Transmission of IP Packets over Ethernet over IEEE802.16
`draft-riegel-16ng-ip-over-eth-over-80216-00`

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Introduction

❑ **Goal of this presentation**
  - Present draft-riegel-16ng-ip-over-eth-over-80216-00.txt
  - Introduce topic and particular issues with Ethernet over IEEE802.16
  - Provide background information on IEEE802.16 link behavior
  - Outline solution approaches
  - Promote contributions from others

❑ **Status of draft-riegel-16ng-ip-over-eth-over-80216-00.txt**
  - Initial I-D
  - Provides outline and hints, how the solution may look like
  - IPv4 solution based on results out of WiMAX NWG
  - Lots of material still missing

IP works fine over Ethernet
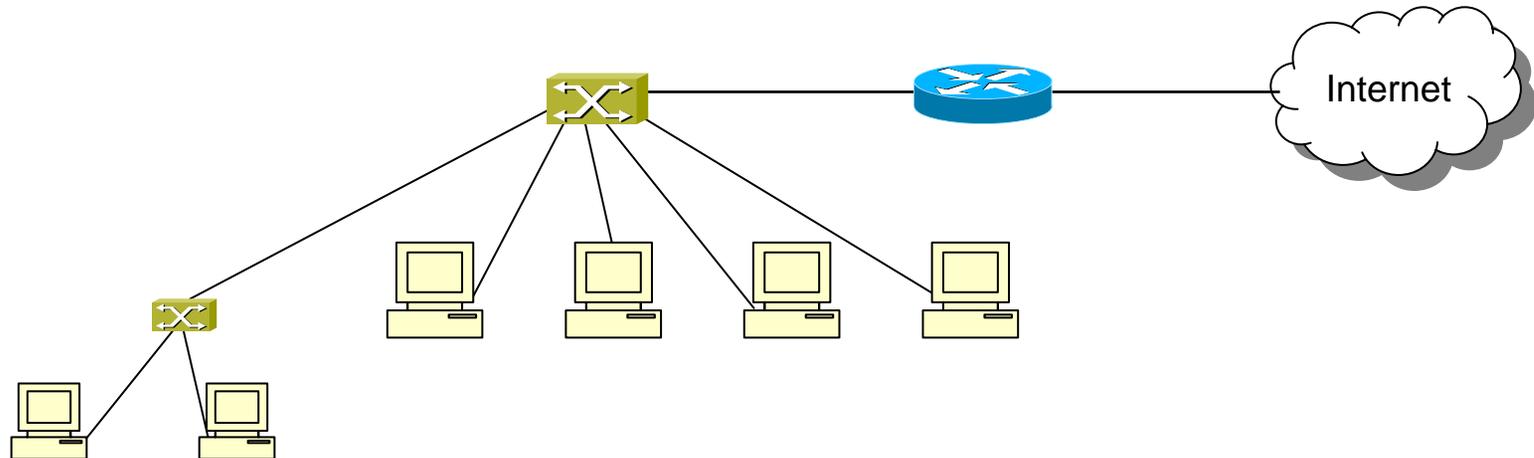
❑ **RFC 894 defines transmission of IPv4 packets over Ethernet**

  ▪ RFC 826 recommends the use of ARP for address resolution

❑ **RFC2464 specifies the transmission of IPv6 packets over Ethernet**

❑ **Today most Ethernets are (bridged) switched LANs with point-to-point links between Switch and Host**

IP works fine over Ethernet over IEEE802.16

Internet
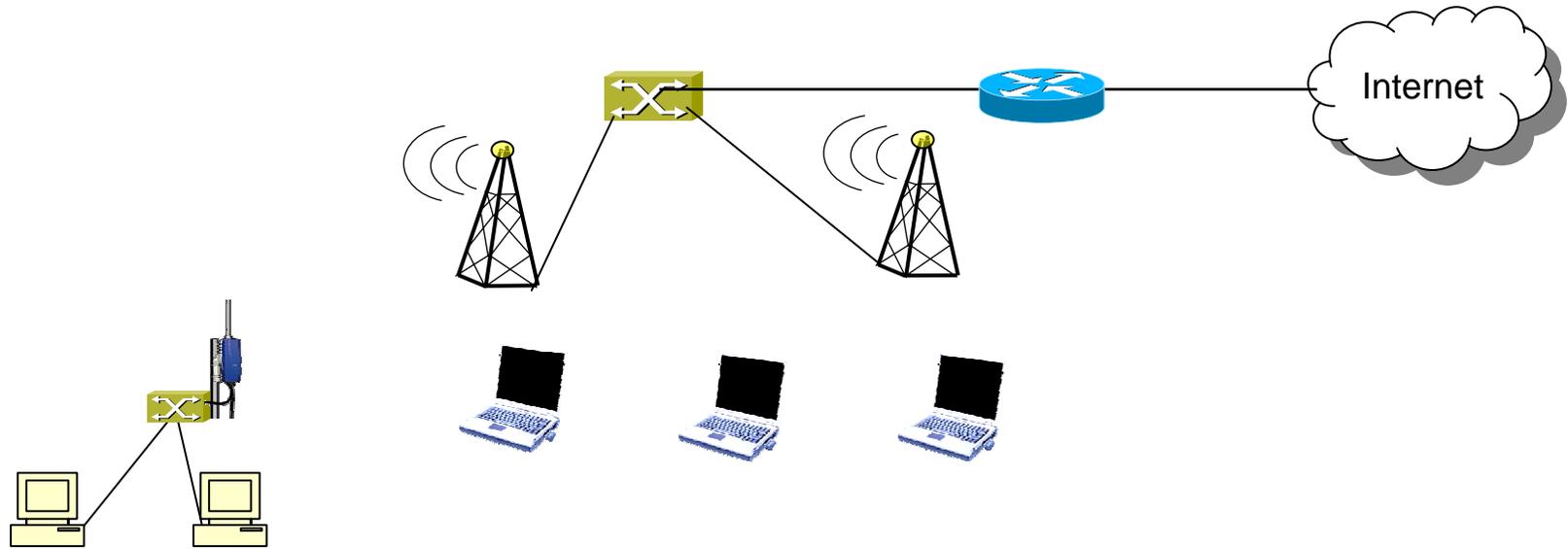
□ **No issues when there is sufficient bandwidth and terminal power**
  ▪ Usually the case for wired Ethernets

□ **Wireless issues:**
  ▪ Shared transmission resource
    • (multiple transmissions for multicast messages)
  ▪ Limited terminal power; terminal has to wake up to receive packets
    • Power issue may even be more critical than scarce transmission resource
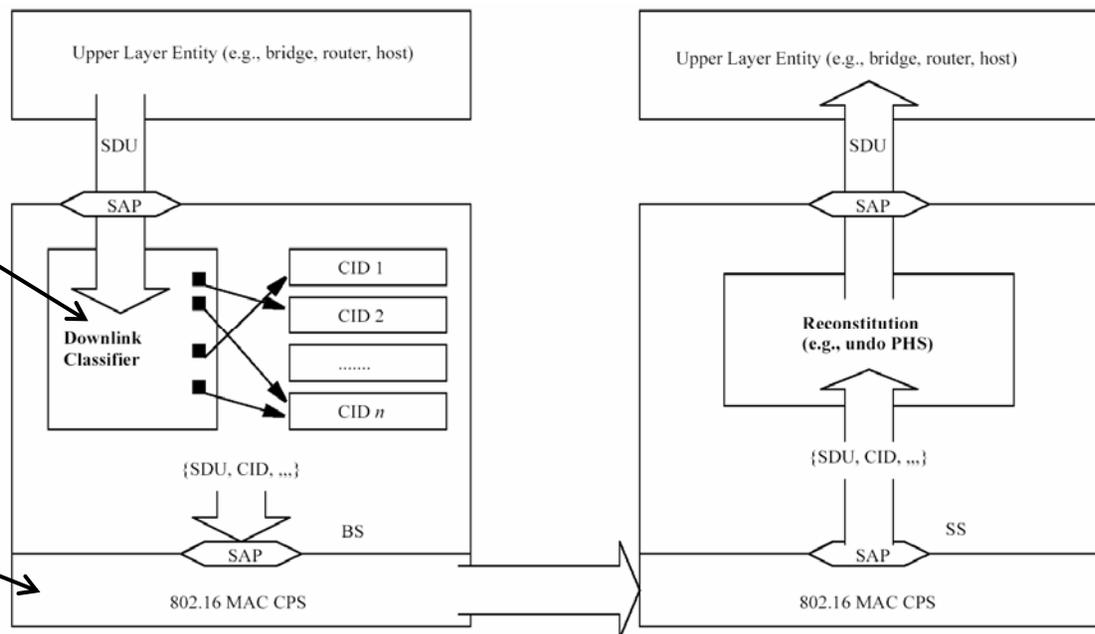
The IEEE802.16 Link Model
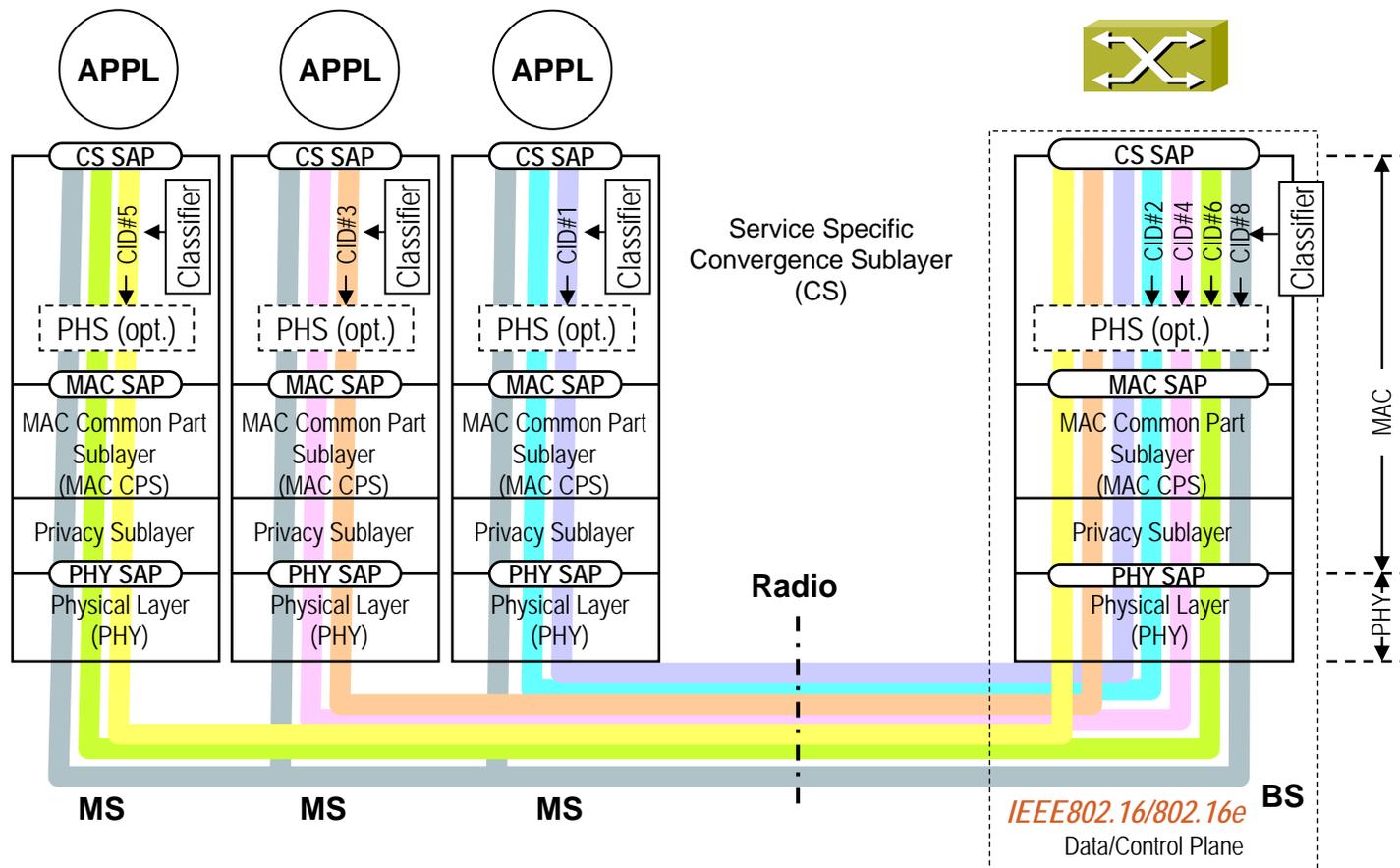
IEEE802.16 provides point-to-point links between the BS and MS

- No direct communication between terminals possible
- Optional multicast connections in 'down-stream'

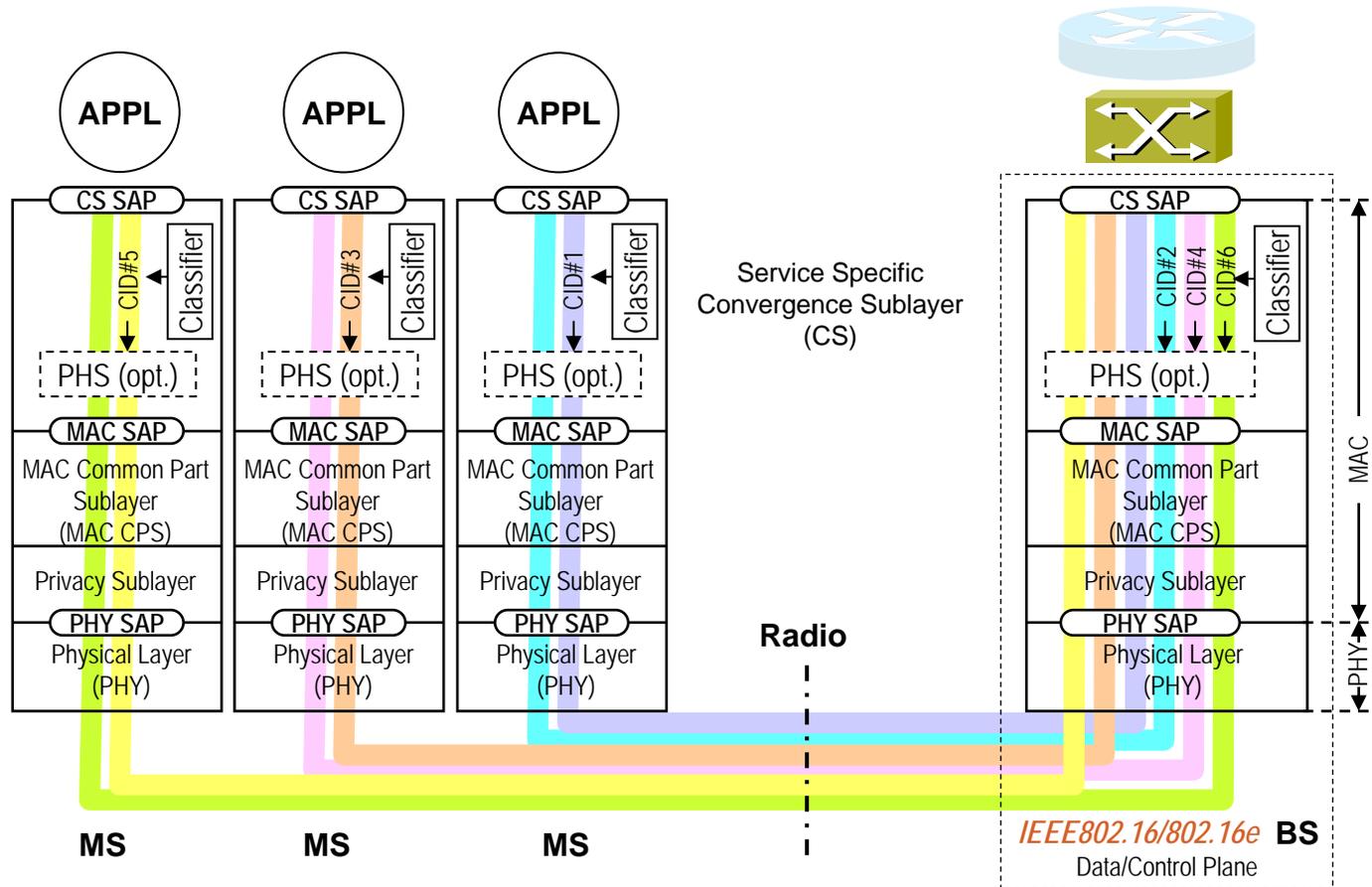# Convergence Sublayer Classification & Encapsulation

Packet-handling in the base station is done based on information in the packet header

Classification based on header information

Encapsulation and forwarding

Bridged Ethernet link model for IEEE802.16

□ **Ethernet bridge in basestation broadcasts packets to all MSs, if destination MAC address is not known in the switch**

- Waste of radio resource (if multicast channels are not deployed)
- All terminals have to wake up to process broadcast packet, even if it don't care.

Enhanced Ethernet link model for IEEE802.16
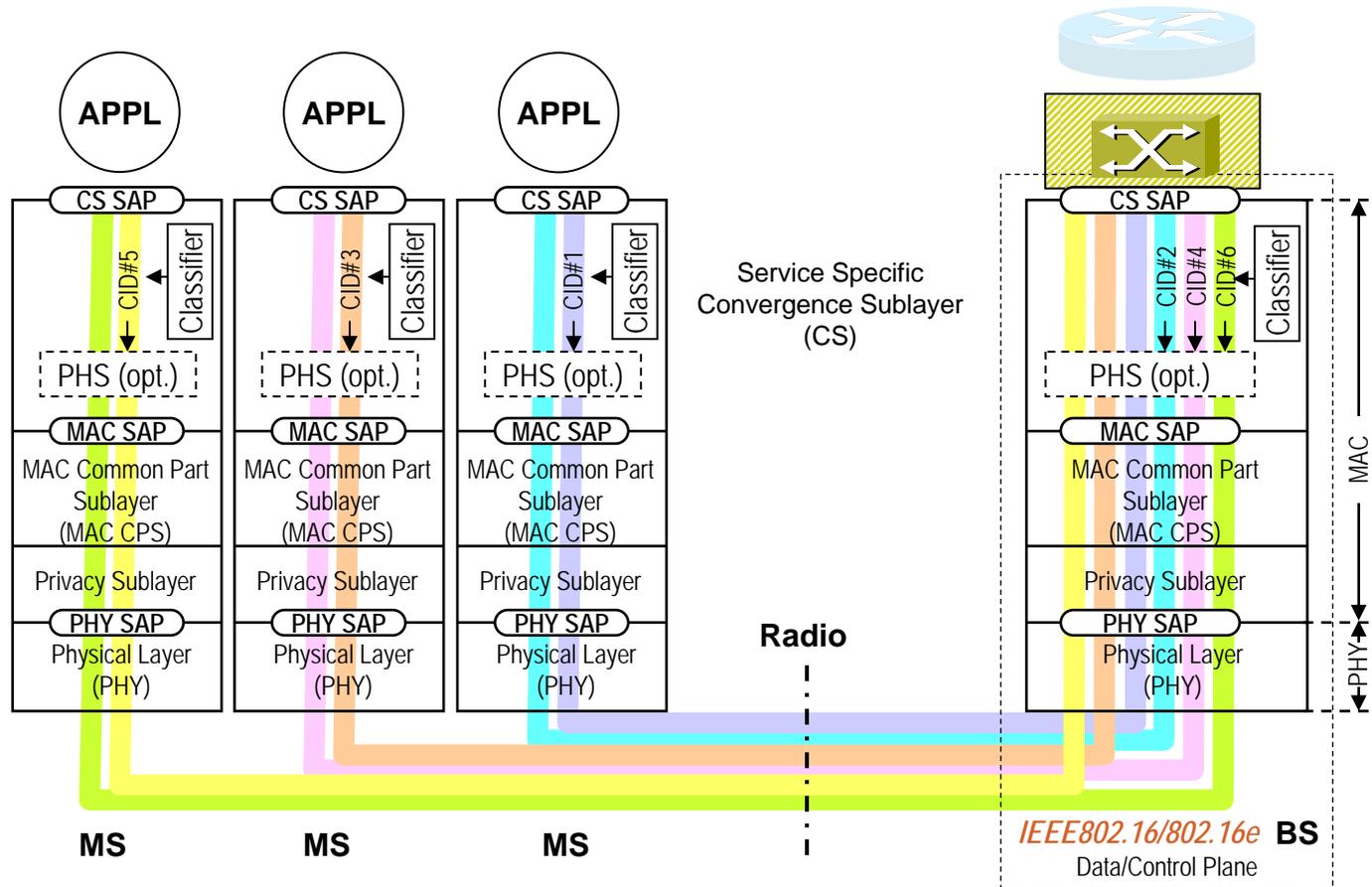
□ **Prevent 'unnecessary' transmissions of ETH frames over the air**

- Response to broadcast and multicast requests on behalf of the MS
  - Must learn about the MAC & IP addresses of the MSs

Layered Approach

❑ **Default processing of ETH Frames: Standard Learning Bridge**
(Provided for information only, does not belong to the scope of 16ng)
  ▪ 'Plain' IEEE802.1D Bridge
  ▪ Direct forwarding between MSs is restricted in the BS

❑ **Packet filtering**
  ▪ Configurable
  ▪ Intercepts particular types of packets, e.g. ARP, multicast

❑ **IPv4 specific packet processing**
  ▪ Proxy ARP

❑ **IPv6 specific packet processing**
  ▪ Not detailed yet in the I-D
  ▪ ND, DAD
  ▪ May closely follow the specification for IPv6 CS

Conclusion

❑**First draft for IP over Ethernet over IEEE802.16 available**
- ▪ IPv6 specific packet processing still missing
- ▪ I-D premature for becoming WG item

❑**I-D should become WG item when IPv6 is also addressed**
- ▪ IPv4 and IPv6 should be kept together for the discussion in the WG
- ▪ Most of the framework identical for IPv4 as well as IPv6

❑**Use of MBS feature of IEEE802.16 MAC should be added as option**
- ▪ MBS may not provide essential benefits for supporting multicast
  - • Power consumption issue may be more important than radio resource issue
  - • Proxy functions in bridge at BS may gain more than enhancements to the multicast behavior of IEEE802.16

❑**Is context transfer between filtering/forwarding tables during handover an issue for 16ng?**

Thank you!

Questions?

Comments