

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.

## 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 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.

### **3.1.5 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.

### **3.1.6 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.

### **3.1.7 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).

### **3.1.8 Change the heading for section 4.6.2.4.2 to the following**

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

### **3.1.9 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.

### **3.1.10 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.

### **3.1.11 Change the following sentence in the 6<sup>th</sup> 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.

### **3.1.12 Change the following sentence in the 9<sup>th</sup> 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.

### 3.1.13 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

### 3.1.14 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 acknowledge the frame and, if the acknowledgement is an ACK, perform a warm boot. A warm boot shall cause a Hard Reset Event to be sent to the port state machine. The behavior of a warm boot should be as close to a power cycle as possible. After the warm boot has completed, the DT device should send a Port Login IU to the automation device port.

As part of a warm boot the DT device shall:

- a) abort all open exchanges;
- b) abort all commands for all device servers;
- c) set port operating parameters to default following transmission of the ACK IU for the Device Reset IU.

As part of a warm boot the DT device should:

- a) Perform initialization that is typically done following a power cycle such as a Power On Self Test.

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.

### 3.1.15 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.

### 3.1.16 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.