Workshop on Ubiquitous Computing Enabling the Networked Society
31 August 2000 at the International Computer Science Institute (ICSI), Berkeley, USA

In the future billions of small, intelligent devices will be equipped with spontaneous networking capabilities, giving them access to any information or service available on the 'net', this development is called ubiquitous computing. Mobile telephones and personal digital assistants (PDAs) are the predecessors of this new era. The present workshop was organized by EURESCOM a European collaboration of 23 Telecom companies. The participants, around 40 (by invitation only), consisted mainly of developers from various leading companies in this field. As a result the workshop provided a very good overview of existing technologies, current prototype developments, problems and ideas for the future including planned projects and trends. In subsequent talks with some of the EURESCOM members, useful insights into their future plans could be gained.

The workshop was of importance to UKHEC because of the close proximity of Grid and ubiquitous computing techniques. Many of the discussed protocols are used in both fields additionally microprocessor and network techniques used in ubiquitous computing could be employed for our purposes e.g. making experimental facilities net or grid aware. In the area of protocols the Telecom companies have not yet decided their next step, they recognized that the multitude of protocols with their varying spectrum of capabilities is counter productive for future developments and that some unification is required. However they have not yet decided if it would be more beneficial to wait for the development of a clear market leader or if they should initiate standardization procedures with a broad consent. It will be important for us to follow these developments so that whatever we develop/use for our grid activities is compatible with the rest of the internet world. Any exploitation by industrial partners will also rely on our compatibility with emerging standards in ubiquitous computing.

The slides of the presented talks are available in paper form. More information on the workshop can be found under URL http://www.???, more information on the EURESCOM project can be found under URL
http://www.eurescom.de/Public/Projects/P1000-series/P1005/P1005.htm

Samples of some of the talks:

Jose Bonnet –Eurescom Project 1005: Jini and Friends @ work

Jose reported on the eurescom project 1005, background and goals. A first report on state of the art techniques for ubiquitous computing incl. Protocol's has just been finished and is available on the web under the eurescom web page. Further reports and first demonstrators are planned until June 2001. Protocols used are Jini, UPNP,ISBIC and NINJA.

Bob Scheifler – Sun Microsystems – Security aspects of Jini

Bob discussed a range of security aspects within Jini, the conclusion was that as Jini had started out as a very open system it was now rather difficult to close all the loop holes. Hereby the downloading of code from unknown sources and the necessity to pass on personal keys to other sites to be allowed access where seen as the major difficulties. Both are concerns that we will also face in the Grid developments.

Current protocols

Toby Lehman, IBM Almaden Research Center – TSpaces

For quite some years a small research group within IBM has been developing TSpaces a communication package aiming to ease the communication among heterogeneous and distributed systems, it bears similarities with JavaSpaces, but claims to offer more functionalities and is used for slightly different purposes. The package includes database capabilities. However it is currently mainly used for onside workgroup support and as it is only working with fixed port numbers for the communication, it is not very flexible. For the future it is planned to change this, as is the incorporation of Jini.
More information can be found under URL http://www.almaden.ibm.com/cs/TSpaces

Alan Karp, HP, E-speak

E-speak is an open services platform for the creation, composition, mediation, virtualisation, management and access of internet based services. Currently it can use five common communication protocols e.g. http, TCP/IP. E-speak allows you via brokering-services to search for services by describing keywords, it is not necessary to know the actual name of the service or its location beforehand. So far interfaces for service providers and users have been developed and are freely available, brokering services do not yet exist, it is envisaged that commercial vendors will provide them. More information can be found under URL http://www.e-speak.net. The generation of new services is supposedly very easy and intuitive only taking a couple of hours to generate.

Simon Schubinger, University of Fribourg, UbiComp

UbiComp is a university project to develop middleware, which eases the application development in a fast changing ubiquitous environment. A working prototype exists, but most projects focus on hardwired applications rather than on spontaneous connections. Devices are grouped by communication concepts e.g. PDA - infrared, mobile – wireless, which allows to select the appropriate protocols e.g. mobile – wireless – IR. These protocols are then used to access the provided services.

Applications:

Christoffer Anderson, Ericsson, Applications for the Mobile Internet

A Mobile Application Initiative (MAI) has been founded to help developers to design and test applications/services. Using mobile devices to access internet aware services brings a whole new set of problems with it, high latency, high packet loss, interruptions, screen size are just a few of them. With the new internet aware mobiles/PDAs (e.g. WAP) application developers have to take these problems into account, first sight have already special mobile phone access buttons (and applications) on their pages. Current mobile internet applications are Client server applications such as WAP , HTML etc. In the future it will also be possible to access client resident services such as Java. It will be necessary to realize that small mobile devices can, due to screen size and computing power, never replace a laptop and will/should be used for different kind of services.

Wieland Holfelder, Daimler-Chrysler, Networked Vehicles

A talk about the seamless integration/connection possibilities of mobile devices (mobile, PDA, laptop etc) into the computing system of cars and their merits. Interesting notion of using the car itself as transmitter in a car based network, allowing the owner free and continous access. Technically many things are possible, however safety and price issues prevent their inclusion at the current point in time.

Hartmut Vogler, SAP,

Ubiquitous computing in enterprise applications
Hartmut talked mainly of the possibilities of intelligent and net-aware goods and their usage for enterprise wide resource management, e.g. your goods could tell you where they are and how they are. So far the price/benefit ratio is not good enough to realisticly consider such solutions, in some cases technology can not yet offer what is required. SAP supports a range of prototype developments to further investigate this area. They recognized the current problem of the variety of possible protocols/middleware which application might use and have not yet developed an opinion as to what their favorite is.

Markus Fromherz, Xerox,

Model based configuration and control of modular systems
Xerox copier systems are build out of a larger number of modules which can be freely combined. Their interaction with each other is controlled by integrated microprocessors communicating in a specially developed modeling language called DCL. However the language is generic, flexible and expandable enough to also be of interest for other device types.