To: INCITS T10 Committee

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Subject: Add a new ADT Link Service IU – Device Reset IU

1 Revision History

Revision 0:
Posted to the T10 web site 3 November 2004.

Revision 1:
Updated based on discussion at the January 2005 T10 meeting, see ADI working group meeting
minutes 05-030.

2 General

In many vendor specific automation protocols used today, there exists a method for the
automation device to cause the data transfer device to perform a "warm boot". This warm boot is
intended to be as close to power cycling the device as possible to provide the same functionality
that many automation devices have when they can control the power to the DT device. In order
to support this functionality in an ADT based environment, a new Link Service IU will be added.

3 Proposal

3.1   Add new Device Reset IU

3.1.1   Change the middle sentence of 4.3.2.2.1 to the following

A port in P0:Initial state shall send a NAK IU with status code of REJECTED, PORT IS
LOGGED OUT (see table 14) in response to any frame other than Port Login IU, Port
Logout IU, NOP IU, Device Reset IU, or acknowledgement IU.

3.1.2   Change the second paragraph of 4.3.2.3.1 to the following

A port in this state shall send a NAK IU with a status code of LOGIN IN PROGRESS (see
table 14) in response to any frame other than Port Login IU, Port Logout IU, NOP IU,
Device Reset IU, or acknowledgement IU.

3.1.3   Change the second sentence of the third paragraph in 4.3.2.4.1 to the following

In addition, the port shall suspend the transmission of all frames other than Port Login IU,
Port Logout IU, Initiate Recovery IU, NOP IU, Device Reset IU, or acknowledgment IU.

3.1.4 Change the state description of P3:Logged-out state as follows:

4.3.2.5.1 State description
A port in P3:Logged-Out state shall not initiate an exchange. While in this state, upon receiving any frame other than a Port Login IU or Device Reset IU, the port shall send a NAK IU with a status code of REJECTED, PORT IS LOGGED OUT (see table 14).

3.1.5 Change the body of section 4.3.5.3.1 to the following

A port in TE1:Initiating Recovery state shall not send any frames other than acknowledgement IUs, Initiate Recovery IUs, Port Login IUs, NOP IUs, Pause IUs, Port Logout IUs, or Device Reset IUs.
A port in TE1:Initiating Recovery state shall discard ACK IUs and NAK IUs for frames other than Port Login IUs, NOP IUs, Pause IUs, Port Logout IUs, and Device Reset IUs.

3.1.6 Change the body of section 4.3.4.4.2 to the following

A port shall transition to T1:Active state after receiving any frame other than a Port Login IU, Port Logout IU, Pause IU, Device Reset IU, or acknowledgment IU.

3.1.7 Change the body of section 4.3.5.4.1 to the following

A port in TE2:Retry Initiate Recovery state shall not send any frames other than acknowledgement IUs, Port Login IUs, NOP IUs, Pause IUs, Port Logout IUs, or Device Reset IUs.
A port in TE2:Retry Initiate Recovery state shall discard ACK IUs and NAK IUs for frames other than Port Login IUs, NOP IUs, Pause IUs, Port Logout IUs, and Device Reset IUs.

3.1.8 Change the body of section 4.3.6.3.1 to the following

While a port is in R1:Pending Recovery state, receipt of a frame other than an Initiate Recovery IU, NOP IU, Port Login IU, Port Logout IU, Pause IU, Device Reset IU, or acknowledgment IU is an error and the port shall send a NAK IU with a status code of AWAITING INITIATE RECOVERY IU (see table 14) and PR bit set to one.

3.1.9 Change the last paragraph of section 4.5.3 to the following

A port that receives a Port Login IU, Port Logout IU, Pause IU, NOP IU, or Device Reset IU shall verify the FRAME NUMBER field in the ADT frame header is set to zero. If the FRAME NUMBER field is not zero, the port shall respond with a NAK IU with a status code of INVALID OR ILLEGAL IU RECEIVED (see table 14).

3.1.10 Change the heading for section 4.6.2.4.2 to the following

Port Logout, NOP, Initiate Recovery, Pause, and Device Reset IUs

3.1.11 Change section 4.6.2.5.2 to the following

4.6.2.5.2 Port Logout, NOP, Pause, and Device Reset IUs
If a protocol error is detected on a Port Logout IU, NOP IU, Pause IU, or Device Reset IU, the port shall send a NAK IU with PR bit set to zero and the appropriate status code (see table 14) then discard the frame.

3.1.12 Change section 4.6.2.6.2 to the following

4.6.2.6.2 Port Logout, NOP, Pause, and Device Reset IUs

If a resource limitation error is detected on a Port Logout IU, NOP IU, Pause IU, or Device Reset IU, the port shall send a NAK IU the PR bit set to zero and the appropriate status code (see table 14) then discard the frame.

If the port is unable to send an acknowledgment IU due to a resource limitation, it shall discard the frame.

3.1.13 Add to subclause 4.8 describing I_T Nexus loss

Add to the list of events that cause an I_T Nexus loss:

c) receives an ACK IU in response to a Device Reset IU;

Add the following text to the subclause:

When an I_T Nexus loss occurs, the ADT port shall:
a) Abort all open exchanges; and
b) Set the operating parameters to default (see 4.2).

3.1.14 Change the following sentence in the 6th paragraph of section 6.3

The FRAME NUMBER field of a Port Login IU, Port Logout IU, Pause IU, NOP IU, or Device Reset IU shall be set to zero.

3.1.15 Change the following sentence in the 9th paragraph of section 6.3

Except for a Port Login IU, Port Logout IU, Pause IU, NOP IU, or Device Reset IU, a receiving port shall send a NAK IU in response to any frame with a FRAME NUMBER field set to zero.

3.1.16   Change table 12 to the following

Frame Type	Description
0h	ACK (acknowledge)
1h	NAK (negative acknowledge)
2h	Port login
3h	Port logout
4h	Pause
5h	NOP (no operation)
6h	Initiate recovery
7h	Initiate recovery ACK (acknowledgement)
8h	Initiate recovery NAK (negative acknowledgement)
9h	Device Reset
Ah - Fh	Reserved

3.1.17   Insert a new section 6.5.11 as follows

6.5.11 Device Reset information unit
A Device Reset IU may be sent by an automation device port to cause the DT device to perform a warm boot. DT device ports shall not initiate a Device Reset IU exchange. If a DT device port receives a Device Reset IU, it shall send an acknowledge IU and if the acknowledgement is an ACK, generate a Hard Reset Event (see 4.7) for the port state machine.

Following reception of an ACK IU for a Device Reset IU an automation port shall:
a)   abort all open exchanges, and
b)   set port operating parameters to default.

An Automation port that receives a Device Reset IU shall respond with a NAK IU with a status code of INVALID OR ILLEGAL IU RECEIVED (see table 14).

The Device Reset IU shall contain zero bytes of payload.

3.1.18   Change the content of 6.5.11.1 to the following

Link service exchanges may be negotiation exchanges, port logout exchanges, pause exchanges, NOP exchanges, or device reset exchanges.

3.1.19   Change the first sentence of 6.5.11.2 to the following

Port logout IUs, Pause IUs, NOP IUs, and Device Reset IUs are sent in simple exchanges.