TDMoIP-LE

Using TDMoIP Loop Emulation for congestion control

PWE3 – 56rd IETF

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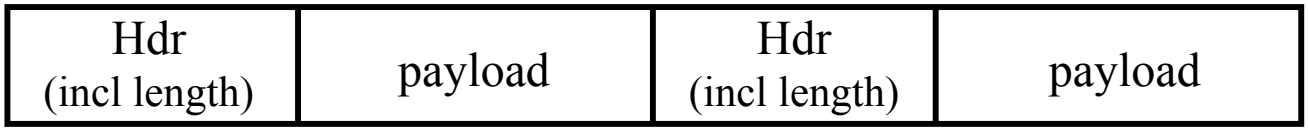
Draft-anavi-tdmoip-05 modes

FORMID	mode
1000	raw bits
1100	AAL1 unstructured
1101	AAL1 structured
1110	AAL1 structured w/ CAS
0000	ATM PW compatibility mode
1001	**AAL2 VBR**
1111	HDLC

TDMoIP AAL2 mode



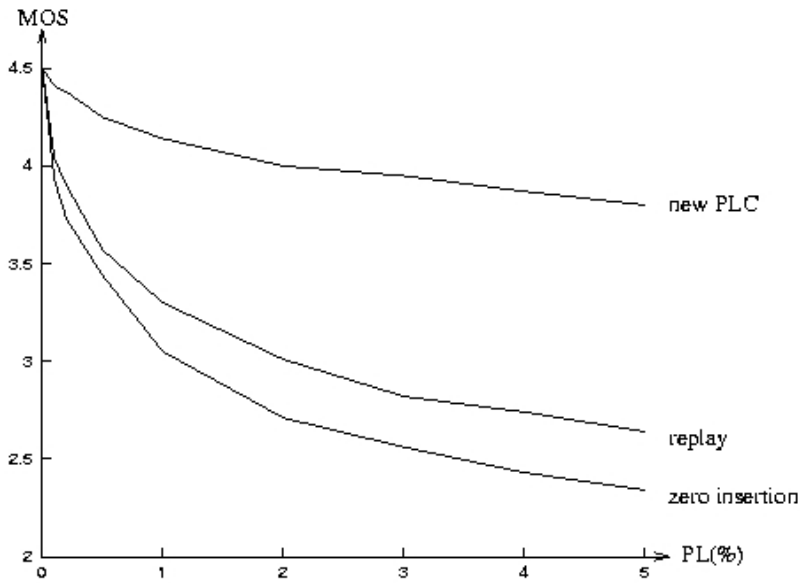
- VBR *without ATM 48 byte cells*
- Enables:
  - Dynamic allocation of timeslots
    - Signaling
    - VAD
  - Use of arbitrary NSP
    - VAD
    - speech compression
    - fax/modem/tone relay
- BW can be reduced to < 5% of original TDM

Congestion avoidance

- PWs are required NOT to interfere with neighboring flows
- Present approach : tear down the PW
- Removal of service is not acceptable for TDM
  - No provider will use an emulation designed to be torn down
  - Service outage impacts many users
  - TDM users are used to “five nines”
- Congestion can be due to:
  - overbooking - nothing can help (*tear down* can’t be helped)
  - short duration statistical peaks (seconds - minutes)
- Less drastic remedies for statistical peaks
  - Drop packets and use PLC - 10% reduction acceptable
  - NSP + AAL2 - 95% BW reduction possible
    - perceivable quality reduction
      but much better than service outage

Packet loss concealment

- Perceptual effect of packet loss on voice can be concealed
- Better concealment possible for TDMoIP than VoIP
  - Idea presented in draft-stein-pwe3-tdm-packetloss-00
- Progress since last meeting
  - Larger packet sizes (up to 40 samples per timeslot)
  - New, more general, PLC algorithm
  - Small scale tests



Proposal

- TDM encapsulation MUST provide for congestion avoidance
  - There MUST be a VBR mode
  - MUST be able to use NSPs such as VAD/compression
  - There MUST be a remote indication of packet loss (R bit)
- TDM control word MUST include a length field
  - BW reduced packets are small
- TDM control word MUST include a per-packet FORMID
  - signaling the format change is too slow

PACKMAN

- Working systems on private networks
- Anecdotal evidence for public Internet

- PACKMAN
  - Software to collect packet loss and PDV data
  - generates periodic TDMoIP stream

- Have already discovered several interesting facts
  - Most packet loss events are isolated (not bursts)
  - There are *periodic* packet loss phenomena