CS 8803 **Ramesh Chandran**
Project Proposal
Preventing Blocking of VoIP Traffic

Motivation and Objectives

Voice Over IP (VoIP) is the transmission of voice messages over a packet switched network. Like most things associated with the Internet, this technology has the potential to change the way we communicate today. It offers a cheap alternative to traditional telephone systems. Due to the disruptive potential of this new technology, many established players see this as a threat. This includes telcos who see VoIP causing a drain in revenues. This leads to cases of VoIP blocking where organizations prevent VoIP traffic from reaching parts of the network under their control [1]. There are also cases where some ISPs block competitors' voice traffic from reaching their customers. But such activities fly in the face of Internet's philosophy of open communications.

This project is an attempt to study existing VoIP blocking methods and counter techniques and so as to evolve a better counter-blocking methodology.

Related Work

Currently there exist mechanisms to mask VoIP traffic as normal web traffic. Most of today's detection methods work by looking at VoIP traffic patterns, which are distinct from that of normal web traffic. Anonymizing networks [2] [3] can be used to mask these traffic patterns, but their use is restricted due to VoIP's low latency requirements. However there do exist low-latency anonymizing networks that finds application in VoIP anonymization.

There has been the recent work by George Mason University researchers who have discovered a novel way to trace Internet phone conversations [4]. This method relies on active watermarking of voice traffic and can be used to trace even calls made through systems like Skype[5], well known for its privacy guarantees. Though this method works only by eavesdropping on both sides of the conversation, this could further drive research in the area of active detection mechanisms.

Network Coding [6] is another recent area of research whose principles may find application in traffic anonymization.

Proposed Work

The project will consist of first understanding the concepts behind the following topics and then proposing a new counter blocking technique or implementing an augmented version of a current counter blocking method.

The following topics will be studied:

Traffic characteristics of VoIP

Study the traffic characteristics of voice traffic and normal web traffic and

compare differences. In the end any masking scheme would have to pass off voice traffic as normal traffic.

Study how blocking works

Study the existing methods that are used by telcos and ISPs to block VoIP traffic currently. Other than rudimentary methods like port blocking, literature on this subject seems to be scarce.

Study how prevention works

Study the concepts behind onion routing, ToR. Investigate the use of P2P systems / node collaboration (Skype) in evading detection.

Evolve new mechanism

Implement new technique

Plan of Action

Proposal	2/16
Revision	2/21
Study	3/5
Traffic characteristics	
Blocking	
Counter blocking	
Work on new method	4/1
Implementation	4/20

Evaluation and Testing Method

As this is a research study rather than an implementation project, the outcomes are rather vague at this stage. Ideally it should be the implementation of an improved counter blocking mechanism that could be evaluated by testing it in a real world scenario.

Access to certain resources like onion routing network, permission to run clients of some popular VoIP products (Skype) will be required. As I am working on this project in CS7260, these resources can be obtained without much difficulty.

Bibliography

[1] http://www.internetnews.com/infra/article.php/3485271

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[4] www.ise.gmu.edu/~xwangc/Publications/CCS05-VoIPTracking.pdf

[5] www.cs.columbia.edu/~library/TR-repository/reports/reports-2004/cucs-039-04.pdf

[6] R. Ahlswede, N. Cai, S.-Y. R. Li and R. W. Yeung, "Network information flow," IEEE Trans. on Information Theory, vol. 46, pp. 1204-1216, 2000.

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