SECURE & FAULT TOLERANCE HANDOFF IN VANET USING SPECIAL MOBILE AGENT

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ABSTRACT

Vehicular Traffic poses an emerging issue nowadays. The critical factors for the data communication are speed and time tradeoffs. For data communication, gathering and retrieving information many cost-effective and tested techniques are required in VANET. Client server architectures being coercive are commonly used in spite of having drawbacks of fault and time in-effectiveness. This paper elaborates a proposed method in VANET for fault tolerance information retrieval based on theory of bandwidth and timestamp. Mobile Agents, with the feature of autonomy, social ability, learning, and most importantly mobility, regarded as an appropriate technology to build applications for instance information retrieval system in mobile computing environment.

KEYWORDS

VANET, Mobile agent, handoff.

1. INTRODUCTION

Vehicular Ad-Hoc network is an applied science which consists of moving vehicles as an elementary node for the wireless networks to act as a mobile network. It is one of the wireless ad hoc networks which allow communications between vehicles and close roadside equipments. It is appearing as an uprising technology to combine recent generation wireless networking and vehicles [1].VANET offers: (1) ubiquitous connectivity and (2) efficient vehicle-to-vehicle communications which supports the Intelligent Transportation Systems (ITS) [1-3]. VANET's are desired to provide high speed and limited degrees of freedom in movement of nodes being distributed, self constructing communication networks. To create high-presentation, extremely measurable and secured technologies of VANET shows an unusual challenge like handoff to the investigate community of wireless [9]. For the handoff mechanism and information retrieval, the software that aims to provide mobility at the programming level is the Mobile Agent.

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A mobile agent is a program, which epitomize a user in a computer network, and is capable of migrating independently from node to node, to perform some computation on behalf of the user. MA is defined as objects that have behavior, state, and location [4]. Mobile code, and in particular mobile agents, will be an essential tool for allowing such access. Mobile agents are considered as a program, though they have some special properties that differentiate them from the principal programs like mandatory and orthogonal (optional) properties [5-7]. Agents can work without the human interruption or others, reactive or proactive decision making. Agents are an active process which aims to achieve the end objectives.

The call should be transferred to the new cell's base station while a vehicular node travels in a cell (network) during the call else the call will be dropped. This mechanism is termed as handoff. The handover process performed by introducing delays due to discovery, configuration, authentication and binding update procedures associated with a mobility event [17, 18]. Consistent Handoffs (VHO) [10] between heterogeneous nodes in VANET required being fault tolerant to provide smooth roaming, supporting service continuity and Quality of Service (QoS).

The network scenario and the basic functionalities required in the system for content request and delivery [3]. The need to support such group operations is bringing together the requirements of (i) a set of transport services that address the group paradigm and provide Quality of Service based broadcast/multicast and the adequate level of fault tolerance, and, (ii), a broadcast/ multicast routing platform to efficiently route packets to the entire population of the network nodes or to a subset [12]. Information retrieval (IR) defines the systems for identifying and presenting documents to relate to mobile environment needs.

2. RELATED WORK

The two major issues in implementing the mobile agents in VANET were Agent naming and mobility[3]. An agent should be uniquely defined that their communication should be controlled during the travel in network [13]. Quality of service (QoS) is the assessment of a service provided by the network to the end user. The more deterministic network performance could be achieved with the mobile agents, so that information processed by the network can be better conveyed and network resources can be effectively used. Qualities of Service (QoS) management parameters are important for alleviating multimedia services in a network. A typical QoS architecture should support the following: configuration, prediction, and management of QoS at all the levels of abstraction (user, system and network level); management, control, and processing of a flow must be distinct activities; application must be transparent from establishment and management; asynchronous resource management of different components; and performance enhancement. An agent based QoS architecture do supports all these features [14]. Mobile agents can better address these issues in VANET [1-3]. In this technique, we propose an intelligent agent based network that can be provides [3].

In paper [15], for the MA based handoff in wireless network, it is very important to employ the call admission control (CAC) mechanism in the mesh router. First, call admission control is a critical step for the provision of QoS guaranteed service In this paper, a proportional threshold based optimal access bandwidth policy for CAC on the mesh router is deployed, which adopts threshold structure and gives handoff calls and new calls different priorities. In paper [15], the set of all possible proportional threshold structured CAC policies can be described as a space of all possible CAC policy vectors. To achieve Optimal Statistical Access Bandwidth, a straightforward method is to employ brute-force search. However, the method of brute-force search usually has

tremendous computational complexity. Genetic algorithm (GA) to search for the near-optimal solution. A genetic algorithm is an adaptive heuristic search program that applies the principles of evolution found in nature. The results show that, our GA algorithm can reach the convergence after 20 generations, thus can guarantee an efficient implementation.

For seamless handoff it is a challenging task to provide mobile users with QoS guaranteed service, especially when the traffic load in WMN is heavy. That is, handoff calls have to be given more preference than new calls in the CAC process, since users are much more sensitive to call dropping than to call blocking.

In [16], proposed the mobile agent architecture to provide application service in mobile computing environment. Even though, paper [16] is to compare the performance of client server architecture and fault tolerance mobile agent system, and cared about security aspects too. A mobile agent is created and dispatched to the certificate authority [7, 16].

Mobile agent is dispatched to the mobile server if request is accepted. Mobile server gets the location of the server system corresponds to the user request from server selection database. Mobile agent is dispatched to the server system for required processing. It is retracted from the mobile server and replica agent (RA) is created. It also has the functionality for monitoring with the mobile host when it returns a mobile agent. If the mobile host is currently lost, the replica agent is set to the inactive status. After the mobile host is connected to mobile server, replica agent is set to active status and it is migrated from the mobile server to the mobile host. Mobile server knows that mobile host had already moved to the cell of another mobile server using IETF's IP mobility Support [5]. To implement, we selected Aglet as a mobile agent platform after analyzing different mobile agent platforms such as Aglets, Grasshopper, Voyager etc [6].

3. PROPOSED WORK

In [1], VANET parallel mobile agent architecture is used to perform the better transmission of mobile agents, the client initiates multiple MAs, each of which visits a number of nodes in VANET. The MAs then return to the client and collect their results to complete the task. When the traffic load in VANET is heavy, many researchers believe that (Call Admission Control) CAC [2] aims handoff calls have to be given more preference than new calls, since users are much more sensitive to call dropping than to call blocking [2].

We adopt a proportional threshold based optimal access threshold structure to implement CAC which, gives Seamless handoff calls and new calls different priorities, and offers high access bandwidth [9]. We apply mobile agent technology to VANET, each vehicular node is assigned a "C_MA" (Client's Mobile Agent), to provide seamless handoff. The mesh client places its C_MA in the mesh router that it registers with [3]. If the C_MA moves from the range of one vehicular node to that of another vehicular node too. When a vehicular node wants to handoff, it will inform its current MH first.

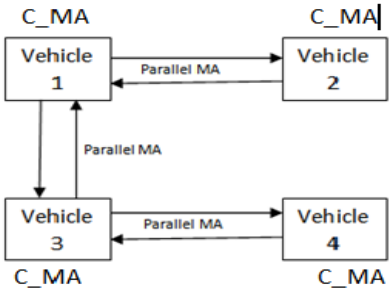

Fig. Special mobile agent**.**

Then the current MH (Mobile Host) transfers the C_MA to the different MH for information retrieval for better handoff in neighborhood. To get the complete benefit of mobile agent system, a suitable information retrieval system for fault tolerance should be taken.

For fault tolerance mechanism, check pointing and replication system is adapted to increase the reliability of the system. All the C_MA makes a duplicate copy of data at each vehicular node called IM_node, makes the system fault tolerance, when they migrates until the destination not found. In this paper we use timestamp 'Ti' and threshold 'Th' for making the system time consuming and reliable, that after a timestamp the data will be invalid.

When C_MA reaches its final node then the communication operations between clients and replicated database servers are implemented using Mobile Agents, takes queries from other vehicular nodes and returning results to them. During the communication system the system must be secure. In this paper we use an authentication system for the secure communication. This authentication system uses a handshaking mechanism, when mobile agent sends request to the MH (vehicular node) for duplicate copy the server first check for the authentication by knowing the digital signature of the agent migrates for.

Mechanism:

```
{
If C_MA==active
//Mobile Agent migrates in the network for //data for handoff
For all IM_nodes
        If IM_node! = vehicle
{
MH_data = C_MA_data;
 //Make a copy of data at //MH
                }
// make a time stamp 'Ti'
For all C_MA i=1 to n
If (C_MA_lifetime<= Ti && C_MA>=Th)
        {
        Security ();
        Use data for handoff.

}
Else
        C_MA++
```

```
}

Security(data)
{
        For all MA
                If (D_sig[MAi]==D_sig)
//Use hash/digital signature function for //authentication
{
        Return;
}
}
```

4. CONCLUSION AND FUTURE SCOPE

In VANET, for better and dynamic data communication, a fault tolerance handoff mechanism plays an important role in the handover process between the vehicular nodes during the vehicles are running on the road then mobile agent plays a important role in retrieving the information during the handoff process. Our research gives a mechanism for fault tolerant mobile agent based information retrieval system with security improvements. A method for fault tolerance information retrieval is given in VANET while traffic is moving with random speeds for random time intervals. Special Mobile agents are considered a suitable technology to develop applications such as information retrieval system for mobile computing environment.

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