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Title: **Transport Protocol and State Machine**

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Abstract: This contribution asks many questions and suggests modifications to the transport protocol (MIH_NET_SAP) and the acknowledgement state machine of clause 8.2 draft D5 April 2007.

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Subjects for discussion

- The MIH_NET_SAP as currently defined in D5 April 2007
  - Needs work
    - What is its function?
    - How is MIH_TP_Data.response to be implemented?
  - Contains ambiguities
    - What is the meaning of Reliable Delivery Flag?
  - Duplicates functionality
    - Is it repeating the reliable transport function?
    - Is it repeating the acknowledgement function defined in clause 8.2?
- MIH Protocol acknowledgement operation and state machines

Needs Work

- What is the MIH_NET_SAP's function?
  - Is it to provide a generic service access point (SAP) for the transmission of MIH messages?
  - Is it hiding the actual method of transport from the MIH?
    - If so, then why
      - Reason for Transport Type (L2 or L3)?
      - Reliable Delivery Flag
        - » Option of the transport type selected?
      - Transport Destination and Source Addresses
        - » Dependent on Transport Type chosen
- How is MIH_TP_Data.response to be implemented?
  - Conclusion:
    - Delete all references to MIH-TP-Data.response primitive

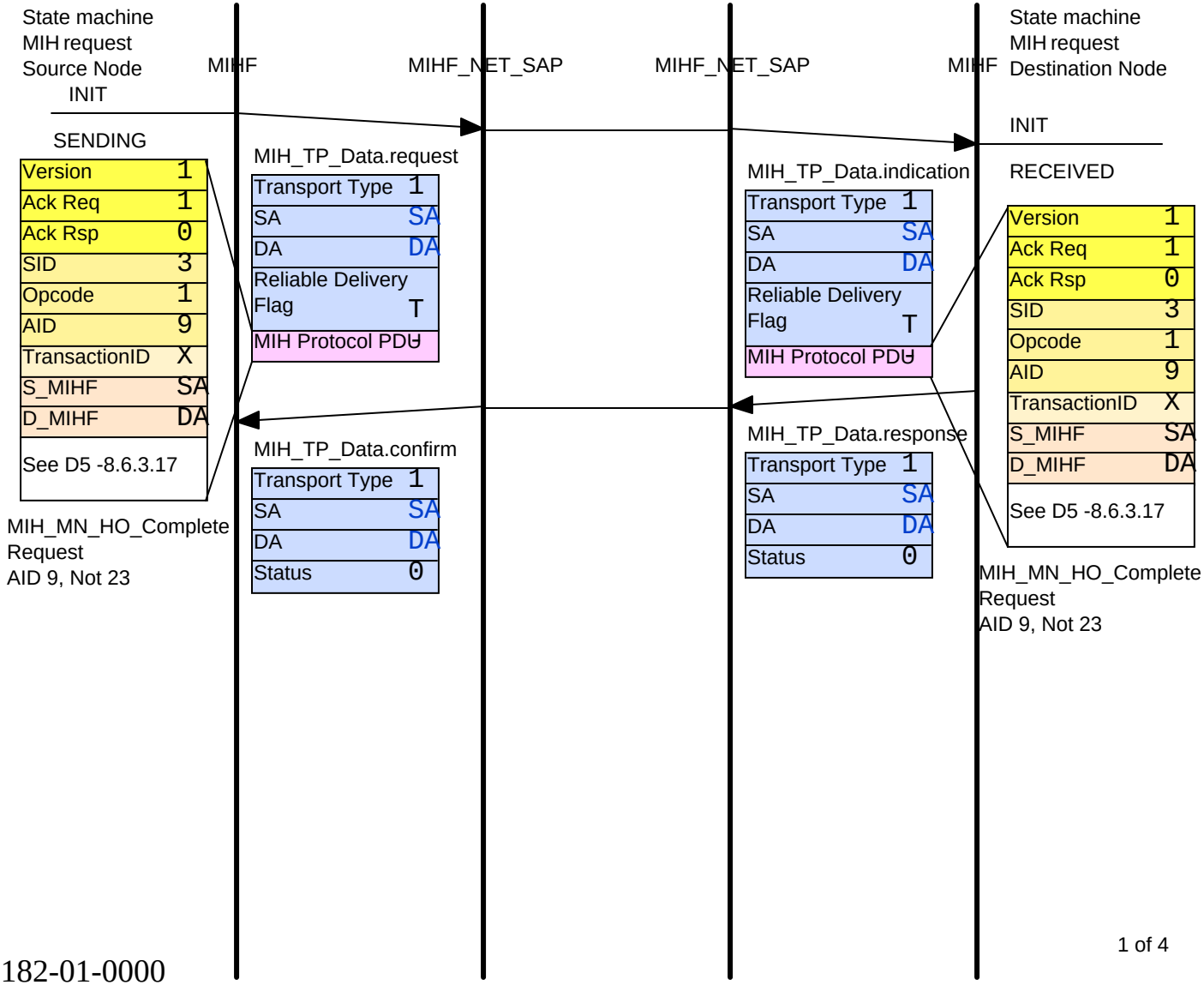
Contains ambiguities

- What is the meaning of Reliable Delivery Flag?
  - Does it indicate that the MIH is requesting a reliable transport?
  - Does it indicate that the MIH is requesting a feature in the transport type chosen?
  - Is the reliable delivery Flag
    - Used in combination with the MIH protocol acknowledgement operation?
    - Mutually exclusive to the MIH protocol acknowledgement operation?
    - Associated with the setting of the Ack Req /Ack Rsp of the MIH protocol acknowledgement operation?

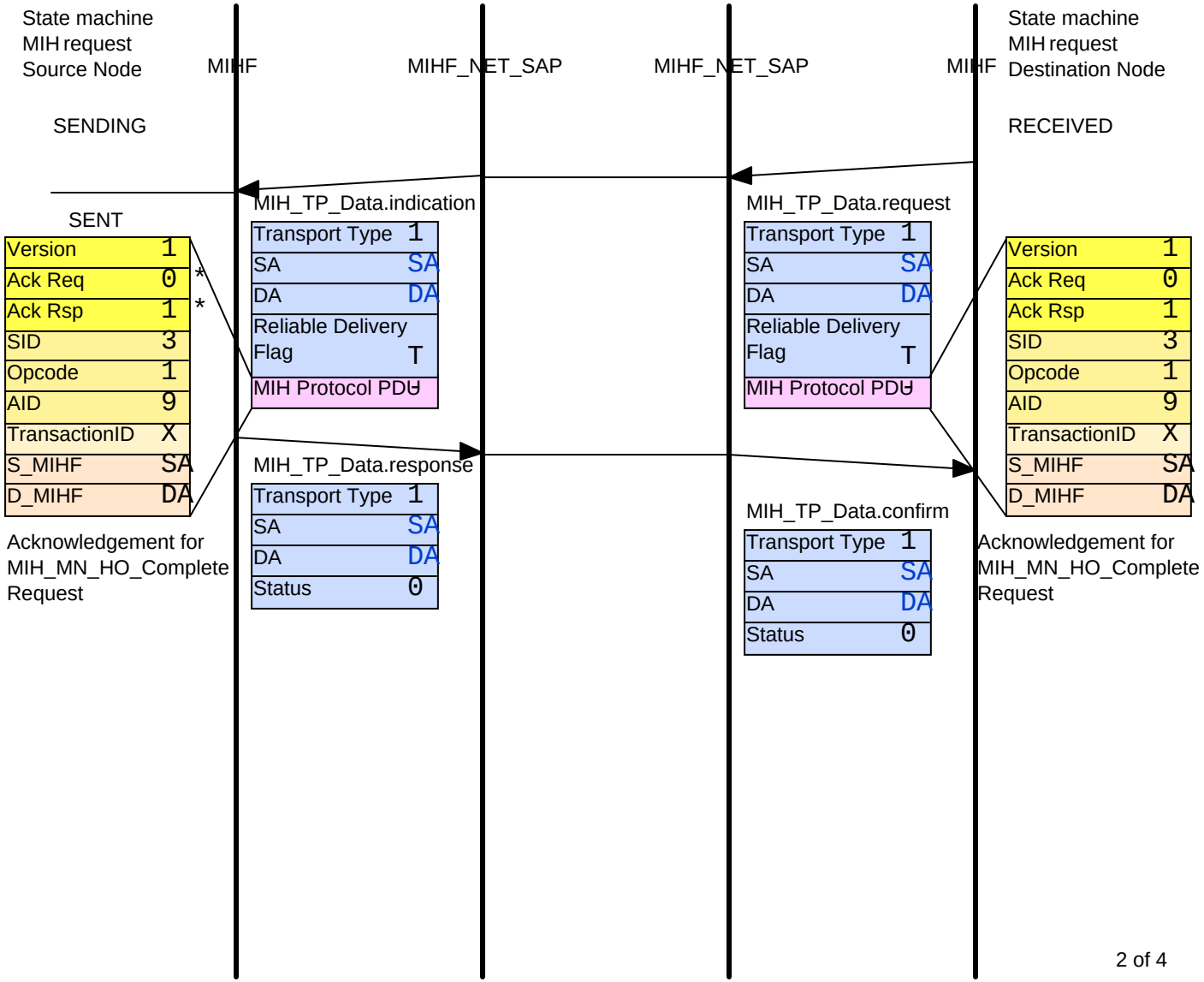
Duplicates functionality

- Is it repeating the reliable transport function?
- Is it repeating the acknowledgement function defined in clause 8.2?

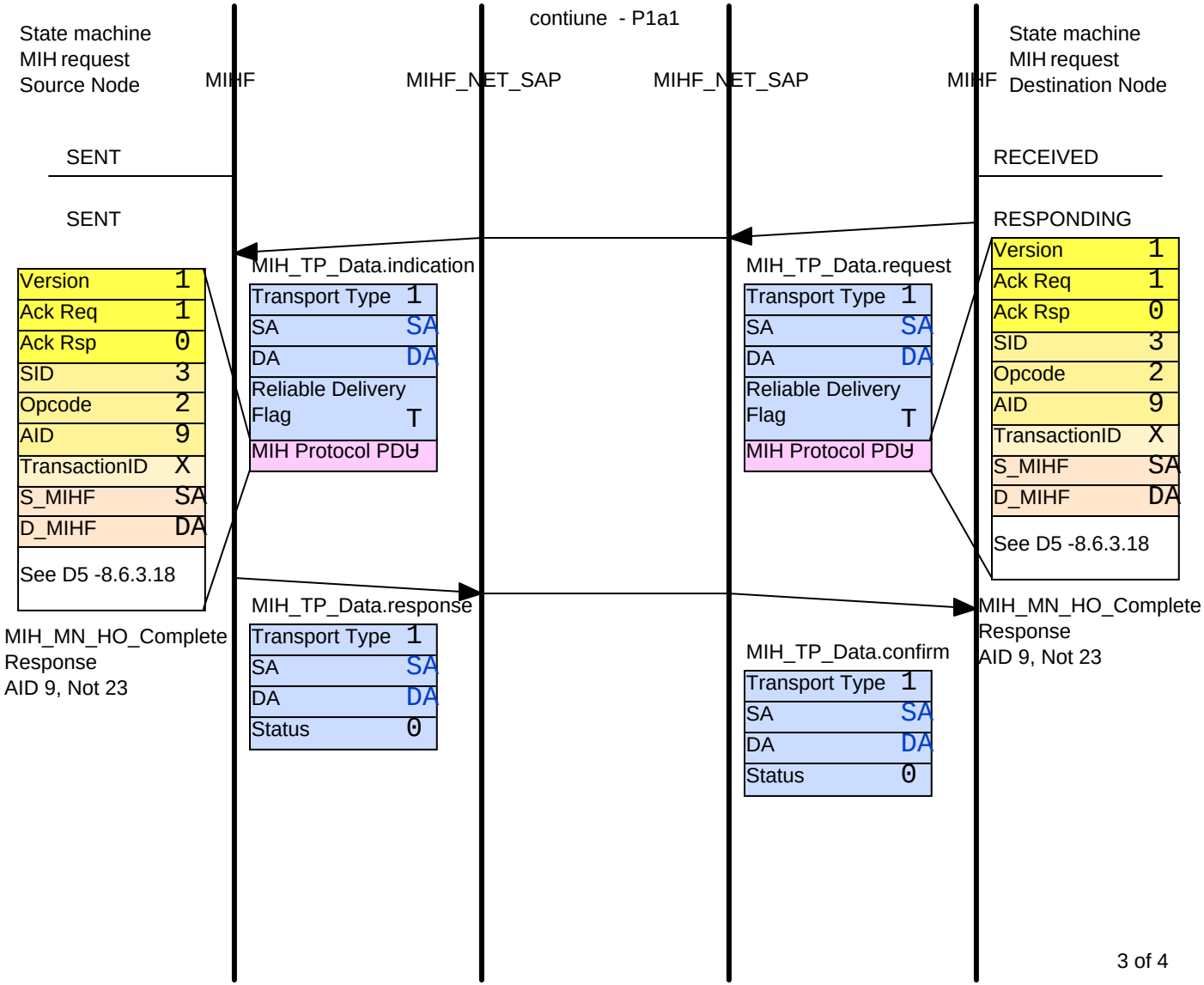
MIH command request & response (1of4)



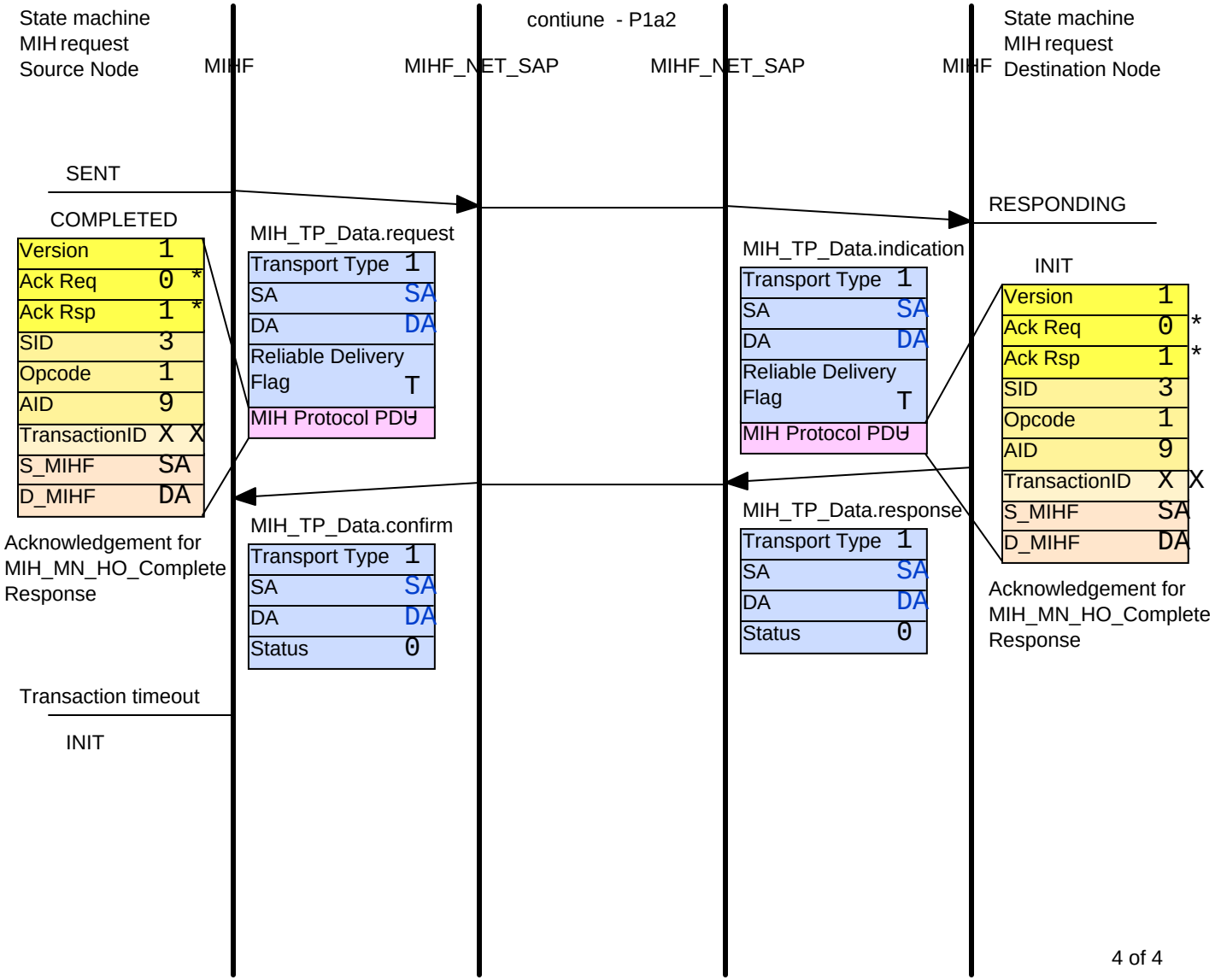
MIH command request & response (2of4)



MIH command request & response (3of4)



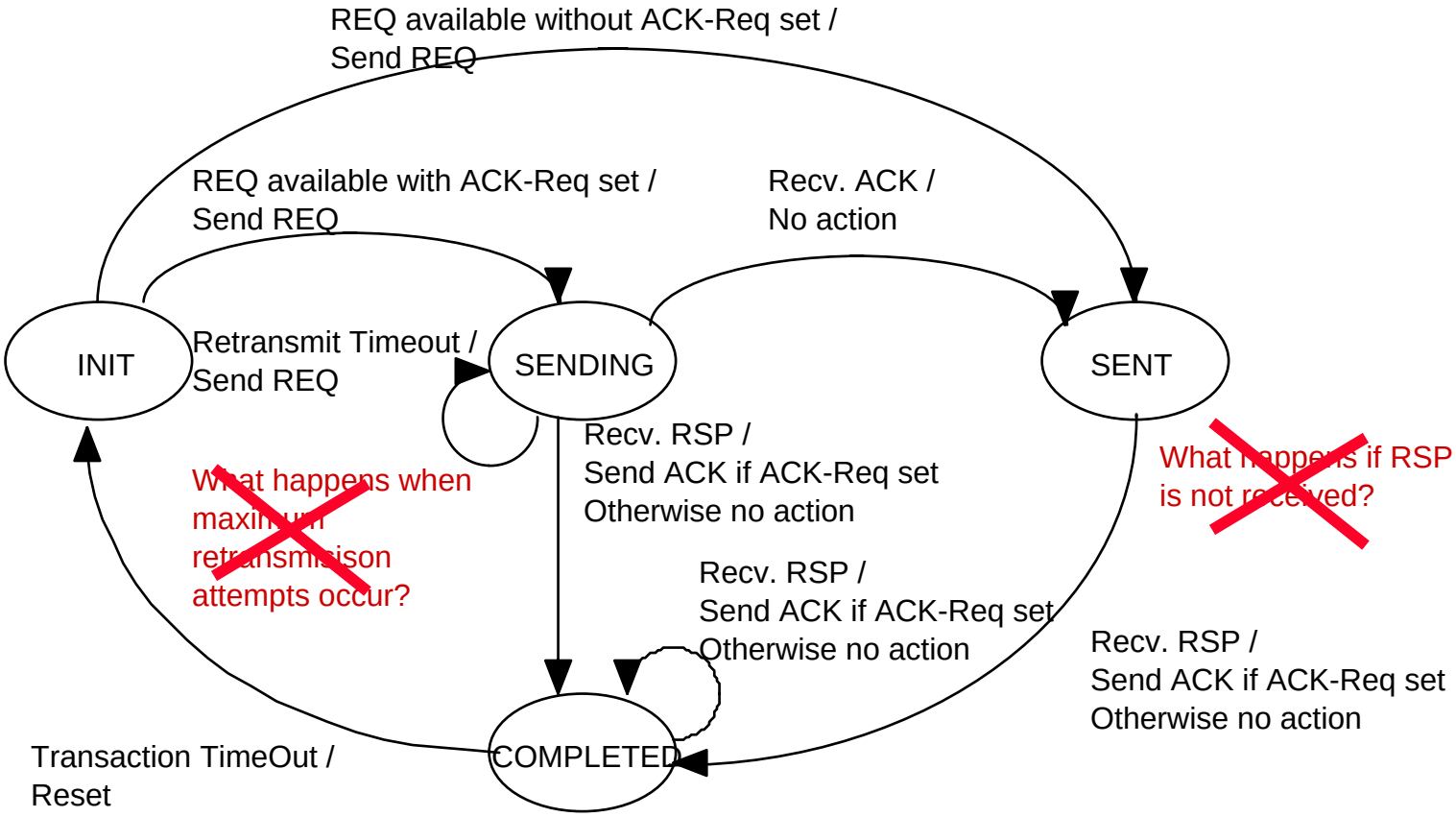
MIH command request & response (4of4)



MIH protocol acknowledgement operation

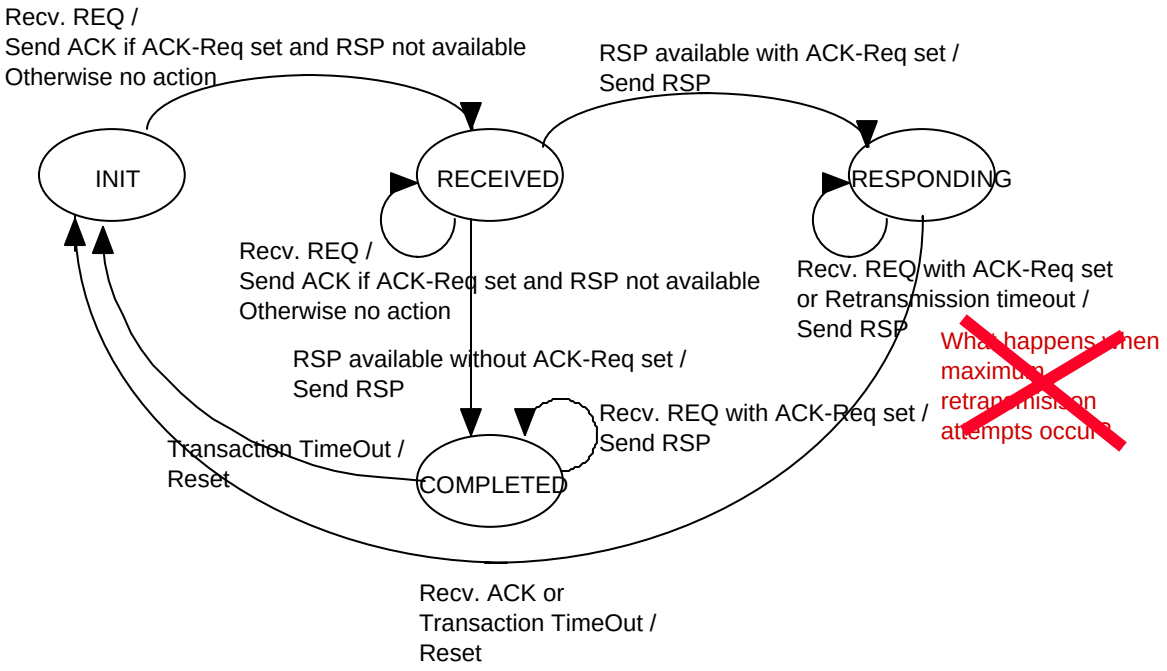
- There are four state machines defined
  - Two for the source node and two for the destination node.
  - Two for the request and response service and two for the indication only service.
- Figure 24 State machine for MIH request source node
  - Missing transitions
- Figure 25 State machine for MIH request destination node
  - Missing transitions
  - Consistency with text
- Figure 26 State machine for MIH indication source node
  - Missing transitions
- Figure 27 State machine for MIH indication destination node
  - Missing transition

Figure 24



1) Should add (Start Transaction Timer) to all transitions out of INIT.
2) Should add (Start Retransmission Timer) to transition from INIT to SENDING and to the loopback transition in SENDING.
3) Should add to all states, except INIT, that do not have it, a transition for the expiry of Transaction timer.

Figure 25

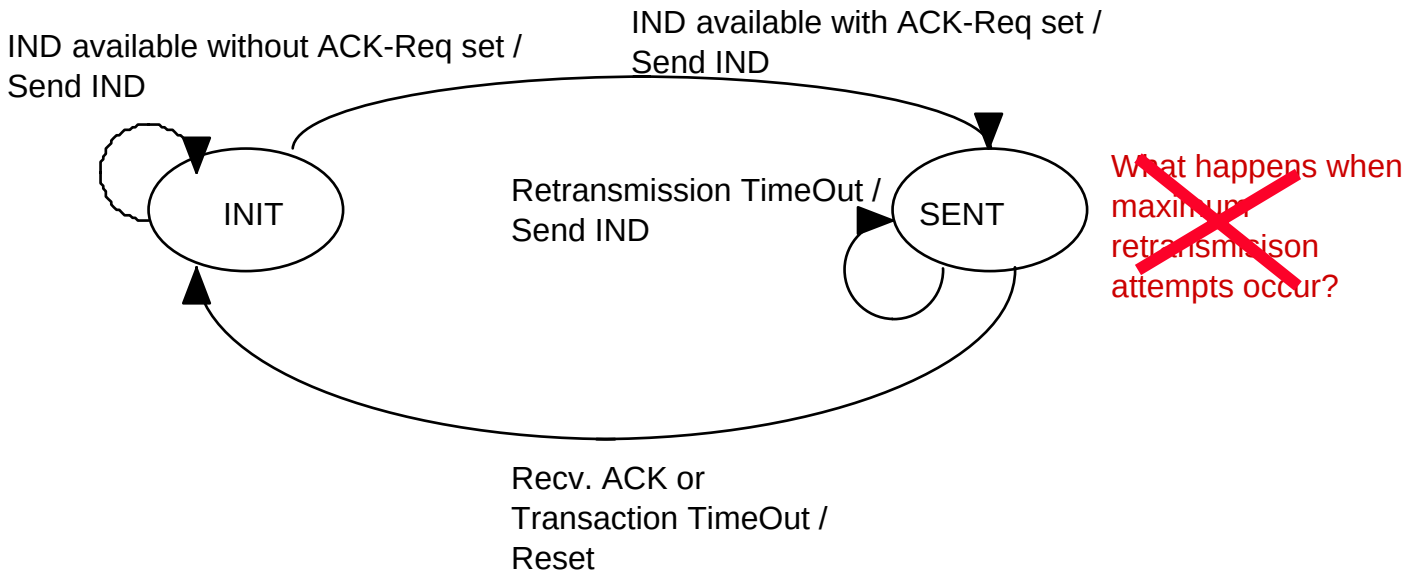


1) Should add (Start Transaction Timer) to transition out of INIT
2) Should add (Start Retransmission Timer) to transition from RECEIVED to RESPONDING and to the loopback transition in RESPONDING
3) Should add to all states, except INIT, that do not currently have it, a transition for the expiry of Transaction timer

Consistency (Figure 25 and 8.2.2.2.2)

- The third paragraph states, “ If the MIH Request message has the ACK-Req bit set and the response is immediately available, the request destination node transits to RESPONDING state via RECEVIED state by sending the MIH Response message with ACK-Rsp bit set.”
- There are two transitions out of RECEIVED and both are for sending the RSP
  - If the RSP has the ACK-Req set, it goes to RESPONDING
  - If the RSP does not have the ACK-Req set, it goes to COMPLETED
- Text and figure do not agree. The choice of transition out of RECEIVED is not dependant upon the ACK-Req in the received REQ, but rather the choice of the ACK-Req bit in the RSP to be sent.
- Conclusion: The word "either" and "or COMPLETED" is added to the draft text to agree with the transitions shown in the figure.
  - If the MIH Request message has the ACK-Req bit set and the response is immediately available, the request destination node transits to "either“ RESPONDING "or COMPLETED" state via RECEIVED state by sending the MIH Response message with ACK-Rsp bit set.

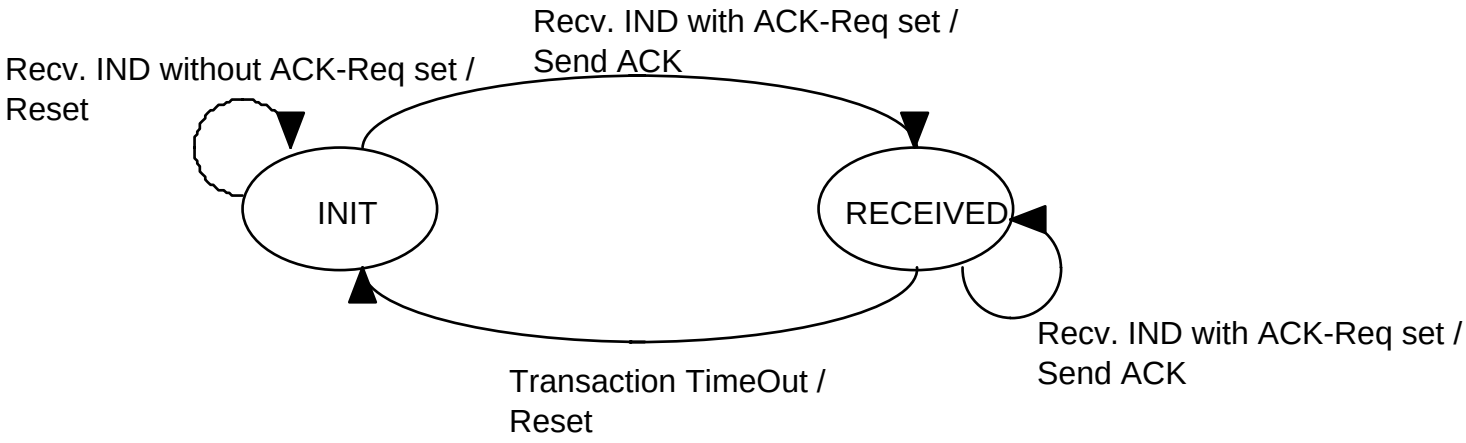
Figure 26



1) Should add (Start Transaction Timer) to transition out of INIT to SENT

2) Should add (Start Retransmission Timer) to transition from INIT to RESPONDING and to the loopback transition in RESPONDING

Figure 27



~~1) Should add (Start Transaction Timer) to transition out of INIT to RECEIVED~~

Conclusions

- There are many issues that need answers before either the transport protocol or the MIH protocol acknowledgement state machines can be finalized and made to operate properly.
- Agreed answers to posed questions could help to guide corrections, modifications, and new text for next version of the draft.
- Conclusion (transport protocol):
  - Delete all references to MIH-TP-Data.response primitive
- Conclusion (MIH protocol acknowledgement):
  - the word "either" and "or COMPLETED" is added to draft text to agree with transitions shown in the figure.
    - If the MIH Request message has the ACK-Req bit set and the response is immediately available, the request destination node transits to "either“ RESPONDING "or COMPLETED" state via RECEIVED state by sending the MIH Response message with ACK-Rsp bit set.