

To: INCITS T10 Committee
From: Susan Gray, Quantum
Date: January 5, 2004
Document Number: T10/04-014r1
Subject: ADT SCSI Application Diagrams

1 Revision History

Revision 1: Incorporate changes based on January 5th conference call. This should be put in an Annex so get rid of shall's and add more text to data in and data out sections to clarify that there are many possible variations.

Revision 0:
Initial proposal

2 Discussion

Section 8 of ADT describes the mapping between SCSI protocol services defined in SAM-2 and the services provided by ADT. In previous group discussions, it was mentioned that it would make the section more understandable if diagrams were provided. This proposal is to add diagrams for clarification.

This proposal applies to ADT Revision 9.

2.1 Changes

8.1 (add the following before the description of table 27)

Refer to Annex A for specific examples that illustrate the use of the SCSI transport protocol services and the interaction between the ADT ports, the application client and the device server.

Table 27

Data-In delivered should be a confirmation instead of an indication.
Receive data out should be a request instead of a response.

8.2.12 Data-In Received transport protocol service

An ADT initiator port uses the Data-In Received transport protocol service to notify an application client of the result of the request to receive data initiated by a call to Receive Data-In transport layer protocol service request [or the result of receiving data initiated by a call to Send SCSI Command transport layer protocol service request where the Data-In buffer size is non-zero.](#)

New text/figures

(Insert the following as Annex A and move the exiting Annex A to Annex B.)

Annex A
(informative)

SCSI transport protocol service examples

A.1 Introduction

This informative annex provides specific examples to illustrate the use of the SCSI transport protocol services.

All of these examples assume an error free exchange.

A.2 SCSI command with no data phase

Figure x shows how SCSI transport protocol services may be used to process a SCSI command that has no data phase.

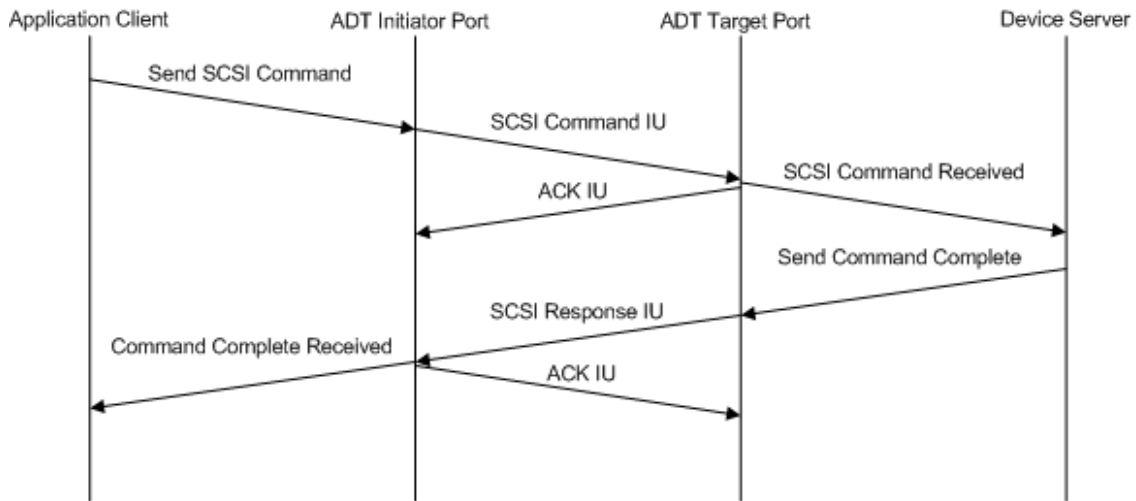


Figure X SCSI Command with no data phase

A.3 SCSI Command with data in

Figure x + 1 shows how SCSI transport protocol services may be used to process a SCSI command with a data-in phase. All IUs transferred between the ADT ports are acknowledged using ACK IUs. Most of the ACK IUs are not shown in this figure in an effort to make it more readable. The ACK IUs that are shown are those that have a direct impact on the communication between the ADT target port and device server.

There are many possible variations of the order and number of protocol service calls and SCSI Data IUs. This is one example of how a SCSI command with data-in may be accomplished.

This example shows a SCSI command that has an overall data-in length of 8k, but the data-in buffer size in the Send SCSI Command request is 4k. The SCSI Command IU has a FIRST BURST LENGTH field value of 4k which has the effect of a SCSI Transfer Ready IU with a BUFFER OFFSET field of zero and a BURST LENGTH field of 4k (see 7.1.2).

Once the device server receives the SCSI Command Received indication, it requests 4k of data to be transferred to the application client. The ADT target port uses multiple SCSI Data IUs to transfer the data to the ADT initiator port. Once it has received the FIRST BURST LENGTH number of bytes it sends a Data-In Received confirmation to the application client. Once the last SCSI Data IU has been acknowledged, the ADT target port notifies the device server using the Data-In Delivered confirmation.

The device server may send more data at any time using the Send Data-In request, but the ADT target port waits until it has received a SCSI Transfer Ready IU (see 7.1.5) before transmitting a SCSI Data IU. When the application client issues a Receive Data-In request, the ADT initiator port transmits a SCSI Transfer Ready IU. The ADT target port responds by transmitting data using one or more SCSI Data IUs until BURST LENGTH bytes (see 7.1.5) of data have been sent.

When the device server has completed sending all the data-in for the command, it uses the Send Command Complete protocol service to request the ADT target port transmit a SCSI Response IU. Upon receiving the SCSI Response IU, the ADT initiator port notifies the application client using the Command Complete protocol service.

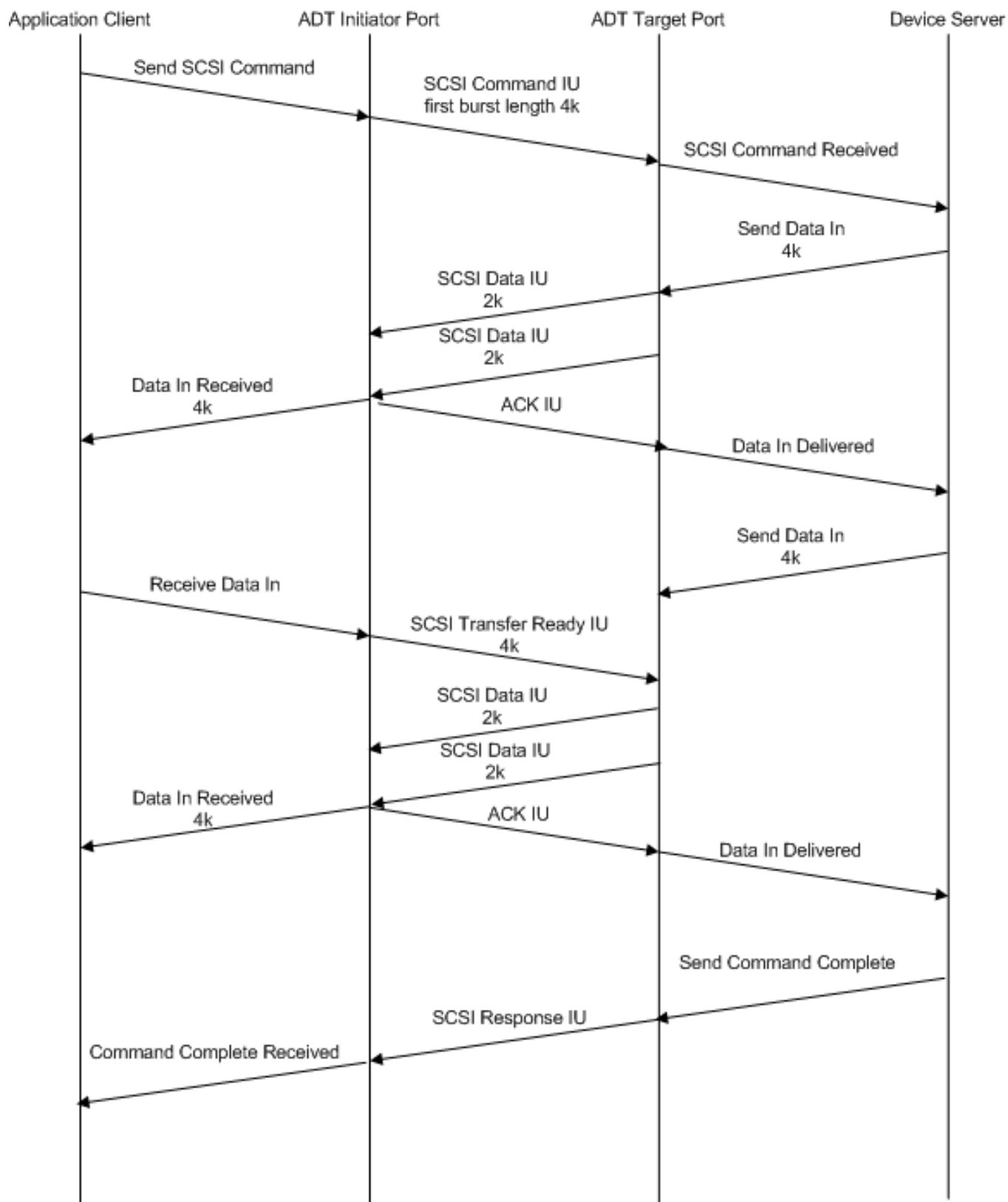


Figure x + 1 SCSI Command with Data In

A.4 SCSI Command with data out

Figure x + 2 shows how SCSI transport protocol services may be used to process a SCSI command with a data-out phase. All IUs transferred between the ADT ports are acknowledged. Most of the ACK IUs are not shown in this figure in an effort to make it more readable. The ACK IUs that are shown are those that have a direct impact on the communication between the ADT initiator port and application client.

There are many possible variations of the order and number of protocol service calls and SCSI Data IUs. This is one example of how a SCSI command with data-out may be accomplished.

This example shows a SCSI command that has an overall data-out length of 8k, but the data-out buffer size in the Send SCSI Command request is 0k. Instead it uses the Send Data-Out protocol service to request the data to be transferred.

The application client requests 4k of data to be transferred to the device server, using the Send Data-Out protocol service. The ADT initiator port waits to transfer the data until it has received a SCSI Transfer Ready IU (see 7.1.5). The device server uses the Receive Data-Out protocol service to request a SCSI Transfer Ready IU be transmitted. The ADT initiator port uses multiple SCSI Data IUs to transmit the data. Once the last SCSI Data IU has been acknowledged, the ADT initiator port notifies the application client using the Data-Out Delivered confirmation.

Once the ADT target port has received the number of bytes requested it notifies the device server using the Data-Out Received confirmation. This process repeats a second time to transfer the remaining 4k of data.

When the device server has received all of the data for the command, it uses the Send Command Complete protocol service to request the ADT target port transmit a SCSI Response IU. Upon receiving the SCSI Response IU, the ADT initiator port notifies the application client using the Command Complete protocol service.

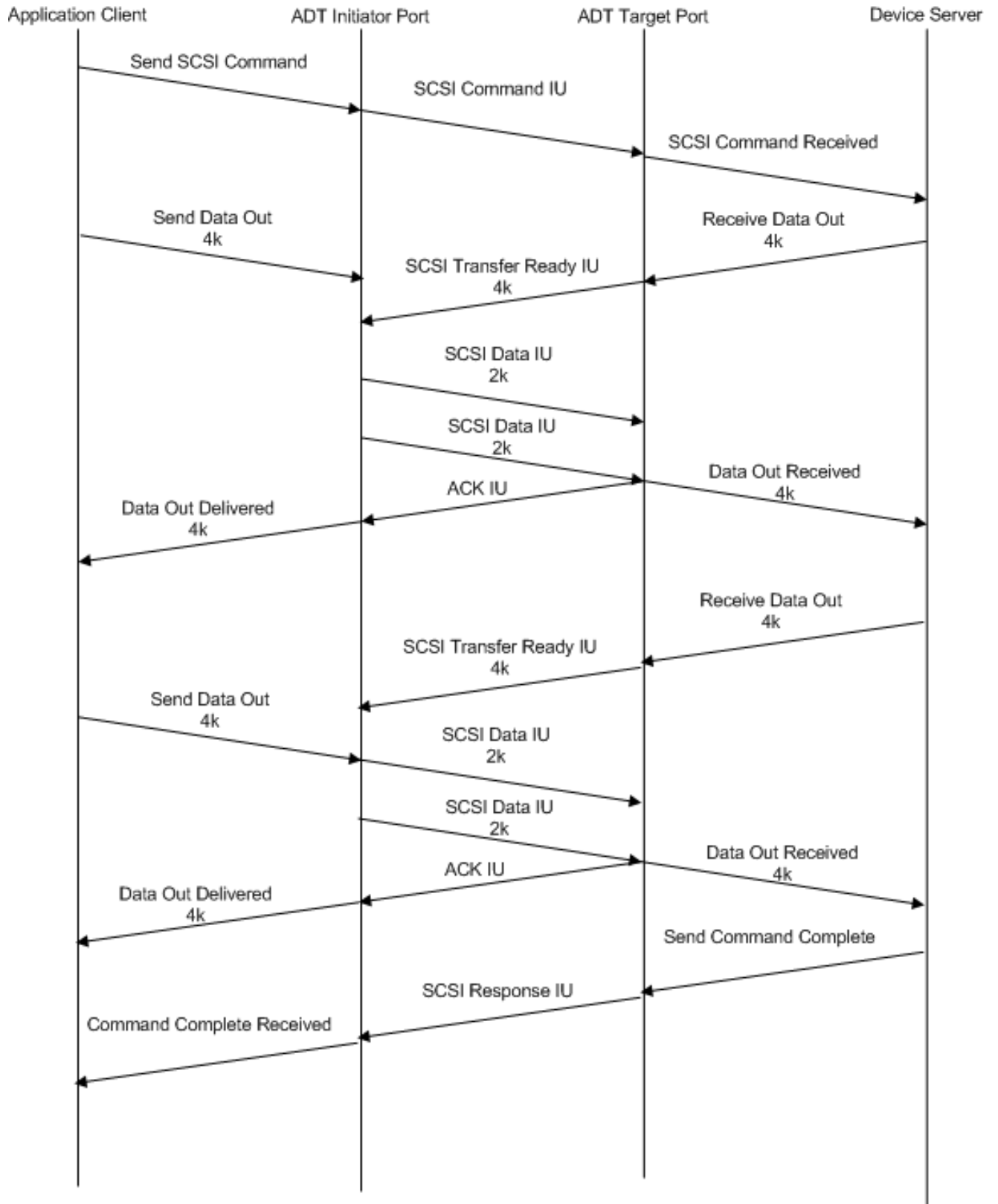


Figure x + 2 SCSI Command with Data Out