

## Sharing resources in virtual communities for storage, communications, and processing of multimedia data

Increasingly software is being designed for networked computer devices (nodes, terminals) that permit other computer devices to utilize locally available storage space, communication bandwidth, processing capacity, and sometimes even hardware components. The advantage of sharing such resources with other nodes on the network is that limitations of individual nodes can be overcome by collaboration with others, or that access can be gained to (multimedia) information that may exist on other nodes. Sharing of computation and communication resources is in particular of importance for power, bandwidth, and cost-constrained networked devices such as hand-held terminals, mobiles, and PDAs.

### Efficient use of resources

Gaining access to multimedia information that is distributed over other nodes is of importance for all sorts of devices, although storage constrained devices may benefit most. An important example of the significance of sharing software is the success of peer-to-peer networks for file and music sharing. Also the rapidly increasing interest in universal Plug and Play (uPnP) is an indication of the importance of software that enables sharing. When a collection of networked computing nodes shares their resources, the sharing not only benefits the individual participating nodes, but also the system as a whole since storage, computation, and communication of data can be optimally distributed.

The I-Share project will investigate the sharing of resources in – what we coined – virtual communities consisting of heterogeneous and

transient nodes and networks. Virtual communities are (virtually bounded) groups of nodes that are willing to share resources and to help each other for the benefit of individual and system performance. As a particular case we consider the sharing of resources for the processing – such as compression – of multimedia streams, as this faces the sharing nodes with significant challenges in terms of volume of data, processing requirements, and security (DRM).



# I-SHARE

## The I-Share project

The I-Share project researches mechanisms for trust, willingness, resource discovery and sharing mechanisms in virtual communities (work package 1), as well as mechanisms for distributed and layered content-processing algorithms utilizing the resource sharing in virtual communities (work package 2). Demonstrations and validation of the developed algorithms and software are planned in collaboration with the Freeband project Personal Network Pilot 2008 and with a number of associated European research projects.

## Main results of the project

- A Web-enabled I-Share system using fixed computers that demonstrate the principles underlying service/information dissemination and discovery within a virtual community.
- An I-Share demonstration for service dissemination and discovery in a heterogeneous setup with wireless and wired components; the demonstration focuses on handling resource-constrained devices differently than traditional, fixed computers.
- An I-Share demonstration of video compression techniques on resource constrained devices making use of distributed and layered compression technologies.
- The use of the core software of the above-mentioned demonstrations in integrated demonstrators to be developed in Freeband's IP "Personal Network Pilot", and in other related projects.
- Scientific publications.
- Ph.D. theses and trained experience researchers.

## Freeband

I-Share is part of the Freeband Communication research programme. For more information:

<http://www.freeband.nl>.

## Project Partners

- Delft University of Technology (TU-Delft)
- Eindhoven University of Technology (TU/e)
- University of Twente (UT)
- Vrije Universiteit Amsterdam (VU)
- Philips Research, Eindhoven

## Project website

<http://ishare.freeband.nl>

## Duration

May 2004 – December 2008

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