To: T10 Technical Committee
From: Jim Jones, Quantum (jim.jones@quantum.com) and Rob Elliott, HP (elliott@hp.com)
Date: 25 June 2003
Subject: T10/03-229r0 SAS-1.1 Transport Layer Retries ladder diagrams

Revision History
Revision 0 (25 June 2003) first revision

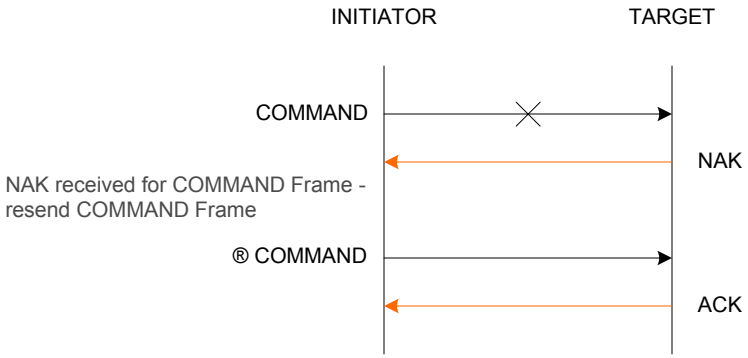
Related Documents
sas-r04 - Serial Attached SCSI revision 4
03-186r1 - SAS-1.1 Transport Layer Retries

Overview
This presents ladder diagrams for all the error recovery cases in 03-186.

Conventions:
® DATA means resend the DATA frame
For certain frame types, the RETRANSMIT bit is set to 1 when retransmitting.

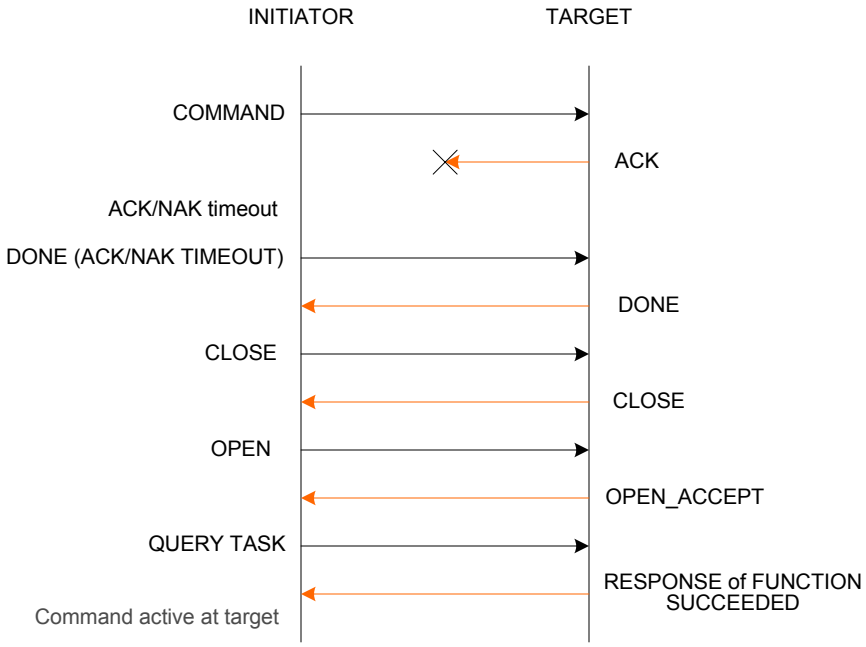
COMMAND Frame NAK Received

Same as in SAS-1

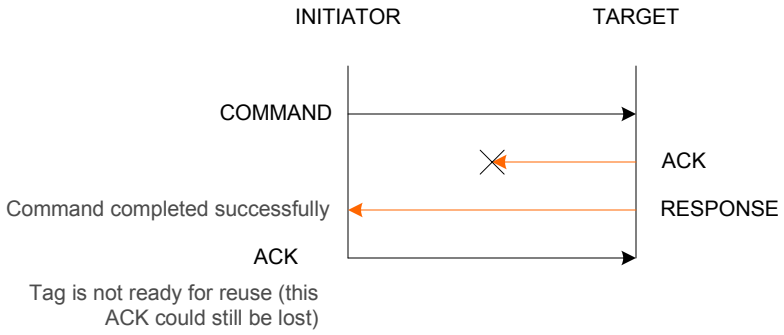


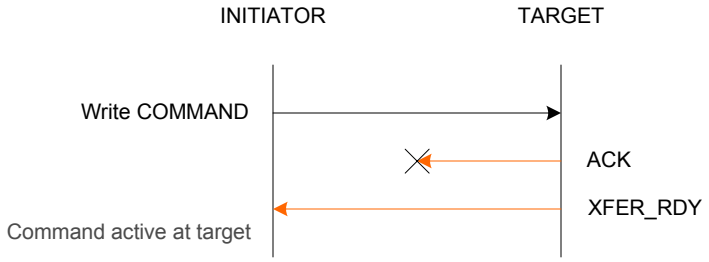
COMMAND Frame ACK lost (command running, but target hasn't sent a frame yet)

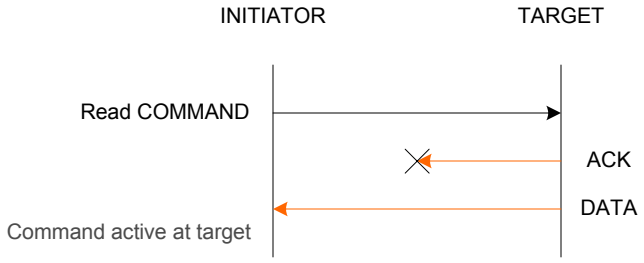
Same as in SAS-1



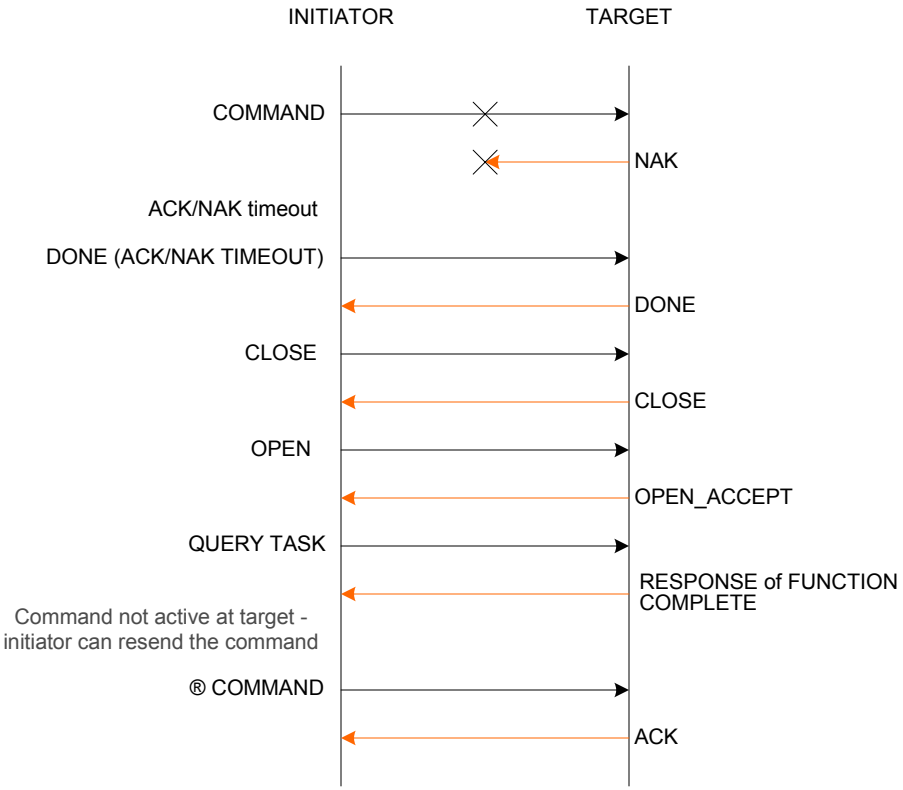
Command Frame ACK Lost, target processes command returning RESPONSE, XFER_RDY, or DATA



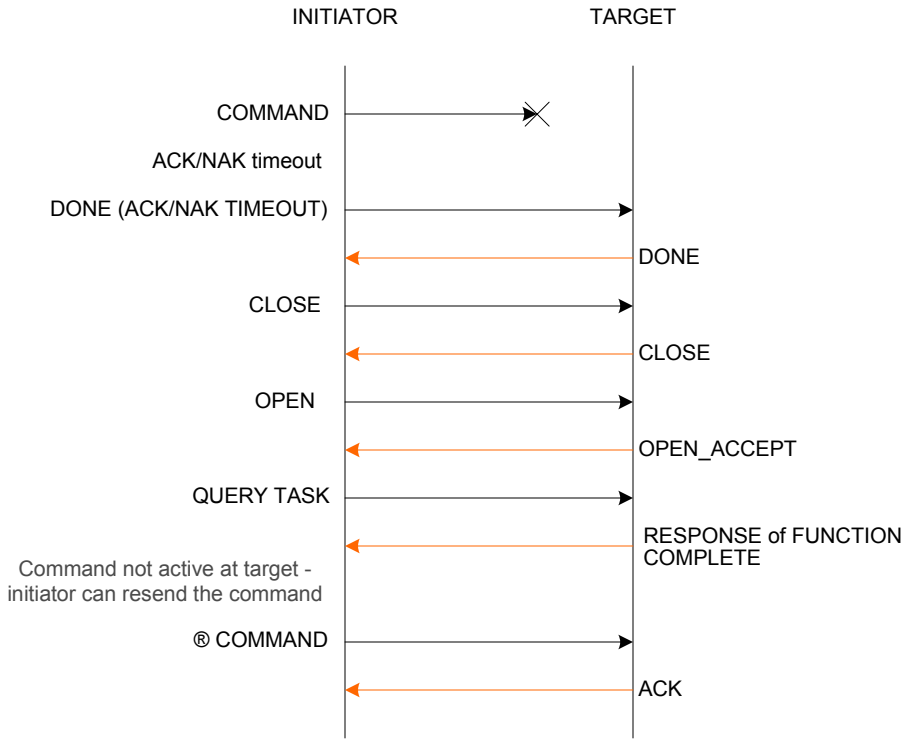




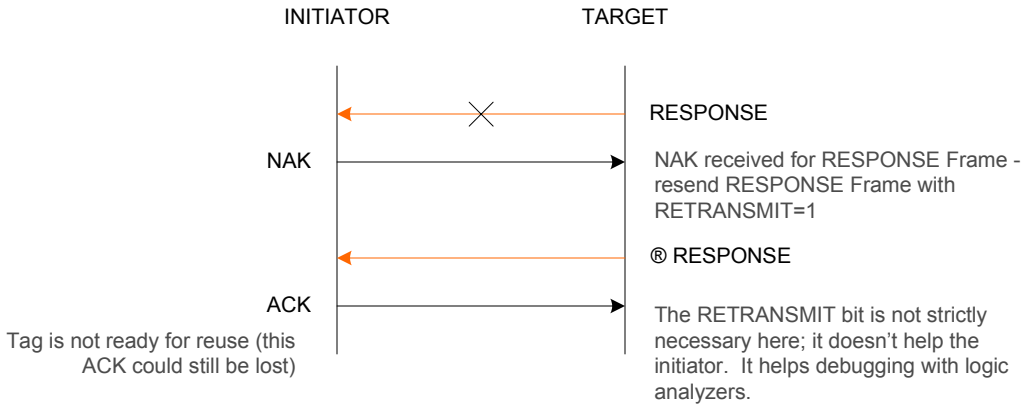
COMMAND Frame NAK Lost (command not running)



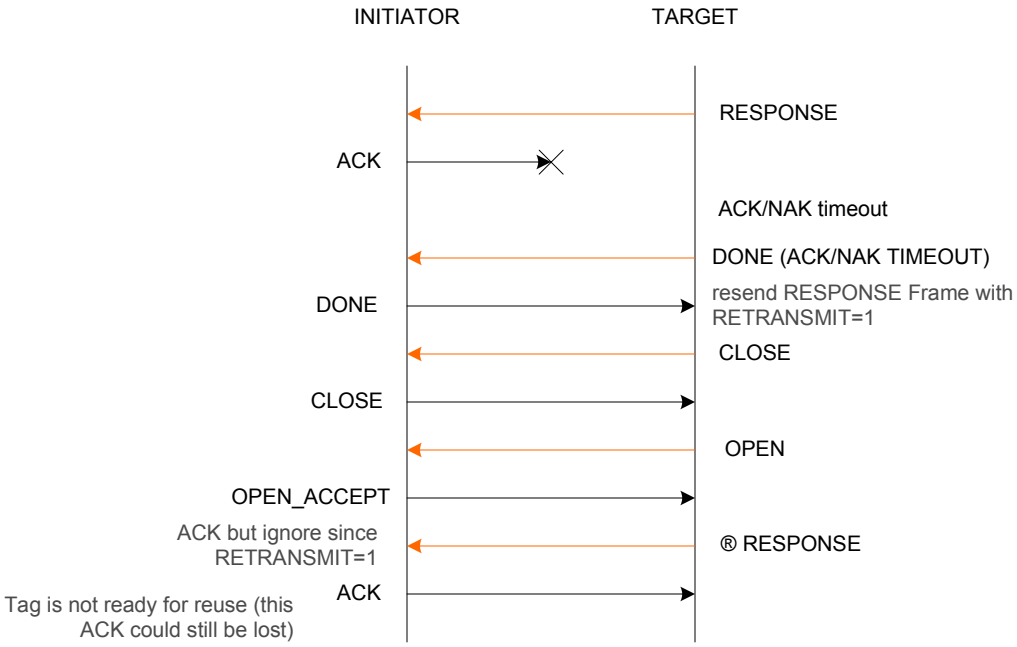
COMMAND Frame Not Delivered



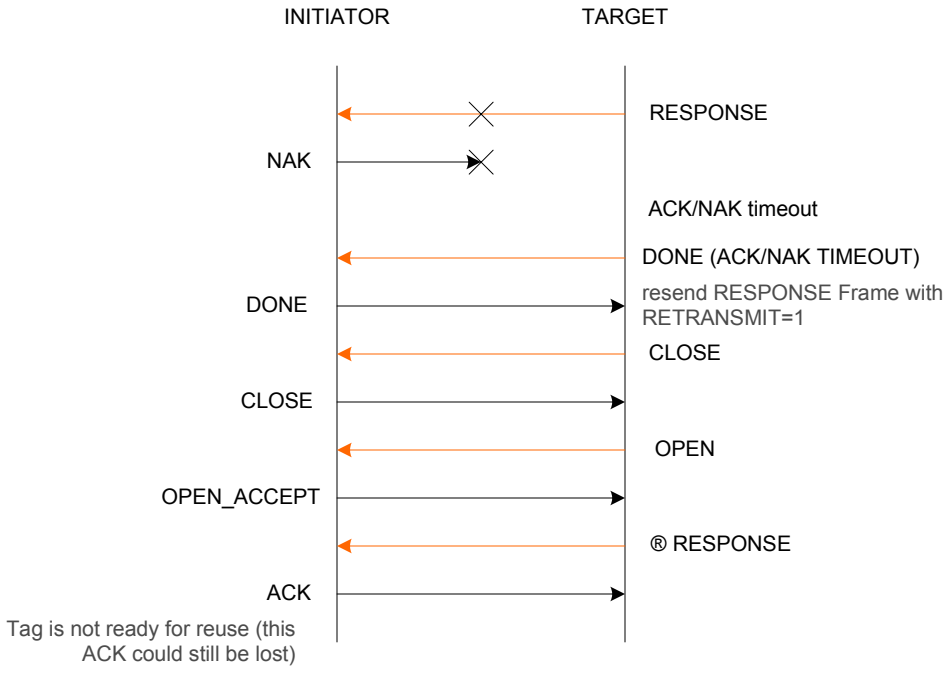
RESPONSE Frame NAK Received



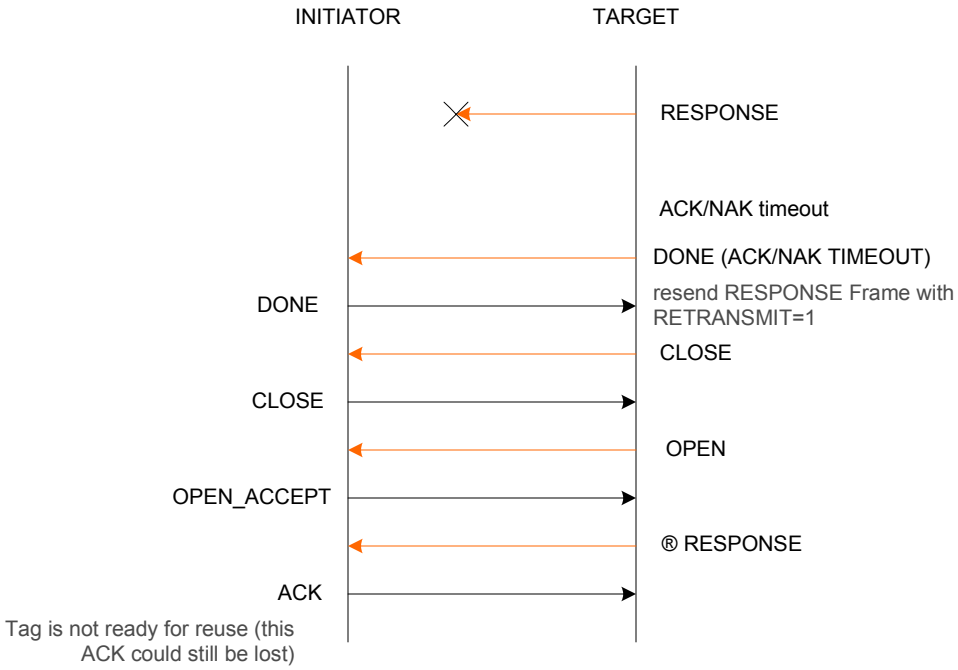
RESPONSE Frame ACK Lost



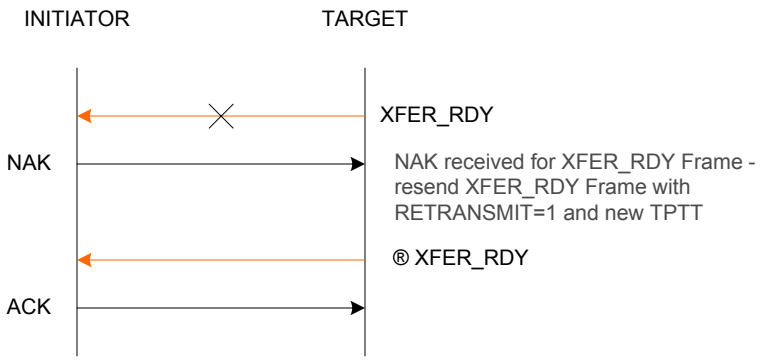
RESPONSE Frame NAK Lost



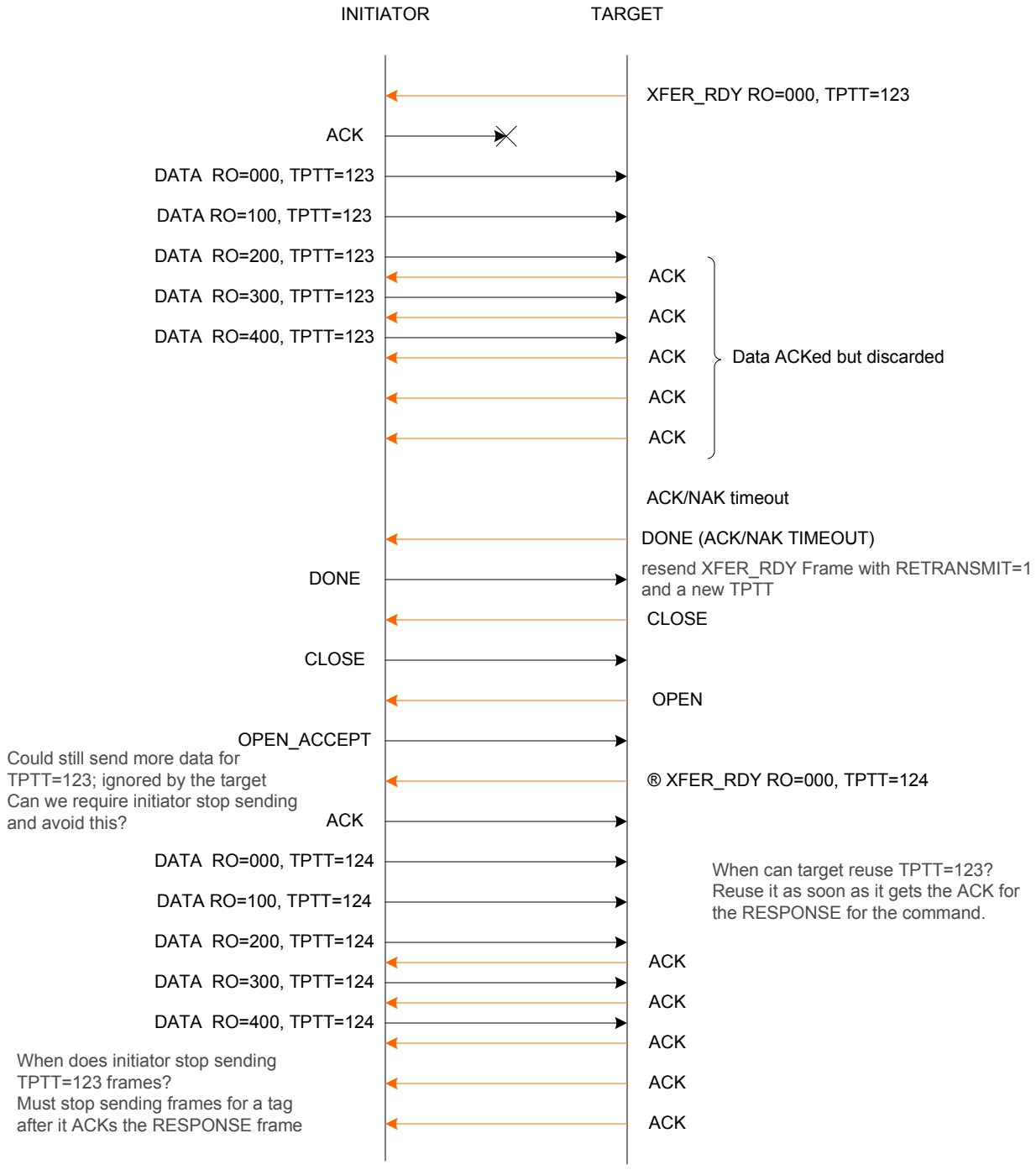
RESPONSE Frame Not Delivered



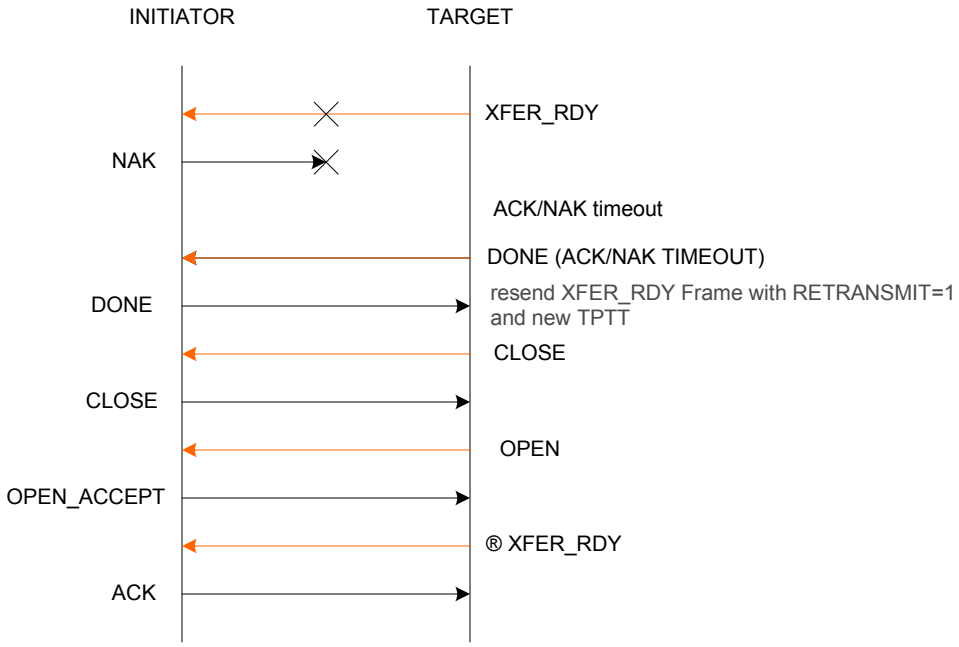
XFER_RDY Frame NAK Received
SAS-1.0: target aborts command



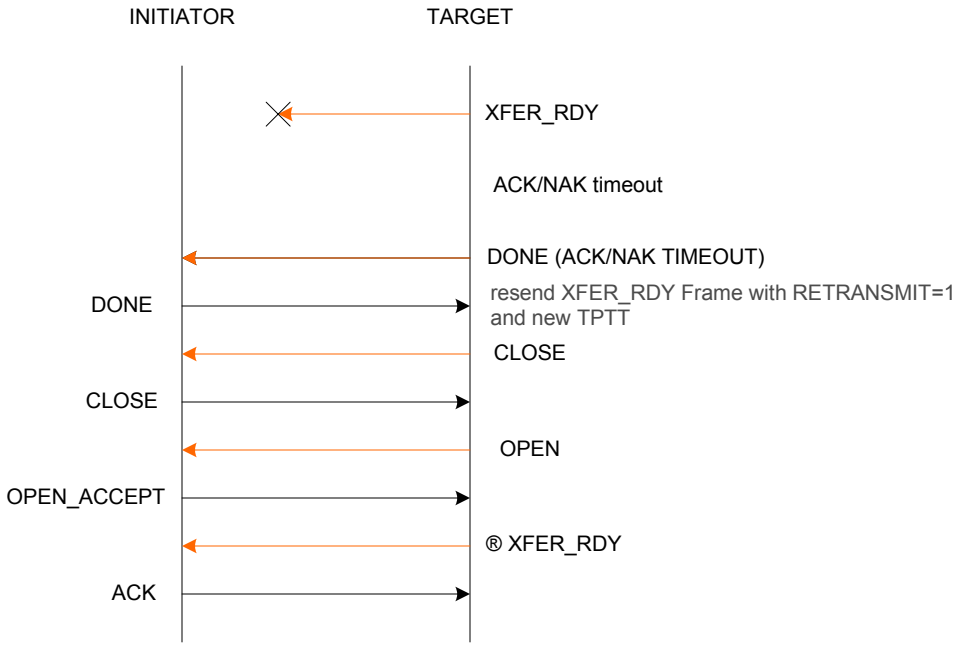
XFER_RDY Frame ACK Lost
SAS-1.0: target aborts command



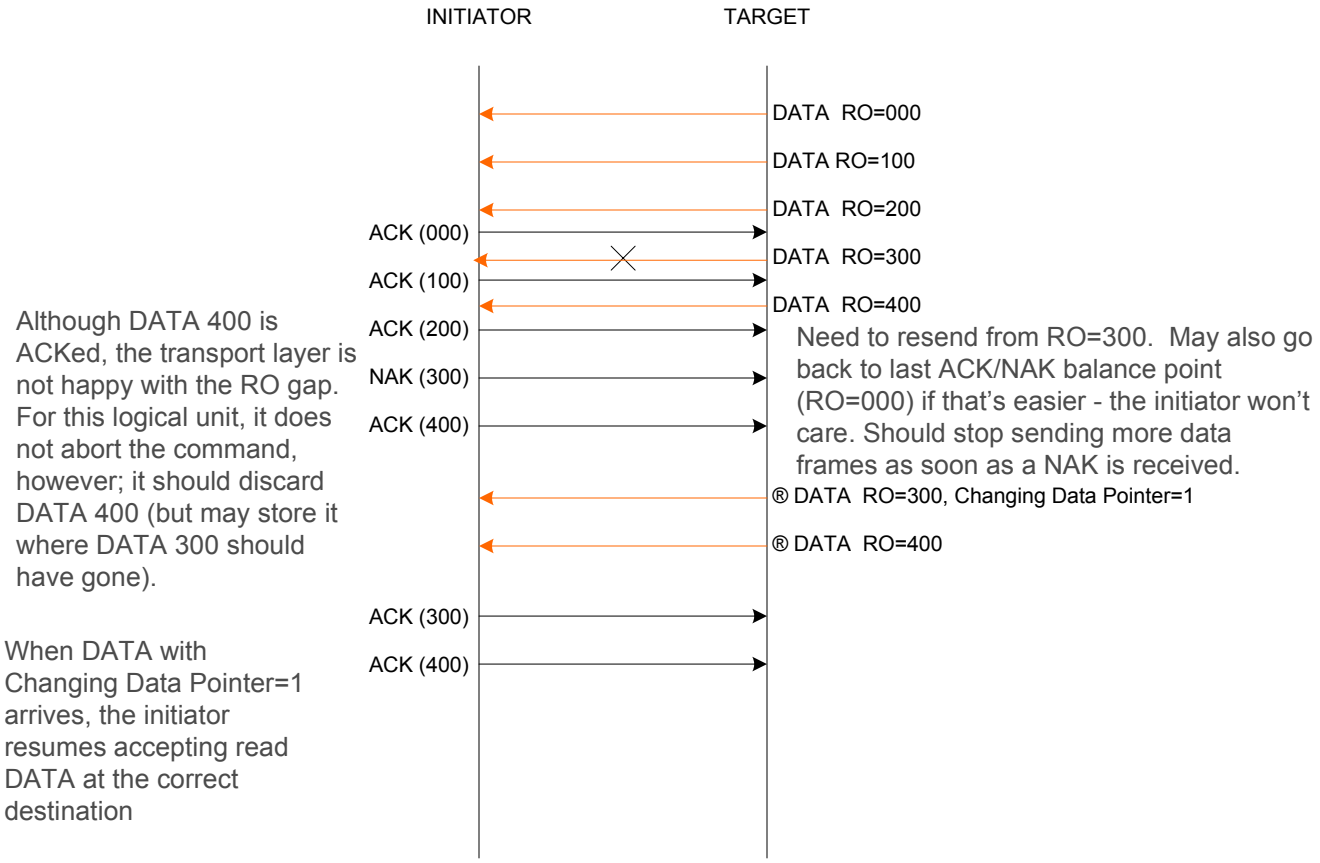
XFER_RDY Frame NAK Lost



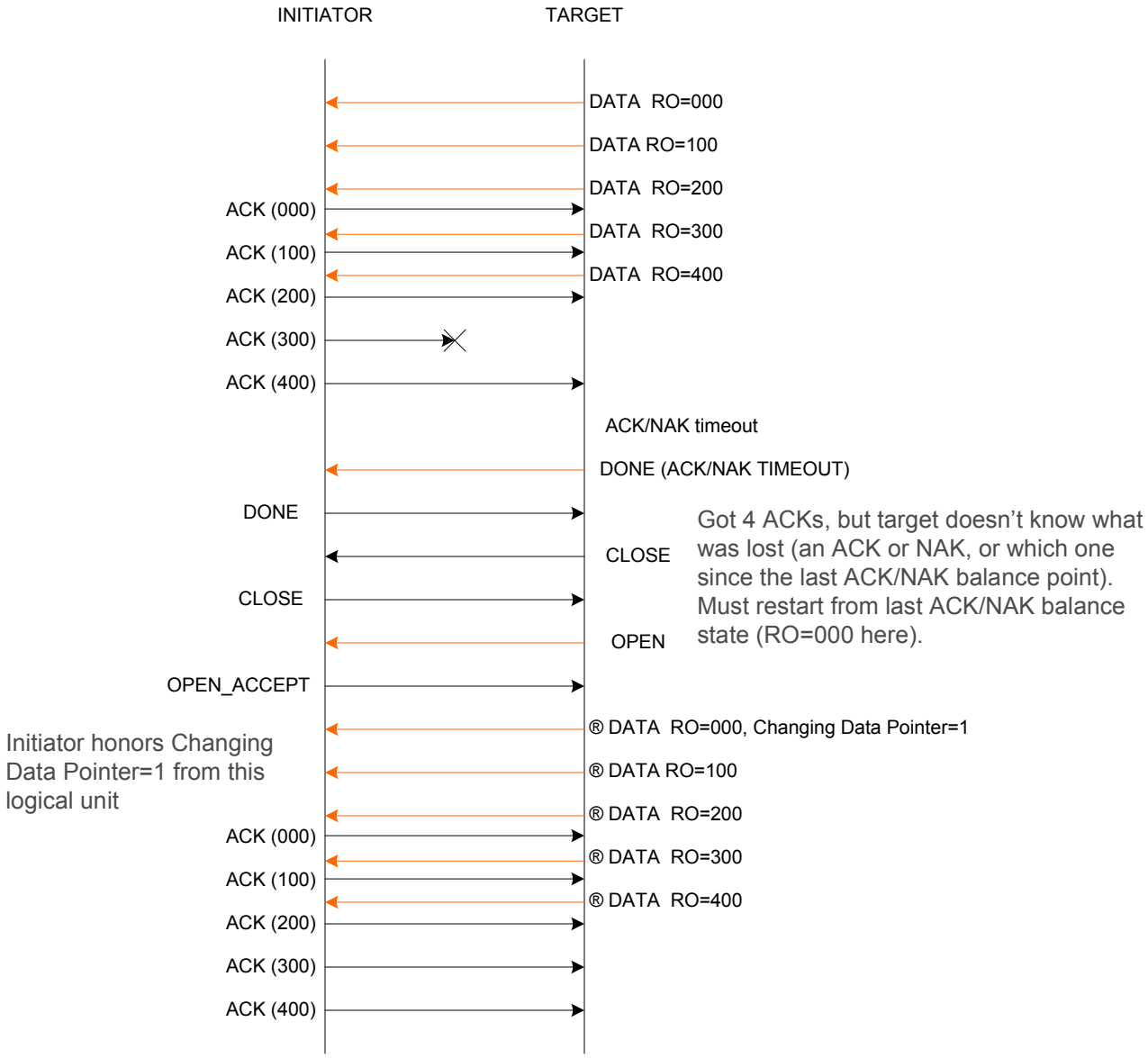
XFER_RDY Frame Not Delivered



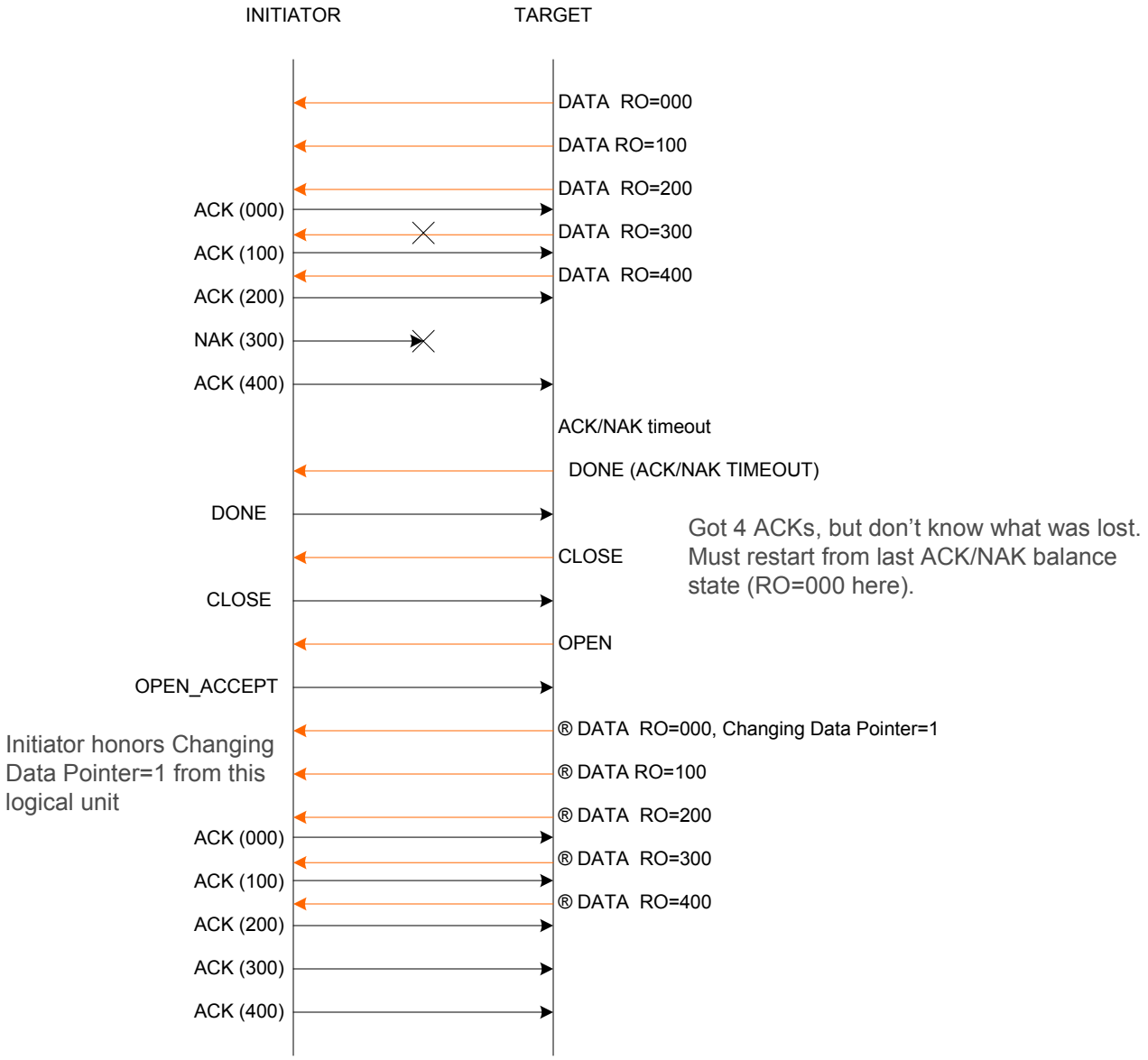
Read DATA Frame NAK Received



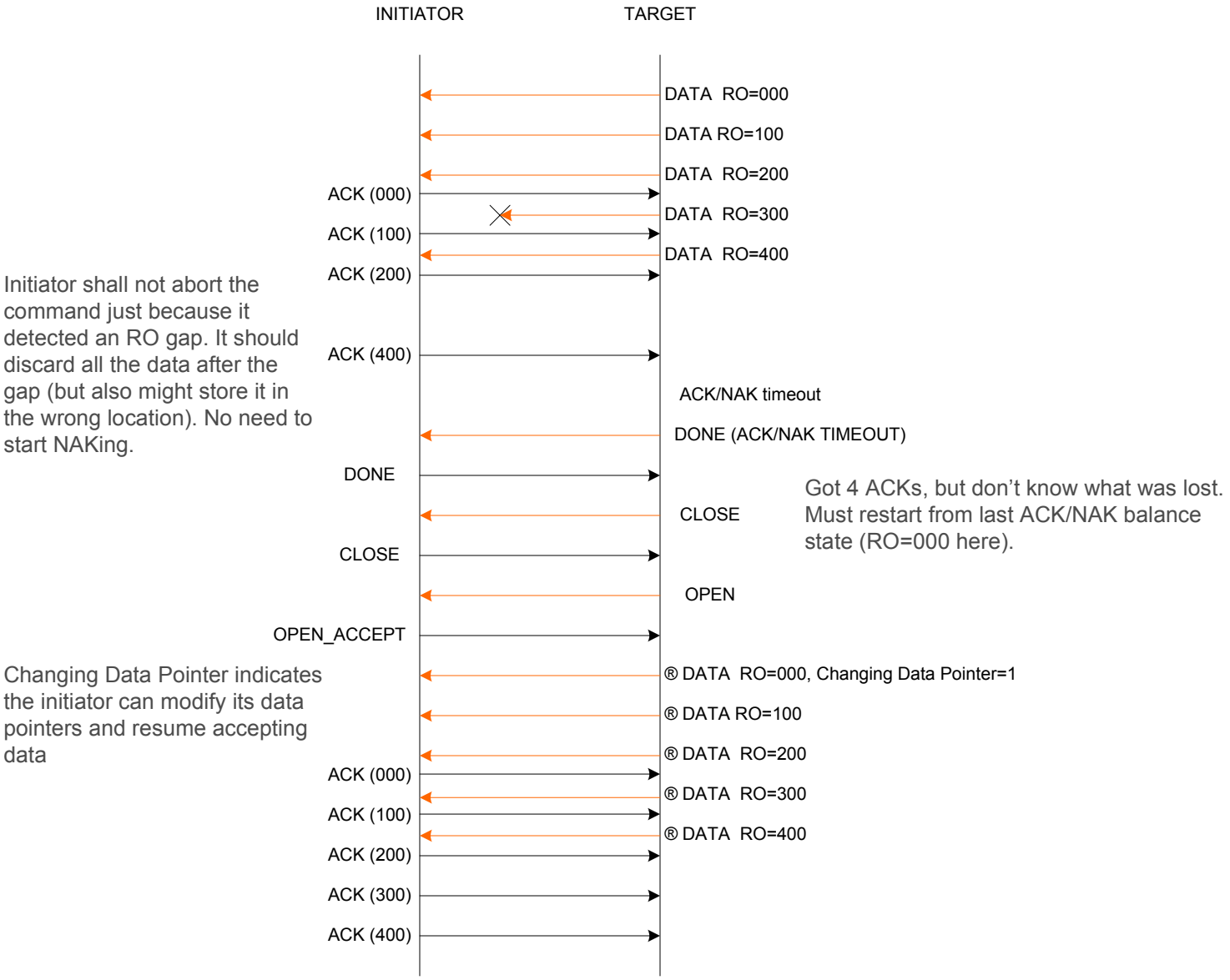
Read DATA Frame ACK Lost



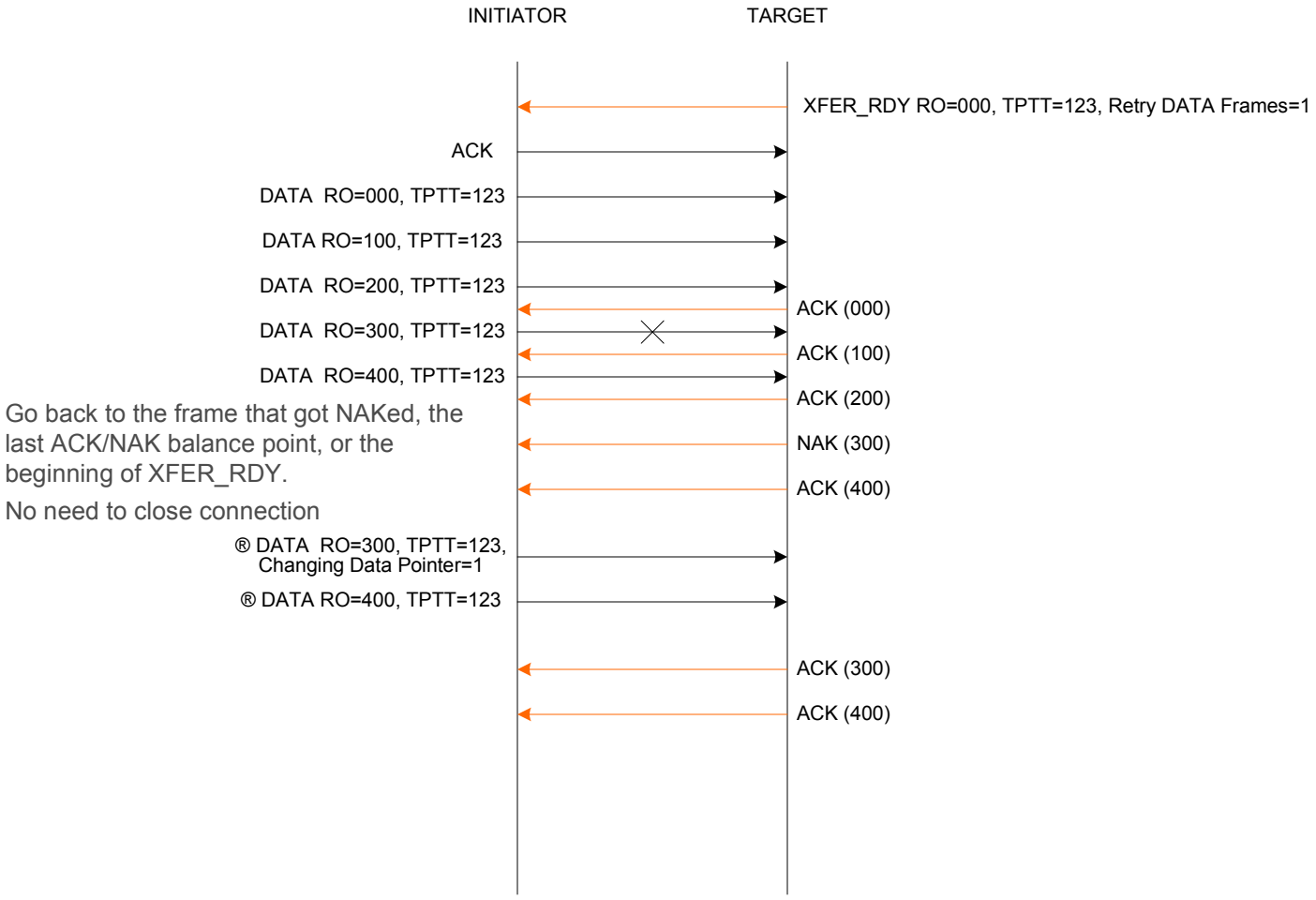
Read DATA Frame NAK Lost



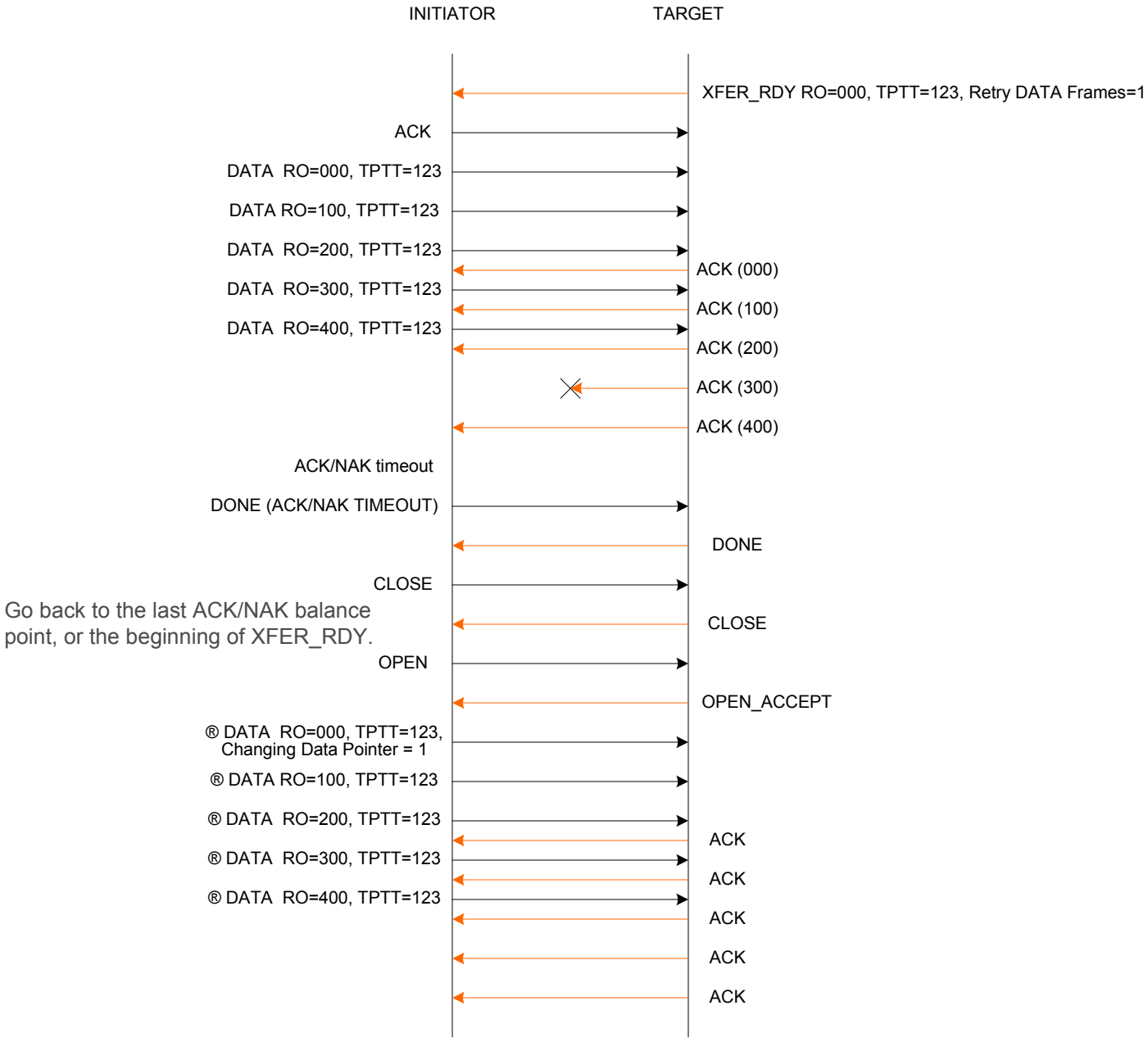
Read DATA Frame Not Delivered



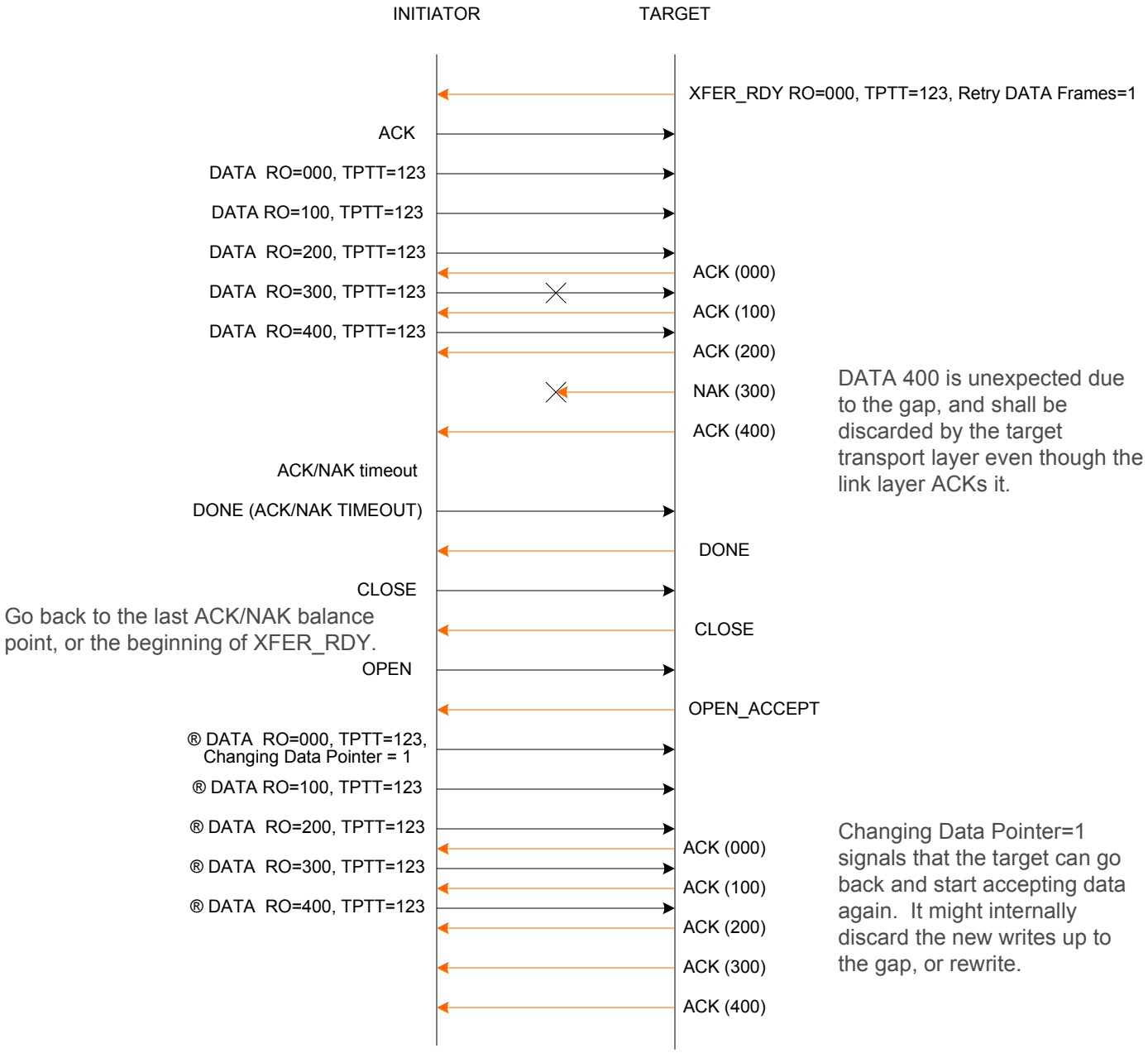
Write DATA Frame NAK Received



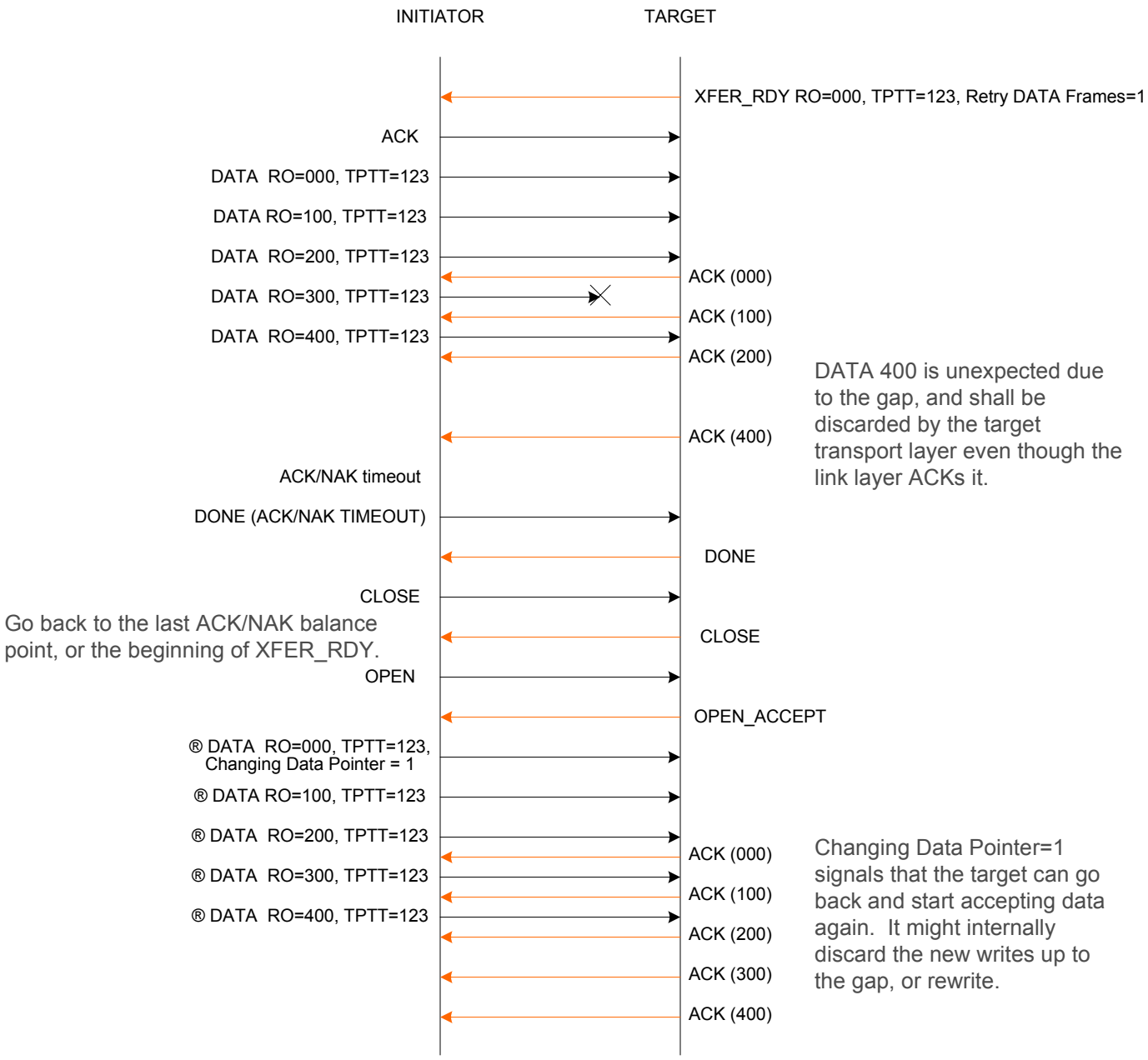
Write DATA Frame ACK Lost



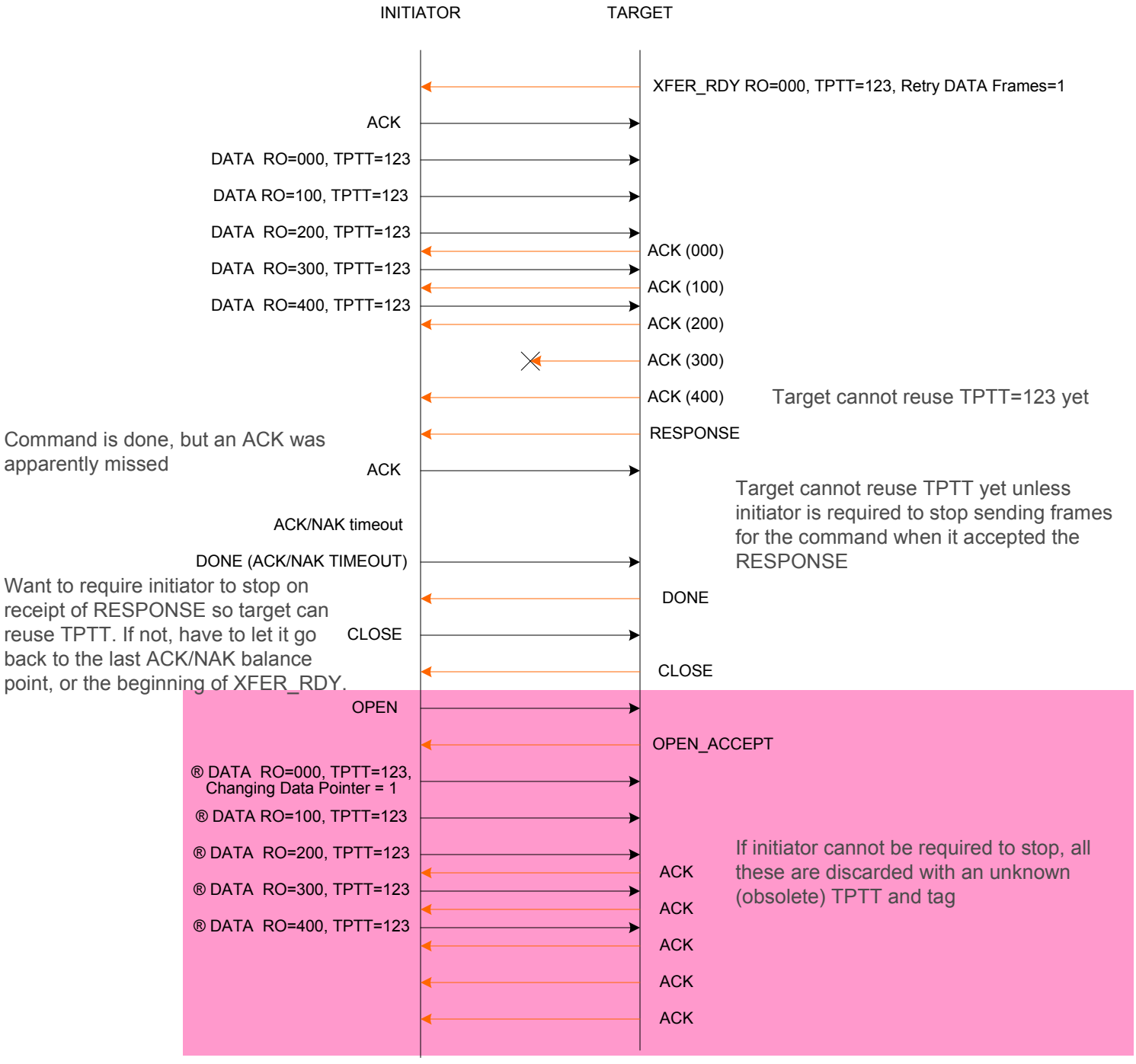
Write DATA Frame NAK Lost



Write DATA Frame Not Delivered



Write DATA Frame ACK Lost crossing RESPONSE



Write DATA Frame ACK Lost crossing XFER_RDY