ITU-T Telecommunications Standardization Sect **AVC 778**

Study Group 15 **15 May 95**
Experts Group for Video Coding and Systems
in ATM and Other Network Environments

Source: AT&T (Barry Haskell)
Title: **Descriptor Information to Aid Timing Recovery**
Purpose: Discussion and Information

Introduction:

In severely jittered or highly lossy networks, timing recovery may be problematic in inexpensive implementations that cannot afford highly stable crystal clocks. Often the encoders can provide information as to which parts of the data stream may be useful for recovering the Decoder System Time Clock (D-STC) frequency and phase.

Generally this means that one or more data rates are locked to the Encoder System Time Clock (E-STC) and can be used in an *Adaptive Clock Recovery* (ACR) scheme at the decoder. The size of the assumed buffer in the ACR will depend on how much jitter is encountered during transmission. The jitter may or may not include multiplexing jitter. If it does, then the assumed ACR buffer will be larger.

There are several possible data items that might be used for clock recovery. For discussion purposes, we include a straw man list in a ITU_video_descriptor() format. Other methods of sending this information are certainly possible, includinf PDU options and capability exchanges. An audio timing descriptor may also be useful. Perhaps a generalized descriptor would be better.

```
ITU_video_timing_descriptor(){
      ...standard stuff.....          16
      vbv_delay_flag                  1     bslbf
      video_bit_rate                  30    bslbf
      video_SCPkR                     25    bslbf
      pw_rate_flag                    1     bslbf
      reserved                        15    bslbf
}
```

vbv_delay_flag-- This is a 1 bit flag which when set to '1' indicates that the video parameter vbv_delay may be used for timing recovery. The last byte of PSC should arrive at time DTS - vbv_delay.

video_bit_rate-- If ≠0x3fffffff, this is the exact rate that video bits are passed from the encoder buffer to the multiplexer. Specified in units of 400 bits/sec.

video_SCPkR-- If ≠ 0x1fffffff, indicates a constant PES packet rate is passed from the encoder buffer to the multiplexer. Integer value is the ratio of 27e6 to the packet rate. Two slices per packet is very convenient. (Alternatively, we could specify the number of slices per packet)

pw_rate_flag-- This is a 1 bit flag which when set to '1' indicates that the **piecewise_rate** TS parameter may be used for timing recovery. Similar to **video_bit_rate**, but more flexible.