



Internationales
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Network architecture for "beyond3G" systems

Mythical creatures and visions

Moby Dick and Daidalos: who would have thought that a famous whale and a mythical Greek character would work together on the future of our data communications? "**Mobility and Differentiated Services in a Future IP Network**" and "**Designing Advanced Network Interfaces for the Delivery and Administration of location-independent, optimized personal services**" are two of the international research projects sponsored by the EU which Deutsche Telekom is involved in.

How will we make calls, send messages, receive data and watch television in 20 years' time? The convergence of telecommunications- and information technologies will create what sort of new services for us? The aim of both projects is not only to research future communications trends, but to develop above all the technology needed for appropriate applications. "Moby Dick" was completed in December 2003, with the follow-up project "Daidalos" now up-and-running.

An access technology for everything

The convergence of the telephone network with the Internet, the growing mobility of terminal devices (smart phones, PDAs) and the resultant change in user behavior or the use of new services (navigation, MMS, VoIP) – such trends in the IT and TC markets have seen the existing network architectures reach their limits. W-LAN, Bluetooth, T-DSL, UMTS, the standards for these data transfers between PCs, telephones or PDAs, speak different "languages". The administration of all systems is also extremely time-consuming due to their inherent differences.

A generic IP architecture should therefore ensure in future that the access technologies, which are independent of each other, can virtually talk to each other – meaning that all terminal devices will be able to communicate as they make the smooth transition from one network technology to the other via the most favorable and fastest access technology at the time. In connection with Moby Dick, the "pure IP architecture" was developed for this. It is based on the Mobile IPv6 protocol, an extension of the Internet protocol of the next generation, IPv6, and supports the mobility of IP-enabled terminals. Data communication will therefore be possible in any form in future – without the need for protocol conversions or gateways. The "Moby Dick" project has already achieved "seamless", continuous mobility between different technologies and supports multimedia services. In the meantime, it

is now possible to continuously view a video with first-rate transmission quality – the terminal switches between two wireless technologies, TD-CDMA (the basis for UMTS-TDD) and WiFi 802.11 (the basis for W-LAN), and a fixed network technology (Ethernet sub-network).

Own "Ariadne's thread" for the Internet world of tomorrow

If today's laptops have various interfaces for different applications, future mobile devices will have several interfaces and will search for the best or most suitable access option. Here's an example: a management consultant is waiting for her flight. She receives a call from company headquarters via UMTS: a virus has wormed its way into the software of her planned presentation. Whilst her new device begins to download the latest virus scanner from the Internet parallel to the call, she receives the modified presentation from company headquarters at the same time. The network connection needed for this is established via the W-LAN in the airport lounge. When the consultant moves away from the W-LAN area on her way to the departure lounge, a "hand-over" of the services automatically takes place in the background. The UMTS network now takes over data transfer from the wireless local network.

"Daidalos" will drive forward the "pure IP architecture" accordingly as well as test new business models for network operators, manufacturers of terminal equipment, service providers and content providers. The aim is to create a versatile yet simple and more cost effective network infrastructure. Key points of the research project include the technical quality (QoS) and the personalization of services, highest possible security mechanisms as well as the development of simple payment methods as part of the A4C model (authentication, authorization, auditing, accounting, charging). Specific research scenarios have been established in the university sphere (Mobile University), the automobile sector (Mobile Automotive: videostreaming via DVB-T) as well as the health sector (Mobile Healthcare). When developing user-specific, highly personalized services, the respective preferences as well as the current surroundings of the customers are to the fore.

"Daidalos" is thus a fitting name in the end. Whilst the ingenious architect Daedalus, who designed the labyrinth for King Minos in Crete, gave Ariadne the tip for escaping with the thread, which in turn helped her lover Theseus find his way safely through the complex labyrinth to freedom, the findings of the research

project of the same name soon lead us automatically into the world of the Internet via the access technology best suited to the desired application.

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