

# MIP Extension for Ethernet Service Support

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# Ethernet Service Transport Support

- Objective
  - Provide ability to transport ethernet Frame over Mobile IP network.
- Motivation
  - Allow the home agent and foreign agent to distinguish, de/en capsule and forward ethernet frame over IP
  - Existing functional entities provided for IP service can be reused for ethernet service
  - WiMAX forum Networking WG has its specification to support ethernet service over WiMAX mobile network.
  - The wireless ethernet bridge has been implemented to extend LAN and allow license free operation which facilitates transport of ethernet frame to the host behind the mobile router. Here the mobile router integrate the wireless ethernet bridge functionality

# Relevant work on transport of ethernet service over IP

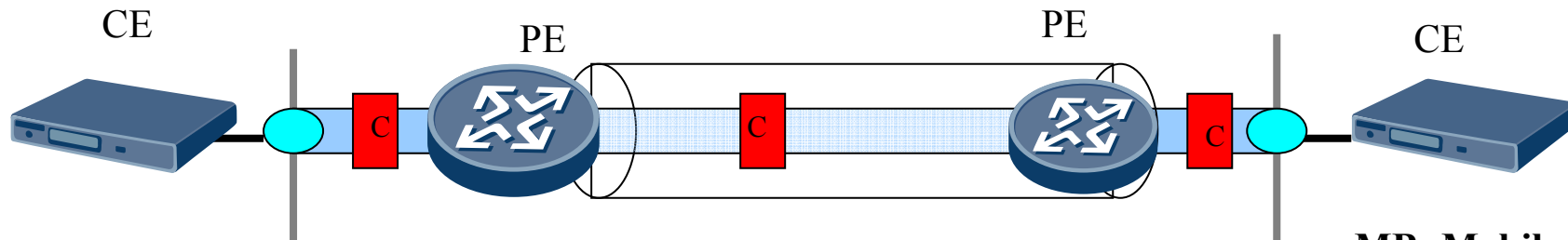
- RFC4448 specifies one mechanism to carry ethernet/802.3 PDU over MPLS network.
- RFC 4719 specifies one mechanism to transport ethernet frame over L2TPv3 which is carried over IP network.

# Transport of ethernet service over IP

VS

## Transport of ethernet service over MIP

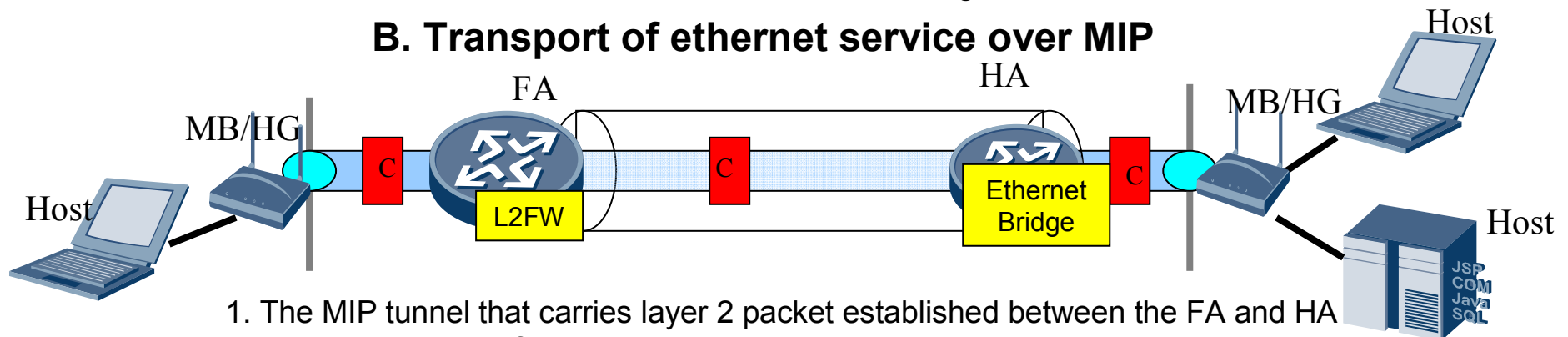
### A. Transport of ethernet service over IP



1. Used between one ingress PE and one egress PE
2. A layer 2 PDU will be received encapsulated at the ingress PE
3. Transported, decapsulated at the egress PE
4. Transmitted out on the attachment circuit of the egress PE

**MB: Mobile Bridge**  
**HG: Home Gateway**

### B. Transport of ethernet service over MIP



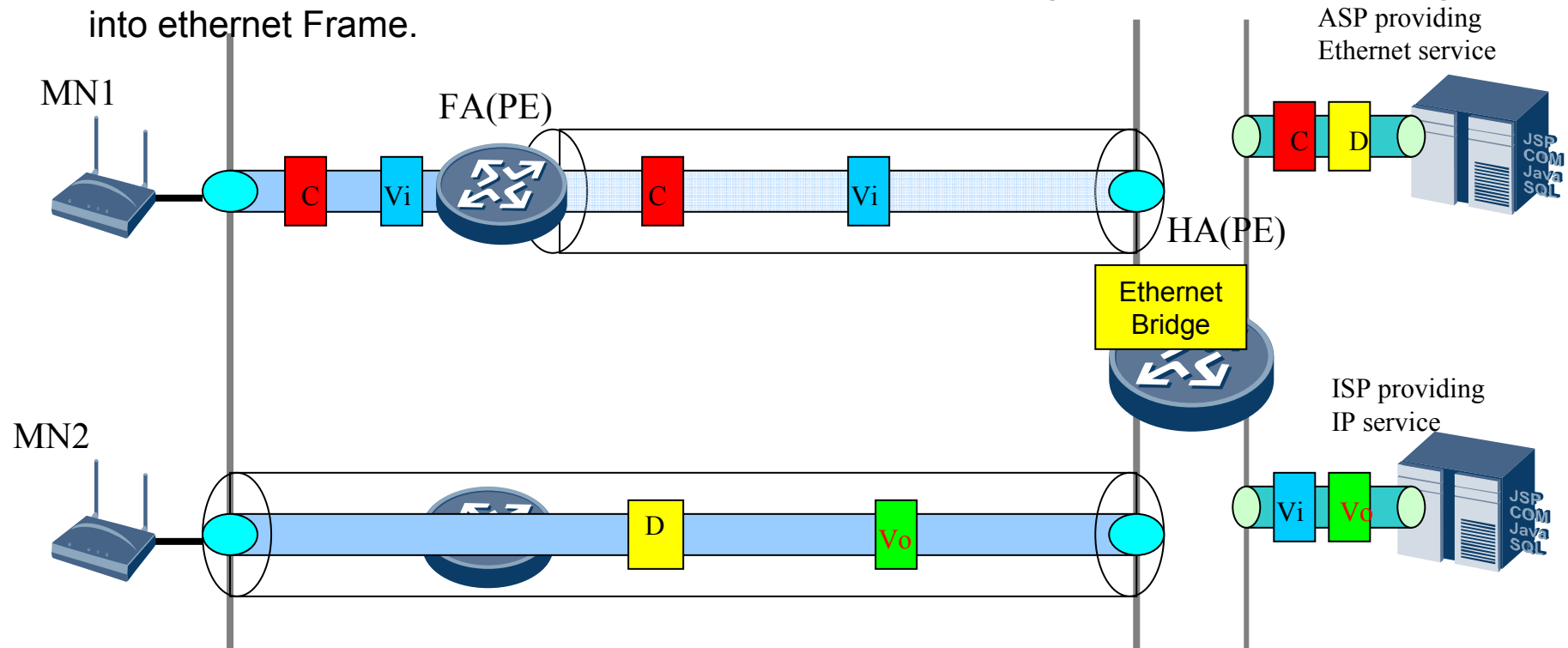
1. The MIP tunnel that carries layer 2 packet established between the FA and HA
2. A layer 2 ethernet frame will be received and encapsulated at the HA
3. Transported over the tunnel between the FA and HA, decapsulated at the FA,
4. Transmitted out to the MN on the point of attachment of the FA.

# The benefits for transport of ethernet Frame over MIP

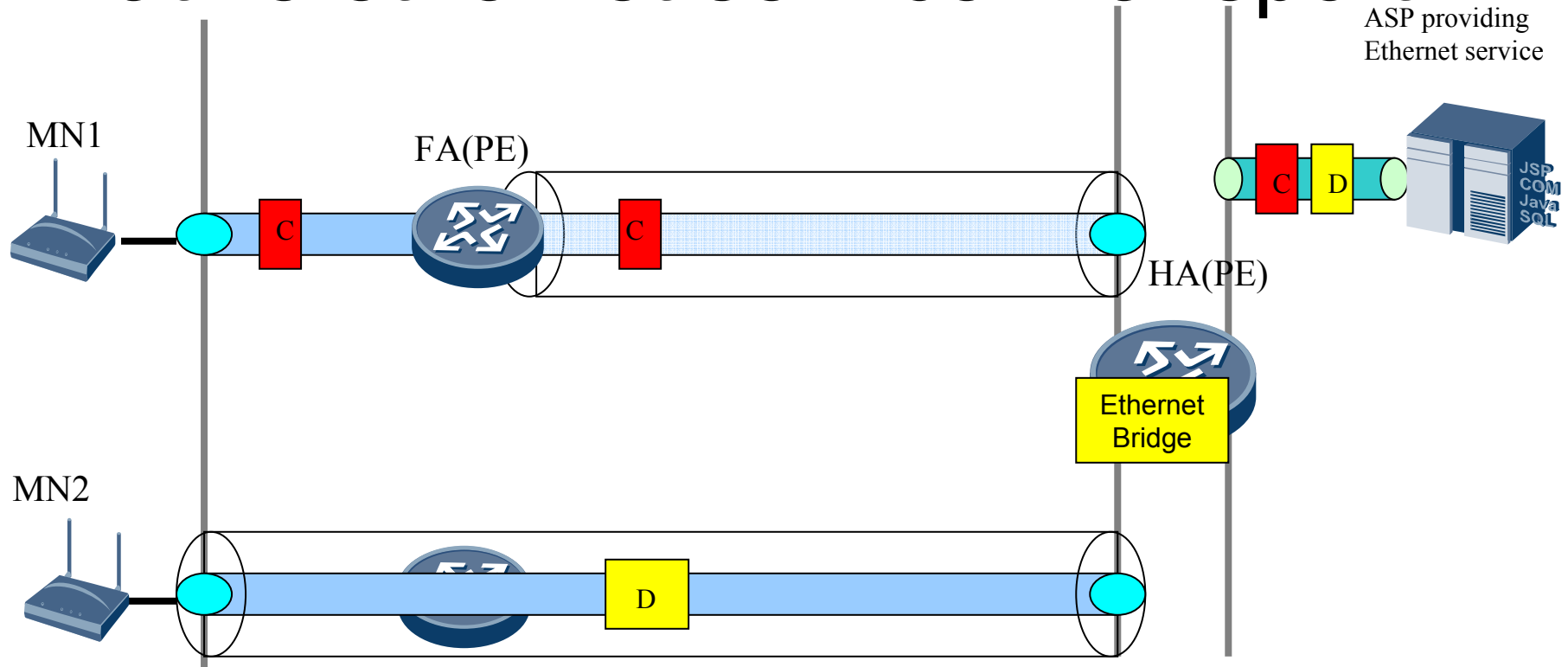
- The mechanism for transport of ethernet frame over IP does not provide cryptographic security of any kind
- The mechanism for transport of ethernet frame over MIP is independent of specific technology and agnostic of access technology.
- This mechanism can reuse existing functionality, provide service continuity and better user experience in the wireless residential network or home network.
- This mechanism has lower requirements on the host, e .g., host support L2 packet processing functionality.

# Service differential and forwarding for transport of ethernet service over MIP

- Traffic classification at the HA can be based on port and Vendor specific info.
- Ethernet frame containing VLAN tags, bridge port is configured as trunk port, plain ethernet frame, bridge port is configured as host port.
- Routing traffic by HA to specific FA is not based on MAC address but service provider tag(e.g., GRE, MPLS, 802.1ad).
- Routing traffic by FA to specific MN is based on MAC address of MN.
- When VLAN is supported, the FA is responsible for inserting, remove, add VLAN tags into ethernet frame.

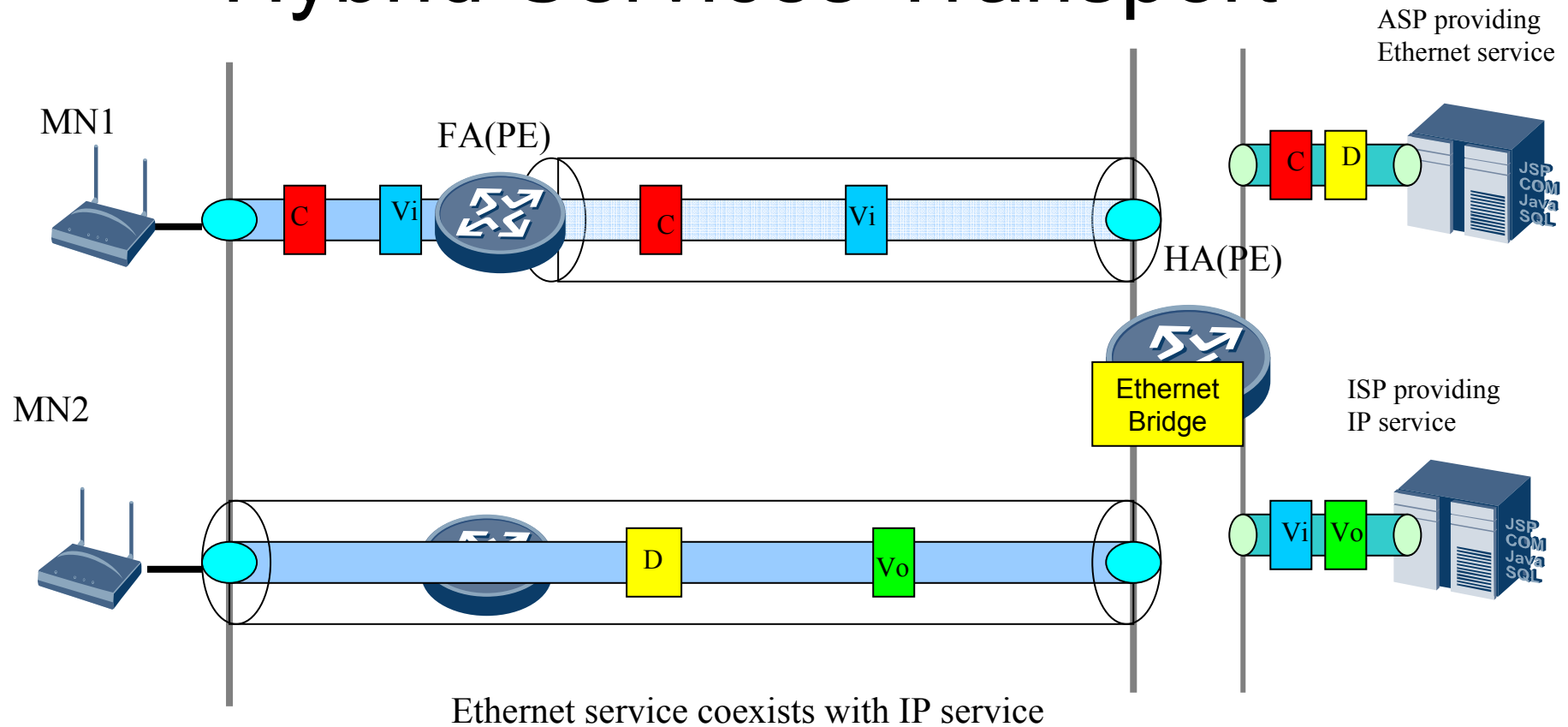


# Use Case 1: Native ethernet service Transport



- It allows node movement from one Ethernet segment to another
- The Ethernet frames are distinguished by the bridging function at the HA based on VSE

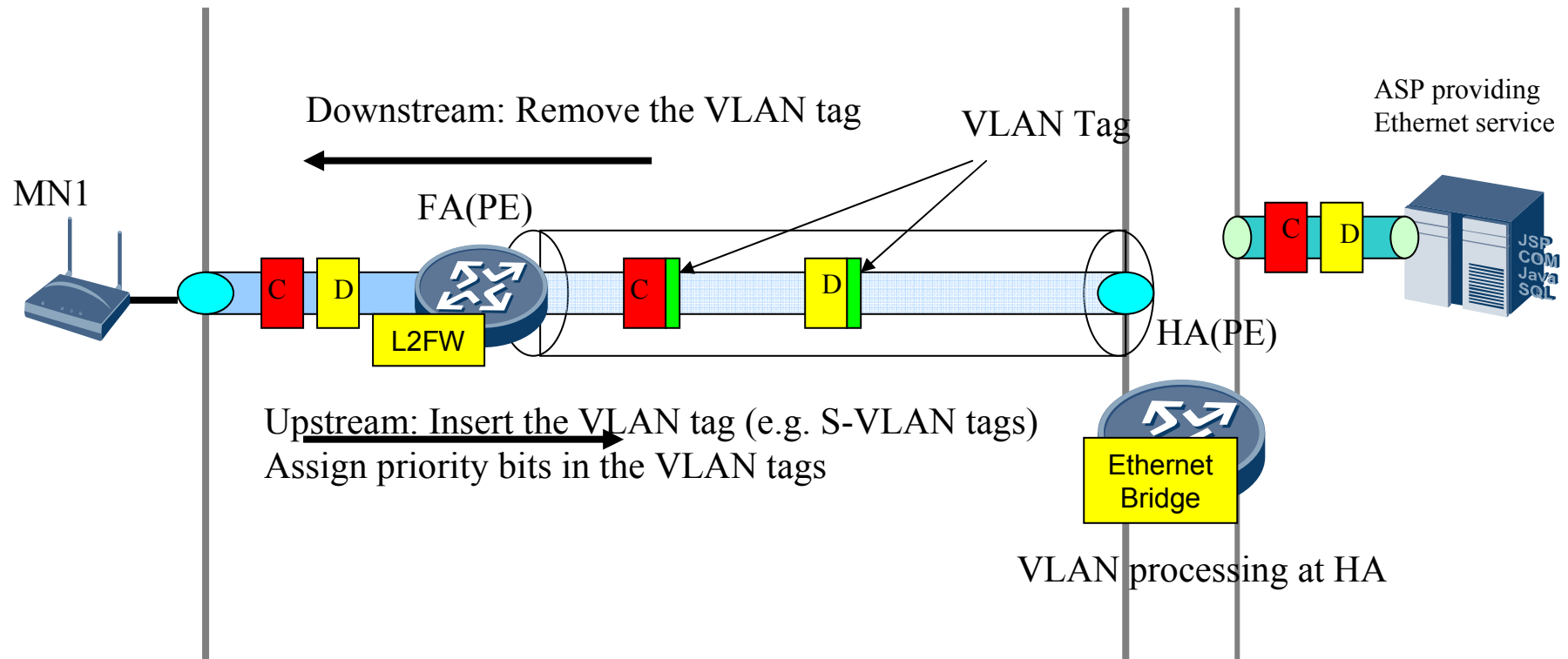
# Use Case 2: Hybrid Services Transport



The ASP provides Ethernet to MN and while the ISP provides IP service (e.g., Internet) to MN

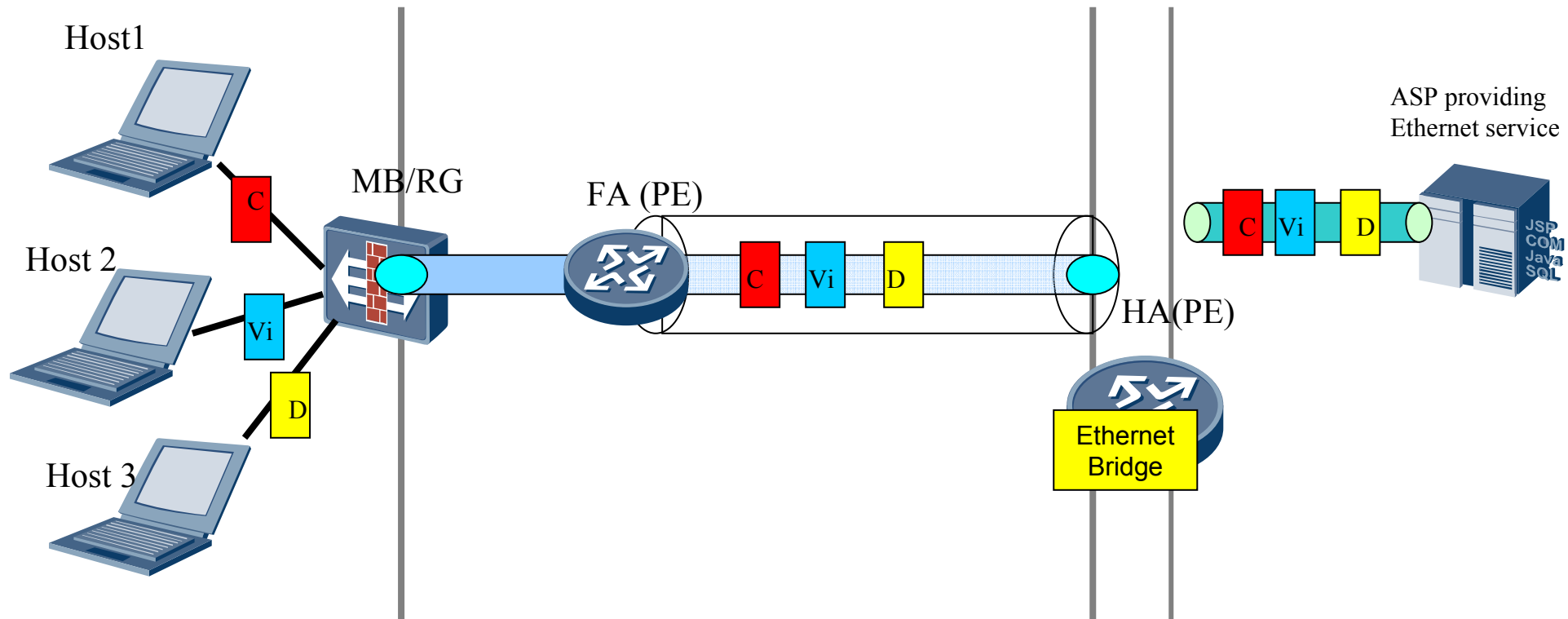


# Usage Case 3: VLAN Tag support



- In downstream direction towards the MN:
  - The L2FW SHALL be able to remove VLAN tags if present.
- In upstream direction from the MN:
  - The L2FW SHALL be able to insert VLAN tags and assign priority bits in the VLAN tags.

# Use Case 4: Multi-Host support



- Multiple hosts/devices connected to a bridge behind MR or RG
- MR/RG forward the packet to the hosts behind MR/RG.
- HA learn MAC address of the hosts behind MR/RG when the host send uplink frame

# Proposal

- Adopt it as WG work item?

# Feedback?

