

**ABSTRACT****TRANSMITTING AND RECEIVING REAL-TIME DATA**

The invention concerns streaming real-time data (e.g. video) over packet
5 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
10 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
15 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
20 streamer to adjust the flow of data accordingly.

Figure 1

