

Data Communication through Mobile Agent with Pre-Processing Techniques in Electronic Environment

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Abstract

Mobile agents are emerging as a major trend of distributed systems. Different mobile agent frameworks are being actively developed in the research community. Electronic commerce and information retrieval are two prospective directions for application of mobile agents. Nevertheless, security and reliability are two crucial concerns for such systems, especially when they are to be used to deal with money transaction.

In spite of some more classical reliability and security problems, attacks to agents by malicious hosts are a new and the most challenging part of the problem unsolved. In this paper, information retrieval of mobile agents, particularly in an electronic environment, is discussed. Models for mobile agent information have been developed and a “Mobile Agent with preprocessing techniques in electronic environment” built based on an experimental mobile agent application. Possible methods and techniques in the system are discussed and a specific solution to retrieve the data is being done. Data retrieval solutions are analyzed and the performance overhead introduced is measured.

Keyword: Mobile Agent, Security, Network, Topology.

1. Introduction

A computer network may be defined as the coordination or interconnection of a number of individual computers. A computer network is basically established by the network layer in the Open Systems Infrastructure model, popularly known as the OSI

model. Computer networks exist on various scales, from links between machines in the same room up through wiring connecting the machines in a building or campus to regional, national and global networks. Various media are used to carry the communications signals, copper wire, fiber-optic cables and wireless or radio transmissions etc.

Networks may be classified according to a wide variety of characteristics, such as the medium used to transport the data, communications protocol used, scale, topology, and organizational scope.

Communications protocols define the rules and data formats for exchanging information in a computer network, and provide the basis for network programming. Well-known communications protocols include two Ethernet, hardware and link layer standard that is ubiquitous in local area networks, and the Internet protocol suite, which defines a set of protocols for internetworking, i.e. for data communication between multiple networks, as well as host-to-host data transfer, and application-specific data transmission formats.

Computer networking is sometimes considered a sub-discipline of electrical engineering, telecommunications, computer science, information technology and computer engineering, since it relies upon the theoretical and practical application of these disciplines.

2. E-commerce

Electronic commerce or ecommerce is a term for any type of business, or commercial transaction that involves the transfer of information across the Internet. It covers a range of different types of businesses, from consumer based retail sites, through auction or music sites, to business exchanges trading goods and services between corporations. It is currently one of the most important aspects of the Internet to emerge.

E-commerce allows consumers to electronically exchange goods and services with no barriers of time or distance. Electronic commerce has expanded rapidly over the past five years and is predicted to continue at this rate, or even accelerate. In the near future the boundaries between "conventional" and "electronic" commerce will become increasingly blurred as more and more businesses move sections of their operations onto the Internet.

Business to Business or B2B refers to electronic commerce between businesses rather than between a business and a consumer.

B2B businesses often deal with hundreds or even thousands of other businesses, either as customers or suppliers. Carrying out these transactions electronically provides vast competitive advantages over traditional methods. When implemented properly, ecommerce is often faster, cheaper and more convenient than the traditional methods of bartering goods and services.

Electronic transactions have been around for quite some time in the form of Electronic Data Interchange or EDI. EDI requires each supplier and customer to set up a dedicated data link (between them), where ecommerce provides a cost-effective

method for companies to set up multiple, ad-hoc links. Electronic commerce has also led to the development of electronic marketplaces where suppliers and potential customers are brought together to conduct mutually beneficial trade.

3. E-Shopping

Online shopping is the process of buying goods and services from merchants who sell on the Internet. Since the emergence of the World Wide Web, merchants have sought to sell their products to people who surf the Internet. Shoppers can visit web stores from the comfort of their homes and shop as they sit in front of the computer.

Consumers buy a variety of items from online stores. In fact, people can purchase just about anything from companies that provide their products online. Books, clothing, household appliances, toys, hardware, software, and health insurance are just some of the hundreds of products consumers can buy from an online store.

4. Mobile Agents

Mobile agents are programs that are capable of executing and migrating from node to node in a networking environment to perform information retrieval tasks on behalf of their owners. A mobile intelligent agent-based e-business architecture that allows buyers and sellers to perform business at remote locations. An integrated mobile agent system called Nomad allows mobile agents to travel to the eAuctionHouse site for automated bidding and auction monitoring on the user's behalf even when the user is disconnected from the network.

5. Issues In Existing System

- While traveling through different servers, the mobile agent must be intimated about any communication failure, otherwise it will wait indefinitely for the failed communication network link to recover, and for the time being the system will be virtually dead.
- The mobile agent remains stable in its state, if it is not exist in the failed server. Suppose, if the failing server is one of the destinations of the agent, the agent must reroute its travel plan.
- The agent has to travel all the servers to fetch the information required, but it is taking much time to process, travel and return back with the result to the requested host.

6. Techniques to Overcome the Issues in Existing System

The drawbacks found: The result stored in agent from each server collected so far are failed to reach the destination due to some inter-mediate problems such as server

failure, malicious hosts, and so on. Also, the time limit for information retrieval is a major drawback as it takes to travel to all sites.

- To overcome the time limit and to improve the speed in retrieving the information, query optimization technique can be used.
- Packaging or encapsulating the query and content in all the stages to provide high security, and it will not loss when the agent reaches the malicious hosts.
- The cost can also be minimized by using the algorithm for cost minimized search, where parallel searching can be implemented.
- To provide protection to mobile agents from malevolent hosts based on dynamic adaptability policy.

7. Conclusion

This study has attempted on theoretical aspects of security and reliability issues of mobile agent's. Mobile agents are going to complement many client/server applications. Enhancing reliability of mobile agent systems surely boosts the process, and it is already taking place actively. On the other hand, mobile agents can be much more useful if the security problem can be tackled. No one can come up with a complete solution for protecting mobile agents, yet no one has proved that this is unsolvable. As more efforts are being spent in this topic, it is believed that the problem can be at least simplified, if not totally solved.

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