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**

<table>
<thead>
<tr>
<th>RES</th>
<th>FLAGS</th>
<th>LENGTH</th>
<th>SEQUENCE NUMBER</th>
</tr>
</thead>
</table>

**CEP Header**

<table>
<thead>
<tr>
<th>E</th>
<th>FLAGS</th>
<th>POINTER</th>
<th>SEQUENCE NUMBER</th>
</tr>
</thead>
</table>

**Fischer CW**

<table>
<thead>
<tr>
<th>LENGTH</th>
<th>SEQUENCE NUMBER</th>
<th>FLAGS</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>RES</th>
<th>FLAGS</th>
<th>LENGTH</th>
<th>SEQUENCE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRUCTURE POINTER</td>
<td></td>
<td>RES</td>
<td></td>
</tr>
</tbody>
</table>
Packet Loss

PWE3 – 55th IETF

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

Encapsulation MUST be able to easily support replay

Implementations SHOULD provide interpolation