IEEE 802.3br IET Negotiation Proposal

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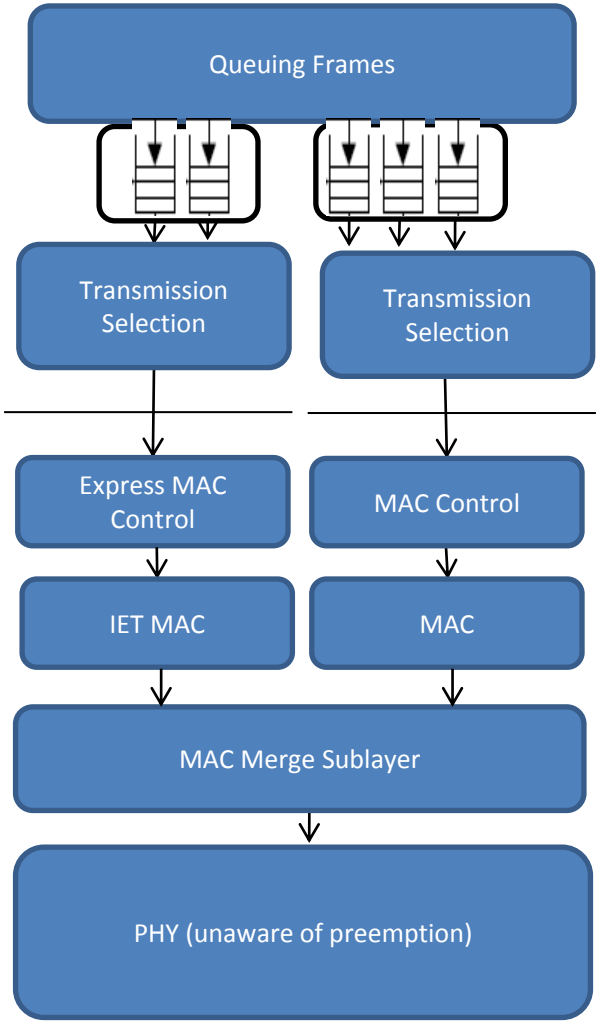
MAC Merge Negotiation Goals

- Determine if the link partner supports MAC Merge
- Prevent MAC Client Frame Loss during the transition to MAC Merge Operation
- After enabling, check that MAC Merge is operational and fall back to normal operation if unsuccessful
- Independent of PHY



Existing Solution Space

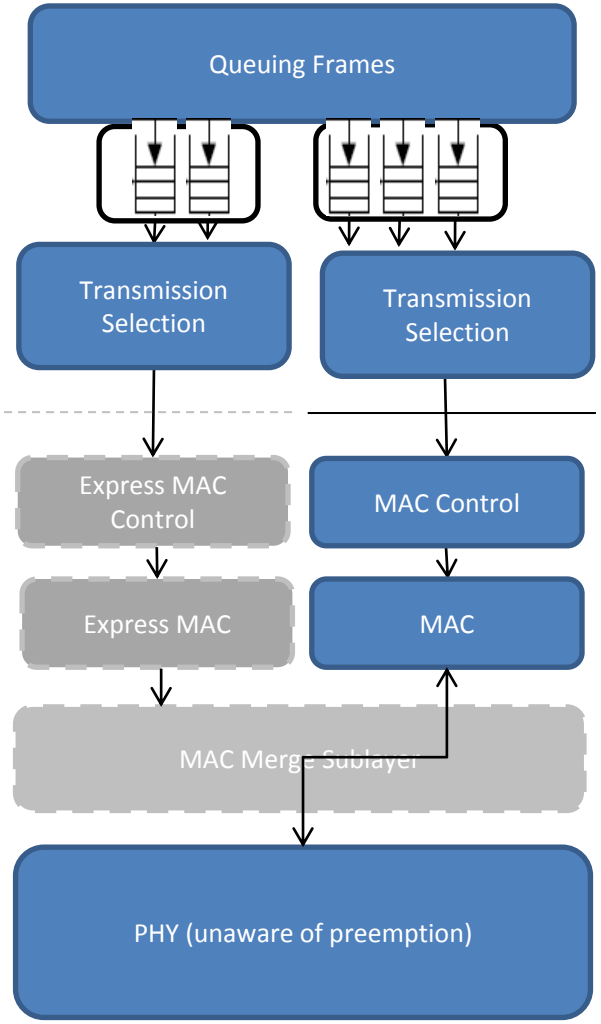
- LLDP
  - more suitable for capability exchange rather than negotiation,
  - not tightly coupled to MAC and PHY and
  - Doesn't provide for prevention of traffic loss during transition
- Auto-negotiation
  - Only supported on a subset of PHY types, e.g. not on optical PHYs except for 1 Gig.
- Slow protocols, e.g. similar to LACP
  - Slow limitation not needed and might delay detection of successful transition

MAC Control based negotiation

- Use MAC Control frames for negotiation
- If a transition to MAC Merge is enabled, MAC Control can block data frame transmission until the transition is successful

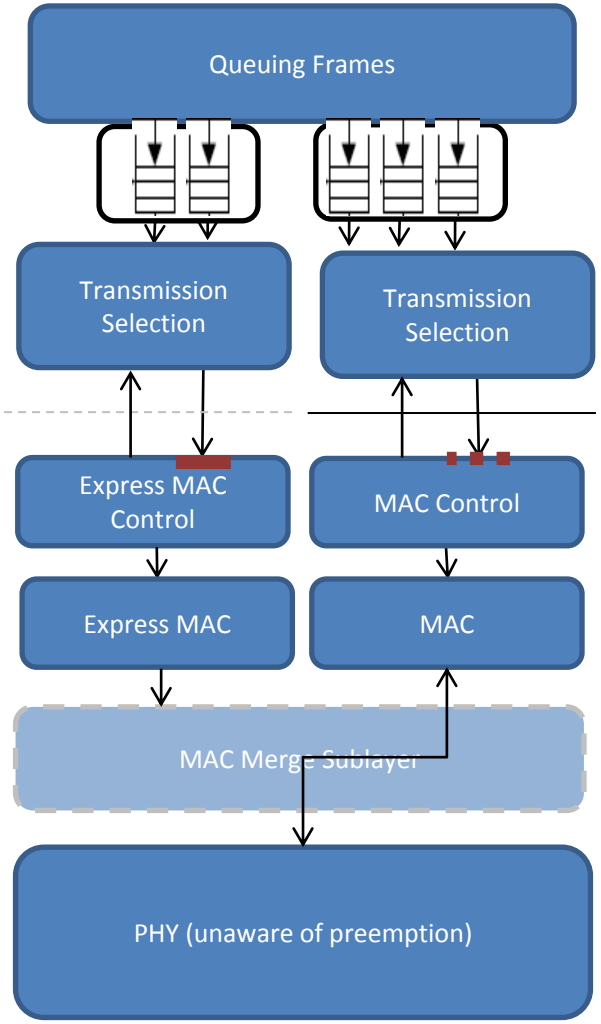
Normal mode: IET operation disabled

- Before negotiation,
  - Express MAC and Express MAC Control are disabled
  - MAC Merge is bypassed so traffic passes through between MAC and PHY
- MA_Control.request from MAC Client initiates negotiation



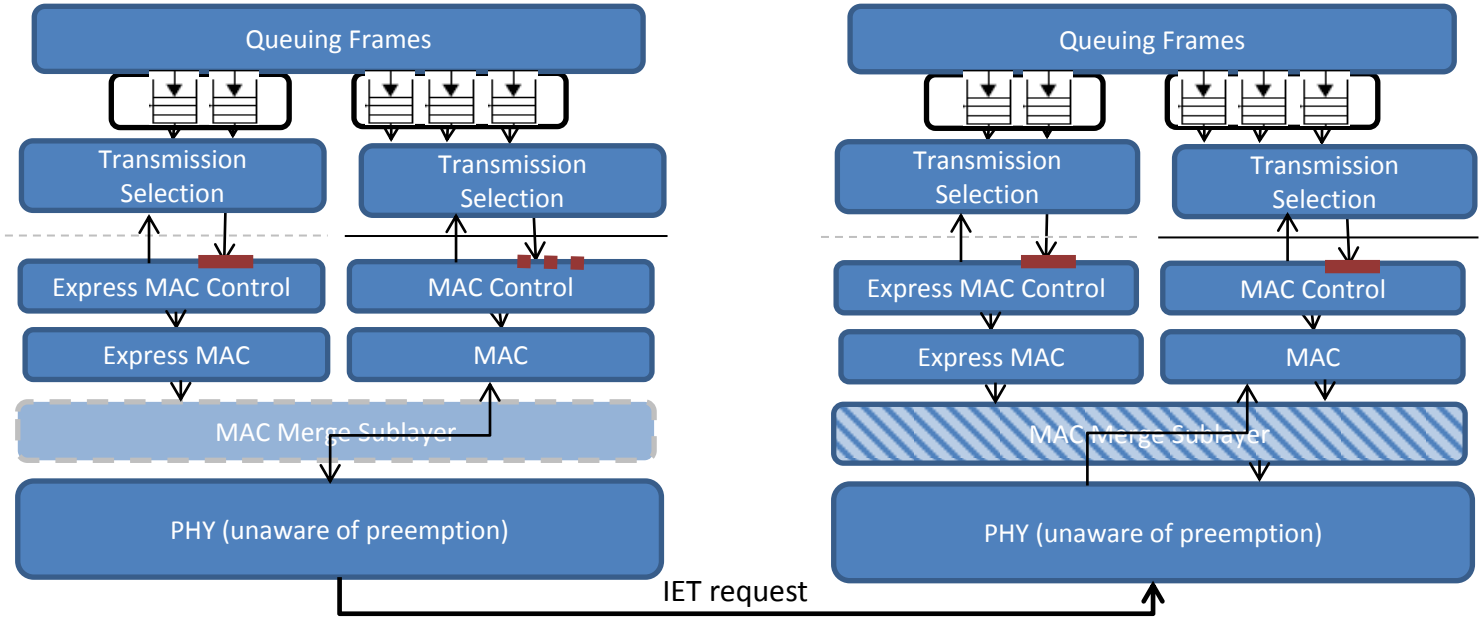
IET request mode: initiate IET negotiation

- Enter IET request mode
  - Express MAC Control and Express MAC enabled
  - Express data frame xmit blocked
  - Normal data frame xmit may be blocked
  - MAC Merge enters detect state
    - Does not alter transmit frames
    - Any frames received with normal SFD are passed to MAC unchanged
    - When first Express encapsulated frame is received, receive side of MAC Merge Sublayer is activated
- Send MAC Control IET request frame sent to link partner
- Start IET detect timer



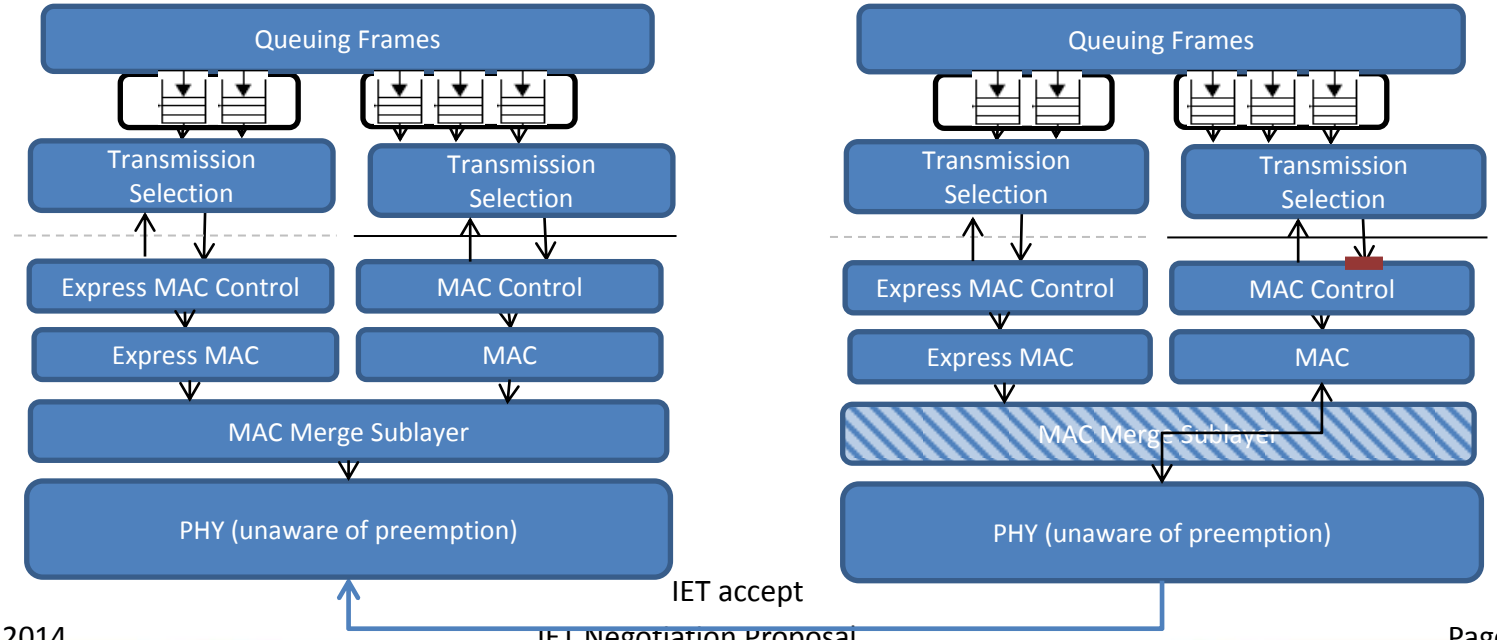
Link Partner receives IET request

- Link Partner passes MA_Control.indication of IET request to MAC Client
- MAC Client sends MA_Control.request to accept IET operation
- Link Partner enters IET transmit mode
  - Transmission of data frames is blocked
  - Express MAC Control and Express MAC enabled
  - MAC Merge Sublayer enters IET transmit mode
    - Transmit path is IET encoded, receive path same as IET check state
  - Sends MAC Control IET accept
  - Starts IET detect timer



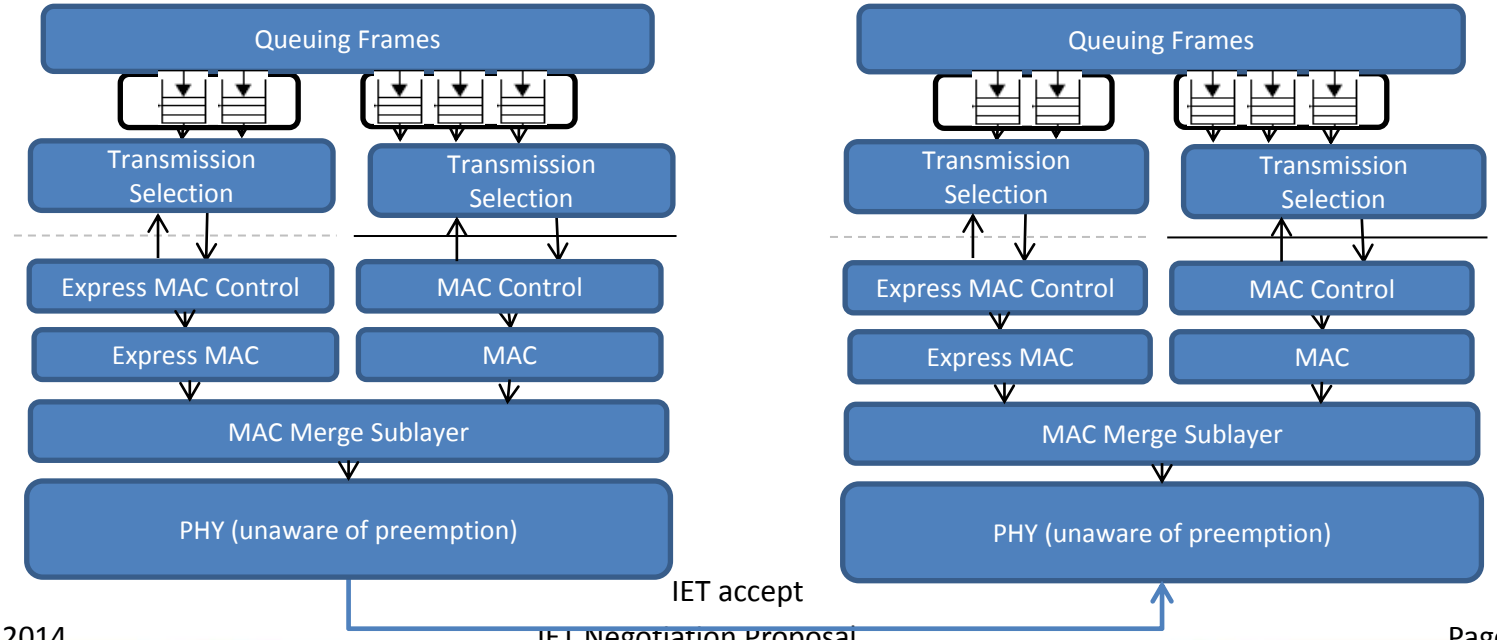
IET accept received

- passes MA_Control.indication of IET accept to MAC Client
- On receipt of IET accept, enter Operational mode
  - MAC Merge Sublayer in operational mode
  - Send IET accept
  - Transmission of data frames enabled

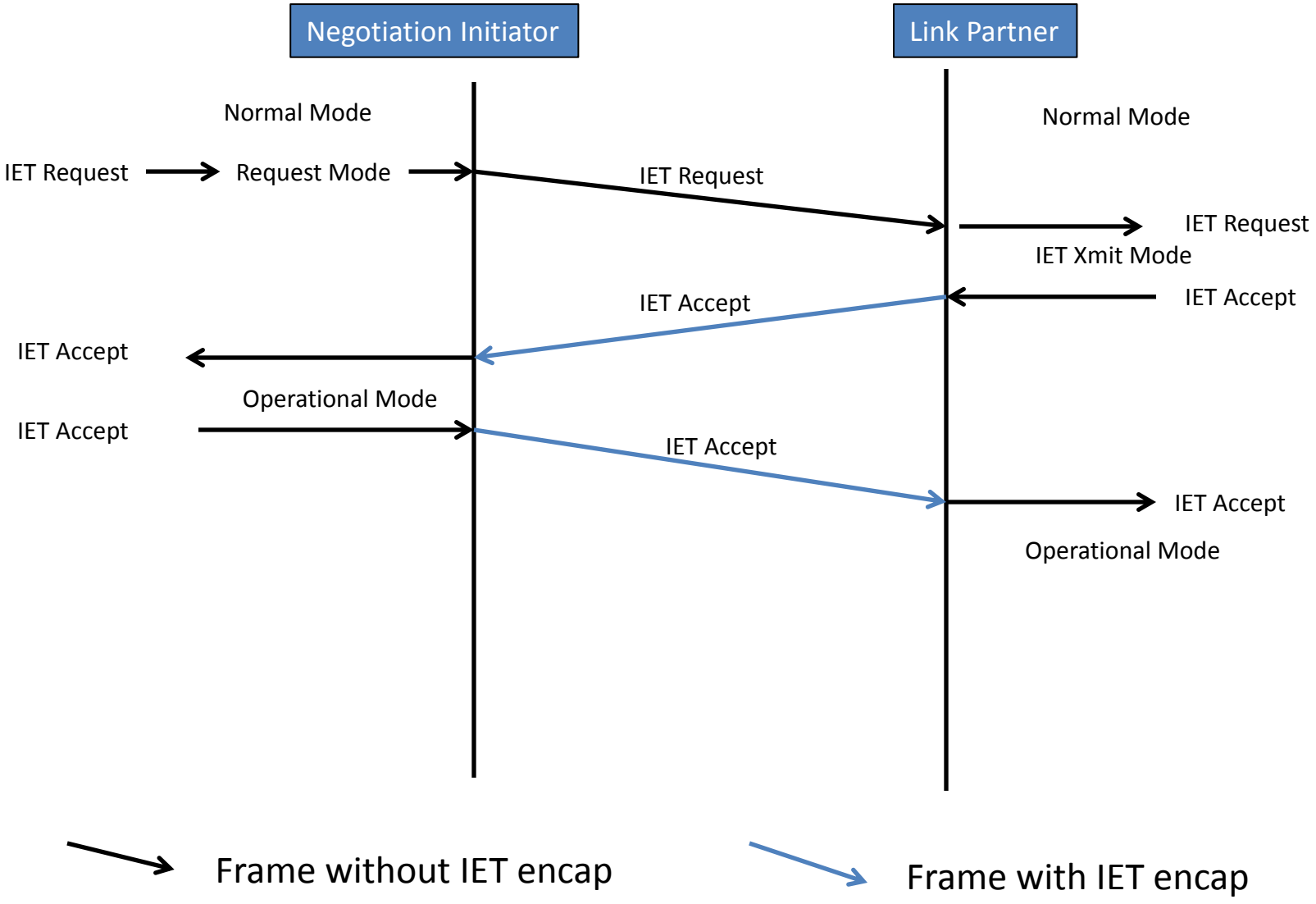


IET accept received by Link partner

- Link Partner passes MA_Control.indication of IET accept to MAC Client
- On receipt of IET accept, enter operational mode
  - MAC Merge Sublayer in operational mode
  - Transmission of data frames enabled



IET negotiation



Frame without IET encap

Frame with IET encap

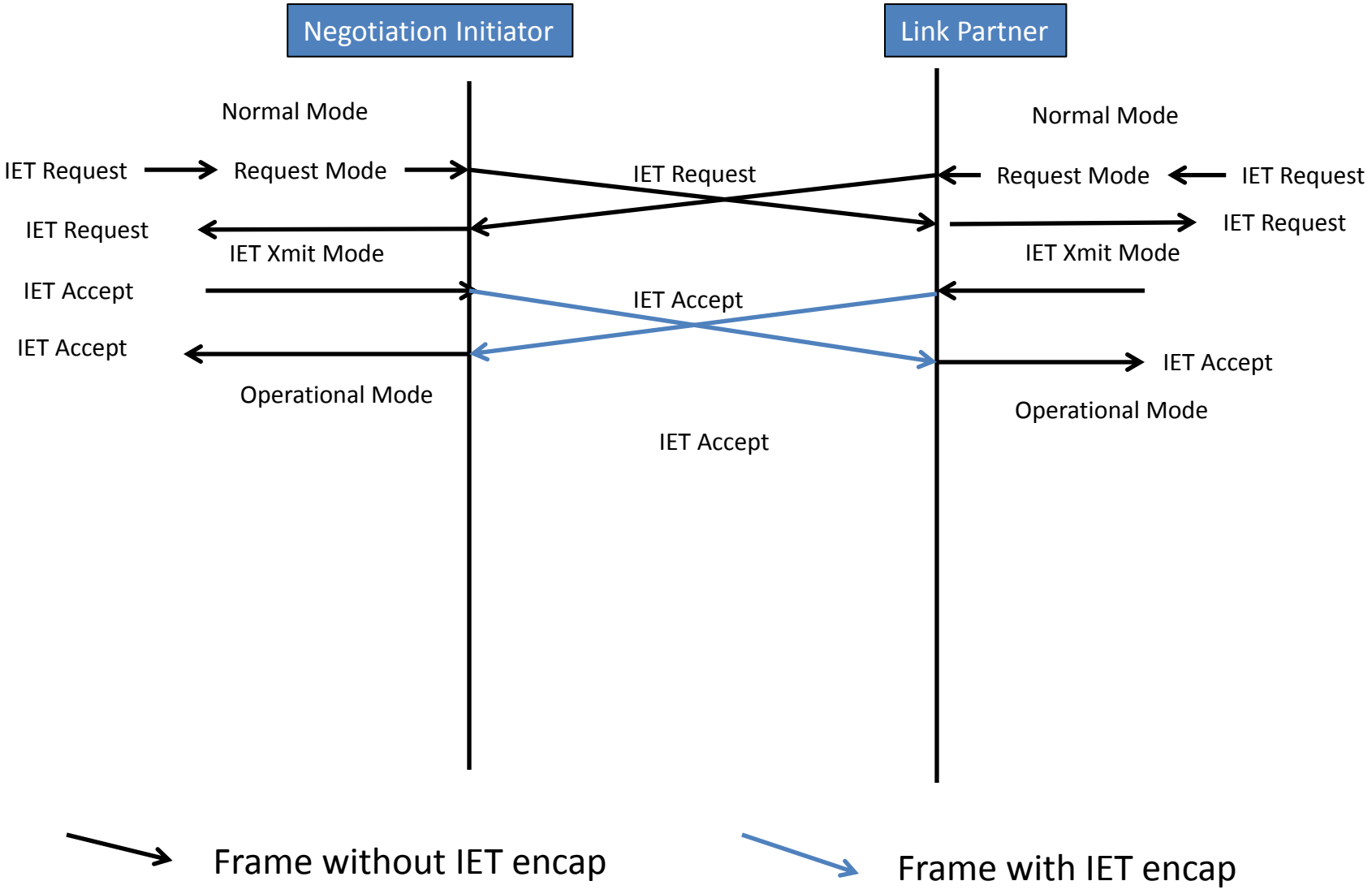
Recovery from time out

- If IET Detect Timeout expires before IET operation is established,
  - Transmit MAC Control IET fail frame
  - Start IET recovery timer
  - Disable IET MAC, IET MAC Control and MAC Merge sublayer
  - When IET recovery time expires, enable transmission of data frames

Simultaneous Initiation

- Both sides can initiate negotion by sending IET
- When a side receives the IET Request, it transitions to IET xmit and sends IET accept
- Since it is in IET xmit, receiving IET accept causes the transition to IET operation

Simultaneous initiation



Thank You.

Questions or Comments?