

Visitor: Ludger Bischofs (OFFIS e.V., Oldenburg, Germany)
Host: Heiko Schuldt, (UMIT, Innsbruck, Austria)

The visit is planned for the period between September 20th and October 1st. The purpose of the visit is to exchange knowledge about peer-to-peer architectures and to investigate the use of structured/hierarchical super-peer networks within the medical sector [1,2] in order to solve the availability problem for distributed patient records: A patient record can be regarded as a specific kind of digital library artefact. These artifacts are typically distributed over several institutions so that their ubiquitous availability cannot be granted for an attending physician. To establish a super-peer network as a solution for the described problem the following three subtasks have to be coped with:

1. **Look up service:** A common look up service must have the ability to find artifacts even beyond the borders of institutions
2. **Data transfer:** The transfer of artifacts within and between institutions must be possible.
3. **Replication:** The replication of artefacts can improve the availability of artifacts in the super-peer network
 - a. within institutions
 - b. between institutions

A joint paper [3] describes a first approach regarding the use of super-peer networks to solve the described problems. To gain deeper insight, however, additional research is needed. Therefore the work packages of the visit are the following:

1. A hierarchical/structured super-peer network will be designed which represents the organisational structures of medical institutions like hospitals and medical practices. The institutions or, more precisely, the information systems within the institutions can be considered as peers and will be equipped with the ability to offer artefacts within the network.
2. A look up service will be designed which is able to locate artifacts within the super-peer network. The use of routing indices and distributed hash tables has to be discussed. The goal of the work package is the construction of a look up service which fulfils the requirements for the search for artifacts (patient records) in the medical sector. Existing standards will be considered.
3. Replication within institutions and between institutions has become the problem of replication within a super-peer network. An adapted replication strategy is needed to improve the availability of artifacts.

[1] BISCHOF, L. ; HASSELBRING, W. ; SCHLEGELMILCH, J. ; STEFFENS, U.: A Hierarchical Super Peer Network for Distributed Artifacts. in: Pre-proceedings of the Sixth Thematic Workshop of the EU Network of Excellence DELOS. S. Margherita di Pula (Cagliari), Italy, pp. 105-114, 2004.

[2] MÝZRAK, A. T. ; CHENG, Y. ; KUMAR, V. ; SAVAGE, S.: Structured Superpeers: Leveraging Heterogeneity to Provide Constant-Time Lookup. in: The Third IEEE Workshop on Internet Applications. San Jose, California, 2003.

[3] BISCHOF, L. ; HASSELBRING, W. ; NIEMANN, H. ; SCHULDT, H. ; WURZ, M.: Verteilte Architekturen zur intra- und inter-institutionellen Integration von Patientendaten. in: Tagungsband der 49. Jahrestagung der Deutschen Gesellschaft für Medizinische Informatik, Biometrie und Epidemiologie (GMDS 2004). Innsbruck, Austria, 2004.