Privacy and Security in Online Auctions

Thesis submitted by
Jarrod Trevathan

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in the School of Mathematics, Physics and Information Technology at
James Cook University

supervisor: Associate Professor Wayne Read

jarrod.trevathan@jcu.edu.au
wayne.read@jcu.edu.au

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Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institute of tertiary education. Information derived from the published and unpublished work of others has been acknowledged in the text, and a list of references is given.

Jarrod Trevathan
March, 2007

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Abstract

Buying and selling online is inherently insecure. Misuse of an individual's personal information is now the leading concern among those who engage in e-commerce. This thesis examines privacy and security issues in online auctions. Various auction fraud issues are investigated, and several novel counter measures proposed. An online auction server was constructed to aid in developing these security measures. This allowed investigation and testing in a controlled environment. The research results include:

1. A complete model for conducting secure and anonymous online auctions;
2. A method for detecting a fraudulent bidding practice referred to as shill bidding;
3. Autonomous bidding agents which bid maliciously. (Used to test the ability of the proposed security mechanisms.);
4. A complete model for conducting secure and anonymous online share trading; and
5. Several alternate proposals for auction clearing algorithms.

The proposed security mechanisms have been implemented on the online auction server. Results are given as simulated and practical tests. In addition, the auction server's software design is documented. Many of the techniques discussed in this thesis can be readily applied to commercial online auctions.

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