

Section: Telemedizin

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Abstract-Title:

MEDICAL GRID AS A TOOL FOR U-HEALTHMEDIZINISCHES GRID ALS HILFSMITTEL FÜR U-HEALTH

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Purpose

Telemedicine promises equally good healthcare at any time from any location: best healthcare for everyone, anytime, anywhere. Information and Communication Technologies support the creation of ubiquitous organizations for health care which are digital representations of the information and services of a physical organization. Creating a ubiquitous organization amplifies the attributes of the physical organization by extending its power and reach. Instead of people having to come to the physical organization for information and services the ubiquitous organization comes to them whenever they need it. For this, the concept of the Grid should be integrated with other communication networks and platforms. A promising approach is the implementation of service-oriented architectures for an invisible Grid, hiding complexity for both application developers and end-users. Thus enhancing development of Grid applications can bring us closer to the simplicity of use that is desired for Grid infrastructures not only within the medico-clinical field.

Method

To integrate these concepts a Virtual Hospital will provide a heterogeneous integrated platform consisting of satellite links and terrestrial links for the application of various medical services, such as medical e-learning, real-time telemedicine and medical assistance. A Grid Tool Suite (GTS) needs to be developed that will facilitate the development of Grid-aware applications. The architecture of the GTS needs to be service-oriented and based on the needs of both application developers and end-users. Inclusion of already existing tools fulfilling the defined requirements as well as the development of new tools will guarantee building on previous achievements while not compromising the strict functionality and architecture requirements.

Results
Services like acquisition and processing of medical images, data storage and archiving are common requirements within the medical application domain. In addition simulations and modelling for therapy planning and computer-assisted interventions and large multi-center epidemiological studies are typical clinical services that will profit strongly from the development and implementation of suitable health Grid environments. Examples of promising medical applications of Grid technology are the real-time 3D-visualization and manipulation of patient data for individualized treatment planning. Using grid resources an on-line calculation would be possible thus enhancing operation planning facilities considerably. Another promising example of a Grid-based application is the MammoGrid project, which developed a Europe-wide database of mammograms. Key aspects are standardisation of mammograms, design of an appropriate clinical workstation for the end-

user, as well as the distribution of data, images and clinical queries across a Grid-based distributed database. In general it is expected that medical applications will profit most from the Grid when they involve large amounts of image data distributed across dispersed sites, which treatment and analysis is computing resource intensive and can be improved by computer-aided routines. Potential examples are in the fields of Teleradiology or Telepathology (virtual microscopy). Conclusion

Grid-based systems can integrate domain knowledge, powerful computing resources and means of communication with partners in a secure system, tailored according to the user requirements. An additional advantage of Grid middleware within a medical context is the ability of sharing expensive clinical and scientific instruments by enabling secure remote access. For an increased success of Grid technology, an integrated framework of cooperating software and middleware modules including GUI support for Grid application users, Grid application developers and for Grid operators and maintainers is essential.

Bild 1/JPG

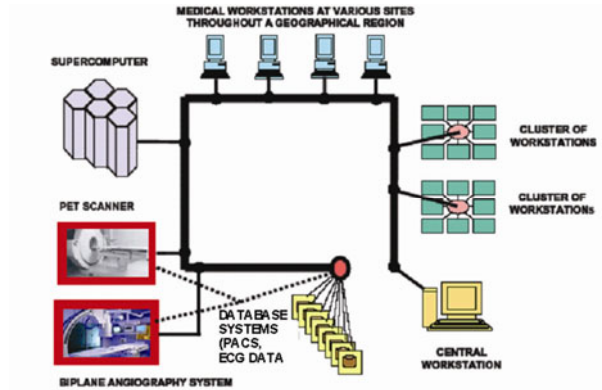


Bild 2/JPG

