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(54) **METHOD AND SYSTEM FOR ESTABLISHING SESSION FOR MESSAGE COMMUNICATION BETWEEN CONVERGED IP MESSAGING SERVICE CLIENT AND SHORT MESSAGING SERVICE CLIENT**

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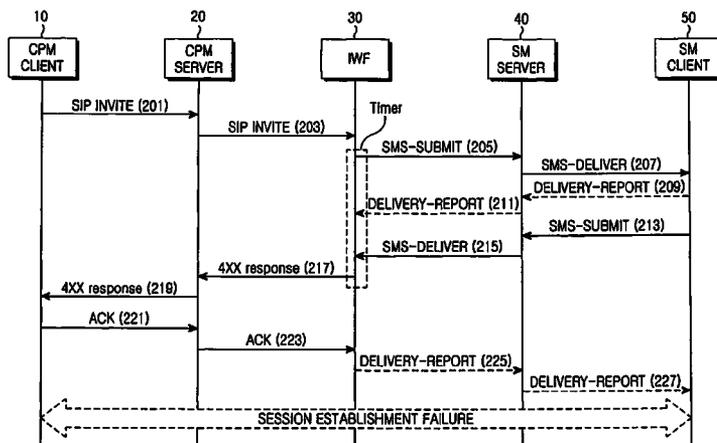
(58) **Field of Classification Search**
     CPC H04L 12/58; H04L 12/589

USPC 709/227–228
See application file for complete search history.

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(57) **ABSTRACT**

A converged IP messaging client transmits a session establishment request for interactive message communication. When a converged IP messaging server receives the request, it determines whether a target client of the interactive message communication uses a converged IP messaging service. If not, the converged IP messaging server transmits the session establishment request to an IWF. If it is determined that the target client is an SM client, the IWF generates an interactive message communication request by transforming a format of the session establishment request into an SMS format and transmits the interactive message communication request to the SM client. If the IWF receives an acceptance response from the SM client in response to the interactive message communication request within an effective response time, a session for the interactive message communication can be established between the converged IP messaging client and the SM client.

43 Claims, 6 Drawing Sheets

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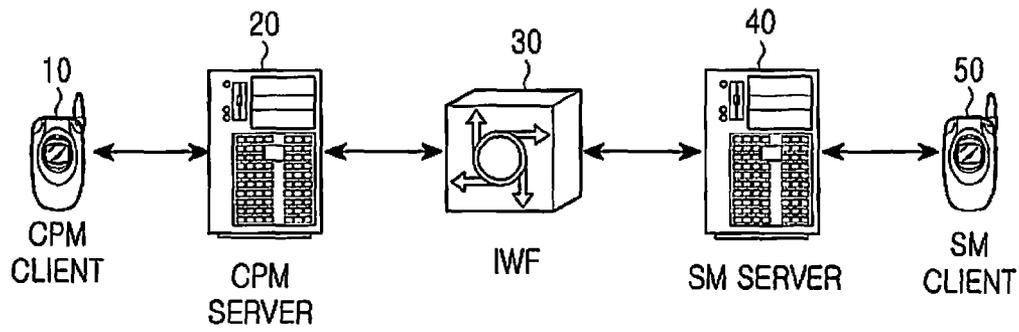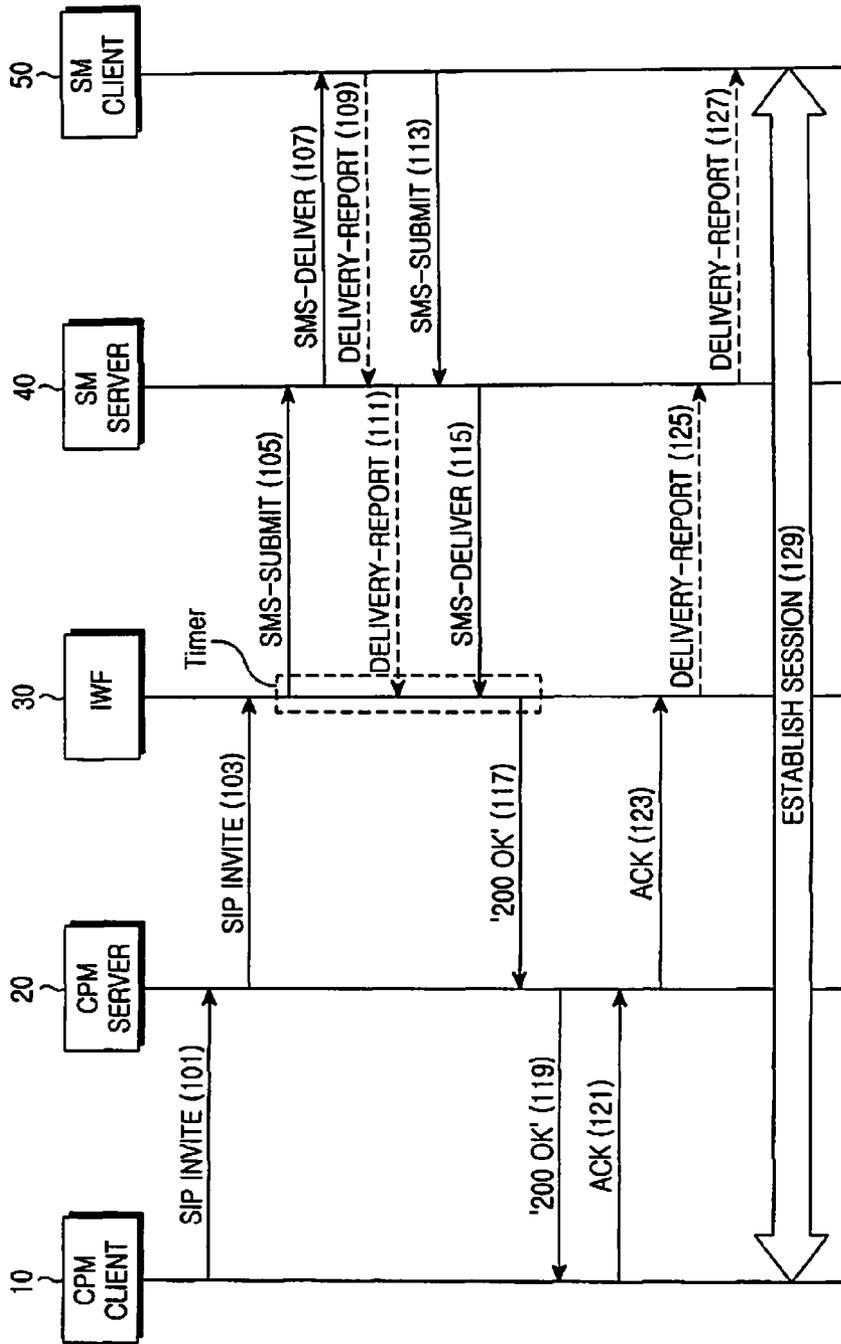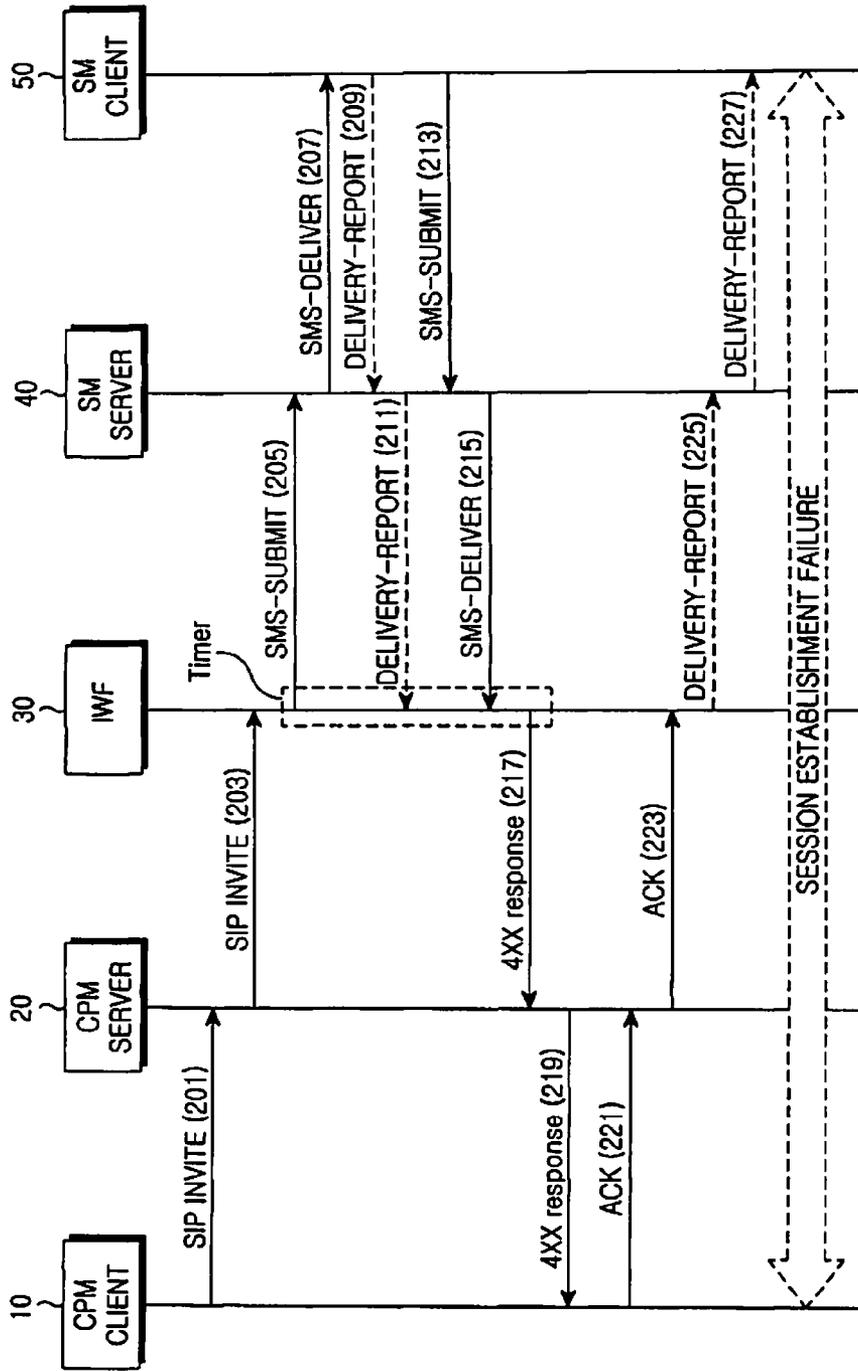
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CPM
CLIENT

CPM
SERVER

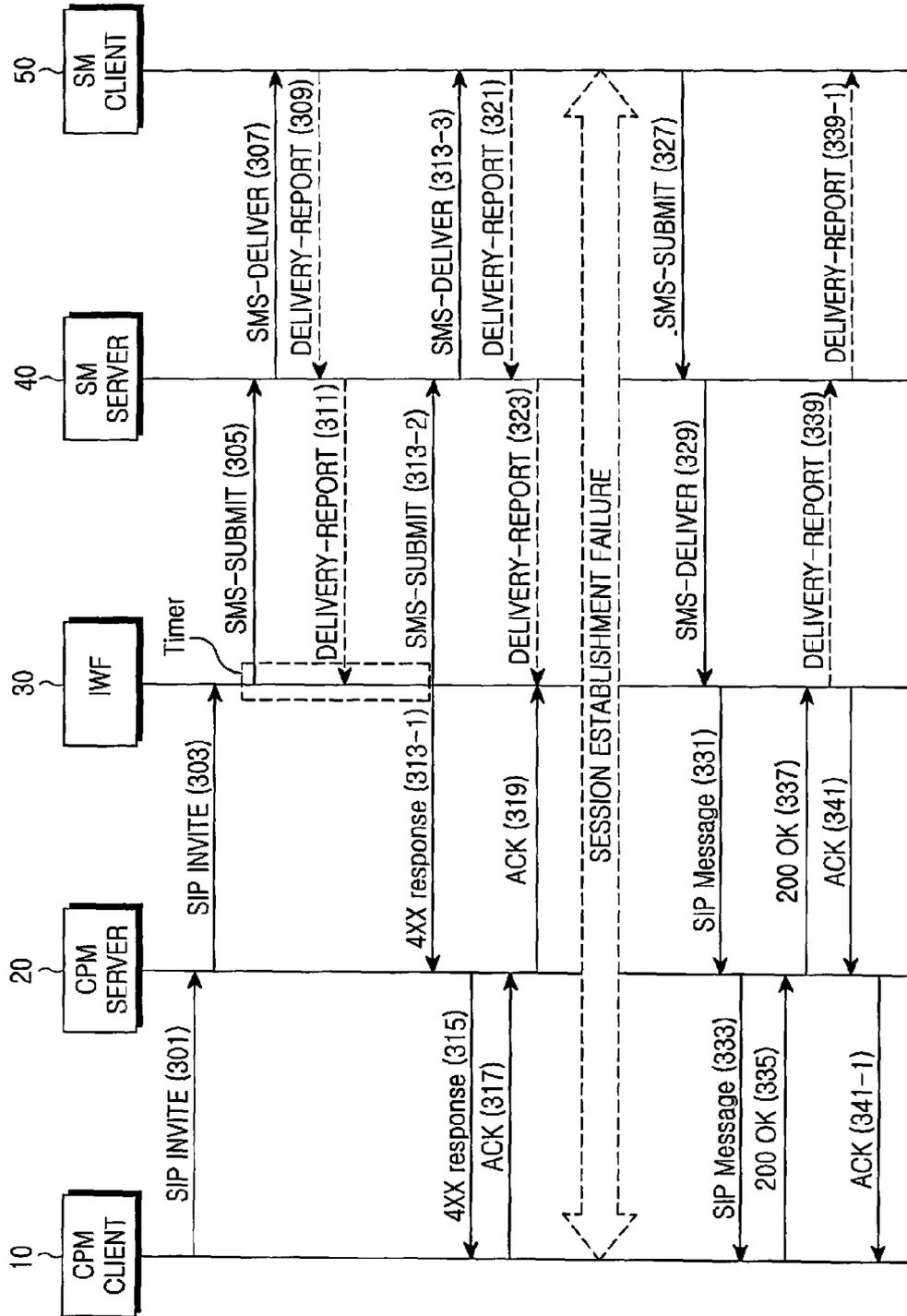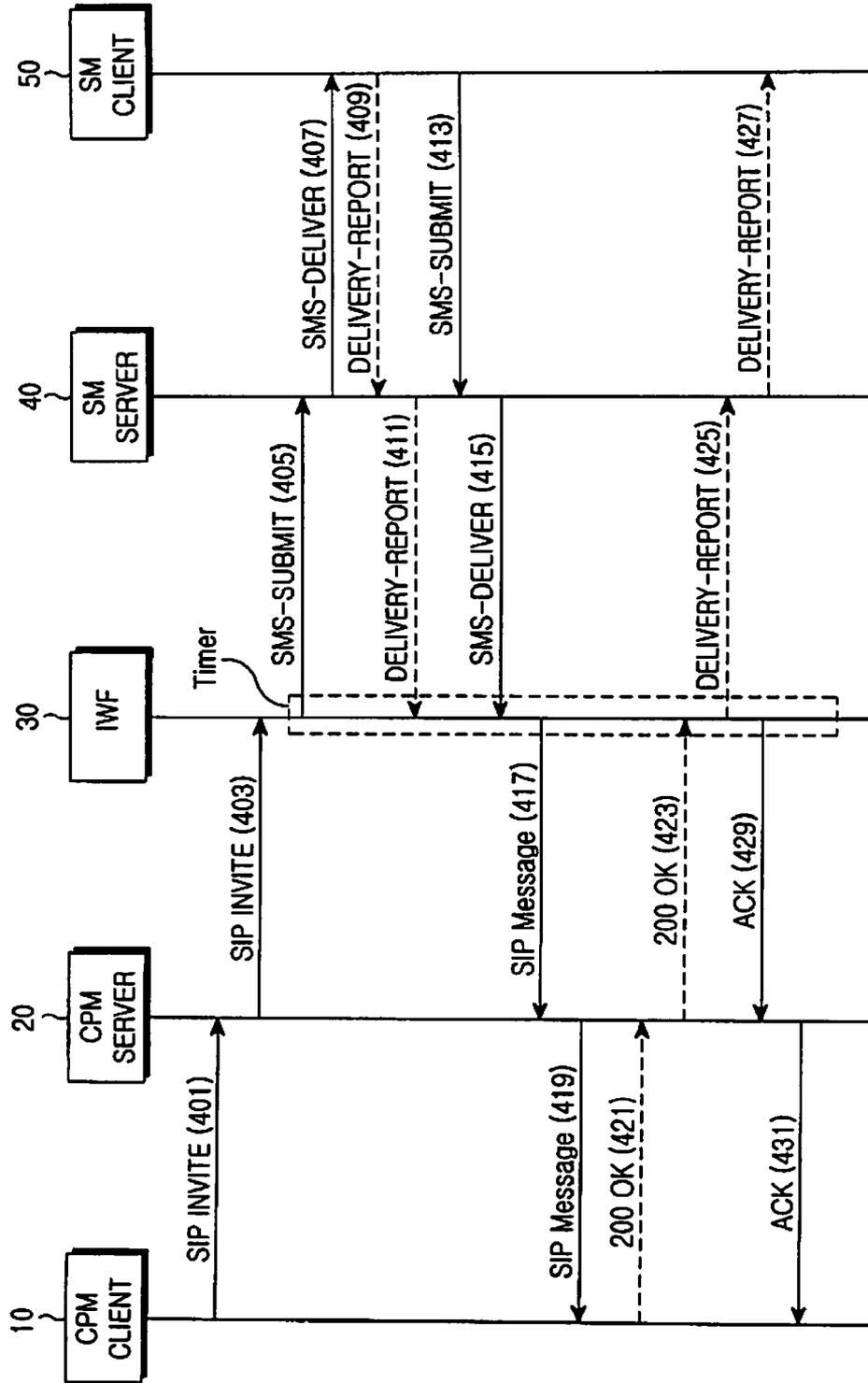IWF

SM SERVER

SM
CLIENT

FIG.1
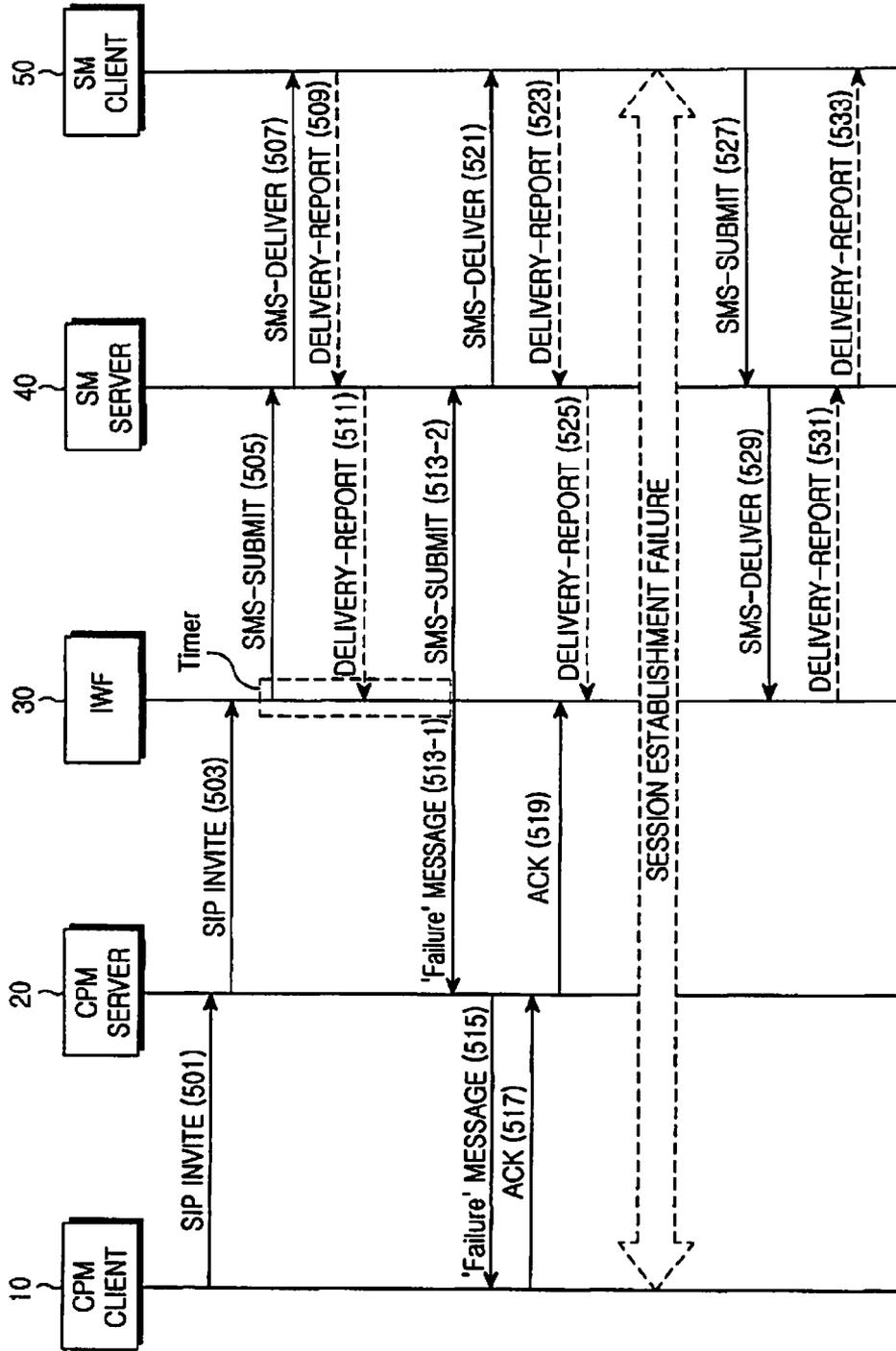
FIG.2

FIG.3

FIG.4

FIG.5

FIG.6

METHOD AND SYSTEM FOR ESTABLISHING SESSION FOR MESSAGE COMMUNICATION BETWEEN CONVERGED IP MESSAGING SERVICE CLIENT AND SHORT MESSAGING SERVICE CLIENT

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

PRIORITY

This application claims priority under 35 U.S.C. §119(a) to a Patent Application filed in the Korean Intellectual Property Office on Nov. 13, 2006 and assigned Serial No. 2006-111780, the contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a messaging service, and in particular, to a method and system for establishing a session for message communication between a converged Internet Protocol (IP) messaging service client and a short messaging service client.

2. Description of the Related Art

Messaging services are for providing communication between a user and a user terminal using a memory device having an accumulated transmission electronic mail box and message processing function as a type of interactive service, and includes such services as Instant Messaging (IM), Short Messaging Service (SMS), Multimedia Messaging Service (MMS) and a Push to Talk Over Cellular (PoC) service.

The IM service indicates a service of converging chatting and file transmitting/receiving functions using a specific program in an Internet environment. Recently, the development of mobile communication services allows personal mobile communication terminals, such as a cellular phone, to provide the IM service for real-time communication, which is provided by a Personal Computer (PC) via the Internet. In the PoC service, a half-duplex communication method is applied to a mobile communication service. The IM service and the PoC service are Session Initiation Protocol (SIP)-based messaging services, wherein message communication is performed by transmitting and receiving a message after establishing a session between a sending client terminal and a receiving client terminal.

For example, a process of establishing a session between two IM clients performing message communication according to the IM service will now be described. A client attempting to start message communication, i.e. an IM client A attempting to open a session, transmits an SIP INVITE message to an IM client B. The IM client B, which has received the SIP INVITE message, transmits a 200 OK message to the IM client A in response. The IM client A, which has received the 200 OK message, transmits an ACKnowledgement (ACK) message to the IM client B in response.

The SMS allows subscribers to send and receive short messages and to perform message communication without establishing a separate session. A SM client stores text input by a user in a user data portion of an SMS-SUBMIT message and transmits the SMS-SUBMIT message to an SM server.

The SM server converts the SMS-SUBMIT message to an SMS-DELIVER message and transmits the SMS-DELIVER message to an SM client corresponding to a reception address. The SM client, which has received the SMS-DE-LIVER message, notifies of a message reception state by transmitting an SMS-DELIVERY-REPORT message to the SM server in response. Even if the SMS-SUBMIT message is converted to the SMS-DELIVER message, the text input by the user is not changed.

As described above, the messaging services use different protocols according to service types. Thus, the messaging services cannot be compatible with each other, and accordingly, a user must begin message communication only after determining whether a type of the message communication is accepted by a target client terminal. Moreover, if messaging service types supported by respective client terminals are different, it is difficult to perform message communication. For example, the IM service in which message communication begins after establishing a session cannot be compatible with the SMS in which message communication begins without establishing a session, and therefore, an IM transmitted from an IM client cannot be received by an SM client.

Thus, a new converged messaging service for converging the messaging services, such as IM, SMS, MMS and PoC services, is needed. Since a user of the converged messaging service must be able to communicate with users of the converged messaging service and users of the existing messaging services without limitation, interworking with the services such as IM, SMS, MMS and PoC must be performed. Furthermore, interworking between a messaging service in which communication is performed by establishing a session and a messaging service in which communication is performed without establishing a session must be performed.

SUMMARY OF THE INVENTION

An aspect of the present invention is to substantially solve at least the above problems and/or disadvantages and to provide at least the advantages below. Accordingly, an aspect of the present invention is to provide a method and system for establishing a session for message communication between a converged messaging service client and a Short Messaging (SM) client in a new converged messaging service of converging messaging services, such as IM, SMS, MMS and PoC services.

According to the present invention, there is provided a method of establishing a session for interactive message communication between a converged IP messaging client and an SM client in a converged IP messaging service system, the method including the converged IP messaging client transmitting a session establishment request for the interactive message communication to a converged IP messaging server, if the session establishment request is received, the converged IP messaging server determining whether a target client of the interactive message communication supports a converged IP messaging service, and if it is determined that the target client does not support the converged IP messaging service, transmitting the session establishment request to an Inter-Working Function (IWF), if the IWF, which has received the session establishment request, determines that the target client of the interactive message communication is the SM client, the IWF generating an interactive message communication request by transforming a format of the session establishment request to an SM service format, and transmitting the interactive message communication request to the SM client, and if the IWF receives an acceptance response from the SM client in response to the interactive message communication request

within an effective response time, the IWF establishing a session for the interactive message communication between the converged IP messaging client and the SM client.

The method further includes, if the IWF receives a rejection response from the SM client in response to the interactive message communication request within the effective response time, the IWF notifying the converged IP messaging client and the SM client of session establishment failure.

The method further includes, if the IWF does not receive the acceptance or rejection response from the SM client in response to the interactive message communication request within the effective response time, the IWF notifying the converged IP messaging client and the SM client of session establishment failure when the effective response time elapses.

The method further includes, if the IWF receives the acceptance or rejection response from the SM client in response to the interactive message communication request after the effective response time elapses, the IWF transmitting the acceptance or rejection response to the converged IP messaging client by processing the acceptance or rejection response as a general short message.

The method further includes, if the IWF receives the acceptance or rejection response from the SM client in response to the interactive message communication request after the effective response time elapses, the IWF discarding the acceptance or rejection response.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawing in which:

FIG. 1 illustrates a converged IP messaging service system according to the present invention;

FIG. 2 illustrates a process of establishing a session for interactive message communication between a converged IP messaging client and an SM client according to a first embodiment of the present invention;

FIG. 3 describes session establishment failure in a process of establishing a session for interactive message communication between a converged IP messaging client and an SM client according to the first embodiment of the present invention;

FIG. 4 describes session establishment failure due to the elapse of an effective response time in a process of establishing a session for interactive message communication between a converged IP messaging client and an SM client according to the first embodiment of the present invention;

FIG. 5 illustrates a process of processing a general short message when a session is established for interactive message communication between a converged IP messaging client and an SM client according to the first embodiment of the present invention; and

FIG. 6 describes session establishment failure due to the elapse of an effective response time in a process of establishing a session for interactive message communication between a converged IP messaging client and an SM client according to a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will be described herein below with reference to the accompanying drawings. In the drawings, the same or similar elements are

denoted by the same reference numerals even though they are depicted in different drawings. In the following description, well-known functions or constructions are not described in detail for the sake of clarity and conciseness.

Hereinafter, in the description, a new messaging service of converging messaging services, such as IM, SMS, MMS and PoC, is called a converged IP messaging service (hereinafter CPM service). The CPM service provides an interworking function between any two among the IM, the SMS, the MMS and the PoC services in order to allow message communication between a CPM client and an existing messaging service user according to the present invention, and in particular, automatically establishes a virtual session between a CPM client and an SM client in order to allow message communication between the CPM client and the SM client.

FIG. 1 illustrates a converged IP messaging service system according to the present invention. Referring to FIG. 1, the CPM service system includes a CPM client 10, a CPM server 20, an Inter-Working Function (IWF) 30, an SM server 40 and an SM client 50, and also includes an MMS server, a PoC server and an IM server, which are not shown.

The CPM client 10 supports a CPM service, and constructs a message for unidirectional message communication or interactive message communication according to selection of a user of the CPM client 10, and transmits the message to the CPM server 20. The CPM client 10 receives and processes various types of messages accompanying message communication, and provides the contents of a message to the user of the CPM client 10 if necessary or according to user settings. An example of the unidirectional message communication may be SMS or MMS, and an example of the interactive message communication may be talking on the IM service. In particular, the CPM client 10 constructs a Session Initiation Protocol (SIP) INVITE message for establishing a session in the interactive message communication and transmits the SIP INVITE message to the CPM server 20, and receives and processes a message from the CPM server 20 in response to the SIP INVITE message.

The CPM server 20 stores subscriber information of CPM clients and clients performing a conventional messaging service, and processes a message related to message communication, which is received from the sending CPM client 10. That is, if the CPM server 20 receives a message related to message communication from the sending CPM client 10, the CPM server 20 determines, by searching the pre-stored subscriber information, whether a receiving client supports the CPM service, and transmits the message to the receiving client according to a result of the determination. For example, if the receiving client is a CPM client, the CPM server 20 transmits the message to a communication network to which the receiving client is connected. If the receiving client is a client supporting only a conventional messaging service, the CPM server 20 transmits the message to the IWF 30. In particular, according to the present invention, if the CPM server 20 receives an SIP INVITE message from the CPM client 10, the CPM server 20 determines whether a target client supports the CPM service, and if it is determined that the target client does not support the CPM service, the CPM server 20 transmits the SIP INVITE message to the IWF 30. The CPM server 20 also transmits a message received from the IWF 30 to the CPM client 10.

When the IWF 30 receives a message related to message communication from the CPM server 20, the IWF 30 detects a receiving client and a message service type supported by the receiving client. If necessary, the IWF 30 transforms a format of the received message to a message format corresponding to a messaging service supported by the receiving client, and

transmits the transformed message to a server of the messaging service, e.g. the SM server **40**, the MMS server, the PoC server or the IM server. If necessary, the IWF **30** transforms a message received from the SM server **40**, the MMS server, the PoC server or the IM server to a CPM message format and transmits the transformed message to the CPM server **20**. Thus, the IWF **30** stores messaging service subscriber information, and message formats and transformation programs corresponding to various types of messaging services.

In particular, if the IWF **30** receives the SIP INVITE message from the CPM server **20**, the IWF **30** detects all types of messaging services supported by the receiving client. If the receiving client is an SM client, the IWF **30** transforms the SIP INVITE message to a format supported in the SMS, i.e. an SMS-SUBMIT message, and transmits the SMS-SUB-MIT message to the SM server **40**. The SMS-SUBMIT message can be constructed in two formats according to the present invention. According to a first embodiment of the present invention, information for notifying that a current SMS-SUBMIT message is an SIP INVITE message is contained in a body of the SMS-SUBMIT message, i.e. user data, without changing the existing SMS-SUBMIT message format. According to a second embodiment of the present invention, a new field, in which information for notifying that a current SMS-SUBMIT message is an SIP INVITE message and a response of a receiving SM client are stored, is added to a header of the existing SMS-SUBMIT message format.

According to the first embodiment of the present invention, if a receiving client of an SIP INVITE message received from the CPM server **20** is the SM client **50**, the IWF **30** transforms the SIP INVITE message to an SMS-SUBMIT message and inserts a query sentence for asking an SM recipient for an acceptance or rejection intention on interactive message communication and a response directive for the recipient to input according to the acceptance or rejection intention into a user data field of the SMS-SUBMIT message as information for notifying that the current SMS-SUBMIT message is the SIP INVITE message. For example, the query sentence may be, "A requested B for message communication. Will you accept?" and the response directive may be "Yes" as the acceptance intention or "No" as the rejection intention. The IWF **30** activates a timer according to an effective response time immediately after transmitting the SMS-SUBMIT message in which the sentences are inserted to the SM server **40**. The effective response time, i.e. a timer value, must be equal to or less than a timer value used when waiting for a response after transmitting a request in the SIP. If the IWF **30** receives an SM from the SM client **50** before the effective response time elapses, the IWF **30** determines whether the received SM is a response message related to an interactive message communication request or a general SM, according to whether the response directive is contained in user data of the received SM. The IWF **30** determines, according to a type of the response directive, whether the SM client **50** has accepted the interactive message communication request. If a response directive indicating acceptance is contained in the received SM, the IWF **30** establishes a session between the CPM client **10** and the IWF **30** by transmitting a 200 OK message to the CPM client **10**. If a response directive indicating rejection is contained in the received SM, the IWF **30** stops a session establishment job by transmitting a proper one of 4xx response messages defined in the SIP to the CPM client **10**. If the received SM is a general SM, the IWF **30** transforms the received SM to an SIP message and transmits the SIP message to the CPM server **20** corresponding to a receiving CPM client. In addition, the IWF **30** generates SMS-DELIVERY-

REPORT messages for all received SMs and transmits the SMS-DELIVERY-REPORT messages to SM clients via the SM server **40**.

If the IWF **30** cannot receive an SM from the SM server **40** in response to the interactive message communication request until the effective response time elapses, the IWF **30** generates a 4xx response according to the elapse of the effective response time, transmits the 4xx response to the CPM client **10** via the CPM server **20**, generates an SM (SMS-SUBMIT message) for notifying that the effective response time has elapsed, and transmits the SM to the SM client **50** via the SM server **40**. In this case, a sentence for notifying the user that the effective response time has elapsed is inserted into the SMS-SUBMIT message transmitted to the SM server **40**. For example, the sentence for notifying that the effective response time has elapsed may be, "The message communication request was cancelled due to the elapse of response time." The IWF **30** considers that all SMs (SMS-DELIVER messages) received after the effective response time elapsed are separate messages regardless of the interactive message communication request, transforms each received SM to an SIP message and transmits the SIP message to the CPM server **20**.

The SM server **40** is a server for supporting the SMS service, and according to the first embodiment of the present invention, transforms an SMS-SUBMIT message received from the IWF **30** into an SMS-DELIVER message and transmits the SMS-DELIVER message to the SM client **50**. When the SM server **40** receives from the SM client **50** an SMS-SUBMIT message, of which a receiving client is the CPM client **10**, the SM server **40** transforms the SMS-SUBMIT message into an SMS-DELIVER message and transmits the SMS-DELIVER message to the IWF **30**. The SM server **40** transmits an SMS-DELIVERY-REPORT message received from the IWF **30** to the SM client **50**, and if the SM server **40** receives from the SM client **50** an SMS-DELIVERY-RE-PORT message, of which a receiving client is the CPM client **10**, the SM server **40** transmits the SMS-DELIVERY-RE-PORT message to the IWF **30**.

The SM client **50** inserts text input by a user of the SM client **50** into an SMS-SUBMIT message and transmits the SMS-SUBMIT message to the SM server **40**, and if an SMS-DELIVER message transmitted from another client is received from the SM server **40**, the SM client **50** notifies that the SM has been received or displays text contained in the SM according to user settings of the SM client **50**. When the SM client **50** receives an SMS-DELIVER message, the SM client **50** transmits an SMS-DELIVERY-REPORT message to the SM server **40** to notify that the SM has been received without an error.

FIG. **2** illustrates a process of establishing a session for interactive message communication between the CPM client **10** and the SM client **50** according to the present invention. Referring to FIG. **2**, if a request for interactive message communication with the SM client **50** is input by a user of the CPM client **10**, the CPM client **10** transmits an SIP INVITE message to the CPM server **20** in step **101** to establish a session for performing the interactive message communication with the SM client **50**. If it is determined through a subscriber information search that a recipient of the SIP INVITE message does not use a CPM service, the CPM server **20** transmits the SIP INVITE message to the IWF **30** in step **103**. The IWF **30** detects a type of a messaging service used by the recipient by searching subscriber information corresponding to a receiving client of the SIP INVITE message. If the IWF **30** detects that the recipient uses the SMS but does not use another messaging service, such as MMS, IM or PoC service, the IWF **30** transforms the SIP INVITE message

into an SMS-SUBMIT message. During the transformation, the IWF **30** inserts an interactive message communication request sentence and a response directive into a user data field of the SMS-SUBMIT message. The IWF **30** transmits the SMS-SUBMIT message to the SM server **40**, which provides the SMS to the receiving SM client **50**, in step **105** and activates a timer immediately after the transmission. The SM server **40** transforms the SMS-SUBMIT message into an SMS-DELIVER message and transmits the SMS-DELIVER message to the SM client **50** in step **107**. The SM client **50** may notify a user of the SM client **50** that the SMS-DELIVER message has been received and display the interactive message communication request sentence and the response directive on a display screen according to SM client **50** user settings . The SM client **50** transmits an SMS-DELIVERY-REPORT message to the SM server **40** in step **109**. The SM server **40** transmits the SMS-DELIVERY-REPORT message to the IWF **30** in step **111**.

The user of the SM client **50** confirms the displayed interactive message communication request sentence, inputs an acceptance response directive, e.g. "Yes", to accept the requested interactive message communication, and requests SM transmission. The SM client **50** constructs an SMS-SUBMIT message in response to the user request and transmits the SMS-SUBMIT message to the SM server **40** in step **113**. The SM server **40** transforms the SMS-SUBMIT message received from the SM client **50** into an SMS-DELIVER message and transmits the SMS-DELIVERY message to the IWF **30** in step **115**. Since the IWF **30** receives the SMS-DELIVERY message from the SM server **40** before the effective response time elapses and the SMS-DELIVERY message contains the response directive indicating "Yes", i.e. the acceptance on the interactive message communication request, the IWF **30** considers the SMS-DELIVERY message as an acceptance message responding to the SIP INVITE message. Thus, the IWF **30** transmits a 200 OK message to the CPM server **20** in step **117**. The CPM server **20** transmits the 200 OK message received from the IWF **30** to the CPM client **10** in step **119**. The CPM client **10** transmits an ACK message to the CPM server **20** in response to the 200 OK message in step **121**. The CPM server **20** transmits the ACK message received from the CPM client **10** to the IWF **30** in step **123**. When the IWF **30** receives the ACK message from the CPM server **20**, the IWF **30** generates an SMS-DELIVERY-REPORT message in response to the SMS-DELIVERY message, which was received in step **115**, and transmits the SMS-DELIVERY-REPORT message to the SM server **40** in step **125**. The SM server **40** transmits the SMS-DELIVERY-REPORT message to the SM client **50** in step **127**, and accordingly, a session between the CPM client **10** and the SM client **50** is established in step **129**. As described above, the SM client **50** can accept the interactive message communication request of the CPM client **10**, and since the SIP INVITE message and the 200 OK message were transmitted and received between the CPM client **10** and the IWF **30**, a virtual session is established between the CPM client **10** and the SM client **50**.

Meanwhile, the user of the SM client **50** can reject the interactive message communication request of the CPM client **10**, and in this case, a process of the CPM service system will now be described with reference to FIG. **3**.

FIG. **3** describes session establishment failure in a process of establishing a session for interactive message communication between the CPM client **10** and the SM client **50** according to the present invention. Steps **201** to **211** illustrated in FIG. **3** are the same as steps **101** to **111** illustrated in FIG. **2**. Referring to FIG. **3**, in steps **201** to **207**, the SM client **50**

receives an SM containing an interactive message communication request of the user of the CPM client **10** and displays an interactive message communication request sentence and a response directive. The user of the SM client **50** confirms the SM, inputs a rejection response directive, e.g. "No", in order to reject the requested interactive message communication, and requests SM transmission. In response to the user request, the SM client **50** transmits an SM (SMS-SUBMIT message) containing the rejection response directive "No" to the SM server **40** in step **213**. The SM server **40** transforms the SMS-SUBMIT message received from the SM client **50** into an SMS-DELIVERY message and transmits the SMS-DELIVERY message to the IWF **30** in step **215**. Since the IWF **30** receives the SMS-DELIVERY message from the SM server **40** before the effective response time elapses and the SMS-DELIVERY message contains the rejection response directive, i.e. "No", the IWF **30** considers the SMS-DELIVERY message as a rejection message responding to the SIP INVITE message. Thus, the IWF **30** transmits a 4xx response indicating rejection of an SMS user to the CPM server **20** in step **217**. The CPM server **20** transmits the 4xx response to the CPM client **10** in step **219**. The CPM client **10** transmits an ACK message to the CPM server **20** in response to the 4xx response in step **221**. The CPM server **20** transmits the ACK message received from the CPM client **10** to the IWF **30** in step **223**. When the IWF **30** receives the ACK message from the CPM server **20**, the IWF **30** generates an SMS-DELIVERY-REPORT message in response to the SMS-DELIVER message, which was received in step **215**, and transmits the SMS-DELIVERY-REPORT message to the SM server **40** in step **225**. The SM server **40** transmits the SMS-DELIVERY-REPORT message to the SM client **50** in step **227**. As described above, since the SM client **50** rejected the interactive message communication request of the CPM client **10** and the CPM client **10** could not receive a 200 OK message responding to the SIP INVITE message, session establishment between the CPM client **10** and the SM client **50** fails.

This session establishment failure may occur when the IWF **30** cannot receive an SM containing a response directive responding to an interactive message communication request before the effective response time elapses besides the case where the SM client **50** rejects the interactive message communication request. In this case, a process of the CPM service system will now be described with reference to FIG. **4**.

FIG. **4** describes session establishment failure due to the elapse of the effective response time in a process of establishing a session for interactive message communication between the CPM client **10** and the SM client **50** according to the present invention. Steps **301** to **311** illustrated in FIG. **4** are to the same as steps **101** to **111** illustrated in FIG. **2**.

Referring to FIG. **4**, in steps **301** to **311**, in response to an interactive message communication request of the user of the CPM client **10**, the IWF **30** transforms an SIP INVITE message received from the CPM client **10** into an SMS-SUBMIT message, transmits the SMS-SUBMIT message to the SM client **50** via the SM server **40**, and receives an SMS-DELIVERY-REPORT message in response. Thereafter, if the IWF **30** cannot receive an SM containing a response directive from the SM server **40** until the effective response time set in step **305** elapses, immediately after the effective response time elapses, the IWF **30** transmits a 4xx response to the CPM client **10**, generates an SM (SMS-SUBMIT message) for notifying that the effective response time for the interactive message communication request has elapsed, and transmits the SM to the SM client **50** in step **313**. In other words, immediately after the effective response time elapses, the IWF **30** transmits the 4xx response to the CPM server **20** in

step **313-1**, generates an SMS-SUBMIT message containing a sentence indicating that the effective response time has elapsed and transmits the SMS-SUBMIT message to the SM server **40** in step **313-2**. The CPM server **20** transmits the 4xx response received from the IWF **30** to the CPM client **10** in step **315**. The SM server **40** transforms the SMS-SUBMIT message, which was received from the IWF **30** in step **313-2**, into an SMS-DELIVER message, and transmits the SMS-DELIVER message to the SM client **50** in step **313-3**. The CPM client **10** transmits an ACK message to the CPM server **20** in step **317** in response to the 4xx response received from the CPM server **20**, and the CPM server **20** transmits the ACK message to the IWF **30** in step **319**. The SM client **50** transmits an SMS-DELIVERY-REPORT message to the SM server **40** in step **321** in response to the SMS-DELIVER message received from the SM server **40**, and the SM server **40** transmits the SMS-DELIVERY-REPORT message to the IWF **30** in step **323**. Accordingly, the session establishment between the CPM client **10** and the SM client **50** fails. Thus, even if the IWF **30** receives an SM containing a response directive, i.e. an SMS-DELIVER message, after the effective response time elapses, a session is not established.

When the IWF **30** receives an SM containing a response directive after the effective response time elapses, the IWF **30** processes the received SM as a general SM. In other words, after the effective response time elapses, the IWF **30** determines and processes every received SM as a message separately transmitted from the SM client **50** to the CPM client **10** regardless of the interactive message communication without determining whether each received SM contains a response directive. Thus, the IWF **30** transforms an SMS-DELIVER message into an SIP message and transmits the SIP message to the CPM server **20**, which is illustrated in steps **327** to **339-1**.

After the session establishment failure between the CPM client **10** and the SM client **50** due to the elapse of the effective response time, if the user of the SM client **50** requests transmission of an SM containing the acceptance response directive "Yes", the SM client **50** constructs an SM (SMS-SUBMIT message) containing the acceptance response directive and transmits the SMS-SUBMIT message to the SM server **40** in step **327**. The SM server **40** transforms the received SMS-SUBMIT message into an SMS-DELIVER message and transmits the SMS-DELIVER message to the IWF **30** in step **329**. Since the effective response time has elapsed even if the IWF **30** receives the SM (SMS-DELIVER message) containing the acceptance response directive, the IWF **30** transforms the SMS-DELIVER message into an SIP message without separately analyzing the SM and transmits the SIP message to the CPM server **20** in step **331**. The CPM server **20** transmits the SIP message received from the IWF **30** to the CPM client **10** in step **333**. The CPM client **10** transmits a 200 OK message to the CPM server **20** in step **335** in response to the SIP message received from the CPM server **20**. The CPM server **20** transmits the 200 OK message received from the CPM client **10** to the IWF **30** in step **337**. The IWF **30** transforms the 200 OK message to an SMS-DELIVERY-REPORT message and transmits the SMS-DELIVERY-REPORT message to the SM client **50** via the SM server **40** in steps **339** and **339-1**. In addition, the IWF **30** transmits an ACK message to the CPM client **10** via the CPM server **20** in steps **341** and **341-1** in response to the 200 OK message.

FIG. **5** illustrates a process of processing a general SM in interactive message communication between the CPM client **10** and the SM client **50** according to the present invention. Steps **401** to **411** illustrated in FIG. **5** are to the same as steps **101** to **111** illustrated in FIG. **2**.

Referring to FIG. **5**, in steps **401** to **411**, in response to an interactive message communication request of the user of the CPM client **10**, the IWF **30** transforms an SIP INVITE message received from the CPM client **10** into an SMS-SUBMIT message, transmits the SMS-SUBMIT message to the SM client **50** via the SM server **40**, and receives an SMS-DELIVERY-REPORT message in response. Thereafter, the SM client **50** generates a separate SM (SMS-SUBMIT message) regardless of the SM containing an interactive message communication request sentence, which was received in step **407** and transmits the SMS-SUBMIT message to the SM server **40** in step **413**. Here, the separate SMS-SUBMIT message does not contain a response directive "Yes" or "No". The SM server **40** transforms the SMS-SUBMIT message received from the SM client **50** into an SMS-DELIVER message and transmits the SMS-DELIVER message to the IWF **30** in step **415**. Since the IWF **30** receives the SM (SMS-DELIVER message) before the effective response time elapses, the IWF **30** determines whether the received SM contains a response directive. If it is determined that the received SM contains a response directive, the process illustrated in FIG. **2** or **3** is performed. If it is determined that the received SM does not contain a response directive, the IWF **30** determines the received SM as a separate message regardless of an SIP-INVITE message received in step **403** or an SMS-SUBMIT message transmitted in step **405**. Thus, the IWF **30** transforms the received SMS-DELIVER message to an SIP message and transmits the SIP message to the CPM server **20** in step **417**. The CPM server **20** transmits the SIP message received from the IWF **30** to the CPM client **10** in step **419**. The CPM client **10** transmits a 200 OK message to the CPM server **20** in step **421** to notify the IWF **30** that the CPM client **10** has received the SIP message. The CPM server **20** transmits the 200 OK message received from the CPM client **10** to the IWF **30** in step **423**. If the 200 OK message is received from the CPM server **20**, the IWF **30** generates an SMS-DELIVERY-REPORT message in response to the SMS-DELIVER message, which was received in step **415**, and transmits the SMS-DELIVERY-REPORT message to the SM client **50** via the SM server **40** in steps **425** and **427**. In addition, in response to the 200 OK message, the IWF **30** transmits an ACK message to the CPM client **10** via the CPM server **20** in steps **429** and **431**.

A process hereinafter may proceed the same as the process illustrated in FIGS. **2**, **3**, or **4** by depending on an operation of the user of the SM client **50**.

As described above, when the IWF **30** receives an SIP INVITE message, of which a receiving client is the SM client **50**, from the CPM client **10** via the CPM server **20**, the IWF **30** transforms the SIP INVITE message into a message having a format supported by the SMS, i.e. an SMS-SUBMIT message, and transmits the SMS-SUBMIT message to the SM client **50** via the SM server **40**. If the IWF **30** receives an SM from the SM client **50** in response to the SMS-SUBMIT message within the effective response time, a session between the CPM client **10** and the SM client **50** is established. According to the first embodiment of the present invention, without changing the existing format of the SMS-SUBMIT message, the SMS-SUBMIT message contains only information for notifying that a current SMS-SUBMIT message is an SIP INVITE message in a user data field of the SMS-SUBMIT message.

Operations of the CPM service system according to the first embodiment of the present invention have been described with reference to FIGS. **2** to **5**. The second embodiment of the present invention will be described with reference to FIG. **6**, wherein when the IWF **30** transforms an SIP INVITE mes-

sage to an SMS-SUBMIT message, the IWF **30** inserts a query sentence for asking an SM recipient for an acceptance or rejection intention on interactive message communication into the user data field of the SMS-SUBMIT message as in the first embodiment, and adds a header field to a conventional SMS-SUBMIT message to notify an SM client that a current SMS-SUBMIT message is an SIP INVITE message, and when the receiving SM client transmits a response to the SMS-SUBMIT message containing the header field, the receiving SM client adds a header field to a current SMS-SUBMIT message to notify that the current SMS-SUBMIT message is an acceptance or rejection response message in response to an interactive message communication request.

According to the second embodiment of the present invention, when an SIP INVITE message is transformed to an SMS message format, since a sentence for the user of the SM client **50** and a header field for the SM client **50** are added to an SMS-SUBMIT message, instead of directly inputting a response directive as in the first embodiment of the present invention when the user of the SM client **50** inputs a response on whether the user of the SM client **50** accepts or rejects an interactive message communication request, by inputting a specific key, a response on whether the user of the SM client **50** accepts or rejects an interactive message communication request can be achieved.

When the IWF **30** transforms an SIP INVITE message to an SMS-SUBMIT message, a header field newly added to a header of the SMS-SUBMIT message according to the second embodiment of the present invention is illustrated in Table 1.

TABLE 1

Header field	Size	Function
TP_INVITE	1 Bit	Add in transmission from the IWF 30 to the SM client 50. When its value is 1, 1. Notify the SM client 50 that SIP INVITE is a transformed message. 2. Indicate that an acceptance or rejection message must be generated and transmitted if a key input pre-defined by a user is received in a state where a message is displayed on a display device of a receiving client. Here, information on the key corresponding to the acceptance or rejection is inserted into a user data field of SMS-SUBMIT. When its value is 0, 1. indicate that it is processed the same as a general SM.

A header field newly added to a response message (SMS-SUBMIT) generated by the SM client **50** when the user of the SM client **50** inputs a specific key according to the second embodiment of the present invention is illustrated in Table 2.

TABLE 2

Header field	Size	Function
TP_RESPONSE	1 Bit	Add in transmission from the SM client 50 to the IWF 30. When its value is 1, 1. accept interactive message communication. When its value is 0, 1. reject interactive message communication.

According to the second embodiment of the present invention, if the IWF **30** receives an SIP INVITE message, of which a receiving client is only the SM client **50** since a recipient uses only the SMS, from the CPM server **20**, the IWF **30**

inserts a sentence for asking the SMS user for interactive message communication into a body, i.e. a user data field, of an SMS-SUBMIT message. The IWF **30** also adds a TP_IN-VITE header field to a header portion of the SMS-SUBMIT message and sets its field value to 1. The process of transmitting the transformed SMS-SUBMIT message to the SM client **50** via the SM server **40** is the same as the process described in the first embodiment of the present invention.

The SM client **50**, which has received the SMS-SUBMIT message to which the TP_INVITE header field is added, provides the sentence indicating an interactive message communication request to the user of the SM client **50** and simultaneously displays a sentence for guiding a specific key for selectively inputting acceptance or rejection in response to the interactive message communication request. The user of the SM client **50** inputs the key for accepting or rejecting the interactive message communication request by referring to the displayed sentences. If the key for accepting or rejecting the interactive message communication request is input by the user of the SM client **50**, the SM client **50** adds a TP_RE-SPONSE header field to a header portion of an SMS-SUB-MIT message, sets a value of the TP_RESPONSE header field to 0 or 1 according to the rejection or acceptance selected by the user of the SM client **50**, and transmits the SMS-SUBMIT message to the SM server **40**. If the IWF **30** receives an SM (SMS-DELIVER) from the SM server **40** before the effective response time elapses, the IWF **30** determines whether the SMS-DELIVER message contains the TP_RE-SPONSE header field. If it is determined that the TP_RE-SPONSE header field is not contained, the IWF **30** determines the received SMS-DELIVER message to be a separate SM regardless of SIP-INVITE, and waits for a response to the SIP-INVITE message until the effective response time elapses. The IWF **30** transforms the received SM to an SIP message and transmits the SIP message to the CPM client **10** via the CPM server **20**. If it is determined that the TP_RE-SPONSE header field is contained in the SMS-DELIVER message, the IWF **30** detects a value of the TP_RESPONSE header field and determines that the SM client **50** has accepted or rejected the interactive message communication when the value is 1 or 0. The IWF **30** inserts a sentence indicating acceptance or rejection of SIP-INVITE into an SIP message and transmits the SIP message to the CPM client **10**.

According to the second embodiment of the present invention, if the IWF **30** receives an SM containing TP_RE-SPONSE after the effective response time elapses, the IWF **30** discards the SM without transmitting the SM to the CPM client **10** regardless of the acceptance or rejection of the interactive message communication. Unlike the first embodiment of the present invention, the IWF **30** can determine by checking only a header field of the received SM, i.e. determining whether a TP_RESPONSE header field is contained in the received SM, whether the received SM is a response to the interactive message communication request, or a general SM. The IWF **30** transmits an SMS-DELIVERY-REPORT message to the SM client **50** in response to the received SM, wherein a sentence for notifying that the effective response time has elapsed is inserted into the SMS-DELIVERY-RE-PORT message. The above-described process is illustrated in FIG. **6**.

FIG. **6** describes session establishment failure due to the elapse of the effective response time in a process of establishing a session for interactive message communication between the CPM client **10** and the SM client **50** according to the second embodiment of the present invention. Referring to FIG. **6**, if a request for interactive message communication with the SM client **50** is input by the user of the CPM client

10, the CPM client 10 transmits an SIP INVITE message to the CPM server 20 in step 501 to establish a session for performing the interactive message communication with the SM client 50. If it is determined through a subscriber information search that a recipient of the SIP INVITE message does not use a CPM service, the CPM server 20 transmits the SIP INVITE message to the IWF 30 in step 503. The IWF 30 detects the type of a messaging service used by the recipient by searching subscriber information corresponding to a receiving client of the SIP INVITE message. If the IWF 30 detects that the recipient uses SMS and does not use another messaging service, such as MMS, IM or PoC service, the IWF 30 transforms the SIP INVITE message into an SMS-SUBMIT message. During the transformation, the IWF 30 adds a TP_INVITE header field to a header portion of the SMS-SUBMIT message, sets a value of the TP_INVITE header field to 1, and inserts an interactive message communication request sentence into a user data field of the SMS-SUBMIT message. The IWF 30 transmits the SMS-SUBMIT message to the SM server 40, which provides the SMS to the receiving SM client 50, in step 505, and activates a timer immediately after the transmission. The SM server 40 transforms the SMS-SUBMIT message into an SMS-DELIVER message and transmits the SMS-DELIVER message to the SM client 50 in step 507. The SM client 50 may notify the user of the SM client 50 that the SMS-DELIVER message has been received, and display the interactive message communication request sentence and a response directive on a display screen according to settings of the user of the SM client 50. The SM client 50 transmits an SMS-DELIVERY-REPORT message to the SM server 40 in step 509. The SM server 40 transmits the SMS-DELIVERY-REPORT message to the IWF 30 in step 511. Thereafter, if the IWF 30 cannot receive an SM containing a response directive from the SM server 40 until the effective response time set in step 505 elapses, immediately after the effective response time elapses, the IWF 30 transmits a 4xx response to the CPM client 10, generates an SM (SMS-SUBMIT message) for notifying that the effective response time for the interactive message communication request has elapsed, and transmits the SM to the SM client 50 in step 513. In other words, immediately after the effective response time elapses, the IWF 30 transmits the 4xx response to the CPM server 20 in step 513-1, and generates an SMS-SUBMIT message containing a sentence indicating that the effective response time has elapsed and transmits the SMS-SUBMIT message to the SM server 40 in step 513-2. The CPM server 20 transmits the 4xx response received from the IWF 30 to the CPM client 10 in step 515. The SM server 40 transforms the SMS-SUBMIT message, which was received from the IWF 30, into an SMS-DELIVER message and transmits the SMS-DELIVER message to the SM client 50 in step 521. The CPM client 10 transmits an ACK message to the CPM server 20 in step 517 in response to the 4xx response received from the CPM server 20, and the CPM server 20 transmits the ACK message to the IWF 30 in step 519. The SM client 50 transmits an SMS-DELIVERY-REPORT message to the SM server 40 in step 523 in response to the SMS-DELIVER message received from the SM server 40, and the SM server 40 transmits the SMS-DELIVERY-REPORT message to the IWF 30 in step 525. Accordingly, the session establishment between the CPM client 10 and the SM client 50 fails. Thus, even if the IWF 30 receives an SM containing a response directive, i.e. an SMS-DELIVER message, after the effective response time elapses, a session is not established.

When the IWF 30 receives an SM containing a TP_RE-SPONSE header field after the effective response time elapses, the IWF 30 discards the received SM. After the session establishment failure between the CPM client 10 and the SM client 50 due to the elapse of the effective response time, the SM client 50 constructs an SM (SMS-SUBMIT message), in which a TP_RESPONSE header field is added and a field value corresponding to acceptance is set according to an input of the user of the SM client 50, and transmits the SMS-SUBMIT message to the SM server 40 in step 527. The SM server 40 transforms the received SMS-SUBMIT message to an SMS-DELIVER message and transmits the SMS-DELIVER message to the IWF 30 in step 529. Although the IWF 30 receives the SM (SMS-DELIVER message) containing the TP_RESPONSE header field, since the effective response time has elapsed, the IWF 30 discards the received SM, generates an SMS-DELIVERY-REPORT message containing a sentence for notifying of transmission failure due to the elapse of the effective response time, and transmits the SMS-DELIVERY-REPORT message to the SM server 40 in step 531. The SM server 40 transmits the SMS-DELIVERY-REPORT message to the SM client 50 in step 533.

As described above, if the IWF 30 receives an SIP INVITE message, of which a receiving client is the SM client 50, from the CPM client 10 via the CPM server 20 according to the second embodiment of the present invention, the IWF 30 transforms the SIP INVITE message into a message of a format supported by the SMS, i.e. an SMS-SUBMIT message, adds a new header field, in which information for notifying that a current SMS-SUBMIT message is an SIP INVITE message is stored, to the SMS-SUBMIT message, and transmits the SMS-SUBMIT message to the SM client 50 via the SM server 40, and if the IWF 30 receives an SM, to which a new header field in which an acceptance response in response to the SMS-SUBMIT message is stored is added, from the SM client 50 within the effective response time, a session between the CPM client 10 and the SM client 50 can be established.

As described above, according to the present invention, a converged IP messaging client transmits a session establishment request for interactive message communication, and when a converged IP messaging server receives the session establishment request, the converged IP messaging server determines whether a target client of the interactive message communication uses a converged IP messaging service. If it is determined the target client does not use the converged IP messaging service, the converged IP messaging server transmits the session establishment request to an IWF, and after the IWF receives the session establishment request, if it is determined that the target client is an SM client, the IWF generates an interactive message communication request by transforming a format of the session establishment request to an SMS format and transmits the interactive message communication request to the SM client. If the IWF receives an acceptance response from the SM client in response to the interactive message communication request within an effective response time, a session for the interactive message communication can be established between the converged IP messaging client and the SM client.

While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A method of establishing a session for interactive message communication between a converged Internet Protocol (IP) messaging client and a non converged IP messaging

client in a converged IP messaging service system, the method in the converged IP messaging system comprising:

receiving a session establishment request message for the interactive message communication from a converged IP messaging client;

determining whether a target client of an interactive message supports a converged IP messaging service on the basis of the session establishment request message; and

if it is determined that the target client is a non converged IP messaging client supporting a non converged IP messaging service, requesting, to an Inter-Working Function (IWF), changing the session establishment request message to an interactive message communication request message which can be received by the non converged IP messaging client,

wherein the IWF transmits the interactive message communication request message including an acceptance request to the interactive message communication, to the non converged IP messaging client, when the IWF receives the request for changing the session establishment request message, the IWF receives the session establishment request by receiving a Session Initiation Protocol (SIP) INVITE message, which was transmitted from the converged IP messaging client, from a converged IP messaging server, the IWF determines by searching subscriber information of the target client of the interactive message communication that the target client of the interactive message communication is the non converged IP messaging client, the IWF generates a Short Messaging Service (SMS)-SUBMIT message in which a sentence indicating the interactive message communication request and [one of] a response directive [and key information, which must] *to* be [input by] *provided to* a user of the non converged IP messaging client [in] *for* response to the interactive message communication request, are contained in response to the SIP INVITE message, and the IWF transmits the SMS-SUBMIT message to the non converged IP messaging client via a non converged IP messaging server.

2. The method of claim 1, further comprising if the IWF receives an acceptance response from the non converged IP messaging client in response to the interactive message communication request message within a response time, the IWF establishes a session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client; and

if the IWF receives a rejection response from the non converged IP messaging client in response to the interactive message communication request within the response time, the IWF notifies the converged IP messaging client and the non converged IP messaging client of session establishment failure.

3. The method of claim 2, further comprising if the IWF does not receive the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request within the response time, the IWF notifies the converged IP messaging client and the non converged IP messaging client of session establishment failure when the response time elapses.

4. The method of claim 3, further comprising if the IWF receives the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request after the response time elapses, the IWF transmits the acceptance or rejection response to the converged IP messaging client by processing the acceptance or rejection response as a short message.

5. The method of claim 3, further comprising if the IWF receives the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request after the response time elapses, the IWF discards the acceptance or rejection response.

6. The method of claim 1, wherein the IWF establishing the session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client further:

receives a non converged IP message from the non converged IP messaging client within the response time;

determines whether the message includes a response directive;

determines, if it is determined that the message includes the response directive, whether the response directive is an acceptance response directive or a rejection response directive;

establishes, if it is determined that the response directive is an acceptance response directive, the session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client by transmitting a 200 OK message to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client; and

if it is determined that the response directive included in the message is a rejection response directive, notifies of session establishment failure by transmitting a 4xx response to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client,

wherein the sentence indicating the interactive message communication request and the response directive are stored in user data.

7. The method of claim 1, wherein the interactive message communication request message includes a response request message for indicating acceptance or rejection for the interactive message communication.

8. The method of claim 5, wherein the IWF transmitting the interactive message communication request to the non converged IP messaging client further:

receives the session establishment request by receiving a SIP INVITE message, which was transmitted from the converged IP messaging client, from a converged IP messaging server;

determines by searching subscriber information of the target client of the interactive message communication that the target client of the interactive message communication is the non converged IP messaging client; and

generates an SMS-SUBMIT message to which a header field indicating an interactive message communication request message is added in response to the SIP INVITE message, and transmitting the SMS-SUBMIT message to the non converged IP messaging client via a non converged IP messaging server;

wherein the SMS-SUBMIT message further comprises a sentence indicating the interactive message communication request [and key information], which must be input by a user of the non converged IP messaging client as an acceptance or rejection in response to the interactive message communication request.

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9. A converged IP messaging server in a converged Internet Protocol (IP) messaging service system, the server comprising:

a message transceiver; and

a processor for receiving a session establishment request message for interactive message communication through the message transceiver from a converged IP messaging client,

determining whether a target client of an interactive message supports a converged IP messaging service on the basis of the session establishment request message, and if it is determined that the target client is a non converged IP messaging client supporting a non converged IP messaging service, requesting, to an Inter-Working Function (IWF), changing the session establishment request message to an interactive message communication request message which can be received by the non converged IP messaging client,

wherein the IWF transmits the interactive message communication request message including an acceptance request to the interactive message communication to the non converged IP messaging client, when the IWF receives the request for changing the session establishment request message, the IWF receives the session establishment request by receiving a Session Initiation Protocol (SIP) INVITE message, which was transmitted from the converged IP messaging client, from the converged IP messaging server, the IWF determines by searching subscriber information of the target client of the interactive message communication that the target client of the interactive message communication is the non converged IP messaging client, the IWF generates a Short Messaging Service (SMS)-SUBMIT message in which a sentence indicating the interactive message communication request and one of a response directive [and key information, which must] *to* be [input by] *provided to* a user of the non converged IP messaging client [in] *for* response to the interactive message communication request, are included in response to the SIP INVITE message, and the IWF transmits the SMS-SUBMIT message to the non converged IP messaging client via a non converged IP messaging server.

10. The server of claim **9**, wherein if the IWF receives an acceptance response from the non converged IP messaging client in response to the interactive message communication request message within a response time, the IWF establishes a session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client; and

if the IWF receives a rejection response from the non converged IP messaging client in response to the interactive message communication request within the response time, the IWF notifies the converged IP messaging client and the non converged IP messaging client of session establishment failure.

11. The server of claim **10**, wherein if the IWF does not receive the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request within the response time, the IWF notifies the converged IP messaging client and the non converged IP messaging client of session establishment failure when the response time elapses.

12. The server of claim **11**, wherein if the IWF receives the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request after the response time elapses, the IWF transmits the acceptance or rejection response to the con-

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verged IP messaging client by processing the acceptance or rejection response as a short message.

13. The server of claim **11**, wherein if the IWF receives the acceptance or rejection response from the non converged IP messaging client in response to the interactive message communication request after the response time elapses, the IWF discards the acceptance or rejection response.

14. The server of claim **9**, wherein when the IWF establishes the session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client, the IWF receives a message from the non converged IP messaging client within the response time, determines whether the message includes a response directive, and if it is determined that the message includes a response directive, determines whether the response directive is an acceptance response directive or a rejection response directive, if it is determined that the response directive is an acceptance response directive, establishes the session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client by transmitting a 200 OK message to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client, and if it is determined that the response directive included in the message is a rejection response directive, the IWF notifies of session establishment failure by transmitting a 4xx response to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client,

wherein the sentence indicating the interactive message communication request and the response directive is stored in user data.

15. The server of claim **9**, wherein the interactive message communication request message includes a response request message for indicating acceptance or rejection to the interactive message.

16. A method of establishing a session for interactive message communication between a converged Internet Protocol (IP) messaging client and a non converged IP messaging client in a converged IP messaging service system, the method of [a] *the* non converged IP messaging client comprising:

receiving a [session establishment request message from an Inter-Working Function (IWF), wherein the session establishment request message includes an acceptance request to an interactive message communication between the converged IP messaging client and the non converged IP messaging client] *sentence and a response directive from a non converged IP messaging server, wherein the sentence indicates an interactive message communication between the converged IP messaging client and the non converged IP messaging client and the response directive is to be provided to a user of the non converged IP messaging client for an acceptance or rejection of the interactive message communication*;

displaying a *request* [for indicating an interactive message communication request] *including the sentence and the response directive*;

receiving a user's input indicating acceptance or rejection [of the] *for an* interactive message communication [responding to the session establishment request message]*;*

transmitting [a session establishment request] *an interactive message communication* response message including *a response corresponding to* the user's input,

wherein [the interactive message communication request message comprises a sentence indicating the interactive

message communication request and one of a response directive and key information, which must be input by a user of the non converged IP messaging client as an acceptance or rejection in response to the session establishment request message] *an Inter-Working Function (IWF) transmits, to the non-converged IP messaging server, a session establishment request message for the interactive message communication between the converged IP messaging client and the non converged IP messaging client.*

17. The method of claim 16, wherein the IWF establishing the session for the interactive message communication between the converged IP messaging client and the non converged IP messaging client further:

receives a message from the non converged IP messaging client within [the] *a* the response time;

determines whether the message includes a header field indicating [an] *the* acceptance or rejection [in response to] *of* the interactive message communication[request];

if it is determined that the message includes the header field indicating [an] *the* acceptance or rejection [intention], determines whether a value of the header field indicating [an] *the* acceptance or rejection corresponds to an acceptance response or a rejection response; and

establishes, if it is determined that the value of the header field corresponds to [an] *the* acceptance response, [the session for] the interactive message communication between the converged IP messaging client and the non converged IP messaging client by transmitting a 200 OK message to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client.

18. The method of claim 17, further comprising if it is determined that value of the header field corresponds to [a] *the* rejection response, notifying of session establishment failure by transmitting a 4xx response to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client.

19. The method of claim 16, wherein *the IWF generates* the session establishment request message [includes] *including* a [response] request message for indicating *the* acceptance or rejection of the interactive message communication.

20. A non converged IP messaging client *terminal* in a converged IP messaging service system, the non converged IP messaging client *terminal* comprising;

a transceiver *for receiving a sentence and a response directive from a non converged IP messaging server, wherein the sentence indicates an interactive message communication between a converged IP messaging client terminal and the non converged IP messaging client terminal and the response directive is to be provided to a user of the non converged IP messaging client terminal for an acceptance or rejection of the interactive message communication*; and

a processor for [receiving a session establishment request message from an Inter-Working Function (IWF), wherein the session establishment request message includes an acceptance request to an interactive message communication between a converged IP messaging client and the non converged IP messaging client,]

displaying [a] *an interactive message communication request* message [for indicating an interactive message communication request] *including the sentence and the response directive,*

receiving a user's input indicating *the* acceptance or rejection of the interactive message communication [responding to the session establishment request mes-

sage], and [transmitting a session establishment request] *controlling the transceiver to transmit an interactive message communication* response message including the user's input, wherein [the interactive message communication request message comprises a sentence indicating the interactive message communication request and one of a response directive and key information, which must be input by a user of the non converged IP messaging client as an acceptance or rejection in response to the session establishment request message] *an Inter-Working Function (IWF) transmits, to the non-converged IP messaging server, a session establishment request message for the interactive message communication between the converged IP messaging client terminal and the non converged IP messaging client terminal.*

21. The non converged IP messaging client *terminal* of claim 20, wherein *the IFW generates* the session establishment request message [includes] *including* a [response] request message for indicating *the* acceptance or rejection of the interactive message communication.

22. The [server] *non converged IP messaging client terminal* of claim 20, wherein the IWF establishes [the] *a* session for the interactive message communication between the converged IP messaging client *terminal* and the non converged IP messaging client *terminal*, the IWF receives a message from the non converged IP messaging client *terminal* within a response time, determines whether the message includes a header field indicating [an] *the* acceptance or rejection [in response to] *of* the interactive message communication [request], and if it is determined that the message includes the header field indicating [an] *the* acceptance or rejection, determines whether a value of the header field indicating [an] *the* acceptance or rejection corresponds to an acceptance response or a rejection response, and if it is determined that the value of the header field corresponds to [an] *the* acceptance response, establishes the session for the interactive message communication between the converged IP messaging client *terminal* and the non converged IP messaging client *terminal* by transmitting a 200 OK message to the converged IP messaging client *terminal* and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client *terminal.*

23. The [server] *non converged IP messaging client terminal* of claim 22, wherein if it is determined that the value of the header field corresponds to [a] *the* rejection response, the IWF notifies of session establishment failure by transmitting a 4xx response to the converged IP messaging client *terminal* and transmitting an SMS-DELIVERY-REPORT message to the non converged IP messaging client *terminal.*

24. A method of establishing a session for interactive message communication between a converged Internet Protocol (IP) messaging client and a non-converged IP messaging client in a converged IP messaging service system, the method comprising:

receiving, by an Inter-Working Function (IWF), a Session Initiation Protocol (SIP) invite message for interactive message communication with a target client from a converged IP messaging client, via a converged IP messaging server;

determining that the target client of the interactive message communication is a non-converged IP messaging client;

generating a Short Messaging Service (SMS)-SUBMIT message including a request for the interactive message communication and a response directive to be provided to a user of the non-converged IP messaging client for response to the request; and

transmitting the SMS-SUBMIT message to the non-converged IP messaging client, via a non-converged IP messaging server.

25. The method of claim 24, further comprising establishing the session for the interactive message communication between the converged IP messaging client and the non-converged IP messaging client, when the IWF receives an acceptance response to the request for the interactive message communication within a response time; and

notifying at least one of the converged IP messaging client and the non-converged IP messaging client of a session establishment failure, when the IWF receives a rejection response to the request for the interactive message communication within the response time.

26. The method of claim 24, further comprising, notifying at least one of the converged IP messaging client and the non-converged IP messaging client of a session establishment failure, when the IWF does not receive a response to the request for the interactive message communication within a response time.

27. The method of claim 24, further comprising:

receiving a response to the request for the interactive message communication, after expiration of a response time;

processing the response as a short message; and

transmitting the processed response to the converged IP messaging client.

28. The method of claim 24, further comprising:

receiving a response to the request for the interactive message communication, after expiration of a response time; and

discarding the response.

29. The method of claim 24, wherein the method further comprises:

receiving a non-converged IP message in response to the SMS-SUBMIT message within a response time;

identifying the response directive in the non-converged IP message;

determining whether the response directive in the non-converged IP message is an acceptance response directive or a rejection response directive;

establishing the session for the interactive message communication between the converged IP messaging client and the non-converged IP messaging client by transmitting a 200 OK message to the converged IP messaging client and transmitting an SMS-DELIVERY-REPORT message to the non-converged IP messaging client, when it is determined that the response directive in the non-converged IP message is the acceptance response directive; and

notifying of a session establishment failure by transmitting a 4xx response to the converged IP messaging client and transmitting the SMS-DELIVERY-REPORT message to the non-converged IP messaging client, when it is determined that the response directive included in the message is the rejection response directive.

30. An Inter-Working Function (IWF) in a converged Internet Protocol (IP) messaging service system, the IWF comprising:

a transceiver; and

a processor for

controlling the transceiver to receive a Session Initiation Protocol (SIP) invite message for interactive message communication with a target client from a converged IP messaging client, via a converged IP messaging server;

determining that the target client of the interactive message communication is a non-converged IP messaging client;

generating a Short Messaging Service (SMS)-SUBMIT message including a request for the interactive message communication and a response directive to be provided to a user of the non-converged IP messaging client for response to the request; and

controlling the transceiver to transmit the SMS-SUBMIT message to the non-converged IP messaging client, via a non-converged IP messaging server.

31. The IWF of claim 30, wherein the processor establishes a session for the interactive message communication between the converged IP messaging client and the non-converged IP messaging client, when the IWF receives an acceptance response to the request for the interactive message communication within a response time, and

notifies at least one of the converged IP messaging client and the non-converged IP messaging client of a session establishment failure, when the IWF receives a rejection response to the request for the interactive message communication within the response time.

32. The IWF of claim 30, wherein the processor notifies at least one of the converged IP messaging client and the non-converged IP messaging client of a session establishment failure, when the IWF does not receive a response to the request for the interactive message communication within a response time.

33. The IWF of claim 30, wherein the transceiver receives a response to the request for the interactive message communication, after expiration of a response time,

wherein the processor processes the response as a short message, and

wherein the transceiver transmits the processed response to the converged IP messaging client.

34. The IWF of claim 30, wherein the transceiver receives a response to the request for the interactive message communication, after expiration of a response time, and

wherein the processor discards the response.

35. The IWF of claim 30, wherein

the transceiver receives a non-converged IP message in response to the SMS-SUBMIT message within a response time, and

the processor

identifies the response directive in the non-converged IP message;

determines whether the response directive in the non-converged IP message is an acceptance response directive or a rejection response directive;

establishes a session for the interactive message communication between the converged IP messaging client and the non-converged IP messaging client by controlling the message transceiver to transmit a 200 OK message to the converged IP messaging client and to transmit an SMS-DELIVERY-REPORT message to the non-converged IP messaging client, when it is determined that the response directive in the non-converged IP message is the acceptance response directive; and

notifies of a session establishment failure by controlling the transceiver to transmit a 4xx response to the converged IP messaging client and to transmit the SMS-DELIVERY-REPORT message to the non-converged IP messaging client, when it is determined that the response directive included in the message is the rejection response directive.

36. A method of establishing a session for interactive message communication between a converged Internet Protocol (IP) messaging client and a non-converged IP messaging client in a converged IP messaging service system, the method of the converged IP messaging client comprising:

    transmitting, to an Inter-Working Function (IWF), a Session Initiation Protocol (SIP) invite message for the interactive message communication; and

    receiving, from the IWF, a response corresponding to a user's input of the non-converged IP messaging client as an acceptance or rejection of the interactive message communication,

    wherein SIP invite message is converted to a session establish request message and the session establish request message is transmitted from the IWF to a non-converged IP messaging server, and

    wherein the session establish request message comprises a sentence indicating the interactive message communication between the converged IP messaging client and the non-converged IP messaging client and a response directive to be provided by the user of the non converged IP messaging client for the acceptance or rejection of the interactive message communication.

37. The method of claim 36, wherein the response is a 200 OK message for the acceptance or a 4xx response for the rejection.

38. The method of claim 36, further transmitting an ACK to the IWF in response to the response.

39. A converged Internet Protocol (IP) messaging client terminal for establishing a session for interactive message communication with a non converged IP messaging client terminal, comprising:

    a processor for generating a Session Initiation Protocol (SIP) invite message for the interactive message communication; and

    a transceiver for transmitting the SIP invite message to an Inter-Working Function (IWF), and receiving, from the

IWF, a response corresponding to a user's input of the non-converged IP messaging client terminal as an acceptance or a rejection of the interactive message communication,

    wherein the SIP invite message is converted to a session establish request message and the session establish request message is transmitted from the IWF to a non-converged IP messaging server, and

    wherein the session establish request message comprises a sentence indicating the interactive message communication between the converged IP messaging client terminal and the non-converged IP messaging client terminal, and a response directive to be provided to the user of the non converged IP messaging client terminal for the acceptance or rejection of the interactive message communication.

40. The converged IP messaging client terminal of claim 39, wherein the response is a 200 OK message for the acceptance or a 4xx response for the rejection.

41. The converged IP messaging client terminal of claim 39, wherein the transceiver transmits an ACK to the IWF in response to the response.

42. The method of claim 36, wherein the session establish request message is converted to an interactive message communication request message and the interactive message communication request message is transmitted from the non-converged IP messaging server to the non-converged IP messaging client.

43. The converged IP messaging client terminal of claim 39, wherein the session establish request message is converted to an interactive message communication request message and the interactive message communication request message is transmitted from the non-converged IP messaging server to the non-converged IP messaging client terminal.

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