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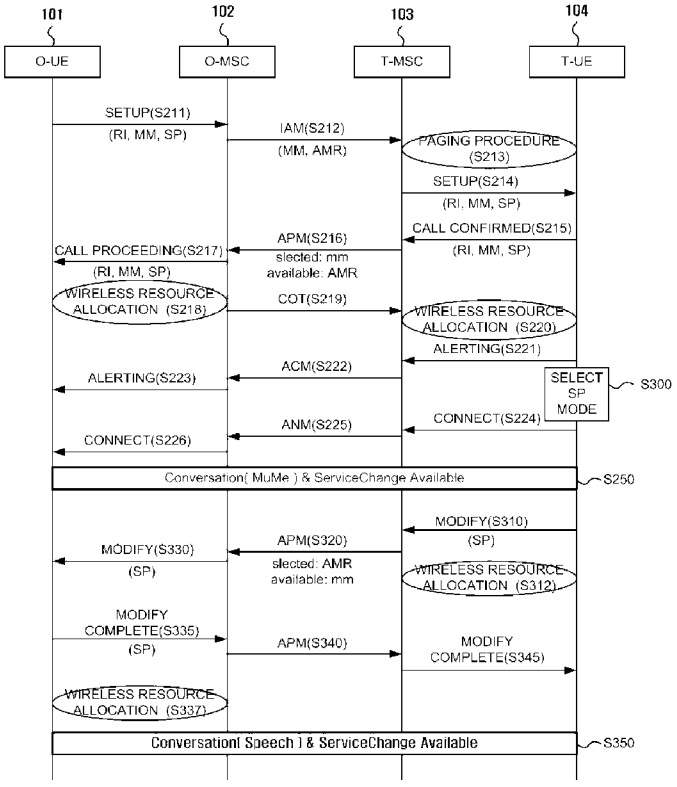
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(54) Title: APPARATUS, SYSTEM AND METHOD FOR SELECTING VOICE OR MULTIMEDIA CALL IN MOBILE COMMUNICATION SYSTEM

[Fig. 3]



(57) Abstract: An apparatus, a system, and a method for selecting a voice or multimedia call in a mobile communication system are provided. The apparatus for selecting a voice or multimedia call, includes a message receiving unit receiving a message reporting the existence of a call attempt request of a first user terminal in a specific calling mode; a dynamic selection processing unit receiving from a user and processing a desired calling mode; and a message transmitting unit requesting establishment of a call path from a mobile switching center (MSC) in accordance with the inputted calling mode.

WO 2010/082769 A2

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Description

Title of Invention: APPARATUS, SYSTEM AND METHOD FOR SELECTING VOICE OR MULTIMEDIA CALL IN MOBILE COMMUNICATION SYSTEM

Technical Field

[1] The present invention relates to an apparatus, a system, and a method for selecting a voice or multimedia call in a mobile communication system, and more particularly to an apparatus, a system, and a method for selecting a voice or multimedia call in a mobile communication system, which can improve the call success rate by dynamically selecting a voice or multimedia call in a mobile communication system.

Background Art

[2] Recent mobile communication systems provide not only voice communications but also functions of handling multimedia transmission such as transmission of pictures, video, music, and the like. Diverse protocols for integrating multimedia into mobile communication systems have been prescribed in the 3GPP (3rd Generation Partnership Project), which is the joint standardization project of diverse standardization bodies in Europe, Japan, Korea, U.S.A., China, and the like. The 3GPP protocols are used, for example, not only in the 3rd generation network, such as a network that is constructed in accordance with the UMTS (Universal Mobile Telecommunication System) standard, but also in the 2nd generation wireless communication network that is constructed in accordance with the GSM (Global System for Mobile communications) standard for mobile communications.

[3] In the previous 3GPP protocol, such as 3G.324 of the 3GPP R99, only one of a voice calling service or a multimedia calling service can be used. Accordingly, it is required that a user, who desires a temporary changeover between a voice calling service and a multimedia calling service, terminates the call and changes over the services. In order to solve this problem, the SCUDIF (Service Change & Unrestricted Digital Interface Fallback) has been integrated into the 3GPP protocol, such as R5 of the 3GPP.

[4] The SCUDIF enables terminals that support both the voice calling service and the multimedia calling service to change over the services in a call connection state between the terminals, and also enables terminals that support either of the voice calling service and the multimedia calling service to change over to the service supported by the corresponding terminals.

Disclosure of Invention

Technical Problem

[5] Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and the subject to be solved by the present invention is to provide an apparatus, a system, and a method for selecting a voice or multimedia call in a mobile communication system, which can improve the call success rate by actively selecting a voice or multimedia call in a mobile communication system.

[6] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention.

Solution to Problem

[7] In one aspect of the present invention, there is provided a system for selecting a voice or multimedia call in a mobile communication system, which includes a first mobile switching center (MSC) receiving a call request of a first user terminal in a specific calling mode; and a second MSC transmitting a call request message from the first user terminal to a second user terminal that is receiver of the call; wherein the second user terminal accepts a desired calling mode input from a user and establishes a call path between the first user terminal and the second user terminal in accordance with the inputted calling mode.

[8] In another aspect of the present invention, there is provided an apparatus for selecting a voice or multimedia call, which includes a message receiving unit receiving a message reporting the existence of a call attempt request of a first user terminal in a specific calling mode; a dynamic selection processing unit accepting a desired calling mode input from a user and processing the input; and a message transmitting unit requesting establishment of a call path to a mobile switching center (MSC) in accordance with the inputted calling mode.

[9] In still another aspect of the present invention, there is provided a method for selecting a voice or multimedia call in a mobile communication system, which includes receiving a call request of a first user terminal in a specific calling mode; accepting a calling mode with the first user terminal input from a user of a second user terminal; and requesting establishment of a call path between the first user terminal and the second user terminal in accordance with the inputted calling mode.

Advantageous Effects of Invention

[10] According to embodiments of the present invention as constructed above, the call success rate can be heightened by actively selecting a voice or multimedia call in a mobile communication system that supports the SCUDIF call.

[11] The effects of the invention are not limited to those as described above, and other un-

mentioned effects will become apparent to those having ordinary skill in the art from the description of the claims of the invention.

Brief Description of Drawings

[12] The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

[13] FIG. 1 is a block diagram illustrating a mobile communication system according to an embodiment of the present invention;

[14] FIG. 2 is a flowchart illustrating a method for selecting a voice or multimedia call in the mobile communication system of FIG. 1;

[15] FIG. 3 is a flowchart illustrating a method for selecting a voice or multimedia call in the mobile communication system of FIG. 1;

[16] FIG. 4 is a flowchart illustrating a method for selecting a voice or multimedia call according to another embodiment of the present invention;

[17] FIG. 5 is a flowchart illustrating a method for selecting a voice or multimedia call according to still another embodiment of the present invention; and

[18] FIG. 6 is a flowchart illustrating a method for selecting a voice or multimedia call according to still another embodiment of the present invention.

Mode for the Invention

[19] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings. The aspects and features of the present invention and methods for achieving the aspects and features will be apparent by referring to the embodiments to be described in detail with reference to the accompanying drawings. However, the present invention is not limited to the embodiments disclosed hereinafter, but can be implemented in diverse forms. The matters defined in the description, such as the detailed construction and elements, are nothing but specific details provided to assist those of ordinary skill in the art in a comprehensive understanding of the invention, and the present invention is only defined within the scope of the appended claims. In the entire description of the present invention, the same drawing reference numerals are used for the same elements across various figures.

[20] The present invention will be described herein with reference to the accompanying drawings illustrating block diagrams and flowcharts for explaining an apparatus, a system, and a method for selecting a voice or multimedia call in a mobile communication system according to embodiments of the present invention.

[21] FIG. 1 is a block diagram illustrating a mobile communication system according to an embodiment of the present invention. The mobile communication system of FIG. 1

may be understood as, but is not limited to, a GSM (Global System for Mobile communications), a UMTS (Universal Mobile Telecommunication System), and the like. For example, the present invention can be used not only in the UMTS communication network but also in an IMS communication network or other next generation communication networks.

[22] Although many typical constituent elements constitute the mobile communication system of FIG. 1, only an originating mobile switching center (hereinafter referred to as "O-MSC") and a terminating MSC (hereinafter referred to as "T-MSC") are illustrated in FIG. 1 for convenience in explaining an embodiment of the invention. It is exemplified that the mobile communication system according to an embodiment of the present invention supports a SCUDIF (Service Change & Unrestricted Digital Interface Fallback) function or a similar function.

[23] As illustrated in the drawing, the mobile communication system 100 according to an embodiment of the present invention includes an originating user equipment (hereinafter referred to as "O-UE") 101, an O-MSC 102, a T-MSC 103, and a terminating user equipment (hereinafter referred to as "T-UE") 104, and the SCUDIF function may be implemented in the O-UE 101, the O-MSC 102, the T-MSC 103, and the T-UE 104. The O-UE 101 and the T-UE 104 may correspond to an originating terminal and a terminating terminal, respectively. The O-UE 101 and the T-UE 104 may be commonly called user terminals, or one of the O-UE 101 and the T-UE 104 may be called a first user terminal and the other thereof may be called a second user terminal. The user terminal includes a user appliance for use in wireless communications, a personal digital assistant (PDA) capable of performing wireless communications, a computer, or the like. In addition, although not illustrated in FIG. 1, it would be apparent that the mobile communication system of FIG. 1 includes typical constituent elements constituting the mobile communication system.

[24] FIG. 2 is a flowchart illustrating a method for selecting a voice or multimedia call in the mobile communication system of FIG. 1. Referring to FIG. 2, a SCUDIF call process in the mobile communication system will now be described.

[25] According to the call process in the mobile communication system according to an embodiment of the present invention, in the case in which the O-UE 101 intends to use a calling service with the T-UE 104, the O-UE 101 transmits a "SETUP" message for setting the SCUDIF call to the O-MSC 102 S211. In this case, the "SETUP" message may include information about services supported by the O-UE 101 (e.g. a multimedia calling service and voice calling service) and preferential services. For example, the "SETUP" message, as illustrated in FIG. 2, may include information, such as a repeat indicator (RI), multimedia (MM), and voice (SP), where the RI indicates the SCUDIF call, the MM denotes a multimedia calling service such as a video calling service, and

the SP denotes a voice calling service. In this case, preferential services can be recognized in accordance with the service order included in the "SETUP" message, and since the MM precedes the SP, it can be understood that the O-UE 101 prefers the MM, and the SP may hereinafter be the preferential service.

[26] The O-MSC 102 transmits an "IAM (Initial Address Message)" to the T-MSC 103 based on the "SETUP" message transmitted from the O-UE 101 S212. In this case, the "IAM" message may include codec information of the services supported by the O-UE 101 and the preferential services. In FIG. 2, it can be understood that "mm" is codec information for the multimedia calling service and "AMR (Adaptive Multi Rate)" is codec information for the voice calling service. In S211, a message including information about services is transmitted, and in S212, a message including information about codec for the services is transmitted. However, this is merely exemplary for help in understanding the present invention, and it can be understood that both the service information and the codec information for the services are used to indicate the services supported by the O-UE 101.

[27] If the "IAM" message is transmitted from the O-MSC 102, the T-MSC 102 performs a paging procedure with the T-UE 104 S213, and transmits a "SETUP" message for setting the SCUDIF call with the T-UE 104 to the T-UE 104 based on the "IAM" message transmitted from the O-MSC 102 S214. In this case, the "SETUP" message transmitted from the T-MSC 103 to the T-UE 104, like the "SEPUP" message in S211 as described above, may include information about services supported by the O-UE 101 and preferential services.

[28] The T-UE 104, in response to the "SETUP" message transmitted from the T-MSC 103, transmits a "CALL CONFIRMED" message, which includes information about services supported by the T-UE 104 and preferential services, to the T-MSC 103 S215. In this case, as illustrated in FIG. 2, it is exemplified that the O-UE 101 and the T-UE 104 support the same services and prefer the same service. Accordingly, it can be understood that the T-UE 104 also supports the multimedia calling service and the voice call service and prefers the multimedia calling service.

[29] On the other hand, it can be understood that service information included in the "CALL CONFIRMED" message in S215 as described above is specific by a user. In other words, a user of the T-UE 104 confirms services supported by the T-UE 104, and specifics preferential services among the supported services, so that the T-UE can perform call connection to the specific preferential service when a call is originated from the O-UE 101.

[30] The T-MSC 103 transmits an "APM (Application transport Message)" to the O-MSC 102 based on the "CALL CONFIRMED" message transmitted from the T-UE 104 S216. In this case, as illustrated in FIG. 2, since the T-UE 104 also supports the

multimedia calling service and the voice calling service and prefers the multimedia calling service, the "AMR" message may include information that mm, which is the codec information for the multimedia calling service, is selected and the "AMR" may hereinafter be the preferential service.

[31] The O-MSC 102 transmits a "CALL PROCEEDING" message to the O-UE 101 based on the transmitted "AMR" message S217. At this time, in the "CALL PROCEEDING" message transmitted to the O-UE 101, information about services supported by the T-UE 104 and preferential messages may be included. As illustrated in FIG. 2, it is exemplified that the O-UE 101 and the T-UE 104 support the same services and prefer the same service (i.e. a normal case). However, service information included in a "CALL PROCEEDING" message may correspond to a case in which the O-UE and the T-UE support the same services, but prefer different services (i.e. a reverse case), or a case in which the O-UE and the T-UE support only one service among plural services (i.e. a fallback case). Also, in addition to the normal case, the reverse case, and the fallback case as described above, a case in which the T-UE 104 does not support the SCUDIF call (i.e. not support SCUDIF case) may occur. At this time, if the O-UE and the T-UE support the same services but change over to another service, A service changeover process in the reverse case and the fallback case is described later.

[32] The O-UE 101, after receiving the "CALL PROCEEDING" message, performs a wireless resource allocation procedure for service connection with the T-UE 104 S218, and the O-MSC 102 transmits a "COT (Continuity Message)" for reporting the wireless resource allocation to the T-MSC 103 S219.

[33] The T-MSC 103 performs a wireless resource allocation procedure with the T-UE 104 S220, and the T-UE 104 transmits an "ALERTING" message for reporting the wireless resource allocation to a terminating user to the T-MSC 103 S221. The T-MSC 103, in response to the "COT" message in S219, transmits an "ACM (Address Complete Message)" to the O-MSC 102 S222, and the O-MSC 102 transmits an "ALERTING" message to the O-UE 101 S223. After the "ALERTING" message is transmitted in S221, the T-UE 104 rings the bell, starts vibration, or displays that the call request has been made through an output unit thereof.

[34] In an embodiment of the present invention, in the case of originating the voice call or the multimedia call of the O-UE 104, the user of the T-UE 104 can dynamically select the call to be received. For example, in the case of a specific call request message to the T-UE 104, the user of the T-UE 104 can select a calling mode for the call to be received through the output display screen of the T-UE 104. For example, the call mode for the call may be classified into a voice preference mode, a multimedia preference mode, a voice dedicated mode, and a multimedia dedicated mode. Here, the

voice preference mode is for preferentially providing the voice calling service although both the voice calling service and the multimedia calling service are provided, and the multimedia preference mode is for preferentially providing the multimedia calling service although both the voice calling service and the multimedia calling service are provided. The voice dedicated mode is for providing only the voice calling service, and the multimedia dedicated mode is for providing only the multimedia calling service. Here, in the voice preference mode and the multimedia preference mode, it is possible to make a service change between the voice mode and the multimedia mode after establishment of a call path. However, in the voice dedicated mode and the multimedia dedicated mode, fallback occurs to allocate voice dedicated or multimedia dedicated wireless resources, and thus no calling mode can be changed by the subsequent service change. In this case, the voice mode means a state in which the voice calling service is provided, and the multimedia mode means a state in which the multimedia calling service is provided. Here, the fallback means that only one of the voice call and the multimedia call is selected, and the corresponding service is provided.

[35] For example, as illustrated in FIG. 2, if the user of the T-UE 104 selects a multimedia (MM) preference mode S240, wireless resources for the multimedia mode have already been allocated between the T-UE 104 and the T-MSC 103, and thus the corresponding service is directly provided without newly allocating the wireless resources. At this time, the T-UE 104 transmits a "CONNECT" message to the T-MSC 103 S224, the T-MSC 103 transmits an "ANM (Answer Message)" to the O-MSC 102 S225, and then the O-MSC 102 transmits a "CONNECT" message to the O-UE 101 S226. Accordingly, the service is connected between the O-UE 101 and the T-UE 104, and the calling becomes available.

[36] Accordingly, if a call path is connected between the O-UE 101 and the T-UE 104, the multimedia calling service is performed, and the service change becomes available S250.

[37] FIG. 3 is a flowchart illustrating a method for selecting a voice or multimedia call in the mobile communication system of FIG. 1. With reference to FIG. 3, in the same manner as in FIG. 2, a SCUDIF call process in the mobile communication system will now be described.

[38] Referring to FIG. 3, the O-UE 101 requests a call in a multimedia preference mode, and in response to this call request, the T-UE 104 selects a voice preference mode. The call request of the O-UE 101 and the response of the T-UE 104 can be performed in a similar manner to S211 to S226 as shown in FIG. 2.

[39] In FIG. 3, the user of the T-UE 104 selects the voice preference mode S300. For example, in accordance with the internal setting of the T-UE 104, a video preference mode is designated, and wireless resources in a multimedia mode are allocated

between the O-UE 101 and the O-MSC 102 S218 and also between the T-UE 104 and the T-MSC 103 S220.

[40] Accordingly, in the case in which the user of the T-UE 104 selects the voice preference mode after the wireless resource allocation is completed, the call path in a multimedia mode is first established to temporarily provide the multimedia calling service S250. Simultaneously, by an automatic service change, the present mode is changed from the multimedia mode to the voice mode S310 to S350. As described above, if the user of the T-UE 104 selects the voice preference mode, a service change from the multimedia mode to the voice mode is performed just after the multimedia call path is established, and thus the request of the user of the T-UE 104 can be satisfied. On the other hand, since the service for the multimedia mode is not temporarily recognized by the users of the O-UE 101 and the T-UE 104 or is performed for a very short time, it can be excluded from being charged for.

[41] The service change, which is performed when the T-UE 104 selects the voice preference mode, may be performed as follows. The T-UE 104 transmits a "MODIFY" message for requesting a service change from the multimedia mode to the voice mode to the T-MSC 103 S310, and allocates wireless resources corresponding to the service change S312. The T-MSC 103, having received the "MODIFY" message, transmits to the O-MSC 102, an "APM" message which includes information that the T-UE 104 intends to use the voice calling service and the multimedia calling service is hereinafter available S320. The O-MSC 102 transmits the "MODIFY" message to the O-UE 101 based on the transmitted "APM" message S330. The O-UE 101 allocates wireless resources for the voice calling service with the O-MSC 102. If the wireless resources for the voice calling service are allocated, the O-MSC transmits the "APM" message for reporting the allocation of the wireless resources to the T-MSC 103 S340. The T-MSC 103 receives the "APM" message, and transmits a "MODIFY COMPLETE" message for reporting the completion of the service change to the T-UE 104 S345.

[42] When the service change is completed, a voice call path is formed between the O-UE 101 and the T-UE 104, and the voice calling service in the voice mode is provided through the call path S350.

[43] On the other hand, referring to FIGS. 2 and 3, if the internal setting of the T-UE 104 is different from the calling mode input to the T-UE 104, the call path is established according to the internal setting of the T-UE 104, and then the T-UE 104 requests the service change to the calling mode input to the T-MSC 103, so that the present mode can be changed to the calling mode selected by the user of the T-UE 104.

[44] As described above, according to an embodiment of the present invention, the T-UE 104 can dynamically select the multimedia mode and the voice mode in response to the call request of the O-UE 101. That is, instead of simply performing a call connection

according to the internal setting of the T-UE 104, the user of the T-UE 104 can select a preference mode at a call termination time, and thus the call success rate is heightened with the user's request satisfied.

[45] FIG. 4 is a flowchart illustrating a method for selecting a voice or multimedia call according to another embodiment of the present invention.

[46] Referring to FIG. 4, under the assumption that with respect to a call request of the O-UE 101 in a specific mode, the T-UE 101 responds to the call request in the same mode, a case in which the voice mode or the multimedia mode is dynamically selected will now be described. Here, the specific mode may be classified into the multimedia preference mode, the voice preference mode, the multimedia dedicated mode, and the voice dedicated mode as in the embodiment described above.

[47] First, the O-UE 101 transmits the "SETUP" message for setting the SCUDIF call to the O-MSC 102 S411. The O-MSC 102 transmits the "IAM" message to the T-MSC 103 based on the "SETUP" message transferred from the O-UE 101 S412.

[48] If the "IAM" message is received from the O-MSC 102, the T-MSC 103, i.e. a message transmitting unit transmits the "APM" message to the O-MSC 102 under the assumption that the T-UE 104 supports the same services as those of the O-UE 101 and prefers the same services as those of the O-UE 101 S413. The O-MSC 102 transmits the "CALL PRODEEDING" message to the O-UE 101 based on the transferred "APM" message S414.

[49] The O-UE 101, after receiving the "CALL PROCEEDING" message, performs the wireless resource allocation procedure with the O-MSC 102 S415, and the O-MSC 102 transmits the "COT (Continuity Message)" for reporting the wireless resource allocation to the T-MSC 103 S416. The T-MSC 103 transmits the "ACM" message for the "COT" message to the O-MSC 102 S417, and the O-MSC 102 transfers the "CALL PROGRESS" message for the "ACM" message transferred from the T-MSC 103 to the O-UE 101 S418.

[50] The T-MSC 103 performs a paging procedure with the T-UE 104 S419, and provides a ring back tone to the O-UE 101 S420. Accordingly, the O-UE 101 can receive the ring back tone in a short time in a state in which the call setting process of the T-UE 104 and the wireless resource allocation process are not performed. After the ring back tone is provided to the O-UE 101, the T-MSC 103 and the T-UE 104 perform the SCUDIF call setting process and the wireless resource allocation process.

[51] After the ring back tone is provided to the O-UE 101, the T-MSC 103 transmits the "SETUP" message for setting the SCUDIF call setting to the T-UE 104 based on the "IAM" message transmitted in S412 as described above S421.

[52] The T-UE 104 transmits the "CALL CONFIRMED" message for the "SETUP" message in S421 to the T-MSC 103 S424, and performs the wireless resource al-

location procedure with the T-MSC 103 S430. In this case, the "CALL CONFIRMED" message may include information about a mode designated according to the internal setting of the T-UE 104. For example, as illustrated in FIG. 4, the "CALL CONFIRMED" message may include information that the T-UE 104 responds to the internal setting in the multimedia preference mode.

[53] The T-UE 104, after performing the wireless resource allocation procedure with the T-MSC 103, transmits the "ALERTING" message for reporting this to the T-MSC 103 S431. The T-MSC 103 transmits the "CPG" message to the O-MSC 102 based on the "ALERTING" message S432, and the O-MSC 102 transmits the "ALERTING" message to the O-UE 101 S433. After the "ALERTING" message is transmitted in S431, the T-UE 104 rings the bell, starts vibration, or displays that the call request has been made through an output unit thereof.

[54] At this time, the user of the T-UE 104 can select a calling mode for the user's desired call as the user looks at the output unit of the T-UE 104. For example, the case in which the multimedia preference mode is selected will be described with reference to FIG. 4, and the case in which the voice preference mode is selected will be described with reference to FIG. 5.

[55] As shown in FIG. 4, if the user of the T-UE 104 selects the multimedia (MM) preference mode S450, wireless resources for the multimedia mode have already been allocated between the T-UE 104 and the T-MSC 103, and thus the corresponding service can be directly provided. At this time, the T-UE 104 transmits the "CONNECT" message to the T-MSC 103 S434, the T-MSC 103 transmits the "ANM (Answer Message)" to the O-MSC 102 S435, and then the O-MSC 102 transmits the "CONNECT" message to the O-UE 101 S436. Accordingly, the multimedia call path is connected between the O-UE 101 and the T-UE 104, and the multimedia calling service is provided. In the state in which the multimedia calling service is provided, the service change to the voice mode becomes available S460.

[56] FIG. 5 is a flowchart illustrating a method for selecting a voice or multimedia call according to another embodiment of the present invention. Referring to FIG. 5, since S411 to S460 are the same as those in FIG. 4, and thus the detailed description thereof will be omitted. In this case, however, the user of the T-UE 104 selects the voice preference mode S500, and the O-UE 101 selects the multimedia preference mode to cause the occurrence of collision.

[57] Referring again to FIG. 5, as the early ring back tone is provided, the wireless resources for the multimedia mode have already been allocated between the O-UE 101 and the O-MSC 102 S415, and the wireless resources for the multimedia mode have already been allocated between the T-UE 104 and the T-MSC 103 S430.

[58] Accordingly, if the user of the T-UE 104 selects the voice preference mode after the

wireless resource allocation is completed, the call path in the multimedia mode is first established to temporarily provide the multimedia calling service S460. At the same time, by the automatic service change just after the call path is established, the present mode can be changed from the multimedia mode to the voice mode S310 to S350. Accordingly, the user of the T-UE 104 can easily select calling mode that the user prefers. The calling mode selected by the user of the T-UE 104 is processed in the communication network, and thus the request of the user of the T-UE 104 can be satisfied. Since the service change in S310 to S350 has already been described with reference to FIG. 3, the detailed description thereof will be omitted.

[59] As described above, with respect to the call request from the O-UE 101 that corresponds to an unwanted multimedia or voice calling service, the call terminating party can select the preferential calling mode, and thus the call success rate can be heightened. Also, since the call terminating party can actively change the call, the customer's satisfaction can be heightened.

[60] FIG. 6 is a flowchart illustrating a method for selecting a voice or multimedia call according to still another embodiment of the present invention.

[61] Referring to FIG. 6, the apparatus for selecting a voice or multimedia call according to another embodiment of the present invention includes a message receiving unit 610, a message transmitting unit 620, an output unit 630, and a dynamic selection processing unit 640. It is exemplified that the apparatus for selecting a voice or multimedia call as illustrated in FIG. 6 is included in the T-UE 104. However, the apparatus according to another embodiment of the present invention may be separately configured.

[62] The message receiving unit 610 receives the "SETUP" message for the call setting from the T-MSC 103. Also, the message receiving unit 610 receives the "MODIFY COMPLETE" message if the service change has been performed.

[63] The message transmitting unit 620 transmits the "CALL CONFIRMED" message that includes information about the services supported by the T-UE 104 and the preference services to the T-MSC 103. Also, the message transmitting unit 620 transmits the "MODIFY" message for requesting the service change to the T-MSC 103 in accordance with the calling mode input to the T-UE 104. In addition, the message transmitting unit 620 transmits the "ALERTING" message for reporting the wireless resource allocation to the T-MSC 103, and if the user presses a call button or a mode selection button, it transmits the "CONNECT" message to the T-MSC 103.

[64] The output unit 630 serves to display a screen for selecting each mode so that the user of the T-UE 104 can select the mode. The output unit 630 displays the state of the T-UE 104 or the background.

[65] The dynamic selection processing unit 640 serves to receive a specific calling mode

from the user with respect to the call request of the O-UE 101. If the user recognizes the call request by ring back tone or vibration, the user of the T-UE 104 receives a specific calling mode that can be selected through the output unit 630 and selects a desired mode. The dynamic selection processing unit 640 can determine whether to newly allocate the wireless resources in accordance with the mode selected by and input from the user. The dynamic selection processing unit 640 can request the T-MSC 103 to establish a call path between the O-UE 101 and the T-OE 104 based on the calling mode input to the T-UE 104.

[66] For example, in the case in which the O-UE 101 requests a call in the multimedia preference mode and the user of the T-UE 104 selects the multimedia preference mode, the modes of the O-UE 101 and the T-UE 104 coincide with each other, and the dynamic selection processing unit 640 directly connects the call by the "CONNECT" message so that the multimedia calling service is provided.

[67] As another example, if the O-UE 101 requests a call in the multimedia preference mode and the user of the T-UE 104 selects the voice preference mode, the modes of the O-UE 101 and the T-UE 104 do not coincide with each other, and the dynamic selection processing unit 640 sets wireless resources for a voice call path to provide the voice preference mode. If the wireless resource allocation for the multimedia mode has already been performed, the dynamic selection processing unit 640 transmits the "MODIFY" message for the service change to the T-MSC 103 to perform the service change process just after the connection in the multimedia mode.

[68] As described above, according to an embodiment of the present invention, the terminating user can select a specific calling mode with respect to the voice or multimedia call request, and thus the call success rate can be heightened. Also, since the voice or multimedia mode is selected by the determination of the terminating user, the call can be dynamically selected in accordance with the situation or the selection of the terminating user.

[69] In an embodiment of the present invention, the selection of the voice or multimedia call has been described based on the call request from the O-UE 101. However, it is apparent that even in the case of the call request from the T-UE 104, the present invention can be applied in the same manner. In the case of the call request from the T-UE 104, the user of the O-UE 101 selects a specific calling mode, and thus the terminating user can dynamically select the voice or multimedia call.

[70] The constituent element or the term "unit", as used herein, may be implemented by software components, such as tasks, classes, subroutines, processes, objects, execution threads and programs, hardware components, such as a field programmable gate array (FPGA) or application-specific integrated circuit (ASIC), and combination of the software and hardware components. Also, the constituent element or the term "unit"

may be included in a computer-readable storage medium, or may be partially separated and distributed into plural computer.

[71] Although preferred embodiments of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Industrial Applicability

[72] Present invention can heighten the call success rate by actively selecting a voice or multimedia call in a mobile communication system that supports the SCUDIF call.

Claims

[Claim 1] A system for selecting a voice or multimedia call in a mobile communication system, comprising:
a first mobile switching center (MSC) receiving a call request of a first user terminal in a specific calling mode; and
a second mobile switching center transmitting a call request message from the first user terminal to a second user terminal that is to receiver of the call;
wherein the second user terminal accepts a desired calling mode input from a user and establishes a call path between the first user terminal and the second user terminal in accordance with the inputted calling mode.

[Claim 2] The system of claim 1, wherein the calling mode is one of a multimedia preference mode, a voice preference mode, a multimedia dedicated mode, and a voice dedicated mode;
the multimedia preference mode and the multimedia dedicated mode are multimedia modes for providing a multimedia calling service; and
the voice preference mode and the voice dedicated mode are voice modes for providing a voice calling service.

[Claim 3] The system of claim 1, wherein the second user terminal comprises a dynamic selection processing unit requesting establishment of the call path between the first user terminal and the second user terminal based on the calling mode inputted in the second user terminal if the calling mode for the call request of the first user terminal is different from the calling mode inputted in the second user terminal.

[Claim 4] The system of claim 3, wherein the second user terminal requests a service change from the second MSC in accordance with the calling mode inputted in the second user terminal after the call path is established by allocating wireless resources to the first user terminal and the second user terminal in accordance with the calling mode according to the call request of the first user terminal.

[Claim 5] The system of claim 1, wherein the second user terminal requests a service change from the second MSC in accordance with the calling mode inputted in the second user terminal after the call path is established in accordance with an internal setting of the second user terminal if the internal setting of the second user terminal is different from the calling mode inputted in the second user terminal.

[Claim 6] The system of claim 1, wherein the second user terminal comprises an output unit providing a display screen for selecting the specific calling mode.

[Claim 7] The system of claim 1, wherein the second mobile switching center provides a ring back tone to the first user terminal in accordance with the calling mode requested by the first user terminal before transmitting the call request message to the second user terminal in accordance with the call request of the first user terminal.

[Claim 8] An apparatus for selecting a voice or multimedia call, comprising:
a message receiving unit receiving a message reporting the existence of a call attempt request of a first user terminal in a specific calling mode;
a dynamic selection processing unit accepting a desired calling mode input from a user and processing the input; and
a message transmitting unit requesting establishment of a call path to a mobile switching center (MSC) in accordance with the inputted calling mode.

[Claim 9] The apparatus of claim 8, wherein the dynamic selection processing unit requests a service change in accordance with the inputted calling mode after the call path is established in accordance with the calling mode when the first user terminal requests according to the call request of the first user terminal if the calling mode requested by the first user terminal is different from the calling mode inputted by the user.

[Claim 10] The apparatus of claim 8, wherein the dynamic selection processing unit requests a service change in accordance with the calling mode input to the mobile switching center after the call path is established in accordance with an internal setting if the internal setting is different from the inputted calling mode.

[Claim 11] A method for selecting a voice or multimedia call in a mobile communication system, comprising:
receiving a call request of a first user terminal in a specific calling mode;
accepting a calling mode with the first user terminal input from a user of a second user terminal; and
requesting establishment of a call path between the first user terminal and the second user terminal in accordance with the inputted calling mode.

[Claim 12] The method of claim 11, further comprising requesting a service change in accordance with the inputted calling mode after the call path

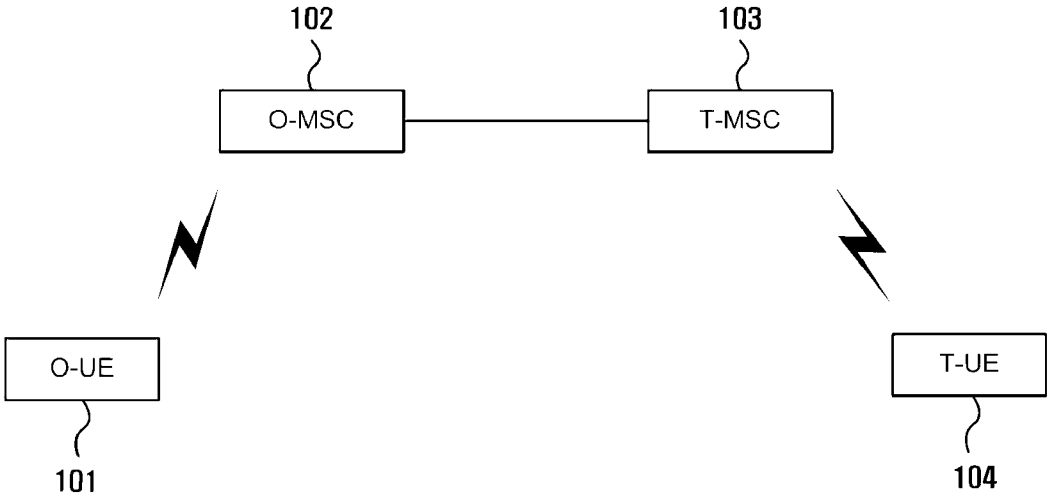
is established in accordance with the calling mode when the first user terminal requests the call.

[Claim 13] The method of claim 11, further comprising requesting a service change from the mobile switching center in accordance with the inputted calling mode after the call path is established in accordance with an internal setting of the second user terminal if the internal setting of the second user terminal is different from the inputted calling mode.

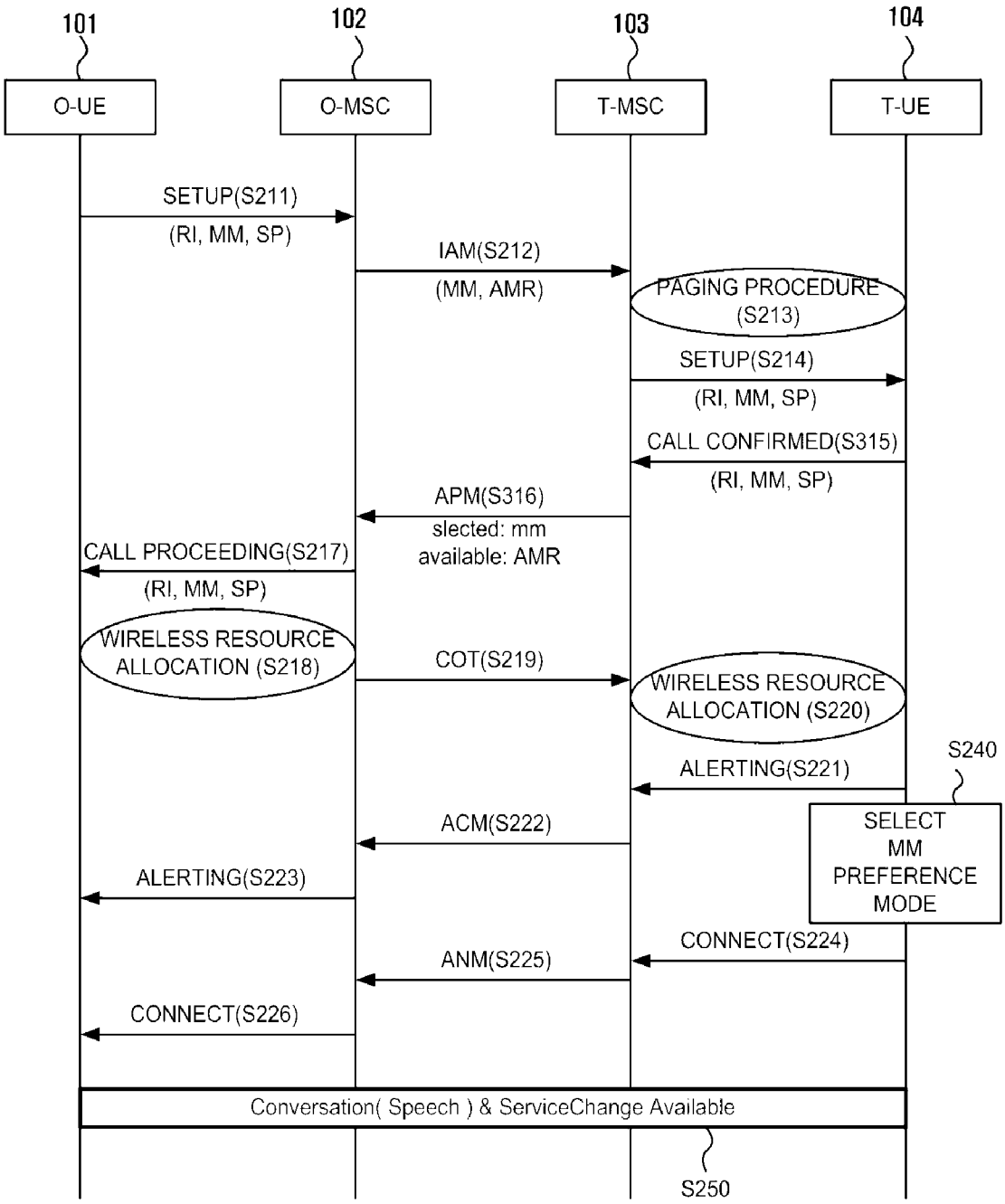
[Claim 14] The method of claim 11, wherein the receiving the calling mode is performed after providing one of a ring back tone, vibration, and display for reporting the call request of the first user terminal.

[Claim 15] The method of claim 14, wherein the requesting the establishment of the call path further comprises requesting a service change if the inputted calling mode is different from the established calling mode after the call path is established subsequent to the input of the calling mode.

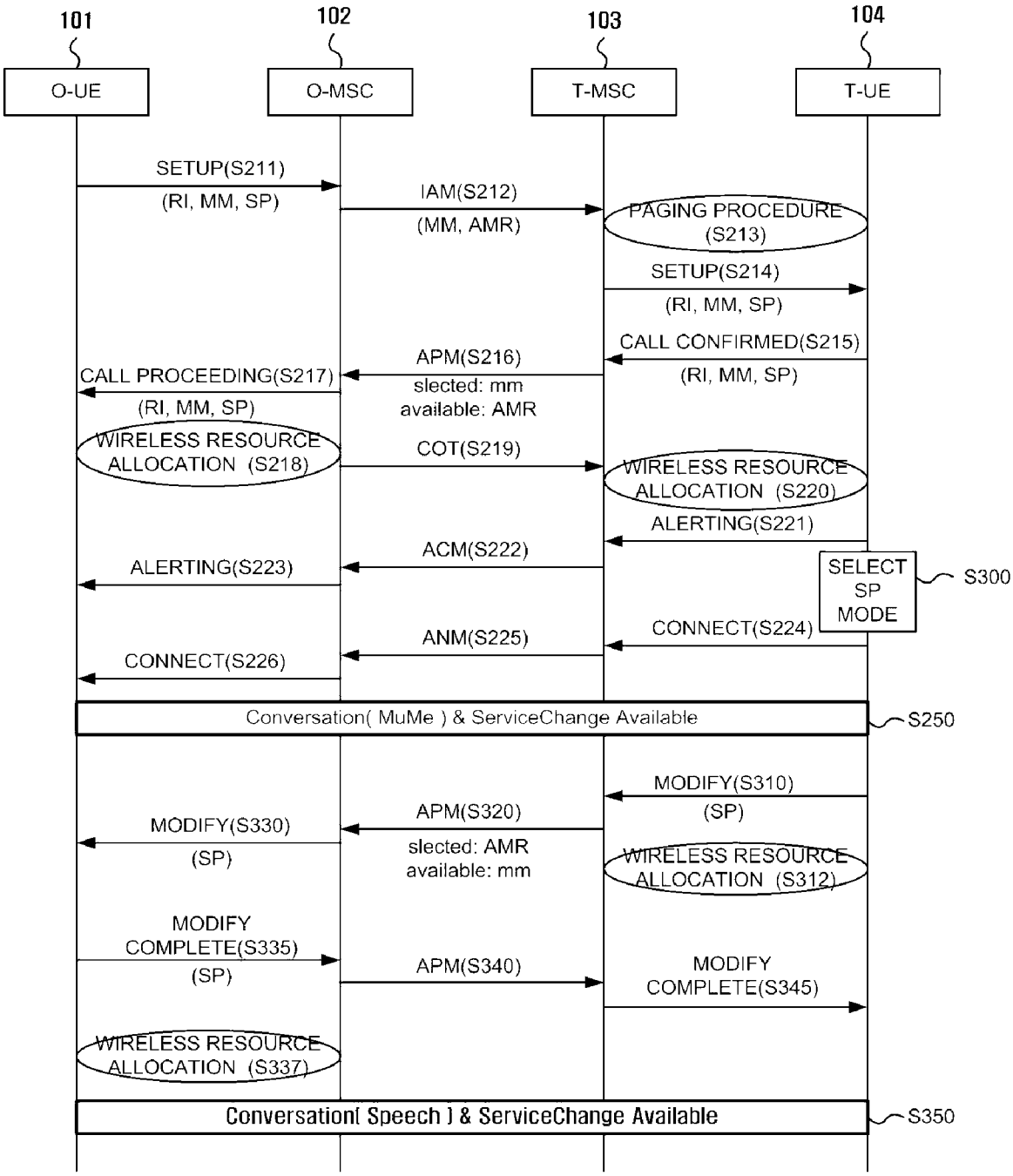
[Fig. 1]


102
103
O-MSC
T-MSC
O-UE
T-UE
101
104

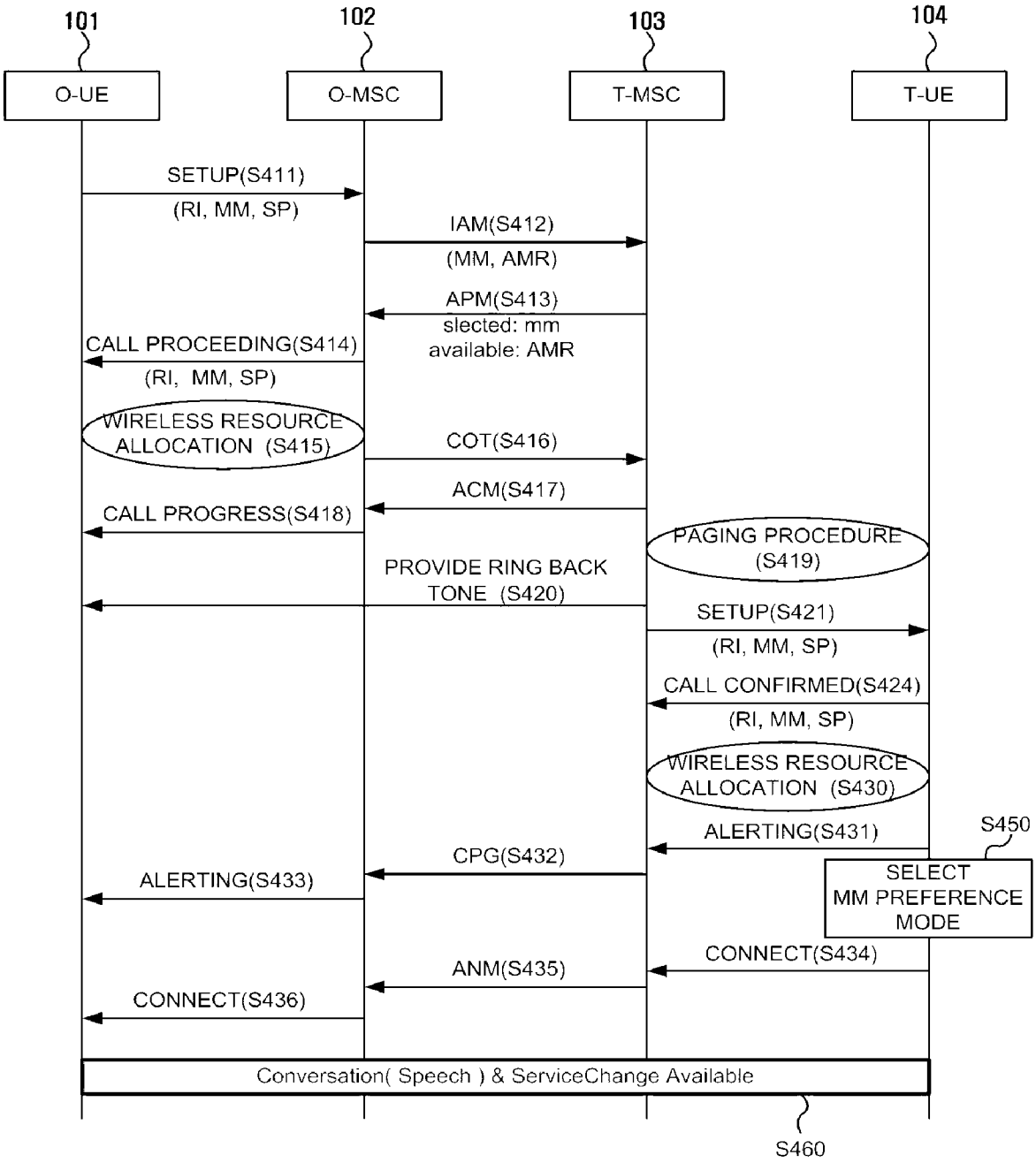
[Fig. 2]


101
102
103
104
O-UE
O-MSC
T-MSC
T-UE
SETUP(S211)
(RI, MM, SP)
IAM(S212)
(MM, AMR)
PAGING PROCEDURE (S213)
SETUP(S214)
(RI, MM, SP)
CALL CONFIRMED(S315)
(RI, MM, SP)
APM(S316)
slected: mm
available: AMR
CALL PROCEEDING(S217)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S218)
COT(S219)
WIRELESS RESOURCE ALLOCATION (S220)
S240
ALERTING(S221)
SELECT MM PREFERENCE MODE
ACM(S222)
ALERTING(S223)
CONNECT(S224)
ANM(S225)
CONNECT(S226)
Conversation(Speech) & ServiceChange Available
S250

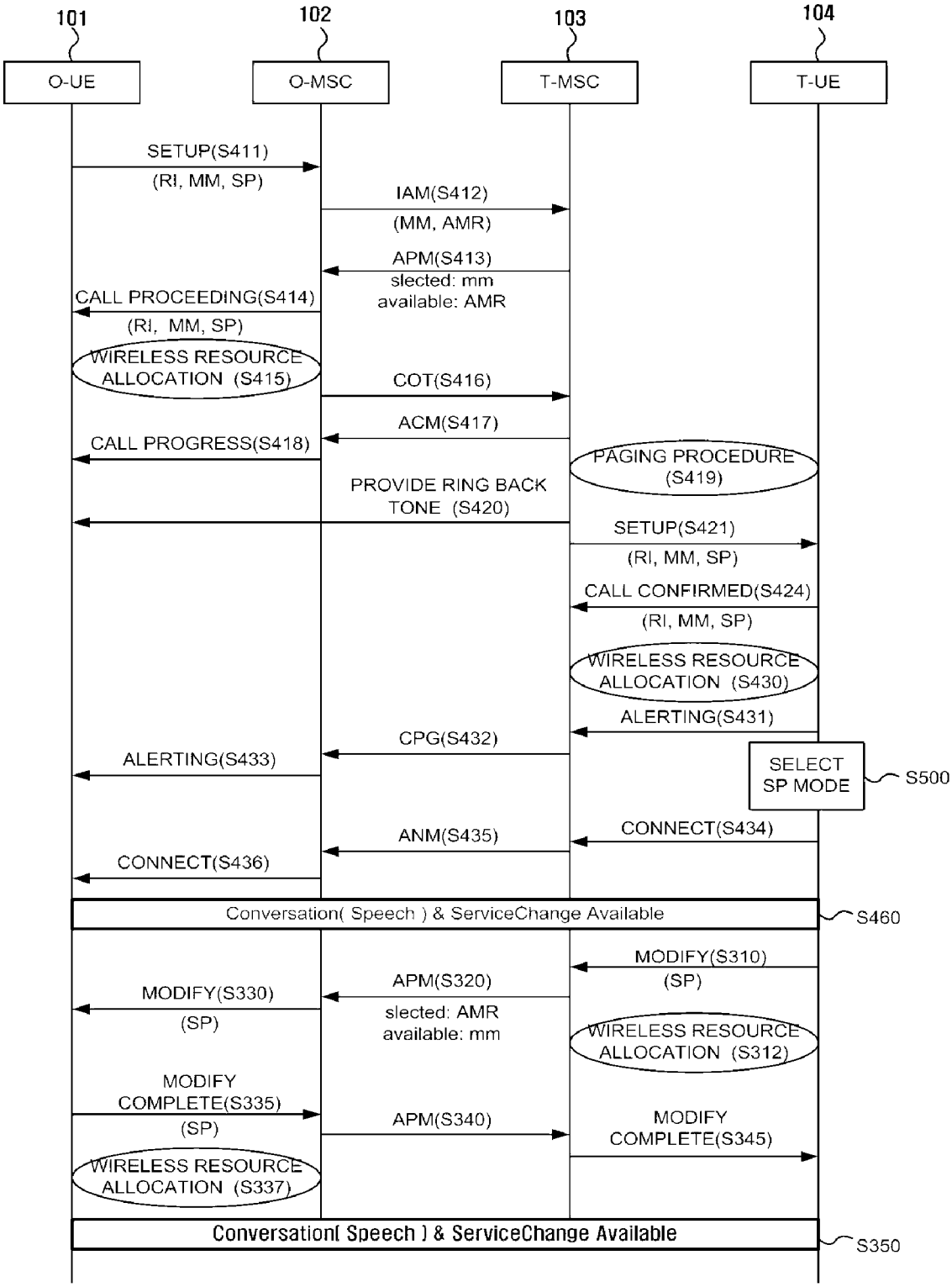
[Fig. 3]


101
102
103
104
O-UE
O-MSC
T-MSC
T-UE
SETUP(S211)
(RI, MM, SP)
IAM(S212)
(MM, AMR)
PAGING PROCEDURE (S213)
SETUP(S214)
(RI, MM, SP)
CALL CONFIRMED(S215)
(RI, MM, SP)
APM(S216)
slected: mm
available: AMR
CALL PROCEEDING(S217)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S218)
COT(S219)
WIRELESS RESOURCE ALLOCATION (S220)
ALERTING(S221)
ACM(S222)
ALERTING(S223)
SELECT SP MODE
S300
CONNECT(S224)
ANM(S225)
CONNECT(S226)
Conversation(MuMe) & ServiceChange Available
S250
MODIFY(S310)
(SP)
APM(S320)
slected: AMR
available: mm
MODIFY(S330)
(SP)
WIRELESS RESOURCE ALLOCATION (S312)
MODIFY COMPLETE(S335)
(SP)
APM(S340)
MODIFY COMPLETE(S345)
WIRELESS RESOURCE ALLOCATION (S337)
Conversation(Speech) & ServiceChange Available
S350

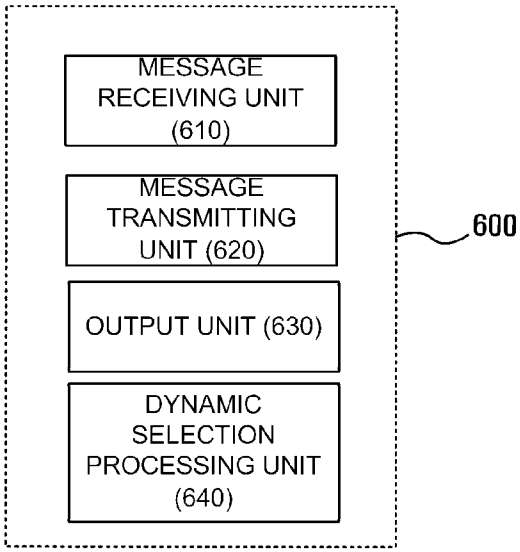
[Fig. 4]


101
102
103
104
O-UE
O-MSC
T-MSC
T-UE
SETUP(S411)
(RI, MM, SP)
IAM(S412)
(MM, AMR)
APM(S413)
slected: mm
available: AMR
CALL PROCEEDING(S414)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S415)
COT(S416)
ACM(S417)
CALL PROGRESS(S418)
PAGING PROCEDURE (S419)
PROVIDE RING BACK TONE (S420)
SETUP(S421)
(RI, MM, SP)
CALL CONFIRMED(S424)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S430)
ALERTING(S431)
S450
CPG(S432)
ALERTING(S433)
SELECT MM PREFERENCE MODE
CONNECT(S434)
ANM(S435)
CONNECT(S436)
Conversation(Speech) & ServiceChange Available
S460

[Fig. 5]


101
102
103
104
O-UE
O-MSC
T-MSC
T-UE
SETUP(S411)
(RI, MM, SP)
IAM(S412)
(MM, AMR)
APM(S413)
slected: mm
available: AMR
CALL PROCEEDING(S414)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S415)
COT(S416)
ACM(S417)
CALL PROGRESS(S418)
PAGING PROCEDURE (S419)
PROVIDE RING BACK TONE (S420)
SETUP(S421)
(RI, MM, SP)
CALL CONFIRMED(S424)
(RI, MM, SP)
WIRELESS RESOURCE ALLOCATION (S430)
ALERTING(S431)
CPG(S432)
ALERTING(S433)
SELECT SP MODE
S500
ANM(S435)
CONNECT(S434)
CONNECT(S436)
Conversation(Speech) & ServiceChange Available
S460
MODIFY(S310)
(SP)
APM(S320)
slected: AMR
available: mm
MODIFY(S330)
(SP)
WIRELESS RESOURCE ALLOCATION (S312)
MODIFY COMPLETE(S335)
(SP)
APM(S340)
MODIFY COMPLETE(S345)
WIRELESS RESOURCE ALLOCATION (S337)
Conversation(Speech) & ServiceChange Available
S350

[Fig. 6]


MESSAGE RECEIVING UNIT (610)
MESSAGE TRANSMITTING UNIT (620)
OUTPUT UNIT (630)
DYNAMIC SELECTION PROCESSING UNIT (640)
600