



WIRELESS WORLD

RESEARCH FORUM

NEC

EURESCOM

Serving and managing users in a heterogeneous environment

17th WWRF Meeting in Heidelberg, Germany
15 – 17 November 2006

Draft Meeting Programme

Overview

	Wednesday 15 Nov	Thursday 16 Nov	Friday 17 Nov
9:00	Opening Plenary	3 rd Plenary Session	4 th WG Session
10:30	Coffee Break	Coffee Break	Coffee Break
11:00	2 nd Plenary Session	4 th Plenary Session	2 nd SIG Session Venture Capital
12:30	Lunch	Lunch	Lunch
13:30	WG Elections	3 rd WG Session 2 nd WG1 Session	WG1 Scenario Summary
14:00	1 st WG Session	Coffee Break	WG/SIG Summary Session
16:00	Coffee Break	3 rd WG1 Session 1 st SIG Session	Wrap with Key findings and outlook
16:30	2 nd WG Session (except WG1)	General Assembly including elections	Meeting adjourn
18.30	Welcome Reception in Hotel Marriottt	Dinner in Prinz Carl Palais	

The **"Wireless World Research Forum (WWRF)"** identifies and promotes research areas and technical trends for mobile and wireless systems. The forum currently has around 150 members from industry and academia including the sponsoring members: Alcatel, Broadcom, Ericsson, France Telecom, Huawei, Intel, LG Electronics, Lucent, Motorola, Nokia, NEC, Nortel, Raytheon, Samsung, Siemens and Vodafone.

The 17th WWRF Meeting will be held on 15 – 17 November 2006 in Heidelberg, Germany, jointly hosted by NEC and Eurescom, at Hotel Marriott, Wangerowstrasse 16, Heidelberg.

WWRF's meetings comprise a mix of plenary and Working Group (WG) or Special Interest Group (SIG) sessions. The theme of the meeting will be **"Serving and managing users in a heterogeneous environment "**, and a number of prominent speakers will present keynote speeches on that topic.

Meeting Room Assignments

The three days WWRF meeting will use 6 meeting rooms at the Hotel Marriott, all on the ground floor.

Session	Room
Plenary and Panel sessions	Friedrich Hegel I+II
WG1 Human Perspective and Service Concepts	Bierstube Pinte
WG2 Service Architecture	Friedrich Hegel II
WG3 Co-operative and Ad-Hoc Networks	Franz Kafka
WG4 New Air Interfaces, Relay based Systems and Smart Antennas	Friedrich Hegel I
WG5 Short Range Wireless Communication Systems	Karl Jaspers
WG6 Reconfigurability	Ernst Bloch
SIG1 Spectrum Topics	Friedrich Hegel II
SIG2 Security and Trust	Friedrich Hegel I
SIG3 Self-organisation in Wireless World Systems	Franz Kafka
SIG4 Convergence of Digital Industries	Karl Jaspers
Venture Capital Session	Hannah Arendt
General Assembly	Friedrich Hegel I

Meeting Room Assignments

The three days WWRF meeting will use 6 meeting rooms at the Hotel Marriott, all on the ground floor.

Wednesday, 15 November 2006

09:00 – 10:30	Plenary						
11:00 – 12:30	Plenary						
12:30 – 13:30	Lunch at the Marriott Hotel						
13:30 – 14:00		WG1 Elections	WG2 Elections	WG3 Elections	WG4 Elections	WG5 Elections	WG6 Elections
14:00 – 16:00		WG1	WG2	WG3	WG4	WG5	WG6
16:30 – 18:30			WG2	WG3	WG4	WG5	WG6
18.30	Welcome Reception in the Hotel						

Thursday, 16 November 2006

09:00 – 10:30	Plenary						
11:00 – 12:00	Plenary						
12:00 – 13:00	Lunch at the Marriott Hotel						
13:00 – 15:00		WG1/SIG2	WG2	WG3	WG4	WG5	WG6
15:30 – 17:30		WG1	SIG1	SIG2	SIG3	SIG4	
17:30 – 18:30	GA / Elections						
19:30	Dinner at Prinz Carl Palais						

Friday, 17 November 2006

09:00 – 11:00		WG1	WG2	WG3	WG4	WG5	WG6
11:30 – 13:00		VC session	SIG1	SIG2	SIG3	SIG4	
13:00 – 14:00	Lunch at the Marriott Hotel						
14:00 – 14:30	WG1 scenarios						
14:30 – 15:30	WG/SIG Summary						
15:30 – 16:00	Wrap-up						
16:00	Meeting Adjourn						

Detailed Session Agendas

Opening Plenary Session

Wednesday 15th November 09:00–10:30, Friedrich Hegel I+II

Session Chair: Amardeo Sarma (NEC)		
Time	Title	Presenter
09:00	Welcome to WWRF17	Amardeo Sarma, David Kennedy
09:10	Welcome to Heidelberg	Beate Weber, Mayor of Heidelberg
09:30	The Wireless World Research Forum – Global Visions of a Wireless World	Mikko A. Uusitalo, Nokia, WWRF Chair
10:00	Improving Service Utility and Delivery for Next Generation Networks	Heinrich Stüttgen, NEC

2nd Plenary Session

Wednesday 15th November 11:00–12:30, Friedrich Hegel I+II

Session Chair: Mikko Uusitalo (Nokia)		
Time	Title	Presenter
11:00	Communication Technologies in Framework Program 7	Rainer Zimmermann, European Commission
11:25	IMT-Advanced: As Is and To Be - Asian Perspectives on 4G	KiHo Kim, VP of Samsung, NGMC, and VVWRF APAC Vice-Chair
11:50	Understanding Communication Habits and Content Types in Web 2.0	Stefan Hottel, Vodafone GROUP R&D Germany
12:15	Announcement about elections and other general matters	Vinod Kumar, Alcatel

3rd Plenary Session

Thursday 16th November 09:00-10:30, Friedrich Hegel I+II

Session Chair: Sudhir Dixit (Nokia)		
Time	Title	Presenter
09:00	Cellular Controlled Short-Range Communication for Cooperative P2P Networking	Frank Fitzek (Aalborg University, Denmark) and Marcos Katz (VTT, Finland)
09:30	Short-range optical wireless communications using visible light	Dominic O'Brien, Oxford University
10:00	Very High Data Rate Home Area Network	Bin XIA, Huawei Technologies

4th Plenary Session

Thursday 16th November 11:00-12:00, Friedrich Hegel I+II

Session Chair: Nigel Jefferies (Vodafone)		
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Time	Title	Presenter
11:00	User-Centric Scenarios: Status of WWRF Reference Scenarios	Lene Sørensen, CICT/DTU
11:30	Social engineering in the world of emerging communication technologies	Seppo Heikkinen, Tampere University of Technology

WG / SIG Sessions

WG1 – Human Perspective and Service Concepts

WG1 is focused on discovering and promoting research areas that strive to understand end-users' actual needs for future wireless systems and how users will interact with devices, systems and applications in the wireless world.

WG1 Session 1		Wednesday 15 th November 13:30 – 16:00
Session Chair: Prof. Knud Erik Skouby (CICT/DTU, Denmark) – Room Bierstube Pinte		
WG1 Elections		
13:30 – 14:00	Election of Chair and Vice Chair for 2007	Chair: TBD
WG1 presentations		
14:00 – 14:30	Context aware user interfaces for portable devices in pervasive environments	Karim Yaici / Ahmet Kondoz I-Lab, CCSR, University of Surrey
14:30 – 15:00	Towards mobile information world for Future City	Ji Yang/ Hu Zheng Beijing University of Post and Telecommunications
15:00 – 16:30	LivingLabs environment for diverse user centered validation	Veli-Pekka Niitamo Nokia
15:30 – 16:00	The end user's perspective on PN services	Rune Roswall / Su-En Tan Telia Sonera/ CICT DTU

WG1 Session 2 (jointly with SIG2)		Thursday 16 th November 13:00 – 15:00
Session Chair: Knud Erik Skouby / Mario Hoffmann – Room Bierstube Pinte		
Time	Title	Author
WG1/SIG2 Joint Session (<i>Usable Security</i> joint WP)		
13:00 – 13:30	Security and non-repudiation for voice-over-IP conversations	Andreas Schmidt et al, Fraunhofer Inst.
13:30 – 14:00	Outline and content of the WP today	Knud Erik Skouby / Mario Hoffmann
14:00 – 15:00	Future work with the joint white paper on <i>Usable Security</i>	Knud Erik Skouby / Mario Hoffmann

WG1 Session 3		Thursday 16 th November 15:30 – 17:00
Session Chair: Prof. Knud Erik Skouby (CICT/DTU, Denmark) – Room Ernst Block		
Time	Title	Author
WG1 Contribution presentations		
15:30 –	Value-sensitive design in the wireless	Dr Amy Tan

16:00	world	I-Lab, CCSR, University of Surrey
16:00– 16:30	Mashing it up for the wireless world	Esko Kurvinen et al MobiLife
16:30– 17:00	Towards multi-dimensional scenario-driven process chain	Yongzheng Liang et al Stuttgart University

WG1 Session 4			Friday 17th November 09:00 – 11:00		
Session Chair: Prof. Knud Erik Skouby (CICT/DTU, Denmark) – Room Bierstube Pinte					
Time	Title		Author		
WG1 White papers and future work					
09:00 – 09:30	Planning for future work of WG1		WG1 Chair		
09:30 – 11:00	WG 1 White Paper Working Teams				

WG2 – Service Architecture

WG2 is focused on the service architecture and enabling technologies for future wireless communication systems. The WG2 follows the approach of WG1 to make the user the driving force in future communication systems. Based on an IP-ficated, always connected world, WG2 investigates how the individual user of future communication systems can be provided with user-centric, ubiquitous and context-aware service environments. The working group exists to gather inputs and views from industry and academia, to synthesise these views to influence future visions and research priorities and to share results across the Forum.

WG2 Session 1			Wednesday 15th November 13:30 – 16:00		
Session Chair: Klaus David (University of Kassel, Germany) – Room Friedrich Hegel II					
Time	Title		Author		
WG2 Elections					
13:30 – 14:00	Election of Chair and Vice Chair for 2007		Chair: TBD		
Service Architecture I					
14:00 – 14:10	Opening and Agenda		Klaus David, University of Kassel Mika Klemettinen, Nokia		
14:10 – 14:30	WG2 Progress Report		Klaus David, University of Kassel, Germany Mika Klemettinen, Nokia		
14:30 – 14:45	Short Introduction to White Papers		Mika Klemettinen, Nokia, Finland		
14:45 – 15:05	Platform for Mobile RFID		Wooshik Kang, Jihun Koo, Kyungho Park, Sigyoung Koo, Donghyun Lee, Kisoo Chang, Samsung		
15:05 – 15:25	SPICE: A Service Platform for Future Mobile Communication Services		Christian Prehofer, Sasu Tarkoma, Nokia Anna V. Zhdanova, University of Surrey Hariharan Rajasekaran, Siemens Networks		
15:25 – 15:45	Mobile Platform Services		Jörg Brakensiek, Nokia		

15:45 – 16:00	CASDM : A Novel Module for Enabling Service Discovery in IMS	Le Kang, IBM China Xuelian Long, Beijing University of Posts and Telecommunications Wei Song, Beijing Institute of Technology
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WG2 Session 2		
Wednesday 15th November 16:30 – 18:30		
Session Chair: Klaus David (University of Kassel, Germany) – Room Friedrich Hegel II		
Time	Title	Author
Service Architecture II		
16:30 – 17:00	Invited Talk: Enterprise Solutions	Lutz Heuser, SAP
17:00 – 17:20	Future Service Based Reference Models for Next Generation Mobile Communication	Seong-Im Yoon, Seung-Hee Kim, Dong-Guk Je, Gyung-Chul Sihm, Dae-Sik Kim, ETRI
17:20 – 17:40	A new mobile service architecture addresses future mobile business environments	Ulla Killström, Elisa Bernd Mrohs, Fraunhofer FOKUS Timber Haaker, Mark de Reuver, Telematica Instituut Olli Immonen, Nokia Olli Pitkänen, HIIT Luca Galli, Neos
17:40 – 18:00	Scalability of the MUSDAC Platform for Service Discovery in B3G Networks	Pierre-Guillaume Raverdy, Sebastien Armand, Valérie Issarny, INRIA
18:00 – 18:30	White Paper: Service Architecture	Christophe Cordier, France Telecom

WG2 Session 3		
Thursday 16th November 13:00 – 15:00		
Session Chair: Mika Klemettinen (Nokia, Finland) – Room Friedrich Hegel II		
Time	Title	Author
Semantic Services		
13:00 – 13:30	Invited Talk: Medical Solutions	Maarten Wegdam, Lucent
13:30 – 13:50	Semantic Modelling of Policies for Context-aware Services	Sandford Bessler, Joachim Zeiss, Telecommunications Research Centre Vienna
13:50 – 14:10	Semantic Service Delivery for Mobile Users	Josef Noll, Unik/Telenor Frode Kileng, Telenor Ralf Hinz, Daimler Chrysler Dumitru Roman, DERI Marcin Pilarski, Warsaw University of Technology Erik Lillevold, Unik
14:10 – 14:30	Service and Information Roaming - Architecture and Design Aspects	Josip Zoric, Telenor Erwin Postmann, Siemens AG Österreich Jan van der Meer, Jos Hendriks, Ericsson Telecommunications Wolfgang Kellerer, Thakolsri Srisakul, DoCoMo Communications Laboratories Jordi Rovira Simon, Telefonica
14:30 – 15:00	White Paper: Semantic Services	Matthias Wagner, DoCoMo Communications Laboratories

WG2 Session 4		Friday 17 th November 09:00 – 11:00
Session Chair: Mika Klemettinen (Nokia, Finland) – Room Friedrich Hegel II		
Time	Title	Author
Service Creation		
09:00 – 09:20	Service Creation in the SPICE Service Platform	João Paulo Almeida, Stichting Telematica Instituut Alberto Baravaglio, Telecom Italia Mariano Belaunde, France Telecom Paolo Falcarin, Politecnico di Torino Ernö Kovacs, NEC Europe Ltd
09:20 – 09:40	Anonymous Real-Time Mobile Community Services	J. G. Markoulidakis, C. Desiniotis, Vodafone-Panafon M. Theologou, C. Eliopoulos, D. Liapis, K. Demestichas, National Technical University of Athens
09:40 – 10:00	Enabling Multimedia Broadcast/Multicast Services over Converged Networks	N. Baker, M. Zafar, UWE A. Al-Hezmi, Fraunhofer FOKUS M. Fuchs, Bamboo Media Casting
10:00 – 10:30	White Paper: Service Creation	Olaf Droegehorn, University of Kassel
10:30 – 11:00	Conclusions and Next Steps	Klaus David, University of Kassel Mika Klemettinen, Nokia

WG3 – Co-operative and Ad-hoc Networks

WG3 is focused on studying co-operative and ad hoc networks as an integral and evolving part of the future wireless and fixed communication infrastructure. This concept entails both the cooperation between networks as administrative entities as well as networks where devices cooperate among each other to enhance network metrics (e.g. by so-called cooperative forwarding). WG3 work includes scenarios, components, architecture, and framework considerations, e.g. to integrate civilian industrial sensor networks into B3G architectures. In general WG3 aims for an understanding of the next generation network paradigms of B3G and all-IP scenarios.

WG3 Session 1		Wednesday 15 th November 13:30 – 16:00
Session Chair: Holger Karl – Room Franz Kafka		
Time	Title	Author
WG3 Elections		
13:30 – 14:00	Election of Chair and Vice Chair for 2007	Chair: TBD
Mobility		
14:00 – 14:15	Welcome and introduction to WG3	H. Karl, Univ. of Paderborn
14:15 – 14:40	Ambient Networks Composition and Media Delivery in the 3GPP Framework	O. Koski, N. Marchenko, A. Schieder, Ericsson Research
14:40 – 15:05	Handover Management Process in Ambient Networks	M. Georgiades, T. Rinta-aho, F. Meago Univ. of Surrey
15:05 – 15:30	Mobility through Heterogeneous Networks in a 4G Environment	S. Sargento, Instituto de Telecomunicações T. Melia, NEC Europe Ltd, Network

		Laboratories A. Banchs, I. Soto, Universidad Carlos III Madrid J. Moedeker, Fraunhofer FOKUS, L. Marchetti, Telecom Italia Lab
15:30 – 16:00	Discussion on relevance for whitepapers	H. Karl, Univ. of Paderborn

WG3 Session 2		Wednesday 15th November 16:30 – 18:30
Session Chair: Holger Karl – Room Franz Kafka		
Time	Title	Author
WG3 whitepapers		
16:30 – 16:50	Context provisioning in the WWI System Architecture	J. Salo, Nokia; R. Giaffreda, BT; G. Bortolomeo, University of Roma Tor Vergata; H. Van Kranenburg, A. Galis
16:50 – 17:10	Mobility management and Multi-Radio Resource Management in the WWI System Architecture	A. Schieder, Ericsson Research; E. Tragos, NTUA; J. Mikola, Nokia; A. Kalokylos, Univ. of Athens; A. Mihailovic, King's College London; J. Luo, Siemens; O. Strandberg, Nokia
17:10 – 17:30	Service and information roaming – architecture and design aspects	J. Zoric, Telenor R&I; E. Postmann, Siemens; J. van der Meer, J. Hendriks, Ericsson; W. Kellerer, T. Srisakul, DoCoMo Eurolabs; J. R. Simon, Telefonica
17:30 – 17:40	Discussion on “WWI System Architecture whitepaper”	A. Schieder, Ericsson
17:40 – 18:00	Cooperative wireless networking beyond store-and-forward: Perspectives for PHY and MAC design	S. Valentin, H. S. Lichte, H. Karl, Univ. of Paderborn; G. Vivier, S. Simoens, Motorola Labs; J. Vidal, A. Agustin, TU of Catalonia; I. Aad, Docomo Eurolabs
18:00 – 18:05	Discussion on “Cooperative Networking” whitepaper	S. Valentin, Univ. of Paderborn
18:05 – 18:15	Discussion on “An E2E Architecture to Handle QoS Requirements in a Home Environment” whitepaper	D. Meddour, Orange-France Telecom
18:15 – 18:30	Discussion on “Requirements and Proposals for Networks of the Wireless World” whitepaper	J. Nilson, Ericsson

WG3 Session 3		Thursday 16th November 13:00 – 15:00
Session Chair: Holger Karl – Room Franz Kafka		
Time	Title	Author
Protocols		
13:00 – 13:30	On the Use of Routing Information to Improve Applications Behaviour in Multi Hop Wireless Networks	D.-E. Meddour, T. Mohamed-Rasheed, France Telecom R&D
13:30 –	An Energy Efficient Medium Access Control	F. Huang, Y. Yang

14:00	Protocol for Wireless Mesh Access Networks	University College London
14:00 – 14:30	Design and evaluation of an AODV-based routing protocol for IEEE 802.15.4 mesh sensor environments	C. Gomez, P. Salvatella, J. Paradells TU of Catalonia
14:30 – 15:00	Discussion on relevance for whitepapers	H. Karl, Univ. of Paderborn

WG3 Session 4		Friday 17th November 9:00 – 11:00
Session Chair: Holger Karl – Room Franz Kafka		
Time	Title	Author
Systems		
09:00 – 09:25	Design of a UMTS/GPRS Assisted Mesh Network	J. Paradells et al., TU Catalonia; J. Rubio, D. Alomodovar, Vodafone R&D; D. Rodellar et al., SwissCom Innovations
09:25 – 09:50	Convergence of Mobile Devices and Sensor Networks	F. H.P. Fitzek, M. V. Pedersen, G. P. Perrucci, S. Rein, C. Gühmann Aalborg University and TU Berlin
09:50 – 10:15	Public Safety Communications Perspectives: The WIDENS experience	H. Aïache, V. Conan, Thales Communications; A. Boukalov, Helsinki University of Technology
10:15 – 10:40	The MIDAS project	J. van Dinther, CapGemini; J. Gorman, L. W. M. Wienhofen, SINTEF ICT
10:40 – 11:00	Discussion on relevance for whitepapers	H. Karl, Univ. of Paderborn

WG4 – New Air Interfaces, Relay based Systems and Smart Antennas

WG4 focuses on air interfaces, and smart antenna and relay network enhancements, in metropolitan and wide-area environments; i.e. wireless MAN and WAN point-to-multipoint, unicast, multicast and broadcast systems, with or without mobility. The beyond-3G systems under consideration are characterized by aggregate bit rates in the 100 Mb/s range or higher, high mobility, high user capacity and ubiquity, and coexistence with complementary services sharing the same or adjacent spectrum. Typical distances between mobile terminals and access points are greater than 100 m, although communication may be facilitated by a relay network with shorter inter-relay distances.

WG4 Session 1		Wednesday 15th November 13:30 – 16:00
Session Chair: Angeliki Alexiou (Bell Labs, Lucent Technologies, UK) – Room Friedrich Hegel I		
Time	Title	Author
WG4 Elections		
13:30 – 14:00	Election of Chair and Vice Chair for 2007	Chair: TBD
Introduction and Invited Presentations		
14:00-14:15	Introduction and WG4 meeting agenda	Angeliki Alexiou, Bell Labs, Lucent Technologies

14:15-14:50	Practical Methods from Multi-Terminal Information Theory	Jossi Sayir, FTW
14:50-15:25	The MIMO OFDM channel: Fundamental capacity and transmission schemes	Gerhard Wunder, Fraunhofer
15:25-16:00	MIMO-OFDM - State of the Art in Wireless Gigabit Transmission	Thomas Haustein and Egon Schulz, Siemens

WG4 Session 2			Wednesday 15th November 16:30 – 18:30		
Session Chair: Gerhard Bauch (DoCoMo Labs, Germany) – Room Friedrich Hegel I					
Time	Title	Author			
Relay Based Systems and Poster Session					
16:30-16:50	Enhanced Multi-hop Relaying System (EMRS) For the B3G Wireless Communication	Tong Wu, Ying Wang, and Ping Zhang, Wireless Tech. Innovation (WTI) Institution, BUPT			
16:50-17:10	A New Cognitive Pilot Channel Concept based on Multi-Hop Networks	Tobias Renk, Clemens Kloeck, Holger Jaekel, and Friedrich K. Jondral, Institut für Nachrichtentechnik, Universität Karlsruhe (TH)			
17:10-17:30	Recovering Multiplexing Loss in Relay Networks	Yijia Fan and John Thompson, Institute for Digital Communications, University of Edinburgh Mark Naden, Nortel			
17:30-18:30	POSTER SESSION				

WG4 Session 3			Thursday 16th November 13:00 – 15:00		
Session Chair: Angeliki Alexiou (Bell Labs, Lucent Technologies, UK) – Room Friedrich Hegel I					
Time	Title	Author			
New Air Interface and Smart Antennas					
13:00-13:20	Cyclic Delay Diversity: Effective Channel Properties and Applications	Armin Dammann and Simon Plass, DLR			
13:20-13:40	Influence of Coherence Bandwidth on the Performance of Space-Frequency Coded MC-CDMA OFDM	Anja Grosch, Veljko Stankovic, and Martin Haardt, Ilmenau University of Technology			
13:40-14:00	Maximization of Sum Capacity under Minimum Rate Requirements in MIMO OFDM Systems	Christian Guthy, Wolfgang Utschick, Munich University of Technology Gerhard Bauch, DoCoMo Communications Laboratories Josef A. Nossek, Munich University of Technology			
14:00-14:20	Layered Space-Time Codes with Power Allocation	K. Y. Wu, X. L. Zhu, H. W. Yang and L. Y. Cai, Research & Innovation, Alcatel Shanghai Bell Co., Ltd			
14:20-14:40	Linear and Non-Linear Multi-user MIMO Downlink Precoding	Veljko Stankovic, Martin Haardt, Ilmenau University of Technology Simon Gale, Andy Jeffries, Nortel			
14.40-15.00	Multi-Antenna Signal Processing for Wide Area Wireless Networks	Veluppillai B. Manimohan, ArrayComm			

WG4 Session 4			Friday 17th November 09:00 – 11:00		
Session Chair: Angeliki Alexiou (Bell Labs, Lucent Technologies, UK) – Room Friedrich					

Hegel I		
Time	Title	Author
White Papers and Brainstorming session		
09:00-09:30	WG4 & WG5 White Paper: Multi-Dimensional Radio Channel Measurement and Modelling for Future Mobile and Short-Range Wireless Systems	Tommi Jämsä and Juha Ylitalo, Elektrobit and University of Oulu / CWC Reiner S. Thomä, Technische Universität Ilmenau Angeliki Alexiou, Bell Labs / Lucent Technologies(editors)
09:30-10:00	White Paper on Error Control Coding Options for Next Generation Wireless Systems	Thierry Lestable, Samsung Electronics Research Institute Moshe Ran, Holon Institute of Technology
10:00-11:00	Discussion on WWRF Vision and System Concept	

Invited Presentations:

The MIMO OFDM channel: Fundamental capacity and transmission schemes

Gerhard Wunder, Fraunhofer, Germany

We consider transmission of multiple users over the MIMO OFDM downlink channel and find the fundamental capacity region in terms of bit/s/Hz for known CSI at the transmitter/receiver.

Furthermore, we introduce several important problems related to scheduling and QoS problems such as e.g. sum power minimization/ or rate maximization subject to rate constraints.

For all problems we provide proper solutions using convex and combinatorial optimization theory. Then, we present practical approaches using rate/power iterative waterfilling and THP. Finally, we comment on scaling of these algorithms wrt. mobility.

Practical Methods from Multi-Terminal Information Theory

Jossi Sayir, FTW, Austria

Multiple access channels, broadcast channels, and relay channels: these are a few of the multi-terminal communication setups that have kept information theorists busy for half a century. Over the past few years, a number of exciting results have emerged, narrowing bounds on the capacity regions for these channels, based on new communication strategies. These results are anticipated to gain importance with the increased use of wireless ad hoc networks and the like. In particular, it is expected that cooperative communication strategies may provide a breakthrough in the achievable throughput for large networks, where constructions without multi-terminal coding have provided disappointing results.

This talk represents a coding engineer's attempt to disentangle theory from practice regarding multi-terminal communications. I will present an overview of known bounds on the capacity regions of some multi-terminal channels. Some of these bounds are based on theoretical constructions that are useful for mathematical proofs but cannot be implemented in practice.

Some, on the other hand, are based on constructions for which we can reasonably expect practical implementations within the near future. I will discuss these techniques, which constitute realistic candidates for inclusion in 4G systems.

MIMO-OFDM - State of the Art in Wireless Gigabit Transmission

Thomas Haustein and Egon Schulz, Siemens, Germany

Next generation wireless transmission systems have to satisfy increasing throughput demands,

reduced latency in communication and more stringent quality of service requirement for new applications. Successful approaches which allow high data rates beyond the 1 Gigabit/s are often based on MIMO-OFDM which is becoming a more mature technique for real-time base band signal processing.

In this talk, we report on the concept and the first successful implementation of an experimental mobile communication system which allows continuous over the air data transmission at a gross rate of 1 Gbit/s and beyond. To allow for true mobility, omni-directional antennas are used and the spectral efficiency is boosted by using multiple antennas at the transmit and receive side. Spatial multiplexing is individually applied on each OFDM sub-carrier. Convolutional coding protects the data transmission against multi-path fading effects and by means of channel aware adaptive modulation which can be applied individually for each transmit antenna and each sub-carrier we can adapt the transmission rate reliably to the capacity of the transmission channel. Our measurements give evidence that resource allocation including bit-loading can be updated at a much lower time scale than channel tracking with MIMO receive filters. This has an fundamental impact on next generation cellular systems which will benefit significantly from channel aware resource scheduling for in order to use the limited frequency spectrum most efficiently.

The talks will give an overview on technical challenges on the physical layer and experimental results will help to illustrate the achievable gains from channel adaptive transmission techniques at very high data rates.

Posters	
Outdoor MIMO Radio Channel Measurements at 2.53 GHz - Transition from LOS to NLOS	Veli-Matti Holappa, Mikko Alatossava and Juha Ylitalo, Centre for Wireless Communications in the University of Oulu, Finland.
Propagation Measurements for Wideband Mobile-to-Mobile Channel at 5.25GHz	Xinying Gao, Jianhua Zhang, Ding Xu, Yang Lu, Weihui Dong, Ping Zhang, Wireless Tech. Innovation (WTI) Lab., Beijing University of Posts and Telecommunications (BUPT), China
Multi-Hop Relaying based on IEEE 802.16 Networks	Simone Redana, Luca Coletti and Lino Moretti, Siemens, Italy
RAN Enhancements for Advanced Multimedia Broadcasting and Multicasting Services	E. Alexandri(1), J. Antoniou(2), T. Clessienne(1), A. Correia(3), R. Dinis(3), E. Hepsaydir(5), R. Höckmann(4), H. Schotten(6), C. Sgraja(6), R. Tönjes(4), N. Souto(3), S. Wendt(1) (1)France Telecom, (2)Univ. of Cyprus, (3)ADETTI, (4)Univ. of Appl. Sci. Osnabrück, (5)Hutchison 3G, (6)Qualcomm CDMA Techn. GmbH
Optimal Power Allocation for MISO channels with PAPR constraints and its performance with quantized channel feedback	V. Ganesh, Devendra Jalihal, K. Giridhar, Indian Institute of Technology, Madras, India
Dynamic Resource Allocation for 3G Systems: OVFS Code Assignment Strategies	Mustafa Karakoç and Adnan Kavak, Kocaeli University, Turkey
Fast Random Access Method for Relay-assisted Communication Systems	Xiaojing Zhang and Wei Pan, Huawei Technologies Co. LTD, China
On Capacity of Modified Quality-Based Channel-State Reporting with Fairness in Mobile Systems	Heesoo Lee, In-Ho Lee, Dongwoo Kim and Hyun Kyu Chung, ETRI, Korea
Channel Estimation in Link Adaptation Strategies for MIMO-OFDM Systems	Darlan Cavalcante Moreira, and Charles Casimiro Cavalcante, Grupo de Pesquisa em Telecomunicacoes Sem-Fio-GTEL, Federal University of Ceara, Brazil
Uplink Interference Management in Cellular Fixed Relay Networks	Hyojin Lee, Heesoo Lee and Hyun Kyu Chung, ETRI, Korea

The Efficient Retransmission Scheme in MIMO Systems with SIC Receiver	Bangwon Seo, Heesoo Lee, and Hyun Kyu Chung, ETRI, Korea
An Iterative SAIC Receiver for Coded OFDMA Systems in Multicell Environments	Junyoung Nam, Seong Rag Kim, and Hyun Kyu Chung, ETRI, Korea Jinho Choi, University of Wales Swansea, United Kingdom

WG5 – Short Range Wireless Communication Systems

WG5 is focused on short-range wireless systems and including all aspects of next generation local and personal area networks (WLAN / WPAN), body area networks (WBAN), home networks and short-range sensor networks. The topics covered by WG5 range from Gigabit Wireless systems to ultra low power sensor networks, as well as from “traditional” radio communications over UWB to optical communications.

WG5 Session 1		Wednesday 15th November 14:00 – 16:00
Session Chair: Rolf Kraemer (IHP Microelectronics, Germany) – Room Karl Jaspers		
Time	Title	Author
WG5 Elections		
13:30 – 14:00	Election of Chair and Vice Chair for 2007	Chair: TBD
Ultra-wide-band communication		
14:00 – 14:10	Welcome and introduction to WG5 programme	Rolf Kraemer, WG5 Chair IHP
14:10 – 15:10	New perspectives on Ultra-Wide-Band Communication (White paper discussion)	Thomas Kaiser Univ. of Hannover
15:10 – 15:35	IR UWB Channel Parameters Estimation in Realistic Environments	Lorenzo Mucchi Univ. of Florence
15:35 – 16:00	Efficient Synchronization Mechanism in UWB - A Building Block for Short Range High-Data Rate Communication System	Yossi Yannai ISRC Consortium

WG5 Session 2		Wednesday 15th November 16:30 – 18:30
Session Chair: Thomas Kaiser (University of Hannover, Germany) – Room Karl Jaspers		
Time	Title	Author
Visible light communication		
16:30 – 16:55	Visible peripheral interface	D. J. Shin Samsung
16:55 – 17:20	Visible Light Communication Architecture	E. T. Won Samsung
17:20 – 17:45	Coexistence Aspects of The MAGNET PAN-optimized Air Interface Targeting High Data Rates	Nicolas Cassiau CEA-Leti
17:45 – 18:10	Complexity evaluation of the low data rate prototype solution in the "My Personal Adaptive Global Net (Magnet Beyond)" project	Marco Giardina CSEM
18:10 – 18:30	Distributed MIMO, DEMIURGO testbed for up to 4x4 MIMO links	Juan Manuel Vazquez Burgos and Efrein Gago-Cerezal, Telefonica Moviles Espana, Valentin Alonso

	Gracia and Luis M Campoy Cervera, Telefonica I+D
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WG5 Session 3			Thursday 16th November 13:00 – 15:00		
Session Chair: Marcos Katz (VTT, Finland) – Room Karl Jaspers					
Time	Title			Author	
Integrative and cooperative aspects of short-range communications					
13:00 – 13:25	Integrative and cooperative aspects of short-range communications (White paper kick-off discussion)			Marcos Katz VTT	
13:25 – 13:50	OFDM-based Medium Access with Rate Constraints			Thomas Deckert TU Dresden	
13:50 – 14:20	A Multiuser Joint Mapping Method for Future Wireless Systems			Yi Wang Huawei	
14:20 – 15:00	Wibree - the missing link between sensors and mobile phones			Antti Lappeteläinen Nokia	

WG5 Session 4			Friday 17th November 09:00 – 11:00		
Session Chair: Daniel Dietterle (IHP Microelectronics, Germany) – Room Karl Jaspers					
Time	Title			Author	
60 GHz communication					
09:00 – 10:00	60 GHz communication (White paper discussion)			NN	
10:00 – 10:25	Front-end Impact on Candidate Air Interfaces in a 60 GHz Multipath Channel			André Bourdoux IMEC	
10:25 – 10:50	NN			NN	

WG6 – Reconfigurability

WG6 is focused on research aspects that will enable the full benefits of the varying technologies and networks within the Radio Eco-Space to be fully realized. WG6 addresses research issues relevant to the general evolution of reconfiguring network services and resources, along with their supporting system functions. Sample areas include Policy-Based Management, Autonomic Computing, Mesh Networks, Reconfigurable Device and Service Design, Implementation, and Business Models, Cognitive Radio, Flexible Spectrum and Radio Resource Management, Software Defined Radio, and Flexible Air-Interfaces.

WG6 Session 1			Wednesday 15th November 14:00 – 16:00		
Session Chair: Panagiotis Demestichas (University of Piraeus, Greece), John Strassner (Motorola Labs, USA) – Room Ernst Bloch					
Time	Title			Author	
WG6 Elections					
13:30 – 14:00	Election of Chair and Vice Chair for 2007			Chair: TBD	
First Session					
14:00 – 14:30	Welcome, WG6 work areas, Meeting overview			Panagiotis Demestichas WG6 Chair (University of Piraeus)	

14:30 – 15:15	End-to-end efficiency: Introducing cognitive systems in the B3G wireless world	Didier Bourse, Markus Muck (Motorola Labs)
15:15 – 16:00	Novel autonomic management platforms for wireless networks in a B3G context	John Strassner WG6 co-chair (Motorola Labs)
16:00	Discussion	

WG6 Session 2		Wednesday 15th November 16:30 – 18:30
Session Chair: Panagiotis Demestichas (University of Piraeus, Greece), John Strassner (Motorola Labs, USA) – Room Ernst Bloch		
Time	Title	Author
Second Session		
16:30 – 17:00	From reconfigurability towards cognition: Distributed, policy-based selection of reconfigurations	Kostas Tsagkaris (UPRC) Klaus Moessner (UoSurrey) J. Strassner (Motorola)
17:00 – 17:30	On Self-reconfigurability of Cognitive Radios	Clemens Kloeck (UoKarlsruhe) Jijun Luo (Siemens)
17:30 – 18:00	IEEE P1900B: cohabitation of multi-homing capable devices in a heterogeneous network context	M. Muck (Motorola) S. Buljore (Motorola) P. Martigne (France Telecom) Didier Bourse (Motorola) Eleni Patouni (UoAthens)
18:00 – 18:30	Robust Discovery of Reconfiguration capabilities in Cognitive Radio Systems	Evgenia Adamopoulou (NTUA) Konstantinos Demestichas (NTUA) Michael Theologou (NTUA)

WG6 Session 3		Thursday 16th November 13:00 – 15:00
Session Chair: Panagiotis Demestichas (University of Piraeus, Greece), John Strassner (Motorola Labs, USA) – Room Ernst Bloch		
Time	Title	Author
Third Session		
13:00 – 13:20	From reconfigurable to cognitive wireless terminals	Vera Stavroulaki (UPRC)
13:20 – 13:40	Software defined radios for mobile terminals: enable and exploit scalability for low power operation	Antoine Dejonghe (IMEC)
13:40 – 14:00	Simulative evaluation of the software download procedure duration	Paolo Goria (TILAB)
14:00 – 14:30	Business challenges in performing mobile terminal mass-upgrades	Oliver Holland (KCL)
14:30 – 15:00	Instantiation of a comprehensive business model framework for cognitive radio environments	P. Ballon (VUB)

WG6 Session 4		Friday 17th November 09:00–11:00
Session Chair: Panagiotis Demestichas (University of Piraeus, Greece), John Strassner (Motorola Labs, USA) – Room Ernst Bloch		
Time	Title	Author
Fourth Session		
09:00 – 09:10	White Paper Overview	Panagiotis Demestichas (University of Piraeus)

		John Strassner (Motorola Labs)
09:10 – 11:00	Discussion on white papers <ul style="list-style-type: none"> • Policy-Based Management and Autonomic Computing in Reconfigurable Systems • Management of Radio Resources in Cognitive Networks • Business Models, Sustainability and Roadmaps for Reconfigurability 	Open discussion

SIG1 – Spectrum Topics

SIG1 covers future spectrum usage and requirements both within the WWRF and externally.

SIG1 Session 1		Thursday 16th November 15:30 – 17:30
Session Chair: Johnny Dixon (BT, United Kingdom) – Room Friedrich Hegel II		
Time	Title	Author
Presentations		
15:30 – 15:45	Welcome & introduction	Johnny Dixon (BT)
15:45 – 16:15	Spectrum deployment scenarios and advanced functionalities development in WINNER	Jean-Philippe Kermaol (Nokia Research)
16:15 – 16:45	Operator assisted cognitive radio for Dynamic Spectrum Access and Spectrum sharing	Lars Berlemann (Swisscom)
16:45 – 17:15	Low complexity modulation methods for future spectrum shared systems	Jiayin Zhang (Huawei)
17:15 – 17:30	Wrap up	Johnny Dixon (BT)

SIG1 Session 2		Friday 17th November 11:30 – 13:00
Session Chair: Johnny Dixon (BT, United Kingdom) – Room Friedrich Hegel II		
Time	Title	Author
Review of White Papers		
11:30 – 12:00	White Paper on “Flexible Spectrum Use Techniques”	Sudhir Dixit (Nokia)
12:00 – 12:30	White Paper on “Considerations in the choice of suitable spectrum for mobile communications”	Johnny Dixon (BT)
12:30 – 13:00	Discussion, conclusions, and close	Johnny Dixon (BT)

SIG2 – Security and Trust

The subject matter scope of the SIG2 includes all areas relevant to the security and trustworthiness of future wireless systems and the applications and services that are used over them.

SIG2 Session 1		Thursday 16th November 15:30 – 17:30
Session Chair: Mario Hoffmann (Fraunhofer SIT, Germany) – Room Friedrich Hegel I		
Time	Title	Author
Presentations		
15:30 – 15:40	Welcome & introduction	Mario Hoffmann
15:40 – 16:00	Service Interaction through Role based Identity	Mohammad M. R. Chowdhury, Josef Noll
16:00 – 16:20	SIM as a key of user identification: enabling seamless user identity management in communication networks	György Kálmán, Josef Noll
16:20 – 16:40	Virtual Identities – A Cross Layer approach to Identity and Identity Management	Joao Girao, Amardeo Sarma and Rui Aguiar
16:40 – 17:00	Security Solutions for Wireless Sensor Networks	Frederik Armknecht, Alban Hessler, Joao Girao, Amardeo Sarma and Dirk Westhoff
17:00 – 17:20	Measuring the cost of adding security on Domain Name System (DNS)	Daniel Migault, Security Lab, Francetelecom R&D
17:20 – 17:30	Wrap up	Mario Hoffmann

SIG2 Session 2		Friday 17th November 11:30 – 13:00
Session Chair: Mario Hoffmann (Fraunhofer SIT, Germany) – Room Friedrich Hegel I		
Time	Title	Author
Review of White Papers		
11:30 – 12:30	Security Awareness Session: Facts and Fiction – Best Practice in Mobile Security	Manuel Matthes, Jan Peter Stotz (Fraunhofer SIT)
12:30 – 13:00	Identification & Discussion of most relevant wireless and mobile security areas for 7 th EU Framework Programme	Mario Hoffmann

SIG3 – Self-organisation in Wireless World Systems

SIG3 is focused on bringing orderliness in the evolving distributed pervasive wireless communication system via adaptive self-organization. It addresses needs and requirements of self-organization of the wireless systems with minimal human intervention required to allow systems to operate the way they are expected to do. The goal is to develop solutions (concepts, tools, and techniques) for self-organization where human is part of the overall adaptive self-organization system, and thereby to enable new business models for existing and new types of players.

SIG3 Session 1		Thursday 16th November 15:30 – 17:30
Session Chair: Sudhir Dixit (Nokia, USA) – Room Franz Kafka		
Time	Title	Author
15:30 – 15:45	Current status overview	Sudhir Dixit (Nokia) and K. C. Chen (National Taiwan University)

15:45 – 16:30	Invited talk: On applications of wireless self-organizing networks	Clemens Kloeck (Universität Karlsruhe)
16:30 – 17:00	A management automation framework for mobile networks	H. Kasinger, B. Bauer (University of Augsburg), H. Sanneck, C. Schmelz (Siemens)
17:00 – 17:30	On self-reconfigurability of cognitive radios	C.Kloeck, T. Renk, H. Jaekel, (Universität Karlsruhe), J. Luo, V. Blaschke (Siemens)

SIG3 Session 2			Friday 17th November 11:30 – 13:00		
Session Chair: Sudhir Dixit (Nokia, USA) – Room Franz Kafka					
Time	Title	Author			
Public Safety Communications Presentations					
11:30 – 12:00	Public safety communications perspectives: the WIDENS experience	H. Aïache, V. Conan, (Thales Communications), A. Boukalov, (Helsinki University of Technology)			
12:00 – 13:00	White Paper Overview & Future Plans – Group discussion	Sudhir Dixit (Nokia) and K. C. Chen (National Taiwan University)			

SIG4 – Convergence of Digital Industries

SIG4 is a new addition to the WWRF structure, and has been introduced to enable WWRF to develop its view of the convergence of the digital industries, which is defined as the bringing together of media and entertainment, broadcasting, telecommunications, information technology and consumer industries in a seamless way to enable selection and combination of services from those available to meet the requirements of a user in any environment.

SIG4 Session 1			Thursday 16th November 15:30 – 17:30		
Session Chair: Bin Xia (Huawei Technologies, China) Djamal-Eddine Meddour, (France Telecom, France) – Karl Jaspers					
Time	Title	Author			
Converged Networks Presentations					
15:30 – 15:50	Agenda Approval and Brief Introduction of SIG4 Progress	Bin Xia, Djamal-Eddine Meddour Huawei Technologies, France Telecom			
15:50 – 16:20	MULTINET: Enabler for Next Generation Services	O. Lazaro, A. Gonzalez1 L. Aginako, T. Hof., etc. Innovalia Association			
16:20 – 16:50	SHIM6 Based Failure Detection and Recovery Mechanism in Multihomed MIPv6 Networks	Adnan K. Kiani, Shoaib Khan, and Wenbing Yao Brunel University			
16:50 – 17:20	Converged Multi-access Radio Network in Beyond 3G Heterogeneous Environment	Bin XIA, Yan PENG, and Guohui ZOU Huawei Technologies			

SIG4 Session 2			Friday 17th November 11:30 – 13:00		
Session Chair: Bin Xia (Huawei Technologies, China) Djamal-Eddine Meddour, (France Telecom, France) – Karl Jaspers					
Time	Title	Author			
SIG4 Group Contributions and Future Work					
11:30 –	Discussions on Home Network Briefing	Martial Bellec			

12:10	WWRF SIG4 Briefings	France Telecom
12:10 – 12:30	On going WP Discussion	Djamal-Eddine Meddour (other editor for the WP, TBD) France Telecom
12:30 – 12:50	Conclusion and Next Action Points	Bin XIA Huawei Technologies