ROLE OF MOBILE COMPUTING & MOBILITY IN MANET & WEB SERVICES

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Abstract

This publication perform seeks to determine the role of mobile computing, computations, and mobility techniques and methodologies in web services. Our work light on high speed, multi-media & internet access to cell phones and wirelessly-enabled PDAs etc. The rollout of 3G technologies and the emergence of wireless LAN technologies are now important drivers in today's fast and technological era. These are the building blocks for today's mobile commerce. We are making pretty use of Computer Programs, Communication Networks & Computer Science applications to evolve new technologies and internet access architectures. Here we will list out the certain concepts and fundamentals that explores the role of Mobile Computing in today's new and emerging web technologies, web services & Personalized Information Systems.

Keywords: Web services. Mobility, MANET Cellular Networks

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1. Introduction

This paper deals with the formulations and approaches towards different modeling techniques for computing out results in modern mobile scenario. We have to maintain the communications between the entities through internet, video calls, short message services (SMS) and MMSs etc. Today everybody is updating his/her location geographically one way or the other in work environment or personalized information world.. Authentication, security and other communication facilities through web services are rendered only by the evolution Mobile Computing which in turn uses the key fundamentasl for Computer Science. It is the field of study concerned with constructing various accessing environment and avail various web services to acces remotely or indimationrectly available information. It can be understood as mobile computing.. In practical use, it is typically application internet and mobile computing to nurture and offer various web services and information exchanging systems ie. PIS. At the same time, device capability is increasing. Devices capable of increased processing power are coming to market and the availability of Java on wireless devices is opening new possibilities, not only for delivering data to mobile devices but for using those devices to deliver information to the enterprise in new ways. The Java 2 Micro Edition (J2ME) [1] allows developers to use Java to develop applications for mobile devices including cell phones and PDAs.

2. Mobile Computing

"Mobile computing [2] is the ability to use computing capability without a pre-defined location and/or connection to a network to publish and/or subscribe to information".

Mobile computing is a form of human–computer interaction by which a computer is expected to be transported during normal usage. Mobile computing has three aspects: mobile communication, mobile hardware, and mobile software. The first aspect addresses communication issues in ad-hoc and infrastructure networks as well as communication properties, protocols, data formats and concrete technologies. The second aspect is on the hardware, e.g., mobile devices or device components. The third aspect deals with the characteristics and requirements of mobile applications.

2.1 Web Services technology and Mobile Computing

Web Services technology profoundly affected distributed computing after it first emerged a few years ago. Like its predecessors, such as the Common Request Broker Architecture (CORBA) [3], Remote Method Invocation (RMI) [4] and Distributed Component Object Model (DCOM) [5], Web Services' primary goal is to inter-relate distributed functionalities. But unlike its predecessors, it achieves its goal in an elegant and technology-neutral manner; it provides well defined interfaces for distributed functionalities, which are independent of the hardware platform, the operating system, and the programming language. So distributed functionalities, or *services*, which may be running on different hardware platforms, may be running in different operating systems, or may be written in different programming languages, can communicate through web Service interfaces.

2.2 The Emergence of Web Services

While a Semantic Web offers the possibility of supplying context for mobile computing, the unique character of mobile networks opens up new opportunities to leverage the emerging Web services frameworks centered around asynchronous, message-based middleware. Web services represents a shift in distributed computing from tightly-coupled networks to a more loosely-coupled architecture that is well suited to the addition of mobile networks and devices. There are three major aspects to Web Services:

1. A **service provider** who provides an interface for software that can carry out a specified set of tasks.
2. A **service requester** who discovers and invokes a software service to provide a business solution. The requestor will commonly invoke a remote procedure call on the service provider, passing parameter data to the provider and receiving a result in reply.
3. A **broker or repository** that manages and publishes the service. Serviceproviders publish their services with the repository and request access to those services by creating bindings to the service provider.

The Web services technical infrastructure ensures that services even from different vendors will interoperate to create a complete business process. Web services accomplishes this by defining new ways of interacting through the registration, discovery, and connection of software packaged as Web services. While still in its early stages, Web services holds the promise of extending the Web from an infrastructure that provides services to humans to one that provides services to software looking to connect with other software. For IT organizations and end users, Web Services makes possible new ways of thinking about the enterprise, working with partners and suppliers and doing business over the Web. For mobile users these opportunities include the following.

2.2.1 Corporate Intranets

The Web Services model of discovery and connection makes it possible to use standard web technologies to promote communication and information distribution within the organization.
Partners and Suppliers. Web Services opens up similar opportunities for connecting between partners and suppliers. For example, by defining an interface that describes how to access inventory data and publishing that interface on a server available to trusted partners, a company can make timely information available to other

companies without requiring that partners share a common network. All that is needed is an Internet connection and an agreement to share data on controlled access servers. Internet-based e-commerce. By publishing a Web service interface on publicly available server repositories, companies can tap into a global base of Web servicesaware clients who will be scouting repositories for matches to their needs. This ability to describe functionality as a service interface also opens the door to new uses for legacy systems.

2.2.2 The Process

While the various technical forces (XML, HTTP, SOAP) lay the groundwork for platform independent software interconnection, there still remains the problem of how software systems can actually begin to communicate with other software systems written in different languages and running on the different platforms for one system to find another and begin communicating. The

Web Services vision is that systems with no prior knowledge of each other can begin to communicate despite internal differences. Web Services addresses this problem by defining rules of engagement that build on HTTP, SOAP and XML. These new rules of engagement provide:

•**Description:** The Web services model specifies white pages that list the identity of a service provider, yellow pages that categorize services and green

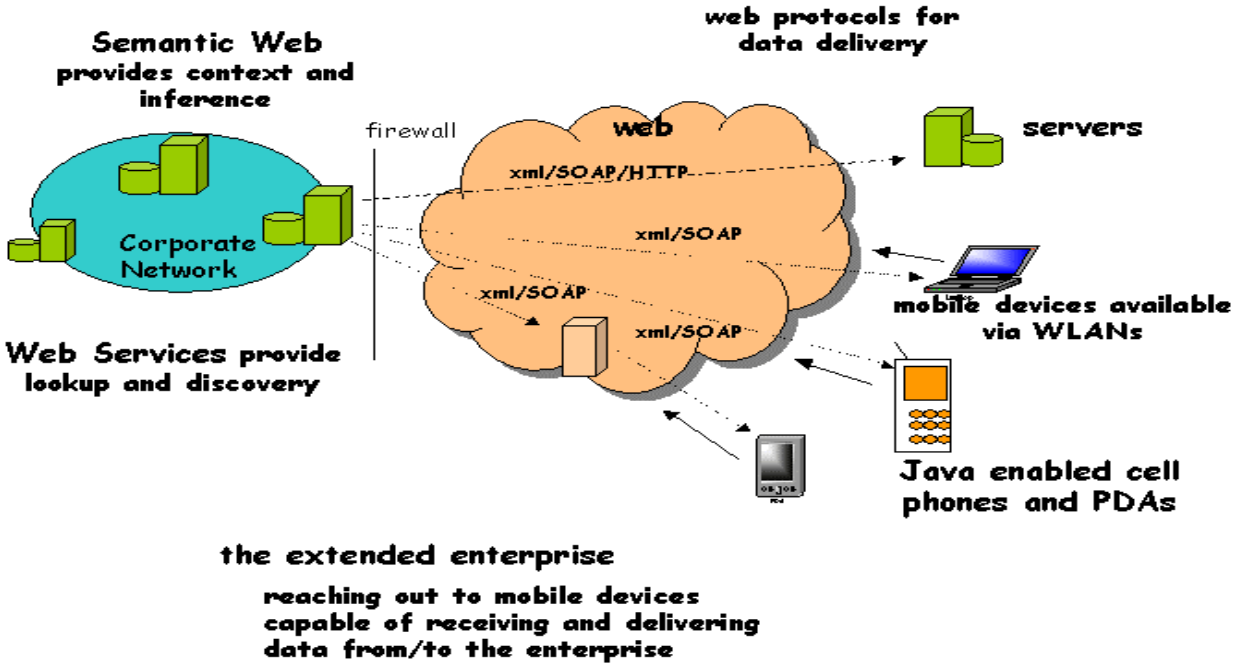

Figure (1): The Semantic Web and the Web Services' XML-based protocols opens up new opportunities for mobile commerce.

pages that describe how to connect and use a service. Providers are responsible for defining this information.

•**Exposure:** Web services repositories host the white, yellow and green pages. Potential clients query repositories and to download descriptors that tell a client how to connect and use the services.

•**Invoking:** Downloaded descriptors tell clients how to invoke a service. The common method of communication is SOAP over HTTP. XML-RPC, a SOAP capability, allows language independent remote procedure calls to be sent to a Web services supplier.

•**Delivering data/services:** When the service has been invoked, XML-RPC returns the any requested data back to the initiating application.

The interoperability of Web Services mainly comes from its Extensible Markup Language (XML) based open standards. The Simple Object Access Protocol (SOAP) [6] is defined in XML. Since it is text-based and self-describing, the protocol can convey 3 information between services in heterogeneous computing environments without worrying about conversion problems. Naturally, there are many other Web Service specifications1. Two of them, which are based on XML, are Web Service Description Language (WSDL) [7] and Universal Description, Discovery and Integration (UDDI) [8]. WSDL defines a standard method of describing a Web Service and its capability, and UDDI defines XML-based-rules for publishing Web Service information. Because of its strong interoperability across diverse services in a distributed environment, Web Service-based Service Oriented Architecture (SOA) has become the backbone of Grid computing. The Open Grid Services Architecture (OGSA) [9] defines a standard Web Service environment for Grid computing.Just as Web Services technology has become an industry standard way of connecting

remote and heterogeneous resources, mobile devices have become a vital part of people's everyday life. People use mobile devices anytime and anywhere, (e.g. cellular phones, PDA devices with either a cellular or a wireless local area network (WLAN) connection based on the IEEE 802.11 specifications [10], and hand held game consoles). In this dissertation, we define mobile devices to be those that are not only small size computing devices, but are also equipped with a wireless connection so that they can participate in
some type of distributed computing.

2.2.3 Web Services from Sun Microsystems

Fast Web Services of Sun Microsystems is intended to provide a fast and efficient Web Services specification that is interoperable with existing technologies and minimizes the impact on application developers. It has been developed by the same group of people at Sun as Fast Infoset. The FWS implementation encodes XML information item data using ASN.1 encoding rules, like X.694. The difference between Fast Infoset and Fast Web Services is that Fast Infoset uses a self-contained message while Fast Web Services uses a schema specific binary data format. Fast Web Services provides fast processing and low bandwidth usage by adopting the ASN.1 standard to XML schema. Additionally, since its data transformation is transparent to the application developer, the Web Service Definition Language (WSDL) and higher layer are unchanged in developing applications. But since the approach needs a tailored encoder and decoder – a stub and a skeleton for the schema specific data – it has a limited expand

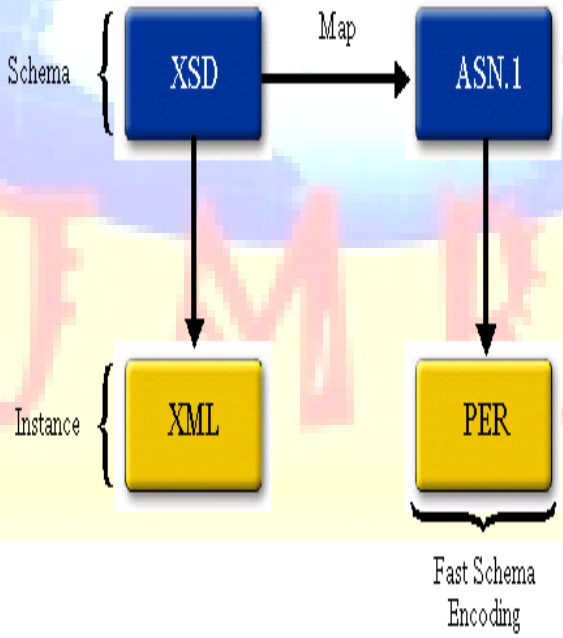

Figure (2) : XML, PER, XSD, ASN.1

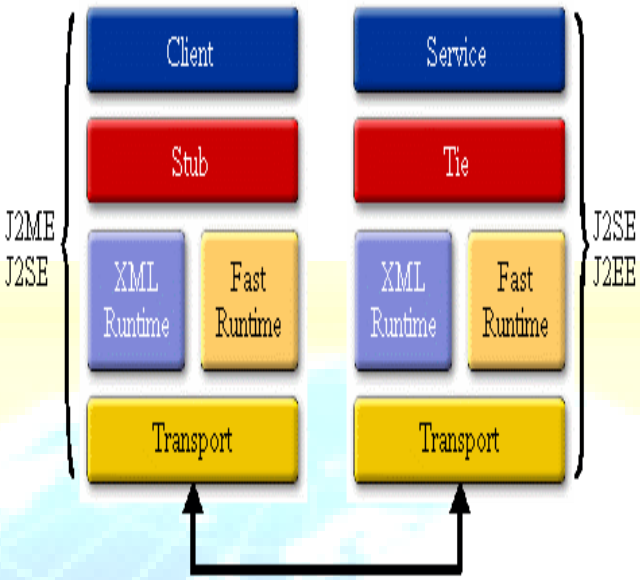

Figure (3) : J2ME, J2SE, XML Runtime, Fast runtime, Stub, Transport

3.MANET:

Mobile ad hoc network is a self-configuring network of mobile devices connected by wireless links. Communication between various devices makes it possible to provide unique and innovative services. The inter device communication is a very powerful mechanism but it is a complex and clumsy mechanism, leading to a lot of complexity in the present-day systems.

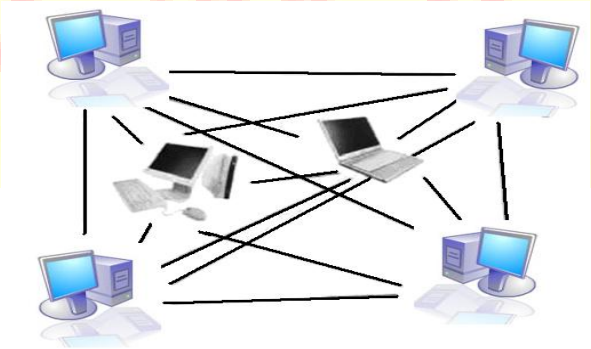

Figure (4) : Mobile Ad-Hoc networks

Mobile ad-hoc networks can turn the dream of getting connected "anywhere and at any time" into reality. Typical application examples include a disaster recovery or a military operation. Not

bound to specific situations, these networks may equally show better performance in other places. As an example, we can imagine a group of peoples with laptops, in a business meeting at a place where no network services is present. They can easily network their machines by forming an ad-hoc network. This is one of the many examples where these networks may possibly be used.

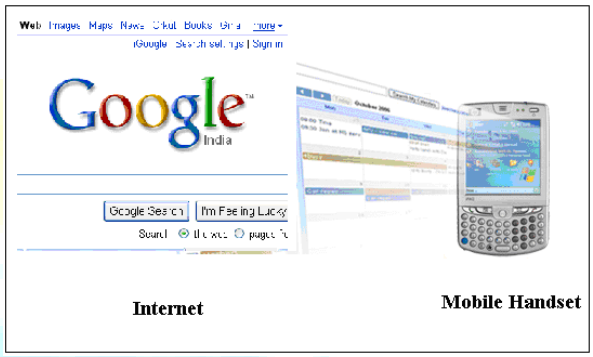

Figure (5) : Internet at Mobile handset

4. XML and Mobile Commerce

One of the foundational building blocks of the Web is XML [4]. Most IT departments have at least been tracking the Extensible Markup Language (XML) over the past several years. During that time XML has emerged as the primary technology for building bridges between different systems. XML's successes include its use as data exchange language between brokerage firms' account systems and various stock exchange order systems. XML is finding increased utility in the wireless world. It is the basis for WAP, theWireless Markup Language and is also used as the basis for XHTML, the next generation XML-compliant HTML that both WAP and i-Mode will be transitioning to in the near future, thus strengthening the connection between wireless and XML. In addition XML also is playing a major role in the middle tier through XML data storage that is used as the source for a wide variety of clients and display types. It's common to expect a wireless strategy to support many different types of clients that expect HTML, WAP, i-Mode, Palm Query Applications, AvantGo, Text, SMS, Paging, or even XML content.One key technology supporting XML for wireless devices is XSLT, the Extensible Stylesheet Language Transform [12]. XSLT supports the Model-View-Controller architectural style [13] where application data may be separated from specific display requirements. As illustrated in Figure 1, XSLT templates can be used to store the markup language-specific content (i.e. HTML, WML,

etc.) and are 'applied' to the XML using an XSLT processor. Combining XML, ASP and database technology provides a powerful mechanism for the development of mobile applications [14]. We describe the development of an application that provides name, rank and phone number information for an organization. The information is accessible from a web browser or a WAP browser on a mobile phone. It uses ASP scripting

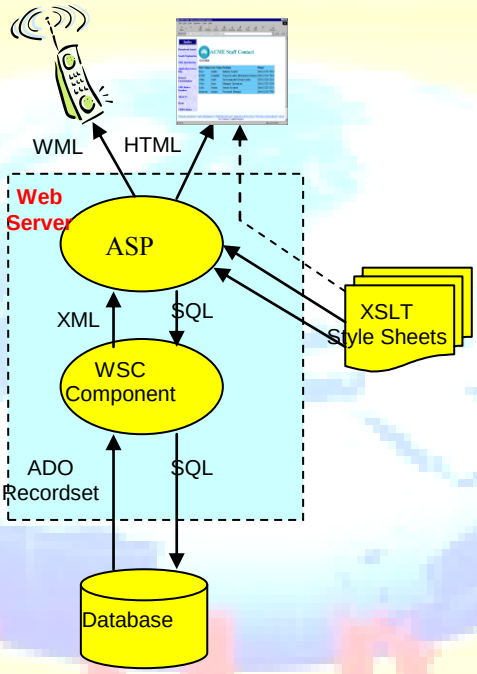

Figure (6)

to query a database and build an XML document satisfying the search criteria. We'll detect the browser type then apply an XSLT style sheet to format the information for display on the detected device. A generic windows scripting component (WSC) derived from that described by Mike D. Jones in a February 7 2000 Active Server Developers Journal article is used to query the database and return the result to an ASP script as an XML document. You can view a working copy of the application at http://mobile.act.cmis.csiro.au and download the files to implement the application. The implementation is illustrated in figure (4).

5. Conclusion

This present work examined the scope and role of the Mobile Computing & Mobilty in MANET and Web Services concepts in improving Web Services. It also discussed the set of applications of various web services that will be used to perform the throughout accessing environment above the geographical and physical world boundaries and limitations. It enhances and empowers the communication strategies and techniques. It can also recall and discuss the role of mobility modeling management, location updating and efficient processing and computing of our data in recently used technologies and modern scenario as per today's need regarding fast movable data.

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