



*Integrated Networks for Seamless
and Transparent Service Discovery*

Newsletter 1/02

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NOMAD IS AN R&D PROJECT IN THE IST PROGRAMME FUNDED BY THE EUROPEAN COMMISSION. THE PROJECT COMMENCED ON THE 1ST OF JANUARY 2002 AND HAS A DURATION OF 30 MONTHS.

NOMAD Drivers

Significant technological advances in recent years in the areas of palm-sized computers and wireless communications are accompanied by an infiltration of the Internet in all aspects of our lives. Consequently, a technology that allows the integration of available networks into a single platform capable of supporting user roaming between them, while not interrupting active communications, will gain importance. Nevertheless, the rapid growth of the mobile Internet user base has not been accompanied by an equivalent evolution in the corresponding products and services for mobile customers. Current practices do not maintain the capacity to adapt to topological changes of the user. It is understood that such services can only be realized through assistance from mechanisms whereby the user's location in the physical world can be determined. Still, the evaluation of this information is rarely enough for the resolution of service discovery applications, mostly because there is no direct correspondence between virtual & physical space.

On the other hand, the lack of mobility considerations in the original Internet design, forces users to remain under the influence of a single service provider, or network technology, in spite of utilizing mobile/portable devices. The turn of operators towards license-free frequencies, and their eventual congestion will lead to the realization of alternative solutions, where users utilise one another's resources to mutually form a dynamic network structure. This poses as a low-cost, high-complexity alternative to conventional systems, dictating a significant shift in complexity from the network towards end-devices, and gives rise to a new generation of terminals allowing simultaneous connectivity over a range of providers / technologies.

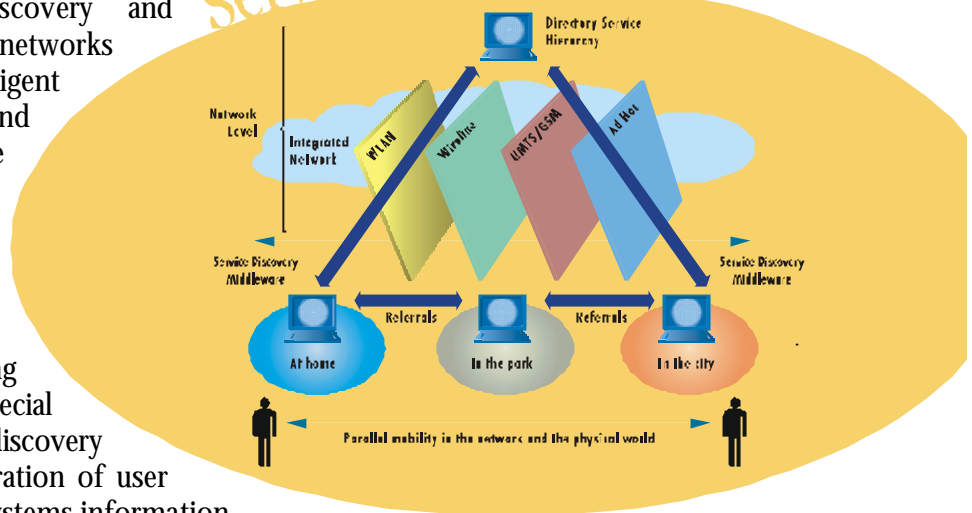
NOMAD Objectives

The main objective of NOMAD is to develop and demonstrate a middleware capable of seamlessly integrating available and future heterogeneous and homogenous network technologies (i.e. UMTS, HiperLAN2), as well as Internet-compatible, multi-hop ad-hoc networks into a single integrated network platform. Highly innovative technologies, like mobility between devices and new algorithms for parallel usage of multiple access interfaces, will be an essential part of NOMAD.



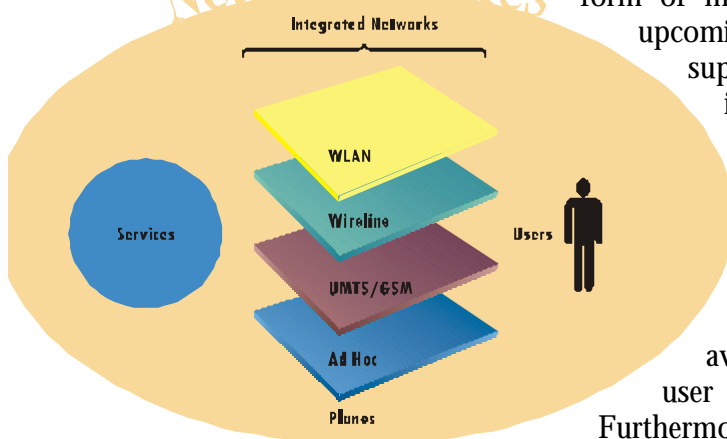
Further, NOMAD will support transparent service discovery and provision over integrated networks by the means of an intelligent service location and configuration middleware mechanism. It will enable users to locate resources and services within their physical and network environment regardless of the underlying network technology. Special focus of the service discovery process will be the integration of user profiles and positioning systems information.

Service Discovery



Technical Approach

Network Planes



The Project will develop a transparent solution in the form of middleware based on Mobile-IP and the upcoming IETF standard for ad hoc network support that will enable the realisation of an integrated network platform which will incorporate every available wireless (e.g. GSM, GPRS, UMTS, IEEE802.11, HiperLAN2, etc.) and wireline access technology that is able to support Internet services. It will investigate new algorithms for efficient manipulation of available access interfaces with respect to user profile and active communications.

Furthermore, an investigation will be carried out about how mobility between devices while communicating can be realised based on the current Internet specification. A service discovery and provision middleware will be developed as part of the infrastructure of integrated networks based on Service Location (SLP) and Directory Service (LDAP) standards. New application layer protocols will be defined for the communication of client and supplier systems in order to offer transparent service/product discovery. Means for personalized and transparent configuration of products, mobility/location awareness, and one-step access will also be provided.

Event Calendar

NOMAD kicked-off on 21-22 January, hosted by the University of Bremen. The second meeting combined with a VISION workshop took place on 22-24 April, at OTEC premises.