With Microsoft marketing its new collaboration features in its office products, it is evident that collaboration is becoming more and more important aspect in software technology. The development of information technology has so far brought us more and more individuality and independence, as everyone can be one's own publishing agency as well as the producer, the content creator and the manufacturer. However, even if the exploded popularity of mobile telephones has been a part of this, it is also a significant part of the new direction. Not only are people now within everyone else's reach, no matter where they are, they can also themselves reach other people, meet new people and share things such as fresh photos and music with each other anywhere.

Most groupware today, however, is still only about coordination of group work. There are ticket systems and other communication systems, but very few systems where people actually work together. The common standard in group working today is that people still do their own work alone, and then it is someone's work to put all the separate parts together. This seems like a waste of the Internet we have available for us today.

Introduced here is a two-part protocol to enable technologically unhindered, real-time, multi-user document editing. The protocol is not dependent on the type of the document which may be text, image or multimedia.

The first part of the thesis concerns synchronizing user activities by using centralized serialization. This is compared to the currently popular peer-to-peer ideology and the locking-methodology.

The second part introduces the idea of using a tree structure for storing the document in the memory. This idea suggests making the same move with the memory structure as has been eventually made with the mass storage systems now, that tape drives have been replaced by random access disks. Similar move has also been made in computer programming languages, as object oriented programming has been brought to us. Only the memory structures seem to have been left mostly untouched.

This tree structure is compared to operational transformation as means to sustain data consistency in multi-user environments.

Concern is also given on how these recommendations should be applied in practice. Without good knowledge in psychology, however, only speculation and notices are made in this area in this thesis.

Keywords: Multi-User Editor, Groupware, Computer Aided Collaboration, Computer Aided Collaborative Work (CSCW), Real-Time