VP9 Payload Format

uberti-payload-vp9-01

VP9 Overview

- Much better compression than VP8/H.264 (40%)
- Up to 8 reference frames
  - Can be different resolution than target frame
  - Allows temporal + spatial layering
- Higher layers can be removed without affecting decode of lower layers

Terminology

- **Layer Frame**: single frame for a specific spatial layer
- **Super Frame**: combo of all layer frames for a given input picture

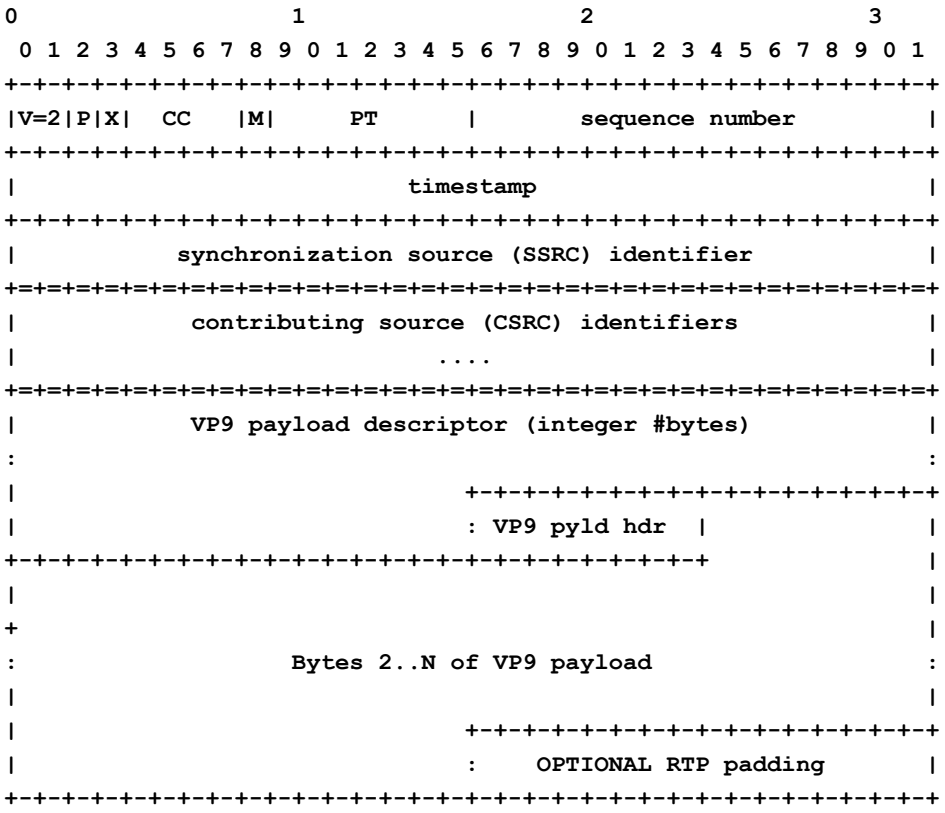
Packetization Features

- Specifies spatial and temporal indices
- Specifies scalability structure so receivers know how many layers are being sent
- Dependencies are explicitly indicated, either using specific indices, or a previously specified structure (SS = Scalability Structure)

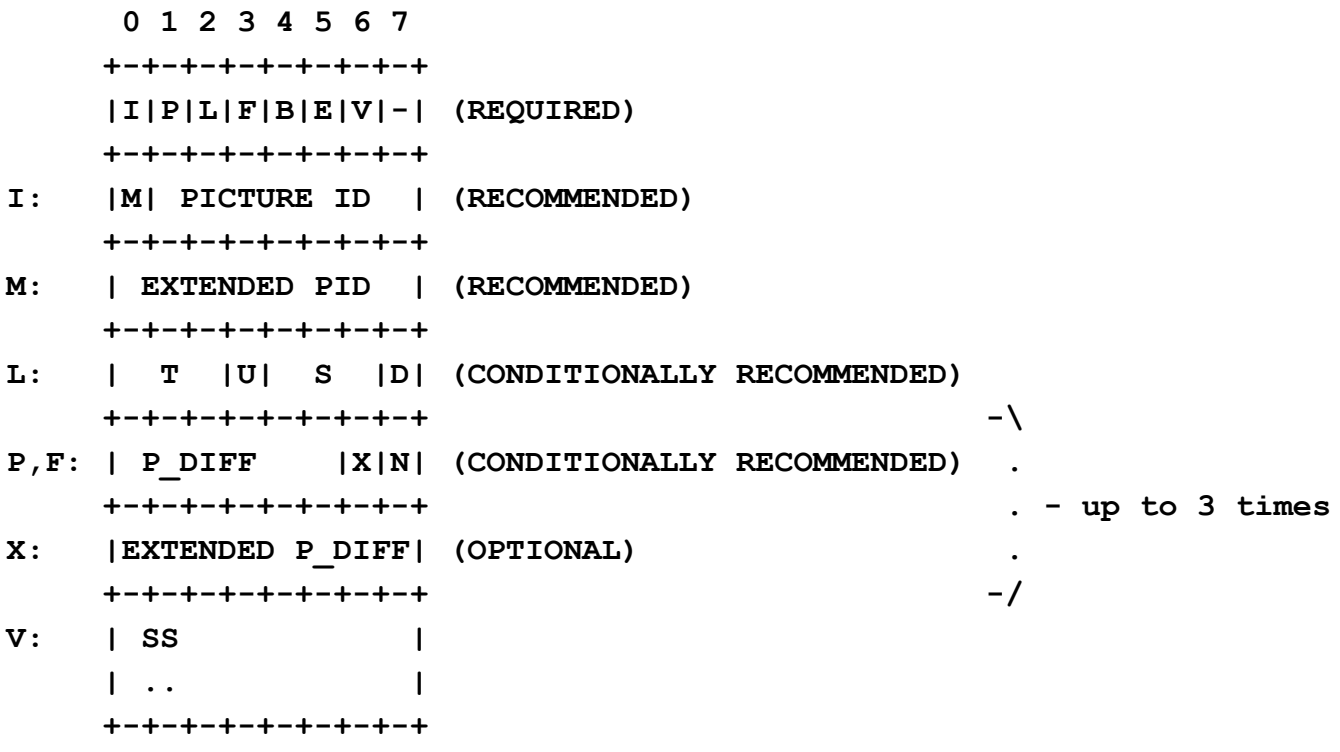
Flexible vs Non-Flexible Mode

- **Flexible Mode:** each packet contains up to 3 indices of reference frames, which can be set arbitrarily
- **Non-Flexible Mode:** the reference indices of a group of frames (GOF) MUST be pre-specified in the scalability structure; each frame will have an index that refers to one of these pre-specified references.

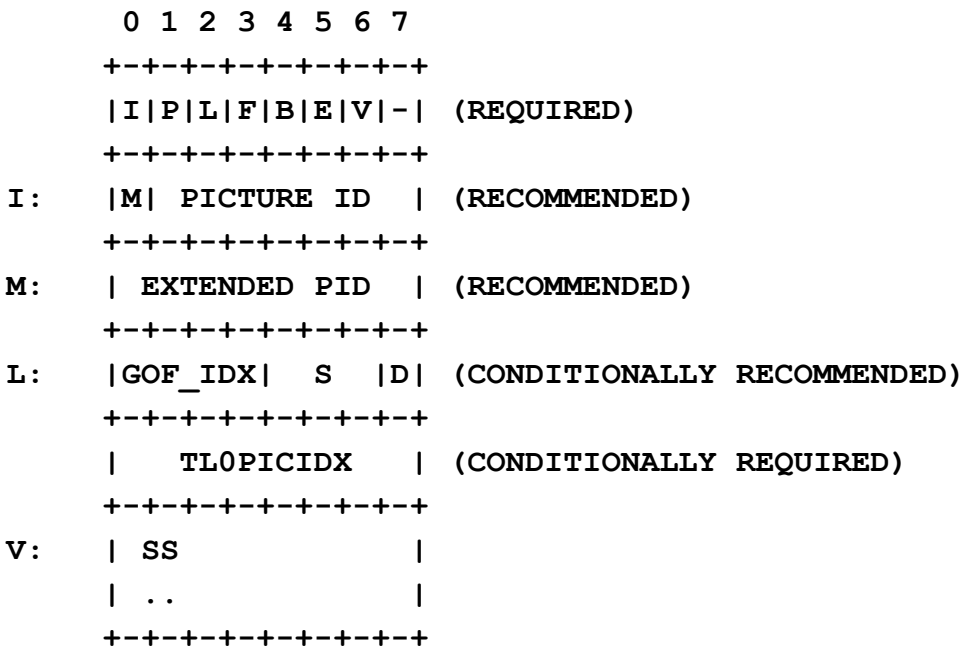
Packetization



Flexible Mode Packetization



Non-Flexible Mode Packetization



Usages

- **No layering:**
  only initial byte used; only B/E bits used
- **Temporal layering (non-flex):**
  PICID, GOF_IDX, TL0PICIDX (+SS sent with key)
- **Spatial + temporal layering (non-flex):**
  PICID, GOF_IDX + S + D, TL0PICIDX (+SS as above)

Scalability Structure (SS) Format