The Layer Refresh Request (LRR) RTCP Feedback Message

draft-lennox-avtext-lrr-00

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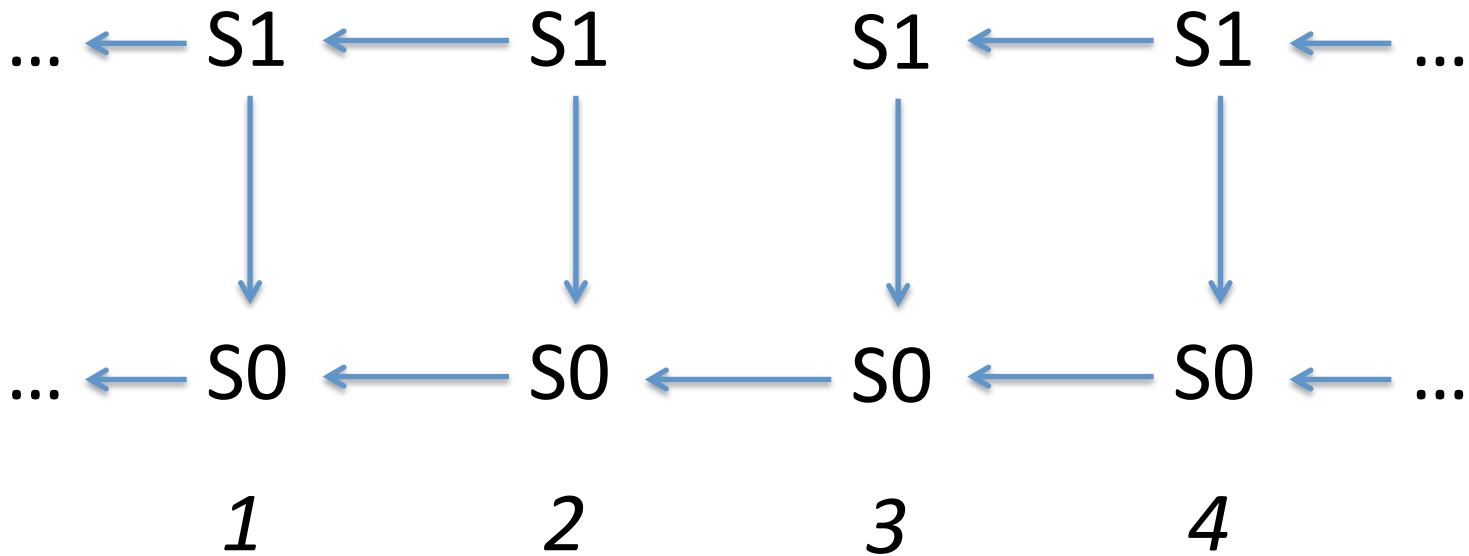Stefan Holmer
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AVTEXT, IETF 92

Layer Refresh Request

- AVPF message to request refresh of one or more substreams of a layered media stream.

  - Without requiring full refresh of entire stream, as with FIR.

- Applicable to both temporal and spatial scalability.

- Applicable to SRST/MRST/MRMT.
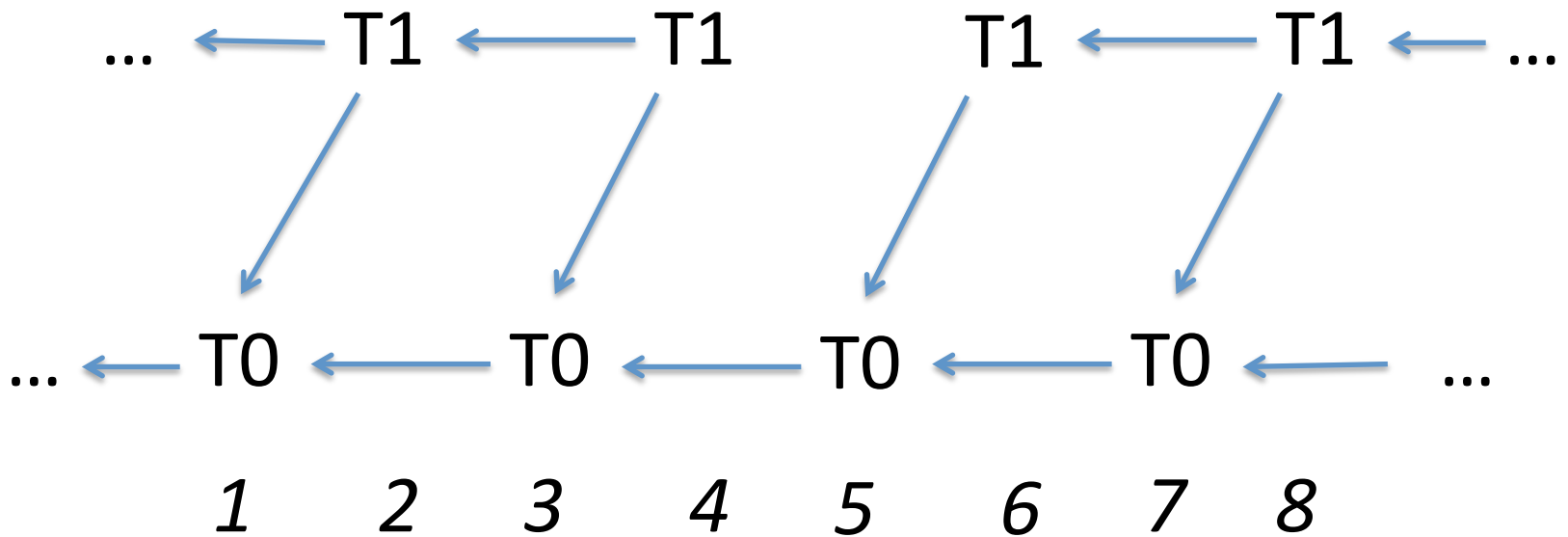
Layer Refresh Point

- Point after which a receiver, which previously had been able to decode only some (possibly none) of the layers of a source, can decode a greater number of its layers.
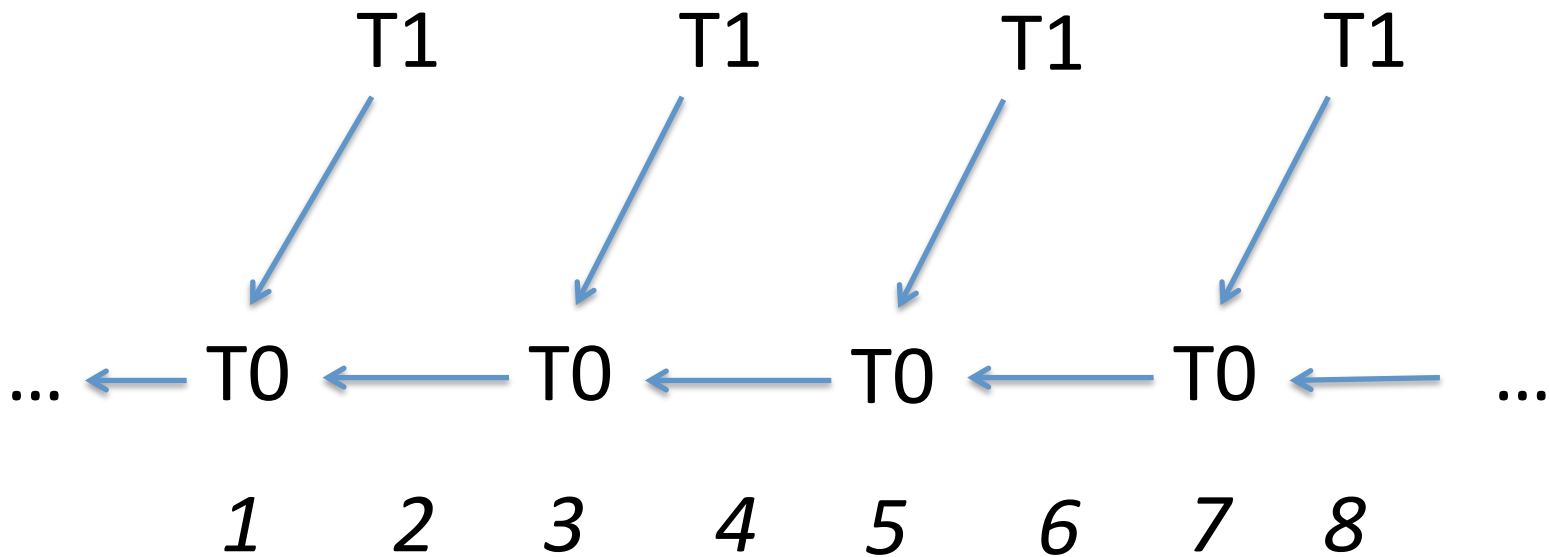
Spatial Refresh Point

$$... \leftarrow S1 \leftarrow S1 \qquad S1 \leftarrow S1 \leftarrow ...$$

$$\downarrow \qquad\qquad \downarrow \qquad\qquad \downarrow \qquad\qquad \downarrow$$

$$... \leftarrow S0 \leftarrow S0 \leftarrow S0 \leftarrow S0 \leftarrow ...$$

1   *2*   *3*   *4*

Frame 3 is a Spatial Refresh Point for Layer S1.

Temporal Refresh Point

... ← T1 ← T1   T1 ← T1 ← ...

... ← T0 ← T0 ← T0 ← T0 ← ...

1   2   3   4   5   6   7   8

Frame 6 is a Spatial Refresh Point for Layer T1.

Temporal Nesting

T1　　　　T1　　　　T1　　　　T1

… ← T0 ← T0 ← T0 ← T0 ← …

1　2　3　4　5　6　7　8

For some temporal structures every frame is a
temporal refresh point.

Layer Refresh message

- Specify layer you want refreshed, optionally lowest layer you can currently decode.

- Description of layers, identification of layer switch points are codec-dependent.

- Draft includes sketch definitions for H.264-SVC, VP8, H.265, VP9.
  - Still a lot of details needed.

Applicability to MRST/MRMT

- For SRST, straightforward.
- For MRST/MRMT, could we just use FIR?
  - FIR semantics not actually specified for multi-stream cases: does it refresh the individual stream, or the whole source?
  - A "refresh the whole source" semantic is useful for MRST/MRMT.
  - So this draft proposes that FIR means "whole source," and uses LRR for "individual layer," even for MRST/MRMT.

Way forward

- WG Adoption?