Chapter XIII

Considering Mobility in Query Processing for Mobile Commerce Systems

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ABSTRACT

With the merge of mobile computing and electronic commerce technologies, millions of mobile users in the near future could carry a mobile device requesting services through the electronic commerce applications. While serving such a mobile user, the server should consider how to minimize the response time of the request. This chapter discusses the issue of data processing for mobile commerce systems. Due to the characteristics of a mobile commerce environment such as user’s mobility, the user may not be at the same site as where he/she issued the request when the request’s result is ready to deliver to the user. This chapter argues that conventional strategies for query processing are no longer adequate in a mobile commerce environment and introduces some query processing strategies considering mobility for the mobile commerce systems. All the strategies are presented along with a cost analysis as the theoretical basis. Last, some of outstanding and interesting issues are described.
INTRODUCTION

The rapid growth of the Internet and the widespread popularity of the Web allow companies to overcome many of the physical constraints that often prevent them from doing business in distant markets (Chol & Whinston, 1999). Therefore, more and more applications of electronic commerce are designed to conduct business between enterprises and customers. Additionally, rapid advances of wireless related technology, such as cellular network, satellite communication, and wireless LANs, have brought new opportunities for accessing information without any time or space constraints. In the foreseeable future, tens of millions of users will carry mobile computers (devices) e.g., portable palmtop or laptop computers, to access online information from various data sources at any time and anywhere (Imielinski & Badrinath, 1994). The merging of these two waves is expected to emerge as an appealing new application in the distributed computing field.

What Is a Mobile Commerce System?

Electronic commerce seems to be a natural and expected extension of the presence of the Web. It has many advantages over conventional commerce such as online shopping, the probability to enable the entire process to occur electronically, the ability to accommodate bidirectional communications between the vendor and the vendee easily, etc. Additionally, it can also record and incorporate customer preferences and use history, such as past purchases or books read, to provide a personal environment to the customer, saving access time. In general, users (customers) can also use computer-based searching techniques to quickly locate products and to shop for competitive prices across many sites.

Recently, the rapid advances in wireless (mobile) communication technologies and the popularity of mobile devices such as PDAs, laptop computers, and mobile phones, offer new opportunities to introduce commerce applications and services to the wireless users as well as the wired ones. Mobile computing constitutes a new paradigm of computing that is expected to revolutionize the way computers are used today. The merging of these two great waves (mobile computing and electronic commerce), forming the paradigm of mobile commerce, will be able to propose attractive solutions in the field of electronic commerce and create numerous business opportunities for various types of commercial companies.

The mobile commerce is fundamentally global, allowing users’ transactions issued and processed via wired and wireless communication networks. Many interesting applications such as stock trading, online order, querying supermarket catalogs, etc., are involved for mobile commerce. An interesting application is, for example, an electronic catalog or newsletter which is updated by retailers from anywhere and at any time. In particular, it allows retailers to change product prices

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