802.3 Frame Expansion Study Group

Open issues

Kevin Daines
World Wide Packets

San Antonio, Texas
Agenda

- Review of plan going into September interim
- Review of open issues
  - Block coding/delimiters
  - Links with FEC (EPON)
  - Use of discovery
  - New maximum frame size
Plan for September interim

- Research following topics:
  - Frame size limitations of:
    - Existing equipment – below MAC (elasticity buffers, block coding, delimiters)
    - Existing equipment – above MAC (FIFO, fabric)
    - Links with FEC (EPON)
    - Rate compensation (WAN PHY, EFM Copper)
  - Effect of increased overhead on performance, especially in aggregation
  - Feasibility of reducing MTU of installed base of clients
  - Tutorial on 802.1AB
  - Straw man frame format modifications
- Finalize PAR/5 criteria
- Draft TF objectives

*Items in red have not had presentations or significant discussion*
Open issues

- Frame size limitations of:
  - Existing equipment – below MAC (block coding, delimiters)
  - Links with FEC (EPON)
  - Rate compensation (EFM Copper)
- Use of “discovery mechanism” to enable larger frames on some links
- New maximum frame size
“As I thought, one of the papers I have has data on double burst detection for our CRC. The paper is:


“It has a table for Double-Burst Error Detecting Capability listing the message length (code length) that ensures detectability for two bursts of various lengths. Unfortunately, the shortest burst length in the table is 9 bits. Any two 9-bit bursts can be detected up to the message size 13000 bits or 1625 bytes. 8-bit bursts will be detected to at least this message size and probably something larger.”

Source: Pat Thaler, private e-mail, 11 November 2004
Links with FEC (EPON)

- “From the standard point of view, we probably only need to worry about FEC specification - FEC should buffer entire frame before correction could begin.

- “If MPCPDU are to be encrypted, there will be additional small changes throughout several state machines.

- “From implementation point of view, I think UNH mentioned they could test existing devices.”

- **Source:** Glen Kramer, private e-mail, 24 September 2004
Use of discovery

- Heard tutorial on LLDP at September interim
  - Considered highly useful for “topology discovery”
  - Operates with all IEEE 802 access protocols and network media
  - One-way protocol with periodic transmissions out each port
  - 802.3 TLV identified in latest draft 802.1AB/D11/Figure G-4

<table>
<thead>
<tr>
<th>Extension TLV</th>
<th>TLV information string length</th>
<th>802.3 OUI</th>
<th>802.3 TLV</th>
<th>Maximum 802.3 frame size</th>
</tr>
</thead>
<tbody>
<tr>
<td>111 1111</td>
<td>0 0000 0110</td>
<td>00-12-0F</td>
<td>subtype=04</td>
<td>2 octets</td>
</tr>
<tr>
<td>7 bits</td>
<td>9 bits</td>
<td>3 octets</td>
<td>1 octet</td>
<td></td>
</tr>
</tbody>
</table>

- However, no mechanism exists within 802.3 to determine maximum frame size support of individual layers (MAC, PCS, PMA, PMD, etc)
- Therefore, no attribute within 802.3 to connect to 802.1AB MIB
New maximum frame size

- “802.1 is requesting 802.3 ... define a larger 802.3 maximum frame size with the new size being in the range of 1650 to 2048 octets.” (802.1 request)
- 1850 emerged as a possibility
  - Based on assumption of integral number of bits used in repeater elasticity buffer (see Pat Thaler’s presentation here: http://www.ieee802.org/3/frame_study/0407.html)
- 2048 less “switch header” emerged as a possibility
- UNH IOL tested 140 devices in lab and reviewed 339 test reports
- Need to determine method for selecting new size
- Size needs to be chosen by March 2005
  - Earliest date to kickoff Working Group ballot