SMD-S ENCODING

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IEEE 802.3br SPECIFICATION CONCERN

We have some concern about Verifying of preemption operation Specification related to

- SMDS_ENCODE
- send_r
- IDLE_TX_PROC → START_PREAMBLE

According to our understanding the IEEE802.3br DF2.3 specification can be interpreted that a preemptable mPacket can be starting (initial fragment) with SFD (0xD5) and continued with SMD-C for a special case during Verification check

Expectation is that an preemptable mPacket starting with SFD is never preempt, when at the start the pActive was FALSE

AMBIGUOUS SPECIFICATION

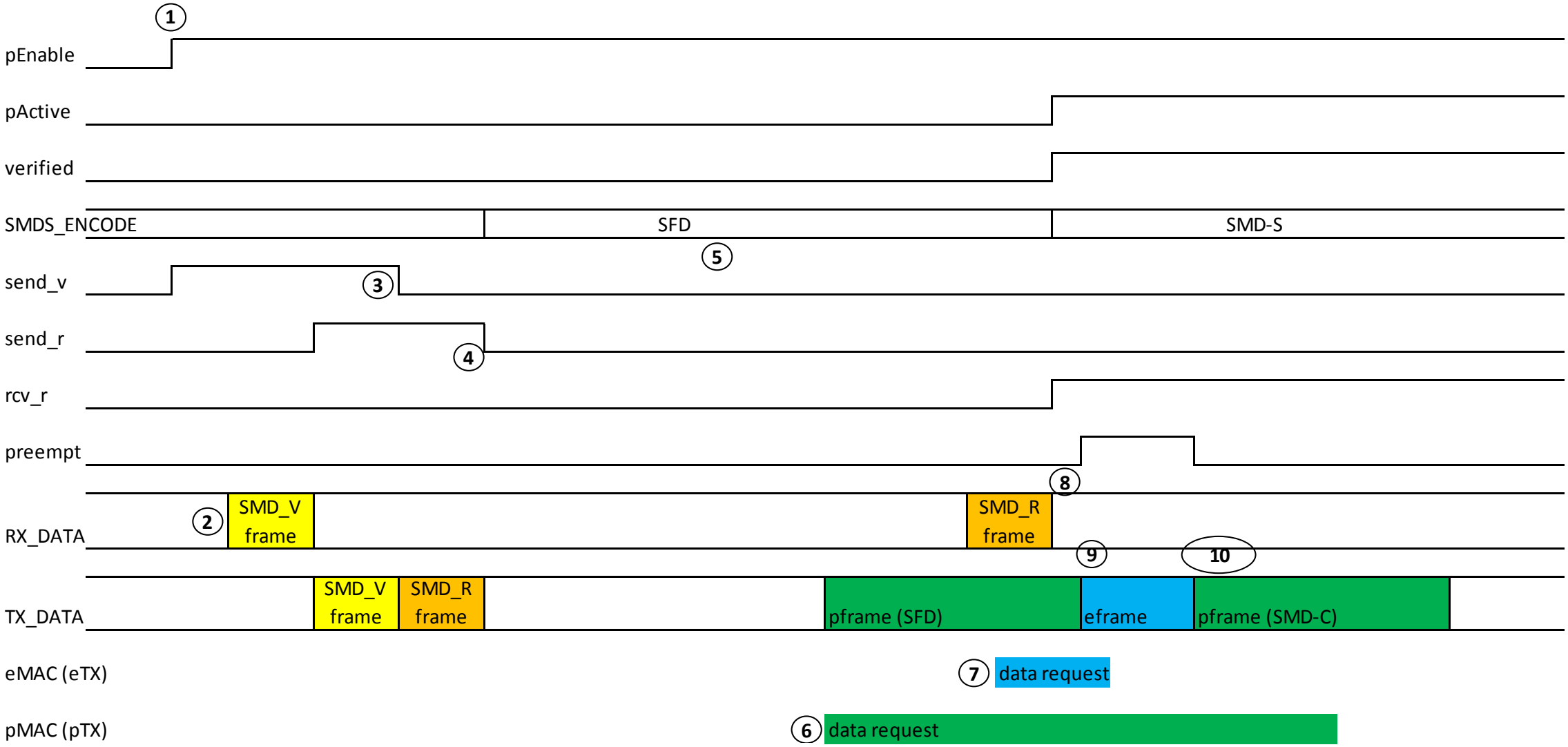
The definition of SMDS_ENCODE permitted to set SMD-S to 0xD5 (i.e. SFD) when the parameter pActive is FALSE

pActive is TRUE when preemption capability is enabled and the link verification is completed

Therefore we see the possibility that the problem mentioned on the previous slide is possible when a preemptable frame is staring short before the pActive changed from FALSE to TRUE

- For details see the timing chart on the next slide

TIMING CHART



TIMING CHART EXPLANATION

1. The parameter pEnable is set to activate the pre-emption capability
2. The MAC Merge layer is receiving a SMD-V frame
3. The MAC Merge layer starts to send for its part the SMD-V frame, after successful transmission send_v is set to FALSE
4. The reception of the SMD-V frame (2) will cause the transmission of an SMD-R frame of this MAC layer instance
   By successful transmission send_r is set to FALSE
5. The SMDS_ENCODE will encode 0xD5 because pActive is still FALSE
6. pMAC has data to transmit, the IDLE_TX_PROC to STAR_PREAMBLE is TRUE and due to the SMDS_ENCODE the pframe is starting to transmit a preemptable frame with 0xD5 (SFD)
7. eMAC has now also data to transmit, but because pActive is still FALSE the data will not be transmitted and pframe is not interrupted
8. In meanwhile the MAC merge layer received the SMD-R, this reception will set pActive to TRUE
9. As pActive is TRUE it is now allowed by specification to preempt frames, the current pframe has still enough data (fragSize) to transmit hence the pframe is interrupted and the express frame (eframe) is transmitted
10. After completion of the express frame the pframe transmission continued with SMD-C

An mPacket is transmitted with incorrect SMD coding

PROPOSAL

The specification needs in our opinion some change to avoid such a scenario

Our proposal is following:

- The parameter pActive should be FALSE while a preemptable frame is ongoing during verification
  - set to TRUE after completion of the started pframe transmission

OR

- The preemptable frame should not be transmitted during the Verification handshake
  - prohibit to set pTX during verification process

APPENDIX

DEFINITION

pActive

- Boolean variable that is TRUE when the preemption capability is active and FALSE otherwise. The value of pActive is pEnable * (verified + disableVerify).

pEnable

- Boolean variable that is set TRUE to enable the preemption capability and set FALSE to disable the preemption capability.

disableVerify

- A Boolean variable that is set by management to control verification of preemption operation (see 99.4.3). TRUE disables verification and FALSE enables verification.

verified

- Boolean that is set TRUE when the ability of the link to support the preemption capability has been verified and FALSE when the INIT_VERIFICATION state of the VERIFY State diagram is entered.

SMDS_ENCODE(frame_cnt)

- Returns an 8-bit vector with the SMD encoding for an SMD-S with frame count of frame_cnt if pActive is TRUE. Otherwise it returns a vector containing 0xD5 (i.e. SFD). Consumes 8 pPLS_DATA.request primitives containing the SFD.

preempt

- Boolean that is TRUE when a preemptable packet is to be preempted. The value of preempt is: pActive * (eTx=TRUE + hold=TRUE) * fragSize>=(minFrag * (1+ addFragSize) – 4) * MIN_REMAIN

MAC MERGE SUBLAYER STATUS

The MAC Merge sublayer could have following status

- inactive
- active

Definition

- inactive:
  - When preemption capability is inactive, the MAC Merge sublayer does not prempt transmission of preemptable packet even if express traffic becomes available.
- active
  - When preemption capability is active, the MAC Merge sublayer allows frames provided over the express MAC service interface (express traffic) or the MMSI service primitives to interrupt transmission of preemptable frames provided over the preemptable MAC service interface (preemptable traffic).