What’s new in the TDMoIP draft (version 03)?

• Edited to conform with PWE concepts/terminology
  • Elimination of motivational text
  • Added applicability statement
  • Layering made explicit
  • Isolation of PSN-dependent details

• Control word format update

• Explicit treatment of MPLS / L2TPv3 / L2Eth

• New OAM/IPPM section added
### TDMoIP Layering Structure

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>PSN / multiplexing</td>
<td></td>
</tr>
<tr>
<td>RTP header when need timing</td>
<td></td>
</tr>
<tr>
<td>TDMoIP Encapsulation</td>
<td></td>
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<tr>
<td>AAL1</td>
<td></td>
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<tr>
<td>AAL2</td>
<td></td>
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<tr>
<td>HDLC</td>
<td></td>
</tr>
</tbody>
</table>

- **AAL1** used for preconfigured setup
- **AAL2** used for *dynamic bandwidth*
- **HDLC** used for CCS signaling
AAL1 for structured TDM

As discussed in the previous meeting

“AAL1” is the simplest method to robustly transport structured TDM (voice, sync, signaling)

ATM community has done the debugging for us!

Any alternative will either

- Fall apart upon packet loss or
- Be less efficient (e.g. require payload duplication) or
- Mandate high latency (e.g. multiframe per packet) or
- Require PE to understand TDM intricacies or
- Be essentially equivalent (i.e. contain a structure pointer)
AAL1 is BW inefficient when timeslots are dynamic

Even with GB rates we should consider efficiency considerations

“AAL2” is the simplest method to robustly transport dynamic structured TDM

Any alternative will either

- Fall apart upon packet loss or
- Be less efficient (e.g. require renegotiation) or
- Require PE to understand TDM intricacies or
- Be essentially equivalent
Unified Approach to TDM PW

<table>
<thead>
<tr>
<th>FORMID</th>
<th>TDMoIP Encapsulation</th>
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<tr>
<td>Raw frames</td>
<td>AAL1</td>
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- PSN / multiplexing
- RTP header when need timing

Similar to “profiles” in some VoX protocols
The problem is the *motivation*

<table>
<thead>
<tr>
<th>Raw frames</th>
<th>AAL1</th>
<th>AAL2</th>
<th>SONET/SDH</th>
<th>HDLC</th>
</tr>
</thead>
</table>

Why so many different payload formats to transport TDM?

**Division of application space**
- AAL1/2 for low speed, SONET/SDH for high-speed
- How justify raw frames except for simple implementation

**Service Interworking**
- Obvious when interfacing to AAL/SONET networks
- but which should be used for simple TDM?
Proposed Solution

- **MUST** use SONET/SDH for high rate

- For low rate (E3/T3 and below):
  - **MUST** use raw frames for unstructured
  - **MUST** use AAL1 for structured / static timeslot with CAS
  - **MUST** use AAL2 when dynamic timeslot allocation required
  - **MAY** use either raw or AAL1 for structured w/o CAS