(54) Title: WAP ENHANCED SIP

(57) Abstract: Transmitting pages according to a wireless application service in a message of a transport protocol in a packet data radio network. A wireless application service is fetched from a database, pages according to the service are embedded in a message of the transport protocol to be transmitted to a subscriber equipment and the message is transmitted to the subscriber equipment.
TITLE OF THE INVENTION

WAP enhanced SIP

FIELD OF THE INVENTION

The present invention relates to improvement of service provision in SIP (Session Initiation Protocol) environment by using WAP pages (e.g. Wireless Markup Language (WML) and WML scripts)

BACKGROUND OF THE INVENTION

IP (Internet Protocol) Telephony is a fast changing domain. The 3GPP (Third Generation Partnership Project) started with H323 as a signaling standard for all IP 3G architecture and have finally adopted SIP (Session Initiation Protocol) in March 2000. SIP has been developed by the IETF (Internet Engineering Task Force) and it offers many tempting possibilities for service creation. SIP can e.g. be used for interactive games or multimedia messaging. SIP adoption induces a lot of changes in the supporting network and services.

WAP (Wireless Application Protocol) on the other hand, has been developed by telecom industry to offer menu-like services in a standard way over limited capacity wireless channel.

Many vendors and operators have made huge investments to WAP technology.

In existing telecom networks like GSM (Global System for Mobile Communications), PSTN (Public Switched Telephone Network), etc. communication services are voice centric and value added services are mostly based on supplementary
service and Intelligent Network (IN) architectures. This service framework is quite static and it is quite difficult to add new advanced features. So, there is a need to have more flexible service architecture which can combine different kind of communication mechanisms (voice, mail, instant messaging, voice mail, etc.) and which provides a framework to deploy new innovative services in a flexible and fast way.

On the other hand there is a need to provide advanced communication services on small and inexpensive devices where memory and battery consumption are critical issues.

WTA (WAP Wireless Telephony Application ) can be used to implement services in WAP. WTA is a more centric service architecture. It needs more functionality in network side, thus making the implementation more complicated and less flexible.

SUMMARY OF THE PRESENT INVENTION

It is therefore an object of the present invention to create a simple and straightforward way to provide SIP services by reusing the mobile device Wireless Application Environment (WAE).

This object is achieved by a method according to claim 1. Moreover, the object is achieved by a network node according to claim 6 and a network node according to claim 7, as well as a packet data radio network according to claim 8.

As shown in Fig. 1, a packet data radio network comprises a network node for providing services according to a specific protocol, for example SIP. A network node for providing services according to SIP is called SIP proxy. The SIP proxy may transmit a message to a subscriber equipment using normal
SIP routing. It is to be noted that the operations explained between the proxy and the subscriber equipment are also applicable between two subscriber equipments.

Referring also to Fig. 2, the SIP proxy may fetch a wireless application service from a database and embed pages according to the service in a message of the SIP protocol to be transmitted to the subscriber equipment. Then, it transmits the message to the subscriber equipment.

According to Fig. 3, at the subscriber equipment the pages according to the wireless application service are received in the message of the SIP protocol. The pages are extracted from the message and processing is performed in accordance with the extracted pages.

Before transmitting the message to the subscriber equipment, processing may be performed by the SIP proxy in accordance with the service fetched from the database.

Moreover, the message may be transmitted in accordance with subscriber information stored in the database.

Furthermore, data for initiating SIP protocol can be included in the pages to be embedded in the embedding step. Then, a service according to SIP protocol can be initiated at the subscriber equipment.

According to the present invention, the advantages of SIP and WAP are combined thus protecting the existing WAP investments. The possibilities of SIP may be utilized, market confusion can be avoided and the existence of WAP can be ensured. WAP is able to fully utilize all SIP features (redirecting/forwarding, URL addressing, etc.). This also extends the WAP usage to pure Internet networks, e.g. cable access networks.
According to the present invention, it is possible to integrate WAP and SIP thus gaining full advantages of both. This is extremely important for 3G vendors. For example, SIP can be used to send WAP messages all the way to the user equipment and SIP messages can be sent form the WAP application to utilize the advanced IP related services available in SIP.

The present invention defines that WAP data is sent over SIP bearer since SIP can carry whatever MIME payload, for example application/wap (to be defined). SIP has many features which may be utilized in this context (global URL addressing, seamless HTTP/RTSP/voice integration, packet forwarding, callee preferences, etc.). This seamless Internet resource integration enables many innovative services and makes WAP even more tempting for 3rd party service providers.

The present invention strengthens WAP and protects the existing WAP investments and makes it even more tempting because of value-added features offered by SIP.

The present invention enables the provision of advanced services on small terminals.

In all IP 3G networks SIP protocol will be used to provide IP Telephony service. Future mobile terminals will also support WAP. By combining SIP and WAP the existing functionalities can be reused to provide enhanced and user-friendly services. That is, the functionality of WAP can be reused to implement SIP services, and SIP services can be provided from WAP.

In the following the present invention will be described by way of a preferred embodiment thereof.
BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a schematic block diagram of a network architecture according to the present invention.

Fig. 2 shows a flowchart comprising steps for transmitting a message to a subscriber equipment according to the present invention.

Fig. 3 shows a flowchart comprising steps for receiving a message at a subscriber equipment according to the present invention.

Fig. 4 shows a communication service example with WAP page according to a preferred embodiment of the present invention.

DESCRIPTION OF THE PRESENT INVENTION

Currently WAP data is sent over GSM data or SMS (Short Message Service) bearer. In GPRS or in 3G it is possible to send WAP data over packet bearer also.

SIP is mandatory protocol between user equipment and network in 3G release R00, and it is used at least to call signaling. It may be used for other services also (e.g. SMS-like messaging). SIP may carry MIME (Multipurpose Internet Mail Extensions) payload (e.g. SDP (Short Data Protocol, gif, etc.) which is WAP in this case. The MIME-name to be defined in this case is application/wap. Standard WAP browsers may be used, only the transport layer is changed.

In other words, the basic idea is to embed WAP content to SIP messages and use SIP messages to transfer the WAP content to a terminal. When the terminal receives a SIP message including a WAP MIME type it extracts the WAP payload and processes it in the Wireless Application Environment (WAE).
WAP page could include WML (WAP markup language) pages and WML scripts reacting to user input and using the local available capabilities to satisfy to the user action.

SIP features e.g. URL based Internet addressing may also be used in WAP so that other true Internet resources (e.g. RTSP URL may be used to request a audiofile from remote RTSP server) may be accessed from WAP.

Fig. 4 shows a communication service example. A subscriber A is trying to call to a subscriber B or Boss. The subscriber B has a terminating call service, which provides a dynamic call management.

At first, the subscriber A sends a SIP Invite message through a SIP Proxy. The SIP proxy fetches the B subscribers service from a database and embeds it to SIP Invite message and sends it further to subscriber B.

Then, a subscriber B terminal or equipment receives the Invite message and extracts the WAP content from the message and delivers it to a Wireless Application Environment (WAE) to be processed.

A WAE browser shows communication alternatives to the user (e.g. answer, reject, send a short message, forward call to voicemail, forward call to secretary, play an announcement, etc.).

The user selects one alternative from the list. The selected alternative is executed through WAE service agents. E.g., if the subscriber B wants to direct the call to voice mail system SIP 302 moves a temporally message triggered through SIP service agent.
7.
Also other SIP services like instant messages could be managed in WAE. WML and WML script could be used to edit and view instant messages. However, the present invention is not limited to WML and WML scripts, but also covers next generation WAP content types, i.e. XML.

Symmetrically a SIP tag could be added to the WAP markup language (WML) to support a click to call. A WAP page could include a sip:christophe.bouret@nokia.com tag that when selected would initiate a SIP request. This system would enable the creation of a WAP based phone book with a direct click to call for example or a click to call for assistance.

Alternatively, JAVA and SIP could be used. A SIP client with all the functionality needed could be installed to the terminal.

While the invention has been described with reference to a preferred embodiment, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications and applications may occur to those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.
CLAIMS:

1. A method of transmitting pages according to a wireless application service in a message of a transport protocol in a packet data radio network, the method comprising the steps of:
   fetching a wireless application service from a database;
   embedding pages according to the service in a message of the transport protocol to be transmitted to a subscriber equipment;
   transmitting the message to the subscriber equipment;
   receiving the pages in the message at the subscriber equipment;
   extracting the pages from the message; and
   performing processing in accordance with the pages.

2. A method according to claim 1, further comprising the step of:
   before transmitting the message to the subscriber equipment, performing processing in accordance with the wireless application service fetched from the database.

3. A method according to claim 1, wherein the message is transmitted in accordance with subscriber information stored in the database.

4. A method according to claim 1, wherein data for initiating the transport protocol are included in the pages to be embedded in the embedding step.

5. A method according to claim 4, wherein a service according to the transport protocol can be initiated at the subscriber equipment on the basis of the data for initiating the transport protocol.
6. A network node in a packet data radio network for providing services according to a transport protocol, the network node comprising:

   means for fetching a wireless application service from a database;
   means for embedding pages according to the service in a message of the transport protocol to be transmitted to a subscriber equipment; and
   means for transmitting the message to the subscriber equipment.

7. A network node, preferably a subscriber equipment in a packet data radio network for providing wireless application services, the network node comprising:

   means for receiving pages according to a wireless application service in a message of a transport protocol at the subscriber equipment;
   means for extracting the pages from the message; and
   means for performing processing in accordance with the pages.

8. A packet data radio network, comprising a network node according to claim 6 and a network node according to claim 7.
Transmitting message to subscriber equipment

Fetching service from database

Embedding pages in message

Transmitting message

End

Receiving message at subscriber equipment

Extracting pages from message

Performing processing on the basis of the pages

End

Fig. 2

Fig. 3
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category * Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No.

A PEHRSON S: "WAP - THE CATALYST OF THE MOBILE INTERNET"
ERICSSON REVIEW, ERICSSON, STOCKHOLM, SE, no. 1, 2000, pages 14-19, XP000908190
ISSN: 0014-0171
page 19, column 1, line 29 - column 2, line 38

A N LEAVITT: "WILL WAP DELIVER THE WIRELESS INTERNET?"
ISSN: 0018-9162
page 20, column 2, line 3 - column 3, line 44

* Special categories of cited documents:

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

'X' document member of the same patent family

Date of the actual completion of the international search

13 June 2001

Date of mailing of the international search report

22/06/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentliaan 2 NL - 2280 HU Rijswijk Tel. (+31-70) 340-2040, Tx. 31 654 epc nl, Fax: (+31-70) 340-3016

Authorized officer

M. García

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<td>EP 1 028 561 A (SAMSUNG ELECTRONICS CO LTD) 16 August 2000 (2000-08-16) column 5, line 51 -column 6, line 33</td>
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