
Enhanced Information Retrieval

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Abstract

This paper presents a Novel Scheme for improved Information Retrieval. The Proposed concept of this paper "FRIEND AGENT" is to enhance the need for Effective Information Retrieval. It helps in gathering the required information Independent of the location. Friend Agent offers Network Bandwidth Consumptions, Optimal routing, Security, Effective Data Transfer.

Keywords : Information Retrieval, Friend Agents, Mobile Agents, Friend Network

0. Introduction

The advances in Computing Technology have produced Miniaturization. The rapid deployment of wireless Communication Technologies such as Cellular Network, Wireless Ad-hoc Networks support the universal connectivity.

Overcoming the challenges facing the network can help access the Global network easily and efficiently. The most important problem concerning mobile networking is Quick Access to Information independent of its Location.

The other concern to be considered is the network security as constant location changes of mobile station occurs. Authentication is needed between mobile and base station. It also requires immediate update of the changes in the location.

In this Paper, We Propose a Novel and Noble scheme for Retrieval of Information and Routing Information Update based on mobile traffic pattern. We begin Section 2 with Mobile Agent Concept. In Section 3, we present the concept of Friend Network. In Section 4, we introduce the concept of "Friend Agent". In Section 5, Performance analysis and other related issues are discussed. In Section 6, conclusion is presented.

1. Mobile Agents and their Challenges

Mobile agents are computational software processes capable of roaming wide area networks (WANs) such as the WWW, interacting with foreign hosts, gathering information on behalf of its owner and coming 'back home' having performed the duties set by its user. These duties may range from a flight reservation to managing a telecommunications network. However, mobility is neither a necessary nor sufficient condition for agent-hood.

Challenges :

- ✍ Transportation
- ✍ Authentication
- ✍ Low Band-width or Busy Network
- ✍ Dynamically Re-plan Migration path to adapt circumstance

2. Friend Network

The Static Network is inadequate to support Mobile Networking. We require the combined function of Mobile Host (MH), Base Station (BS), and Mobility Support Router (MSR) to be a part of Mobile Networking. Friend Network forms a

“Ad-hoc Network” whenever required. It does not require any fixed infrastructure to work. It provides greatest possible Flexibility. It forms Instant Infrastructure for Disaster Relief and Remote area Communication.

A network is considered as Friends Network of mobile host if the following conditions occur :

- ✍ Substantial network traffic exists between the network and the mobile host
- ✍ The network is trusted network of the mobile host and equipped with Mobility support router.
- ✍ Prohibiting the routing information into unfriendly networks can also Provide the network security.

3. Friend Agent

The introduced concept “FRIEND AGENT” has the advantages of friend network and overcomes the challenges facing the mobile agents.

It is the combination of Friend network concept and the Mobile agent Technology.

Overcoming the barriers of Mobile agents : Friend Agent provides the solutions for overcoming the challenges faced by the mobile agents. The challenges mentioned above can be solved by providing an optimal solution through the Friend Agent.

Network-Bandwidth Problem : Friend agents solve the network bandwidth problem. Network bandwidth in a distributed application is a valuable (and sometimes scarce) resource. A transaction or query between a client and the server may require many round trips over the wire to complete. Each trip creates network traffic and consumes bandwidth. In a system with many clients and/or many transactions, the total bandwidth requirements may exceed available bandwidth, resulting in poor performance for the application as a whole. By creating an agent to handle the query or transaction, and sending the agent from the client to the server, network bandwidth consumption is reduced. So instead of intermediate results and information passing over the wire, only the agent need be sent.

The Network Bandwidth used for routing information update can be greatly reduced by achieving Optimal Traffic Routing. Information should be propagated

only to those routers or hosts who need to communicate with the mobile host, instead of Broadcasting. This assumption is quite normal in mobile traffic scenarios.

Dynamic Re-plan Migration :

Case (i) : When the encapsulated packet destined for mobile host arrives to mobility support router, it is de-encapsulated and finds whether the mobile host is available within the Home Location Register (HLR). If yes, it is delivered to mobile host via its own mechanism, through Base station.

Case (ii) : If mobile host is out of HLR, and MSR updates the information of the location of the MH. In the mean time, the MH on reaching the other location registers in the corresponding Visiting location Register (VLR), which is updated in the HLR, the packet is re-encapsulated and routed through the MSR and VLR for serving the MH. In this way, the Migration is re-planned dynamically.

4. Performance Analysis of Friend Agent

Many factors needed to be considered in Network routing, and the information retrieval. In Ad-hoc networks each node must be able to forward data for other nodes. The routing table must somehow reflect these changes in topology have to be adapted. It takes very minimum time for the routing table to be updated. The topology changes during distribution, LIR- (Least Interference Routing) can be used to avoid the wastage of Bandwidth, and while Topology changes occur during distribution.

Comparison between Traditional Information Retrieval and Friend Agent Information Retrieval

Traditional Information Retrieval :

Transfer Information : $100\text{KB} \times 1\text{S}/\text{KB} = 100\text{S}$

Transfer Back Results : $1\text{KB} \times 1\text{S} = 1\text{S}$

Total Time spent in communicating: $100\text{S} + 1\text{S} = 101\text{S}$

Friend Agent Information Retrieval :

Transfer Agent : $1\text{KB} \times 1\text{S} = 1\text{S}$

Carry Information Locally: $100\text{KB} \times 0.1\text{S}/\text{KB} = 10\text{S}$

Transfer Back result : 1S

Total Time spent in communicating: $1\text{S} + 10\text{S} + 1\text{S} = 12\text{S}$

As a result of the Performance Analysis, Time for retrieving information is reduced approximately EIGHT times by using Friend Agents in comparison to Traditional Retrieval Systems.

5. Conclusion

We have proposed a novel concept called "Friend Agent" which overcomes the challenges in mobile agents using the advantages of Friend Network, and it provides Secured and Faster Information Retrieval. It offers the advantage reduced Network resource consumption by providing Optimal routing and authentication only to Friend Networks thus paves a way for the Network Security. In addition to this, it also offers greatly reduced time for Data transfer when compared to traditional Information Retrieval Systems. This Concept can be deployed to a wide range of Information Retrieval Applications.

6. References

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