Title: SYSTEM AND METHOD FOR DYNAMICALLY REFRESHING AN ACTIVE HOME SCREEN

Abstract: A system and method for providing time-sensitive information to a handset using a scrolling ticker. The method includes receiving the time-sensitive information at a server, determining the time period before the next update for a second set of information, and if less than a pre-determined value, then streaming the time-sensitive information at the end of the time period to the handset. If the time period is greater than the pre-determined value, then streaming the time-sensitive information immediately. In an alternative embodiment, a method is provided which includes determining a base schedule for periodically streaming the information to a handset via a scrolling ticker, receiving time-sensitive information relating to an event, determining a second schedule for periodically streaming time-sensitive information related to the event, and streaming the time-sensitive information in accordance with the second schedule during a time period associated with the event.
SYSTEM AND METHOD FOR DYNAMICALLY REFRESHING AN ACTIVE HOME SCREEN

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U. S. Application No. 11/616,593 filed December 27, 2006, the entire disclosure of which is herein incorporated by reference.

FIELD OF THE INVENTION

[0002] This invention is directed to the provision of data to a handset; and more particularly, determining the most efficient timing for delivering time-sensitive data to a handset using a scrolling ticker.

BACKGROUND OF THE INVENTION

[0003] In wireless data applications, there are two types of technology utilized to transfer data to a handset, categorized generally as either push technology or pull technology. In push technology, a server typically will periodically push available information to a handset, or alternatively, send a message to the handset indicating that additional information is available for the handset to retrieve. Pull technology is typically defined as the client initiating communication with a server in order to retrieve information.

[0004] Recently, carriers and vendors of wireless devices have developed systems, methods and wireless devices that push content to subscribers in the form of a scrolling ticker which may contain headlines, sports scores, stock information, or other data or alerts on a portion of the display screen. For example, such systems are commercially available on Motorola wireless device model V557 and available to subscribers of Cingular Wireless, the assignee of the present invention, which Cingular Wireless markets as Active Home Screen™. The scrolling ticker may receive data from multiple channels, including news, sports, weather, and the like.

[0005] Such data that is pushed to devices typically have a useful life before the data is considered stale or out of date. Thus, time-to-live ("TTL") schemes have been defined which is the measure of the time data is made available until that data is out of date. TTL data has an expiration, after which it is preferable that he data be updated.
TTL will vary based on the type of data and the current activity level. By way of example only, news events may be updated every hour, weather forecasts may be updated several times per day, and horoscopes updated daily. Unfortunately, simply scheduling periodic updates based on the types of information does not provide flexibility in determining the delivery times based on the information itself. Notwithstanding periodic updates, additional information that becomes available that is time-sensitive may be received. It would be desirable to be able to push this time-sensitive information to the handset immediately.

Currently there is no system of method for intermediate delivery of time-sensitive information that may be accomplished periodically or a-periodically. In addition to there being a need to provide intermediate delivery for time-critical information, there is also a need for the delivery times of the data be subject to multiple and variable cycles. For example, it would be desirable to have a system and method for providing sports information relating to baseball that be updated once a day during the off-season, once every four or six hours during the season and just prior to a game, and perhaps every fifteen minutes during a game or alternatively, a-periodically whenever a run is scored during the game. Such a system and method does not exist.

SUMMARY OF THE INVENTION

Fig. L is a functional block diagram of an exemplary network environment within which the present invention may operate;

The I-CSCF function, which forms the entrance to a home network, hides the inner topology of the home network from other networks and provides flexibility for selecting an S-CSCF.

The S-CSCF 144 performs the session control services for the MS 102. This includes routing originating sessions to external networks and routing terminating sessions to visited networks. The S-CSCF 144 also decides whether one or more application servers (AS) 152 is required to receive information on an incoming SIP session request to ensure appropriate service handling. This decision is based on information received from the HSS 150 (or other sources, such as an application server 154).

The HSS 150 contains a subscriber profile and keeps track of which core network node is currently handling the subscriber. It also supports subscriber authentication and authorization functions (AAA). In networks with more than one HSS 150, a subscriber location function provides information on the HSS 150 that contains the profile of a given subscriber.

The MGCF 146 provides interworking functionality between SIP session control signaling from the IMS 140 and ISUP/BICC call control signaling from the external
GSTN networks (not shown). It also controls the media gateway (MGW) 148 that provides user-plane interworking functionality (e.g., converting between AMR- and PCM-coded voice). The MGW 148 also communicates with other IP multimedia networks 154.

[0013] While Fig. 1 illustrates a GSM/GPRS/IP multimedia architecture which supports the present invention, implementation of the present invention is not limited thereto. With reference to Fig. 2, there is shown a simplified block diagram for a system constructed in accordance with the present invention. A plurality of data feeds 156 are input to the scrolling ticker application server 154 which then transmits selected feeds across a wireless network 160 to MS 102. The wireless network may be that as illustrated and described with reference to Fig. 1, or it could be TDMA, CDMA, WCDMA, or any other wireless network, including those specific to 3G and beyond. For the convenience of the user, the terms mobile station, user equipment and wireless device may be used interchangeably throughout this specification.

[0014] The scrolling ticker application server 154 is one form of the one or more application servers 152. The scrolling ticker server 154 is preferably a content server configured to communicate with one or more wireless devices, such as MS 102. The scrolling ticker server 154 streams content to wireless devices configured to receive such data. The scrolling ticker server 154 may, for example, provide text streams based on a set of user-defined alerts, such as stock information, sports scores, news, weather, and any other information, or the text streams may be provided on a periodic basis. One communication protocol between the scrolling ticker server 154 to MS 102 may, for example, be really simple syndication (RSS), more specifically, the RSS 2.0 standard.

[0015] Turning to Fig. 3, there is a block diagram which illustrates functionally the scheduling logic of the scrolling ticker application server 154. Input to the server may come from a variety of sources in various formats, each of which is known by those skilled in the art. The scrolling ticker application server 154 parses the input through a TTL filter 202 to determine whether the input data is time sensitive. If the input data is time sensitive and has an associated TTL, the data is passed through to the TTL content function 204 for input into the TTL scheduler 154. This data will be referred to as TTL data. If the input data is not time sensitive, the input data is passed through the content function 206 for input into the content scheduler 210. This data will be referred to as normal content data.

[0016] The TTL scheduler 208 will analyze the TTL data and determine a time for delivery of that TTL data. The TTL scheduler 208 may also determine minimum and maximum ranges of time for delivery of the TTL data. The content scheduler 210 will schedule delivery of the normal content data in accordance with a predetermined schedule. It should be noted that the
predetermined schedule may be modified either by a user or administrator, it may be periodic or a-periodic, or it may even be based on "pull" requests by the user. It should also be noted that there may be various predetermined schedules based on the type of normal content data and the particular channel on which that normal content data is to be delivered. The output of the content scheduler 210 and the TTL scheduler 208 are fed into scheduling logic 212. Scheduling logic 212 performs a comparison function in which the time for delivery of the TTL data as determined by the TTL scheduler 208 is compared to the next scheduled delivery of the normal content data as processed by the content scheduler 210. If the comparison function determines that the next scheduled delivery from the content scheduler 210 is within an acceptable time frame for delivery of the TTL data as determined by the TTL scheduler 208, then the scheduling logic will schedule the delivery of the TTL data to coincide with the delivery of the normal content data. In this context, coincide may mean that the delivery of the two data types will be serial or alternatively, the delivery may be parallel on different RSS channels, or some combination of the two. The scheduling logic 212 will then initiate delivery of the content in accordance with the scheduling comparison functionality.

[0017] Turning now to Fig. 7, there is shown an alternative embodiment of the present invention. An alternative block diagram which illustrates functionally the scheduling logic of the scrolling ticker application server 254. Input to the server may come from a variety of sources in various formats, each of which is known by those skilled in the art. The scrolling ticker application server 254 parses the input through an event filter 302 to determine whether the input data is related to an event and therefore is time sensitive. If the input data is time sensitive and has an associated TTL, the data is passed through to the event content function 304 for input into the event scheduler 308. This data will be referred to as event data. If the input data is not time sensitive, the input data is passed through the content function 306 for input into the content scheduler 310. This data will be referred to as non-event content data.

[0018] The event scheduler 308 will analyze the event data and determine a time for delivery of that event data. The event scheduler 308 may also determine minimum and maximum ranges of time for delivery of the event data. The event scheduler 308 may determine that event data be delivered periodically during a time period associated with an event, or alternatively, the event scheduler 308 may determine that the event data be delivered a-periodically during the event based on some action that occurs during the event, or some combination of the two. For example, if the event is a football game, the event scheduler 308 may determine to deliver updated event data every fifteen minutes, or alternatively, the event
scheduler 308 may determine to deliver updated event data every time the score changes, or some combination of the two.

[0019] The content scheduler 310 will schedule delivery of the non-event content data in accordance with a predetermined schedule. It should be noted that the predetermined schedule may be modified either by a user or administrator. It should also be noted that there may be various predetermined schedules based on the type of normal content data and the particular channel on which that normal content data is to be delivered. The output of the content scheduler 310 and the TTL scheduler 308 are fed into scheduling logic 312.

[0020] Scheduling logic 312 will exercise a series of scheduling rules as determined by a user or an administrator. For example, scheduling logic 312 may suspend delivery of all non-event content data during the time period associated with the event and deliver only event data during that time period. Alternatively, scheduling logic may perform a comparison function similar to the comparison function set forth above in which the time for delivery of the event data as determined by the event scheduler 308 is compared to the next scheduled delivery of the non-event content data as processed by the content scheduler 310. If the comparison function determines that the next scheduled delivery from the content scheduler 310 is within an acceptable time frame for delivery of the event data as determined by the event scheduler 308, then the scheduling logic will schedule the delivery of the TTL data to coincide with the delivery of the normal content data. In this context, coincide may mean that the delivery of the two data types will be serial or alternatively, the delivery may be parallel on different RSS channels, or some combination of the two. Alternatively, the scheduling logic 312 may simply deliver the non-event content data in accordance with its normal schedule and deliver the event data when received. In any case, the scheduling logic 312 will then initiate delivery of the content in accordance with the scheduling comparison functionality.

[0021] Figs. 4, 5, and 6 are flow charts illustrating various embodiments of the method of the present invention. With respect to Fig. 4, data is received at the scrolling ticker application server 154 at action block 400. At decision block 402, a determination is made as to whether the data received is time sensitive (TTL data). If the data is TTL data, the TTL data is passed to action block 403 where the preferred delivery time of the TTL data is compared to the next scheduled delivery of the content data. At decision block 404, if the preferred delivery time of the TTL data falls within an acceptable window around the next scheduled delivery of the content data, the TTL data is passed to action block 408 for delivery with the content data. At decision block 404, if the preferred delivery time of the TTL data does not fall within an
acceptable window around the next scheduled delivery of the content data, then the TTL data is passed to action block 406 wherein it is independently scheduled for delivery to the MS 102.

[0022] Going back to decision block 402, if the data is not TTL data and therefore content data, it is passed to action block 408 for scheduling of delivery. Recall that an affirmative output of decision block 404 may also be input into action block 408. From action block 408, any TTL data present and the content data are then delivered to the MS 102 in accordance with the next delivery time at action block 410.

[0023] Turning now to an alternative embodiment of the method of the present invention in Fig. 5, a base schedule is determined at action block 416 and a second event schedule is determined at block 418. Information is received at action block 420. At action block 422, the time period of receipt is compared to the base schedule and the second event schedule. If at decision block 424 it is determined that the data is received within a time window defined by the event schedule, then the event data is delivered in accordance with the second event schedule at action block 426. If at decision block 424 it is determined that the data was not received within a time window defined by the event schedule and therefore is considered non-event content data, the data is delivered in accordance with the base schedule.

[0024] Turning now to yet another alternative embodiment of the present invention in Fig. 6, a base schedule is determined at action block 450 and a second event schedule is determined at action block 452. Information is received at action block 454 and passed to action block 456 where the time of receipt is compared to the base schedule and the second event schedule. At decision block 458, if the time of receipt falls within the second event schedule, then the base schedule is suspended at action block 460 and the event data is delivered at action block 462. If at decision block 458 it is determined that the time of receipt falls does not fall within the second event schedule, then the non-event content data is delivered in accordance with the base schedule at action block 464.

[0025] While the present invention has been described in connection with the preferred embodiments of the various figures, it is to be understood that other similar embodiments may be used or modifications and additions may be made to the described embodiment for performing the same function of the present invention without deviating therefrom. Therefore, the present invention should not be limited to any single embodiment, but rather should be construed in breadth and scope in accordance with the appended claims.
What is Claimed:

1. A method for providing time-sensitive information to a handset using a scrolling ticker, comprising:

   receiving the time-sensitive information at a server;

   determining the time period before the next update for a second set of information; and

   if the time period is less than a pre-determined value, then streaming the time sensitive information at the end of the time period to the handset.

2. The method of claim 1 wherein if the time period is greater than the pre-determined value, then streaming the time-sensitive information immediately.

3. The method of claim 1 wherein the second set of information is updated periodically.

4. The method of claim 1 wherein the streaming step includes streaming the second set of information and the time sensitive information as part of a communication event.

5. The method of claim 4 wherein the communication event includes streaming on a plurality of channels.

6. The method of claim 4 wherein the communication event comprises streaming on a single channel.

7. A system for providing time-sensitive information to a handset via a scrolling ticker comprising:

   means for receiving time-sensitive information and a second set of information wherein the second set of information is updated periodically;

   means for determining a next update time for the second set of information;

   means for comparing a time period before the next update time to a predetermined value; and
means for scheduling the streaming of time-sensitive information responsive to the means for comparing.

8. The system of claim 7 further comprising means for streaming the time-sensitive information and the second set of information to a handset.

9. The system of claim 7 further comprising means for streaming the time-sensitive information immediately to a handset if the time period is greater than the pre-determined value.

10. The system of claim 7 further comprising means for streaming the time-sensitive information and the second set of information to a handset as part of a single communications event if the time period is less than the pre-determined value.

11. The system of claim 10 wherein the single communications event includes streaming on a plurality of channels.

12. The system of claim 10 wherein the single communications event includes sequential streaming on a single channel.

13. A method for scheduling delivery of information via a scrolling ticker comprising:

determining a base schedule for periodically streaming the information to a handset via a scrolling ticker;

receiving time-sensitive information relating to an event;

determining a second schedule for periodically streaming time-sensitive information related to the event; and

streaming the time-sensitive information in accordance with the second schedule.

14. The method of claim 13 wherein the time-sensitive information is streamed in accordance with the second schedule during a time period associated with the event.

15. The method of claim 14 further comprising reverting back to the base schedule after the time period has elapsed.
16. A method for scheduling delivery of information via a scrolling ticker comprising:

determining a base schedule for periodically streaming the information to a handset via a scrolling ticker;

suspending the base schedule during a time period associated with an event;

receiving time-sensitive information relating to the event; and

streaming the time-sensitive information based on the receiving step.

17. The method of claim 16 wherein the streaming step is performed promptly after receipt of the time-sensitive information.

18. The method of claim 16 wherein the streaming step is performed within a pre-defined window of time after receipt of the time-sensitive information.

19. A system for streaming information to a handset via a scrolling ticker relating to an event comprising:

means for streaming the information periodically in accordance with a base schedule; and

means for streaming the information in accordance with a second schedule based on an event.

20. The system of claim 19 wherein the information is streamed in accordance with the second schedule during a time period associated with the event.

21. The system of claim 20 wherein the second schedule is periodic.

22. The system of claim 20 wherein the second schedule is based on alerts relating to the event.
FIG. 4
DETERMINE BASE SCHEDULE

DETERMINE SECOND EVENT SCHEDULE

RECEIVE DATA

COMPARE TIME OF RECEIPT

WITHIN EVENT SCHEDULE?

DELIVER ACCORDING TO BASE SCHEDULE

DELIVER ACCORDING TO EVENT SCHEDULE

FIG. 5
DETERMINE BASE SCHEDULE 450

DETERMINE SECOND EVENT SCHEDULE 452

RECEIVE DATA 454

COMPARE TIME OF RECEIPT 456

WITHIN EVENT SCHEDULE? 458

N  
DELIVER ACCORDING TO BASE SCHEDULE 464

Y  
SUSPEND BASE SCHEDULE 460

DELIVER 462

FIG. 6
FIG. 7