Trivial TLV Transport (T3P)
Proposed T3PDU and State Machines

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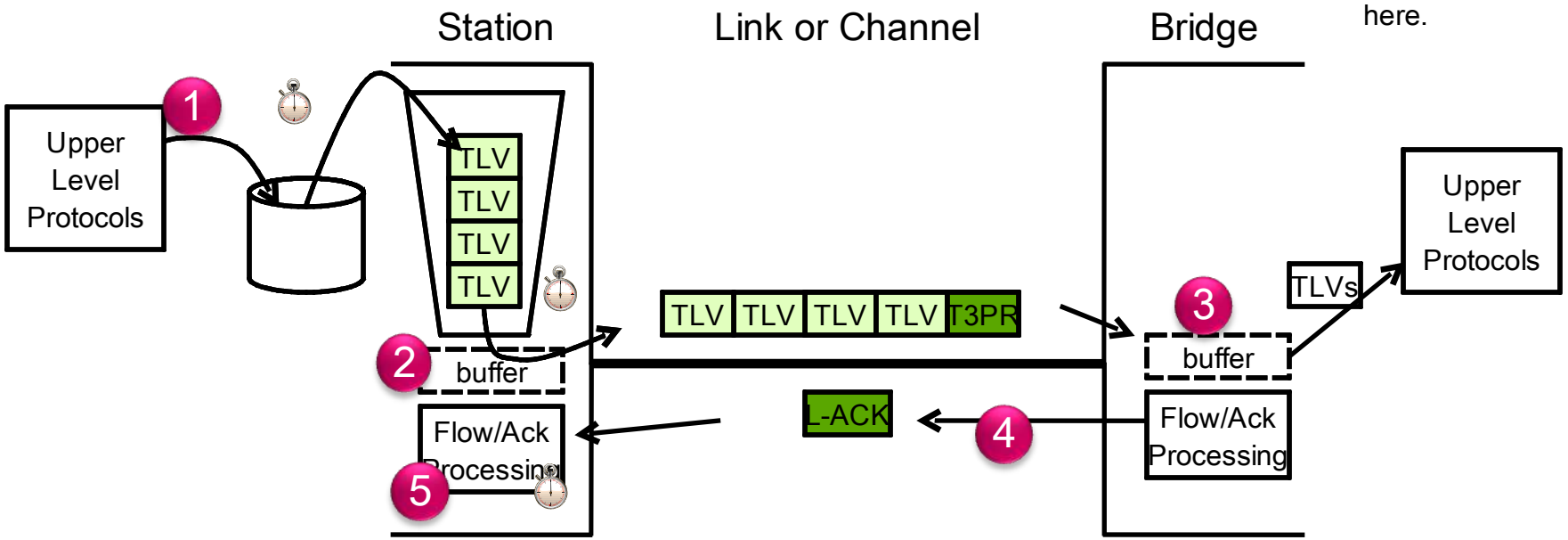
Trivial TLV Transport Protocol (T3P) Goals
(From 11/09 “bg-hudson-tlvtransport-1109-v02.pdf” presentation)

- What should stay the same
  - TLV format (but allow multiple of the same TLV type)
  - Addressing
  - Strong push to minimize traffic
- Very simple
- Meets needs of VSI Discovery Protocol
- Minimizes traffic for new protocols
- Easy to learn (re-uses LLDP knowledge)
- Could carry other client protocols
  - Example: LLDP TLVs
    - LLDP ‘client protocol’ holds inventory of LLDP TLVs
    - Use TLV transmit timers to match LLDP intervals
    - Add timers for each TLV received (to clear if no longer sent)

Trivial TLV Transport Protocol (T3P) Lower-level Transport Overview

T3P-R has symmetric behavior, but only a single direction shown here.



1. Client protocols pass outgoing TLVs to lower-level transport. TLVs are queued until frame is ready to be sent.**

2. Frame with TLVs is transmitted but the frame is not yet deleted from the transmit buffer. A L-ACK timer is set.

3. Arriving frame is received into a receive 'buffer', where it is held until it is removed by frame/TLV processing to pass TLVs to the upper level protocols.

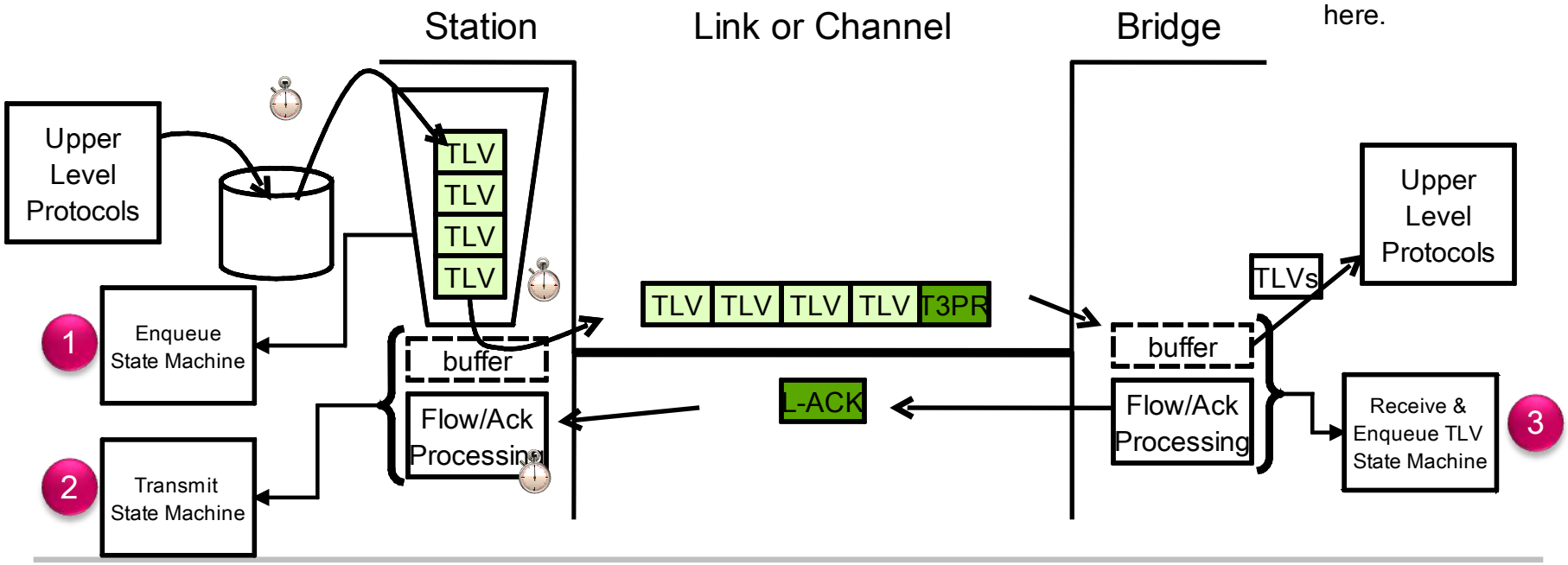
4. When the receive buffer is emptied, a low-level acknowledge (L-ACK) is sent to the sender.

5. If the L-ACK is received before the timer expires, then the transmit buffer is cleared and the next TLV can be transmitted from the queue.

   If the L-ACK timer expires before the L-ACK is received, then the frame in the transmit buffer is resent (some preset number of times).

Trivial TLV Transport Protocol (T3P) Lower-level Transport Overview

T3P-R has symmetric behavior, but only a single direction shown here.

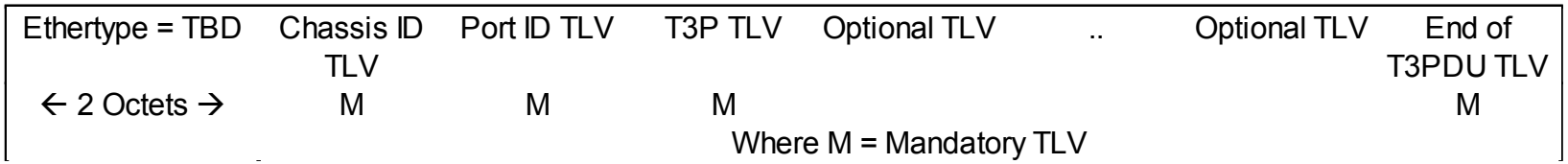


1 **Transmit Side - Enqueue State Machine**
Places TLVs received from ULP into a T3P queue.

2 **Transmit Side - Transmit State Machine**
Transmits one or more TLVs from T3P queue.

3 **Receive Side - Receive & Enqueue TLV State Machine**
Receives a T3PDU and enqueues TLVs to ULPs.

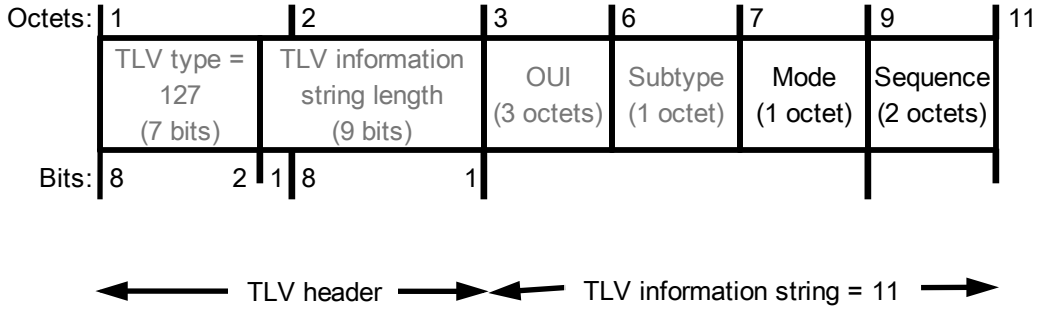
T3P PDU Overview



- The destination address of the Ethernet frame that contains a T3PDU has the following semantics:
  - Nearest bridge (01-80-C2-00-00-0E)
  - Nearest Customer Bridge (01-80-C2-00-00-00)
- The source address shall be the sending station or port individual MAC address.
- A new Ethertype will be needed for T3P.
- If T3P is performed over Multi-channel,
  then the STAG for the channel shall precede the T3PDU.
- Each T3PDU contains 3 mandatory TLVs and
  can contain optional TLVs, in the order shown below:
  - A Chassis ID TLV*
  - A Port ID TLV*
  - A T3P TLV
  - Zero or more optional TLVs, as allowed by the maximum size of the T3PDU.
  - An End Of T3PDU TLV*

*Note: These TLVs shall use the same format as defined in the LLDP specification,
given the transport semantics of T3P, the LLDP TTL TLV is not used.

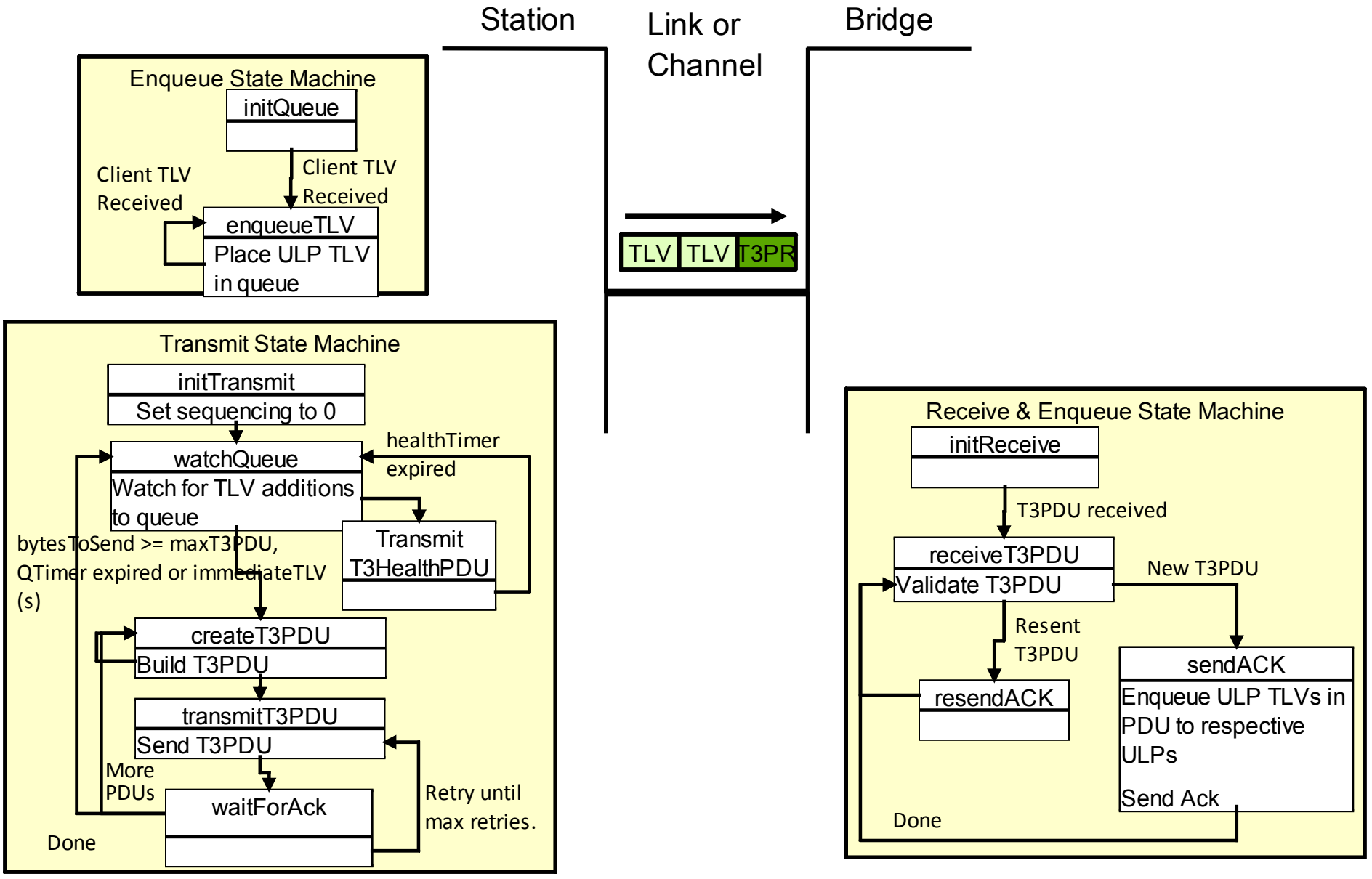
T3P TLV Overview



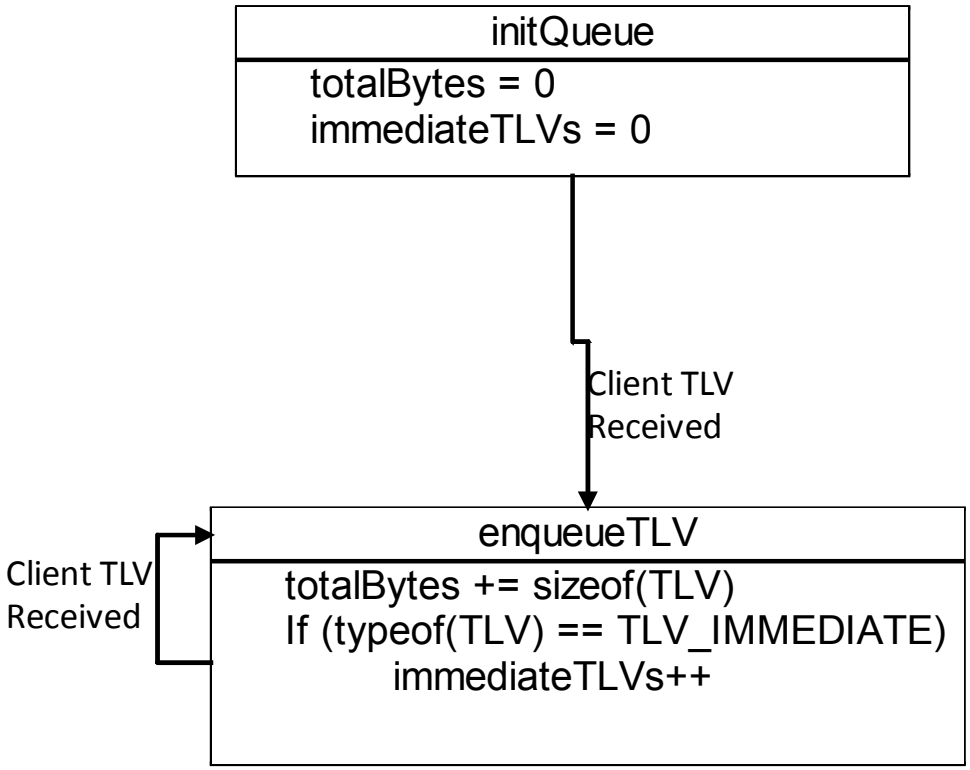
- Mode – Identifies whether the operation is a:
  - T3P request (0x00)
  - T3P acknowledgement (0x01)

- Sequence number – identifies the sequential order of the TLV, with respect to other T3PDUs. The sequence number for the first T3PDU is x0000, each subsequent new T3PDU is incremented by 1.

T3P State Machine Overview

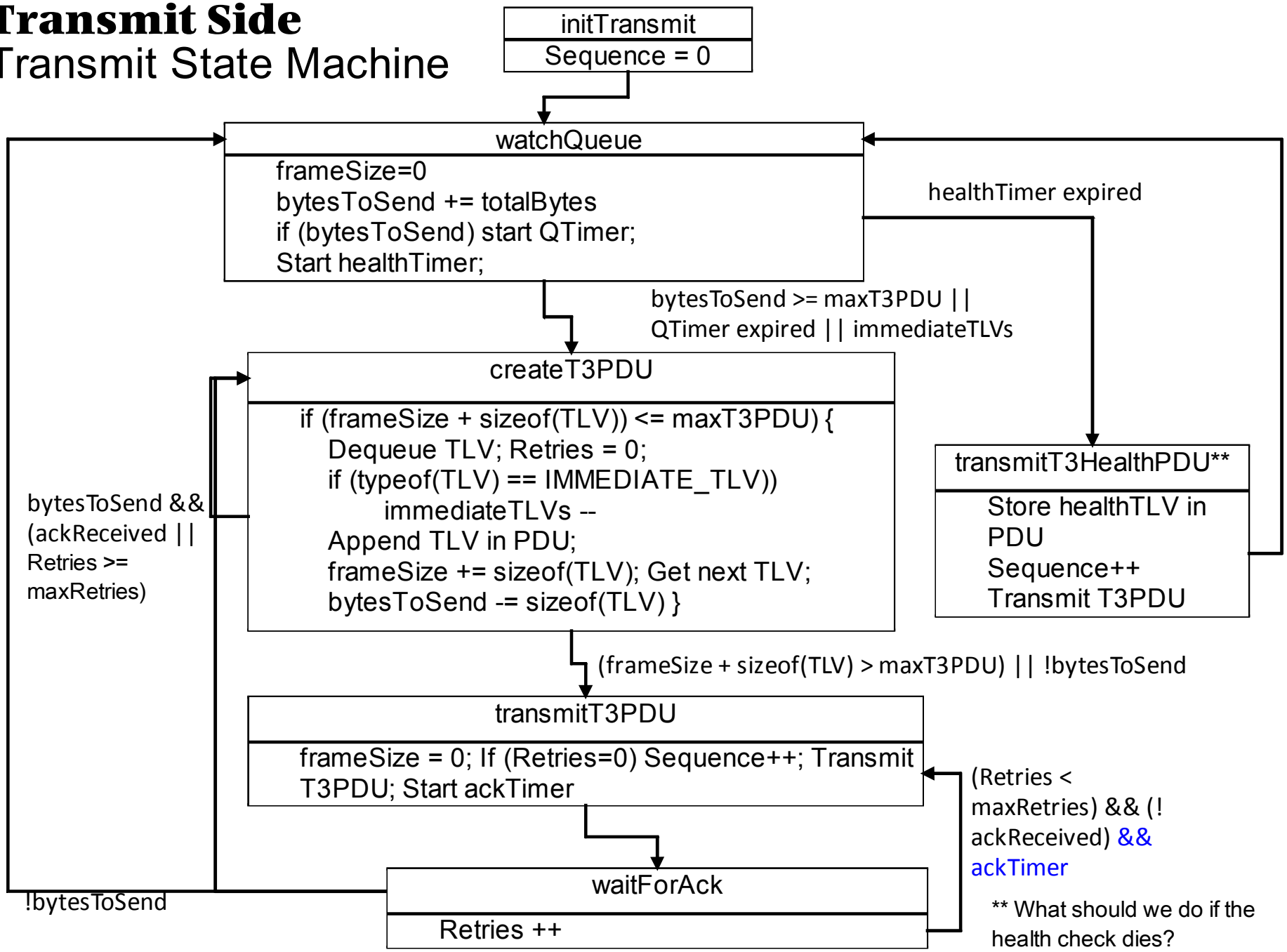


Transmit Side - Enqueue State Machine



Transmit Side

Transmit State Machine



Receive Side

Receive & Enqueue TLV State Machine