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## **Efficient Metering Schemes with Pricing**

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**Abstract** In order to decide on advertisement fees for web servers, Naor and Pinkas [7] introduced metering schemes. They proposed metering schemes in which any server is able to construct a proof to be sent to an audit agency if and only if it has been visited by at least a certain number, say  $h$ , of clients. Afterwards, the authors of [3] generalized the idea of Naor and Pinkas and proposed metering schemes with pricing. In their schemes any server is able to construct a proof which depends on the number  $r$  of clients visiting it, for any number  $r$ . Therefore, the audit agency can decide the price to be paid to servers depending on the number of visits  $r$  that the server received by clients.

In this paper we are interested in the efficiency of metering schemes with pricing. We propose a new model for metering schemes with pricing and we provide lower bounds on the size of the information distributed to clients and servers, and on the number of random bits needed by the audit agency to set up a metering scheme with pricing. These bounds are tight, as we provide a scheme which achieves them with equality. Compared with the scheme presented in [3], our scheme is more efficient since it distributes less information to clients and servers.