

P802.1AS-2025-Rev: syncGrandMasterIdentity and syncStepsRemoved propagation

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Introduction

- 802.1AS-2025-Rev-D0.2 comment 50:
with Drift_Tracking TLV usage, the global variables syncGrandMasterIdentity and syncStepsRemoved are copied to globals regardless of whether the receiving PTP Port is in TimeReceiver portState so a transmitting port (and internal usage) would randomly get the values from one of the ports that receive Sync / Follow_up messages.
- This slide set discusses the issues and options to address
- Underlying documents:
 - [AS]: 802.1AS-2025
 - [ASRev]: P802.1AS-2025 Rev/D0.2

PTP Port states observations (single PTP Instance)

- Can be assigned by BTCA or external port configuration
- At most one port is a TimeReceiver
- Ports that receive sync messages but are not the selected TimeReceiver are typically PassivePort
- A PassivePort typically connects to a TimeTransmitter

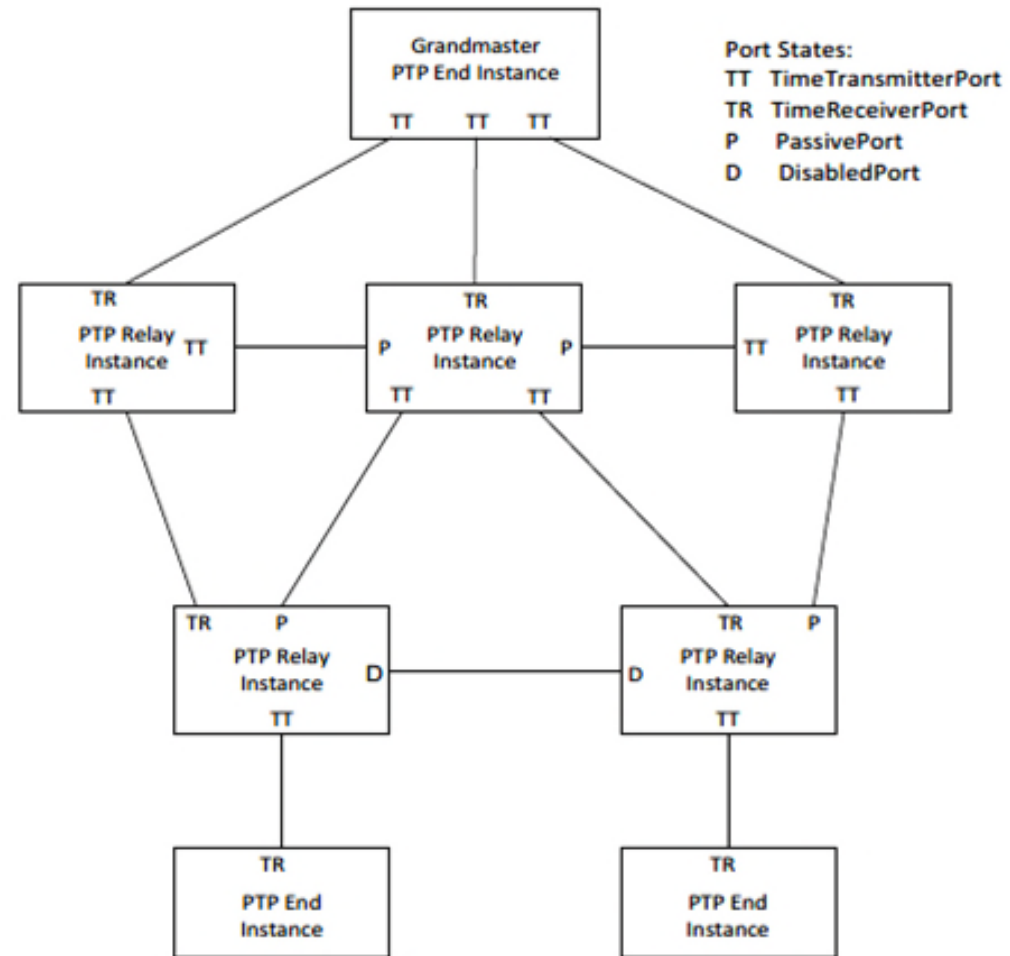
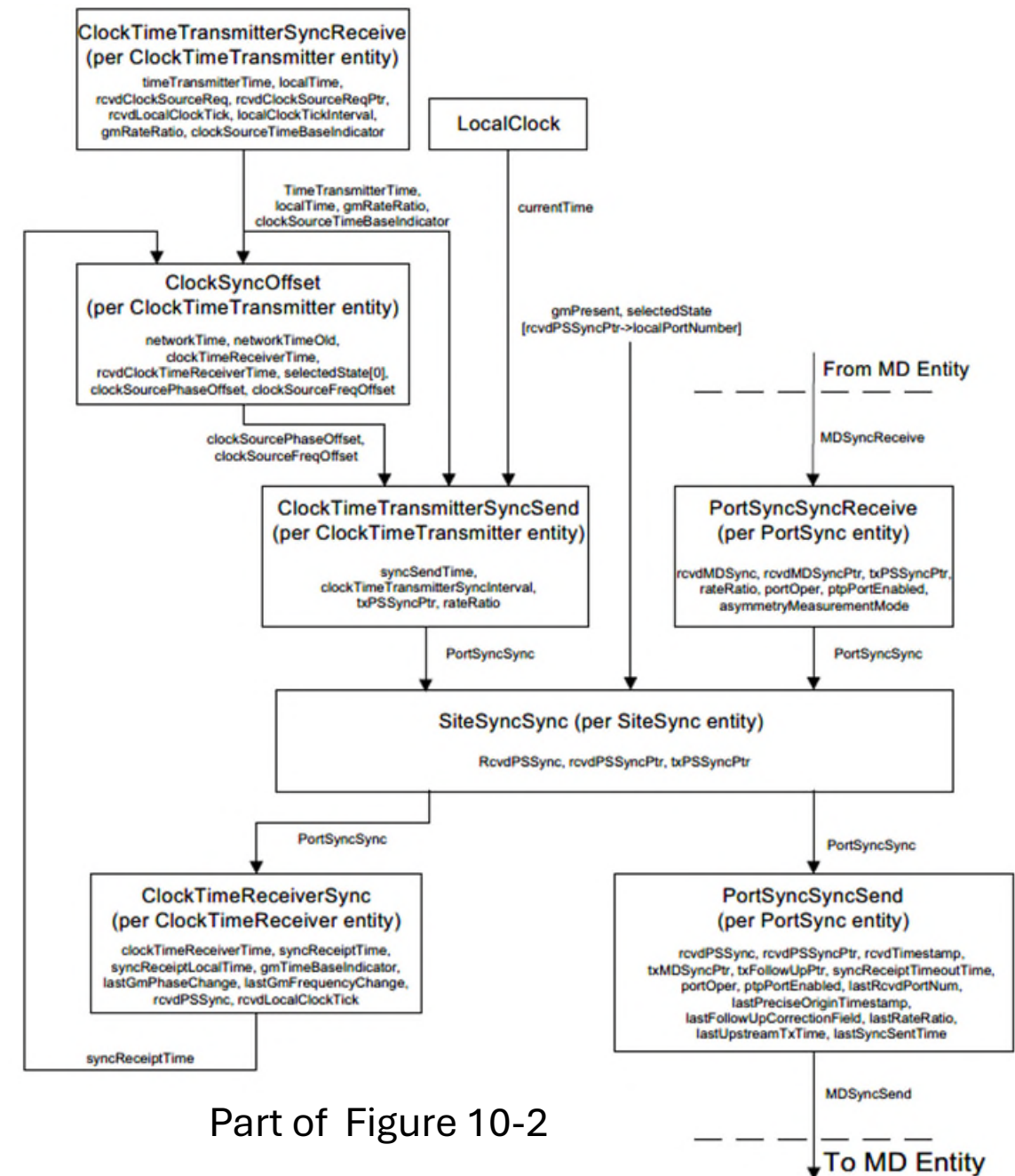


Figure 10-11—Example timeTransmitter/timeReceiver hierarchy of PTP Instances

Port State awareness in time synchronization state machines

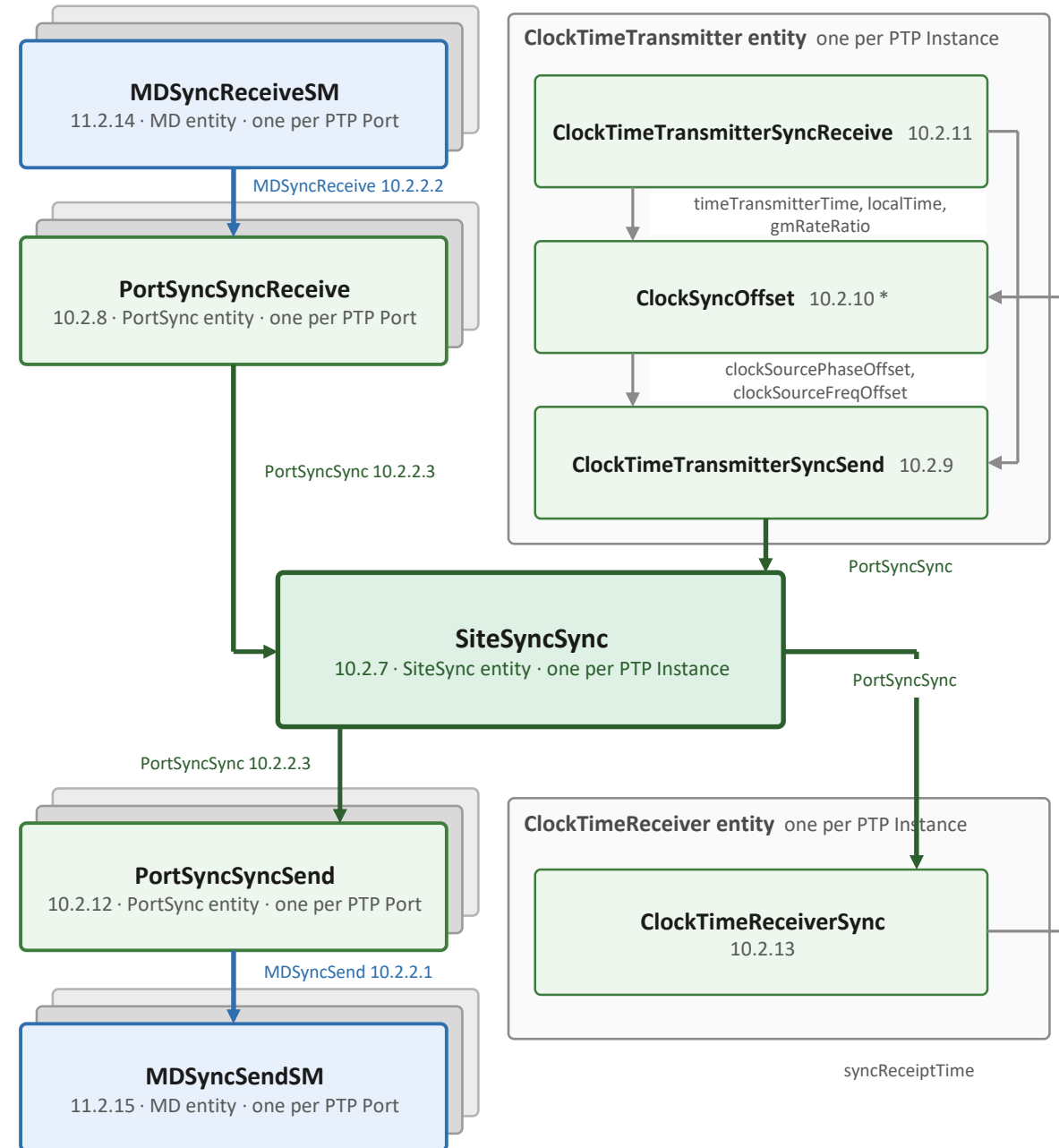
- Only the SiteSyncSync state machine is acting on the basis of Port State
 - It checks if $(\text{selectedState}[\text{rcvdPSSyncPtrSSS} \rightarrow \text{localPortNumber}] == \text{TimeReceiverPort})$ as a qualifier to entering the RECEIVING_SYNC state and forwarding data from the incoming PortSyncSyncSync structure to all the PortSyncSyncSend and ClockTimeRecieveSync SMs.
- The PortSyncSyncReceive and related MDSyncReceiveSM do not take Port State into account
 - Data from all incoming Sync messages is processed and forwarded towards the SiteSyncSync SM



Part of Figure 10-2

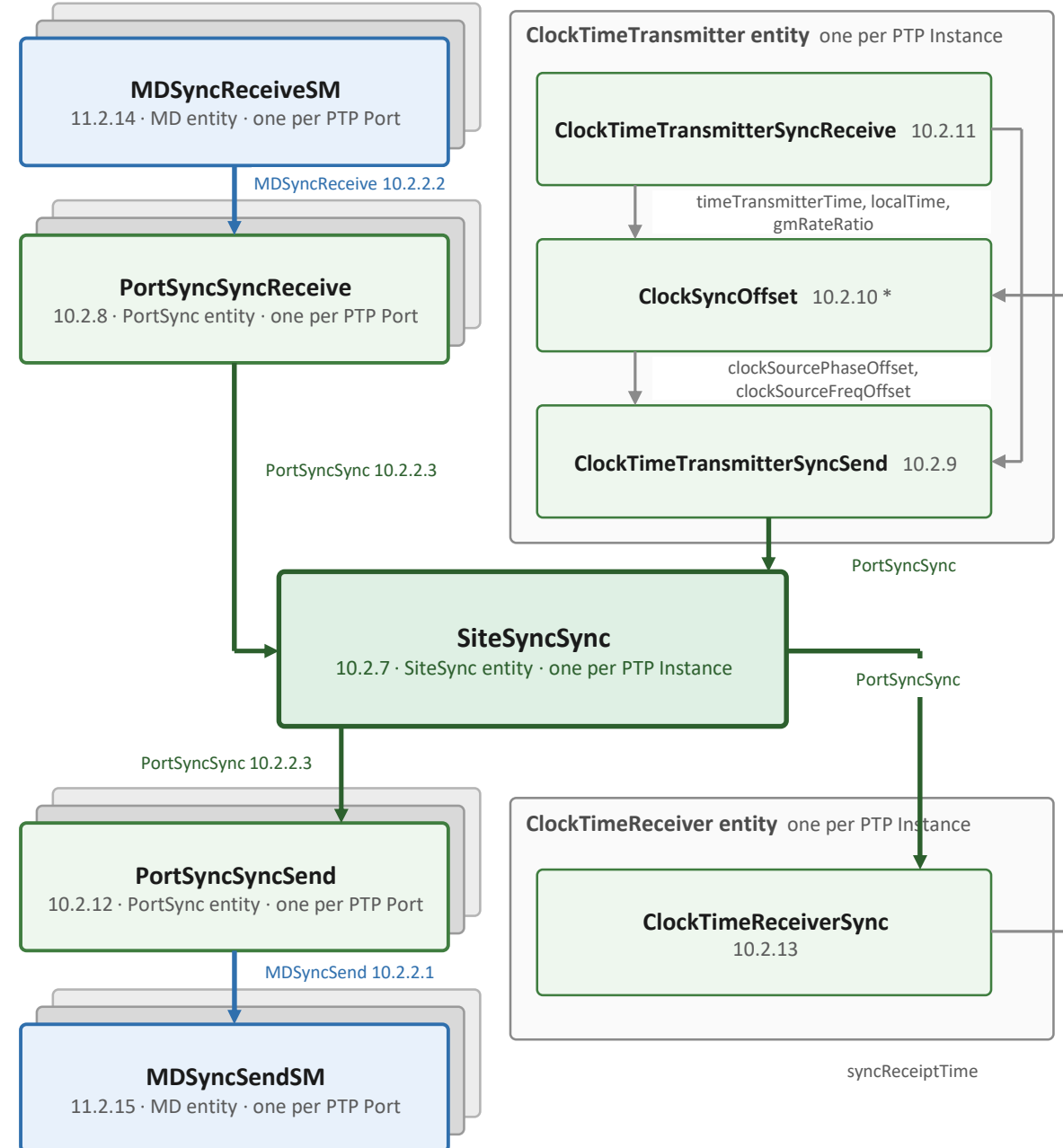
Drift tracking implementation

- In 11.2.13.2.1 setMDSyncReceiveMDSR() f):
 - 1) syncGrandmasterIdentity (see 10.2.4.26) is set equal to the syncGrandmasterIdentity of the Drift_Tracking TLV.
 - 2) If the value of syncStepsRemoved of the Drift_Tracking TLV is not equal to 0xFFFF, syncStepsRemoved (see 10.2.4.27) is set equal to the value of syncStepsRemoved of the Drift_Tracking TLV plus one. If the value of syncStepsRemoved of the Drift_Tracking TLV is equal to 0xFFFF, syncStepsRemoved (see 10.2.4.27) is set equal to 0xFFFF.
- In 11.2.14.2.3 setFollowUp() g):
 - 1) syncGrandmasterIdentity is set equal to the value of the global variable syncGrandmasterIdentity (see 10.2.4.26).
 - 2) syncStepsRemoved is set equal to the value of the global variable syncStepsRemoved (see 10.2.4.27).
- The MDSyncReceiveSM does not take Port state into effect, so a Sync message received on any port (not only the TimeReceiver port) will update the globals.
- The value sent by the MDSyncSendSM could contain a combination of Sync data received on one port (the TimeReceiver port) and globals set from Drift_Tracking TLV received on a different port (such as a Passive or Disabled port)



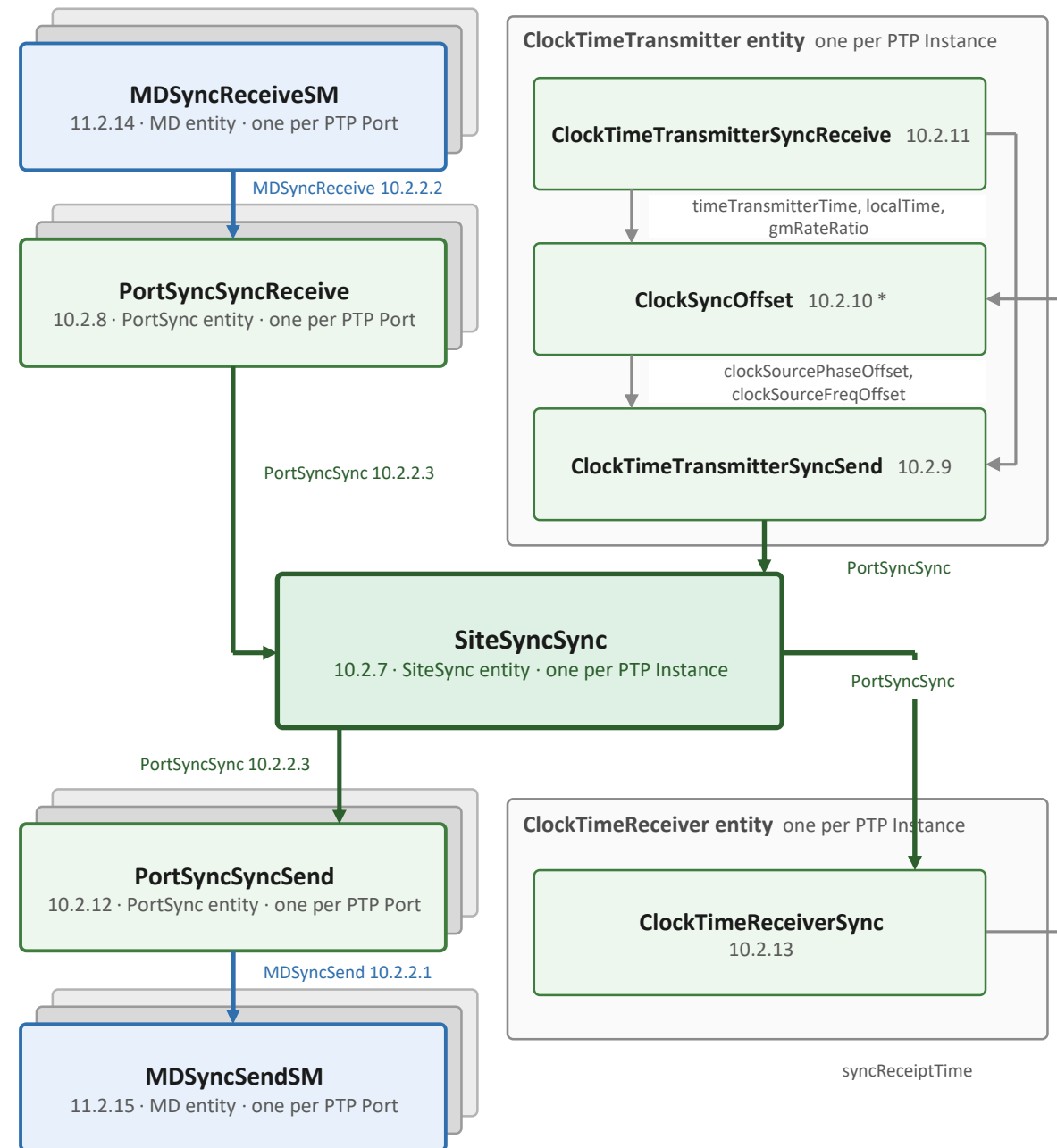
Possible solution 1: MDSyncReceiveSM to check Port State prior to assigning data to globals

- Modify 11.2.13.2.1 f) and g), add “If the Port State of the PTP Port is TimeReceiver”
- Pros
 - Likely simplest solution
- Cons
 - Potential race condition when clock source changes
 - Inconsistent with structure of the rest of the state machines
 - Does not account for drift between the GM clock source and GM local clock
 - Does not allow Drift Tracking support by other MD types



Possible solution 2: Transfer the syncGrandmasterIdentity and syncStepsRemoved to the SiteSyncSync SM and have the SiteSyncSync choose the source

- Modify MDSyncReceive, PortSyncSync, and MDSyncSend structures to add the Drift_Tracking data
- Transfer the data along the path from the MDSyncReceiveSM to the SiteSyncSync
- The SiteSyncSync will transfer the data from the current TimeReceiver
- Pros
 - Consistent with structure of the rest of the state machines
 - Allows adding Drift Tracking support to other MD types and to drift between the GM clock source and GM local clock
- Cons
 - May require touching every MD clause to set Drift Tracking fields in the MDSyncReceive structure to default values.
 - More complicated change
- Pro/Con:
 - Moves Drift Tracking from Clause 11 to Clause 10 (which depends on your opinion may be good or bad)
 - How much of Drift Tracking to move can be discussed



Possible solution 3: Add optional “MD-specific” or “feature-specific” additions to the MDSyncReceive, PortSyncSync, and MDSyncSend structures

- Modify MDSyncReceive, PortSyncSync, and MDSyncSend structures to allow adding either “MD_specific” or “feature-specific” additions
- Transfer the data along the path from the MDSyncReceiveSM to the SiteSyncSync
- If the optional “MD-specific” or “feature-specific” fields are present, the SiteSyncSync will transfer the data from the current TimeReceiver
- Pros
 - Consistent with structure of the rest of the state machines
 - Allows adding Drift Tracking support to other MD types and to drift between the GM clock source and GM local clock
 - Potentially allows supporting other future data
- Cons
 - More complicated change
- Pro / Con
 - Need to decide where Drift Tracking lives (as this approach allows making it mostly independent of a specific MD clause if desired)

