Implementation and Evaluation of a Peer-to-Peer based Multiplayer Game

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The Internet Research Group at Eurecom, Sophia Antipolis, France (http://www.eurecom.fr/~btroup/) proposes a Masters Thesis (Diplomarbeit) in the area of peer-to-peer systems.

Project Description:

Peer-to-peer systems have received a lot of attention recent years. The key property of P2P systems is self-scaling, which means that the amount of resources grows with the number of participants.
Computer Gaming has become very popular. Up to now games have been implemented in a client-server fashion and all interactions between the different players are mediated by a *central server*. Since computer games have very strict latency requirements, popular games such as World of Warcraft require hundreds of servers and very high network bandwidth.

In our group we have been working on P2P gaming for over two years (for papers see http://www.eurecom.fr/~varvello/index3.html) and we have already developed an infrastructure for support of P2P gaming. In this MSc thesis we propose to investigate whether a P2P architecture would be suitable for large scale gaming. The objective of this project is to implement and evaluate a prototype of a real game. More precisely, we propose to take the source code for a popular game such as Quake II, which is publicly available (see http://www.bytonic.de/index.html), port that code onto our P2P infrastructure for games and carry out some experiments.

Requirements:
- Good Knowledge of *JAVA.*
- Interest in Peer-to-Peer applications.
- Interest in Games

References:

- Ashwin Bharambe, John R. Douceur, Jacob R. Lorch, Thomas Moscibroda, Jeffrey Pang, Srinivasan Seshan, Xinyu Zhuang, Donnybrook: Enabling large-scale, high-speed, peer-to-peer games, Aug. 2008 http://research.microsoft.com/apps/pubs/default.aspx?id=72879
- M. Varvello, E. Biersack, C. Diot, P2P Second Life: experimental validation using Kad, *Infocom, Rio de Janeiro, Brazil, April, 2009*
- M. Varvello, F. Picconi, C. Diot,E. Biersack, *Is There Life in Second Life? Conext, Madrid, Spain, December, 2008*
- M. Varvello, E. Biersack, C. Diot ,*Dynamic Clustering in Delaunay-Based P2P Networked Virtual Environments, Netgames, Melbourne, Australia, September, 2007.*
- Ashwin Bharambe, Jeffrey Pang and Srinivasan Seshan: A Distributed Architecture for Multiplayer Games , ACM/USENIX NSDI 2006, San Jose, USA.
  http://www.cs.cmu.edu/~ashu/colyseus/downloadplay.html#downloads