ICLab Web-based Network Measurement Using Flash Plug-in

CSE 534 Research Paper Proposal

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ABSTRACT

Our project is to implement a subset of features presented in the Centinel client for ICLab. This will enable more users to participate in the process of collecting censorship related data through a browser-only client.

1. INTRODUCTION

Currently, the ICLab[1] application requires the end users to download the Centinel client and run locally to utilize it. This download requirement may limit the number of users who are willing to participate in the censorship data collection program, because some users might be reluctant to download unknown software applications from the web. Our goal is to create a customized Flash plug-in tool of ICLab for any web browser, enabling users to simply input texts and click buttons on this tool to help ICLab collect censorship related data.

2. EXISTING LMITATION

The current Centinel client[2] is written in Python. It has several limitations:

- Python runtime and the client must be downloaded.
- The current client depends on Tcpdump and Traceroute binaries installed on user's computer. This is neither cross platform nor reliable.

3. DESIGN

Flash is a popular plugin that many users have installed on their computers. It is available for various popular operating systems, and provides a consistent programming environment.

Our goal is to implement some parts of ICLab's functionality using Flash. All the functionality we choose to implement will only depend on the Flash runtime. As in *Figure 1*, the client will first collect data using Flash library API. See the next section for specific data we plan to collect. Like the Python client, our Flash tool will send data to ICLab Server. Because of certain security limitations of Flash, this tool cannot collect certain data.

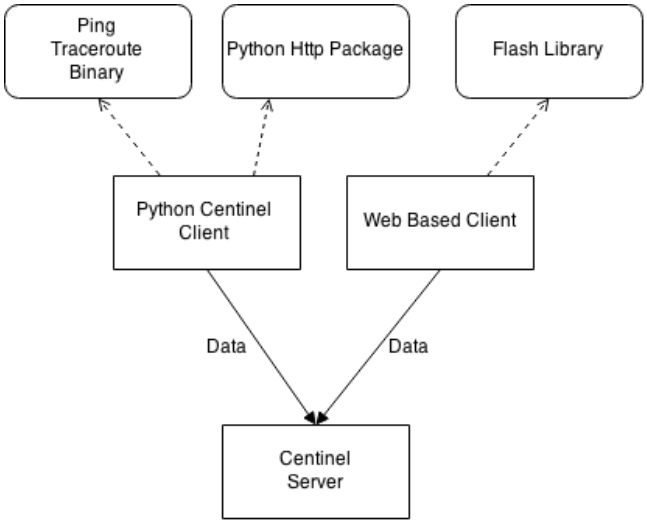

Figure 1 Overview of Web-based Flash Client in the ICLab System

4. DETAIL SCOPE

Based on our research on the functionality of Flash, and our discussion with Professor Phillipa Gill[3], we would implement the application layer functionality, ie. HTTP request and DNS query using Flash. Furthermore, since we discovered that Flash supports TCP and UDP[4], and following a discussion with Mr. Abbas Razzaghpanah[5], we opt to first focus on implementing the HTTP using TCP supported by Flash.

Flash does not provide API to send ICMP or raw IP packets. We cannot implement ping or traceroute commands because they depend on ICMP or the TTL field in the IP packet.

4.1 HTTP Requests

Our tool will first download a list of URLs from the ICLab Server. Then our tool will issue HTTP requests to these URLs in order. The result will be recorded as either successful, time-out, or not available. If the result is successful, the content of the page will also be included. Our tool will then send these URLs with results to the ICLab Server for further analysis.

4.2 DNS Queries

Our tool will first download a list of host names from the ICLab Server. Then depending the test requirement, our tool will issue DNS requests to either the host machine's default DNS server, or a server at the choice of ICLab Server. The result of the DNS query will be recorded. Our tool will then send the results to the ICLab Server for further analysis.

5. HOW TO ACCOMPLISH IT

We will use the Adobe Flash CS6 installed in the graduate lab and transaction lab of our department to do the ActionScript coding. Some online resources which may help us learn ActionScript will also be used.

6. TIMELINE OF OUR PROJECT

- February 16, 2015: Submit this proposal to our TA Mr. Chien-Chun Ni.
- Staring from Feb 19, we meet up every Thursday night at 7pm the Transaction Lab to do the ActionScript coding.
- April 1, 2015: Finish the implementation of the HTTP connection to other websites.
- April 3, 2015: Email Abbas to report our progress, and to get his advice about how we may connect this tool to the ICLab server.
- April 6, 2015: Submit the midterm report to Professor Phillipa Gill.
- May 4, 2015: Target date to complete the ICLab Flash Plug-in Project.
- May 10, 2015: Submit the final report to Professor Phillipa Gill.

7. TARGET COMPLETION DATE

Monday, May 4, 2015

8. REFERENCES

[1] The Internet Censorship Lab: http://www.internetcensorshiplab.com/

[2] Centinel client source code: https://github.com/iclab/centinel

[3] Discussion of our project scope with Professor Phillipa Gill. Wednesday, February 11, 2015.

[4] Adobe Flash Platform. Sockets. http://help.adobe.com/en_US/as3/dev/WSb2ba3b1aad8a27b0-181c51321220efd9d1c-8000.html

[5] Discussion of our project scope with Abbas Razzaghpanah, a PhD student participating in the Internet Censorship Lab. Thursday, February 12, 2015.