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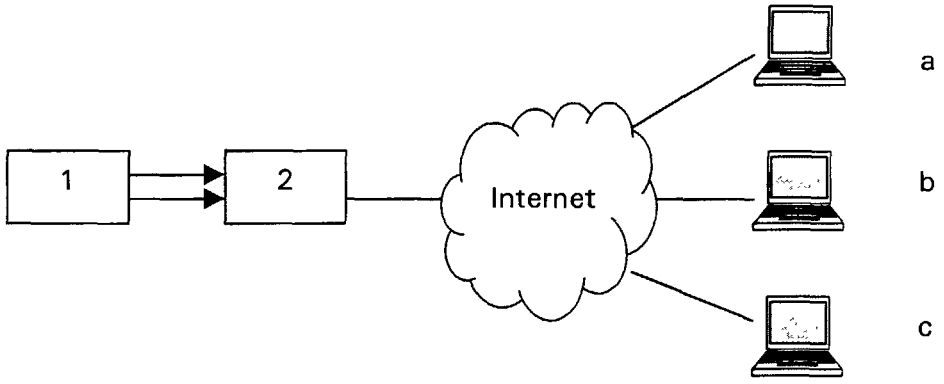
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(54) Title: TRANSMITTING AND RECEIVING REAL-TIME DATA



(57) Abstract: The invention concerns streaming real-time data (e.g. video) over packet networks (e.g. the Internet). Conventionally, in packet networks, in order to view streamed video data a reservoir of data is built up to reduce the effect of jitter, caused by variations in the inter-arrival times of packets of data. Consequently, a delay is experienced before the video material can be viewed as the reservoir is filled. The invention is concerned with providing streamed video without the start-up delay by transmitting data from a video streamer to the video viewer more rapidly than the video viewer consumes the data and using the excess data to build a buffer at the video viewer. When a suitable sized buffer is built the transmission rate of data to the buffer may be reduced. In order to deliver the best quality material for the available bandwidth, the supply of video data may be switched to a higher bit-rate source when the reservoir is filled. Fluctuations in network throughput may be accommodated during the transmission of data on a fine scale by adjusting the transmission rate of the data and on a coarse scale by switching between data streams encoded at different bit-rates. Fluctuations in network throughput are determined by counting the number of missing packets at the video viewer which information may then be fed back to the video streamer to adjust the flow of data accordingly.

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