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Subject: Transmitting a DONE primitive to close an SAS connection

Introduction

The wording in the latest revision of the SAS draft describing when a DONE should be transmitted strongly suggests that an SAS device should send a DONE primitive when it has no frames to send. However, this could result in one device that was opened by a second device sending a DONE before the second device had an opportunity to issue a request to the first device that would require a frame to be transmitted by the first device. In this case, the first device would have to wait until a new connection was established before it could respond to the request from the second device.

We propose that the standard specifically allow devices opened by other devices to wait for the opening device to issue a DONE before issuing its DONE. This allows for the "opened" device to respond to a request in the same connection. The intent of this is that the "opened" device will not wait an inordinate amount of time after receiving a DONE before sending its DONE, but will quickly determine if it can immediately respond to the request. The intent is this determination should take less time than the time required to close and then reopen a connection.

In the above scenario, the draft had no hard requirement for either device to send a DONE. This could result in a deadlock. This proposal clarifies that issue.

The following are the changes in SAS-r00a required to implement this proposal.

7.13.5 Preparing to close an SSP connection

DONE is exchanged prior to closing an SSP connection. When ~~it~~ an SSP device that originated a connection has no frames to send ~~on its own, an SSP device~~, it ~~should~~ shall send a DONE. When an SSP device that did not originate a connection has no frames to send, it may wait for a vendor-specific period of time before sending a DONE. This allows for the device to respond with frames to requests from the device that opened the connection. ~~This~~ Transmission of a DONE signals that ~~it~~ a device will originate no more frames during this connection. However, ~~it~~ a device may send ACK, NAK, and RRDY after sending DONE if the other device is still sending frames on the back channel.
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