



COST 290

WiMAX Study Group

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<http://www.cost290.org>

- WiMAX is **not** IEEE 802.16 WirelessMAN
- IEEE 802.16x WirelessMAN
 - Family of standards for Wireless Broadband Access (BWA)
- WiMAX Forum
 - Industry-led, non-profit corporation
 - Promotes and certifies compatibility and interoperability of BWA products
 - Standards
 - IEEE 802.16 **and** ETSI HiperMAN

- Family of standards for Wireless Broadband access
- Clearly confined to PHY and MAC layer
 - Set of PHYs in licensed and un-licensed bands
 - MAC layer based on DOCSIS and ATM's QoS model
- Motivation
 - Powerful but cheap Broadband Access (BA) alternative for impervious and remote areas

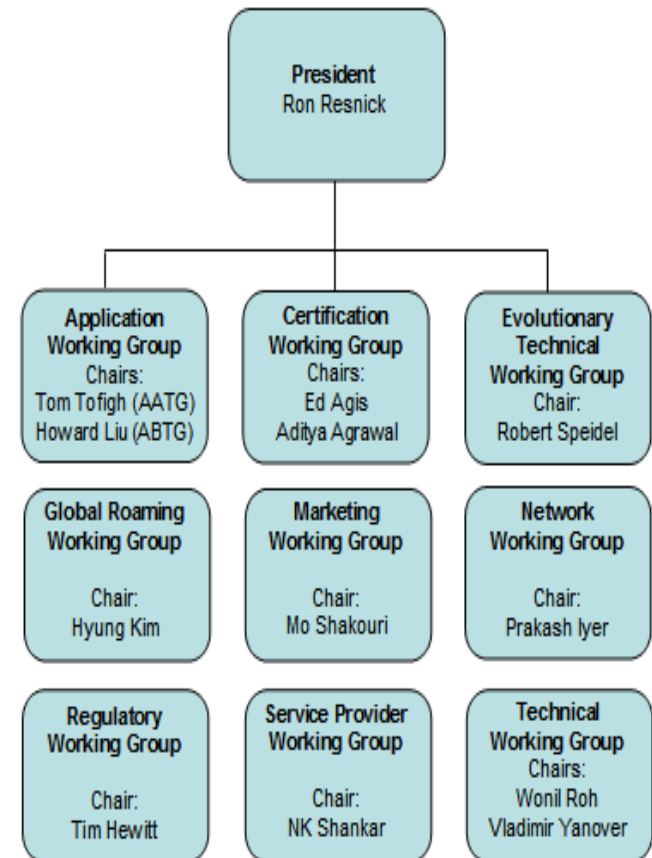
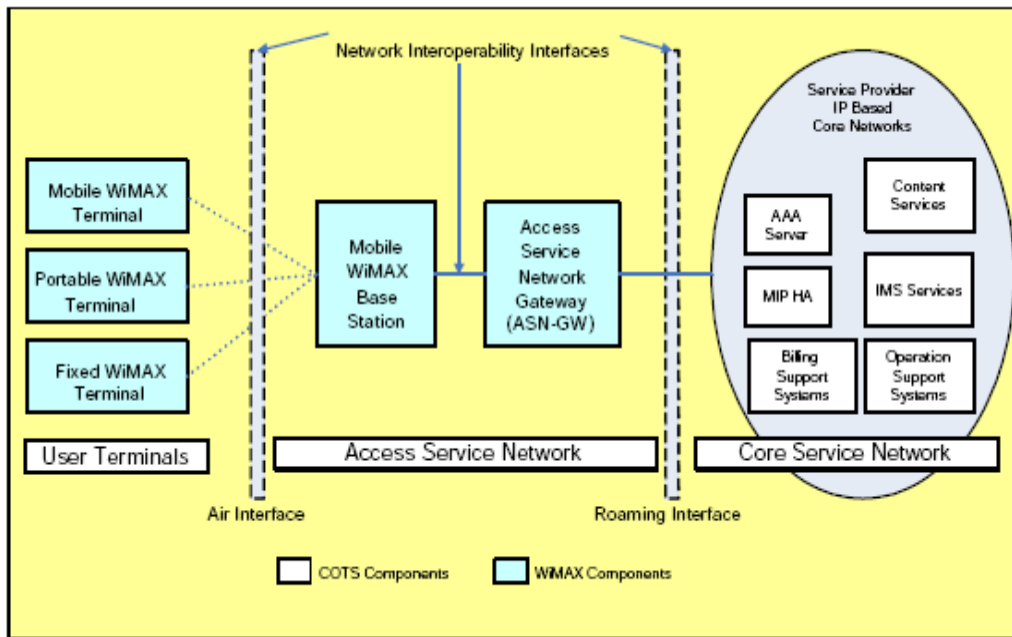
IEEE 802.16 Standard

Source: WiMAX Forum

	802.16	802.16a/REVd	802.16e
Completed	Dec. 2001	802.16a: Jan 2003 802.16 REVd: Q3 2004	Estimate: 2nd half of 2005
Spectrum	10 to 66 GHz	< 11 GHz	< 6 GHz
Channel Conditions	Line-of-sight only	Non line-of-sight	Non line-of-sight
Bit Rate	32 to 134 Mb/s at 28 MHz channelization	Up to 75 Mb/s at 20 MHz channelization	Up to 15 Mb/s at 5 MHz channelization
Modulation	QPSK, 16 QAM and 64 QAM	OFDM 256, OFDMA 64 QAM, 16 QAM, QPSK, BPSK	Same as REVd
Mobility	Fixed	Fixed and Portable	Mobility, Regional Roaming
Channel Bandwidths	20, 25 and 28 MHz	Selectable channel bandwidths between 1.25 and 20 MHz, with up to 16 logical sub-channels	Same as REVd
Typical Cell Radius	1 to 3 miles	3 to 5 miles; Maximum range 30 miles based on tower height, antenna gain and transmit power (among other parameters)	1 to 3 miles

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- WiMAX Forum Certified systems
 - Provide fixed, nomadic, portable and mobile BWA
 - Are proven interoperable with other vendors' equipment that is also certified
 - Certification of products is on-going
 - WiMAX Forum Certified™ equipment began commercial deployment in 2006
 - Organized in a number of working groups to address critical areas and to bring certified products to the marketplace

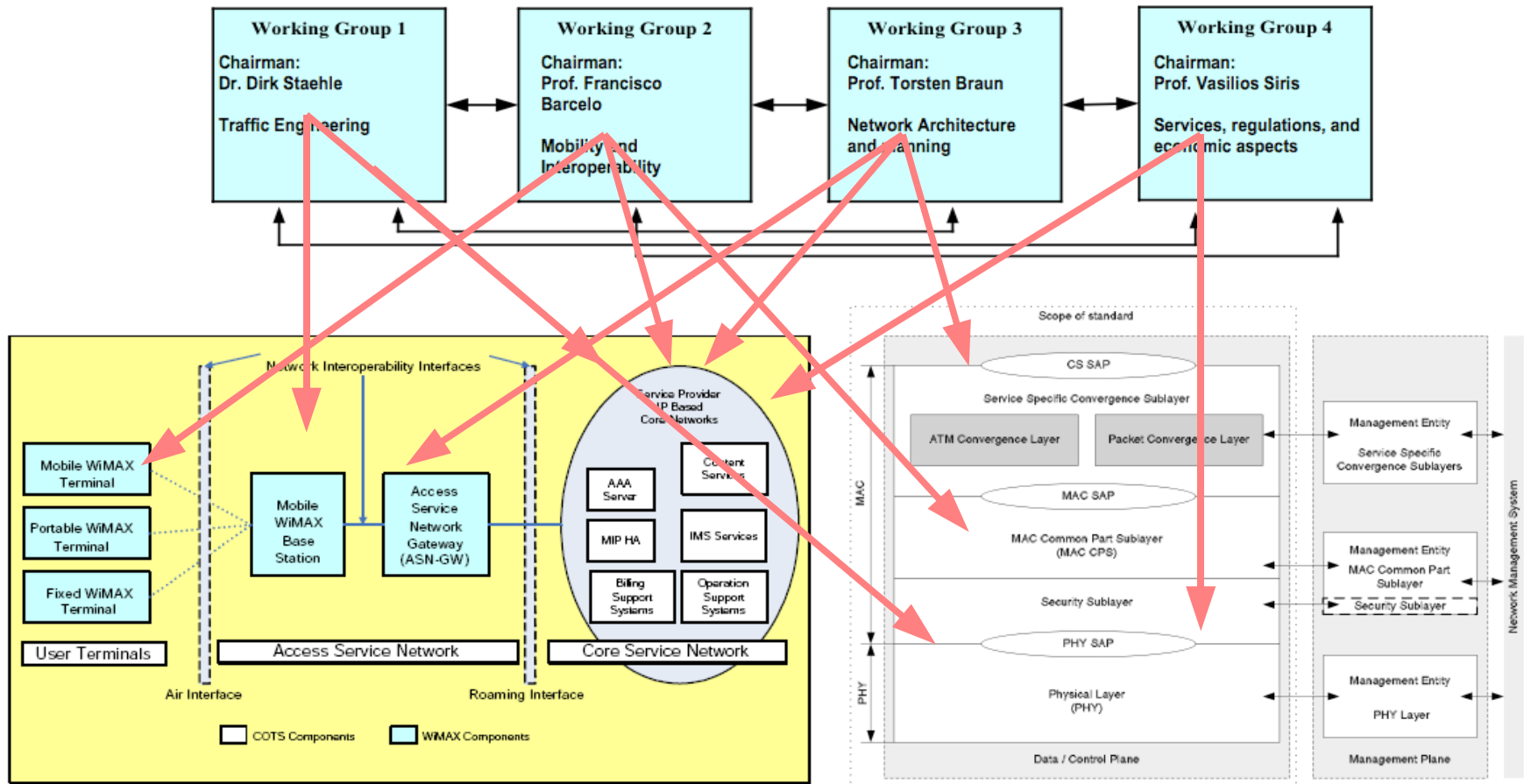
- Definition of a complete Wireless All-IP New Generation Network (WNGN)
- Focus: 3GPP(2) interoperability
- Far beyond IEEE 802.16 WirelessMAN



- IEEE WirelessMAN
 - Defines many features, however intentionally without implementation directives to hand manufacturers a means to distinguish products
 - Examples (Research Subjects):
 - MAC layer
 - Admission Control, Scheduling, etc.
 - PHY layer
 - RLC, Interference Coordination, etc.
 - General
 - Mesh mode by far underdeveloped

- Ongoing in WiMAX
 - All-IP network architecture
 - End-to-End QoS and signalling
 - Mobility and Roaming, Pricing
 - IPv4 and IPv6 over 802.16
 - „16ng“, new IETF Charter (10/2006)
 - etc.
 - Application level
 - Definition of applications and their requirements
 - Service quality, availability, etc.

WiMAX Study WG: Motivation



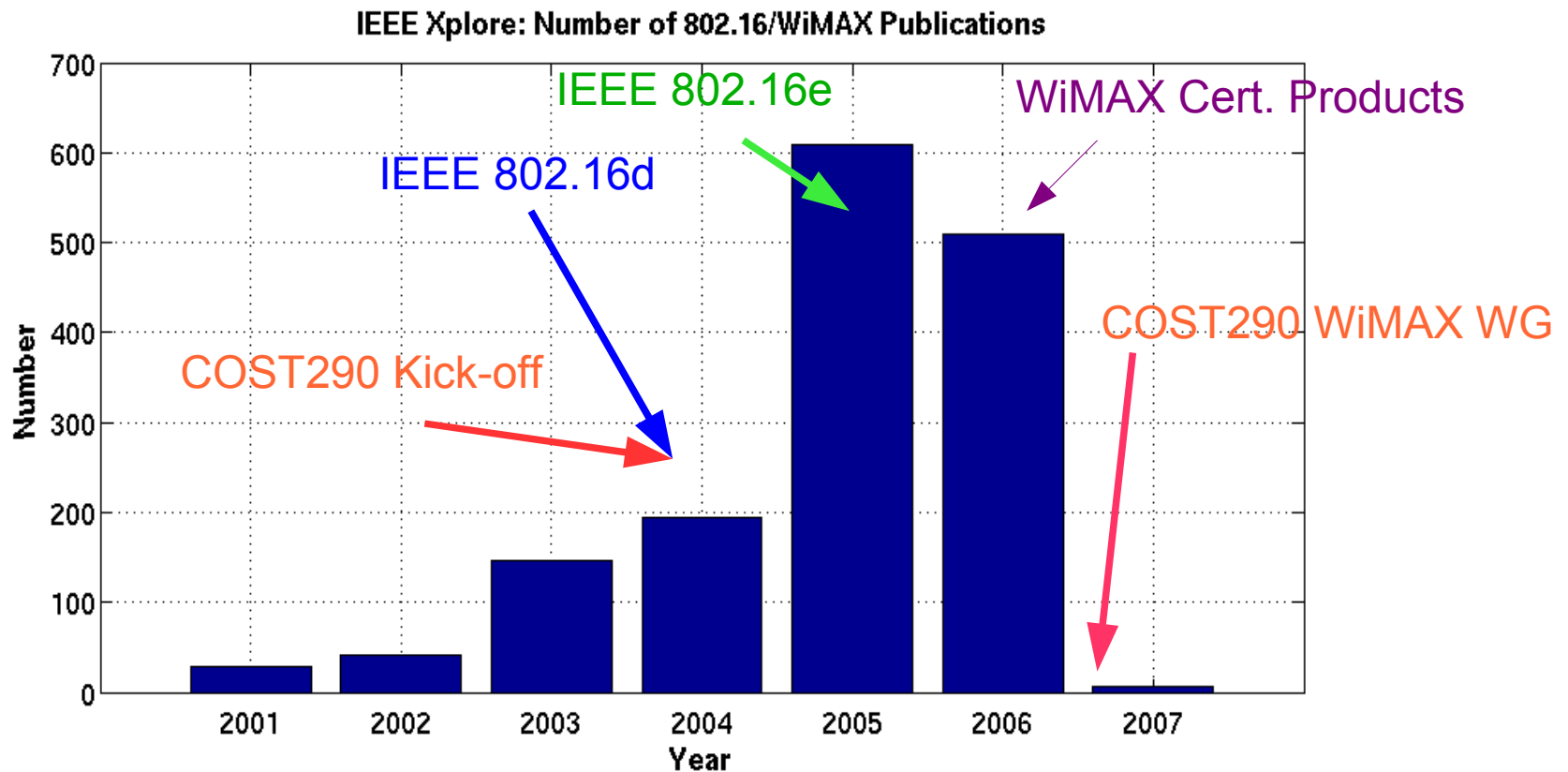
WiMAX NRN

IEEE 802.16

WiMAX Study WG: Motivation



- Research State-of-the-Art
 - IEEE Xplore „802.16 OR WiMAX“



- Current 802.16 and WiMAX related research
 - IST FP6 WiMAX Extension for Isolated Research Data Networks (WEIRD)
 - „Implementing WiMAX research testbeds“
 - IST FP6 „Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services“ „DAIDALOS“
 - „Seamlessly integrate heterogeneous network technologies“
 - IST FP6 „Scalable, Ultra-fast and Interoperable Interactive Television“ (SUIT)
 - „DVB-T/H over WiMAX“
 - IST FP6 „Foresight on Information Society Technologies in Europe“ (FISTE)
 - Assessing future mobile networks. This years work will concentrate on WiFi/WiMax developments.“

WiMAX Study WG: Objectives



- Sharing ideas and expertise guarantees mutual benefits
 - Short Term Scientific Mission (3, 6, 9 months)
- Cooperation allows:
 - Sharing software tools and hardware infrastructure
 - To shorten implementation time, avoids redundancy
 - Integration and testing on a larger scale
 - Joint publication, better dissemination of achievements
- Regular meetings co-located with COST290 MC meetings
 - COST 290 WiMAX Workshop
- Continuous cooperation even beyond WiMAX
 - IST FP6 and 7: WEIRD, DIADALOS, etc ...
 - COST 2xxx „Next Generation Mobile Broadband Wireless Access Networks“

WiMAX Study Group: Participants



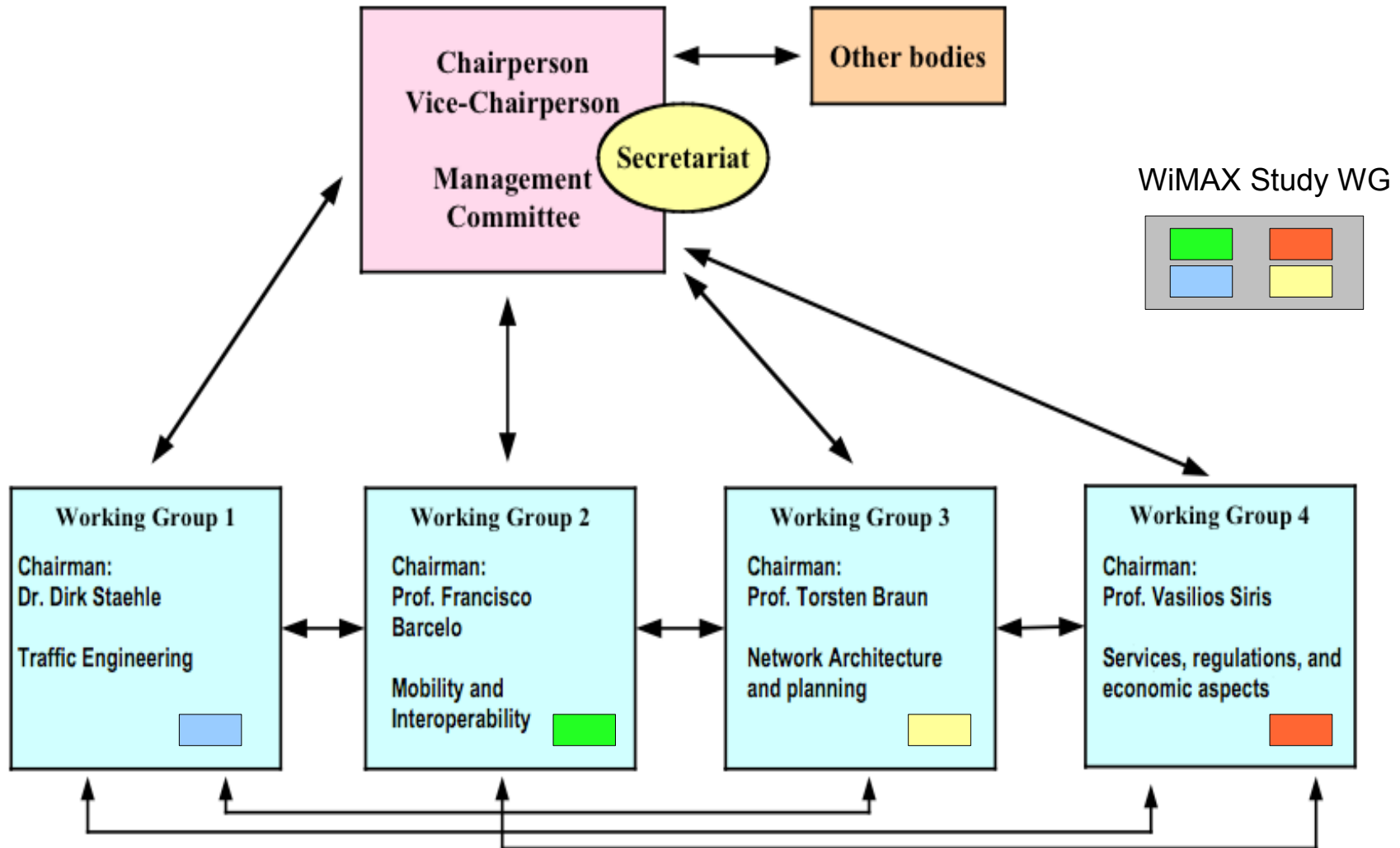
- Confirmed COST290 members so far
 - University of Coimbra, Portugal
 - T. Bohnert, E. Monteiro, WEIRD project
 - Tampere University of Technology, Finland
 - J. Jakubiak, R. Dunaytsev, Y. Koucheryavy
 - Proposal for 3-year project, Finnish Academy of Science
 - Submitted 31.01.2007
 - Universita de Siena, Italy
 - S. Hadzic, G. Giambene
 - University of Castilla La-Mancha, Spain
 - F. M. Delicado
 - University of Wuerzburg, Germany
 - D. Staehle, R. Pries

WiMAX Study Group: Participants



- Confirmed COST290 members so far (cont'd)
 - University of Colmar, France
 - N. Kettaf
 - University of Cyprus
 - C. Christophorou, A. Pitsillides
 - City University London
 - V. Rakocevic
- Beyond COST290
 - University of Posts and Telecommunications, Beijing, China ?
 - University of Colmar project partners

WiMAX Study WG and COST290



WiMAX Study Group: What's next?



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- Further Interest Inquiry
 - Complete list of participants
 - Precise definition of scope and goals
 - Formal integration in COST290
 - Create an Internet presence
 - Create a mailing list
 - Announce kick-off

Comments

