TDM Agreement

There is rough consensus in the TDM DT for:

- **Unstructured TDM draft**

    – **MUST support uCESoPSN (N * 125μsec)**

    – **MAY support unadapted-TDMoIP (N * 47)**

- **Structured TDM draft**

    – **MUST support TDMoIP-AAL1**

    – **MAY support TDMoIP-AAL2**

    – **MAY support CESoPSN (N * frames)**

PWE3 Control Word

PWE3 – 55th IETF

21 November 2002

Yaakov (J) Stein

CW Information

- Sequence number

- Payload dependent flags

- Packet length

- Fragmentation indicators

- Payload type identifier

Three different formats

Martini CW

RES	FLAGS	LENGTH	SEQUENCE NUMBER

CEP Header

E	FLAGS	POINTER	SEQUENCE NUMBER

Fischer CW

LENGTH	SEQUENCE NUMBER	FLAGS

Why are there three formats?

- **Different services may have different requirements**

  - **only CEP drafts require structure pointer**

  - **sequence number may be optional**

  - **varying number of flags**

  - **may support fragmentation bits**

  - **may need basic and extended format**

- **Historical reasons**

  - **different groups wrote drafts**

  - **different existing implementations**

Proposal

PWE3 should adopt a SINGLE control word structure

This CW should be based on the Martini CW

If insufficient room for required fields (e.g. CEP's pointer)

   then an extended word should be used

   but this format should be mandated for that service

| RES	FLAGS	LENGTH	SEQUENCE NUMBER
STRUCTURE POINTER			RES

Packet Loss

PWE3 – 55th IETF

21 November 2002

Yaakov (J) Stein

Effects of Congestion

- **PWE should be taking congestion into account**

- **Congestion causes**
  - **packet delay variation (PDV)**
  - **packet loss**

- **For TDM services, handling congestion requires**
  - **bandwidth reduction mechanisms (e.g. AAL2)**
  - **sophisticated clock recovery mechanisms**
  - **packet loss concealment techniques**

Effect of Packet Loss on Voice Quality
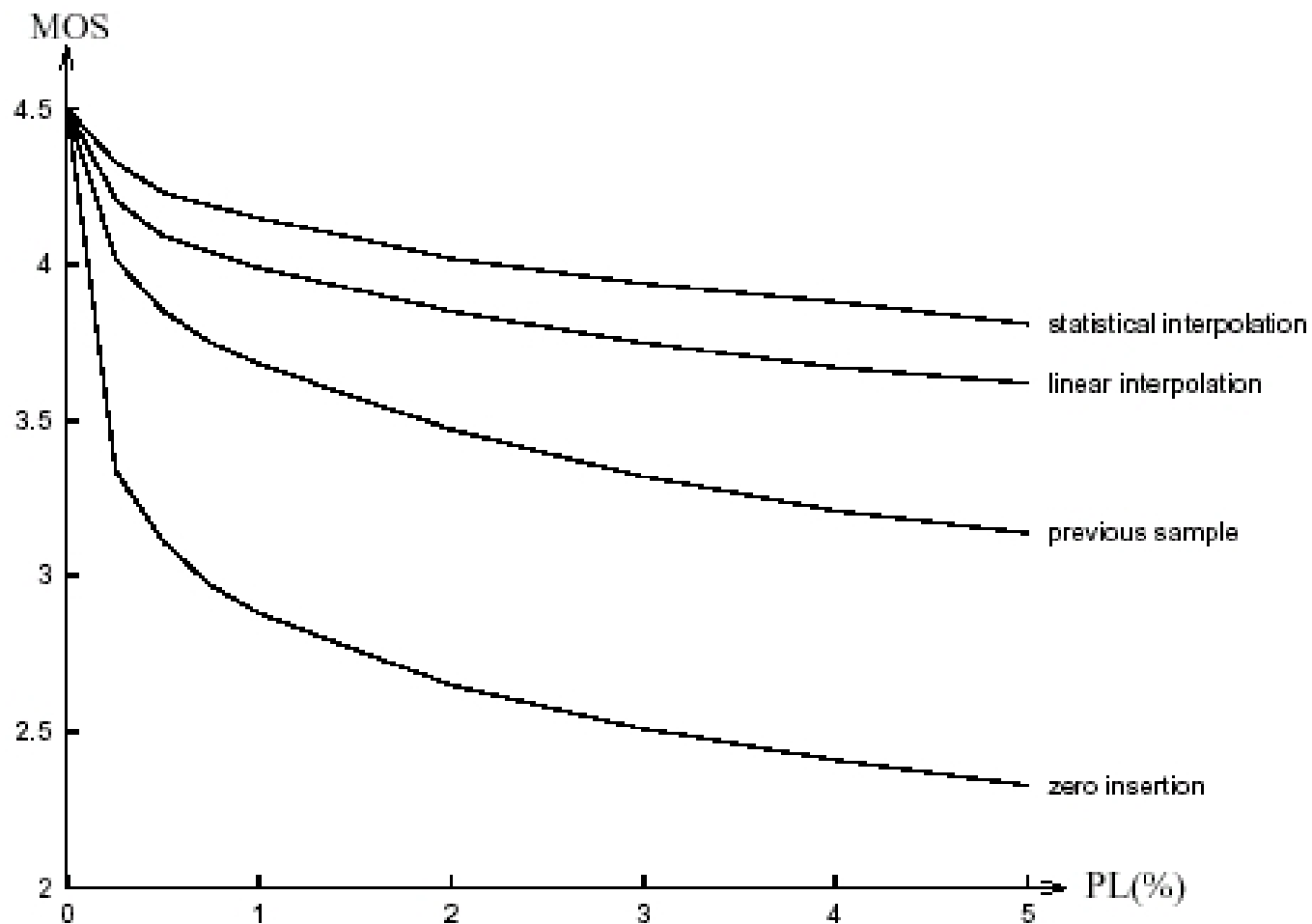
Analysis

- **Packet loss concealment has been built into VoIP**

- **For TDM (interleaved timeslots) the job is easier since packet loss induces smaller gaps**

- **Simple AIS injection fails at about 0.2% packet loss**

- **Unstructured TDM transport can do no better**

Proposal

- **Structured TDM transported should be used for > 0.2 % packet loss**

- **Encapsulation MUST be able to *easily* support replay**

- **Implementations SHOULD provide interpolation**