Wireless Application Protocol

1.0 Characteristics:

Wireless application protocol (WAP) is an open standard set of protocols which provide internet content and other digital services to mobile phones (i.e. Smart phones), pagers, PDA’s and other wireless communications devices.

WAP has been widely adopted and is the driving technology behind many products available to consumers today such as:

- Mobile web browsing
- E-commerce
- Audio/video phone downloads
- Ring tone downloads
- Multimedia Messaging Service (MMS)

Because of WAP’s modular design, it is easy for mobile developers to utilize as much or as little of the WAP technology as they need, without over complicating things. This mobile technology is designed to work with most wireless data networks currently in use such as:

- CDMA
- GSM 900/1800/1900
- IS-95
- PDC
- PHS
- TDMA IS136
- FLEX / REFLEX
- iDEN
- Many 3G systems just to name a few. [5]
1.1 How does it work?

So, WAP is mobile technology that enables mobile devices to access web content such as web pages and other online services. You might be wondering “how can a full web site be viewed on such a small device?”

This is a good question. The basic idea behind WAP is firstly the client device (phone, PDA, etc) makes a request for a web resource to a WAP gateway, which goes out and finds the webpage, and looks to see if a WML file exists on the server (wireless mark-up language, document type mobile devices can read and understand). If it does, the server sends it back to the device for viewing. Images and graphics are cut down to a minimum and when viewing many websites, they are primarily text based. As of now, there are only a handful of organisations making wireless content of their websites available, but as the technology becomes more and more popular (which it is already), most websites on the internet would be expected to be able to be viewed on a mobile device.

2.0 Specifications:

The WAP protocol is a protocol suite which consists of five (5) wireless technology protocols or components of the suite which enable WAP to carry out its many functions.

Protocols involved with providing a programming environment and a platform to run WAP (more specifically WML files), session handlers, protocols which handle data transactions (similarly to TCP), a security protocol and a base level protocol which works like an adapter to other data networks.
More specifically, each protocol outlined above can be listed below with an outline on the details on what each does for the functionality of WAP.

- Application Layer: Wireless Application Environment (WAE).

Each of these protocols makes up the WAP architecture in hierarchical form. You can think of each protocol sitting on a separate layer, which provides functionality and a method to interface with the layer below.

2.1 Wireless Application Environment Protocol (WAE):

The WAE is the highest layer of the WAP protocol hierarchy. Its sole purpose is to provide an environment containing tools for developers to utilize such as WML (Wireless Mark-up Language) and WMLScript which has similar properties such that of JavaScript.

The application environment is the key interface to the mobile device which not only provides the necessary languages to write for mobile devices, but also controls the execution of code. [2]

2.2 Wireless Session Protocol (WSP):

The wireless session protocol is responsible for creating and managing sessions of data transmission. In this instance, a session can be described as a period in which communications between the client/server has been established, and data is being transmitted back and forth.

The WSP works closely with the layer below (Transaction layer – Wireless Transaction Protocol WTP) and has three main functions; it can start a new session, aid in transferring data back and forth between the client and server, and can then terminate a data session. The actual specifics of handling the input/output of data is handled by the WTP, the session protocol can be said to provide ‘flow’ control.
2.3 Wireless Transaction Protocol (WTP):
The wireless transaction protocol is responsible for handling the transfer of data and works very closely with the wireless datagram protocol (WDP). WTP was derived from the well known TCP/IP protocol which is widely implemented in larger computer systems for data transmission. The WTP symbolically ‘sits atop’ the wireless datagram protocol which links it in with the wide scale mobile networks such as CDMA and GSM.

2.4 Wireless Transport Layer Security (WTLS):
The wireless transport layer security protocol is an optional layer or stack in the WAP hierarchy. A WAP service or WML document does not require the use of this protocol; however it is available mainly for providing encryption and other security features for transmitting sensitive data such as in mobile e-commerce or banking applications. The WTLS also can carry out data integrity checks and make use of a variety of user authentication algorithms.

2.5 Wireless Datagram Protocol (WDP):
The wireless datagram protocol is the lowest (base level) layer in the WAP construct. It however plays a very important role as it provides an interface to the WTP (and indeed WAP in general) between a variety of mobile networks such as CDMA and GSM and allows access to currently existing mobile data services such as GPRS, SMS, CSD (data bearer service), etc.

Because of the wireless datagram protocol, the entire WAP technology is completely independent of any mobile network which doesn’t limit its development in any way and can be used worldwide, regardless of network carrier (bearer).
3.0 Sources & References:


