Fixing Priority Encoding in 802.16k

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Purpose:  
Correct the encoding of user_priority and access_priority in the M_UNITDATA.req primitive onto 802.16 frames

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Priority Encoding Now

- `user_priority` and `access_priority` are passed to us on a M_UNIUNITDATA.req from bridge or L3 stack (802.1D 6.4.1).
- They are encoded into the ISSP as follows:

<table>
<thead>
<tr>
<th>ISSP:</th>
<th>user_priority</th>
<th>access_priority</th>
<th>Reserved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(3 bits)</td>
<td>(3 bits)</td>
<td>(2 bits)</td>
</tr>
</tbody>
</table>
What’s wrong..

• access_priority on the M_UNITDATA.req is computed by a bridge as a function of the user_priority.

• In 802.16 this is a 1:1 mapping, so access_priority == user_priority;

• So encoding both priorities is redundant
Solution

• Replace ISSP with Priority byte
• Encode priority as a 3 bit value
• Encode in 3 MSBs to allow lower significance bits to have effect in the future

Priority:  
- priority (3 bits)
- Reserved (5 bits)
Behaviour

- On M_UNITDATA.req, access_priority is encoded in priority field of the priority byte of the 802.1 CS payload header.
- On M_UNITDATA.ind, user_priority takes its value from the 3 bit priority field on the priority byte of the 802.1 CS payload header.
I.E.

• Primitive Parameter Mappings – 802.1 CS

M_UNITDATA.request (frame_type, destination_address, source_address, mac_service_data_unit, user_priority, access_priority, frame_check_sequence)

No point forwarding CRC
It almost always changes with 802.16.

Use LLC coded SNAP header to determine contents

SNAP Encoded Header

LLC Payload
N-10 Bytes

Payload
N Bytes

Priority
1 Byte

DA
6 Bytes

SA
6 Bytes

Length
= N
2 Bytes

This makes PHS look like a pretty good idea.

PHSI
(if PHS is active)

802.1 Frame embedded in MAC CPS MSDU
Specific Text: Changes 6.5.5.2

• Change
  • The **user_priority** parameter of the M_UNITDATA primitive is **not encoded** in the MAC CPS MSDU as described in 6.5.5.2.1.1. **encoded directly** in the ISSP byte of the MAC CPS MSDU as described in 6.5.5.2.1.1.
Specific Text: Changes 6.5.5.2

• Change
  • The access_priority parameter found in the M_UNITDATA.request primitive is encoded directly in the Priority ISSP byte of the MAC CPS MSDU as described in 6.5.5.2.1.1.
Specific Text Changes: Figure 6-2

• Change
  • ISSP to Priority
Specific Text Changes 6.5.5.2.1.1

• Change
  • The ISS Priority byte (ISSP) shown in Figure 6-2 is a 1 byte encoding of the user_priority and access_priority parameters from the M_UNITDATA.request primitive.
  • The value of the user_priority access_priority parameter is encoded as a three bit number in bits 6, 7 and 8 of the priority ISSP byte, where bit 8 of the priority is the most significant bit of the access_priority parameter and bit 6 of the priority the least significant bit of the access_priority parameter.
  • Bits 1 and 2 through 5 of the priority ISSP byte are reserved and shall each be 0.

• Strike
  • The value of the access_priority parameter is encoded as a three bit number in bits 3, 4 and 5 of the ISSP byte, where bit 5 is the most significant bit and bit 3 is the least significant bit.