

# IEEE802.16 Convergence Sublayer

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# Convergence Sublayer

- IEEE802.16-2004:

## 5. Service specific CS

*The service specific CS resides on top of the MAC CPS and utilizes, via the MAC SAP, the services provided by the MAC CPS. The CS performs the following functions:*

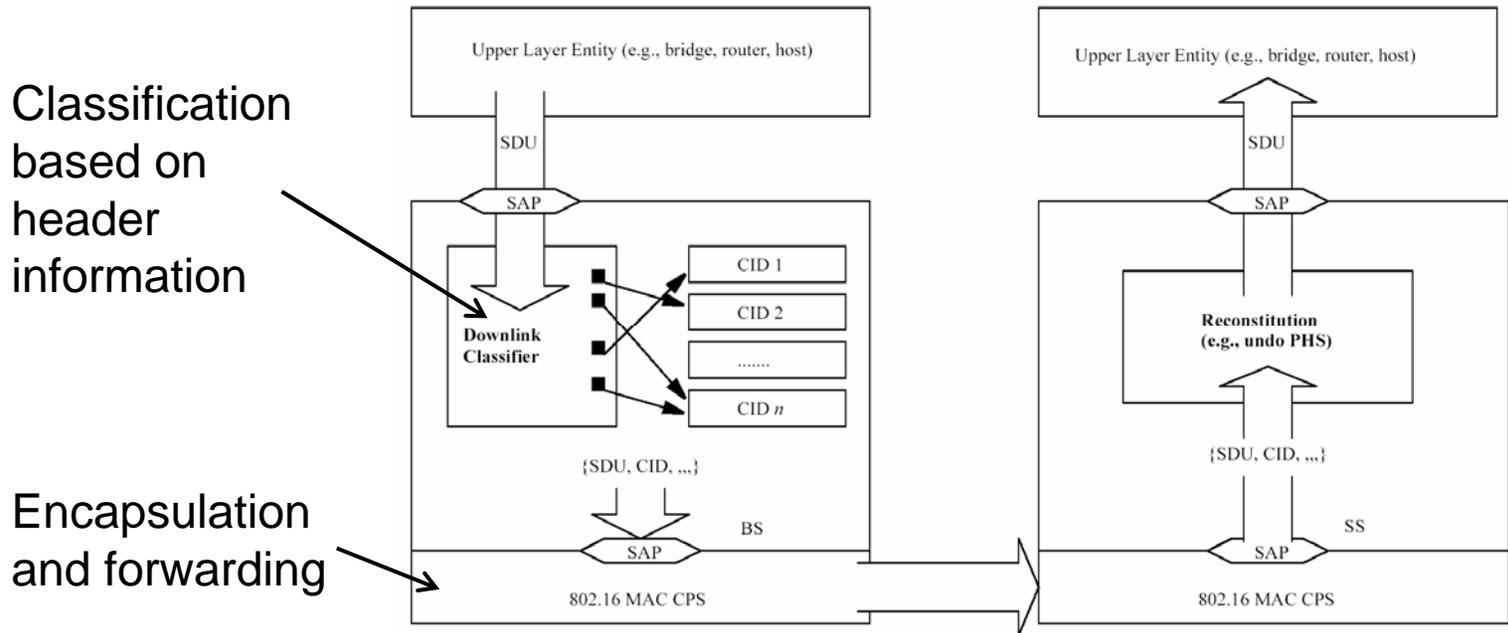
- *accepting higher layer protocol data units (PDUs) from the higher layer*
  - *performing classification of higher layer PDUs*
  - *processing (if required) the higher layer PDUs based on the classification*
  - *delivering CS PDUs to the appropriate MAC SAP*
  - *receiving CS PDUs from the peer entity*
- 802.16e defines 11 different Convergence Sublayer types suitable for IP

# IEEE802.16e: CS Options

est	CS
99	ATM
100	Packet, IPv4
101	Packet, IPv6
102	Packet, 802.3/Ethernet
103	Packet, 802.1Q VLAN
104	Packet, IPv4 over 802.3/Ethernet
105	Packet, IPv6 over 802.3/Ethernet
106	Packet, IPv4 over <del>802.3/Ethernet</del> <u>802.1Q VLAN</u>
107	Packet, IPv6 over <del>802.3/Ethernet</del> <u>802.1Q VLAN</u>
<u>108</u>	<u>Packet, IP with header ROHC compression</u>
<u>109</u>	<u>Packet, IP with EC RTP header compression</u>
<u>110</u>	<u>Packet, IP over 802.3/Ethernet with ROHC header compression</u>
<u>111</u>	<u>Packet, IP over 802.3/Ethernet with EC RTP header compression</u>

# Classification & Encapsulation

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



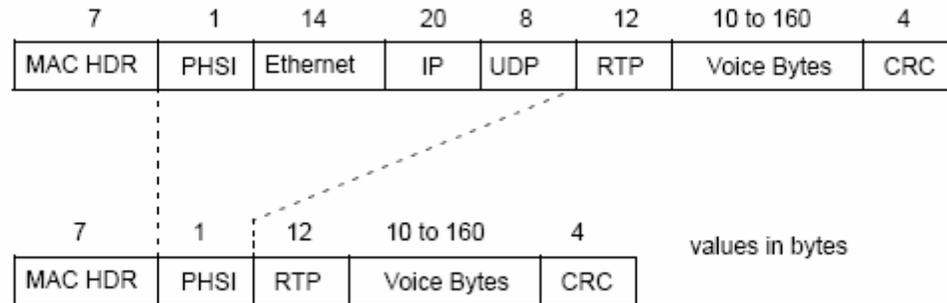
# Header fields for classification

- IP on 802.16
  - CID = function of :
    - destination IP address
    - source IP address
    - type of service field
    - destination port
    - source port
- Ethernet on 802.16
  - CID = function of :
    - destination Ethernet address
    - source Ethernet address
    - Ethernet user priority field
- IP over Ethernet over 802.16
  - CID = function of:
    - {IP on 802.16}
    - {Ethernet on 802.16}

# Header overhead

- ROHC/ECRTP CS may be necessary for VoIP
  - Compresses IP/UDP/RTP into 1-4 bytes.
  - PHS is not so efficient for VoIP.

a) VoIP with Normal Encapsulation



b) VoIP with Header Suppression

- ROHC/ECRTP compresses only IP/UDP/RTP
  - PHS necessary for ETH header suppression
  - (1 byte/packet more (~ 4% w/ 20 byte packets))

# Conclusion

- NWG created Stage 2 specification assuming IP CS as default due to
  - 3G/802.16e Dual Band Dual Mode Operation(e.g., Smart Phone with 3G/802.16e) does not work
  - Air resource overhead
- NWG also describes Eth CS (and IPoEth CS) as an option in Stage 2.