THE IMPLEMENTATION OF PRESENTATION SERVICE USING JAVA WEB SERVICES

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Abstract

Recently, Location-based services (LBS) allow consumers to receive services based on their geographic location data. For example, these services can provide information to find a traffic facility, a public restaurant, a hospital, and a station based on the consumer’s location. Soon, the standards of the Open GIS Consortium, Inc. (OGC) are going to establish including the route determination services, directory services, location utility services, presentation services, and navigation services on LBS. According to the fast development of devices such as PDA, cellular phone, smart phone and so on, these services are brought into relief. Also, a lot of killer applications connected with LBS are produced and many services put in operation. In this paper, open presentation services related to the open LBS platform are proposed and we implements in the handset devices using WIPI (Wireless Internet Platform for Interoperability), meaning Korean wireless telecommunication standards and the open presentation services are based on Java Web Services.

INTRODUCTION

The importance of location based services grows highly as the development of mobile communication. For user’s convenience, several location based services such of the route determination, directory, location utility and navigation service are proposed. For this tendency, the program is implemented in this paper to present a map in mobile device based Java Web Services technology without Korean mobile communication companies’ various platform. These services consisted of Java based Web Services are available in various platform. These structures of EJB (Enterprise Java Bean) are used to implement them and we have simulated it by PC. And as the form of correspondent to the standard of OpenLS specification, a map presentation program was designed and implemented. Also, the opened LBS platform was supported, used the SOAP and XML as the data transformation standard.

WEB SERVICES

Now, the fundamental standards promoted on W3C are XML (Extensible Markup Language), UDDI (Universal Description Discovery and Integration), WSDL (Web Service Description Language), SOAP (Simple Object Access Protocol). And Figure 1 shows the basic structure of web services. The XML schema defines web service’s basic data format, UDDI provides web services publication, advertisement, and outer web service’s findings. WSDL provides the detailed information necessary to invoke a particular service (Chappell and Jewell, 2002).
Web Services is one of the latest developed technologies in fields such as e-business, m-commerce, and so on. Web Services’ goals are enabling universal interoperability, enabling dynamic binding and supported both open Web and more constrained environments. Web Services are consisted of service requesters, service registries, and service providers. Web Services in this paper are based Java XML (extensible markup language) Web Services in data implementation layer, therefore these technologies can be operated each other in the core layer, and supported several standard protocols (SMTP, HTTP, FTP). Also, they show input/output parameters, the structure of function, and service protocol binding using the WSDL stated Web Service’s interface (Bequet et al., 2002).

Figure 2 shows that the service requestor asks the service registry to find its desired service. Then, the service registry searches the registration data of provider and sends the service provider’s connection URL or information of service to the service requestor. So, the service requestor combines to the service provider through the connection URL, and receives services.

XML-RPC is a specification for representing remote procedure calls and results using XML in a simple yet powerful way. Figure 3 explains the communication procedure of XML-RPC based Java language. If client calls a Java method, the method is serialized by XML, enveloped SOAP and transported using the standard protocols. And in response it can be accepted java method. In the procedure, it can be communicated either .NET or J2EE platform. Presentations service provides a map using web service. Figure 4 shows the whole system of presentation service. The system called a presentation service in the mobile device as a Web Services form connected a wireless network WIPI platform.
PRESENTATION SERVICE

1) Presentation service form

Figure 5 shows a presentation service system flow. First, the users input the parameters of presentation service. And the data such as width, height and format are set up the map initialization, we connect to DB with spatial operation, we generate a map of POI, position, and route information, the output parameters used Literal XML. And Figure 6 shows presentation map generation flow.
The proposed system in this paper is the presentation service in the mobile device as a Web Services form connected a wireless network WIPi platform. In server side, the presentation service’s structure are consisted of input part through the XML format, DB connection part, image map creation part, and output parameter generation part. In this paper, it needs to show the XML generation part and image viewer part. If the client would request a map with the OpenLS core services such as route determination service and POI (Position of Interest) service and position service, the system provides base64 encoded PNG images using the Web Services for the users and implements it through J2EE-EJB (Christenson et al., 2001, and Johnson, 2002).

2) Presentation service schema
Figure 7 and Figure 8 shows respectively request and response definition XML file of presentation service XML schema. The presentation service supported in this paper keeps proposed OpenLS standard perfectly (Open GIS Consortium Inc., 2002).
3) Presentation service test environment

Presentation service supports OpenLS presentation functionality and met the XLS (XML for location services) requirements. As previously stated, they provides simplified map data like PNG (Portable Network Graphics) image and represents the overlays for route, POI, Position information. Java web based services and literal SOAP message are implemented. And the presentation service supported in this paper really keeps proposed OpenLS standard perfectly.

Table 1 shows test environment of presentation service. JDK compiler version is Java SDK 1.3 version and web service toolkit is Apache AXIS toolkit. And DBMS is Oracle 9.2.0.1 supported spatial operation, WAS (Web Application Server) used IBM WebSphere Application Server 5.0, Java developer tool is WSAD (WebSphere Studio Application Developer).

<table>
<thead>
<tr>
<th>Test Environment factors</th>
<th>Language</th>
<th>J2EE 1.3 EJB + J2SE 1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SOAP</td>
<td>Apache AXIS</td>
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<tr>
<td></td>
<td>DBMS</td>
<td>Oracle 9.2.0.1 + SDO</td>
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<tr>
<td></td>
<td>WAS</td>
<td>IBM WebSphere Application Server 5.0</td>
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RESULT & DISCUSSION

Figure 9 shows position and POI display. The text included in the Figure 9 consists of Korean language.

Figure 10 and Figure 11 shows the OpenLS specification suggested XML files of PortrayMapRequest and PortrayMapResponse. Figure 12 shows the result of the experiment using a Korean language. According to the input XML parameters, a lot of map images are created. In the map request part, input parameters are consisted of several Overlay tag, Output tag, and Basemap tag. At First, Overlay tag has one of POI, position, RouteGeometry. And the second, Output-tag has width, height, data format, and parameters of rendering the map. At last, Basemap-tag has several layers that are capable of drawing map in the interested area. In the response part, output parameter has a Map tag. And this
The implementation of presentation service using Java web services

tag is consisted of either CenterContext tag or BBoxContext tag and Content tag. The Content tag has either Data tag or URL tag. The Data tag is Base64 encoded data and URL is address of providing data.

Figure 10: OpenLS PortrayMapRequest.

Figure 11: OpenLS PortrayMapResponse.

Figure 12: XML request & XML Response.
Now, it is going to be establishing the standards of OpenLS specification. If the standard will be completed, original source codes reproduction are need for the modified standard.

The presentation service’s problems are as follows. The OpenLS specification is not fixed finally. Also, map presentation service is not flexibly adapted. Map drawing module is static provided by each level. Before long, map drawing module will be dynamically created without levels.

CONCLUSION AND FUTURE

We implements a presentation web service which is supported multi-platforms. The implemented system in this paper is the map presentation service based Java fit for OpenLS specification and supported the architecture implementation of multi-platforms, both .NET and J2EE.

Yet, OpenLS specification is not standard but only request for comments. In the future, if the standards publish completely, we will implement Web Services properly.

REFERENCES

Christenson, E., Curbera, F., Meridith, G. and Weerawarana, S., 2001: Web Services Description Language (WSDL) 1.1, W3C Note (March 15, 2001), see http://www.w3.org/TR/wsdl.