Master’s Thesis Proposal

Counteracting Dynamic Pricing Strategies

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Issue date: May 2016

Introduction

Several e-commerce providers, including plane ticketing and hotel booking websites, present significantly varying prices for the same product. These providers follow dynamic pricing strategies that typically depend on various factors, such as a user’s geographic location (higher prices in richer countries), a user’s IP address (lower prices for comparison websites), or even a user’s cookies (higher prices for users that already checked the price in the past).

The goal of these strategies is to maximize profits by always charging the highest price the customer is willing or able to pay. Since different customers might not all be willing to pay the same price, the website providers aim to determine the optimal price for each customer, based on the available information. Many of these parameters can be influenced by the user, e.g., by using proxies or VPN connections to change the IP address or modifying the header or the browser history. As a result, users could potentially exploit the dynamic pricing strategies to their advantage, and obtain lower prices.

Assignment

Objectives

The objective of this project is to develop a potentially disruptive plug-in or a service that enables a user to take advantage of dynamic pricing strategies and enjoy low prices for the products for which the user is looking. A browser plug-in or a service shall be developed that identifies effective price-reducing feature-modifications for the product in which the user is interested. The implementation shall expects a model of a dynamic pricing strategy and modifies a wide range of a user’s traffic features (e.g., header, IP address, or browser history) such that the target provider displays to the user the lowest price (according to the model of the pricing strategy). In order to achieve a comprehensive modification of the traffic features, the browser and traffic fingerprinting attacks from the literature shall be discussed and compared to the modifications of the implementation. Finally, the effectiveness of the implementation shall be experimentally evaluated.

This project and the project “Learning Dynamic Pricing Strategies” would be suitable for two students that work in close collaboration.

Tasks

1. Research related work on browser fingerprinting and other relevant related work.

2. Develop a browser plug-in or a service that identifies effective price-reducing feature-modifications for the product in which the user is interested.

3. Experimentally evaluate the effectiveness of the browser plug-in.
Deliverables

**Final report** The final report may be written in English or German. It must contain an abstract written in both English and German, this assignment and the schedule. It should include an introduction, an analysis of related work, and a complete documentation of all used software tools. Three copies of the final report must be delivered to the supervisor.

**Counteracting Plug-in or Service** Software and configuration scripts developed during the thesis must be delivered in electronic form.

**Presentation** At the end of the thesis a presentation of 30 minutes must be given during an Infsec group seminar. It should give an overview as well as the most important details of the work.