

MAC Privacy Maximum Latency

Working Draft

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Forward

- This presentation is for discussion
- It may contain errors/omission and should be consider a work in progress.
- An updated version the presentation will be posted after discussion to correct it, but it will remain a work in progress.

Latency

MAC Privacy Transmission Delay Range

- MAC Privacy has Privacy Frames that are encapsulated and sent based on supported QoS. Essentially MAC Privacy Frames add negligible overall delay.
- Mac Privacy also supports Privacy Channels that have a fixed size MAC Privacy data Unit (MPPDU), fixed rate bandwidth and fixed transmission interval. Privacy Channels add additional delay at the source waiting for the transmission interval and some propagation delay due to the larger frame size.
 - Note this assumes MAC Privacy Channel MPPDUs are always transmitted at a fixed rate – i.e. not a number prebuilt in advance.
- Small additional delay due to processing at a destination.

Maximum Latency

- In the Privacy Channel case:
 - The latency can increase if the rate of arrival of the user frames bandwidth exceeds the supported continuous bandwidth the channel.
- To address this:
 - A parameter Maximum latency would be used to discard user frames, that would experience a delay larger than the Maximum latency, prior to including them in the MPPDU.
 - Another approach to addressing Maximum Latency is to allow the bandwidth rate of the channel to increase by some amount. Ultimately, the Maximum Latency parameter would still be an upper bound also in this case.
 - This type of change could expose externally that the channel requires more bandwidth.
- Only concerned with source head of the MAC Privacy Encapsulation latency

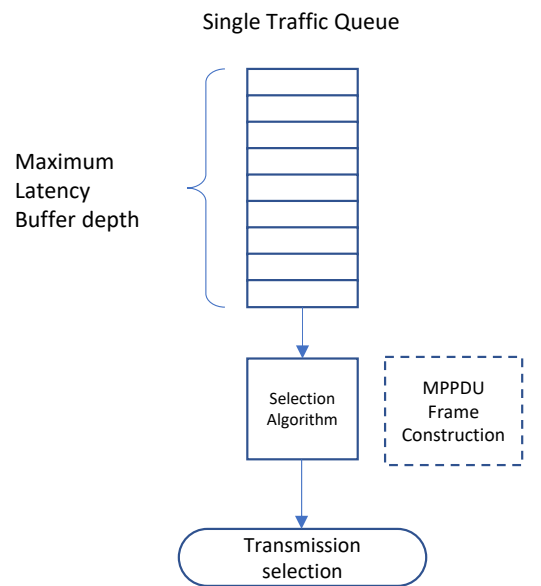
Applying Maximum latency to MAC Privacy

- As we develop the specification for MAC privacy, we are not creating new transmission queues for MAC Privacy.
- It is easiest to envision MAC Privacy Channel MPPDUs being constructed in the configured transmission queue scheme where user data is added, or the frame is padded, with minimal delay to the required size even as the frame transmission has started.
- In the case where the MAC Privacy Channel MPPDUs are being constructed, there may be a queue including user frames to be added to the channel. This queue should not exceed a certain buffersize or the user frames will exceed the maximum delay.

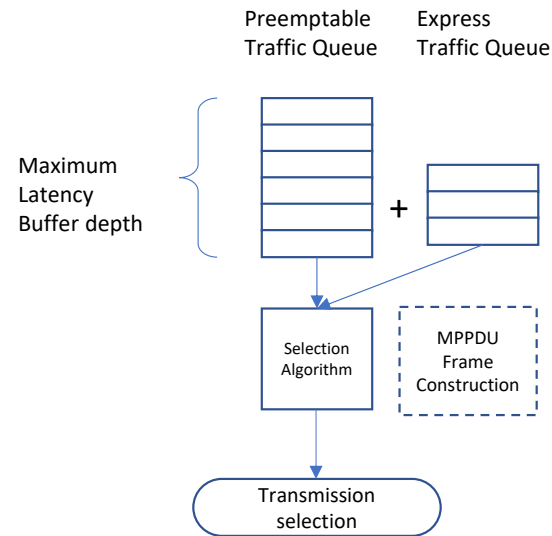
Max Latency and Express Frames

- MAC Privacy Channels may support express and preemptable frames.
- Express frames are chosen over preemptable frames. Care must be taken not to allow express frames to totally block preemptable frames. (The MAC Privacy standard does not force any queuing mechanisms.)
- In this case, the total buffer for express and preemptable frames should be considered for the maximum latency.

Do we need a Model ?



Simple discard when buffer exceeded



May require more elaborate discard when buffer exceeded?

Implication for the MAC Privacy Specification

- We could add a Maximum Latency configuration item to allow implementations to control the delay added by Privacy Channels.
- An additional statistic of Frames discarded due to Maximum latency would allow monitoring of discarded frames.

Comments?
Thank You