AN EFFICIENT PAYMENT SCHEME BY USING ELECTRONIC BILL OF LADING

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ABSTRACT. *Nowadays, the electronic commerce plays an important role in different business environments around the world. Thus, how to design a practical and reliable payment system becomes a significant issue. However, most payment systems, including electronic credit card, electronic cash and electronic check, have the deadlock problem on transactions. To solve this problem, the previous payment systems focus on the way of transacting synchronously online. Nevertheless, this solution is not efficient. In this paper, we propose an efficient payment system by using electronic bill of lading. Compared with other payment systems, the proposed scheme can solve the deadlock problem without synchronized transaction online. In addition, this scheme is constructed with simplicity, only using several hash functions and one modular-exponentiation computation, which makes it efficient and practical. Moreover, the proposed scheme provides a new method of payment in e-commerce.*
Keywords: Electronic commerce, Deadlock problem, RSA

1. **Introduction.** With the development of computer technologies, more and more transactions in the real world are implemented on the Internet. All these electronic transactions are so-called e-commerce. The most important component of e-commerce is electronic payment. Therefore, many electronic payment models are proposed to satisfy various applications. The payment models can be generally divided into three categories: electronic credit card, electronic cash and electronic check. Their properties can be described as follows.

Electronic Credit Card

In an electronic credit card payment system, the payer uses his electronic credit card as the payment tool to pay the bill. The whole payment process must be done online to ensure the payment security. When the payer pays the bill online, he creates the payment information that includes the merchant's name, the payment value, the expired date, and the credit card number. After the merchant receives the information sent from the payer, he sends it to the issuing bank of the payer's credit card to verify the correctness of this payment. If the payment information is correct, the issuing bank deposits the money in merchant's account and the merchant sends back the corresponding goods to the payer.

Electronic Cash

In electronic cash system, the payer uses electronic cash (e-cash) to pay the bill online. The electronic cash works and transacts just like cash in the real world. First, the payer