TWAMP for Capacity – Burst Rate Measurement Features

draft-morton-ippm-twamp-rate-00

Al Morton and Len Ciavattone

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Capacity is Interesting

- Overseers like to measure something that relates to user experience
- Consumer access = Asymmetric Speeds
- SPs advertise a different metric:
  - It's the traditional metric for access
  - Has similar units of measure
  - A simple, intrusive test can verify
- See Definitions of Raw & Restricted Capacity in (this is a proposal for Raw):
  - draft-ietf-ippm-reporting-metrics-05

Advantages of "T"

Yes, you could do this with OWAMP, but

- Server and Session-Reflector are fairly simple functions
  - Add to edge/large scale device
- Results returned to Sender
  - No Fetching or Storage at large scale Reflector
- NTP accuracy sufficient
 - Measuring Rate, at a single Meas Point

Capacity Meas Streams – Summary of Designs
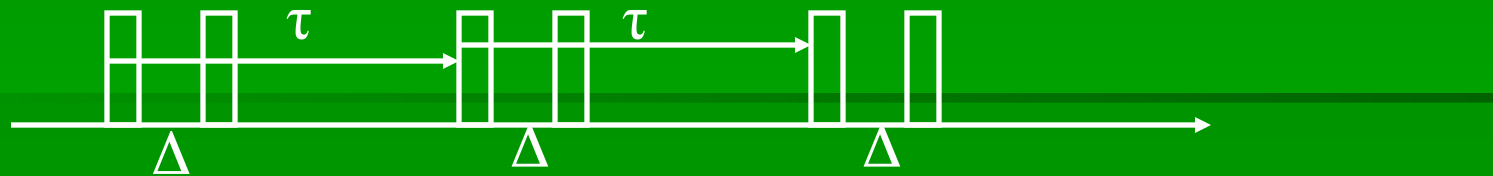
- Packet pairs, fixed Δ, fixed or random τ
- Multiple streams of packet pairs with a range of Δ and τ
- Multiple Streams using $\Delta = 0$ or range of Δ, $\Delta = \tau$ (Streams, not pairs)
- Stream of Chirps – decreasing Δ, no τ, each pair represents a rate in a range of rates, then repeat the same Chirp again


4
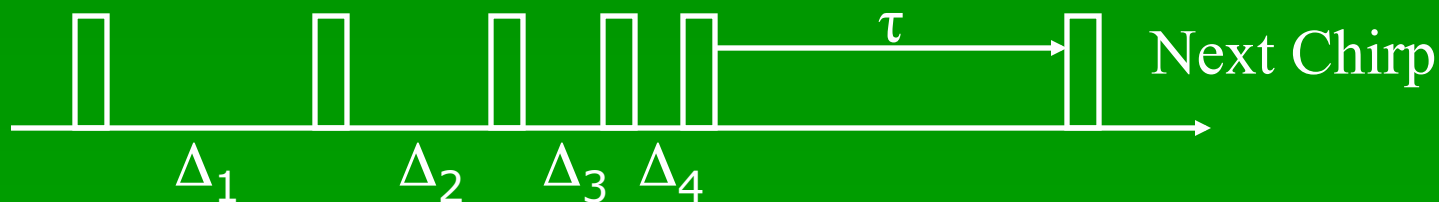
TWAMP Session Reflector – Burst Measurement

τ … Session-Sender

t → Bits/t = Rate

Session-Reflector

Δ_2 Δ_3 Δ_4
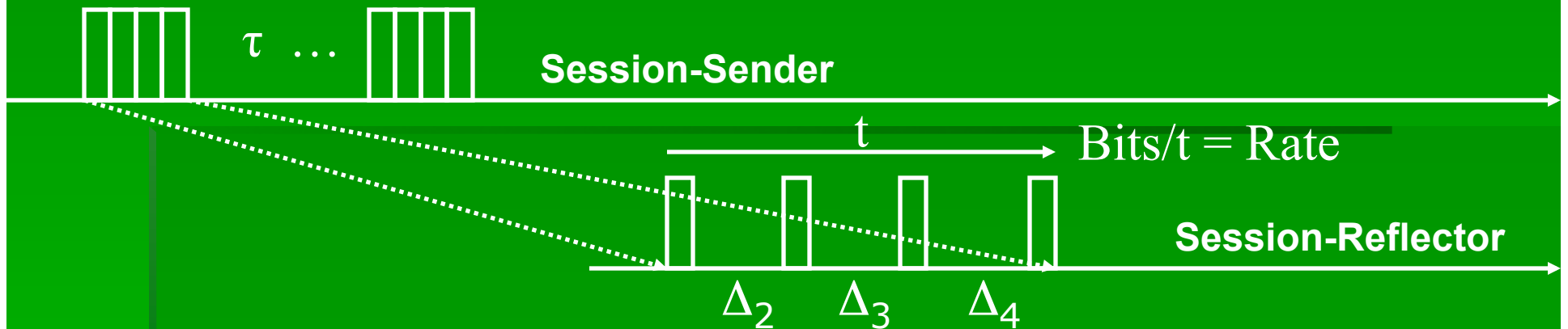
- Packet Burst from Session-Sender
- then …   Measure Rate and Dispersion @ Reflector
- And finally:
- Return MINIMUM size packets (Reflector Header)
- OR
- Return Concatenated Reflector Headers in ONE REPLY

5

TWAMP Session Reflector – Burst Generation

$$\text{Bits/t} = \text{Rate}$$

$$\tau \quad \dots \qquad \text{Session-Sender} \qquad \qquad t$$

$$\Delta_2 \qquad \Delta_3 \qquad \Delta_4$$
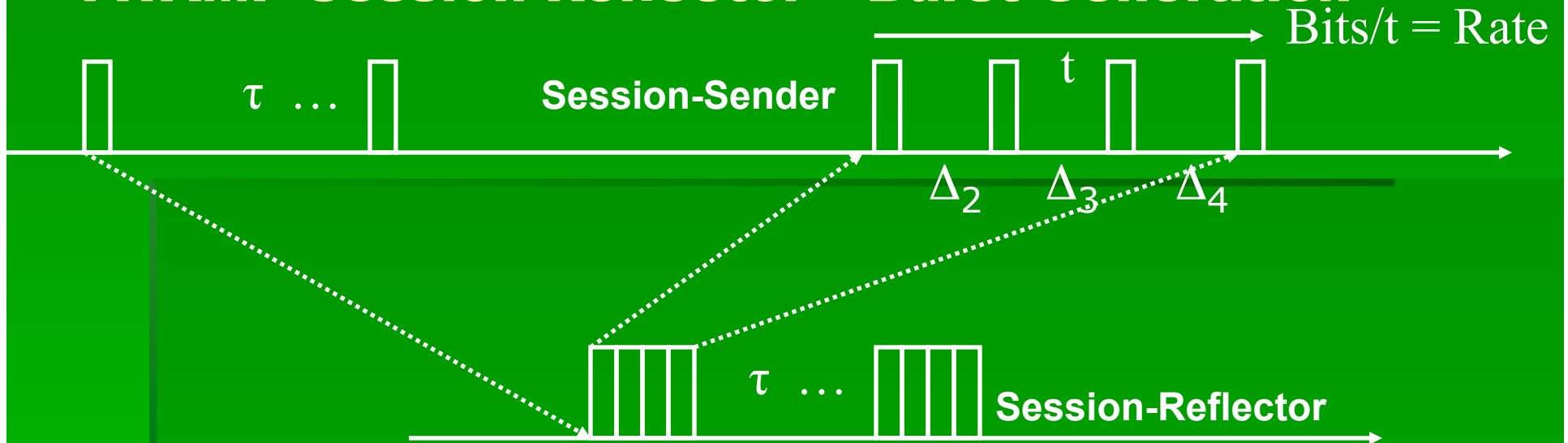
$$\tau \quad \dots \qquad \text{Session-Reflector}$$

- Burst Initiation Packet from Session-Sender
- Reflector Generates Burst as configured by Control Protocol
- then …   Measure Rate and Dispersion @ Sender

TWAMP Asymmetric Size – Burst Length = 1

τ … Session-Sender

τ … Session-Reflector
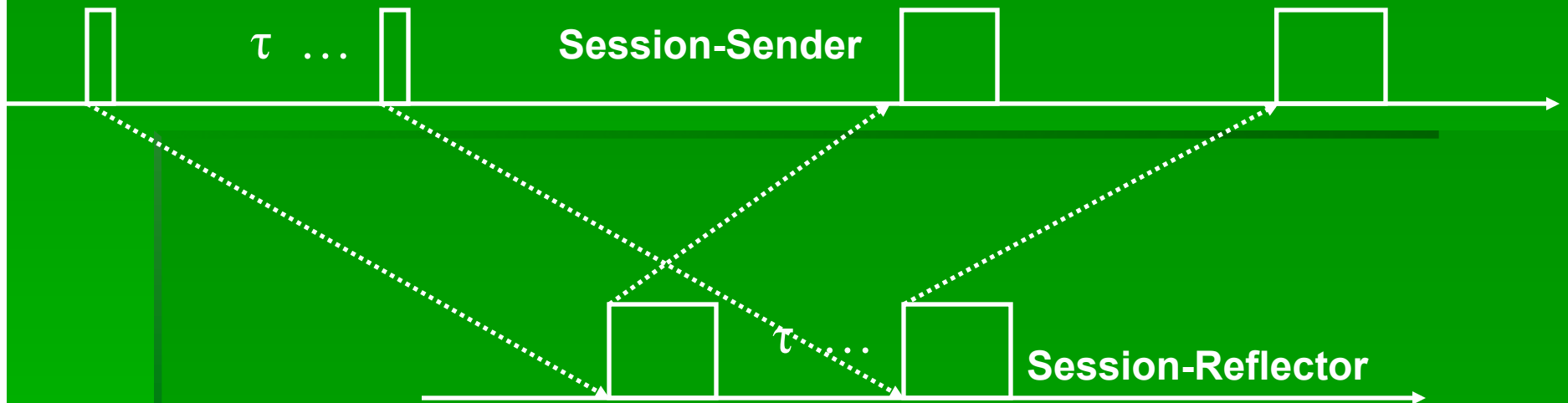
- Burst Initiation Packet from Session-Sender
- Reflector Generates MTU as configured by Control Protocol
- then … Measure @ Sender

Near-Trivial Modifications

Control Protocol

- Burst Gen and Meas use <u>same</u> Request-TW-Session Format with <u>2 re-interpreted fields</u> each
    - Number of Packets + Padding Length or Timeout

Test Protocol

- <u>Retain</u> Sender and Reflector Packet Formats

- <u>Reflector Behavior</u> as Described in slides

- Multiple <u>Simultaneous Test Sessions</u> allow variable burst lengths and/or test packet sizes

Intrusive Capacity: Mode Field Assignment

```
Value   Description                  Reference/Explanation
 ...
  8       Unauth. TEST protocol,  bit position (3)
          Encrypted CONTROL
--------------------------------------------------------------
 xxx      Burst Generation        this memo, bit position(X)

 zzz      Burst Measurement       this memo, bit position(Z)
```

9

Questions for IPPM

- Is this simplified capacity estimation:
    - Acceptable?
    - Preferred?
- WG action?