IETF 100 draft-zheng-xrblock-effective-loss-index-00

Hui Zheng, Roni Even, Qin Wu, Rong Gu

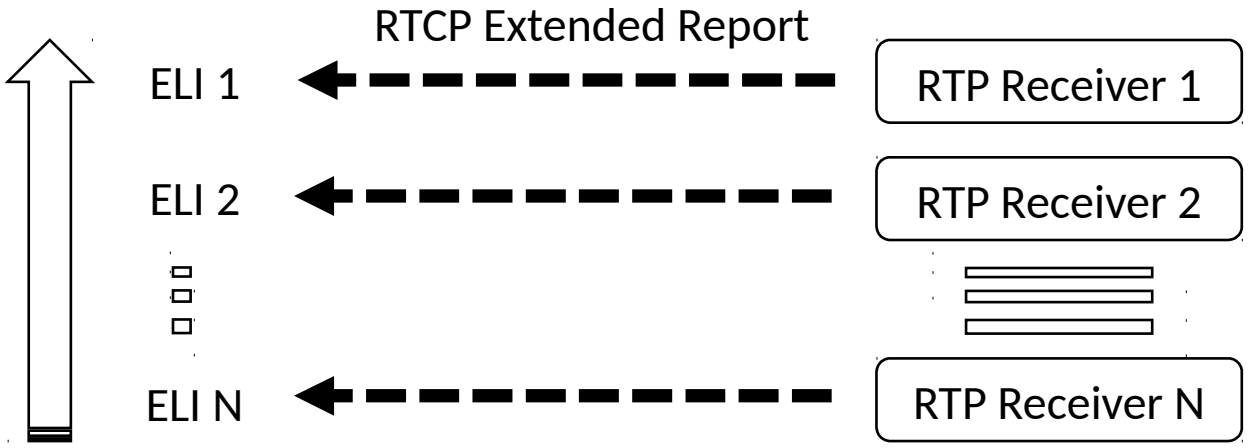
Overview

- This is a new XRBLOCK draft
  - Define a new metric type for Effective Loss Index
  - Define a new block type for Effective Loss Index Metric
- It augments post-repair pack loss related metrics defined in [RFC7509][RFC5725].
- Different from [RFC5725], reporting overhead for the packet-by-packet report block can be saved.
- Different from [RFC7509], it is used to provide statistics of the total packet loss changes during a period of time and reflect the tend of packet loss changes over time.

Introduction

- Effective Loss Index (ELI) intends to be a simple metric that
  - measures the effectiveness of loss repair means.
  - reported values can be directly compared, thus can be used to rank the effectiveness measured
  - measure the degree of burst of packet loss in case of loss repair mechanism are applied.

<u>An example usage:</u>
Sort the reported ELIs to find the 5% worst performing RTP endpoints, which might need further treatments.



The Model for Calculating ELI

- Effective Loss Index (ELI) assumes a model that
  - An RTP endpoint is thought to process received data streaming packets;
  - loss repair methods are applied on RTP packets chunk by chunk, each chunk is equal in size;
  - For each chunk, if there is still some unrecoverable loss after having applied the loss repair mechanism, then the repair mechanism are deemed as ineffective. The ineffectiveness value is denoted by Effective Loss Factor (ELF)

```
if Total Loss with loss repair method applied >
Effective Loss Threshold
     Effective Loss Factor (ELF) = 1
else
     Effective Loss Factor (ELF) = 0
endif
```

  - For N chunks

$$ELI = \frac{ELF(1)+ELF(2)+ \ldots +ELF(N)}{N} \times 10000$$

A Simplified Example

Assume that

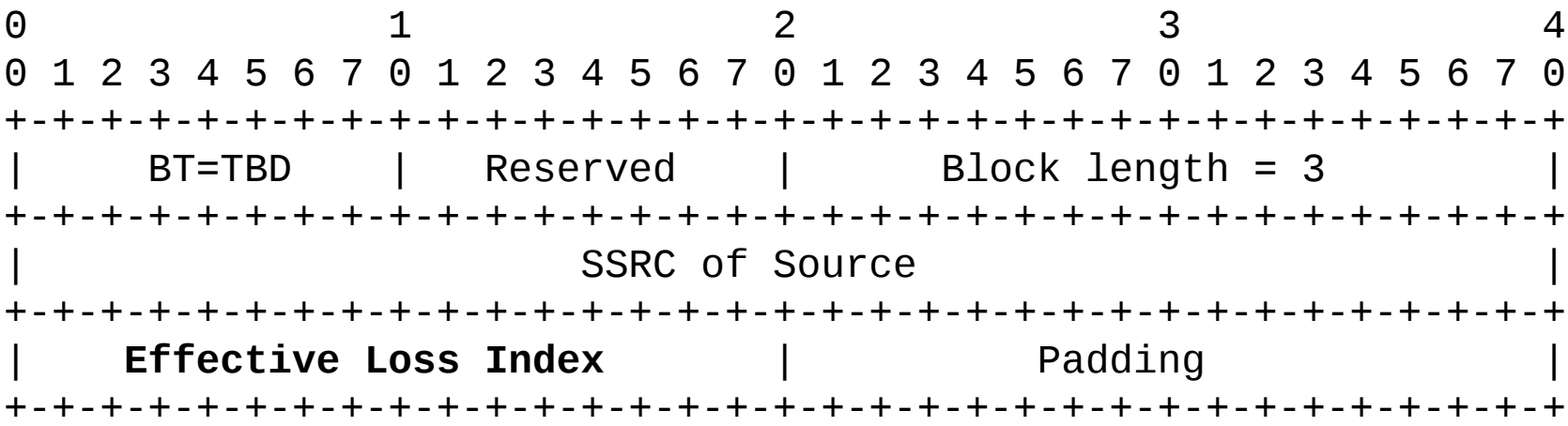
- **Chunk Size** = 3 (in packets)
- **Effective Loss Threshold** = 1 (in packets)
- The number of chunks =3

Chunks of RTP Packets	Post-Repair Loss	Effective Loss Factor
| 1 2 3 |	2, 3	1
| 4 5 6 |	5	0
| 7 8 9 |	7	0

$$\text{Effective Loss Index} = \frac{1 + 0 + 0}{3} \times \mathbf{10000} = 3333$$

10000 is selected to be the multiplier that turns the result into an integer.

The new XR Block



Effective Loss Index: It is calculated by dividing Effective Loss factors over a sequence of consecutive chunks of RTP packets by the number of consecutive chunks.

The new SDP Attribute

ABNF Definitions:

```
xr-format =/ xr-eli-block

xr-eli-block = "effective-loss-index"
               [ ":" effective-loss-bulk-size]
               [ ">" effective-loss-threshold]

effective-loss-bulk-size  = 1*DIGIT
effective-loss-threshold   = 1*DIGIT

DIGIT = %x30-39
```

Examples:

```
xr-eli-block = "effective-loss-index" : "100" > "2"
xr-eli-block = "effective-loss-index" : "100"
xr-eli-block = "effective-loss-index" > "2"
```

Consideration on Effective Loss threshold and the number of chunks

- Effective Loss Threshold: It can be signaled using SDP or other out-band mechanism. The value of Effective Loss Threshold can be selected based on specific RTP applications, e.g., in FEC application case, the number of packets in FEC stream.

- Number of chunks: the number of chunks against which ELI is calculated should not be too few, otherwise the result may be too biased. No recommended value for the number of chunks has been proposed in this version of draft.

Thanks

- Comments & questions?