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Contingency-Inattentive Migratorial Services in Mobile Ad-Hoc Networks

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Abstract: We propose a completely different approach to Short range wireless technology is on its way to becoming ubiquitous, and it will soon be possible to program real-world mobile Ad-Hoc networks, which can be formed spontaneously for example, vehicles on the road or deployed for specific tasks in specific regions for example, monitoring a certain region during an emergency situation. Traditionally, mobile Ad-Hoc networks have been viewed as data carriers between a mobile device and an Internet server or between two mobile devices. However, besides transferring static data to/from mobile nodes, these networks can be leveraged to provide a new class of services that acquire, process, and distribute real-time information from nodes located in the immediate proximity of geographical regions, objects, or activities of interest. For instance, a mobile ad hoc network of vehicles can provide traffic information from a region 10 miles ahead of a given car on a highway, whereas an ad hoc network of intelligent video cameras can transmit images from the proximity of a disaster area.

Key words: Short range wireless technology, mobile Ad-Hoc networks, migratorial services, network simulator, digital assistants, GPRS interface, entity-tracking.

I.INTRODUCTION

We propose a novel model of service provisioning in mobile Ad-Hoc networks based on the concept of contingency inattentive migratorial services. Unlike a regular service that executes always on the same node, a migratorial service can migrate to different nodes in the network in order to accomplish its task. The migration is triggered by changes of the operating contingency, and it occurs transparently to the client application. We design and implement a framework for developing migratorial services.

However, besides transferring static data to/from mobile nodes, these networks can be leveraged to provide a new class of services that acquire, process, and distribute real-time information from nodes located in the immediate proximity of geographical regions, objects, or activities of interest. Building such services is difficult because the rapidly changing nodes' operating contingencys can often lead to situations where a node currently providing a certain service becomes unsuitable for hosting that service any longer.

Mobile Ad-Hoc networks can be used not only as data carriers for mobile devices but also as providers of a new class of services specific to ever-present computing environments. Building services in mobile Ad-Hoc networks, however, is challenging due to the rapidly changing operating contingencys, which often lead to situations where a node hosting a certain service becomes unsuitable for hosting the service execution any longer. Short-Range wireless technology is on its way to becoming ubiquitous, and it will soon be possible to program real-world mobile Ad-Hoc networks, or deployed for specific tasks in specific regions for example, monitoring a certain region during an emergency situation. Traditionally, mobile Ad-Hoc networks have been viewed as data carriers between a mobile device and an Internet server or between two mobile devices.

II.SYSTEM OVERVIEW

Mobile Ad-Hoc networks can be used not only as data carriers for mobile devices but also as providers of a new class of services specific to ever-present computing environments. Building services in mobile Ad-Hoc networks, however, is challenging due to the rapidly changing operating contingencys, which often lead to situations where a node hosting a certain service becomes unsuitable for hosting the service execution any longer. Short-Range wireless technology is on its way to becoming ubiquitous, and it will soon be possible to program real-world mobile Ad-Hoc networks, or deployed for specific tasks in specific regions for example, monitoring a certain region during an emergency situation. Traditionally, mobile Ad-Hoc networks have been viewed as data carriers between a mobile device and an Internet server or between two mobile devices.

We propose a novel model of service provisioning in mobile Ad-Hoc networks based on the concept of contingency inattentive migratorial services. Unlike a regular service that executes always on the same node, a migratorial service can migrate to different nodes in the network in order to accomplish its task. The migration is triggered by changes of the operating contingency, and it occurs transparently to the client application. We design and implement a framework for developing migratorial services. However, besides transferring static data to/from mobile nodes, these networks can be leveraged to provide

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a new class of services that acquire, process, and distribute real-time information from nodes located in the immediate proximity of geographical regions, objects, or activities of interest. Building such services is difficult because the rapidly changing nodes' operating contingencys can often lead to situations where a node currently providing a certain service becomes unsuitable for hosting that service any longer.
Typically, service interaction models are connection oriented: clients select services, bind to the service interfaces, and then invoke operations on these interfaces. As the environment and network connectivity change, different rebinding techniques can be employed in an attempt to maintain the illusion of a connection-oriented communication. The simplest way to address such an issue is to require the client to discover a similar service running on a different node every time the old node becomes unsuitable, and then restart the interaction with the new one. There are two potential issues posed by this solution. First, it is possible that no other node providing the service of interest exists in the ad hoc network; rather than offering all possible services, each node will tend to offer just a small set of services determined by its owner or resources. Furthermore, even though another node providing the service of interest may exist, such a node could still be incapable of hosting the service execution due to its current operating contingency for example, low battery power. Second, any state associated with the old service execution is lost unless a handoff mechanism is employed. In addition to these issues, the deployment of services in mobile Ad-Hoc networks is hampered by the possible unavailability of Internet connectivity. Due to costs, limited resources, or deployment issues, Internet connectivity is not always available in these networks, thus precluding the use of Domain Name System (DNS). and well-known service discovery protocols such as Jini and WS-Discovery.

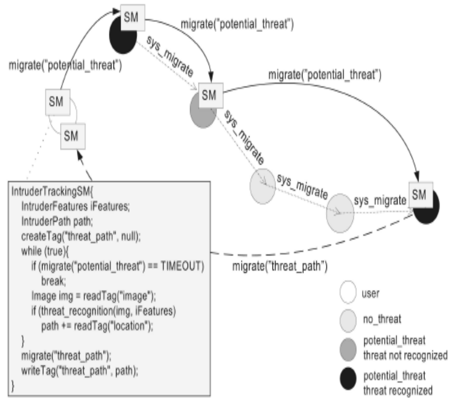
III.THE WORKING PRINCIPLE

Contingency-Inattentive Migratorial Services:

A prominent interest behind the deployment of services in mobile Ad-Hoc networks originates from their capability of exploiting temporary and unstable network support to acquire real-time information in the proximity of geographical regions, entities, or activities of interest. We assume that nodes in these networks are willing to collaborate; some nodes offer services, others host client applications, and the rest cooperate to provide service discovery and routing of messages. To achieve its goal, in principle, a service of this type can contact other services, thus acting as a client for those services. Intuitively, this kind of service is capable of migrating to different nodes in the network in order to effectively accomplish its functions. It executes on a certain node as long as it is able to provide semantically acceptable results using the available resources; when this is not possible anymore, it migrates through the network until it finds a new node where it can continue to satisfy the client request. The service migration occurs transparently to the client and, except for a certain delay, no service interruption is perceived by the client. Although a migratorial service is physically located on different nodes over time, it constantly presents a single virtual end point to the client. Hence, a continuous client-service interaction can be maintained.

An entity-tracking client application can provide policemen with real-time images of certain suspicious entities (for example, people and cars) as they move across a given region, as well as with alerts every time a potential threat is recognized. This type of application particularly suits crowded events such as political conventions, conferences, and manifestations in which it is hard to quickly deploy wired networks of video cameras. A more feasible and cost-effective solution is to exploit a mobile ad hoc network of wireless video cameras that, for instance, can be installed on police patrols and policemen's helmets (both mechanisms have already been tested in real-life events). Tracking services execute on each video camera; they are capable of performing image recognition of entities specified by policemen and sending back images of those entities. There are two factors, however, that can force the client to interrupt its current interaction with a certain tracking service and start a new interaction with a different service:
1) The node where the service executes is mobile and might move away from the tracked entity and
2) Likewise, the tracked entity is mobile and might move away from the sensing range of the service node.

Simple Architecture: Migratorial Service



Vehicular ad-hoc networks:

Vehicular ad-hoc networks (VANETs) form when vehicles are equipped with devices capable of short-range wireless communication. Accurate simulation of VANETs is a challenging task, requiring both a vehicle mobility model and a network simulator. Although separate simulators exist, integrating them is difficult. We have developed an integrated simulator, based on studied, validated models. We argue that our simulator can be used for the studying of a large range of VANET protocols and applications, which would be very difficult to study by using other tools.

Vehicle-to-vehicle communication is a very challenging topic in recent years. Vehicles equipped with devices capable of short-range wireless connectivity can form a particular mobile ad-hoc network, called a "Vehicular Ad-hoc NETwork" (VANET). The existence of such networks opens the way for a large range of applications. We consider that two of the most important classes of such applications are those related to route planning and traffic safety. Route planning aims to provide drivers with real-time traffic information, which would, in the absence of a VANET, require expensive infrastructure. By contrast, the VANET approach is highly scalable and has very low maintenance costs. Moreover, short-range wireless communication technologies have no associated cost, other than the communication device.

Safety applications involve disseminating urgent information, which is unavailable in the driver's field of view, or is difficult to notice for reasons such as fog or other vehicles obstructing the line of sight. For instance, a lot of accidents occur in foggy conditions, because drivers notice too late that some kind of incident has occurred in front of them. Safety at intersections could also be enhanced, because the risk of collisions could be detected in advance and the driver could be warned seconds before what would otherwise be an imminent accident. Most applications to be deployed on top of a VANET require some sort of data-dissemination model. This is a challenging problem, due to the unique characteristics of a VANET. Such a network has a very high degree of nodes' mobility and a very large scale. Network partitioning occurs frequently, making end-to-end communication impossible at times. Several studies show that the performance of classical, topology-based routing protocols in vehicular networks is poor, due to the extremely high mobility of the nodes.

The evaluation of VANET protocols and applications could be made through real outdoor experiments, which should involve a large number of nodes, in order to obtain significant results. However, performing such large-scale experiments is extremely difficult. Therefore, simulation is an indispensable tool. The simulation of a VANET requires two different components: a network simulator, capable of simulating the behavior of a wireless network, and a vehicular traffic simulator, able to provide an accurate mobility model for the nodes of a VANET. Recent studies have proven that the vehicular mobility model is very important, and in order to obtain relevant results, it should be well integrated with the wireless network model. The use of an inaccurate mobility model, like the popular random waypoint model (which may work for some mobile ad-hoc networks, but is definitely not an accurate representation of mobility in a VANET), can lead to erroneous results.

Simulating a vehicular network involves two different aspects. First, there are issues related to the network, such as medium access control, signal strength, propagation delays. Network simulators, like "The Network Simulator – ns-2" and Jist/SWANS , cope with such issues. However, a general-purpose wireless network simulator is by no means enough for an accurate simulation of a vehicular network. Nodes in a wireless network usually move according to the random-waypoint model. This means they have an origin and a destination and move towards the destination. But vehicles only move along roads and that is a very particular situation. Furthermore, real vehicles move according to very particular traffic models, due to the street topology, intersections, traffic regulations and drivers' behavior. That takes us to the second very important aspect of a vehicular network simulator, which is using a mobility model as close as possible to real vehicular mobility. Vehicular traffic simulators can be classified in macroscopic and microscopic simulators. Macroscopic simulators such as those in[13]deal with global measures, like traffic flow, while microscopic simulators take into account the movement of each particular vehicle.

There are a lot of commercial vehicular traffic simulators. They have not been designed especially for vehicular computing. They are primarily used to study traffic, in order to validate projects, like building a new road, or a new tram line, or for designing effective traffic signals. An example of a commercial vehicular traffic simulator is VISSIM . It is a microscopic simulator and implements driver behavior models, like car-following or lane changing. According to its producers, it is used in over 70 countries. An integrated simulator was developed by a team at Northwestern University. It is based on an original vehicular traffic model, called Street Random Waypoint (STRAW). Their simulator is implemented on top of JiST/SWANS, and it is free and open-source. The authors have used the simulator in order to prove that studying routing protocols for a vehicular network without an accurate vehicular traffic model is a wrong approach. In this respect, they compared results obtained with the Random Waypoint model (which is a very inaccurate representation of a vehicular network) with results obtained with the STRAW model

IV.IMPLEMENTATION OF SYSTEM

Creating Edit form

Include the following code in a JSP page (editjsdata.jsp) this is for my example

```
<%
// creating local variables
String email= request.getParameter("email");
// connecting with DB
java.sql.Connection
mycon=DB.MyDBBean.getDataBaseConnection();
// preparing SQL java string version
String q="select * from jsdata where email=' "+email+" '
";
// creating Statement OBject
java.sql.Statement stmt=mycon.createStatement();
// invoking executeQuery() ---------   ResultSet Object
java.sql.ResultSet rs= stmt.executeQuery(q);
// rs contains list of rows returned by your sql query
String tname=null, tphn=null, tqual=null;
if(rs.next())
{
tname=rs.getString(2);
tphn=rs.getString(4);
tqual=rs.getString(5);
%>
```

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```
<form action="EditJsActionServlet" method="POST">
<table border="0">
<tbody>
<tr>
<td>Your email is :</td>
<td>
<%=email%>
<input type="hidden" name="email"
value="<%=email%>">
</td>          </tr>          <tr>          <td>Your
Name is :</td>
<td>
<input type="text" name="n" value="<%=tname%>" />
</td>                    </tr>
<tr>
<td>Your Phone Number is :</td>          <td><input
type="text" name="phn" value="<%=tphn%>" /></td>
</tr>
<tr>          <td>Your Qualification is</td>
<td><input type="text" name="q" value="<%=tqual%>"
/></td>
</tr>          <tr>          <td><input type="submit"
value="Edit MY Data" /></td>
<td></td>          </tr>
</tbody>     </table>
</form>
}     else
{
%>
<h1>Email id is not available</h1>
<%
}%>
```

Edit Action Logic
This is a servlet code for edit your data

```
try {
// creating local variable
String e=null, n=null, p=null,q=null;
e= request.getParameter("e");
n= request.getParameter("n");
p= request.getParameter("p");
q= request.getParameter("q");
// creating Connection Object
java.sql.Connection mycon=
DB.MyDBBean.getDataBaseConnection();
// creating SQL query -- Update for 3 with where for email
String q1="update jsdata set
name='"+n+"',phone='"+p+"',qualification='"+q+"' where
email='"+e+"'";
// creating STMT Object
java.sql.Statement stmt= mycon.createStatement();
// invoking executeUpdate() int

int i= stmt.executeUpdate(q1);
if(i>0)                    {
// RD
javax.servlet.RequestDispatcher rd=
request.getRequestDispatcher("viewalljsdetails.jsp");

rd.forward(request, response);
}          else
{
javax.servlet.RequestDispatcher rd=
request.getRequestDispatcher("viewalljsdetails.jsp");
rd.forward(request, response);
}
} catch (Exception e) {
out.print(e);

}
```

VI.TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

Functional test:
Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals. Functional testing is centered on the following items:
Valid Input :identified classes of valid input must be accepted.
Invalid Input :identified classes of invalid input must be rejected.
Functions :identified functions must be exercised.
Output :identified classes of application outputs must be exercised.
Systems/Procedures :interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

System Test:
System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

VI. Future Enhancements

We used this framework to build a migratorial service prototype, which was evaluated using an ad hoc network of PDAs, as well as large-scale simulations. The experimental results demonstrated the viability of our model in highly dynamic mobile Ad-Hoc networks such as cars moving on a highway. In future this project can be

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extended to take the coordinates information from GPRS interface and update the database through the central server periodically and sending the information for each path which is taken by the mobile devices thus enabling the administrators and the program which is running at the server side to better calculate the distance for the migratorial service.

VII. CONCLUSION

In this project, we presented a contingency-inattentive service model that allows mobile Ad-Hoc networks to provide services that quickly adapt to contingency changes while still guaranteeing service continuity to the client. A migratorial service framework monitors these changes and reacts by triggering a service migration each time it renders the current hosting node unsuitable for supporting the service execution any longer. As a result, the service resumes its execution on a new node where it can effectively accomplish its task. Service migrations are transparent to client applications because the framework constantly presents a single virtual end point for every migratorial service.

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