Implementing the *swift* Protocol in the Linux Kernel

Project Proposal, SOA/OS – Autumn 2010

Index terms: P2P systems, network protocols
Keywords: swift, BitTorrent, Linux kernel
Team size: 2 students

1   Project Description

BitTorrent is the protocol responsible with the greatest chunk of traffic in the Internet. A new approach, similar to BitTorrent, is *swift* – the multiparty transport protocol. *swift* may be understood as BitTorrent at transport layer; it ultimately aims at the abstraction of the Internet as a single big data cloud.

The *swift* protocol is currently implemented in user-space on top of UDP, the thinnest wrapper over IP. We propose the implementation of *swift* as a transport protocol in the Linux kernel networking stack. This will allow maximum performance and pave the way for the integration of *swift* in the Linux kernel.

2   Objectives

This project aims to deliver the following:

- *swift* protocol implementation in the Linux kernel;
- performance testing and evaluation of the implementation;
- documentation regarding the protocol, kernel implementation and required kernel interface.

3 Bibliography

- swift site – `http://libswift.org/`
- swift sources at GitHub – `http://github.com/gritzko/swift`
- the BitTorrent protocol – `http://bittorrent.org/`
- B. Cohen – Incentives Build Robustness in BitTorrent, Workshop on Economics of Peer-to-Peer Systems, 2003
- J. Pouwelse, P. Garbacki, D. Epema, H. Sips – The BitTorrent P2P File-sharing System: Measurements and Analysis, Peer-to-Peer Systems IV, 2005
- Christian Benvenuti – Understanding Linux Network Internals

4 Prerequisites

kernel programming, communication protocols, algorithms, C/C++ programming, version control systems (Git, SVN)

5 Other

Work on this project will imply communication and collaboration with TUDelft, namely Victor Grishchenko, the architect of the *swift* protocol, and Johan Pouwelse, the coordinator of several projects in the PDS research group.