

Wireless Intelligent Network – The Flexibility of Future Vision

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Abstract: Wireless intelligent network (WIN) techniques enable a broad scope of service possibility that is attracting the attention of network operator. This creates an opportunity for building market share and reducing churn by marketing innovative services tailored to fit the individual need of different type of peoples. Enhanced services are very important to wireless customers. They have come to expect, for instance, services such as caller ID and voice messaging bundled in the package when they buy and activate a cellular or personal communications service (PCS) phone. Whether prepaid, voice/data messaging, Internet surfing, or location-sensitive billing, enhanced services will become an important differentiator in an already crowded, competitive service-provider market. Enhanced services will also entice potentially new subscribers to sign up for service and will drive up airtime through increased usage of PCS or cellular services. The movement to develop a WIN strategy was originally triggered by wireless network operators under the auspices of the Cellular Telecommunications Industry Association (CTIA). They developed a set of requirements calling for industry standards that defined new network architecture incorporating the service flexibility of intelligent network (INs) with the mobility aspects of wireless networks. The present paper deals with the overview the concept and application of wireless intelligent network (WIN) technology in the wireless present scenario and discusses the unique service requirement of wireless system and its fulfillment.

1. Introduction

With the wireless market becoming increasingly competitive, the rapid deployment of enhanced services becomes critical to a successful wireless strategy. Intelligent network solutions have revolutionized wire line networks. Rapid creation and deployment of services has become the hallmark of the wire line network based on IN concepts. Wireless intelligent network will bring those same successful strategies into the wireless networks. The evolution of wireless networks to a WIN concept of service deployment delivers the advantages, similar to the IN benefits reaped by wire line providers. The possible advantages are multivendor product offerings that foster competition,

uniform services to subscribers across service areas, efficient network utilization, rapid service creation and deployment.

2. UNIQUE SERVICE REQUIREMENTS OF WIRELESS:

2.1 Roaming:

Mobility dictates a need for technology or standards that make it possible for different networks to talk to each other. Subscribers want to be able to use the same voice activated services that they use in their home city when they travel to Phoenix. They also want the service to work in the same way. Roaming is one of the factors driving the WIN standards now being developed.

2.2 Carrier select:

When customers make a wireline call they have no option as to their providers, but the wireless world is different. Wireless providers are making agreements with one another. There are options because of business partnerships and because many carriers have licenses in many different markets. Carrier select services can benefit both provider and subscriber.

2.3 Hands –free operation:

Hands free wireless services are most sought after services for safety minded customers today. They need features such as voice activated dialing and feature activation, which requires special technology that converts voice into data. By speaking “call mom” or “5551212”, a call can be completed without physically dialing.

2.4 Fee structure:

Calls are being handed off among networks. After the call is handled properly, billing takes place. IN flags can be written right into the call record so that billing reflects the specific call handling. With so many different agreements carriers may have negotiated different fee structures with each partner. Providers will also offer services such as calling party pays to make it easier for a wireless subscriber to receive calls at no charge.

2.5 Data service Capabilities:

Handset displays allow customers to use various messaging services. One called short message service works much like a pager. It allows phones to send & receive messages in addition to making or taking telephone calls. SMS requires many SS7 messages

just to set up the signaling and mechanism to get data through the wireless network. [1-2]

3. EXAMPLES OF WIN SERVICES:

Enhanced services are increasing in popularity. At this point, various points within different serving areas are implementing them using available IN protocols and concepts. As WIN standards are implemented, the same enhanced services will be applicable across serving areas so that wireless users will have a more consistent interface for seamless use while roaming. These WIN standards which are under development will make wireless services really successful.

3.1 Hands Free, Voice controlled services:

Voice controlled services employ voice recognition technology to allow the wireless user to control features and services using spoken commands, names and numbers. There are two main types of automatic speech recognition i.e. speaker dependent and speaker independent.

3.2 Voice controlled dialing: It allows a subscriber to originate calls by dialing digits using spoken commands instead of keypad.VCD may be used during call origination or during call itself.

3.3 Voice controlled Feature Control: VCFC permits a calling party to call a special VCFC directory number, identify the calling party as an authorized subscriber with a mobile directory number and personal identification number and specify feature operations via one or more feature control strings.

3.4 Voice Based User Identification: VUI permits a subscriber to place restrictions on access to services by using VUI to validate the identity of speaker.VUI employs a form of ASR technology to validate the identity of speaker rather than determine what was said by speaker.

4. Incoming Call Restriction/control:

Incoming calls to a subscriber may be given one of the following termination treatments: call is terminated normally to subscriber with normal or distinctive alerting; it is forwarded to voice mail or to another number; it is routed to a subscriber specific announcement or it is blocked. These kinds of services help subscribers control incoming calls and their monthly airtime bills.

4.1 Calling Name Presentation: CNAP provides the name identification of calling party (e.g., personal name, company name, restricted not available) to the called subscriber. The calling name information is derived from calling number

information which is generally provided to the terminating network as part of the basic call setup.

4.2 Password Call Acceptance: PCA is a call screening feature that allows a subscriber to limit incoming calls to only those calling parties who are able to provide a valid password (a series of digits).Calls from parties who cannot provide a valid password will be given call refusal while PCA is active.

4.3 Selective call Acceptance: SCA is a call screening service that allows a subscriber to receive incoming calls only from parties whose calling party numbers are in a SCA screening list.

5. Data Capability

5.1 Short Message Service: SMS provides the ability to deliver short messages as a packet of data between two service users, known as short message entities SMS incorporated into PCS networks allows for simultaneous paging and voice.

5.2 Speech to Text conversion: STC permits a calling party to create a short alphanumeric message by speaking to an ASR device that will perform speech to text conversion.

5.3 Billing, Prepaid: Cellular prepaid Cellular can take a number of forms. One might be a debit card; one might be a connection to a smart card. These services allow customers to pay before they call and not be billed later.

6. FUNCTIONAL COMPONENTS OF A WIN

The WIN mirrors the wireline IN mode. But distinction between wireline and wireless network is that many of the wireless call activities are associated with movement, not just the actual phone call. In the WIN, more call associated pieces of information are communicated between MSC and SCP or HLR. The WIN moves service control away from the MSC and up to a higher element in the network, usually SCP [3]

1. **MSC as service Switching Point (SSP)**-In the intelligent network, SSP is the switching function portion of network

2. **Service control Point (SCP)**-This device provides a centralized element in the network that controls service delivery to subscribers.

3.**Intelligent Peripheral(IP)**:-The IP gets information directly from the subscriber, be it credit card information, a PIN or voice activated information. The peripheral gets information translates it to data and hands it off to another element in the network-like SCP-for analysis and control.

4. **Signal transfer Point (STP)**: This is a packet switch in the signaling network that handles

distribution of control signals between different elements in network such as MSC's and HLR's or MSC's and SCPs

5. **Location Registers:** These are used to supplement MSC's with information about the subscriber. The number of subscribers that switch supports changes as roamers move in and subscribers move to other switches.

6. **Visitor Location Register:** Within an MSC there is a VLR that maintains the subscriber information for visitors or roamers to that MSC. Every MSC or a group of MSC's will have a VLR.

7. **Home Location Register:** Information on roamers is obtained from that subscriber's HLR. Each subscriber is associated with a single HLR, which retains the subscribers record. When subscriber roams to another switch, the VLR queries the subscribers home HLR to get information about that subscriber. [4]

8. **WIN call model:** The WIN call model enables the network to handle new triggers (which are decision points in a call) and new transaction capability application part (TCAP) messages. The evolution to WIN will be a major step forward for North American wireless networks. The following steps will need to occur before WIN will be a reality:

1. Incorporation of SCP, IP, SN into wireless network architecture
2. Evolution of MSC to SSP
3. Separation of call control and transport from service control
4. Development of generic call models, events and trigger points.

7. CURRENT STATUS OF WIN STANDARDS|

The present phase of WIN standards incorporates enhancements to support location based services. These requirements are based on four service drivers: location based charging, fleet and asset management service, enhanced call routing service and location based information service.

CONCLUSION

Win technology creates opportunities for building market share and reducing churn by marketing innovative services tailored to fit the individual needs of different types of people and groups in business and residential applications.

REFERENCES

- 1."WIRELESS INTELLIGENT NETWORK" by International Engg Consortium
- 2."Wireless Intelligent Networks-The Flexible Future by Robert Foster

3. www.mobilein.com

4."David Crowe's" Cellular Networking Perspectives" Wireless review magazine articles, March, 1998 issue.