

ANYTHING GOES

At the very least, Paul Feyerabend's postulate for postmodern society should hold true for telephony. When we make a call now, we want connectivity wherever we may be, and we also want to send and receive a broad array of information and not merely talk. Building the components that make all this work smoothly and efficiently is the job of the Competence Center for Next Generation Network Infrastructures (NGNI).

The very first sentence transmitted over a telephone line was simply »The horse doesn't eat cucumber salad.« The content present-day telephony handles is a good deal more complex: a vast cargo of data – anything from hours of chat with friends, photos of the grandson's first day at school and Lady Gaga's greatest hits to car-to-car accident alerts and even »conversations« between machines – is transmitted quickly and reliably. Yet the basic enabling technology hasn't changed a great deal: information is still sent from a sender to a receiver. »Actually, I've been doing the same thing these past 20 years,« says the head of NGNI and University Professor at the Technical University of Berlin, Prof. Dr. Thomas Magedanz.

Network Convergence, Service Integration

Evolution from cabled fixed networks to wireless mobile communication networks to packet switched communication in IP-based networks not only has resulted in a steady increase in the number of transmission modes, protocols and standards, but has also created an increasing demand for broadband. Convergence of networks and transmission standards and integration of services are what the times now call for – and this is where NGNI steps in. The Competence Center develops open (= extendible) smart communication platforms based on international standards with which its customers – major telecoms and leading industry players – can develop and optimize seamless multimedia added-value services. The range of services offered by NGNI is mainly grouped around licensable technologies and includes technology coaching, prototype development, proof-of-concept realizations, and performance and conformity testing.

SERVICES

NGNI develops open, extendible smart communication platforms based on converging heterogeneous networks. These include wired and wireless telecommunication networks, Next Generation Networks (NGNs), Next Generation Mobile Networks, the Internet and the Future Internet (FI). The range of services offered is mainly grouped around a core of licensable software and covers technology coaching, prototype development, proof-of-concept realizations and performance and conformity testing.

Always Best Connected

The success story of NGNI began in 2005 with the development of the Open Source IMS Core (OSIMS) and the associated OpenIMS-Playground. IMS stands for IP Multimedia Subsystem, and its aim is the uniform standardized deployment of multimedia services across a variety of disparate networks. The architecture of IMS is built from a combination of telephone networks, intelligent network concepts and voice-over-IP protocols, and thus serves as the basis for present-day Next Generation Networks (NGNs). As all their communication is IP-based, IMS also serves as the basis for the latest network operator services, such as Rich Communications Services (RCS)

and upcoming Voice-over-LTE services. With the software toolkits of the OpenIMS Playground, customers can develop their own communication applications and IMS-compliant products and test them in a neutral environment. OpenIMS was also the basis for the development of OpenEPC (Evolved Packet Core). OpenEPC is a prototype implementation of the architecture of the LTE (Long Term Evolution) core network. OpenEPC enables the joint operation and coordination of a variety of mobile access networks and thus provides common security, mobility, and handover capabilities. At the same time, OpenEPC ought to control the application-,

Communication platforms developed by NGNI provide the backbone for a broad spectrum of Smart City application areas, like Rich Communications, Smart Mobility, eHealth, eGovernment, Smart Energy and Public Security.

user- and network-specific quality of service (QoS) and QoS-based charging. Depending on the particular application and user contract, the end device can then be dynamically assigned to the most appropriate access network or a switch of network can be recommended (always best connected).

Machine-to-machine (M2M) communication – also widely referred to as the »Internet of Things« – is the next paradigm shift in telecommunications. Today we already have a large array of mainly monolithic communication solutions for M2M communication. The closed nature of such systems up to now has proved a major impediment for the development of new smarter applications. Yet present-day open network architectures like the IMS are insufficient for the efficient realization of large-scale M2M communication scenarios. NGNI's OpenMTC now offers a standards-compliant middleware platform for the development of all types of M2M applications. What's more, prototypes for End2End communication in M2M systems are also available, including a range of different sensors and applications.

The FUSECO Playground

The whole range of NGNI expertise is converged in the FUSECO Playground which offers an independent and dynamically extendible testbed for all forms of FUTURE SEAMLESS COMMUNICATION. With its test licenses for certain frequency bands, NGNI can act as its own micro-mobile communications operator and test and trial run realistic service and technology scenarios. Prototype developments and integrated multi-access network environments (DSL/WLAN/2G/3G/LTE/LTE-A), new concepts, components and protocols can be validated and checked for practical feasibility. FUSECO is suitable for use by large and small equipment developers, network providers, application developers and research groups. Affiliated members of the FUSECO Playground also organize an annual cross-industry international conference - the FOKUS FUSECO Forum.

The Smart Communications Playground

Last but not least, NGNI also operates the new Smart Communications Playground, which is the successor of the Open SOA Telco Playground. By means of providing appropriate human-to-human and machine-to-machine abstract programming interfaces (APIs) and development toolkits, it is primarily intended for application developers. Additionally, the Smart Communications Playground is also suitable for the testing of innovative application scenarios and business models on top of heterogeneous network technologies.

TECHNOLOGY PLAYGROUNDS FOR GROWN-UPS

To integrate the raft of technologies and standards now used in present-day telecommunications into one single solution, what you need is a healthy sense of play, says Thomas Magedanz. He develops extendible communication platforms which are used all over the world.

Mr. Magedanz, you seem to spend a lot of time in playgrounds. What are you doing there?

15 years ago, we realized that what we were essentially doing at FOKUS was experimenting with the very latest cutting-edge technology. As industry showed a keen interest in our high-quality software platforms, we opened up our platforms and prototypes for third-party use as technology testbeds and named them playgrounds (for engineers).

...and what kind of games do your customers like most?

Customers need low cost proof-of-concept realizations prior to the roll-out of new communication technologies. They want to get an understanding of the practical feasibility of their products and of any problems associated with a new technology before they go to the enormous expense of bringing it to market.

What kinds of technology do you offer your customers?

We offer toolkits for person-to-person and machine-to-machine communication, represented by platforms that can either be used on their own or in integrated units. The platforms include OpenIMSCore (IP Multimedia Subsystem) toolkits, OpenEPC (Evolved Packet Core) toolkits, OpenMTC (Machine Type Communication) toolkits and SDP (Service Delivery Platform) toolkits. Four years ago all the hype around IMS cooled off, and in light of the wide acceptance of mobile internet services like Skype and the introduction of LTE (Long Term Evolution), we've turned our attention to newer forms of platform technology. This has given rise to our OpenEPC development. This is not just allowing seamless quality of service provision for own network operator services, but also offers this to over the top service providers aiming to differentiate their services.

What kind of solutions do you develop for machine-to-machine communication?

In close collaboration with my department at the TU Berlin, we've developed the OpenMTC – Machine Type Communication platform. At the moment OpenMTC is one of our key communication toolkits in the context of Smart Cities, because given the importance of converging infrastructures, this is a market

which is showing signs of a trend towards a converged M2M communication platform. All network operators – like telecoms, electricity companies and waterworks – are going to have to get involved in this if they want to realize »smarter applications« built from a variety of available devices, networks and data.

Can service providers also benefit from your technology platforms?

Our services and products are primarily aimed at network operators. The past few years have seen big changes in the roles they play and in service development and delivery, changes that have been driven by increasingly complex value chains and new business models. Today's telecommunications industry still aims for delivering lucrative value-added services beyond pure voice communication. This is why for over 10 years now network operators have been pursuing the »enabling« of third-party service providers by way of appropriate programming interfaces (APIs). With our Smart Communications Playground we use reference implementations of the latest APIs with our aforementioned toolkits to assist network operators and application developers to realize innovative multimedia services.

PROFILE

Prof. Dr. Thomas Magedanz was born in Berlin in 1962. He studied computer science at the Technical University of Berlin and took his Ph.D. there in 1993 with a doctoral dissertation on Integrated Management for Intelligent Networks. In 2000 he performed his habilitation in the field of Applied Computer Science. In 2002 Thomas Magedanz was appointed to the Chair of Next Generation Networks (NGN) at the TU Berlin and at the same time became the head of the Competence Center for Next Generation Network Infrastructures (NGNI) at Fraunhofer FOKUS. A passionate Harley Davidson biker and Karate blackbelt holder, Thomas Magedanz is married with one (almost) grown-up son.

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»Convergence drives competition and innovation. And uniform open communication platforms are the beating heart of this convergence.«