Chapter XXXVIII
Understanding Mobile Web Services (MWS) and Their Role in Integrating Mobile Devices

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ABSTRACT

Web services (WS) have become the industry standard tools for communication between applications running on different platforms, and built using different programming languages. The benefits, including the simplicity of use, that Web services provide to developers and users have ensured integration of Web services architecture by almost all IT vendors in their applications. As expected, with the proliferation of mobile phones, PDAs and other wireless devices, the same requirements of making applications talk across platforms has become necessary on mobile devices. This has lead to the mobile Web services (MWS), which are based on the Web services and related technologies like XML, SOAP and WSDL, and which provide the best choice to be used in the architecture for integration of Web services in mobile devices. This chapter discusses WS and MWS in the context of integration architecture, together with their advantages and disadvantages in usage. Since MWS is deployed using wireless technologies and protocols, they are also presented and explained in this chapter.

INTRODUCTION

Web services (WSs) represent the next major chapter of online computing that has enabled seamless integration of application services across the Internet. WSs are the cornerstone towards building a global distributed information system, in which many individual applications will take part. The centre for that global system will obviously be the WS. As there is no place today for a stand-alone computer, there will be no place for stand-alone applications in the future. Therefore, building a powerful application whose capability is not limited to local resources will unavoidably require interacting with other partner applications through WS. The Internet has been the revolution in networking that links computers and people in a

manner that changes the way we live and work and do business forever. It is believed that WSs will be changing the way we develop software and build applications, in a way that one application will depend on and use many other applications online (El-Masri & Unhelkar, 2005).

The strengths of WSs come from the fact that WSs use XML and related technologies connecting business applications based on various computers and locations with various languages and platforms.

The increase of applications in the mobile world (mobile phones, personal digital assistants (PDAs), etc.) makes it necessary for those applications to communicate with other applications residing on computers on the Internet. WS is a successful architecture for building software applications on the classic network. Recently, Java readied itself for wireless Web services (Yuan & Long, 2002). Microsoft, the leading company in building computer applications, and Vodafone, the leading group in the MS world (Microsoft & Vodafone, 2005a, 2005b) agreed to work together to build standards to facilitate the integration of mobile applications with other applications using a new architecture called mobile Web services (MWSs). Many papers have been published recently in this area (e.g., El-Masri, 2005; El-Masri & Unhelkar, 2005; El-Masri & Suleiman, 2005). The proposed MWSs are to be the base of the communications between the Internet network and wireless devices such as mobile phones, PDAs, and so forth. The integration between wireless device applications with other applications would be a very important step towards global enterprise systems. Similar to WS, MWS is also based on the industry standard language XML and related technology such as SOAP, WSDL, and UDDI. These technologies will be presented with more details in the next sections. Practically, Microsoft .NET framework makes it a simple task to build

a mobile Web application consuming Web services (Arora & Kishore, 2002). Java and IBM also have their own environment for the same purpose.

EXTENSIBLE MARKUP LANGUAGE (XML)

Understanding XML forms the starting point of this discussion, leading into Web services. This is because XML is at the core of WS. XML is a simplified version of SGML (Standard Generalised Markup Language), on which HTML (HyperText Markup Language) is based (Quin, 2004; Ray, 2001). HTML has its own defined tags, which cannot be modified. On the contrary, XML allows users to choose their own tags and elements depending on their need. HTML is a data and presentation language viewed by humans via browsers. XML is a data carrier document and is independent of any presentation using a related technology like XSLT (Extensible Style Sheet Transformation), which in turn is an XML document. The XML document can be viewed with different formats via Internet browsers, PDAs, or mobile phones, or it can be transferred to another XML document. Because of those features, XML represents for IT vendors a brilliant future as a common language and a medium to exchange data independently of the languages and the platforms used by applications. XML is dramatically and rapidly changing technology, and many believe that XML is the next revolution in technology. Below is an example of a simple XML document of a health record of a patient:

```
<?xml version="1.0"?>
<Patient_ Health_Record>
 <Patient_Name> Peter Lee</Patient_Name>
```

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