An Introduction to IEEE802.16(e)

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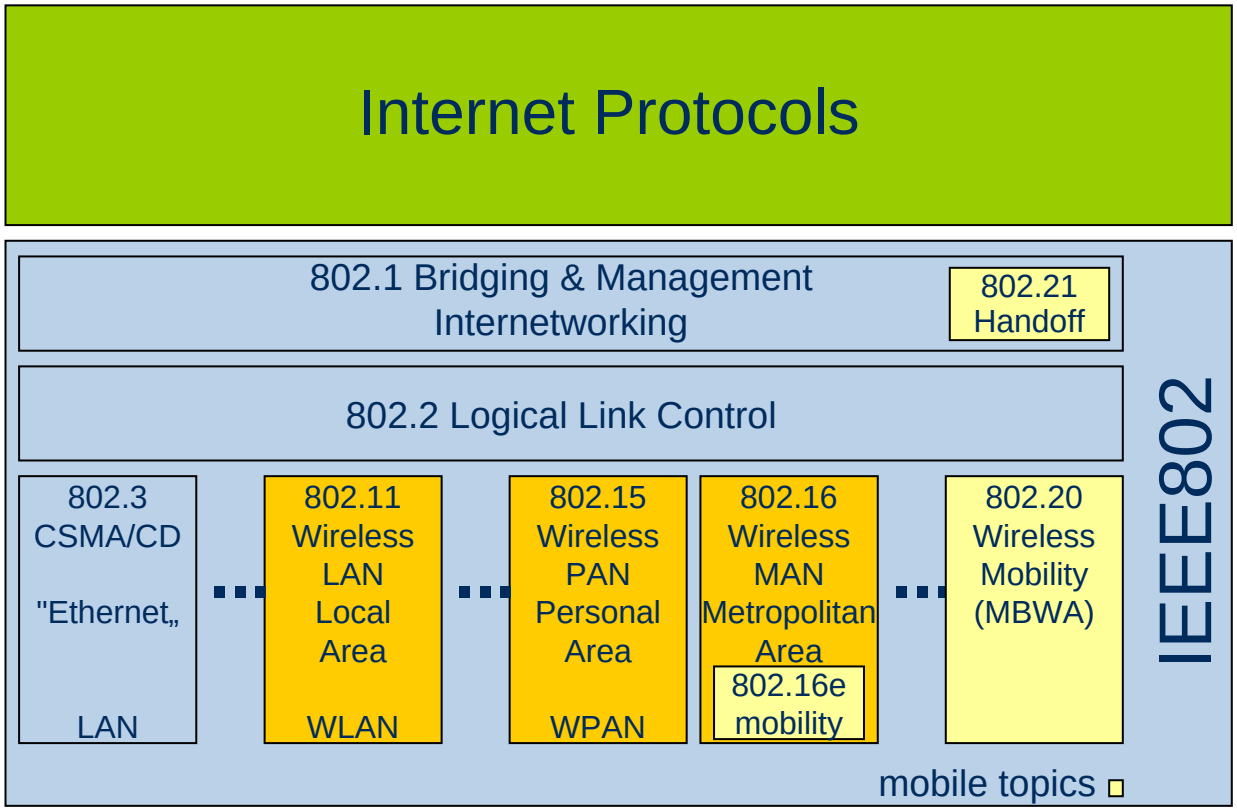
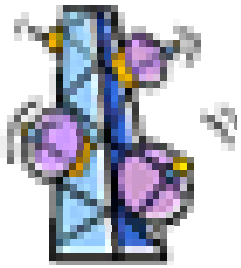
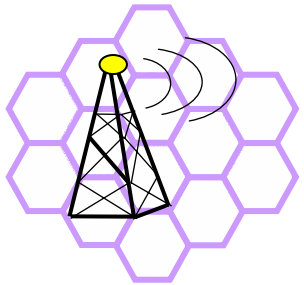
Wireless topics in IEEE 802



- IEEE802 provides a complete set of standards for carrying IP
- IEEE802 defines only the Physical and Link Layer of a network

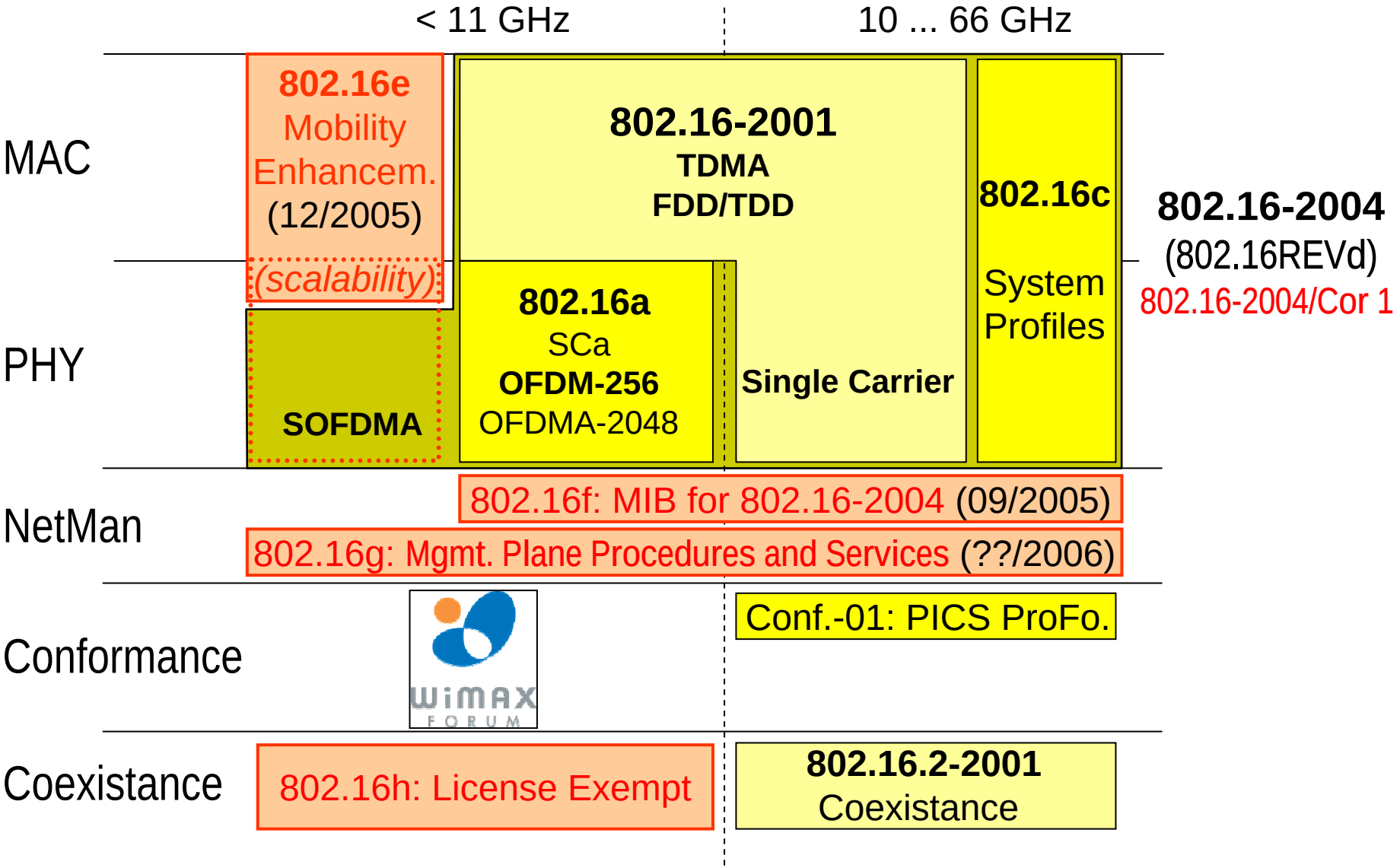
IEEE 802.16



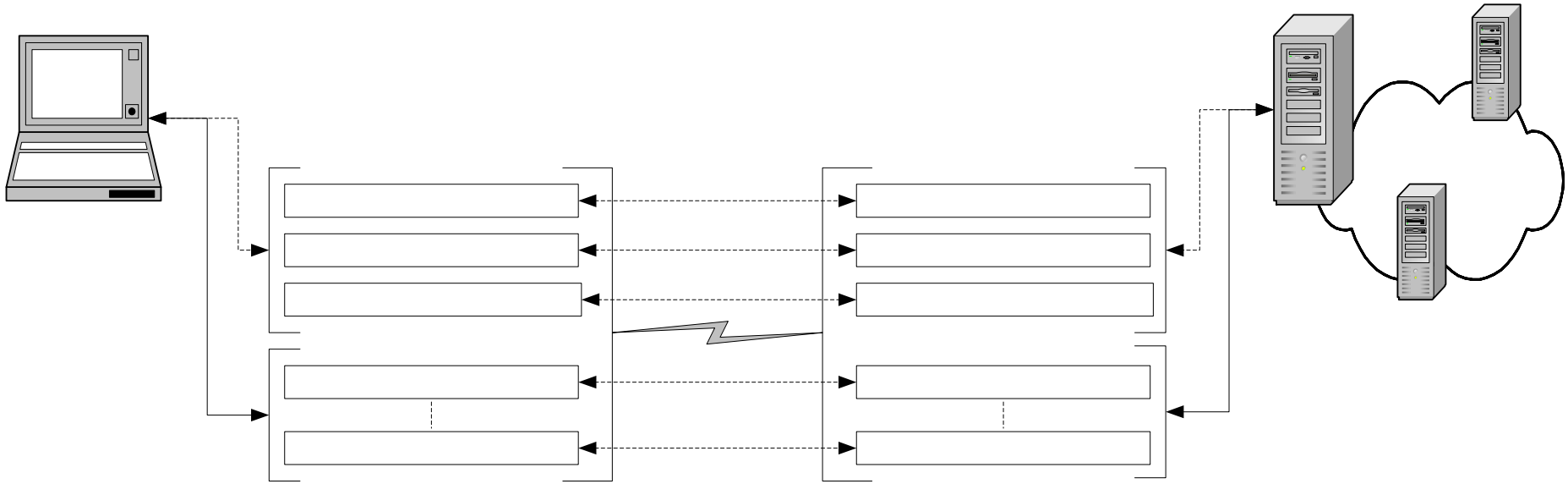


	Feeding	Fixed Wireless Access	Cellular
Completed	December 2001	January 2003	June ’04/Mobility end ‘05
Spectrum	10 - 66 GHz	< 11 GHz	< 6 GHz
Channel Conditions	Line of Sight Only	No Line of Sight	Non Line of Sight
Bit Rate	32 – 134 Mbps in 28MHz channel bandwidth	Up to 75 Mbps in 20MHz channel bandwidth	Up to 15 Mbps in 5MHz channel bandwidth
Modulation	Single Carrier QPSK, 16QAM, 64QAM	OFDM 256 sub-carriers QPSK, 16QAM, 64QAM	1x Scalable OFDMA QPSK, 16QAM, 64QAM
Mobility	Fixed	Fixed	Portable Mobile (up to 120 km/h)
Channel Bandwidths	20, 25 and 28 MHz	Scalable 1.5 to 20 MHz	Scalable 1,25 to 20 MHz
Typical Cell Radius	2-5 km	7 to 10 km Max range 50 km	1-5 km

IEEE 802.16 Standards Overview



MAC Layer : Over Air Connections

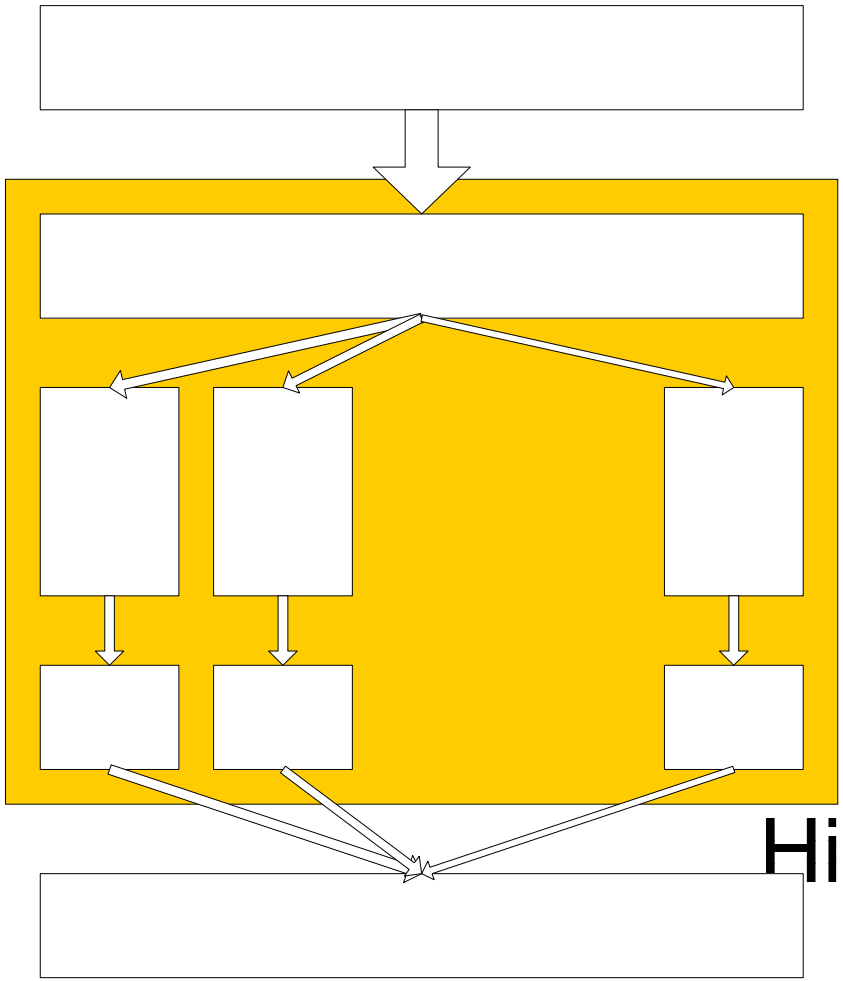


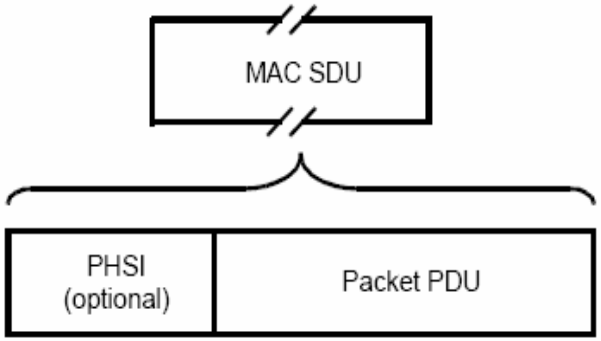
MAC layer follows a connection oriented paradigm

- **Three management connections**
- **Zero or more service flows (SFID)**
- **Managed Quality of Service on a per connection basis**
- **Four service classes specified**

Header suppression, packing, and fragmentation

MAC Layer : Convergence Sub Layer





Packet Header Suppression (PHS):

- **Replaces Header**
- **Rule established by signalling**
- **Not compression!**

Higher Layer Entity (e.g. Host IP

SD

Privacy Key Management (PKM)

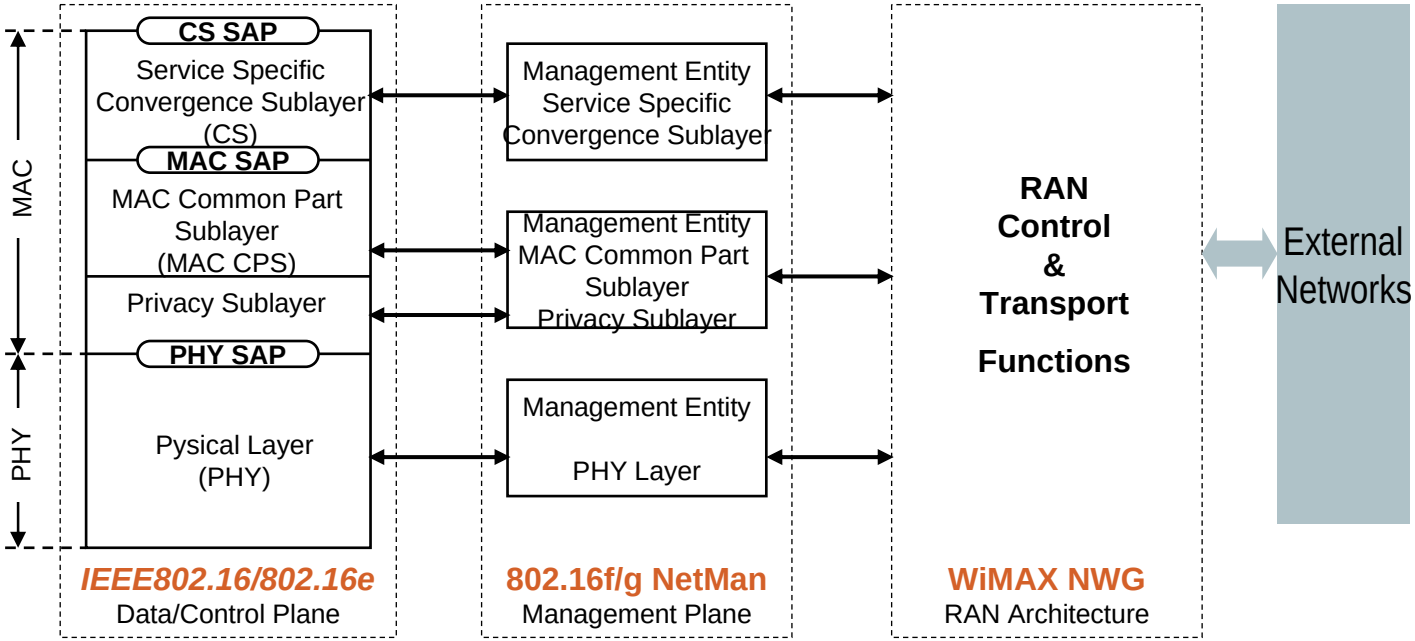
IEEE 802.16-2004

- **PKM RSA (mandatory)**

IEEE 802.16e

- **PKM version 1**
  - PKMv1 RSA (mandatory)
  - PKMv1 EAP (optional)
- **PKM version 2**
  - PKMv2 RSA
  - PKMv2 EAP
  - PKMv2 RSA+EAP

Relation IEEE802.16 vs. WiMAX NWG



IEEE802.16-2004 & 802.16e define data and control plane

Management plane functions are added by 802.16f & g (NETMAN)

IEEE P802.16 does not deal with functions usually provided by the RAN

- **The standardization of these missing parts of a portable/mobile WiMAX access network is the scope of the WiMAX NWG.**

Summary

- **IEEE 802.16 is a flexible standard that aims to offer a solution for a number of usage scenarios**

- **The relationship between Wimax and IEEE 802.16 can be compared with Wifi's relationship with IEEE 802.11.**