

P802.1ASds

Proposed resolutions for comments #75,
#40, and #74 against P802.1ASds-D0.1

Silvana Rodrigues (Editor)
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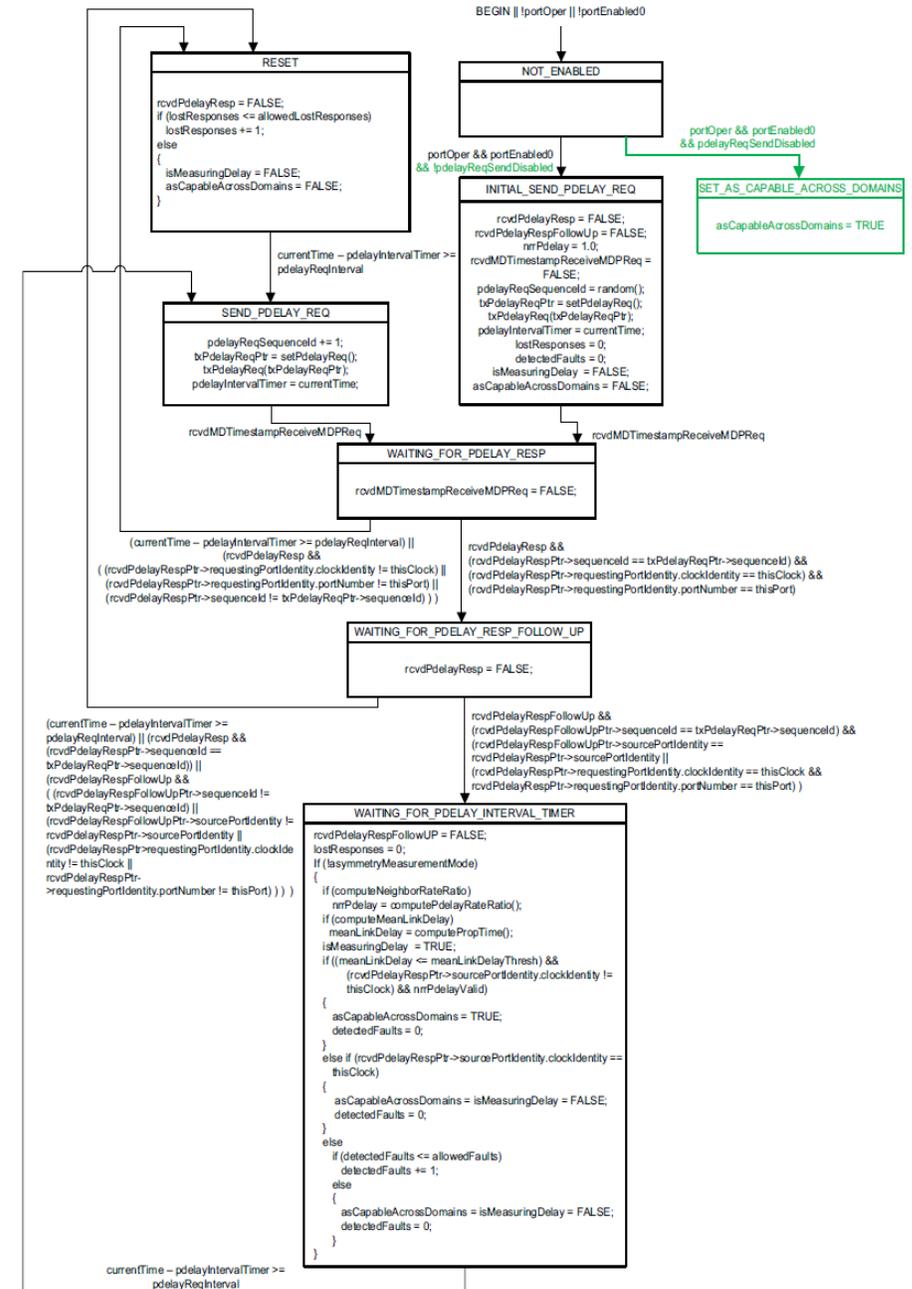
Acknowledgment

- The proposed resolutions for comments #75, #40, and #74 are the collaborative work of:
 - Geoff Garner (ADI)
 - Martin Ostertag (zhaw)
 - Olaf Mater (Marvell)
 - Adriaan Niess (Bosch)
 - Don Pannell (NXP)
 - Max Turner (Ethernovia)
 - Christian Boiger (Infineon.com)
 - Martin Mittelberger (Siemens)
 - Woojung Huh (Microchip)
 - Silvana Rodrigues (Huawei)

Pdelay Messages are initiated by the TimeReceivers only



- For 802.1ASds, the initiator for Pdelay messages is the End Station. TimeReceiver sends Pdelay_Req
- timeTranmitter does not send Pdelay_Req



MDPdelayReq state machine for timeReceiver

- pdelayReqSendDisabled is FALSE
- The state machine runs normally: AsCapableAcrossDomains is set TRUE or FALSE depending on the execution of the state machine at the “WAITING_FOR_PDELAY_INTERVAL_TIMER” state

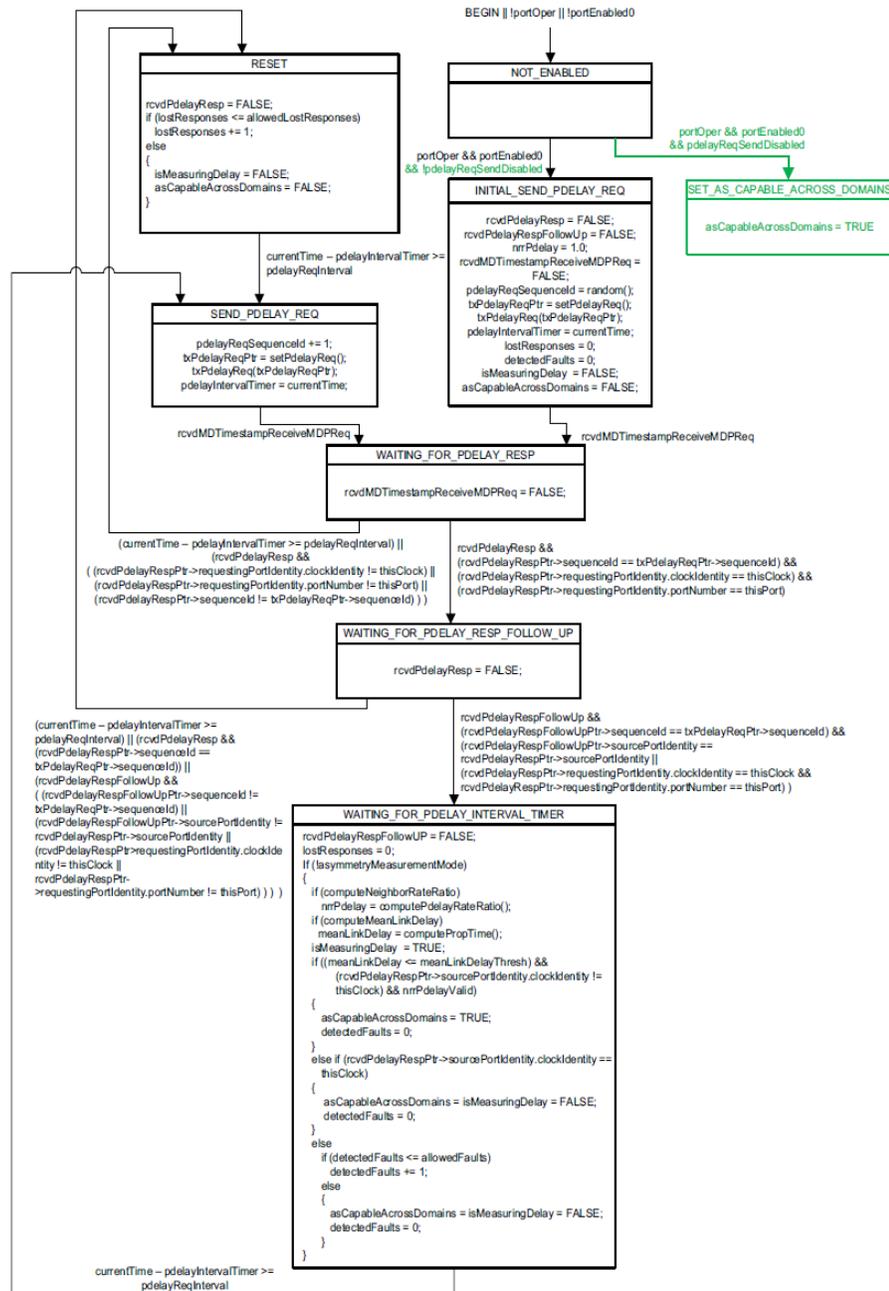


Figure 11-9—MDPdelayReq state machine

Clause 11.2.2 works for timeReceiver, no changes are needed

11.2.2 Determination of asCapable and asCapableAcrossDomains

There is one instance of the global variable asCapable (see 10.2.5.1) per PTP Port, per domain. There is one instance of the global variable asCapableAcrossDomains (see 11.2.13.12), per port, that is common across, and accessible by, all the domains.

The per-PTP Port global variable asCapable (see 10.2.5.1) indicates whether the IEEE 802.1AS protocol is operating, in this domain, on the PTP Link attached to this PTP Port, and can provide the time-synchronization performance described in B.3. asCapable is used by the PortSync entity, which is media-independent; however, the determination of asCapable is media-dependent.

The per-port global variable asCapableAcrossDomains is set by the MDPdelayReq state machine (see 11.2.19 and Figure 11-9). For a port attached to a full-duplex point-to-point PTP Link, asCapableAcrossDomains shall be set to TRUE if and only if it is determined, via the peer-to-peer delay mechanism, that the following conditions hold for the port:

- a) The port is exchanging peer delay messages with its neighbor,
- b) The measured delay does not exceed meanLinkDelayThresh,
- c) The port does not receive multiple Pdelay_Resp or Pdelay_Resp_Follow_Up messages in response to a single Pdelay_Req message, and
- d) The port does not receive a response from itself or another PTP Port of the same PTP Instance.

NOTE 1—If a PTP Instance implements only domain 0 and the MDPdelayReq and MDPdelayResp state machines are invoked on domain 0 (see 11.2.19), asCapableAcrossDomains is still set by the MDPdelayReq state machine.

The default value of meanLinkDelayThresh shall be set as specified in Table 11-1.

- At the timeReceiver port, if items a), b), c), and d) are satisfied then asCapableAcrossDomains is TRUE
- At the timeReceiver port, if items a), b), c), and d) are not satisfied then asCapableAcrossDomains is FALSE

Table 11-1—Value of meanLinkDelayThresh for various links

Link	Value of meanLinkDelayThresh (ns) (see NOTE)
100BASE-TX, 1000BASE-T	800 ₁₀
100BASE-FX, 1000BASE-X	FFFF FFFF FFFF FFFF FFFF FFFF ₁₆
NOTE—The actual propagation delay for 100BASE-TX and 1000BASE-T links is expected to be smaller than the above respective threshold. If the measured mean propagation delay (i.e., meanLinkDelay; see 10.2.5.8) exceeds this threshold, it is assumed that this is due to the presence of equipment that does not implement gPTP. For 100BASE-FX and 1000BASE-X links, the actual propagation delay can be on the order of, or larger than, the delay produced by equipment that does not implement gPTP; therefore, such equipment cannot be detected by comparing measured propagation delay with a threshold. In this case, meanLinkDelayThresh is set to the largest possible value (i.e., all 1s).	

The per-PTP Port, per-domain global variable asCapable shall be set to TRUE if and only if the following conditions hold:

- e) The value of asCapableAcrossDomains is TRUE, and
- f) One of the following conditions holds:
 - 1) The value of neighborGptpCapable for this PTP Port is TRUE, or
 - 2) The value of domainNumber is zero, and the value of sdoId for peer delay messages received on this PTP Port is 0x100.

- At the timeReceiver port, if asCapableAcrossDomains is TRUE, then item e) is satisfied.
- Item f) 1) is satisfied because both GptpCapableTransmit and GptpCapableReceive state machines shall be disabled, and according to Asdm, neighborGptpCapable is set to TRUE
- Therefore, asCapable is set to True
- At the timeReceiver port, if asCapableAcrossDomains is FALSE, the asCapable is set to FALSE, as item e) is not satisfied

MDPdelayReq state machine for timeTransmitter

- pdelayReqSendDisabled is TRUE
- The state machine goes to “SET_AS_CAPABLE_ACROSS_DOMAINS” state and sets AsCapableAcrossDomains to TRUE
- timeTransmitter does not send Pdelay_Req,
 - Pdelay_Resp are not received at the timeTransmitter for HDE
 - No need to check whether or not Pdelay_Resp are received or meanLinkDelayThresh is exceeded, as timeTransmitter port does not measure meanLinkDelay

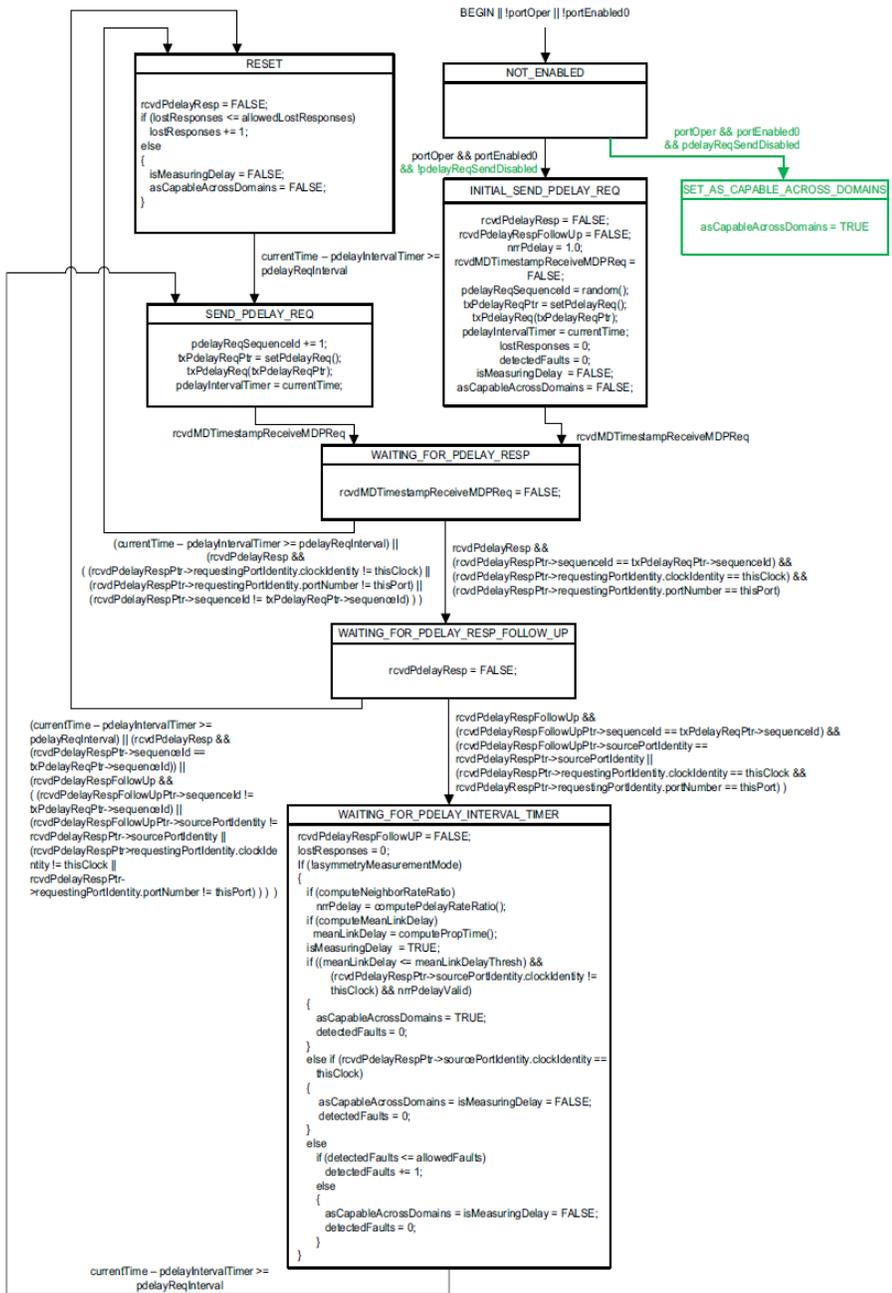


Figure 11-9—MDPdelayReq state machine

Clause 11.2.2 works for timeTransmitter

11.2.2 Determination of asCapable and asCapableAcrossDomains

There is one instance of the global variable asCapable (see 10.2.5.1) per PTP Port, per domain. There is one instance of the global variable asCapableAcrossDomains (see 11.2.13.12), per port, that is common across, and accessible by, all the domains.

The per-PTP Port global variable asCapable (see 10.2.5.1) indicates whether the IEEE 802.1AS protocol is operating, in this domain, on the PTP Link attached to this PTP Port, and can provide the time-synchronization performance described in B.3. asCapable is used by the PortSync entity, which is media-independent; however, the determination of asCapable is media-dependent.

The per-port global variable asCapableAcrossDomains is set by the MDPdelayReq state machine (see 11.2.19 and Figure 11-9). For a port attached to a full-duplex point-to-point PTP Link, asCapableAcrossDomains shall be set to TRUE if and only if it is determined, via the peer-to-peer delay mechanism, that the following conditions hold for the port:

- a) The port is exchanging peer delay messages with its neighbor,
- b) The measured delay does not exceed meanLinkDelayThresh,
- c) The port does not receive multiple Pdelay_Resp or Pdelay_Resp_Follow_Up messages in response to a single Pdelay_Req message, and
- d) The port does not receive a response from itself or another PTP Port of the same PTP Instance.

NOTE 1—If a PTP Instance implements only domain 0 and the MDPdelayReq and MDPdelayResp state machines are invoked on domain 0 (see 11.2.19), asCapableAcrossDomains is still set by the MDPdelayReq state machine.

The default value of meanLinkDelayThresh shall be set as specified in Table 11-1.

- At the timeTransmitter port, asCapableAcrossDomains is set to TRUE by the state machine
- At the timeTransmitter port, items a), b), c), and d) are not applicable, as the state machine sets asCapableAcrossDomains to TRUE. Need a small modification of clause 11.2.2, see slide 9.

Table 11-1—Value of meanLinkDelayThresh for various links

Link	Value of meanLinkDelayThresh (ns) (see NOTE)
100BASE-TX, 1000BASE-T	800 ₁₀
100BASE-FX, 1000BASE-X	FFFF FFFF FFFF FFFF FFFF ₁₆

NOTE—The actual propagation delay for 100BASE-TX and 1000BASE-T links is expected to be smaller than the above respective threshold. If the measured mean propagation delay (i.e., meanLinkDelay; see 10.2.5.8) exceeds this threshold, it is assumed that this is due to the presence of equipment that does not implement gPTP. For 100BASE-FX and 1000BASE-X links, the actual propagation delay can be on the order of, or larger than, the delay produced by equipment that does not implement gPTP; therefore, such equipment cannot be detected by comparing measured propagation delay with a threshold. In this case, meanLinkDelayThresh is set to the largest possible value (i.e., all 1s).

The per-PTP Port, per-domain global variable asCapable shall be set to TRUE if and only if the following conditions hold:

- e) The value of asCapableAcrossDomains is TRUE, and
- f) One of the following conditions holds:
 - 1) The value of neighborGptpCapable for this PTP Port is TRUE, or
 - 2) The value of domainNumber is zero, and the value of sdoId for peer delay messages received on this PTP Port is 0x100.

- At the timeTransmitter port, asCapableAcrossDomains is set to TRUE, item e) is satisfied.
- Item f) 1) is satisfied because both GptpCapableTransmit and GptpCapableReceive state machines shall be disabled, and according to Asdm, neighborGptpCapable is set to TRUE
- Therefore, asCapable is set to True
- At the timeTransmitter port, asCapableAcrossDomains and asCapable are always TRUE for HDE

MDPdelayReq state machine

when pdelayReqSendDisabled is TRUE at the timeReceiver and at the timeTransmitter

- pdelayReqSendDisabled is TRUE
- The state machine goes to “SET_AS_CAPABLE_ACROSS_DOMAINS” state and sets AsCapableAcrossDomains to TRUE
- timeTransmitter and timeReceiver do not send Pdelay_Req
 - Transport-specific peer-to-peer delay mechanism is not used
 - No need to check whether or not Pdelay_Resp are received or meanLinkDelayThresh is exceeded, as there is no measurement done for meanLinkDelay

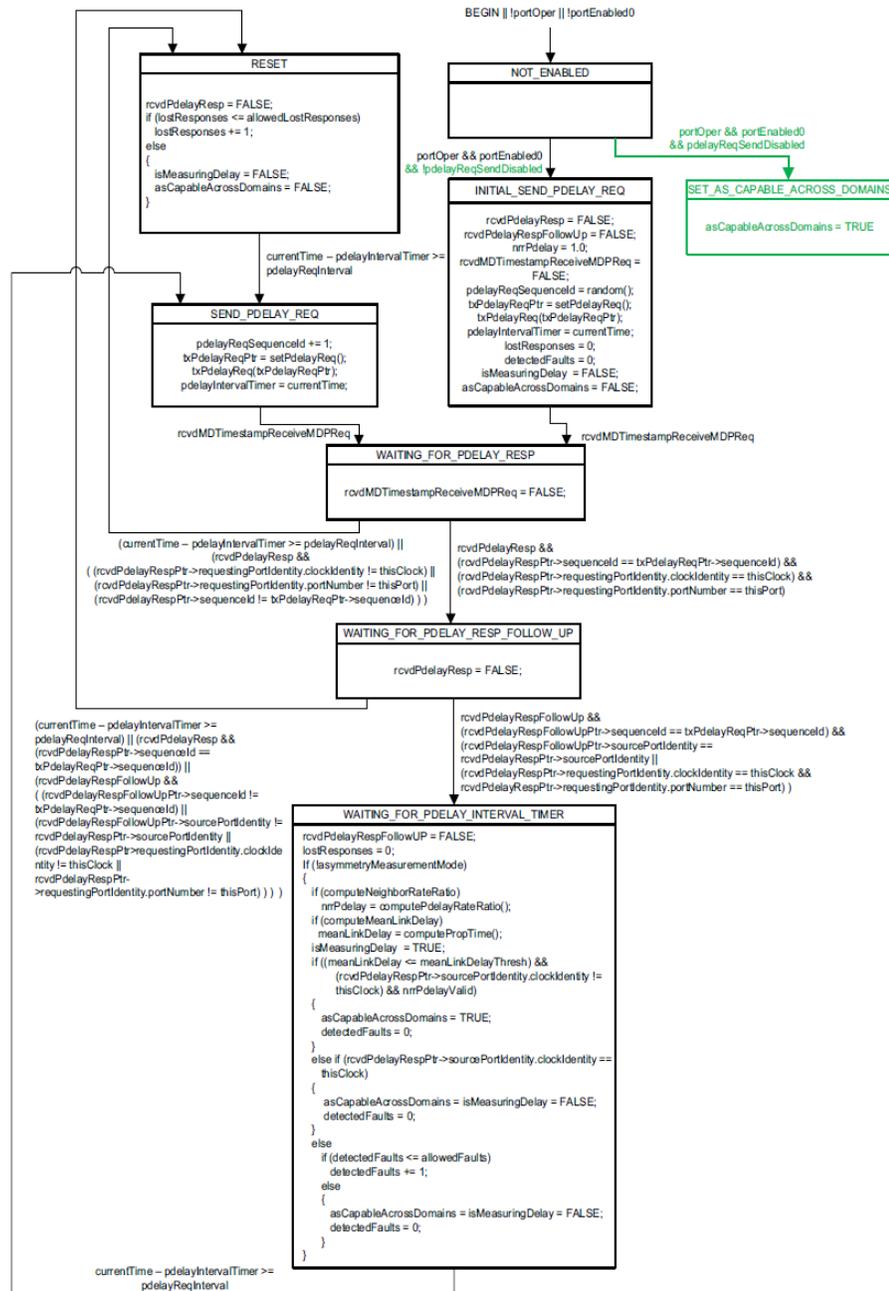


Figure 11-9—MDPdelayReq state machine

Clause 11.2.2 works for timeTransmitter and timeReceiver when pdelayReqSendDisabled is TRUE for both

11.2.2 Determination of asCapable and asCapableAcrossDomains

There is one instance of the global variable asCapable (see 10.2.5.1) per PTP Port, per domain. There is one instance of the global variable asCapableAcrossDomains (see 11.2.13.12), per port, that is common across, and accessible by, all the domains.

The per-PTP Port global variable asCapable (see 10.2.5.1) indicates whether the IEEE 802.1AS protocol is operating, in this domain, on the PTP Link attached to this PTP Port, and can provide the time-synchronization performance described in B.3. asCapable is used by the PortSync entity, which is media-independent; however, the determination of asCapable is media-dependent.

The per-port global variable asCapableAcrossDomains is set by the MDPdelayReq state machine (see 11.2.19 and Figure 11-9). For a port attached to a full-duplex point-to-point PTP Link, asCapableAcrossDomains shall be set to TRUE if and only if it is determined, via the peer-to-peer delay mechanism, that the following conditions hold for the port:

- a) The port is exchanging peer delay messages with its neighbor,
- b) The measured delay does not exceed meanLinkDelayThresh,
- c) The port does not receive multiple Pdelay_Resp or Pdelay_Resp_Follow_Up messages in response to a single Pdelay_Req message, and
- d) The port does not receive a response from itself or another PTP Port of the same PTP Instance.

NOTE 1—If a PTP Instance implements only domain 0 and the MDPdelayReq and MDPdelayResp state machines are invoked on domain 0 (see 11.2.19), asCapableAcrossDomains is still set by the MDPdelayReq state machine.

The default value of meanLinkDelayThresh shall be set as specified in Table 11-1.

- At the timeTransmitter and timeReceiver ports, asCapableAcrossDomains is set to TRUE by the state machine (as **pdelayReqSendDisabled is TRUE on both ports**)
- At the timeTransmitter port and timeReceiver port (**when pdelayReqSendDisabled is TRUE**), items a), b), c), and d) are not applicable, as the state machine sets asCapableAcrossDomains to TRUE. Need a small modification of clause 11.2.2, see slide 9.

Table 11-1—Value of meanLinkDelayThresh for various links

Link	Value of meanLinkDelayThresh (ns) (see NOTE)
100BASE-TX, 1000BASE-T	800 ₁₀
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NOTE—The actual propagation delay for 100BASE-TX and 1000BASE-T links is expected to be smaller than the above respective threshold. If the measured mean propagation delay (i.e., meanLinkDelay; see 10.2.5.8) exceeds this threshold, it is assumed that this is due to the presence of equipment that does not implement gPTP. For 100BASE-FX and 1000BASE-X links, the actual propagation delay can be on the order of, or larger than, the delay produced by equipment that does not implement gPTP; therefore, such equipment cannot be detected by comparing measured propagation delay with a threshold. In this case, meanLinkDelayThresh is set to the largest possible value (i.e., all 1s).	

The per-PTP Port, per-domain global variable asCapable shall be set to TRUE if and only if the following conditions hold:

- e) The value of asCapableAcrossDomains is TRUE, and
- f) One of the following conditions holds:
 - 1) The value of neighborGptpCapable for this PTP Port is TRUE, or
 - 2) The value of domainNumber is zero, and the value of sdoId for peer delay messages received on this PTP Port is 0x100.

- At the timeTransmitter port and timeReceiver port (**when pdelayReqSendDisabled is TRUE**), asCapableAcrossDomains is set to TRUE, item e) is satisfied.
- Item f) 1) is satisfied because both GptpCapableTransmit and GptpCapableReceive state machines shall be disabled, and according to Asdm, neighborGptpCapable is set to TRUE
- Therefore, asCapable is set to True
- At the timeTransmitter port and timeReceiver port (**when pdelayReqSendDisabled is TRUE**), asCapableAcrossDomains and asCapable are always TRUE

Resolution for Comment #75 and #40

19.2.2 Determination of asCapable and asCapableAcrossDomains

Delete the editor's note and add the following text:

“Determination of asCapable and asCapableAcrossDomains is described in 11.2.2.”

Modify 11.2.2 as follows (green - text is added, red – text that is removed)

There is one instance of the global variable asCapable (see 10.2.5.1) per PTP Port, per domain. There is one instance of the global variable asCapableAcrossDomains (see 11.2.13.12), per port, that is common across, and accessible by, all the domains.

The per-PTP Port global variable asCapable (see 10.2.5.1) indicates whether the IEEE 802.1AS protocol is operating, in this domain, on the PTP Link attached to this PTP Port, and can provide the **required** time-synchronization **performance requirement performance described in B.3**. asCapable is used by the PortSync entity, which is media-independent; however, the determination of asCapable is media-dependent.

The per-port global variable asCapableAcrossDomains is set by the MDPdelayReq state machine (see 11.2.19 and Figure 11-9). For a port attached to a full-duplex point-to-point PTP Link **or to an HDE link**, asCapableAcrossDomains shall be set to TRUE if and only if **either**:

1) **It ~~is~~** is determined, via the peer-to-peer delay mechanism, that the following conditions hold for the port:

- a) The port is exchanging peer delay messages with its neighbor,
- b) The measured delay does not exceed meanLinkDelayThresh,
- c) The port does not receive multiple Pdelay_Resp or Pdelay_Resp_Follow_Up messages in response to a single Pdelay_Req message, and
- d) The port does not receive a response from itself or another PTP Port of the same PTP Instance.

or:

2) **pdelayReqSendDisabled is set to TRUE**

Editor's note: Note that the rest of Clause 11.2.2 are kept as in 802.1AS-2020 (except for renumbering the items e) and f)), it was not copied here as the font would be too small to fit in one slide.

Modify the note in 10.2.5.1 as follows:

“...It is computed by the MDPdelayReq state machine (see 11.2.19). For full-duplex point-to-point **and HDE** links (see 11), asCapableAcrossDomains is used ...”

Resolution for Comment #74

19.2.13.12 asCapableAcrossDomains

Delete the editor's note and add the following text:

“asCapableAcrossDomains is described in 11.2.13.12.”

Modify 11.2.13.12 as follows (green - text is added)

A Boolean that is TRUE if and only if **either: 1)** conditions a) through d) of 11.2.2 are satisfied, **or 2) pdelayReqSendDisabled is set to TRUE** . This Boolean is set by the MDPdelayReq state machine and is used in determining asCapable for a port (see 11.2.2). There is one instance of this variable for all the domains (per port). The variable is accessible by all the domains. When only one domain is active, asCapableAcrossDomains is equivalent to the variable asCapable (see 10.2.5.1).

Thank you!