RTCP

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Exercise

Multimedia Technology,

Tutorial 4, section 1

RTCP

Assume RTP and RTCP are used in a video conference with 30 participants, 10 of whom send and receive media, while the remaining 20 only receive media. At any given time, only one of the senders is transmitting media at a rate of 950 Kbps.

If each sender report requires 128 bytes and each receiver report requires 256 bytes, at how many packets per second (pps) should each sender send sender reports and each receiver send receiver reports, according to RTCP conventions?

Calculate Bandwidth (BW)

At any given time, the sender is transmitting media at a rate of 0.95 Mbps.

RTCP limits traffic to 5% of the total BW.

Therefore:

$$BW = 0.95Mbps + 0.05*BW =>$$

$$BW * (1 - 0.05) = 0.95Mbps =>$$

$$BW = 0.95 / 0.95 \ Mbps = 1 \ Mbps.$$

RTCP Sender Report Packet Transmission Period Calculation

$$T_S = \frac{N_s * L}{0.25 * 0.05 * BW}$$

- T_S : Sender packet transmission period

- N_S : Number of senders = 10

- L : Average RTCP packet size = 128 Bytes = 128 * 8 bits

- BW : Available bandwidth = 1 Mbps

RTCP Sender Report Packet Rate Calculation

$$T_S = \frac{10 \;*\; 128 \;*\; 8 \; bit}{0.25 \;*\; 0.05 \;*\; 1000000 \; bit/s} =$$

$$\frac{1024 \; bit}{1250 \; bit/s} = 0.8192 \; \text{sec}$$

The packet transmission rate in packets per second (pps) is then calculated as:

$$1 \,/\, T_S = 1.22 \; \text{pps}$$

RTCP Receiver Report Packet Transmission Period Calculation

$$T_R = \frac{N_R * L}{0.75 * 0.05 * BW}$$

- T_R : Receiver packet transmission period
- N_R : Number of senders = 30
- L : Average RTCP packet size = 256 Bytes = 256 * 8 bits
- BW : Available bandwidth = 1 Mbps

RTCP Receiver Report Packet Rate Calculation

$$T_R = \frac{30 \ * \ 256 \ * \ 8 \ bit}{0.75 \ * \ 0.05 \ * \ 1000000 \ bit/s} =$$

$$\frac{6144 \ bit}{3750 \ bit/s} = 1.6384sec$$

The packet transmission rate in packets per second (pps) is then calculated as:

$$1 \ / \ T_R = 0.61 \ \text{pps}$$