP working group, is that the current buffer descriptor formats are designed to work with Infiniband™ and VI. We do not know the requirements of other transport protocols that might be used in the future. They might require differently formatted buffer descriptors or multiple formats of buffer descriptor.

This proposal is that we restructure the current fields that define buffer descriptor formats to allow more than two formats. Our current two formats (direct and indirect) will be defined, all others will be reserved.

A future multi-channel data transfer proposal would define one or more additional buffer descriptor formats. One benefit is that we do not need to add reserved fields to SRP\_CMD as proposed by 01-085r2, since any additional fields can be defined as part of the new buffer descriptor format. In particular this eliminates any risk that the size of any reserved fields we add now might turn out to be wrong for the final proposal.

Similarly, if some future transport might need a differently sized buffer descriptor, we could address it at the time the issue arises by defining a different buffer descriptor format.

Proposal specifics.

At present buffer descriptors are defined by a one bit indirect flag and an eight bit count field. The indirect flag indicates whether the buffer descriptor is direct or indirect. The count field indicates the number of 16-byte memory descriptors present in the buffer descriptor.

These would be replaced by a buffer format code and a size field. I propose that the buffer format code be four bits and the size field be eight bits. The minimum size is probably two bits for the format code and four bits for the size field. Combining the two fields into a single field (e.g. eight bits) is also practical.

The size field will indicate the length of the buffer descriptor in 4-byte units. Permissible combinations of the format code and size fields would be:

Format=0, size=0: no buffer descriptor present.

Format=0, size=2: direct buffer descriptor present.

Format=1, size=m\*4+5: indirect buffer descriptor present containing m cached memory descriptors.

All other combinations would be reserved.

SRP\_CMD byte 1 currently contains DOIND in bit 7 and DIIND in bit 6. It would be changed to contain DOFMT in bits 7-4 and DIFMT in bits 3-0.

SRP\_CMD byte 2 currently contains DOCOUNT. It would be changed to DOSIZE.

SRP\_CMD byte 3 currently contains DICOUNT. It would be changed to DISIZE.

The INDREQ bit in SRP\_LOGIN and the INDSUP bit in SRP\_LOGIN\_RSP would be renamed and expanded to sixteen bit fields, containing a bit mask of the buffer format codes requested and supported on the channel.