802.1Q Bridge Baggy Pants Explanation

Date: 2012-09-19

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Abstract

Explanation of 802.1Q bridge "Baggy Pants" diagram

Annotated 802.1Q-2011 Figure 8-2
VLAN-aware Bridge architecture

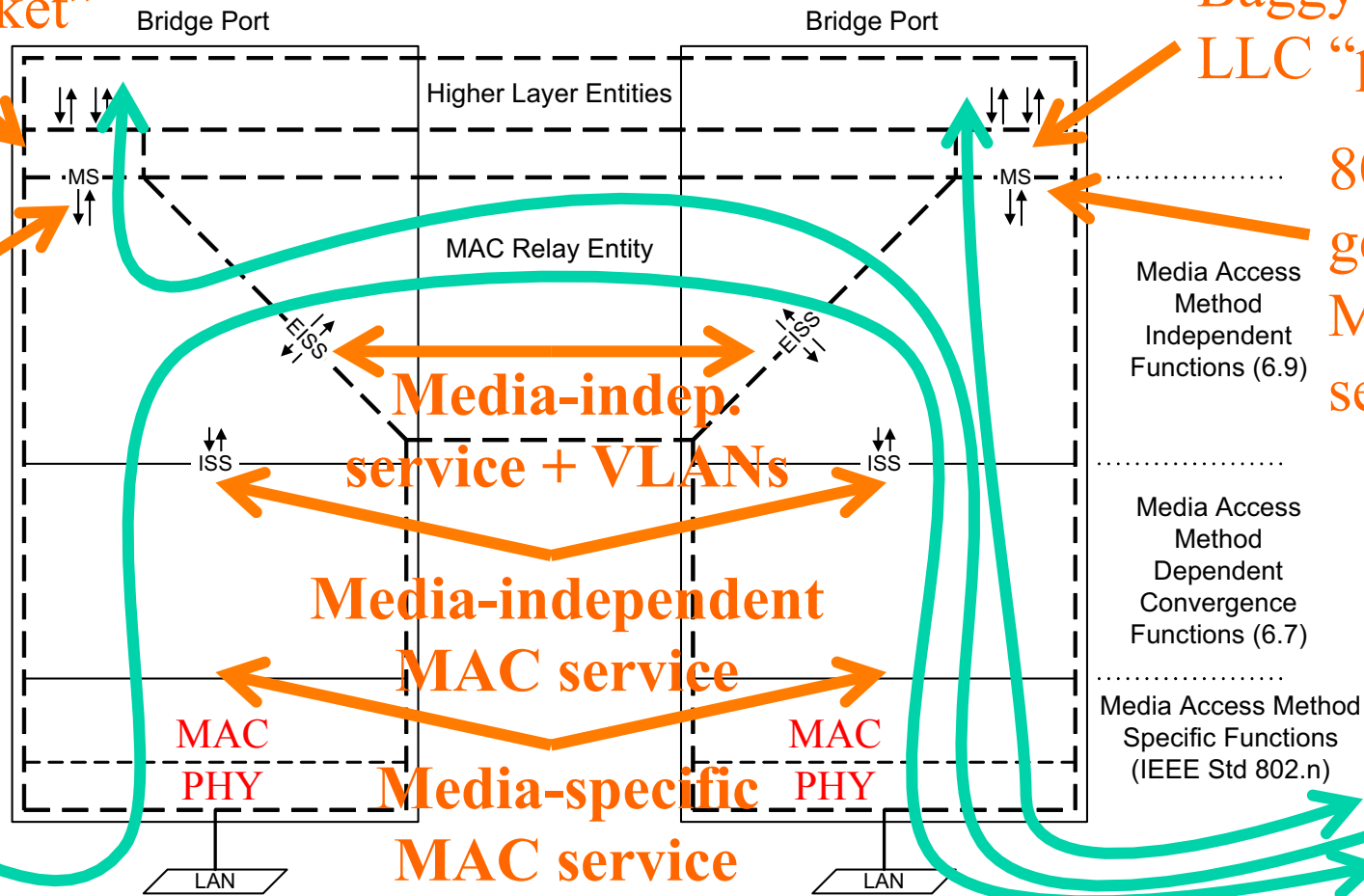Baggy pants LLC "pocket"

Baggy pants LLC "pocket"

802.1AC generic MAC service

802.1AC generic MAC service

Media-indep. service + VLANs

Media-independent MAC service

Media-specific MAC service

Possible paths

Bridge Port

Bridge Port

Higher Layer Entities

MS

MS

MAC Relay Entity

Media Access Method Independent Functions (6.9)

EISS

EISS

ISS

ISS

Media Access Method Dependent Convergence Functions (6.7)

MAC PHY

MAC PHY
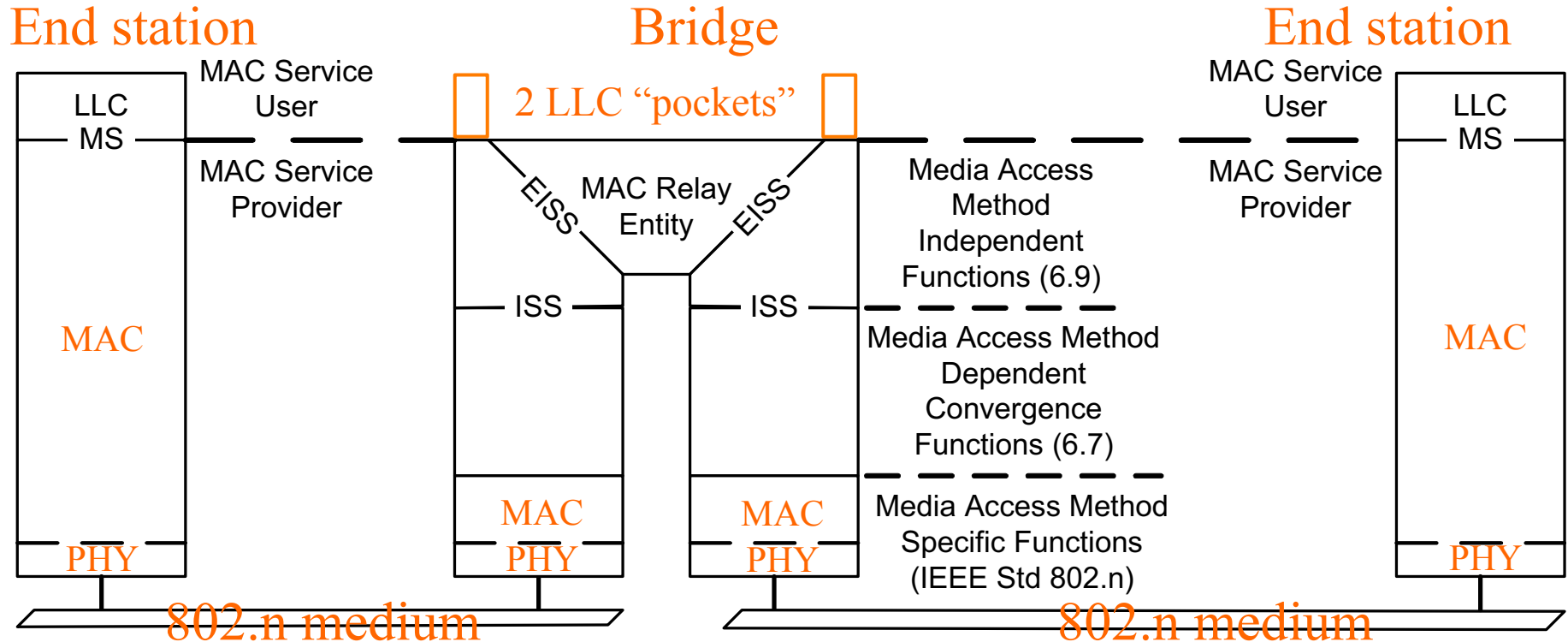
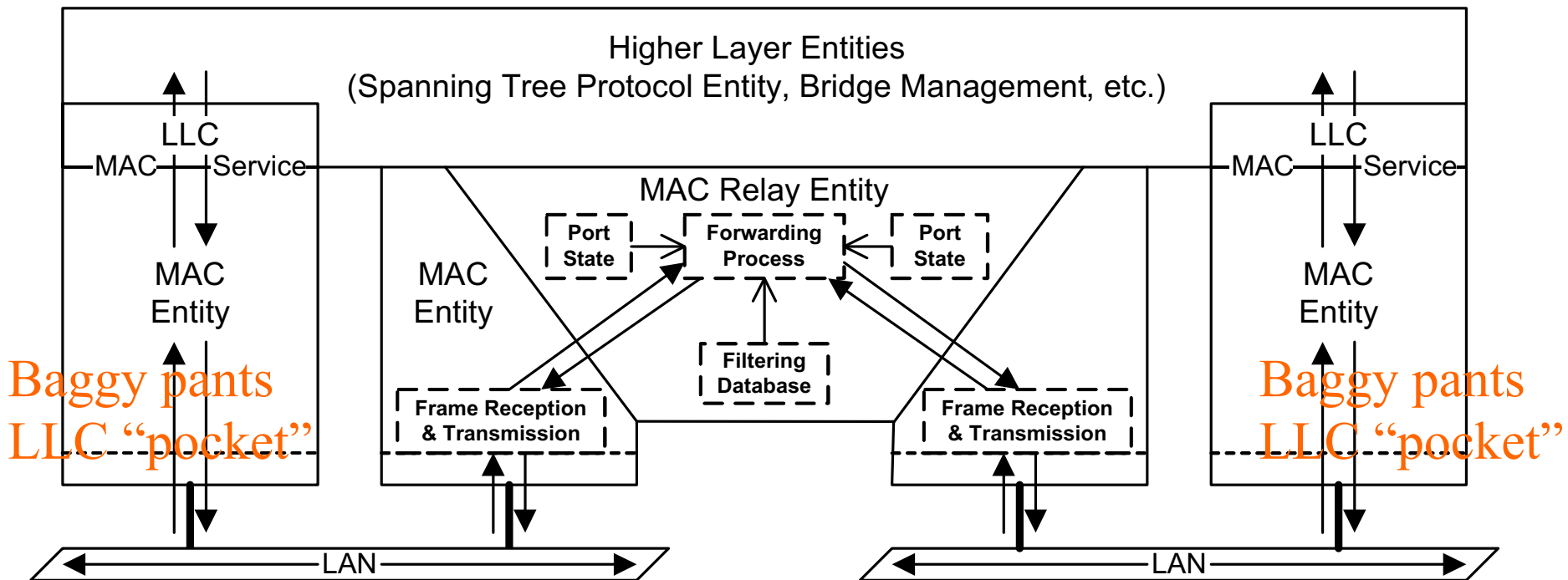Media Access Method Specific Functions (IEEE Std 802.n)

LAN

LAN

Annotated 802.1Q-2011 Figure 6-1
Internal organization of the MAC sublayer

All four LLCs are peers, so an *n*-port Bridge is also *n* end stations.

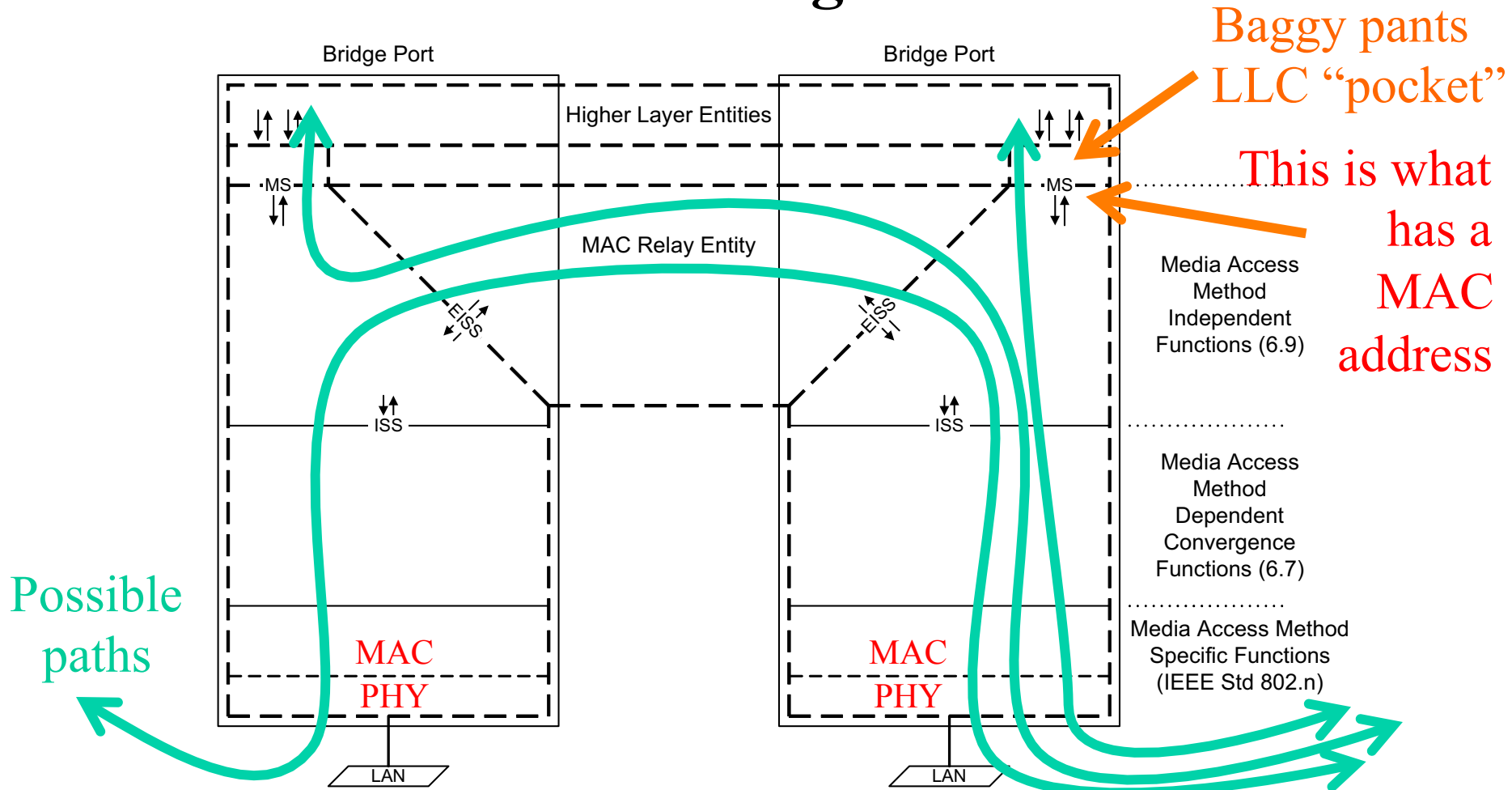End station   Bridge   End station

Figure 8-11 Logical points of attachment of the Higher Layer and Relay Entities

This is another way of looking at the LLC "pockets".
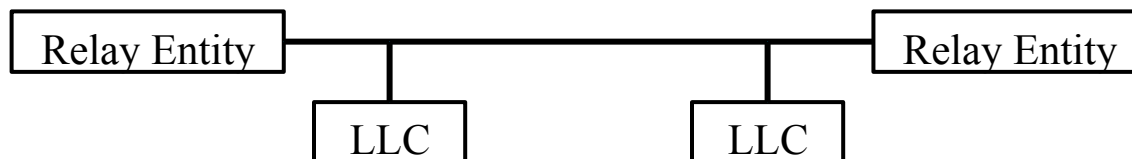It's the LLC pocket that has the MAC address, really.

Annotated 802.1Q-2011 Figure 8-2
VLAN-aware Bridge architecture

Baggy pants
LLC "pocket"

This is what
has a
MAC
address

Possible
paths

In a sense, every medium is shared

So, as far as the bridge's "baggy pants pockets" are concerned, every medium is a shared medium.

An 802.3 point-to-point link is actually a shared medium to bridges:

```
+---------------+                              +---------------+
| Relay Entity  |------+----------------+------| Relay Entity  |
+---------------+      |                |      +---------------+
                   +-------+        +-------+
                   |  LLC  |        |  LLC  |
                   +-------+        +-------+
```

Don's picture from 12-1128:

Therefore, IF the 802.11 AP + STAs act like a shared medium, Don's picture is, in a sense, accurate.

```
                        ┌────────┐
                        │ bridge │
                        └───┬────┘
                            │    ┌──────┐
                            ├────│  AP  │
                            │    └──────┘
                            │
  ┌────────┐                │                ┌────────┐
  │ bridge │────────┬───────┴───────┬────────│ bridge │
  └────────┘        │               │        └────────┘
                 ┌──┴──┐         ┌──┴──┐
                 │ STA │         │ STA │
                 └─────┘         └─────┘
```
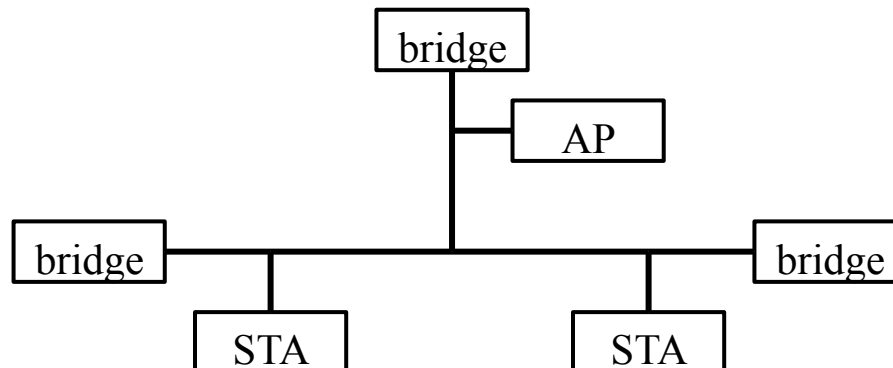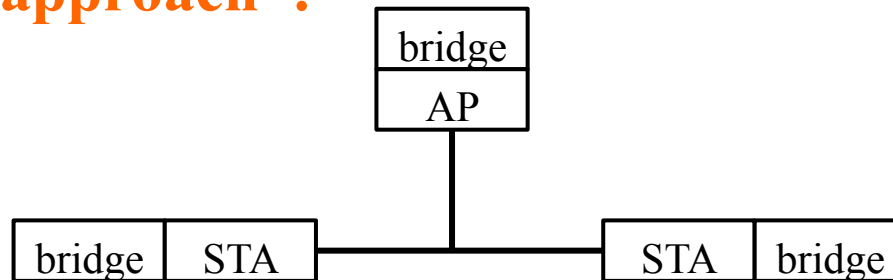
AP & STAs are LLCs; the bridge is the Relay Entity.

But, the baggy pants pocket takes care of paralleling the station and relay, already!

There is no need for 802.11 to do anything except provide a MAC service that can operate in promiscuous mode and doesn't reflect frames back to the bridge.

What the bridges require is just this, for the emulated LAN approach*:

```
              ┌──────────┐
              │  bridge  │
              ├──────────┤
              │    AP    │
              └────┬─────┘
                   │
┌────────┬───────┐ │ ┌───────┬────────┐
│ bridge │  STA  ├─┴─┤  STA  │ bridge │
└────────┴───────┘   └───────┴────────┘
```

* The other approaches (point-to-point or emulated bridge) are not described, here.

The bridges have been, and can continue to, handle the station vs. bridge issues.

References

IEEE Std 802.1Q-2011 Media Access Control (MAC) Bridges and Virtual Bridged Local Area Networks

IEEE Std 802.1AC-2012 Media Access Control (MAC) Service Definition