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Subject: SAS port layer description modifications

Introduction

The following proposes adjustments to the clause describing the SAS port layer. This proposal includes corrections and updates some of which are based on the review of requests and confirmations (see 03-023r0) and so that the format is more like that of the link and transport layers. This proposal does not include figures. Modifications required in the figures in this clause are detailed in the Maxtor SAS letter ballot comments document. The following proposal is “drop-in replacement text” based on SAS-r03.

8 Port layer

8.1 Overview

The port layer (PL) contains state machines that run in parallel to:

- a) receive requests from the SSP, SMP, and STP transport layer state machines for connection management and frame transmission;
- b) send requests to the SAS link layer state machines for connection management and frame transmission;
- c) receive confirmation from the SAS link layer state machines; and
- d) send confirmations to the SSP, SMP, and STP transport layer state machines.

The port layer state machines are as follows:

- a) Overall control (PL_OC state machines); and
- b) Phy manager (PL_PM state machines).

There is one PL_OC state machine per port. There is one PL_PM state machine for each phy contained in the port.

Figure 90 shows the relationship of the port layer to the transport and link layers.

Figure 90 – Port layer state machines

8.2 Port layer timers and counters

8.2.1 Timers and counters overview

The port layer contains the following timers and counter for each phy (i.e., for each PL_PM state machine):

- a) bus inactivity time limit timer (for SSP target ports only);
- b) maximum connect timer (for SSP target ports only);
- c) I_T nexus loss timer (for SSP target ports only);
- d) arbitration wait time (AWT) timer; and
- e) pathway blocked count (PBC) counter.

The PL_OC state machine contains the following timers:

- a) an AWT timer for each connection attempt to be retried; and
- b) an I_T nexus loss timer for each destination for which a connection is requested.

8.2.2 Bus inactivity time limit timer

A bus inactivity time limit timer is initialized and monitored by the PL_PM state machine for SSP target ports. The bus inactivity time limit timer is initialized to the BUS INACTIVITY TIME LIMIT field in the Disconnect-Reconnect mode page (see 10.1.5.1). The timer shall decrement from the initial value. When the timer count has decremented to zero, the timer shall stop counting. A count of zero signifies that the timer has expired.

8.2.3 Maximum connect time limit timer

A maximum connect time limit timer is initialized and monitored by the PL_PM state machine for SSP target ports. The maximum connect time limit timer is initialized to the MAXIMUM CONNECT TIME LIMIT field in the Disconnect-Reconnect mode page (see 10.1.5.1). The timer shall decrement from the initial value. When the timer count has decremented to zero, the timer shall stop counting. A count of zero signifies that the timer has expired.

8.2.4 I_T nexus loss timer

An I_T nexus loss timer is initialized by the PL_OC state machine for an SSP connection when a Transmit Frame request for a new I_T nexus is received from the transport layer. This timer shall be initialized to the value in the I_T NEXUS LOSS TIME field in Protocol-Specific Port Control mode page (see 10.1.6.2.2). When running, the timer shall decrement. When the timer count has decremented to zero, the timer shall stop.

In addition, each I_T nexus loss timer has a status of stopped, running, or timed-out assigned as follows:

- a) stopped: assigned after set to an initial value and before starting to decrement;
- b) running: assigned while decrementing; and
- c) timed-out: assigned after the timer has decremented to zero.

An I_T nexus loss timer is also initialized by a PL_PM state machine with the I_T nexus loss time value and status arguments (i.e., stopped, running, or timed-out) that are received from the PL_OC state machine's I_T nexus loss timer. If the PL_OC state machine's I_T nexus loss timer is initialized with a status of stopped, then that I_T nexus loss timer shall remain stopped. If the PL_OC state machine's I_T nexus loss timer is initialized with a status of running, then that I_T nexus loss timer shall start decrementing from the initialized I_T nexus loss time. If the PL_OC state machine's I_T nexus loss timer is initialized with a status of timed-out, then the I_T nexus loss timer shall remain stopped and shall retain a status of timed-out.

8.2.5 Arbitration wait time (AWT) timer

The arbitration wait time (AWT) timer (see 7.12.3) is initialized and monitored by the PL_PM state machine for each connection request. The AWT timer value is sent to the link layer by the PL_PM state machine as an argument in its Open Connection request. The AWT timer is initialized to zero and shall increment.

8.2.6 Pathway blocked count (PBC) counter

A pathway blocked count (PBC) counter (see 7.12.3) is initialized and monitored by the PL_PM state machine for each connection request. The PBC counter is initialized to zero and shall increment. The PBC counter shall not increment past FFh.

8.3 PL_OC state machine

8.3.1 Overview

The PL_OC state machine:

- a) receives connection management requests from the SSP, SMP, and STP transport layers (e.g., Cancel, SMP Transmit Break, and Accept_Reject Opens);
- b) receives Transmit Frame requests from the SSP, SMP, and STP transport layers;
- c) receives Retry Frame parameters from the PL_PM state machines;
- d) selects frames to transmit;
- e) selects phys on which to transmit frames by sending a Tx Frame parameter to a PL_LM state machine;
- f) cancels frame transmissions by sending Cancel parameters to a PL_LM state machine;
- g) sends connection management requests to the link layer;
- h) receives connection management confirmations from the link layer;
- i) receives HARD_RESET received confirmations from the link layer;
- j) sends HARD_RESET received confirmations to the transport layer;
- k) receives connection and transmission parameters from the PL_LM state machines;
- l) sends connection and transmission confirmations to the transport layer; and
- m) initializes and operates the I_T nexus loss timers and the AWT timers.

This state machine contains the following states:

- a) PL_OC1:Idle (see 8.3.2) (initial state); and
- b) PL_OC2:Overall_Control (see 8.3.3).

After power on this state machine shall start in the PL_OC1:Idle state. The state machine shall transition to the PL_PM1:Idle state from any other state after receiving a Phy Enabled confirmation from any phy assigned to the port.

Figure 91 shows the PL_OC state machine.

Figure 91 – Port layer PL_OC state machine

8.3.2 PL_OC1:Idle state

8.3.2.1 State description

This state is the initial state of the PL_OC state machine.

If this state receives a HARD_RESET Received confirmation from the link layer, then this state shall send a HARD_RESET Received confirmation to the transport layer.

For each Transmit Frame request received from the transport layer, this state shall send a Transmission Status (No Phys In Port) confirmation to the transport layer.

8.3.2.2 Transition PL_OC1:Idle to PL_OC2:Overall_Control

This transition shall occur after one of the following is received from at least one phy assigned to the port:

- a) Phy Enabled confirmation;
- b) Enable Disable Link Layer (SAS Enable) confirmation; or
- c) Enable Disable Link Layer (SATA Enable) confirmation.

8.3.3 PL_OC2:Overall_Control state

8.3.3.1 State description

8.3.3.1.1 State description overview

This state receives Transmit Frame requests from the transport layers (e.g., SSP, SMP, and STP) and Retry Frame parameters from the PL_PM state machines. There may be more than one Transmit Frame request pending at a time for each transport layer, and there may be more than one Retry Frame parameter pending at a time for each PM_PM state machine (see 8.3.3.1.2).

This state sends Tx Frame parameters to the PL_PM state machines, one for each Transmit Frame request and one for each Retry Frame parameter received. This state selects the order in which these parameters are sent and to which PL_PM state machine they are sent. If more than one PL_LM state machine is active, this state may send a parameter to each PL_PM state machine (e.g., request to establish connections to multiple destination SAS addresses, one per PL_PM state machine). This state machine shall process one Transmit Frame request or Retry Frame parameter at a time.

This state also:

- a) receives connection management requests from the transport layers;
- b) sends connection management requests to the link layer;
- c) receives connection confirmations from the link layer; and
- d) sends connection management confirmations to the transport layers (see 8.3.3.1.5).

8.3.3.1.2 Frame transmission

A Transmit Frame request from a transport layer shall include the following arguments:

- a) Interlocked or non-interlocked (for SSP requests only);
- b) I_T nexus loss value;
- c) initiator bit value;
- d) connection rate;
- e) initiator connection tag;
- f) destination SAS address;
- g) source SAS address; and
- h) frame.

This state shall process a Transmit Frame request from a transport layer as soon as resources become available.

A Retry Frame parameter from the PL_PM state machine shall include the following arguments:

- a) phy identifier of the phy on which transmission of the frame was last attempted;
- b) balance required (for SSP frames only);
- c) initiator bit value;
- d) connection rate;
- e) initiator connection tag;
- f) destination SAS address;
- g) source SAS address;
- h) I_T nexus loss timer value and status;
- i) pathway blocked count;
- j) arbitration wait time; and
- k) frame.

This state shall not process a Retry Frame parameter until after a retry delay (see 7.12.2.2). When Retry Frame parameters are pending with non-zero arbitration wait times, this state shall increment the AWT timer until a Tx Frame parameter for the Retry Frame is sent to the PL_PM state machine.

After receiving a Transmit Frame request or Retry Frame parameter for which the retry timer has timed-out, this state shall select an available PL_PM state machine and send a Tx Frame parameter to that state machine. The PL_PM state machine should be selected using the following order of precedence:

- 1) the PL_PM state machine has an active connection with the same destination and is not processing a Tx Frame request;
- 2) the PL_PM state machine does not have a connection open; or
- 3) the PL_PM state machine has an open connection with a different destination and is not processing a Tx Frame request.

This state shall consider a PL_PM state machine as having an active connection from the time after it receives a Connection Opened confirmation until it receives a Connection Closed confirmation.

A destination shall be considered the same if it has the same SAS address and protocol as the new request.

This state shall consider a PL_PM state machine to be processing a Tx Frame parameter from the time it send the parameter to the PL_PM state machine until this state receives a Frame Transmitted or Unable to Connect parameter.

If a PL_PM state machine is selected with a connection open to a different destination, this state shall send a Close Connection to the link layer for that connection.

Additional rules for wide SSP port selection of phys are described in 9.2.3.

This state shall send a Tx Frame parameter to the selected PL_PM state machine with the following arguments:

- a) Balance Required or Balance Not Required (Balance Not Required may be included for SSP frames only);
- b) initiator bit;
- c) connection rate;
- d) initiator connection tag;
- e) destination SAS address;
- f) source SAS address;
- g) pathway blocked count;
- h) arbitration wait time;
- i) I_T nexus loss timer value and status; and
- j) frame.

A Balance Not Required argument may only be included for requests for SSP frames if:

- a) a Transmit Frame (Non-interlocked) request is being processed;
- b) the selected PL_PM state machine has a connection open to the same destination;
- c) the previous request processed was a Transmit Frame (Non-interlocked) request to the same destination;
- d) the connection has not been lost since the previous frame was transmitted; and
- e) the frame has the same tag value as the previous frame.

If a Balance Not Required argument is not included in the request for transmission of an SSP frame, then a Balance Required argument shall be included.

A Balance Required argument shall be included for transmission of Retry Frame parameters.

The arbitration wait time argument shall be set to:

- a) zero or a vendor-specific value less than or equal to 7FFFh (see 7.7.3), or
- b) the value of the arbitration wait time argument received with the last Retry Frame parameter. If the arbitration wait time argument from the last Retry Frame parameter is used for a different frame transmission request, the arbitration wait time for the last Retry Frame parameter shall be set to zero (i.e., only the next request from the port uses that arbitration wait time argument). If the port selects a request to a different destination, it may transfer the arbitration wait time argument with that request.

The pathway blocked count argument shall be the value of the pathway blocked count argument received with the last Retry Frame parameter if:

- a) the Retry Frame parameter is the next Tx Frame parameter sent to a PL_PM state machine having the same destination SAS address as was in the Retry Frame parameter; and
- b) the selected PL_PM state machine does not have a connection opened with the destination SAS address indicated in the Tx Frame parameter.

If this state selects a request to a different destination, then the pathway blocked count argument shall be set to zero.

The arbitration wait time and pathway blocked count arguments for the Tx Frame parameter are transferred to the selected PL_PM's AWT timer and PBC counter. The arbitration wait time and pathway blocked count arguments for the Retry Frame parameters are sent as arguments in the Unable to Connect parameter. The PL_OC Retry Frame arbitration wait time argument is stored in a corresponding PL_OC Retry Frame AWT timer that shall start incrementing if the arbitration wait time argument received from the PL_PM state machine is non-zero. If the arbitration wait time argument received from the PL_PM state machine is zero, the PL_OC AWT timer shall not start incrementing.

The I_T nexus loss timer value and status for the Tx Frame parameter are transferred to the selected PL_PM's I_T nexus loss timer. The selected PL_PM timer shall be set to the value and status (i.e., either stopped, running, or timed-out) of these arguments received in the Tx Frame parameter. The I_T nexus loss time and status arguments for the Tx Frame parameter are read from the PL_OC I_T nexus loss timer for this destination. For each destination, the PL_OC I_T nexus loss timer is updated with the time and status arguments of the PL_PM I_T nexus loss timer received with an Unable To Connect parameter.

8.3.3.1.3 Transmission Confirmations

After sending a Tx Frame parameter, this state shall wait until either a Frame Transmitted or Unable To Connect parameter is received.

If this state receives a Frame Transmitted parameter, then this state shall send a Transmission Status (Frame Transmitted) confirmation to the transport layer.

If this state receives an Unable To Connect parameter with any argument other than Cancel Acknowledge, then this state shall send a Transmission Status (Opened Failed) confirmation to the transport layer including the argument received with the Unable To Connect parameter (e.g., if this state receives an Unable To Connect (Wrong Destination) parameter from the PL_LM state machine, then this state shall send a Transmission Status (Opened Failed - Wrong Destination) confirmation to the transport layer). The I_T nexus loss timer value and status arguments received with the Unable To Connect parameter shall be included in the confirmation.

If this state receives a Connection Closed confirmation from the link layer after a Tx Frame parameter is sent to the PL_LM state machine but before a Frame Transmitted parameter is received for the Tx Frame parameter, then this state shall send a Connection Failed confirmation to the transport layer.

[delete Table 86 - Confirmations to transport layer from the PL_OC state machine. It is redundant with the words in the above and the tables in 4.3.]

8.3.3.1.4 Transmission cancellations

If this state receives a Cancel request for a previous Transmit Frame request and a Tx Frame parameter or a Retry Frame parameter for the request has not been sent to a PL_PM state machine, then this state shall terminate processing of the Transmit Frame request and send a Cancel Acknowledge confirmation to the transport layer.

If this state receives a Cancel request for a previous Transmit Frame request and a Connection Opened confirmation has not been received for the destination SAS address argument in the request, then this state shall send a Cancel parameter to the PL_PM state machine. After the Unable To Connect (Cancel Acknowledge) parameter is received, this state shall terminate processing of the Transmit Frame request and send a Cancel Acknowledge confirmation to the transport layer.

If this state receives a Cancel request for a previous Transmit Frame request and a Connection Opened confirmation has been received for the destination SAS address argument in the request, then this state shall send a Cancel parameter to the PL_PM state machine and a Close Connection request to the link layer. After the Connection Closed confirmation is received, then this state shall terminate processing of the Transmit Frame request and send a Cancel Acknowledge confirmation to the transport layer.

8.3.3.1.5 Connection management

This state may receive one of the following confirmations from the link layer indicating that another phy is available:

- a) Phy Enabled confirmation;
- b) Enable Disable Link Layer (SAS Enable) confirmation; or
- c) Enable Disable Link Layer (SATA Enable) confirmation.

If a Disable Tx Frames parameter is received, then this state shall not send another Tx Frame parameter to the PL_PM state machine until after a Connection Closed confirmation has been received.

If this state receives an Accept_Reject Opens request, then this state shall send an Accept_Reject Opens request to the link layer.

If this state receives an SMP Transmit Break request, then this state shall send an SMP Transmit Break request to the link layer.

If this state has no pending Transmit Frame requests or pending Retry Frame parameters for a PL_PM state machine with an open connection, this state should send a Close Connection request to the link layer for that phy.

8.3.3.2 Transition PL_OC2:Overall_Control to PL_OC1:Idle

This transition shall occur after:

- a) a Phy Disabled confirmation is received from all of the link layers in the port;
- b) a Enable Disable Link Layer (Disable) confirmation is received from all of the link layers in the port; or
- c) a HARD_RESET Received confirmation is received.

8.4 PL_PM state machine

8.4.1 Overview

The PL_PM state machine:

- a) receives frame transmission and transmission cancellation parameters from the PL_OC state machine;
- b) sends connection management requests to the link layer;
- c) receives connection confirmations from the link layer;
- d) sends Retry Frame parameters to the PL_OC state machines;
- e) sends parameters to the PL_OC state machine containing frame transmission and connection status;
- f) sends confirmations to the transport layer;
- g) updates the PL_PM I_T nexus loss timer, the PL_PM AWT timer, and the PL_PM pathway blocked count counter; and
- h) for SSP target ports only, implements the bus inactivity time limit timer and the maximum connect time timer and closes the connection if one of the timers has expired.

The PL_PM state machine contains the following states:

- a) PL_PM1:Idle (see 8.4.2) (initial state);
- b) PL_PM2:ReqWait (see 8.4.3);
- c) PL_PM3:Connected (see 8.4.4); and
- d) PL_PM4:Wait_For_Close (see 8.4.5).

The state machine shall start in the PL_PM1:Idle state. The state machine shall transition to the PL_PM1 state from any other state after receiving a Phy Disabled or Enable Disable Link Layer (Disable).

Figure 92 shows the PL_PM state machine.

Figure 92 — Port layer phy manager (PL_PM) state machine part 1

Figure 93 shows more details on the PL_PM state machine.

Figure 93 — Port layer phy manager (PM_LM) state machine part 2

8.4.2 PL_PM1:Idle state

8.4.2.1 State description

This is the initial state of the PL_PM state machine.

8.4.2.2 Transition PL_PM1:Idle to PL_PM2:ReqWait

This transition shall occur after receiving a Tx Frame parameter.

8.4.2.3 Transition PL_PM1:Idle to PL_PM3:Connected

This transition shall occur after receiving a Connection Opened parameter.

8.4.3 PL_PM2:ReqWait state

8.4.3.1 State description

8.4.3.1.1 State description overview

This state sends an Open Connection request to the selected phy and waits for a response.

The Open Connection request includes the following arguments:

- a) initiator bit value;
- b) protocol field value;
- c) connection rate
- d) initiator connection tag;
- e) destination SAS address;
- f) pathway blocked count; and
- g) arbitration wait time.

This state shall start incrementing the AWT timer after sending the Open Connection request to the phy.

If this state receives a Connection Opened (Destination Opened) confirmation from the link layer, then this state shall check the destination SAS address is the same as the destination SAS address in the Open Connection request. If the address is the same, then this state shall:

- a) stop the I_T nexus loss timer;
- b) set the I_T nexus loss timer to zero; and
- c) set the I_T nexus loss time status to stopped.

If the destination SAS address is not the same, then this state shall:

- a) stop the AWT timer; and
- b) send a Retry Frame parameter to the PL_OC state machine with arguments from the Tx Frame parameter including the updated arbitration wait time.

If this state receives one of the following confirmations:

- a) Open Failed (Bad Destination);
- b) Open Failed (Break Received);
- c) Open Failed (Connection Rate Not Supported);
- d) Open Failed (Protocol Not Supported);
- e) Open Failed (STP Resources Busy); or
- f) Open Failed (Wrong Destination);

then this state shall:

- a) stop the I_T nexus loss timer;
- b) set the I_T nexus loss timer to zero;
- c) set the I_T nexus loss time status to stopped;

- d) stop the AWT timer; and
- e) send an Unable To Connect parameter to the PL_OC state machine.

If this state receives an Open Failed (No Destination) or Open Failed (Open Timeout Occurred) confirmation, then this state shall check the status of the I_T nexus loss timer. If the status of the timer is timed-out, then this state shall send an Unable To Connect parameter to the PL_OC state machine with the argument I_T Nexus Loss. If the status of the I_T nexus loss timer is not timed-out, then this state shall:

- a) start the I_T nexus loss timer if it is not running;
- b) set the I_T nexus loss time status to running if it is not set to running; and
- c) send an Unable To Connect parameter to the PL_OC state machine.

Any Unable To Connect parameter sent to the transport layer shall include the following arguments:

- a) the same argument as that received with the Open Failed confirmation;
- b) pathway blocked count;
- c) arbitration wait time; and
- d) I_T nexus loss time and status.

If this state receives an Open Failed (Retry) confirmation, then this state shall:

- a) stop the I_T nexus loss timer;
- b) set the I_T nexus loss timer to zero;
- c) set the I_T nexus loss time status to stopped;
- d) stop the AWT timer;
- e) increment the pathway blocked counter by one; and
- f) send a Retry Frame parameter to the PL_OC state machine.

If this state receives an Open Failed (Pathway Blocked) confirmation, then this state shall:

- a) stop the I_T nexus loss timer;
- b) set the I_T nexus loss timer to zero;
- c) set the I_T nexus loss time status to stopped;
- d) increment the pathway blocked counter by one; and
- e) send a Retry Frame parameter to the PL_OC state machine.

The arguments for a Retry Frame parameter shall be copied from the Tx Frame parameter.

[\[delete Table 87 – Retry frame conditions. This is now in the words above.\]](#)

If a Cancel parameter is received from the PL_OC state machine and a Connection Open confirmation has not been received from the link layer, then this state shall:

- a) send a Stop Arb request to the link layer; and
- b) send an Unable To Connect (Cancel Acknowledgement) parameter to the PL_OC state machine.

8.4.3.2 Transition PL_PM2:ReqWait to PL_PM1:Idle

This transition shall occur after:

- a) sending a Retry Frame parameter to the PL_OC state machine;
- b) sending an Unable To Connect parameter to the PL_OC state machine;
- c) receiving an Enable Disable Link Layer (Disable) confirmation; or
- d) receiving a HARD_RESET Received confirmation.

8.4.3.3 Transition PL_PM2:ReqWait to PL_PM3:Connected

This transition shall occur after receiving a Connection Opened (Destination Opened) confirmation and setting the I_T nexus loss timer.

8.4.3.4 Transition PL_PM2:ReqWait to PL_PM4:Wait_For_Close

This transition shall occur after:

- a) receiving an Open Failed (Port Layer Request) confirmation; or
- b) receiving a Cancel parameter from the PL_OC state machine before receiving a Connection Open confirmation from the link layer

8.4.4 PL_PM3:Connected state

8.4.4.1 State description

When in this state:

- a) a connection is open;
- b) frame transmission requests are sent to the link layer;
- c) transmission confirmations are received from the link layer;
- d) transmission confirmations are sent to the transport layer
- e) frame receipt confirmations are received from the link layer;
- f) frame receipt confirmations are sent to the transport layer.

If this state receives a Tx Frame parameter, then this state shall send a Tx Frame request to the link layer.

If this state receives a Frame Transmitted confirmation, then this state shall send a Transmission Status (Frame Transmitted) confirmation to the transport layer, and a Frame Transmitted parameter to the PL_OC state machine.

If this state receives an ACK/NAK Timeout confirmation from the link layer, then this state shall send a Transmission Status (ACK/NAK Timeout) confirmation to the transport layer.

If this state receives a Credit Timeout confirmation from the link layer, then this state shall send a Transmission Status (Credit Timeout) confirmation to the transport layer.

If this state receives a Done Received confirmation from the link layer, then this state shall send a Transmission Status (Done Received) confirmation to the transport layer.

If this state receives a Done Timeout confirmation from the link layer, then this state shall send a Transmission Status (Done Timeout) confirmation to the transport layer.

If this state receives an ACK Received confirmation from the link layer, then this state shall send an ACK Received confirmation to the transport layer.

If this state receives a NAK Received confirmation, then this state shall send a NAK Received confirmation to the transport layer.

If this state receives a Frame Received (ACK/NAK Balanced) or Frame Received (ACK/NAK Unbalanced) confirmation, then this state shall send the Frame Received (ACK/NAK Balanced) or Frame Received (ACK/NAK Unbalanced) confirmation to the transport layer.

If this state receives a Frame Received (SMP) or Frame Received (SMP Failure) confirmation, then this state shall send the Frame Received (SMP) or Frame Received (SMP Failure) confirmation to the transport layer.

If this state receives an ACK Transmitted confirmation, then this state shall send the ACK Transmitted confirmation to the transport layer.

If this state receives a DONE Transmitted confirmation, then this state shall send a Disable Tx Frames parameter to the PL_OC state machine.

For SSP target ports, upon entry into this state, the bus inactivity time limit timer shall be initialized and started. The timer shall be re-initialized each time a Tx Frame request sent to the link layer. If the timer times out, then this state shall send a Close Connection request to the link layer after the current Tx Frame parameter has been processed and shall ignore new Tx Frame requests. The timer stops running upon exit from this state.

For SSP target ports, upon entry into this state, the maximum connect time timer shall be initialized and started. If the timer times out, then this state shall send a Close Connection request to the link layer and shall ignore new Transmit Frame requests. The timer shall be stopped upon exit from this state.

8.4.4.2 Transition PL_PM3:Connected to PL_PM1:Idle

This transition shall occur after receiving one of the following:

- a) a Connection Closed confirmation;
- b) an Enable Disable Link Layer (Disable) confirmation; or
- c) a HARD_RESET Received confirmation.

8.4.5 PL_PM4:Wait_For_Close state

8.4.5.1 State description

This state shall wait for a Connection Closed confirmation to be received and then send an Unable to Connect (Cancel Acknowledge) parameter to the PL_OC state machine.

8.4.5.2 Transition PL_PM4:Wait_For_Close to PL_PM1:Idle

This transition shall occur after:

- a) receiving Connection Closed confirmation;
- b) receiving an Enable Disable Link Layer (Disable) confirmation; or
- c) receiving a HARD_RESET Received confirmation.