26 July 2024

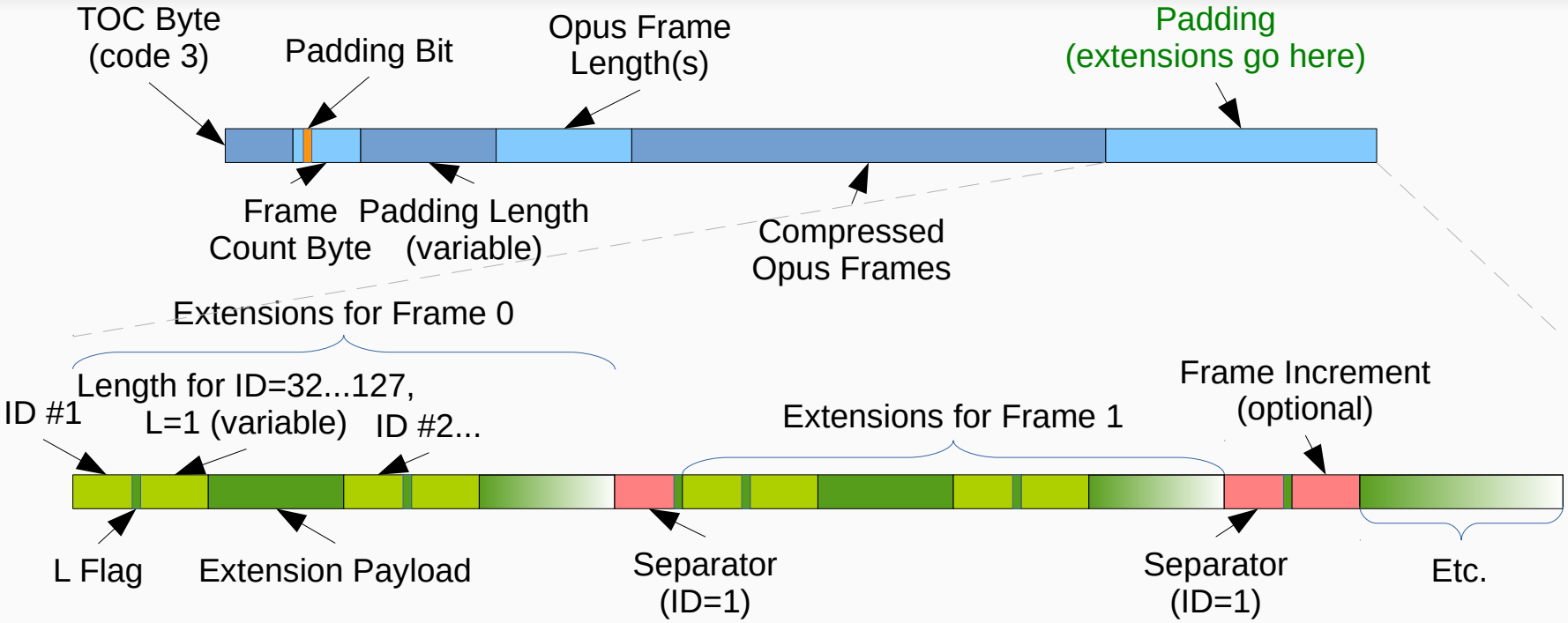
IETF 120

draft-ietf-mlcodec-opus-extension

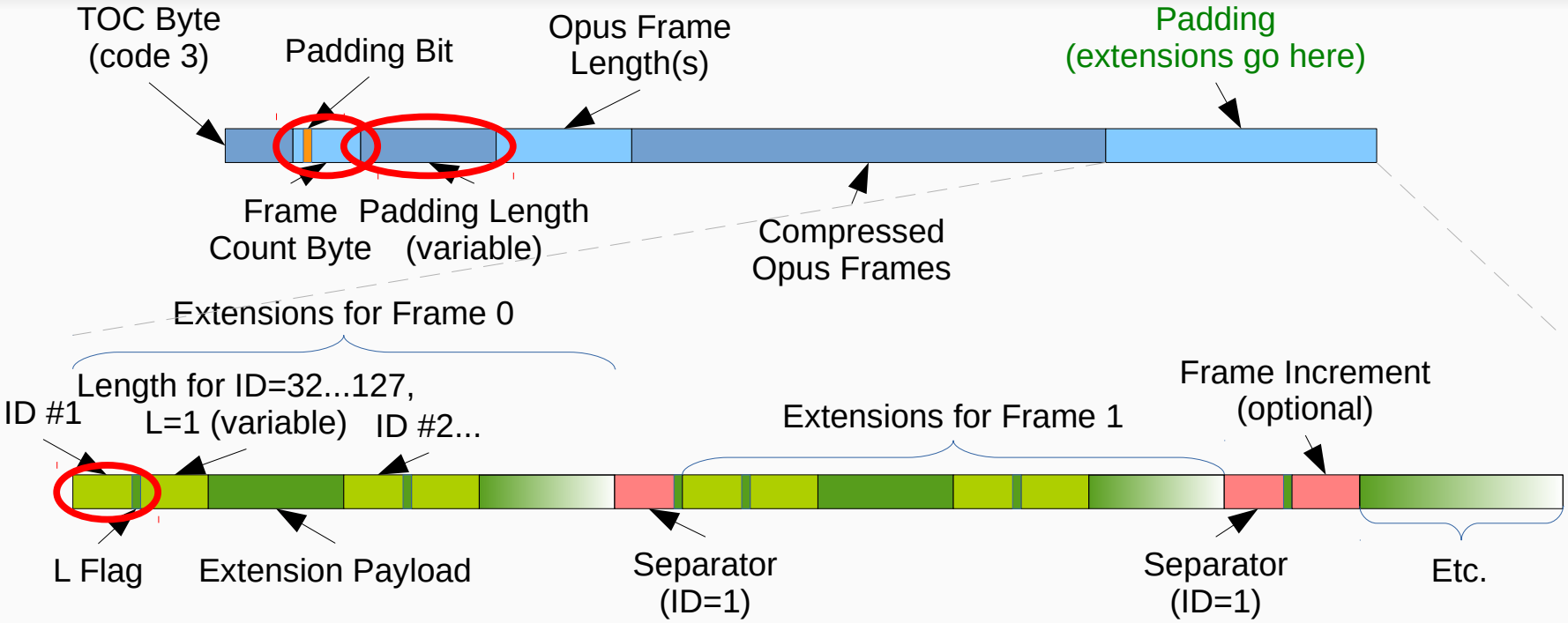
Draft Status

- No change since Prague
  - 02 submitted to refresh expiry

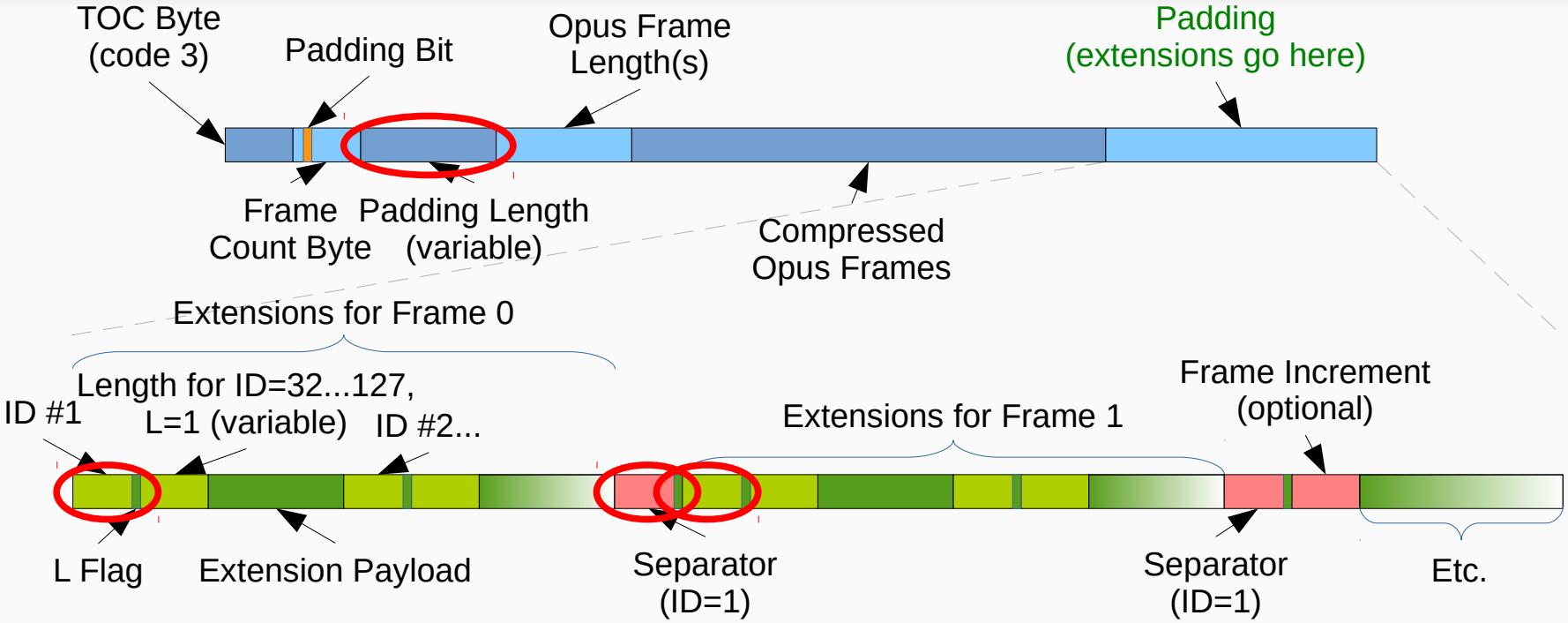
Opus Extension Format



Overhead
Single-frame: 3 bytes (minimum)



Overhead
Multi-frame: 2 bytes each (minimum)



Example:
60 ms packet with 3×20 ms frames

- Short (1-byte) extension on each frame
  - 3×2 bytes of overhead
  - 3×1 bytes of payload
- Total: 9 bytes

Proposal:
Repeat These Extensions (RTE)

- Additional mandatory-to-implement extension (ID=2)
- When encountered in current frame C
  - For each frame F after frame C in the same packet
    - For each extension E already seen in frame C (after any previous RTE extension)
      - Decode an extension payload of type E for frame F
        - Short extension: Use same L flag as the original
        - Long extension: Use L=1 (explicit length), unless RTE extension had L=0 and this is the last repeated extension
  - If RTE extension had L=1, continue decoding extensions for frame C
  - If RTE extension had L=0 and did not end with a long extension, continue decoding extensions for frame C+1
    - If frame C was already the last frame, zero pad to the end of the packet

Example Revisited:
60 ms packet with 3×20 ms frames

- Short (1-byte) extension on each frame
  - 1 byte for padding length
  - 1 byte for extension ID
  - 1 byte for RTE extension
  - 3×1 bytes of payload
- Total: 6 bytes

Summary

- Reasons to do this
  - Can reduce overhead even with just 1 extension appearing in 2 frames
  - Savings scale with the number of frames and repeated extensions
  - Applies to any extension: no extra IDs to register or SDP signaling
  - Integrates well with non-repeated extensions (e.g., DRED)
  - Doing it later would be a breaking change to extension parsing
- Reasons not to do this
  - Additional implementation complexity (entirely optional for encoder)
  - Extensions for a frame no longer guaranteed to be physically contiguous

Extension ID numbering: Strawman Proposal

- Split Extension ID space into “Short” and “Long” extensions

Ext. Byte (B)	ID(s)	Length
0...1	0	(B & 1) → 0 = rest, 1 = coded
2...3	1	(B & 1)
4...5	2	0
6...7	N/A	Reserved
8...63	a0...a55	(B & 3)
64...255	b0...b95	(B & 1) → 0 = rest, 1 = coded

Questions?

- How do we get more reviews and feedback?