Technische Universität München
Lehrstuhl für Netzarchitekturen und Netzdienste
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Thesis
(B.Sc./M.Sc.)

Conducting and Analysing Attacks on the Kad P2P Network (aMule/eMule)

Motivation

aMule/eMule are two popular filesharing clients. Both use the Kad protocol to search for content. Kad is a Distributed Hash Table that is based on the **Kademlia protocol**. The general idea is a routing mechanism where the next hop is determined using XOR distances.

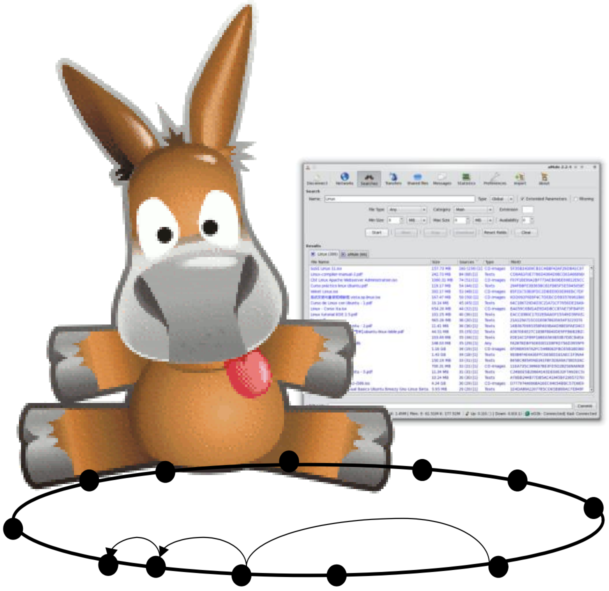
Prior work has found the Kad network to be quite **vulnerable to so-called Eclipse Attacks** on content (Steiner 2008, Kohen/Leske 2009). There, an attacker aims to introduce nodes to the network in such a way that he can block all lookups for a given content (thus “eclipsing” it from the view of the network).

In this work, we will also analyse the **Eclipse Attack**, but in a particular variation that has so far received little attention in the scientific community. As part of a previous thesis, we have conducted extensive simulations with the Oversim framework. Now, we will test our findings in the **real world**.

Your Task

Your task consists of the following steps.

1) We have already written a **framework** that covers the most important aspects. However, this is going to need **extension**.
2) **Conduct the Eclipse Attack** as we have designed it – live and for real. However, we will only **attack only our nodes**.
3) Draw **conclusions from your findings**.
4) M.Sc. only: **refine the attack** to make it even better.



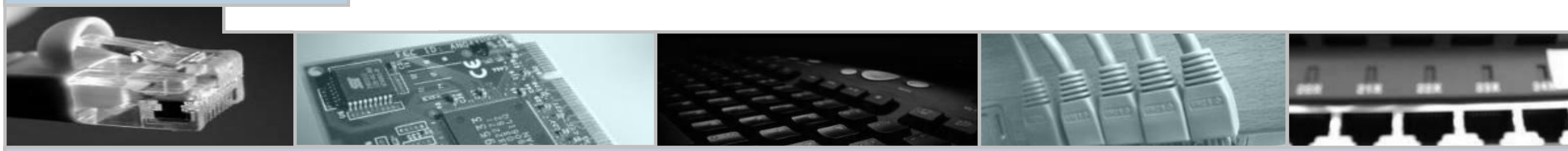
Nodes at several German universities plus several privately owned hosts can be used in this work.

Requirements

Previous knowledge of P2P and Kademlia is useful, but we can teach you everything you need to know. We will use C++ (but you may be able to talk us into using OCAML). Above everything, we appreciate **passion**: we want someone who enjoys learning and really wants to participate in this research. We are excited about it – and so you should be, too.

Keywords

Kademlia, Eclipse Attack, P2P Security



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