



DEPARTMENT OF ELECTRICAL ENGINEERING

Faculty of Engineering , Chulalongkorn University
DSP Lecture Room, Engineering 4 Building, Faculty of Engineering, Chulalongkorn University,
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The Department of Electrical Engineering (<http://www.ee.eng.chula.ac.th>) and the DAAD's University Future Internet (UNIFI) Project (<http://daad-unifi.org/unifi-project/>) cordially invite you to attend a two day course entitled:

***NEXT GENERATION NETWORK (NGN) TO FUTURE INTERNET (FI) EVOLUTION FOR
SMART CITY COMMUNICATIONS –
UNDERSTANDING THE ROLES AND RELATIONSHIPS BETWEEN APIS, IMS, EPC
AND MTC WITHIN EMERGING SMART CITY PLATFORMS***

**BY PROF. Dr. THOMAS MAGEDANZ
VISITING PROFESSOR AT THE UNIVERSITY OF CAPE TOWN AND FULL
PROFESSOR AT THE TECHNICAL UNIVERSITY OF BERLIN, GERMANY**

Motivation and Overview

Due to the ongoing convergence of telecommunications, Internet and entertainment, and the increasing adoption of internet technologies in our daily lives, we are moving rapidly into a world of total interconnection of humans and machines.

This means that after fixed mobile convergence (FMC) and voice data integration which has coined the evolution of telecommunication infrastructures in the last decade under the banner of the Next Generation Network (NGN), we are now witnessing the start of a much broader convergence of quite different application domains with different value chains and technologies. This new convergence is driven by the adoption and extension of Internet technologies in various application domains under the banner of the Future Internet (FI), which today is getting a lot of attention by the increasing notion of Smart Cities as a typical use case for the three key domains of FI research, namely, the Network of the Future (NoF), the Internet of Things (IoT) and Machine to Machine (M2M) communications, and the Internet of services (IoS). Thus different transport and control platforms need to be integrated into a "future internet service platform" enabling an open set of higher layer Smart City application domains, such as eUtilities, eHealth, eAutomotive, eGovernment, etc., by so-called common or generic enablers for Human 2 Human as well as Machine 2 Machine communications on top of different fixed and mobile network infrastructures.

This three day lecture course will provide an overview of relevant control platforms and the related standards in the context of fixed and mobile Next Generation Network (NGN) evolution towards the Future Internet (FI) . Starting from Intelligent Networks (IN) we will look at the 3GPP IP Multimedia Subsystem (IMS), the 3GPP Evolved Packet Core (EPC) and the emerging 3GPP Machine Type Communications (MTC) platform. In addition, we look briefly at relevant Service Delivery Platform (SDP) concepts and related service enablers and Application Programming Interfaces (APIs) as defined by ETSI, 3GPP, GSMA and OMA for enabling



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seamlessly various applications on top of fixed and mobile networks. We also address the current state of the art in international Future Internet research performed in Germany, Europe, US, and Japan.

We will illustrate that operators can play a dominant role in the future internet context when providing the right infrastructures and appropriate interfaces to the right partners in the future. Also the tutorial provides an introduction to relevant toolkits and laboratories from Fraunhofer FOKUS and Technical University Berlin, enabling rapid prototyping for academic and industry research in the context of NGN to FI evolution for prototyping SC applications.

The first day provides the motivation and overview of all technology domains and draws an overall picture how the mentioned technologies fit together.

The second day is devoted to the important functionality of providing seamless connectivity across various networks for different application domains, including H2H and M2M, and focuses on the EPC and the related OpenEPC Toolkit (www.openepc.net). We will also illustrate how IMS and EPC fit together by showing how OpenIMS (www.openimscore.org) can be used on top of OpenEPC for VoLTE and RCS service implementations as done in the Future Seamless Communications (FUSECO) Playground (www.fuseco-playground.org)

On the third day we will look on M2M applications, standards and platforms and introduce the the OpenMTC toolkit (www.open-mtc.org) enabling comprehensive M2M prototyping in the context of academic and industry research. We will also illustrate how OpenMTC can be used on top of OpenEPC and also make use of OpenIMS if desired. An outlook on current FOKUS/TUB research activities based on the mentioned toolkits will conclude the lecture.

The detailed lecture plan follows:

DATES: May 21-22, 2013

VENUE: DSP Lecture Room, Engineering 4 Building, Faculty of Engineering, Chulalongkorn University, Payathai Road, Bangkok, Thailand.



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PRESENTER:

The course will be presented by Prof. Dr. Thomas Magedanz, TU Berlin, Germany,
and Visiting Professor at Chulalongkorn University

TARGET AUDIENCE:

The course is offered to postgraduate students and staff of the Department of Electrical
Engineering at Chulalongkorn University, as well as invited technical staff of selected Industry
and Operators in Thailand.

FEES:

There are no fees associated with the course for students and staff of the Department of
Electrical Engineering at Chulalongkorn University. And there is a registration fee of 1,500
Baht per person for other attendants to cover lunch/breaks and course materials.

REGISTRATION:

To register, please contact:

Ms. Tasaporn Intarachaiya

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DAY 1 – May 21, 2013:

**Part 1: UNDERSTANDING NGN AND SERVICE PLATFORM EVOLUTION IN THE
CONTEXT OF FUTURE INTERNET AND SMART CITIES**

9h00 – 10h30:

1. NGN 2 FI Evolution – the rise of Smart Cities

1. FOKUS Overview
2. NGN to FI Evolution in the light of emerging Smart Cities
3. Future Internet Overview
4. Smart Cities as Future Internet Use Case
5. Smart City communication needs: H2H plus M2M
6. Q&A

11h00 – 12h30:

2. The related Platforms for a Smart City Communication Infrastructure

1. Next Generation Networks: From IN to IMS
2. Mobile Next Generation Networks: From IMS to EPC
3. Internet of Things: The rise of M2M applications and platforms
4. SOA based SDPs and Open H2H and M2M APIs
5. FOKUS Toolkits and Testbeds in a Nutshell
6. Q&A

Part 2: IMS AND EPC OVERVIEW AND TOOLS AND FUSECO PLAYGROUND

13h30 – 15h00:

3. Understanding IMS and EPC

1. IMS Motivation, Architectural Principles and Standards (3GPP, TISPAN, Packet Cable)
2. IMS Core and Application Layer components and interactions
3. IMS Enablers and Applications (MMTEL, RCS, IPTV)
4. Mobile Broadband: 3GPP Evolved Packet System (EPS) Overview (LTE & EPC)
5. 3GPP Evolved Packet Core (EPC) Motivation, Architectural Principles and Standards
6. EPC Architecture: Components & Interactions
7. Q&A



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DAY 2 – May 22, 2013:

Part 2: IMS AND EPC OVERVIEW AND TOOLS AND FUSECO PLAYGROUND

9h00 – 10h30:

4. FOKUS Open IMS and OpenEPC Toolkits and FUSECO Playground

1. EPC Service Domains (IMS vs. Over the top)
2. IMS over EPC: VoLTE/RCS
3. FOKUS Open Source IMS toolkit and the Open IMS Playground
4. FOKUS OpenEPC Toolkit and FUSECO Playground (componets and functionalities)
5. Sample Projects
6. Evolution Outlook (Open Flow integration and virtualisation)
7. Q&A

Part 3: M2M COMMUNICATIONS AND THE OPEN MTC PLATFORM

11h00 – 12h30:

5. M2M / Machine Type Communication (MTC)

1. The role of Machine 2 Machine (M2M) communication in the future
2. Existing M2M applications and platforms
3. Toward a common M2M communication platform (MTC)
4. ETSI M2M Standards
5. 3GPP Machine type Communication (MTC) Standards
6. The role of OMA in M2M API standardisation
7. Q&A

13h30 – 15h00:

6. FOKUS OpenMTC Toolkit

8. FOKUS OpenMTC Toolkit (componets and functionalities)
1. Integrating OpenMTC with OpenEPC and Open IMS within the FUSECO Playground
2. Sample Projects
3. Evolution Outlook
4. Q&A



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SHORT BIOGRAPHY:

Thomas Magedanz (PhD) is full professor in the electrical engineering and computer sciences faculty at the Technical University of Berlin, Germany, leading the chair for next generation networks (www.av.tu-berlin.de). In addition, he is director of the “next generation network” division of the Fraunhofer Institute FOKUS (www.fokus.fraunhofer.de/go/NGNI), which also provides various software tools and testbeds to industry and academia. He has been working for over 20 years in the convergence field of fixed and mobile telecommunications, the internet and information technologies, which resulted in many industry driven R&D projects centred on Next Generation Service Delivery platforms. In the course of his research activities he published more than 250 technical papers/articles. In addition, Prof Magedanz is a senior member of the IEEE and editorial board member of several journals.

Full CV at:

http://www.av.tu-berlin.de/menue/team/prof_dr_thomas_magedanz

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