MAC address transparency

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Rev. 2

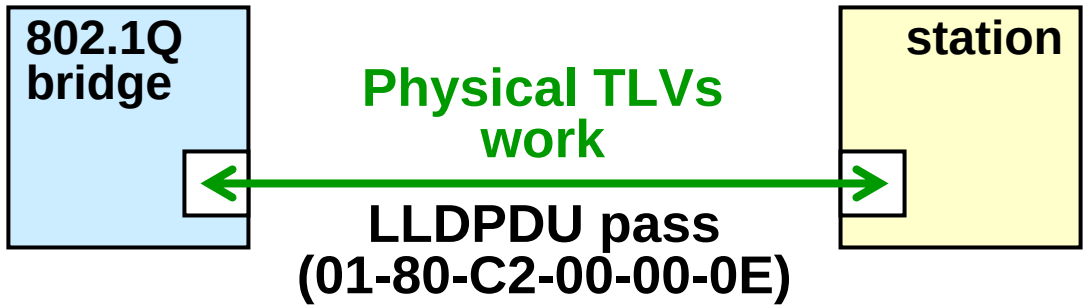
Background: LLDP and Provider Bridges

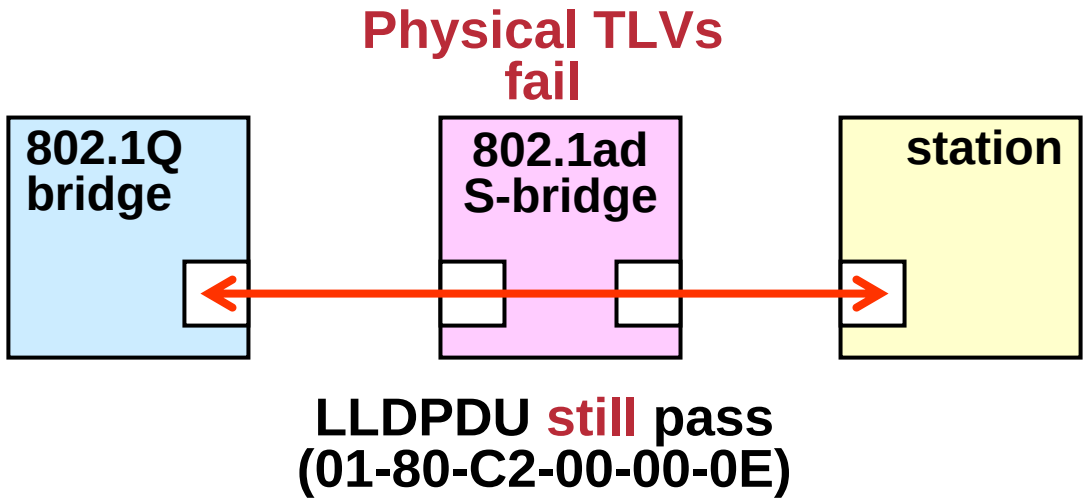
- A standard 802.1D or 802.1Q Bridge filters (does not bridge) any frame whose destination MAC address is in the range 01-80-C2-00-00-00 through ...-0F.
- 802.1AB specifies that LLDPDUs are transmitted on the 01-80-C2-00-00-0E address. Therefore, they are blocked by an 802.1D or 802.1Q Bridge.
- Various standards bodies, most particularly 802.3, but also including TIA T.R. 41, have defined "physical TLVs" for LLDP. These give misleading information if the systems exchanging LLDPDUs are not physically connected, e.g. if they are connected via a bridge.
- Since .1D and .1Q Bridges, even those not implementing LLDP, block the LLDP address ...-0E, these physical TLVs work properly; systems that are not physically adjacent cannot exchange LLDPDUs.

Background: LLDP and Provider Bridges

- **A standard 802.1ad Provider Bridge's S-component filters only frames whose destination MAC address is in the range 01-80-C2-00-00-01 through ...-0A. It bridges addresses ...-00 and ...-0B through ...-0F in the same manner as any other multicast address.**
- **Therefore, if you connect two systems via a Provider Bridge network containing only S-components, the two systems are able to exchange LLDPDUs on the standard LLDP ...-0E address, even though they are not physically connected.**
- **This violates the assumptions of the physical TLVs, causing their intended uses to fail.**

Background: LLDP and Provider Bridges





The Request for Interpretation

I wish to request an interpretation of IEEE Std. 802.1ad-2005. The relevant parts of the document are:

Subclause 8.6.3 “Frame filtering”, particularly Table 8-2.

The question I raise is the interaction between the cited table in 802.1ad and the following subclause of IEEE Std. 802.1AB-2005:

Subclause 1.2 “Purpose”.

Annex G.2 “MAC/PHY Configuration/Status TLV”

The expectation of 802.1AB, as expressed in point b) of subclause 1.2 and in the existence of the MAC/PHY Configuration/Status TLV, is that two systems A and B, each connected to a physical LAN, e.g. one complying with IEEE Std. 802.3-2002 Clause 25, and that are able to trade LLDPDUs (802.1AB Clause 4), can make use of the information carried in that TLV.

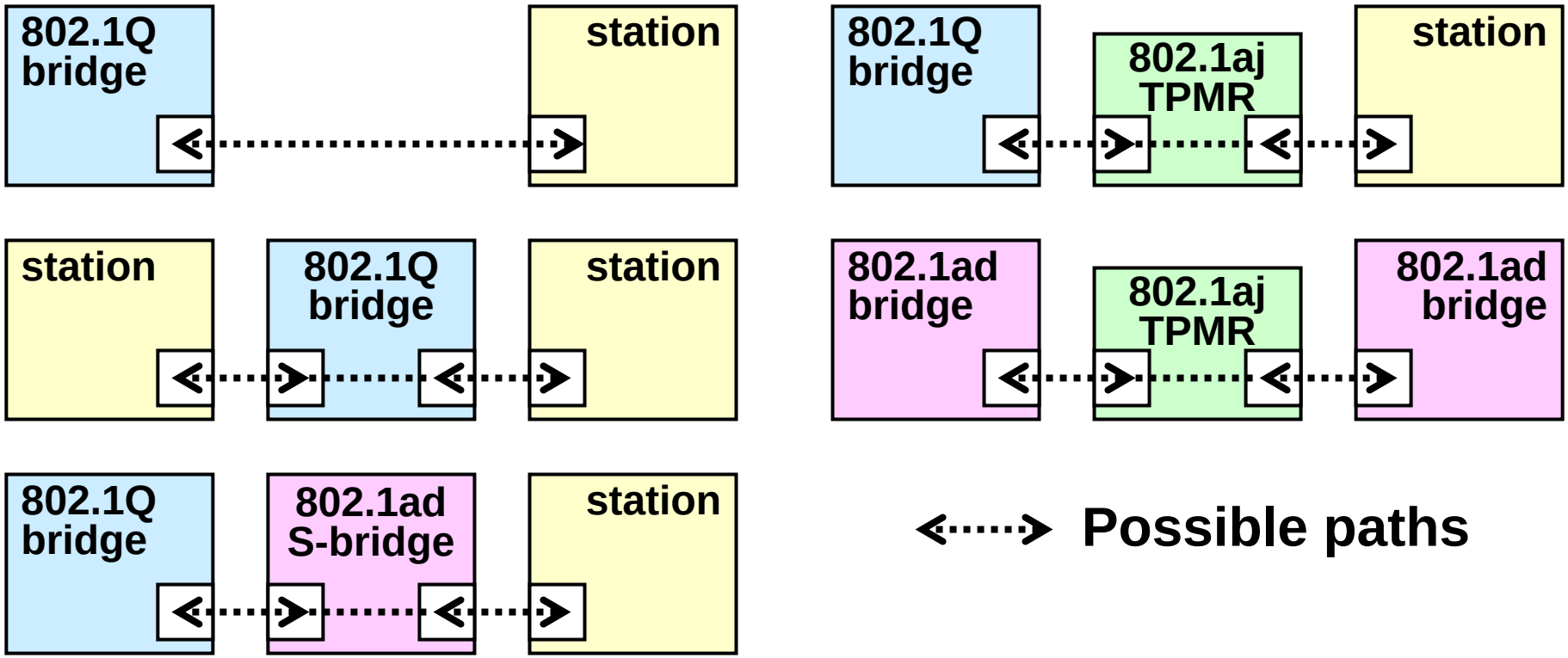
However, if the LANs to which A and B are connected are each connected to a Provider Bridge, so that A and B are separated by a Provider Bridged Network (802.1ad subclause 3.61), 802.1ad Table 8-2 indicates that A and B will still be able to trade LLDPDUs that use the standard destination MAC address 01-80-C2-00-00-0E. This defeats the purpose of the MAC/PHY Configuration/Status TLV, since these TLVs in the two systems’ LLDPDUs carry information about two separate LANs, instead of a single LAN.

The problem is therefore that the expectations of the users of 802.1AB are violated by 802.1ad networks. This could be corrected by altering 802.1ad Table 8-2 to include address 01-80-C2-00-00-0E. If this creates a problem, in that both addresses 01-80-C2-00-00-03 and … -0E have the same reachability, then -03 could be removed from Table 8-2.

Since neither 802.1AB nor IEEE Std. 802.1X-2004 have been modified, yet, to handle additional destination MAC addresses as suggested in the note in subclause 1.2 of 802.1ad, no significant interoperability issues should result from this suggested change to Table 8-2 of 802.1ad. Deployed 802.1ad-compliant equipment would have to change their operation, but this change should be easier for the user community to bear than the impact on the use of 802.1AB that would result from the current Table 8-2 of 802.1ad.

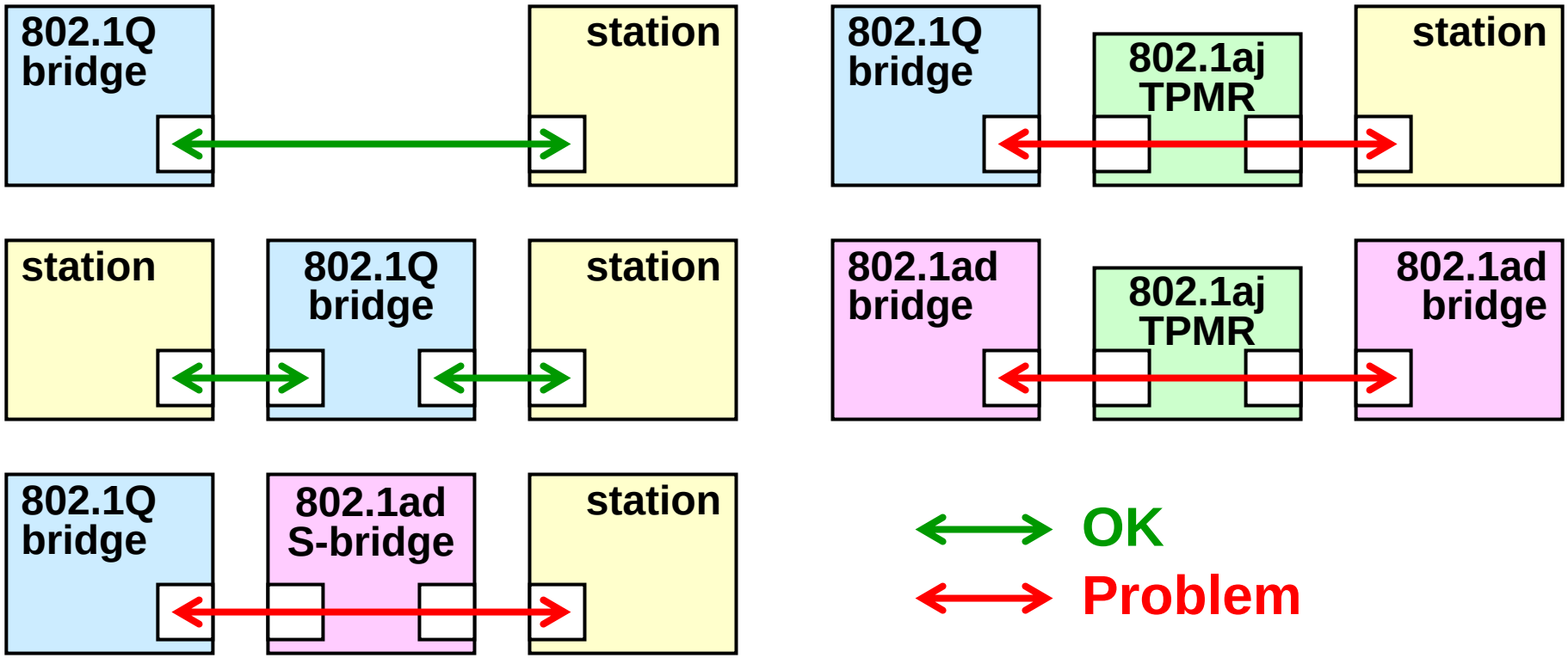
I believe that the chairs of both 802.1 and 802.3 will be interested in this request, since 802.3 generated the text for 802.1AB Annex G.

Relevant scenarios



- How far does each address go?

Relevant scenarios

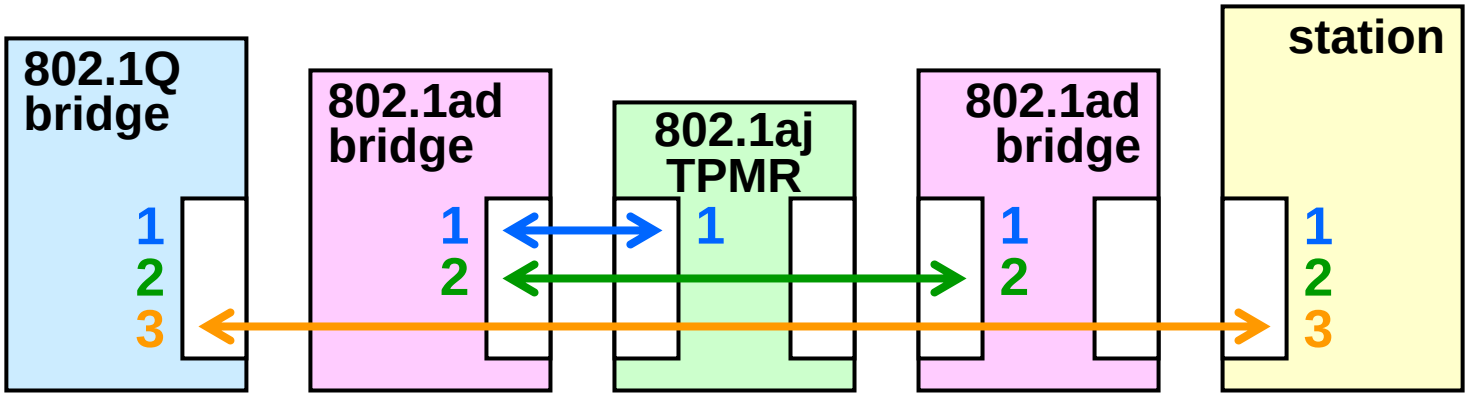


- **Today: address 01-80-C2-00-00-0E**

Alternatives

1. **Change 802.1ad, so that the existing LLDP address -0E is always physical.**
   - **This is problematical for existing Provider Bridges.**
   - **It leaves the phones and existing LLDP standard intact.**
   - **But, it is a quick fix to publish.**
2. **Change 802.1AB to use another address for LLDP that is physical.**
   - **This is problematical for existing LLDP-aware phones and for T.R. 41.**
   - **It leaves Provider Bridges and 802.1ad intact.**
   - **But, it is not a quick fix to publish; MIB support for multiple addresses (reaches) and information on what TLVs go with what addresses are required.**

How many addresses are required?



- **At least three different distances are required.**
  1. **Stopped by everything, e.g. LLDP physical TLVs.**
  2. **Stopped by Provider Bridge, not by TPMR, e.g. PB-to-PB authentication.**
  3. **Stopped only by non-Provider Bridge or Station, e.g. bridge-to-router LLDP.**

Proposal for action:

1. **This week:**

   We (as individuals) create a motion for a specific answer to the Request for Interpretation on 802.1ad.

   We (802.1) publish this motion on the 802.1 web site.

   We (as individuals) advertise this motion.

2. **At the July plenary:**

   We pass the motion created this week.

   We start work on a PAR for the necessary changes to 802.1ad and/or 802.1AB.

Recommendation

- **The following individuals recommend that 802.1 respond to the Request for Interpretation by passing a motion at the July, 2006 plenary including the following items:**

  802.1 will create a corrigendum to IEEE Std. 802.1ad-2005, adding address 01-80-C2-00-00-0E to Table 8-2, so that frames with that destination address do not pass through an S-VLAN component.

  IEEE 802.1 does not intend to define any device that relays address 01-80-C2-00-00-0E.

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