

Wireless INternet

Introduction

Many people are familiar with wireless Internet - the term often used to describe the convergence of the Internet with wireless, initially represented by such technologies as Wireless Application Protocol (WAP). What many people don't realize is the importance of Intelligent Network (IN) technology in the convergence of wireless with the Internet and realization of value added services. *Wireless INternet* represents the convergence of wireless, Internet, and IN technologies for improved products and services.

Wireless Web

In order to access the Web, a user must have a wireless Web capable mobile terminal device often referred to as an Internet Appliance. An Internet appliance can be described as any device that provides connectivity and communication to the Internet. WAP capable phones and iMode terminals are two examples of Internet Appliances. In addition to a special terminal device, there must also be network infrastructure to support wireless Web access and transport of information. Mobile networks are evolving to IP based technologies to support wireless Web access and transport. These technologies include Universal Mobile Telecommunications Service (UMTS) third generation (3g) systems based on variations of CDMA for enhancement of GSM, TDMA, and CDMA networks and the 2.5g intermediate step for GSM and TDMA (IS-136) networks: General Packet Radio Service (GPRS) and Enhanced Data Rates for GSM Evolution (EDGE).

Value Proposition

While the initial focus for mobile operators is to deploy Internet Appliances, enabling infrastructure, and basic wireless Web services, long-term value will be based on the successful deployment of compelling applications and content. The future of wireless will be determined by the extent of rich data and targeted information available to mobile users. Much of this information will be personalized and multi-media in nature.

Service Control

In addition to ease of use and simplicity, wireless customers increasing desire improved service control including application accessibility, content flexibility, and

personalization. The long-term success of wireless Web may be dictated by the extent to which wireless users are able to control various service attributes such as what, when, where, and how they receive information.

In terms of service control, mobile communications has inherent advantages and disadvantage. One significant disadvantage is the fact that the user is not always in an opportune place, time, or frame-of-mind to search for information or place transactions. However, this restriction is countered by two principle advantages. First, with mobile IP, the phone can always be on and accessible to receive information. Secondly, the user is by definition mobile and thus allowing for very targeted location based information and commerce applications.

This means that the mobile phone can become more than a communications tool - it can be an agent of the user. The future may allow information to find the user, rather than relegating the user to find information. In addition to personalization and intelligent agent technologies, mobile IN will play a large role.

Mobile IN and the Wireless Internet

Intelligent network (IN) technology was deployed in wireline networks shortly after the introduction of SS7 in the mid-to-late eighties. However, mobile networking protocols such as IS-41 and GSM MAP have only recently been supplemented by mobile IN protocols such as INAP, CAMEL, and WIN. These Mobile IN technologies, however, have been largely voice centric.

The future of these mobile IN technologies will be largely determined by their ability to evolve to support data. As wireless data applications driven by GPRS, EDGE, and UMTS proliferate, there will be a need to manage the interaction between voice and data networks and call sessions. It is likely that mobile IN technologies will also need to evolve to support various multimedia applications.

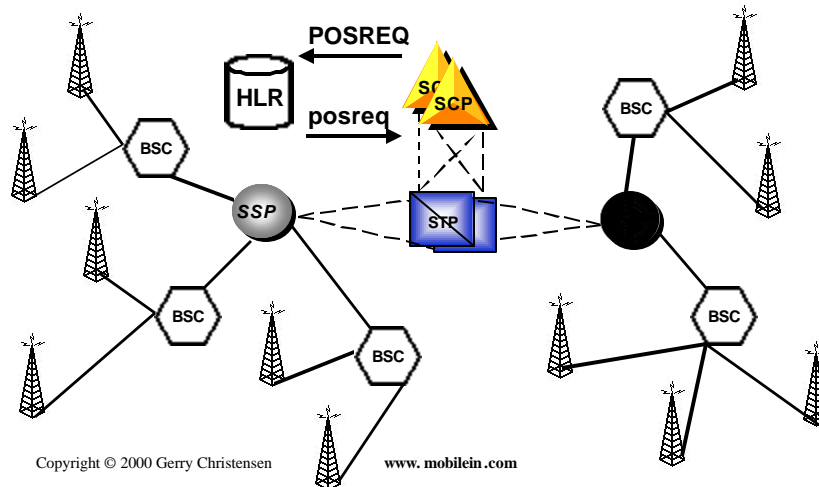
There are also initiatives within the Internet Engineering Task Force (IETF) to establish convergence of IN and IP. This convergence will allow delivery of circuit switched based services to packet networks and vice versa. With the proliferation of mobile IP based services, mobile IN will play an increasingly important role in the delivery of non-voice services to mobile users.

Wireless INternet

Mobile IN technologies will enable additional control of information for support of value-added wireless Web services. For example, WIN supports a procedure in IS-848 called the Position Request (PosReq) message. A WIN based network, equipped with the appropriate software logic, could launch a PosReq to acquire position information of the mobile user.

Mobile IN Capability

Position Request message - WIN (IS-848)



The above figure illustrates a mobile network in which a SCP via the PosReq message interrogates a HLR. The HLR knows the last VLR that the mobile user was served. The HLR launches a request to the VLR for position information (such as cell site ID) and then sends this information back to the SCP in a PosReq response message.

This could be used to enable additional service control. As an example, the mobile user could receive only Internet content that is relevant to the customer's location. GSM networks can use a similar message for a similar purpose called the MAP Anytime Interrogation message.

Convergence of IN with wireless Internet goes beyond location. The future of wireless Internet is likely to entail rich multimedia applications. While the world of voice centric communications utilizes phone numbers, data applications utilize IP addresses. IN technologies are already employed in applications such as number portability to perform PSTN-to-IP address mapping for delivery of PSTN based services (such as enhanced caller ID) to IP based networks. Similar procedures may be employed for more advanced services such as video calling.

Future phones will be sophisticated multimedia terminals, capable of receiving various voice, data, and multimedia services. Mobile IN will provide the control to resolve capability and interoperability issues. For example, people will likely dial a phone number to engage in a video call as IP addresses are too cumbersome

to deal with and/or remember. IN technologies can be used to determine device availability and mapping, allowing the called party to either receive a video call on the display or just the audio portion if the right equipment and/or infrastructure is not available.

Summary

Despite the industry's significant focus on wireless Internet, core technologies such as SS7 and IN have been, and will continue to be, a vital part of the overall infrastructure for delivery of advanced and value-added services. In fact, IN technologies can be exploited to leverage greater value from IP technologies as the industry evolves to next generation networks. Those astute in IP are recommended to study IN. Conversely, IN professionals are recommended to further evolve the standards to become more data centric. Together, the two groups can work to realize greater commercial value through the deployment of *wireless INternet*.