MPCP End-of-Grant Check

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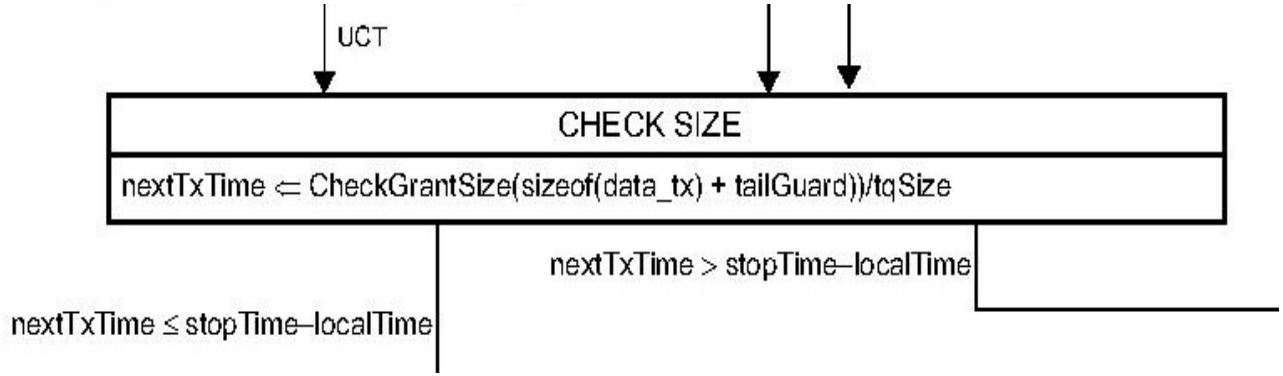
Background



- Current behaviour in ONU Control Mux (figure 77-14)

  a) Determine the number of bytes needed for transmission of the next frame

  b) Convert to TQ by rounding **<u>down</u>**

- Problem: This permits transmission of a frame which will continue transmitting after StopTime (by up to 1 TQ)

Option #1

- Simple remedy: just round up when converting to TQ (rather than round down as currently)

- Specifically, change definition of CheckGrantSize() to:

ceiling(T / tqSize)

where T = $$\left\lceil \frac{\text{fecOffset} + \text{length}}{\text{FEC\_PAYLOAD\_SIZE}} \right\rceil \times \text{FEC\_CODEWORD\_SIZE} - \text{fecOffset}$$

TQs vs. Bytes

- Option #1 prevents transmission past ***stopTime***
- But very cumbersome to do calculations on codewords, convert to bytes, and compare in TQ
- Better solution is to do the entire calculation in bytes:
  - Two additional variables are needed
  - But resulting calculations are much simpler

Option #2: Changes to 77.2.2.3 variables

a) Globally replace "NextTxTime" with "BytesRequired"

b) In "BytesRequired" definition: Change "measured in units of time_quanta" to "measured in units of bytes"

c) Add the following definitions:

ByteTimeOffset:

TYPE: 8 bit unsigned

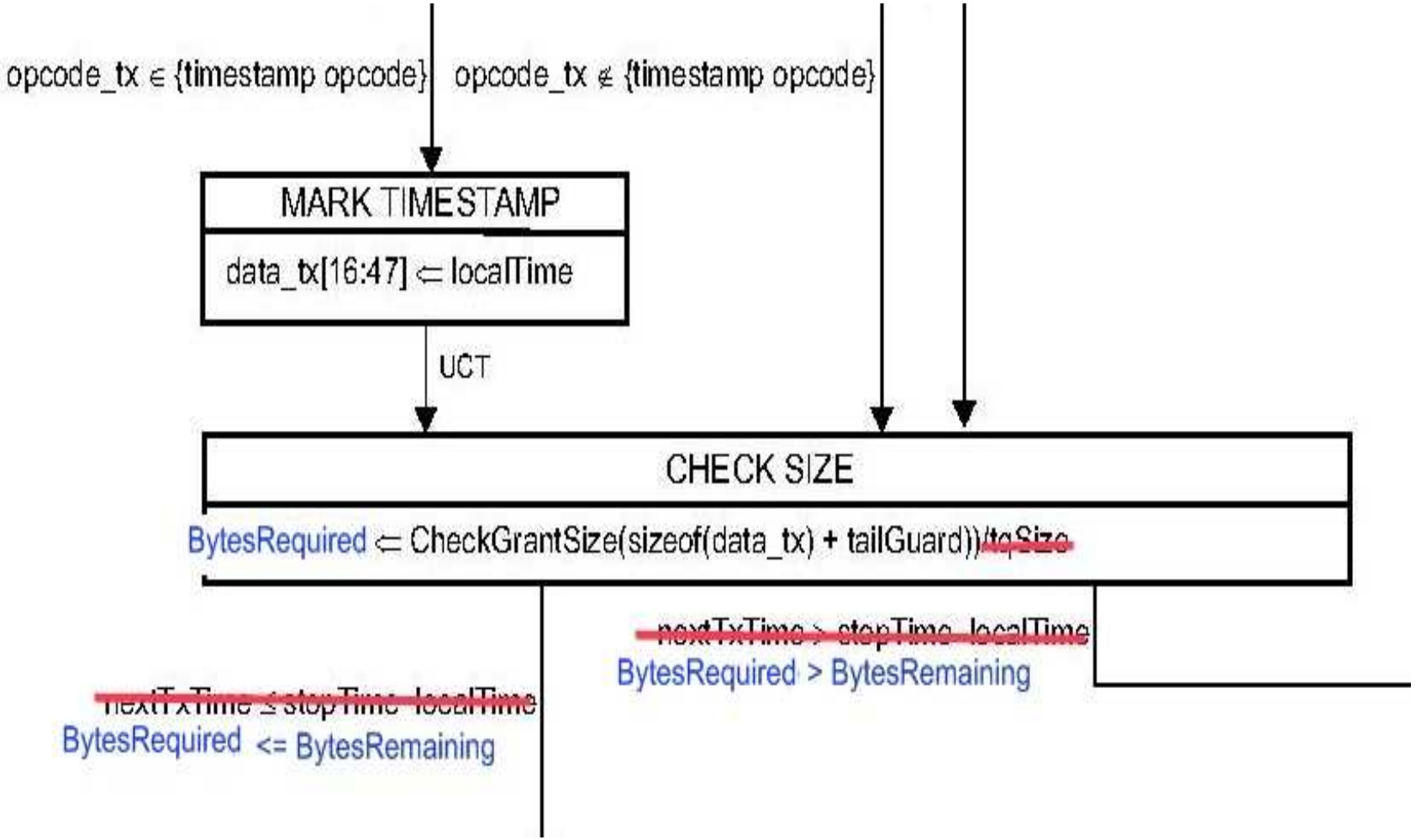
- This variable denotes the offset (in octet times) of the current actual time from the **localtime** variable (which maintains the current time in units of time quanta). This variable enables calculations which require granularity more precise than a time quantum.

BytesRemaining:

TYPE: 32 bit unsigned

This variable is an alias for the expression (**((stopTime – localTime) x tqSize) – ByteTimeOffset)**. It denotes the number of bytes that can be transmitted between the current time and the end of the grant.

Option #2: Changes to Fig 77-14



Option #3: Changes to 77.2.2.3 variables

a) Globally replace “NextTxTime” with “OctetsRequired”

b) In “OctetsRequired” definition: Change “measured in units of time_quanta” to “measured in units of octets”

c) Add the following definitions:

tqOffset:

TYPE: 8 bit unsigned

- This variable denotes the offset (in octet times) of the current actual time from the **localTime** variable (which maintains the current time in units of time quanta).

OctetsRemaining:

TYPE: 32 bit unsigned

This variable is an alias for the expression (**((stopTime – localTime) x tqSize) – tqOffset)**. It denotes the number of octets that can be transmitted between the current time and the end of the grant.

Option #3: Changes to Fig 77-14