

Exploring DNS Security

Focused and Deliciously Witty Subtitle

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December 15, 2016

Abstract

The security of common internet protocols is an important issue when considering how to satisfy the requirements of security and privacy as technology becomes more integral to our daily lives. The components required to simulate a DNS lookup were implemented in Java. This simulation was used to attempt a common DNS cache poisoning attack, and explore methods for improving the security of DNS protocol.

Introduction

One of the most important requirements of any communication network, such as the internet or the United States Postal Service, is the ability to uniquely identify and locate participants of the network. This requirement is often met by assigning some form of address to participants: to determine the location to which an outgoing letter should be delivered, the sender must specify country of the recipient, what part of the country they live in, and finally the specific street/number combination at which the recipient resides. This system, however, was designed for human comprehension, and could be more concisely represented by numerical coordinates if readability

was not an issue. A similar issue arises when considering the numerical Internet Protocol addresses (IP addresses) used to identify computers and resources connected to the internet: IP addresses are convenient for use in networking protocols, but are difficult for humans to memorize. The Domain Name System (DNS) is in place to allow individuals or companies to register readable domain names (www.google.com) that can be mapped to the IP addresses needed to locate certain computers on the network, and is fundamental to the functionality of the internet.

When considering the security of systems as important to the internet as the DNS, one might hope that the conventional principles of **C.I.A.**¹

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¹**Confidentiality:** Only authorized parties should be able to view data; **Integrity:** Data should not be altered in any unauthorized fashion; **Availability:** Data should be available to and modifiable by authorized individuals.

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Conclusion

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