A Distributed Network Architecture for Robust Internet Voting Systems

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Abstract. Web-based Internet voting services cannot be provided in a reliable manner where a publicly visible website forms the basis of interacting with voters and collecting votes, as the service cannot resist a distributed denial of service attack. The problem is a profound one for all interactive web services, however, an Internet voting session is a well defined and quite simple interaction and an interactive service similar to web-based voting is proposed. This architecture uses a P2P web cache as the source of a Java voting applet. The applet interacts with the voter via their web browser to collect a vote. The applet then uses a common P2P file sharing network to deposit encrypted votes for collection by the electoral returning officer. The issues of how to authenticate voters and how to provide receipting in such an asynchronous system are described along with premininary findings using a large P2P network established for this purpose. A successful demonstration of this approach may have implications for other mission critical web services which must collect information.

1 Introduction

The availability of the Internet to provide legally binding elections is of increasing importance as western and emerging democracies struggle to reach the growing electorate of mobile, Internet connected, "time-poor" citizens. We refer to Internet voting specifically as website voting, and this can also include polling, "e-consultation", online deliberative or direct democracy, and "e-participation".

Website voting is a form of remote voting where the voter is unsupervised and this new technique is used to supplement or replace traditional postal ("absentee") voting. There has been a dramatic increase in the use of postal voting in the 2004 US Presidential election where absentee requests in some states climbed over 30% [1].

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