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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON	2461

26158 7590 07/29/2025
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

EXAMINER
LY, NGHI H

ART UNIT	PAPER NUMBER
2642	

NOTIFICATION DATE	DELIVERY MODE
07/29/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

BostonDocket@wbd-us.com
IPDocketing@wbd-us.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/431,686	29-Jul-2025	12375890

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
ATLANTA, GA 30357-0037

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	07/29/2025	12375890	BKT004USCON	2461

26158 7590 07/16/2025
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

John Marvin Suzuki, Rockville, MD;
Lorenzo Cruger JR., Boynton Beach, FL;
James Lowell Teel JR., Lynchburg, VA;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

BK Technologies, Inc., West Melbourne, FL;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors:	John Marvin Suzuki	Examiner:	n/a
Appl. No.:	18/431,686	Art Unit:	2642
Filed:	February 2, 2024	Confirmation No.:	2461
Title:	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	Atty Docket No.:	BKT004USCon

E-Filed via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Examiner:

Applicant respectfully submits these Comments ("Comments") on the Examiner's statement of reasons for allowance in the Notice of Allowance mailed April 1, 2025.

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Applicant agrees that claims 1-7 and 16-20 of the Application are patentable over the applied art. Applicant is therefore submitting contemporaneously with these Comments the Issue Fee for this Application, to speed the issuance of a patent.

Applicant believes that allowable subject matter in claims 1-7 and 16-20 is not necessarily limited to the features or combinations of features as presented in the Examiner's statement of reasons for allowance ("Reasons for Allowance") (Notice of Allowability, pages 2 and 3). The statement of reasons with respect to claims 1-7 and 16-20 excludes certain features of the claimed combination, and allowable subject matter may exist in the excluded features or in various combinations and configurations including the excluded features. Additionally, Applicant does not

necessarily acquiesce to any characterizations regarding the art of record in the Examiner's statement of reasons. Applicant reserves all rights to address or refute any aspect of the Examiner's statement of reasons as applicable.

CONCLUSION

Applicant respectfully requests entry of these Comments and reserves all arguments with respect to the issues presented herein. Applicant's failure (if at all) to expressly address above any particular statement, assertion, or suggestion by the Examiner should not be construed as an admission or acquiescence that such statement, assertion, or suggestion is accurate or proper.

It is believed that no fees are required for this Response. Please charge any deficiency or credit any overpayment to Deposit Account Number 09-0528, with reference to the above-referenced attorney docket number. The undersigned attorney may be contacted at the number below to facilitate the resolution of any matters.

Respectfully submitted,

/ Jason D. Radachy /

Jason D. Radachy
Attorney for Applicant
Registration No.: 64,360

Womble Bond Dickinson (US) LLP
Attn: IP Docketing
P.O. Box 570489
Atlanta, GA 30357-0037
919-614-5050

Date: June 25, 2025

PART B – FEE(S) TRANSMITTAL

Complete and send this form, together with the applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By fax, send to: (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

WOMBLE BOND DICKINSON (US) LLP

ATTN: IP DOCKETING

P.O. Box 570489

ATLANTA, GA 30357

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

Sylvia Morrison	(Typed or printed name)
/Sylvia Morrison/	(Signature)
July 1, 2025	(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCon	2461

TITLE OF INVENTION:

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
Non-Provisional	small	$516.00	$0.00	$0.00	$516.00	07-01-2025

EXAMINER	ART UNIT	CLASS-SUBCLASS
n/a	2642	370/329.000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. WOMBLE BOND DICKI
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: BK Technologies, Inc.

(B) RESIDENCE: (CITY and STATE or COUNTRY): West Melbourne, USA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees Submitted: ☒ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment (*Please first reapply any previously paid fee shown above*):

☐ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 090528

5. Change of Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29. NOTE: Absent a valid Certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27. NOTE: If the application was previously under micro entity status, checking this box will be taken as a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. NOTE: Checking this box will be taken as a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Jason D. Radachy/ Date July 1, 2025

Typed or printed name Jason D. Radachy Registration No. 64,360

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;

2) a federal, state, local, or international agency, in response to its request;

3) a contractor of the USPTO having need for the information in order to perform a contract;

4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;

5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;

6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;

7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;

8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));

9) the Office of Personnel Management (OPM) for personnel research purposes; and

10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**07/01/2025 03:30:39 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2461	FILED BY	Sylvia Morrison
PATENT CENTER #	71170022	FILING DATE	02/02/2024
CUSTOMER #	26158	FIRST NAMED INVENTOR	John Marvin Suzuki
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Jason Radachy

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
BKT004USCon - Statement on Comments for Reasons of Allowance.pdf	2	Amendment after Notice of Allowance (Rule 312)	96 KB
BKT004USCon - Fee Transmittal.pdf	2	Issue Fee Payment (PTO-85B)	245 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
BKT004USCon - Statement on Comments for Reasons of Allowance.pdf	6C7F5946830C11639140D43DDA01294DC560D91640EFF292CAEDA17E2B9797333848982A6AEA36B2F2D6FD2771D5798D3548A491535E0CC9DD00A832CFC756CB

BKT004USCon - Fee Transmittal.pdf

8A2ACC6749BBF8A8699C26152ACF8B3F73A9A7396B22F89C
D82B223CC383AD5470E8B65306E110A857C4EFE75552E7C2D
6B078230283116AB6A6467EB1AFB28C

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**07/01/2025 03:30:39 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

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PATENT CENTER #	71170022	AUTHORIZED BY	Jason Radachy
CUSTOMER #	26158	FILING DATE	02/02/2024
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	John Marvin Suzuki

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
DA / 090528	**E202571F31207831**	**Sylvia Morrison**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2501	UTILITY ISSUE FEE	516.00	1	516.00
			TOTAL AMOUNT:	**$516.00**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

26158 7590 04/01/2025
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

EXAMINER
LY, NGHI H

ART UNIT	PAPER NUMBER
2642	

DATE MAILED: 04/01/2025

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON	2461

TITLE OF INVENTION: SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$516	$0.00	$0.00	$516	07/01/2025

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26158 7590 04/01/2025
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON	2461

TITLE OF INVENTION: SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$516	$0.00	$0.00	$516	07/01/2025

EXAMINER	ART UNIT	CLASS-SUBCLASS
LY, NGHI H	2642	370-329000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1_____
2_____
3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON	2461

26158 7590 04/01/2025
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

EXAMINER
LY, NGHI H

ART UNIT	PAPER NUMBER
2642	

DATE MAILED: 04/01/2025

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/431,686	Applicant(s) Suzuki et al.	
	Examiner NGHI H LY	Art Unit 2642	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 02/03/2025.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-7 and 16-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/NGHI H LY/
Primary Examiner, Art Unit 2642

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with Jason D. Radachy (Reg. No. 64360) on 03/14/2025.

The application has been amended as follows:

Claims 8-15 have been cancelled.

Double Patenting

2. Terminal Disclaimer has been submitted (02/03/2025) and approved. Therefore, the Double Patenting rejections as indicated the previous Office action has been withdrawn.

REASONS FOR ALLOWANCE

3. Claims 1-7 and 16-20 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 1-7 and 16-20 are allowable for the reasons as stated in Applicant's remarks (dated 02/03/2025).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H LY whose telephone number is (571)272-7911.

The examiner can normally be reached 8:30am-9:00pm Monday-Tuesday and Thursday-Friday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool.

To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center.

Unpublished application information in Patent Center is available to registered users.

To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format.

For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/NGHI H LY/
Primary Examiner, Art Unit 2642

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

CPC						
Symbol					**Type**	**Version**
H04W	/	4	/	10	F	2013-01-01
H04W	/	8	/	20	I	2013-01-01
H04W	/	4	/	08	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE (Assistant Examiner) (Date)		**Total Claims Allowed:** 12	
/NGHI H LY/ Primary Examiner, Art Unit 2642 (Primary Examiner) (Date)	15 March 2025	O.G. Print Claim(s) 1	O.G. Print Figure 3

U.S. Patent and Trademark Office Part of Paper No.: 20250315

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W4/10	/	4	/	10
H04W8/20	/	8	/	20
H04W4/08	/	4	/	08

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
370	329

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					
370	328	338	341	345	350	

NONE (Assistant Examiner) (Date)		**Total Claims Allowed:** 12	
/NGHI H LY/ Primary Examiner, Art Unit 2642 (Primary Examiner) (Date)	15 March 2025	O.G. Print Claim(s) 1	O.G. Print Figure 3

U.S. Patent and Trademark Office Part of Paper No.: 20250315

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☑ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10	11	19										
2	2		11	12	20										
3	3		12												
4	4		13												
5	5		14												
6	6		15												
7	7	8	16												
	8	9	17												
	9	10	18												

NONE (Assistant Examiner) (Date)		**Total Claims Allowed:** 12	
/NGHI H LY/ Primary Examiner, Art Unit 2642 (Primary Examiner) (Date)	15 March 2025	O.G. Print Claim(s) 1	O.G. Print Figure 3

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/29/2024	03/15/2025							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
6	6	✓	=							
7	7	✓	=							
	8	✓	-							
	9	✓	-							
	10	✓	-							
	11	✓	-							
	12	✓	-							
	13	✓	-							
	14	✓	-							
	15	✓	-							
8	16	✓	=							
9	17	✓	=							
10	18	✓	=							
11	19	✓	=							
12	20	✓	=							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

CPC - Searched*		
Symbol	**Date**	**Examiner**
H04W4/10, H04W4/08, H04W8/20	03/15/2025	nly

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
370	329,328,338,341,345,350	03/15/2025	nly

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
See search history.	03/15/2025	nly

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
370	329,328,338,341,345,350	03/15/2025	nly

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L18	17	(push adj1 talk) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near14 (software soft ADJ ware application) near12 (access$3 adj5 talk ADJ group))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/15 01:32 AM
L19	4	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((push-to-talk) SAME grant$3).clm.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/15 01:32 AM
L20	4	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2025/03/15 01:33 AM

		((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj1 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L21	8	((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj1 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/15 01:33 AM
L22	8	((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj1 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/15 01:34 AM
L23	21	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$2 providing receive$1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN,	OR	ON	ON	2025/03/15 01:35 AM

		receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12 ((access$3 join$3) adj5 (talk near1 group)))	WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L24	19	(push adj2 talk adj2 cellular) AND (((access$4 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj12 ((talkgroup talk ADJ group group poc push adj2 talk conference meeting))) near22 ((link hyperlink hypertext reference hyper ADJ (text link) contact$3 nexus connection address$3) near12 ((upload$3 download$3 up-load$3 down-load$3 load$3) near5(software soft ADJ ware instruction program application))))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/15 01:36 AM
L25	10	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2025/03/15 01:36 AM

		370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND ((software soft ADJ ware application program$4) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N14	8	(push adj1 talk) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near14 (software soft ADJ ware application) near12 (access$3 adj5 talk ADJ group))	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:32 AM
N15	3	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((push-to-talk) SAME grant$3).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:32 AM

N16	3	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj1 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:33 AM
N18	4	((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj1 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:34 AM
N19	8	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$2 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:35 AM

		submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12 ((access$3 join$3) adj5 (talk near1 group)))					
N20	8	(push adj2 talk adj2 cellular) AND (((access$4 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj12 ((talkgroup talk ADJ group group poc push adj2 talk conference meeting))) near22 ((link hyperlink hypertext reference hyper ADJ (text link) contact$3 nexus connection address$3) near12 ((upload$3 download$3 up-load$3 down-load$3 load$3) near5(software soft ADJ ware instruction program application))))	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:36 AM
N21	5	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND ((software soft ADJ ware application program$4) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/15 01:36 AM

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 18/431,686 *	18/431,686	Suzuki et al.	
	Examiner	**Art Unit**	
	LY, NGHI H	2642	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☑ APPROVED	☐ DISAPPROVED
Date Filed: **03 February 2025**	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/TRINA STEPTOE/

Technology Center: **OPLC**

Telephone: **(571)272-2577**

_____

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**02/03/2025 05:53:27 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2461	FILED BY	Dawn DeLuca
PATENT CENTER #	69031514	AUTHORIZED BY	Jason Radachy
CUSTOMER #	26158	FILING DATE	02/02/2024
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	John Marvin Suzuki

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
DA / 090528	**E202523H53549600**	**Dawn DeLuca**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2814	STATUTORY DISCLAIMER, INCLUDING TERMINAL DISCLAIMER	183.00	1	183.00
			TOTAL AMOUNT:	**$183.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**02/03/2025 05:53:27 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

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CONFIRMATION #	2461	FILED BY	Dawn DeLuca
PATENT CENTER #	69031514	FILING DATE	02/02/2024
CUSTOMER #	26158	FIRST NAMED INVENTOR	John Marvin Suzuki
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Jason Radachy

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
BKT004USCon OA Reply 05Feb25.pdf	3	Amendment/Request for Reconsideration-After Non-Final Rejection	97 KB
BKT004USCon Terminal Disclaimer.pdf	2	Terminal Disclaimer Filed	226 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
BKT004USCon OA Reply 05Feb25.pdf	B0BD74F3934F8577968DCF5C041FCF80BC73A36193E56583A629875A69BF0DD4C7738D004EE86188EDD56322D5BE1F724EC245E459D85599DBF05980A6A78FA8

BKT004USCon Terminal Disclaimer.pdf

879BB73233DE1BAFC863A001BC992AA6CD0EE3B26E1DF35C1BF8BBAB261CA8C2F38D4A51DE9C397BC150085C352B3745042DEFB9782BA739B83E4DEAE5DB4218

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/26 (04-14)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT

Docket Number (Optional)
BKT004USCON

In re Application of: BK Technologies, Inc.

Application No.: 18/431,686

Filed: 02/02/2024

For: SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

The applicant, BK Technologies, Inc., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 11,997,568 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☑ The undersigned is an attorney or agent of record. Reg. No. 64,360

/Jason D. Radachy/ — Signature
February 3, 2025 — Date

Jason D. Radachy — Typed or printed name

Attorney for Applicant — Title
202-857-4461 — Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 12 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **If filing this completed form by mail, send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to: 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law; 2) a Federal, state, local, or international agency, in response to its request; 3) a contractor of the USPTO having need for the information in order to perform a contract; 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record; 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record; 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations; 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals; 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)); 9) the Office of Personnel Management (OPM) for personnel research purposes; and 9) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Additional Uses

Additional USPTO uses of the information in this record may include disclosure to: 1) the International Bureau of the World Intellectual Property Organization, if the record is related to an international application filed under the Patent Cooperation Treaty; 2) the public i) after publication of the application pursuant to 35 U.S.C. 122(b), ii) after issuance of a patent pursuant to 35 U.S.C. 151, iii) if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections, or an issued patent, or iv) without publication of the application or patent under the specific circumstances provided for by 37 CFR 1.14(a)(1)(v)-(vii); and/or 3) the National Archives and Records Administration, for inspection of records.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors:	John Marvin Suzuki, et al.	Examiner:	Nghi H Ly
Appl. No.:	18/431,686	Art Unit:	2642
Filed:	February 2, 2024	Confirmation No.:	2461
Title:	System and Method for Managing Access to a Push-To-Talk-Over-Cellular Communication Network	Atty Docket No.:	BKT004USCon

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY UNDER 37 C.F.R. §1.111

AMENDMENT UNDER 37 C.F.R. §1.121

Sir:

Responsive to the Non-Final Office Action mailed November 1, 2024 (hereinafter "the Office Action") to which a reply is due by February 3, 2025, Applicant respectfully requests reconsideration, withdrawal of the rejections, and allowance of the Claims based upon the following amendments and remarks. Please charge any fees due or credit any overpayment to Deposit Account Number 09-0528, with reference to the above-referenced attorney docket number.

Remarks begin on page 2 of this correspondence.

REMARKS/ARGUMENTS

The Office Action addressed Claims 1-20. No amendments to the application are presented herein. Applicant respectfully requests withdrawal of the rejections and passage of the claims to allowance. Applicant expressly reserves the right to re-introduce and/or re-file unclaimed subject matter.

NONSTATUTORY DOUBLE PATENTING REJECTION

Claims 1-20 are rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over commonly owned U.S. Patent No. 11,997,568.

Without conceding to the propriety of the above-noted double patenting rejection, and solely in the interest of advancing prosecution of this application to allowance, a Terminal Disclaimer is submitted herewith to overcome the double patenting rejection. Accordingly, Applicant respectfully requests withdrawal of the double patenting rejections and passage of the claims to allowance.

CONCLUSIONS

In view of the foregoing remarks, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for allowance. Favorable action is respectfully requested.

Applicant's failure (if at all) to expressly address above any particular statement or argument by the Examiner should not be construed as an admission or acquiescence that such statement or argument is accurate or proper.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number. It is believed that no fees are required for this Amendment. Please charge any deficiency or credit any overpayment to Deposit Account Number 09-0528, with reference to the above-referenced attorney docket number. The undersigned attorney may be contacted at the number below to facilitate the resolution of any matters.

Respectfully submitted,

/Jason D. Radachy/
Jason D. Radachy
Attorney for Applicant
Registration No.: 64,360

Womble Bond Dickinson (US) LLP
2001 K Street, NW
Washington, DC 20006
T: (202) 857-4461
Jason.Radachy@wbd-us.com

Date: February 3, 2025

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON	2461

26158 7590 11/01/2024
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

EXAMINER
LY, NGHI H

ART UNIT	PAPER NUMBER
2642	

NOTIFICATION DATE	DELIVERY MODE
11/01/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

BostonDocket@wbd-us.com
IPDocketing@wbd-us.com

Office Action Summary	Application No. 18/431,686	Applicant(s) Suzuki et al.	
	Examiner NGHI H LY	Art Unit 2642	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 02/02/2024.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 02/02/2024 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

2. Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-21 of Suzuki et al. U.S. Patent No**. 11,997,568 B2**. Although

the claims at issue are not identical, they are not patentably distinct from each other because they both teach system and method for managing access to a push-to-talk-over-cellular communication network.

Regarding claims 1, 8, 10 and 16, Suzuki teaches a method of managing access to a push-to-talk-over-cellular (POC) talkgroup, the method comprising: providing a control device configured to: provide a POC service; and manage a first POC talkgroup; controlling the control device to grant a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service; and transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service (see claims 1, 8 and 15, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 2, 9 and 17, Suzuki teaches automatically revoking access of the first non-subscriber device to the first POC talkgroup after a predetermined period of time has elapsed (see claims 2, 4, 9, 10, 16 and 17, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 3 and 18, Suzuki teaches providing a first subscriber device; and transmitting, from the first subscriber device to the control device, first non-subscriber contact information associated with the first non-subscriber device (see claims 3, 5, 8, 11, 12, 13 and 15, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 4, 11 and 19, Suzuki teaches setting a predetermined time via the first subscriber device; and automatically revoking access of the first non-subscriber device to the first POC talkgroup after the predetermined period of time has elapsed (see claims 2, 4, 9, 10, 16 and 17, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 5, 12 and 20, Suzuki teaches the first non-subscriber device is a cellular device; and the first non-subscriber contact information is a first cellular telephone number (see claims 5, 11 and 18, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 6 and 14, Suzuki teaches the first non-subscriber device is one of a plurality of non-subscriber devices; the granting the first non-subscriber device access to the first POC talkgroup comprises granting the plurality of non-subscriber devices access to the first POC talkgroup; and the transmitting the first communication comprises transmitting the first communication to each non-subscriber device of the plurality of non-subscriber devices (see claims 1, 6, 8, 13, 15 and 20, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claims 7 and 15, Suzuki teaches the first POC talkgroup is one of a plurality of POC talkgroups; and each POC talkgroup of the plurality of POC talkgroups is linked as part of a single virtual incident (see claims 7, 14 and 21, or see claims 1-21 of US Patent No. 11,997,568 B2).

Regarding claim 13, Suzuki teaches the first non-subscriber device is a land mobile radio (LMR) gateway; and the first non-subscriber contact information is an

internet protocol address of the LMR gateway (see claims 12 and 19, or see claims 1-21 of US Patent No. 11,997,568 B2).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H LY whose telephone number is (571)272-7911. The examiner can normally be reached 8:30am-9:00pm Monday-Thursday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free). If you would like assistance from a USPTO Customer Service

Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/NGHI H LY/
Primary Examiner, Art Unit 2642

Notice of References Cited	Application/Control No. 18/431,686	Applicant(s)/Patent Under Reexamination Suzuki et al.	
	Examiner NGHI H LY	Art Unit 2642	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-11997568-B2	2024-05-28	Suzuki; John Marvin	H04W4/08	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

CPC - Searched*		
Symbol	**Date**	**Examiner**
H04W4/10, H04W4/08, H04W8/20	10/29/2024	nly

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
370	329,328,338,341,345,350	10/29/2024	nly

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
See search history.	10/29/2024	nly

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
370	329,328,338,341,345,350	10/29/2024	nly

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/431,686	Suzuki et al.
	Examiner	**Art Unit**
	NGHI H LY	2642

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/29/2024								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

Bibliographic Data

Application No: 18/431,686

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☑ Met After Allowance

Verified and Acknowledged: /NGHI H LY/ (Examiner's Signature) N.H.L (Initials)

Title: SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
02/02/2024	370	2642	BKT004USCON
RULE			

APPLICANTS

BK Technologies, Inc., West Melbourne, FL, UNITED STATES

INVENTORS

John Marvin Suzuki, Rockville, MD, UNITED STATES

Lorenzo Cruger JR., Boynton Beach, FL, UNITED STATES

James Lowell Teel JR., Lynchburg, VA, UNITED STATES

CONTINUING DATA

This application is a CON of 17844488 06/20/2022 PAT 11997568

17844488 has PRO of 63300899 01/19/2022

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

02/15/2024

** **SMALL ENTITY** **

STATE OR COUNTRY

UNITED STATES

ADDRESS

WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037
UNITED STATES

FILING FEE RECEIVED

$664

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	71	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND (push-to-talk).clm	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:15 PM
L2	0	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((push-to-talk) SAME grant$3) AND @ad<"20220119"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:15 PM
L3	17	(push adj1 talk) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:15 PM

		broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application) near12 (access$3 adj5 talk ADJ group))					
L4	0	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((download$3 down ADJ load$3 load$3 transfer$4 copy$3 transpost$3 upload$3 up ADJ load$3) adj22 (software soft ADJ ware application) adj12 ((access$3 join$3 admissi$4 entry) adj5 (talk near1 group conferenc$3 meeting discussion consult$4 exchang$3 debat$3 conversation dialog$3 chat$3 negotiat$4 confabulat$3 tete adj2 tete parley$3 palaver$3)))	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:16 PM
L5	21	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2024/10/29 12:16 PM

		obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12 ((access$3 join$3) adj5 (talk near1 group)))	IBM_TDB)				
L6	64	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:17 PM

		transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting distribut$2 distributing get got gotten$3 getting) adj22 (software soft ADJ ware application) adj12 ((access$3 join$3 admissi$4 entry) adj5 (talk near1 group conferenc$3 meeting discussion consult$4 exchang$3 debat$3 conversation dialog$3 chat$3 negotiat$4 confabulat$3 tete adj2 tete parley$3 palaver$3)))					
L7	16	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND ((number email e-mail mail id identifier identification identity name address) near12 (nonsubscribe$3 non adj2 subscribe$3)) AND POC	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:18 PM
L8	23	((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:18 PM
L9	109	(push adj2 talk adj2 cellular) AND	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	OR	ON	ON	2024/10/29 12:19 PM

		((access$3 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj22 (talkgroup talk ADJ group group)) SAME (($4load$3 load$3 download$3 (down ADJ load$3)) near12 (software soft ADJ ware application program$4))	AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L10	19	(push adj2 talk adj2 cellular) AND (((access$3 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj12 ((talkgroup talk ADJ group group poc push adj2 talk conference meeting))) near22 ((link hyperlink hypertext reference hyper ADJ (text link) contact$3 nexus connection address$3) near12 ((upload$3 download$3 up-load$3 down-load$3 load$3) near5(software soft ADJ ware instruction program application))))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:28 PM
L11	14	((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:28 PM

		sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)					
L12	4	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:28 PM
L13	10	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND ((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/29 12:29 PM

PE2E SEARCH - Search History (Interference)

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		James near3 Gilley James near3 Teel) AND (push-to-talk).clm					
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N3	8	(push adj1 talk) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application) near12 (access$3 adj5 talk ADJ group))	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:15 PM
N4	0	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((download$3 down ADJ load$3 load$3 transfer$4 copy$3 transpost$3	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:16 PM

		upload$3 up ADJ load$3) adj22 (software soft ADJ ware application) adj12 ((access$3 join$3 admissi$4 entry) adj5 (talk near1 group conferenc$3 meeting discussion consult$4 exchang$3 debat$3 conversation dialog$3 chat$3 negotiat$4 confabulat$3 tete adj2 tete parley$3 palaver$3)))					
N5	8	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:16 PM

		((access$3 join$3) adj5 (talk near1 group)))					
N6	45	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND (push adj1 talk speech$3 talk$3 voice) AND ((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting distribut$2 distributing get got gotten$3 getting) adj22 (software soft ADJ ware application) adj12 ((access$3 join$3 admissi$4 entry) adj5 (talk near1 group conferenc$3 meeting discussion consult$4 exchang$3 debat$3 conversation dialog$3 chat$3 negotiat$4 confabulat$3 tete adj2 tete parley$3 palaver$3)))	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:17 PM
N7	8	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:18 PM

		370/328.ccls. 370/338.ccls. 370/341.ccls. 370/345.ccls. 370/350.ccls.) AND ((number email e-mail mail id identifier identification identity name address) near12 (nonsubscribe$3 non adj2 subscribe$3)) AND POC					
N8	13	((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:18 PM
N9	16	(push adj2 talk adj2 cellular) AND ((access$3 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj22 (talkgroup talk ADJ group group)) SAME (($4load$3 load$3 download$3 (down ADJ load$3)) near12 (software soft ADJ ware application program$4))	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:19 PM
N10	8	(push adj2 talk adj2 cellular) AND (((access$3 join$3 participat$3 shar$3 partak$3 entr$3 admission enter$3 connect$3 admit$5 link$3) adj12 ((talkgroup talk ADJ group group poc push adj2 talk conference meeting))) near22 ((link hyperlink hypertext reference hyper ADJ (text link) contact$3 nexus connection address$3) near12 ((upload$3 download$3 up-load$3 down-load$3 load$3) near5(software soft ADJ ware instruction	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:28 PM

		program application))))					
N11	7	((provide$1 providing receive$1 receiving receipt$1 receipted obtain$2 obtaining acquire$1 acquiring achieve$1 achieving collect$2 collecting gain$2 gaining gather$2 gathering retriev$2 retrieving convey$2 conveying transport$2 transporting carry$2 carrying transfer$2 transferring rout$2 routing brought bringing relay relaying relai$2 transmit$2 transmitting deliver$2 delivering pass$2 passing broadcast$2 broadcasting send sending sent forward$2 forwarding submit$2 submitting report$2 reporting distribut$2 distributing get got gotten$3 getting) near12 (software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:28 PM
N12	3	(John near3 Suzuki Lorenzo near3 Cruger James near3 Gilley James near3 Teel) AND ((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:28 PM
N13	5	(H04W4/10.cpc. H04W4/08.cpc. H04W8/20.cpc. 370/329.ccls. 370/328.ccls. 370/338.ccls. 370/341.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/29 12:29 PM

		370/345.ccls. 370/350.ccls.) AND ((software soft ADJ ware application program$3) near12 (non-subscriber non-PoC ADJ subscriber)) AND ((push adj2 talk press adj1 tramnsmit$3) POC) AND (cell$5 cellular)					

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18431686
Filing Date	2024-02-02
First Named Inventor	John Marvin Suzuki et al.
Art Unit	2642
Examiner Name	Nghi H Ly
Attorney Docket Number	BKT004USCon

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10681506	B1	2020-06-09	Walker	
	2	7499720	B2	2009-03-03	Idnani	
	3	7529558	B1	2009-05-05	Blair et al.	
	4	7801494	B2	2010-09-21	Emrich et al.	
	5	7889726	B2	2011-02-15	Poikelkä et al.	
	6	8331971	B2	2012-12-11	Turcanu	
	7	9143902	B2	2015-09-22	Fu et al.	
	8	9787733	B2	2017-10-10	Poikselka et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	2642
	Examiner Name	Nghi H Ly
	Attorney Docket Number	BKT004USCon

	9	9913300	B2	2018-03-06	Ayyasamy et al.	

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	1	20050233776	A1	2005-10-20	Allen et al.	
	2	20060252442	A1	2006-11-09	Nurmi	
	3	20070117552	A1	2007-05-24	Gobburu, et al	
	4	20120036534	A1	2012-02-09	Balestrieri	
	5	20150326523	A1	2015-11-12	Reilly, et al.	
	6	20160065742	A1	2016-03-03	Nasir, et al.	
	7	20170237600	A1	2017-08-17	Patel, et al.	
	8	20180227342	A1	2018-08-09	Bodilis	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18431686
	Filing Date	2024-02-02
	First Named Inventor	John Marvin Suzuki et al.
	Art Unit	2642
	Examiner Name	Nghi H Ly
	Attorney Docket Number	BKT004USCon

	9	20180278718	A1	2018-09-27	Brown, et al.		

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	1	100692639	KR	B1	2007-03-13	Ji Hyun-wook et al.	English Translation Only	☒

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	1	INTL JOURNAL OF ELECTRONICS AND TELECOMMUNICATIONS, A Hybrid Extension for IP Multicasting in Push-to-talk over Cellular Systems, 2012, VOL. 58, NO. 1, 7 pgs., (PP. 77–83), http://ijet.pl/old_archives/2012/1/11.pdf	☐
	2	OPEN MOBILE ALLIANCE LTD., Push to talk over Cellular 2 Requirements, 2008, 95 pgs., https://www.openmobilealliance.org/release/PoC/V2_0-20080806-C/OMA-RD-PoC-V2_0-20080421-C.pdf	☐
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Patents KR100692639B1

Method and apparatus for providing group communications service

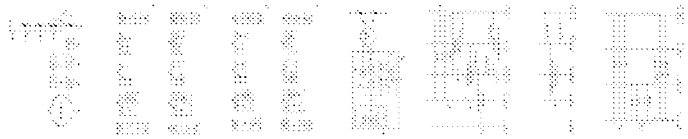
Abstract

translated from Korean

The present invention relates to a method and apparatus for providing a group communication service, and more particularly, to provide a group communication service including voice, data, and message using a push-to-talk (PTT) scheme. A method and apparatus are disclosed. In accordance with another aspect of the present invention, there is provided a group communication service providing apparatus including: a SIP server unit configured to perform call setup with a terminal coupled through a packet data serving node, and perform interworking according to a binary protocol with the terminal; A group list manager connected to the SIP server and configured to manage group list information corresponding to the terminal; A status management server unit for maintaining subscriber status information corresponding to the terminal during the logout period after the terminal logs in to the group list manager; A PTT server unit for performing call control and session control for a group communication service including a PTT service and a PTD service using a call set by the SIP server unit; And a media distribution server unit connected to the packet data serving node and configured to transmit bearer traffic corresponding to the PTT service and the PTD service to the terminal.

Group communication, PTT, terminal, PTD

Images (16)



Classifications

H04W4/08 User group management

View 2 more classifications

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South Korea

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Other languages: Korean

Inventor: 서현호, 김낙표, 이동진

Worldwide applications

2004 KR

Application KR1020040063414A events

2004-08-12	Application filed by 주식회사 케이티프리텔
2004-08-12	Priority to KR1020040063414A
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2007-03-13	Publication of KR100692639B1

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Claims (13)

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translated from Korean

An apparatus for providing a group communication service. A SIP server unit for performing call setup with a user terminal coupled through a packet data serving node and interworking with the user terminal according to a binary protocol; Connected to the SIP server unit, and for managing the group list information corresponding to the user terminal including the type information of the group set by the subscriber to receive the group communication service and the information on the members of each set group A group list manager; A status management server unit connected to the group list manager and configured to maintain subscriber status information corresponding to the terminal during a logout period after the user terminal logs in to the group list manager; A PTT server unit connected to the SIP server unit and performing call control and session control on a group communication service including a PTT service and a PTD service using a call set up by the SIP server unit; And And a media distribution server unit connected to the packet data serving node and configured to transmit bearer traffic corresponding to a PTT service and a PTD service to the user terminal. The method of claim 1, The group for providing the group communication service A default group corresponding to the user terminal and predefined by default; A predetermined group previously designated by the user terminal and having a fixed member; A chat group previously designated by the user terminal but not having a fixed member; And And an ad hoc group for performing group communication with a member designated by the user terminal in real time. The group managed by the group list manager is the default group, the predetermined group and the chat group. The method of claim 1, The SIP server unit A proxy unit for performing Digest Authentication and transmitting a SIP message when the subscriber first logs in; A retransmitter for performing a retransmission function on the transmitted SIP message; A compression unit for performing compression in accordance with a preset standard; A protocol unit for communicating with the terminal according to the binary protocol and generating and interpreting the SIP message Group communication network service providing apparatus comprising a. The method of claim 1, The group list management unit When the registration request message including the primary authentication information is received from the user terminal, the primary authentication information is received from the SIP server that extracts the primary authentication information included in the registration request message, and the primary authentication is performed. Subscriber authentication unit for performing the first authentication using the information; A subscriber information management unit for storing and managing subscriber information of the user terminal when the user terminal is initially registered and providing the subscriber information to the PTT server unit; For managing group information including at least one of a group name of the group, a member of the group, a member ID of the group, and status information of a member of the group with respect to a group list and a contact list of the group set by the subscriber; A contact list manager; And When a group communication is requested, an access list manager for managing a list for allowing the request and a list for rejecting the request. Group communication network service providing apparatus comprising a The method of claim 4, wherein When receiving the second authentication information including the source number (IMSI) and the IP address of the user terminal from the group list management unit that performed the first authentication, after performing the second authentication using the second authentication information And a location management server unit for transmitting the authentication result to the group list manager and the SIP server. The method of claim 1, The state management server unit A subscriber information holding unit for holding subscriber information corresponding to the user terminal until the user logs out after the user terminal logs in; A subscriber information changing unit for changing information according to registration, re-registration, cancellation of registration, and deregistration of the subscriber; A subscriber status management unit that stores information of the subscriber and registers the subscriber with information providing unit for providing status information of members on the contact list of the subscriber; And When the subscriber is called, the query response unit for performing a response to the IP address and status information request for the called subscriber from the SIP server unit Group communication network service providing apparatus comprising a. The method of claim 2, The PTT server unit Call control according to a preset method is performed with respect to the call request for the default group, the predetermined group, and the chat group, and a corresponding caller member is confirmed through a message of a caller requesting a call, and the group list manager is provided. After obtaining the information about the member whose call is requested, request the media resource allocation to the media distribution server for the call, allocate the media resource to send the incoming message, and then start the timer to wait for the response, and then resend. A call controller for controlling a call by transmitting a command for retransmission to the retransmission unit; A session controller for processing session control and session related events with respect to a call controlled by the call controller; A PTD session establishment unit for performing a call processing function for providing the PTD service; And And a charging CDR generation unit for generating a charging CDR for the PTT service and the PTD service. The method of claim 7, wherein The call controller A call forwarding unit configured to perform incoming call of the member by using a text message designator received from the group list manager when the state of the member requesting the call is offline; During a

group call, a specific call termination unit capable of ending a call only by a specific member; A session termination unit for terminating the call session when all members participating in the call session are notified of the traffic transmission for a predetermined time from the media distribution server unit; A call adder for adding a member to the session and joining the call session, when the subscriber who participated in the call session further invites a specific member to the call; And And a call release unit for initially releasing the entire group call by the member requesting the call. The method of claim 1, The media distribution server unit A media session control unit for allocating resources in response to the request, when a resource allocation request is received from the PTT server unit during a call session generation; A media distribution unit for analyzing, copying and distributing the media, using an RTP / UDP protocol for transmitting PTT bearer traffic, and using an MSRP / TCP protocol for transmitting PTD bearer traffic; And One talk session is controlled so that only one talk right is allowed at the same time, so that the talk request is granted to the user who first requested the talk right, and the other talk request requested before the call talk is released is ignored. Speak control unit for performing the status management of each participating user and the subscriber who has the utterance Group communication network service providing apparatus comprising a. The method of claim 9, The media session controller A traffic discarding unit for receiving only bearer traffic from a user who has the right to speak, and discarding bearer traffic sent by a user who has not obtained the right to speak; And Upgrade unit for recognizing the withdrawal of the call session of a specific member of the members participating in the call session, and to perform the real-time media session upgrade Group communication network service providing apparatus comprising a. The method of claim 1, And a plurality of load distribution units for distributing loads to the plurality of PTT server units when there are a plurality of PTT server units. In the method for providing a group communication service, Performing a call setup with a user terminal coupled through a packet data serving node in a SIP server unit, and interworking with the user terminal according to a binary protocol; Connected to the SIP server unit, and for managing the group list information corresponding to the user terminal including the type information of the group set by the subscriber to receive the group communication service and the information on the members of each set group Extracting, by the group list manager, group list information corresponding to the user terminal and providing the same to the user terminal; Connected to the group list management unit, the state management server unit for maintaining the subscriber state information corresponding to the user terminal during the logout period after the user terminal logs in to the group list management unit; Extracting state information of a corresponding member and providing the same to the user terminal; In a PTT server unit connected to the SIP server unit, performing call control and session control on a group communication service including a PTT service and a PTD service using a call set up by the SIP server unit; And And transmitting, at the media distribution server unit connected to the packet data serving node, bearer traffic corresponding to a PTT service and a PTD service to the user terminal. The method of claim 12, The group for providing the group communication service A default group corresponding to the user terminal and predefined by default; A predetermined group previously designated by the user terminal and having a fixed member; A chat group previously designated by the user terminal but not having a fixed member; And And an ad hoc group for performing group communication with a member designated by the user terminal in real time. The group managed by the group list manager is the default group, the predetermined group, and the chat group.

Description

translated from Korean

Method and apparatus for providing group communications service

1A is a diagram illustrating a connection relationship with an existing communication network according to a preferred embodiment of the present invention.

1B and 1C illustrate a protocol stack in accordance with a preferred embodiment of the present invention.

2 is a diagram illustrating a configuration of a group communication network according to a preferred embodiment of the present invention.

3A is a flowchart illustrating a login method of a group communication network according to a preferred embodiment of the present invention.

3B is a flowchart illustrating a logout method of a group communication network according to a preferred embodiment of the present invention.

3C is a flowchart illustrating a method of updating a self state of a group communication network according to a preferred embodiment of the present invention.

3d is a flowchart illustrating a group state inquiry method of a group communication network according to a preferred embodiment of the present invention.

3E is a flowchart illustrating a method for adding a contact list member in a group communication network according to an exemplary embodiment of the present invention.

4 is a diagram showing the configuration of a group list manager according to a preferred embodiment of the present invention.

5 is a diagram showing a configuration of a state management server unit according to a preferred embodiment of the present invention.

6 is a diagram showing the configuration of a SIP server unit according to an embodiment of the present invention.

7 is a diagram showing the configuration of the PTT server unit according to an embodiment of the present invention.

8 is a view showing a configuration of a load distribution unit according to a preferred embodiment of the present invention.

9 is a diagram showing the configuration of a media distribution server unit according to a preferred embodiment of the present invention.

10 is a diagram showing the configuration of a charging information providing unit according to a preferred embodiment of the present invention.

<Description of Symbols for Main Parts of Drawings>

100: user terminal

310: node management server (MOMP)

400: group list management unit

500: state management server unit

600: SIP server unit

700: PTT server unit

800: load distribution unit

900: media distribution server unit

The present invention relates to a method and apparatus for providing a group communication service, and more particularly, to provide a group communication service including voice, data, and message using a push-to-talk (PTT) scheme. A method and apparatus are disclosed. Here, PTT (Push-To-Talk) refers to an instant communication service that can provide a relatively very fast communication service compared to the standby time of a general mobile phone.

However, according to the prior art, there is a problem in that there is no effective technology capable of incorporating such a PTT service into an existing CDMA network. In addition, the existing code division multiple access (CDMA) communication network has a problem in that it is practically impossible to make a call immediately with almost no response waiting time like a radio due to the characteristics of a network.

The present invention has been made in view of the above-described problems, and an object thereof is to provide a group communication service including voice, data, and message using a push-to-talk (PTT) method. Here, not only small and medium sized groups can be designated, but also one-to-one communication can be performed.

Another object of the present invention is to provide a group communication service by integrating a PTT service to an existing CDMA network.

Further, another object of the present invention is to provide an efficient group communication network that can reduce response latency, and will be further embodied in the embodiments described below for other purposes.

According to an aspect of the present invention for achieving the above object, a method and apparatus for providing a group communication service including voice, data, messages, etc. using a push-to-talk (PTT) method May be provided.

According to a preferred embodiment, the apparatus for providing a group communication service includes: a SIP server unit for performing call setup with a terminal coupled through a packet data serving node and interworking with the terminal according to a binary protocol; A group list manager connected to the SIP server and configured to manage group list information corresponding to the terminal; A status management server unit for maintaining subscriber status information corresponding to the terminal during the logout period after the terminal logs in to the group list manager; A PTT server unit performing call control and session control on a group communication service including a PTT service and a PTD service by using a call set up by the SIP server unit; And a media distribution server unit connected to the packet data serving node and configured to transmit bearer traffic corresponding to a PTT service and a PTD service to the terminal.

According to a preferred embodiment, the group communication service providing method comprises the steps of performing call setup with a terminal coupled through a packet data serving node in a SIP server unit, and interworking with the terminal according to a binary protocol; Extracting, by a group list management unit connected to the SIP server unit and managing group list information corresponding to the terminal, the group list information corresponding to the terminal to the terminal; Connected to the group list management unit, the state management server unit for maintaining the subscriber status information corresponding to the terminal during the logout period after the terminal logs in to the group list management unit, corresponding to the group list; Extracting state information of a member and providing the same to the terminal; And a call control and session control for a group communication service including a PTT service and a PTD service in a PTT server unit connected to the SIP server unit using a call set up by the SIP server unit, and serving the packet data. The media distribution server unit connected to the node may include transmitting bearer traffic corresponding to a PTT service and a PTD service to the terminal.

The group for providing the group communication service may include a default group corresponding to the terminal and designated as a default; A predetermined group previously designated by the terminal and having a fixed member; A chat group previously designated by the terminal but not having a fixed member; And an ad hoc group for performing group communication with a member designated by the terminal in real time, and the group managed by the group list manager may be the default group, the predetermined group, and the chat group.

The SIP server unit may include a proxy unit configured to perform Digest Authentication and to transmit a SIP message when the subscriber first logs in; A retransmitter for performing a retransmission function on the transmitted SIP message; A compression unit for performing compression in accordance with a preset standard; And a protocol unit for communicating with the terminal according to the binary protocol and generating and interpreting the SIP message.

When the group list manager receives a registration request message including primary authentication information from the user terminal, the group list manager receives the primary authentication information from the SIP server unit that has extracted the primary authentication information included in the registration request message. A subscriber authentication unit for receiving and performing primary authentication using the primary authentication information; A subscriber information management unit for storing and managing subscriber information of the terminal and providing the subscriber information to the PTT server unit when the terminal is initially registered; A contact list manager configured to manage group information including at least one of a group name, a group member, a group member ID, and status information of the group member of the group list and the contact list set by the subscriber; And an access list manager configured to manage a list for allowing the request and a list for rejecting the request when the group communication is requested. Here, when receiving the second authentication information including the origination number and the IP address of the terminal from the group list management unit that performed the first authentication, after performing the second authentication using the second authentication information, the The location management server unit for transmitting the authentication result to the group list management unit and the SIP server may be further included.

After the terminal logs in, the state management server unit maintains subscriber information corresponding to the terminal until the user logs out, and registers, re-registers, cancels and cancels registration of the subscriber. A subscriber state management unit including a subscriber information change unit for performing information change, and at the time of registering a subscriber, an information provider for storing information of the corresponding subscriber and providing status information of members of the subscriber's contact list; And when the subscriber is called, the SIP server may include a query response unit for performing a response to the IP address and status information request for the called subscriber.

In addition, the PTT server unit performs a call control according to a preset method for the call request for the default group, the predetermined group and the chat group, and confirms the destination member through the message of the caller requesting the call, After obtaining information on the member whose call is requested through the group list manager, the media resource allocation request is made to the media distribution server for the call, the media resource is allocated and the incoming message is transmitted. A call controller for driving a timer for waiting and controlling a call by transmitting a command for retransmission to a retransmission unit; A session controller for processing session control and session related events with respect to a call controlled by the call controller; A PTD session establishment unit for performing a call processing function for providing the PTD service; It may include a billing CDR generation unit for generating a billing CDR for the PTT service and PTD service. The call control unit may include: a call forwarding unit configured to perform incoming call of the member using a text message designator received from the group list manager when the call request member is in an offline state; During a group call, a specific call termination unit capable of ending a call only by a specific member; A session termination unit for terminating the call session when all members participating in the call session are notified of the traffic transmission for a predetermined time from the media distribution server unit; A call adder for adding the member to the session and joining the call session, when the subscriber who has participated in the call session can additionally invite a specific member to the call; The member who originally requested the call may include a call release unit for releasing the entire group call.

The media distribution server unit may include a media session control unit for allocating resources in response to the request when a resource allocation request is received from the PTT server unit during a call session generation; A media distribution unit for analyzing, copying and distributing the media, using an RTP / UDP protocol for transmitting PTT bearer traffic, and using an MSRP / TCP protocol for transmitting PTD bearer traffic; One talk session is controlled to allow only one talk right at the same time, granting talk talk to the user who first requested the talk, ignoring any other talk request that was requested before the talk was released. It may include a voice control unit for performing the state management of each user participating in the and the subscriber who has a voice. Here, the media session control unit receives only bearer traffic from the user who has the right to speak, and when receiving the bearer traffic sent by the user who does not have the right to speak, a traffic discarding unit for discarding it; And an upgrade unit for recognizing the withdrawal of the call session of a specific member among the members participating in the call session, and performing a real-time media session upgrade according to the withdrawal.

And if there are a plurality of PTT server unit, the load distribution unit for distributing the load to the plurality of PTT server unit may be further included.

Hereinafter, the configuration of a method and apparatus for providing a group communication service according to a preferred embodiment of the present invention will be described in detail with reference to the accompanying drawings, and in the following description with reference to the accompanying drawings, the same or corresponding configuration regardless of reference numerals. Elements are given the same reference numerals and redundant description thereof will be omitted.

Group network and stack structure

Hereinafter, FIG. 1A describes a connection relationship with an existing communication network according to a preferred embodiment of the present invention, and FIGS. 1B and 1C will describe a protocol stack structure according to a preferred embodiment of the present invention. In FIG. 2, the configuration of the group communication network will be described.

FIG. 1A illustrates a connection relationship with an existing communication network according to a preferred embodiment of the present invention, and FIGS. 1B and 1C

illustrate a protocol stack structure according to a preferred embodiment of the present invention.

Since the group communication method according to the present invention is provided by using an existing communication network, there is an advantage that a group communication service can be provided without a separate infrastructure. Referring to FIG. 1A, after a user terminal (UE) according to the present invention accesses a relay base station (BTS) not shown in the figure, a base station controller (BSC) 120 and a packet control function are provided. Via PCF 130 and Packet Data Serving Node (PDSN) 140, or via Base Station Controller (BSC) 120, Mobile International Controller (MSC) 150, and Myeongdong Interlock (IWF) 150. The group communication network 300 according to the present invention can be connected. The user terminal 100 is divided into a calling user terminal 110 and a called user terminal 120, the calling user terminal 110 refers to one terminal obtained the right to speak, the called user terminal 120 is a It refers to a terminal consisting of more than one group (120-1, 120-2, 120-3, ...).

1B and 1C, a protocol stack structure in accordance with a preferred embodiment of the present invention is shown. Services that can be provided in the group communication network according to the present invention may include a push-to-talk (PTT) service, an instant messaging (IM) service, and a push-to-data (PTD) service. Hereinafter, a protocol stack structure for each service will be described. For convenience of explanation, a protocol stack structure is connected to a group communication network through a base station controller (BSC), a packet control function unit (PCF), and a packet data serving node (PDSN). The description will be based on one case.

FIG. 1B (a) is a diagram illustrating a stack structure on a user plane in a PTT service. According to a preferred embodiment, the mobile terminal and the media distribution server unit may provide a PTT service using the RTP / RTCP protocol.

FIG. 1B (b) is a diagram illustrating a stack structure on a user plane in a PTD service. According to a preferred embodiment, the mobile terminal, the SIP server unit and the PTT server unit may provide a PTD service using the Message Session Relay Protocol (MSRP) protocol.

FIG. 1C (a) is a diagram showing a stack structure on a user plane in an IM service. According to a preferred embodiment, the mobile terminal, the SIP server unit and the PTT server unit may provide an IM service using a Session Initiation Protocol (SIP) and a Session Description Protocol (SDP) protocol.

FIG. 1C (b) is a diagram illustrating a stack structure on a signaling plane. According to a preferred embodiment, the mobile terminal, the SIP server unit and the PTT server unit can transmit and receive signaling messages using the Session Initiation Protocol (SIP) and Session Description Protocol (SDP) protocols.

2 is a diagram showing the configuration of a group communication network according to a preferred embodiment of the present invention.

The user terminal (UE) is connected to a group communication network according to the present invention through an existing mobile communication network, the group communication network is a group list management unit 400, state management server 500, SIP server 600, PTT server The unit 700 may include a load distribution unit 800, a media distribution server unit 900, and a node management server (MOMP) 310.

The Group List Management Sever (GLMS) 400 is a server that performs subscriber information management, contact list management, group list management, and access list management. Presence server (PS) 500 is a server that manages the status information of the subscriber, and maintains the status information of the subscriber until the subscriber logs in and logs out to the group list manager (MGCS). To perform. The SIP server 600 is a server in charge of the SIP Proxy function, performs SIP Digest authentication and SIP ignaling Compression (sigcomp) functions, and performs interworking with the terminal and Binary Protocol for PTT call setup. The PTT server unit (PTTS, Push-To-Talk Server) 700 is responsible for call control and session control for PTT / PTD, generates charging CDR for MGCS service, and works in conjunction with DCSP to provide real-time information on intelligent network subscribers. A server that performs a subtraction function.

Load Distributor (LD) 800 is a system that is responsible for load distribution for a plurality of PTT server unit. The media distribution server unit (MDS) 900 is a system for transmitting bearer traffic for the PTT and PTD services. In the case of the PTT, the media distribution server unit (MDS) 900 may perform a voice control through the RTCP protocol. The node management server (MOMP) 310 may manage shape information, fault information, performance, and statistical information of each node for the group communication service according to the present invention. In addition, the service network may further include the following additional server unit, which is summarized in Table 1 below.

designation function Data Service Control Server (DSCP: Data Service Control Point) It is a server that collectively controls the processing for the data service of the intelligent network service according to the present invention. File Conversion Server (FCS: File Conversion Server) It is a server for converting a file transmitted from the media distribution server unit (MDS) in accordance with the subscriber information server unit (JUICE) to the terminal of the receiver. Interlocking East (IWF) It is a device that provides KTF 2G data service, and provides PPP connection with terminal, interworking with No7 / ISUP with exchange. Subscriber Information Server (JUICE) DB that contains all information about subscribers in KTF. It is a system that includes all information of subscribers registered on WISE computer, such as subscriber's terminal model name, IMSI, intelligent network subscription, subscription plan, MGCS service subscription, and message manager subscription. Group Management Department (MagicN Server) It is a system that manages Buddy registration / deletion and group creation / deletion of MGCS subscriber, and performs the approval process to the corresponding Buddy. Billing server department (MAS) It is responsible for collecting the billing CDR transmitted from PTTS and transmitting it to WISE. Other network interworking server part (MGS) This server is in charge of interworking with other networks for PTT service and is in charge of signaling gateway function and media gateway function. Location Management Server (IPLS: Internet Protocol Location Server) It manages the location and status of 1x and 1xEV-DO subscribers and, when receiving AT Activation request of LMSC, interworks with DNS and SCMM and activates AT. Packet Data Serving Node (PDSN) It is a system in charge of R-P Interface with PCF, PPP Interface with Terminal, and Mobile IP Interface with Home Agent in KTF HPDN. Short Message Service Center (SMSC) It is a system that provides a short message to the subscriber and the system and performs the charging function. Subscriber Management Server (WISE) A system for performing subscriber management, service control, and billing, and the subscriber management server may include a billing system (BS) and a customer care system (CS).

Group type and management

The present invention can provide a convenient user interface for convenient group communication by providing a user interface (UI) such as information on a state that the other party can receive on each mobile terminal screen.

As shown in Table 2 below, a group according to the present invention may include a default group, a predetermined group, a chat group, and an ad hawk group.

Default group A preset group by default Pre-define group A group that you specify randomly and has fixed members in that group Chat group Group that is randomly assigned by the user and does not have members in the group Ad-hoc group Select group in real time

The default group refers to a group in which group call is possible by simply operating a PTT dedicated key without selecting a particular group among groups managed by the terminal UI. According to the present invention, in the case of a corporate subscriber, a group administrator is designated, and a general user who is not the administrator cannot add / delete group members, and only the group administrator can add or delete group members. . According to the preferred embodiment, if the corporate subscriber is registered in the default group, the pre-specified group cannot be set as the default group, and if it is not registered in the default group, the default group can be set in the same manner as the general subscriber. Can be. In the case of a general subscriber, one of the predesignated groups managed by the subscriber may be set as the default group and managed. If the general subscriber does not have a default group set, the terminal and the server recognize the highest level group as the default group, and the default group of the corporate subscriber is displayed on the terminal user interface with the same default group as the members of the group. The group list management unit GLMS matches the default group setting information for the corresponding subscriber with the terminal, and the general subscriber is configured to notify the group list management unit GLMS of the change as soon as the default group is changed.

Pre-define group is a group arbitrarily designated by the user and has a fixed member in the group. The subscriber can create and delete the group existing on his UI, and can add and delete members of the group. When creating / deleting a preset group of a subscriber or adding / deleting a group member, the terminal should immediately perform a change request to the group list management unit (GLMS).

A chat group is a group arbitrarily designated by a user, and a group does not have a member in the group. The user requests the group list management unit GMLS to create a chat group and maintains the group for a predetermined time. A member wishing to make a call through the chat group must receive a text message (SMS noti.) From the creator of the chat group and join the corresponding chat group to perform the chat group call. The group list management unit GLMS maintains the chat group for a specific time and deletes the chat group if the corresponding time expires.

Ad-hoc groups are created when a subscriber requests a group call by selecting two or more buddies from a specific group of the user interface and a contact list, and is not managed by the group list management unit (GLMS). Say When a subscriber requests an ad hoc group call, the PTT server unit (PTTS) may set a temporary group and manage it while the call session is maintained.

Provided Services and Operation Procedures

The group communication service according to the present invention may include a push-to-talk (PTT) service, an instant messaging (IM) service, and a push-to-data (PTD) service. Here, in the case of the group communication service targeting the group according to the present invention, a plurality of destination terminals can listen to the voice of the calling terminal using their respective terminals, thereby overcoming the limitation of the one-to-one communication of the existing voice call. can do,

Push-To-Talk (PTT) service is a half-duplex based voice call function and can provide a voice call service between a plurality of users through the control of the voice. Private (1: 1) call and group (Default, Pre-define, Chat, Ad-hoc group) call are available and can operate in Session Mode. Here, the PTT service is limited to support only one session per subscriber, and PTD and IM services are simultaneously provided together with the PTT service.

Instant Messaging (IM) service is a full-duplex instance messaging service that operates in Pager Mode. Here, the Multi service can be simultaneously provided to the IM service, and as described above, it can be simultaneously provided to the PTT and PTD services.

Push-To-Data (PTD) service is a full-duplex file transfer service, operates in a TCP-based session mode, and may provide a file conversion function for heterogeneous terminals. Multi service can be simultaneously provided for the PTD service, and PTT and IM service can be simultaneously provided.

In addition, the present invention may provide status information for each service, where the status information service may provide not only status information of the subscriber but also status information on buddies and group members managed by the subscriber. In addition, the state information service may provide a location based service of a subscriber in association with a location based service (LBS). Hereinafter, a procedure of providing a group communication service according to the present invention will be described with reference to FIGS. 3A to 3E.

3A is a flowchart illustrating a login method of a group communication network according to an exemplary embodiment of the present invention.

Group communication service according to the present invention does not go through a dial or a ring tone, and can provide a quick communication with a quick response time compared to the existing mobile phone calls, PTT (Push-To-Talk) service, IM (Instant) It may include a Messaging service and a Push-To-Data service. Login to the group network to receive these services. That is, the authentication method may be performed through second authentication. Hereinafter, a description will be given with reference to FIG. 3.

In step S305, when the client program for group communication is driven, the user terminal automatically receives and receives its contact list information from the group list manager GLMS. (HTTP Request / Response)

In step S310, if the user terminal transmits a registration request message (SIP REGISTER) to the SIP server unit (SIPS), in step S315, the SIP server unit (SIPS) is received from the user terminal ID (for example, hexa ID) Requests primary authentication to the group list manager (GLMS) with and password. (Auth_Request)

In step S320, the group list management unit GLMS requests an authentication to the location management server unit IPLS again with the source number IMSI and the IP address of the user terminal, and the location management server unit IPLS sends the source number / IP address. The second authentication is performed after determining whether the DB value is identical with the DB value. (MS_Info_Request / MS_Info_Response)

In step S325, when both the first and second authentications pass, if the group list management unit GLMS successfully responds to the SIP server unit SIPS, in step S330, the SIP server unit SIPS is the state management server unit PS. Inform the authentication result of the user terminal. (PLSP AddTuple_Request / AddTuple_Response)

If the authentication result from the group list manager GLMS is successful (SIP 200 OK), in step S335, the user terminal requests member information for each Contact List group from the group list manager GLMS and receives the received member information.

In step S340, the user terminal makes a request to the state management server unit PS via the SIP server unit SIPS to find out the state information of each group member. (SUBSCRIBE)

In step S350, the state management server unit PS notifies the user terminal of the member for the group via the SIP server unit SIPS. (NOTIFY)

Here, when there are a plurality of groups, it is configured to repeat the steps S340 (group member information grasp) and step S350 (group member status grasp status information) for each group.

3B is a flowchart illustrating a logout method of a group communication network according to a preferred embodiment of the present invention.

In step S405, the user terminal requests logout to the SIP server unit (SIPS). (REGISTER) In step S410, the SIP server unit (SIPS) requests the state management server unit (PS) to delete from the SIP location service (SIP Location Service) management target for the user terminal and receives the result. In step S415, the SIP server unit (SIPS) notifies the user terminal of the logout completion response.

3C is a flowchart illustrating a method of updating a self state of a group communication network according to an exemplary embodiment of the present invention.

In step S505, the user terminal requests the status management server unit PS to update its own status via the SIP server unit SIPS using the update information command PUBLISH.

In step S510, the state management server unit PS notifies the user terminal of the successful update.

In step S515, the user terminal makes a request to the state management server unit PS via the SIP server unit SIPS to find out the constituent members of each group. (SUBSCRIBE)

In step S520, the state management server unit PS requests and receives a configuration member for the group for which the inquiry is requested from the group list management unit GLMS. (SUBSCRIBE / NOTIFY)

In step S525, the state management server unit PS notifies the user terminal of the state information on the group constituent members via the SIP server unit SIPS. (NOTIFY)

Here, when there are a plurality of groups, it is configured to repeat the procedures of step S515 (group member status information request), step S520 (group member information request), and step S350 (provide status information of group members) for each group. do.

The present invention can perform the group state update in the above-described manner as well as the self state update. Here, the request message according to the self state and the group state update may be performed using a preset identifier.

3d is a flowchart illustrating a group state inquiry method of a group communication network according to an exemplary embodiment of the present invention.

In step S605, the user terminal 1 makes a request to the state management server unit PS for the group to be queried via the SIP server unit SIPS. (SUBSCRIBE) At this time, the user terminal 1 may request that the inquiry group be informed of the continuous status for the next T seconds. In step S610, the state management server unit PS requests and receives a configuration member for the group for which the inquiry is requested from the group list management unit GLMS. (SUBSCRIBE / NOTIFY) In step S615, the status management server unit PS requests another status management server unit PS2 if it does not have member status information received from the group list management unit GLMS. (Qeury Presence / Response) In step S620, the state management server unit PS notifies the user terminal 1 of the member information which is being managed by itself and the status information on the received and received member. (NOTIFY)

When the release time is set in the user terminal 1 to a specific time T and the user terminal 2 is included in the group member, the user terminal 1 is automatically and immediately notified whenever the user terminal 2 updates its status during the corresponding time. In the case where the user terminal 2 updates the status in step S625, when the other state management server unit PS2 notifies the state management server unit PS1 of the state change in step S630, in step S635, the user terminal 1 automatically and immediately Be notified.

Likewise, if the user member 3 is included in the group member, the user terminal 1 is automatically and immediately notified whenever the user terminal 3 updates its status during the corresponding time.

When the user terminal 3 updates the status, in step S640, the status management server unit PS1 recognizes this, and in step S645, the user terminal 1 is automatically and immediately notified.

3E is a flowchart illustrating a method for adding a contact list member of a group communication network according to an exemplary embodiment of the present invention.

In step S705, the user terminal 1 requests the Web server to add a new user terminal 2 to its Contact List. (HTTP: AddContact) In step S710, the Web Server, which has been requested to add a member, requests authorization from the user terminal 2 via the SMSC in the form of a short message. In step S715, the user terminal 2 that has received the short message manually responds to the approval. It can be checked or canceled by using the URL Callback function of the short message. (HTTP: Accept_Request on Approval, HTTP: Reject_Request on Decline)

In operation S720, when the user terminal 2 receives the result of approval, the Web server requests the group list manager GLMS to add the user terminal 2 to the contact list of the user terminal 1. In step S725, the Web server notifies the user terminal 1 that the approval request to the user terminal 2 is confirmed via the SMSC in the form of a short message.

In step S730, when the user terminal 1 re-requests its own contact list information, the web server notifies the user terminal 1 of the list in which the user terminal 2 has been added. In step S735, the user terminal 1 requests the status information of the contact list member to the status management server unit PS via the SIP server unit SIPS. (SUBSCRIBE) In step S740, the state management server unit PS requests and receives a configuration member for the group from the contact list that has been requested for inquiry to the group list management unit GLMS. (SUBSCRIBE / NOTIFY)

In step S745, the state management server unit PS notifies the user terminal 1 of the most recently updated Contact List member status via the SIP server unit SIPS. (NOTIFY) Here, the description is based on the case of notifying through a short message, but it is natural that notification can be made through other data services.

Group List Manager

4 is a diagram illustrating a configuration of a group list manager according to an exemplary embodiment of the present invention.

Referring to FIG. 4, the group list manager may include a subscriber register 410, a subscriber authenticator 420, a subscriber information manager 430, a contact list manager 440, and an access list manager 450.

When a subscriber tries to register to receive GLMS service, the subscriber registration unit 410 may perform registration by providing contact list, group list, and access list information for the corresponding subscriber. have. The subscriber registrar 410 stores subscriber information about a subscriber who has attempted to register, and may perform re-registration and deregistration for a subscriber who has requested re-registration and deregistration. The subscriber registration unit 410 may provide a registration cancellation function for a registration cancellation request from the corresponding subscriber in the registration process.

The subscriber authentication unit 420 may perform service authentication through HTTP Digest authentication when registering a subscriber. In this case, the subscriber authentication unit 420 is configured to interwork with IPLS for authentication of illegal subscribers, and when registering subscribers, it may perform authentication for the corresponding subscriber. In addition, the subscriber authentication unit 420 must manage a list of subscribers that have failed authentication, and is configured not to provide a group list management unit (GLMS) service to subscribers that have failed authentication.

When the subscriber information management unit 430 registers the first terminal to the customer management server unit according to the present invention, the subscriber information management unit 430 performs a function of receiving, storing and managing the registered subscriber information. It may include subscriber attributes such as host ID, hexa ID, screen name, answer mode, and do-not-disturb (DND) of the subscriber. Naturally, the subscriber information can be updated in real time at the request of the subscriber. In the present invention, a text message indication (SMS noti. Indicator) field for receiving an SMS message to an offline subscriber must be managed, and when a request for information on a called subscriber of the PTT server unit (PTTS) for the caller's invitation is requested. May provide the above information.

The contact list manager 440 may perform a function of managing a group and a contact list set by the subscriber. Here, the group list stores and manages information such as a default, a predetermined designation, and a chat group. Each group information may include a group name, a group member, a group member ID, and status information of the group member. Here, the chat group exists only a group name, and is configured to store and manage group information other than the group name when the chat service is actually requested. Here, the contact list may store a group name set by an individual or a specific subscriber. In the case of an individual, a name, status information, location information, and the like may be stored. In the case of a group, a group name, a group creator name, and the like may be stored. The subscriber's group and contact list change (addition and deletion) requests are updated in real time, and individual, group or contact list information can be transmitted at the subscriber's request.

The access list manager 450 may set an access list regarding whether to allow a caller's service request in each terminal, and the group list manager GLMS may manage the access list. It is divided into "Reject list" and "Aaccept list", and when the subscriber is registered, the group list management unit (GLMS) can transmit the access list information to the subscriber, and when the subscriber's access list change request, the access list in real time Can be updated.

The interworking unit 460 is a SIPS interworking unit 461 for interworking with SIPS for subscriber registration, authentication, group list management, contact list management, and access list management, PTT server unit for PTT / PTD call processing and IM service provision. A PTTS interworking unit 463 for interworking with the PTTS and a state information management server unit PS 465 for changing parental information of the subscriber may be included. In addition, the linkage unit 460 is a WISE linkage unit 467 for interworking with a subscriber management server unit (WISE) to obtain the subscriber's information at the time of initial subscriber registration, and the WISE linkage unit 467 performs IPLS for subscriber authentication. And an interworking unit 469 for interworking with the group registration server unit for performing interworking with the MagicNen server for the buddy / group information change and the buddy approval procedure of the subscriber. .

In the IPLS interworking unit 468, the Mobile Directory Number (MDN) / International Mobile Subscriber Identity (IMSI) is a group list management unit (GLMS) using a value included in a SIP register message of a terminal or a HexaID included in a SIP register value as a key.) It can be the value extracted from DB. Here, when HexaID is extracted as a key, the IMSI / MDN value bound with HexaID can be used as an input value in the group list management unit (GLMS) DB instead of the IMSI (or MDN)

value sent from the terminal. IPLS interworking may be configured to be approved only when logged in with the ID of the registered UE. Therefore, when registration is performed by the caller ID / Password to another user's terminal, it may be configured to be treated as an IPLS Subscriber IP Address Mismatch.

State management server part

5 is a diagram showing a configuration of a state management server unit according to a preferred embodiment of the present invention.

Referring to FIG. 5, the state management server unit 500 according to the present invention may include a subscriber state management unit 510, a query response unit 520, and an interworking unit 530.

The subscriber status management unit 510 is a subscriber information maintenance unit 511 for maintaining subscriber information until the subscriber logs in the program and then terminates the program. And a subscriber information changing unit 513 for performing information change according to the cancellation of registration, an information providing unit 515 for storing the information of the corresponding subscriber when registering the subscriber and providing status information of the members on the contact list of the subscriber. Field management unit 517 for managing and changing subscriber information and status information fields stored and managed. In consideration of the characteristics of the mobile communication network, the subscriber state management unit 510 according to the present invention may synchronize state information on subscribers and groups between a terminal and a server without putting a load on an existing mobile communication network.

The query response unit 520 may perform a response to the IP address and status inquiry for the called subscriber from the SIP server unit (SIPS) when the subscriber is called.

The interworking unit 530 is a SIPS interworking unit 531 for performing an interworking function with the SIPS for subscriber registration and status information management, and a GMLS interworking unit 532 for interworking with GMLS for subscriber group and contact list management. And an IPLS interworking unit 533 for interworking with the IPLS periodically to update the status information of the subscriber. Here, when the interworking result by the IPLS interworking unit 533 is 'AT member' Can be updated with 'OffLine'. In addition, the linkage unit 530 may further include an LBS linkage unit 534 for interworking with the LBS to update the location information of the subscriber.

SIP server

6 is a diagram illustrating a configuration of a SIP server unit according to a preferred embodiment of the present invention.

SIP server 600 according to the present invention is a proxy unit 605, retransmission unit 610, response unit 615, upgrade unit 620, compression unit 625, protocol unit 630, SDB unit (635 and the linkage unit 640 may be further included.

The proxy unit 605 performs a SIP Proxy and Routing function, and may perform a Digest Authentication function when a subscriber first logs in. The proxy unit 605 performs an IP address lookup function to the PS to transmit a SIP message to the called subscriber, and may provide a detection function for a looped request and a loose routing function. The retransmission unit 610 performs a retransmission function for the transmitted SIP message, and according to a preferred embodiment, may retransmit the message by the retransmission timer, and the response unit 615 may be sent to the state management server unit. When inquiring the subscriber's IP address, the result of the inability to send an incoming message to the offline subscriber can be transmitted to the PTT server unit (PTTS).

The upgrade unit 620 may perform a function of upgrading additional services according to 3GPP / 3GPP2 and other standards without changing the H / W platform. For example, the upgrade unit 620 performs a function of upgrading a network to perform a video calling system and a packet network based switch CSCF (Call State Control Function) function.

The compression unit 625 may perform a function of performing compression in accordance with an optimal compression ratio and a preset standard. According to a preferred embodiment, the compression unit 625 may support SigComp (Signaling Compression). That is, the compression unit 625 operates as an endpoint of SigComp, which is a message compression function, when SIP interworking with a user element (UE), compresses a SigComp message for a SIP message between a user element (UE) and a SIPS, and It may provide a decompression function.

The protocol unit 630 may accommodate the Binary Protocol and operate as a Binary Protocol when the SIP is interworked with the UE. Here, the protocol unit 630 may perform reception / interpretation and generation / transmission of the Binary Protocol message, and the SIP message. It is configured to enable Binary Protocol message or SIP message interworking.

The SDB unit 635 may perform a function of transmitting an "SDB Indicator" in order to use an SDB function of transmitting a Binary Protocol message on a common channel (PCH / ACH) on a CDMA wireless network. According to a preferred embodiment of the present invention, when using the "SDB Indicator" field, to use the upper two bits of the TOS field of the load distribution unit (LD) of the IP Header field, or to use the Option field of the IP Header field Can be configured.

The interlocking unit 640 is a PTTS interlocking unit 641 for interworking with a PTT server unit (PTTS) for PTT / PTD / IM call processing. DNS to get IP address from Domain when routing SIP message, with GLMS interlocking unit 643, GLMS interlocking unit 643 for linking with group list management unit (GLMS) for subscriber registration, authentication and group management. And the PS interworking unit 645 for interworking with the Presence Server for the Location inquiry of the called UE.

PTT server section

7 is a diagram showing the configuration of the PTT server unit according to an embodiment of the present invention.

Referring to FIG. 7, the PTT server unit according to the present invention includes a call controller 710, a session controller 720, an IM service provider 730, a PTD session setup unit 740, a billing CDR generator 750, and a prepaid payment. It may include a billing processing unit 760, SMS communication unit 770 and interlocking unit 780.

The call control unit 710 performs call control for 1: 1 and 1: n PTT voice calls. In the case of a group call, the call controller 710 may perform call control according to a preset method for a default, a chat, a predetermined call, and a call request for an Ad-hoc group. In addition, the call controller 710 may identify the corresponding destination member (s) through the message of the caller who requested the call, and obtain information on the member (s) for which the call is requested through the group list manager GLMS. . In addition, the call controller 710 may allocate a media resource by requesting a media distribution server unit (MDS) to allocate a media resource for the corresponding call. After the call controller 710 transmits the incoming message, the call controller 710 may drive a timer for waiting for a response, and transmit a command for retransmission to the retransmission unit.

The call control unit 710 receives a text message designator (eg, a SMS noti. Indicator) from the group list management unit GLMS when the state of the member (s) for which the call is requested is in an "Offline" state. Call reception unit 711 for receiving and performing an incoming call using a text message, a specific call end unit 712 where only a specific member can terminate a call during a group call, and a call session from a media distribution server unit (MDS). If all the members who participated are notified that there is no traffic transmission for a certain time (timer), the session end part 713 for terminating the call session, and the subscriber who participated in the call session can invite additional members to the call. If so, it may include a call adder 714 for adding the member to the session and participating in the call session.

In addition, the call control unit 705, even if the member initially rejected the call request, the re-addition unit 715, the call session to re-join the call at any time while the call session is maintained by the doctor After this is set, the status information providing unit 716 for changing the status information by notifying the state management server (PS) of the call session creator and the participant with the status information of the participants in the call session. The member information providing unit 717 for notification may further include a call release unit 718 for releasing the entire group call by the member who originally requested the call.

The session controller 720 may perform a function of processing session control and session related events. The session controller 720 may manage session

information of subscribers participating in each call session, and if a specific subscriber wants to participate in an already created call session, whether the subscriber has a right to participate in the call session. Check and, if authorized, participate in the call session. When the session controller 720 requests an additional member not participating in the call session to participate in the call session, the session controller 720 performs a function of joining the member to the call session under the control of the call controller 710. Status information of the additionally participated subscriber is reported to the group list management unit (GLMS) at the time of additional participation is configured to change the status information. When the participant participating in the call session wants to leave the call session, the session controller 720 is configured such that only the corresponding subscriber can leave while the call session is maintained, and the state information of the withdrawn subscriber is withdrawn. The status information may be changed by being reported to the group list manager GLMS at this time.

The instant messaging (IM) service provider 730 may provide an IM service based on a pager mode using a SIP message, and may be simultaneously performed with a PTT service.

The push-to-data (PTD) session setting unit 740 performs a call processing function for providing a PTD service, and in the case of a group session for a PTT call, a method of transmitting a PTD to the corresponding group member and a PTT call group; Call processing may be performed by transmitting a PTD to another member. Similar to the PTD call setup, the method of releasing a PTD session may implement a PTD session releasing method for a PTT talk group member and a PTD session releasing method for a PTT talk group and other members, respectively. .

The billing CDR generation unit 750 performs a billing CDR generation function for the PTT, PTD, and IM services, and can generate individual billing CDRs and transmit them to the billing server unit (MAS) even during simultaneous services of the PTT, PTD, and IM. . In the case of the PTT, a CDR of a speech unit is generated and the billing CDR for each group type is transmitted to the billing server unit (MAS) .In the case of a PTT group call, the subscriber speaks about an additional member who joins or leaves during one member's speech in a call session. When this is done billing CDR is generated, it is configured not to be considered. In addition, the billing CDR generation unit 750 generates a billing CDR per case in the case of IM and PTD, and generates a billing CDR for the subscriber that has received a call completion (200 OK) response from the called party in the case of group transmission, and then billing server unit (MAS).

The prepaid billing unit 760 may perform a real-time prepaid subtraction function in conjunction with a data service control server unit (DSCP) when the caller is an intelligent network subscriber. In the case of PTT, when the subscriber who requested the right to speak is an intelligent network subscriber, the amount of money used when requesting balance information to the data service control server (DSCP) and release the right to speak is transmitted to the data service control server (DSCP) in real time. I can deduct it. When the subscriber of the intelligent network acquires the right to speak and the balance is exhausted and receives the service interruption message from the data service control server unit (DSCP), the PTT server unit (PTTS) immediately receives the media distribution server unit (MDS). The request for release of the right to speak to the subscriber is no longer allowed to speak, but the PTT terminating service for the subscriber is configured to continue.

The text message transmitter 760 may transmit a connection message to the group communication service through a text message such as a short message for an incoming service to an offline subscriber.

The interlocking unit 780 is interlocked with the group list management unit GLMS, the SIPS, the load distribution unit LD, the media distribution server unit MDS, the billing server unit MAS, and the other network interworking server unit MGS. When the list management unit (GLMS) service, the group list management unit (GLMS) may be linked to obtain individual subscriber information or group information. In addition, the linker 780 may be linked with the SIPS through the load balancer LD for PTT and PTD call processing. In addition, the interlocking unit 780 is a billing server unit for transmitting the billing CDR for the media distribution server unit (MDS), the general subscriber to the subscriber management server (WISE) in order to send and receive PTT / PTD media session settings and billing information (MAS) and interworking with the data service control server unit (DSCP) for real-time billing processing and the message service center and the interworking with the message service for the incoming message to the offline subscribers.

Load balancer

8 is a view showing a configuration of a load distribution unit according to a preferred embodiment of the present invention.

Referring to FIG. 8, a configuration of a load distributor (LD) according to a preferred embodiment of the present invention will be described. The load distributor 800 may distribute media for providing a PTD service. A function of allocating load to a plurality of PTT server units according to a UE environment of a subscriber to be delivered for each content requested from a server unit (MDS) is performed.

The load distributing unit 800 searches for the UE environment of the corresponding subscriber with JUICE to know the UE environment of the subscriber and the PTT server according to the information extracted by the environment information extractor 810 and the information extracted from the environment information extractor. It may include a PTTS selector 820 for selecting a part.

The load distributing unit 800 further includes an interlocking unit 830. The interlocking unit 800 receives a conversion request for a specific packet from a media distribution server unit (MDS) and converts it to a UE environment. A media distribution server unit (MDS) interworking unit returned to the media distribution server unit (MDS) and environment information, it may include a JUICE interlocking unit for extracting the terminal environment of the subscriber.

Media distribution server unit and voice control

9 is a diagram showing the configuration of a media distribution server unit according to a preferred embodiment of the present invention. Hereinafter, the media distribution server unit and the voice control structure will be described.

Referring to FIG. 9, a media distribution server 900 according to a preferred embodiment of the present invention may include a media session controller 910, a media distributor 920, a voice control unit 930, and billing. The information transmitter 940, the duplication unit 950, and an interlocking unit 960 may be included.

When the media session controller 910 receives a resource allocation request from the PTT server unit PTTS from the media distribution server unit MDS during the creation of the call session, the media session controller 910 performs a function of allocating resources in response to the request. Here, the resources of the media distribution server unit MDS allocated to the initial call session may be expanded and reduced as necessary. In addition, the media session control unit 910 receives only bearer traffic from the user who has the right to speak, and receives the bearer traffic sent by the user who does not have the right to speak. An upgrade unit 913 may be configured to recognize withdrawal of a call session of a specific member among participating members, and to perform a real-time media session upgrade according to the withdrawal.

The media distribution unit 920 may perform a function of analyzing, copying, and distributing media. The media distribution unit 920 may classify and analyze bearer traffic entering the media distribution server unit MDS in a preset manner according to its attributes. According to an embodiment of the present invention, the media distribution unit 920 uses an RTP / UDP protocol for PTT bearer traffic transmission, an MSRP / TCP protocol for PTD bearer traffic transmission, and voice control and QoS. The RTCP protocol is used for feedback. Here, the RTP packet entered into the media distribution server unit (MDS) may be copied as much as the user participating in the call session except for the user who has the voice, and then distributed based on the destination IP of each user.

The TCP packet entering the media distribution server unit (MDS) is converted and distributed according to the subscriber terminal environment in accordance with the file conversion server unit (FCS) as necessary, and the voice packet and the file packet are simultaneously transmitted through the media channel. In this case, the file packet may be provided so as not to affect the voice quality. Here, the media distribution server unit (MDS) is configured to release the media channel when media traffic is not transmitted for a specific time within a preset media session using a specific timer.

The talk right control unit 930 may control only one talk right to be allowed at the same time in one call session. The talk control unit 930 is configured to grant a call talk right to the first user who requested the talk right, and to ignore the other talk request requested before the call talk is released. In addition, the talk right control unit is configured to transmit the release information to the PTT server unit after releasing a talk right in the call session when a user having a talk right sends a talk right release

message. Here, the media distribution server unit (MDS) controls a particular member using a timer for a predetermined time after obtaining a speaking right by using a timer, and after the member obtaining the speaking right obtains the speaking right, the user is silent for a predetermined time. If the state is maintained, it is configured to take measures such as releasing the voice. In addition, the voice control unit 930 may perform state management of each user who participated in the PTT session and a user who has acquired the voice.

The billing information transmitter 940 performs a function of generating billing information in units of the floor of the talker who participated in the PTT session. Here, the charging information of the talk right unit is configured to notify the PTT server unit (PTTS) when the talk right of the talk right is released. The billing information transmitter 940 may generate session billing information at the end of the PTT session, and the billing information of the session may be notified to the PTT server unit (PTTS) when the corresponding session ends. According to an embodiment of the present invention, in the case of a PTD session, the billing information may be generated in units of transmission of the speaker (see group transmission in case of group). The billing information for each PTD service case is notified to the PTT server unit (PTTS) immediately after the end of the PTD session.Also, in connection with the PTT server unit (PTTS) for the exhaustion of the balance of the subscribers of the intelligent network, the right to speak can be granted to the speaker. It is configured not to.

The redundant unit 950 may perform a function of managing a media session when there are a plurality of media distribution server units (MDSs), and for each of the plurality of media distribution server units (MDSs), each media distribution server unit (MDS).) Can provide a load sharing function to share the same load. Here, it is obvious that the redundancy unit may be configured as a multiplexer.

The interlocking unit 960 interlocks with the file conversion server unit (FCS) for file conversion for each terminal for the PTTS interworking unit 961 and the PTD service for interworking with the PTT server unit (PTTS) for PTT / PTD call processing. It may include an FCS linkage unit 963 to. In this case, the PTTS interworking unit 961 is configured to interwork with a user when performing the PTT service, and to interwork with the TCP when performing the PTD service.

The format for transmitting a right control message according to an embodiment of the present invention may use an RTCP APP packet. Referring to Table 3 below, the talk control protocol stack and the talk control message according to the preferred embodiment of the present invention are summarized.

Layer Protocol Application Floor control application (RTCP APP format) Transport UDP Network IP Data Link Network Access Protocol (IEEE802.3, Ethernet) Physical Layer 10 / 100Base-T

Message type Subtype Application-dependent data Remarks (based on MDS) Floor Request 0 none Incoming Floor grant One none Sent Floor taken 2 CNAME / NAME Sent Floor Deny 3 Reason code / length / reason phrase Sent Floor release 4 Sequence number of last packet / padding Incoming Floor idle 5 none Sent Floor revoke 6 Reason code / additional information Sent

Here, the floor request message (Floor Request) is a message for requesting permission to speak to the MDS in the terminal. A floor grant message (Floor Grant) is a message that the MDS gives the right to speak to the terminal. The floor taken message is a message informing that the MDS has already occupied the floor. In addition, the floor deny message (Floor Deny) is a message indicating that the request for the MDS denial of speech to the UE requesting the right to speak, may be configured in the form shown in Table 5.

ADD Length (octets) Description Reason Code One Reason for denial of speech Length One Length of Reason Phrase Reason Phrase 6 String with additional information (filled with 0 if none)

In this case, the code value of 1 may indicate that the voice is already occupied, and the code value of 2 indicates an internal PTTS server error.

A floor release message (Floor Release) is a message to inform the MDS that the terminal has released the right to speak, the floor idle message (Floor Idle) is a message indicating that the MDS is not currently occupied the right to speak. And the floor right cancellation message (Floor Revoke) is a message for canceling the speech permission granted to the terminal by the MDS, it may be configured in the form shown in Table 6.

ADD Length (octets) Description Reason Code 2 Cause of invalidity Additional information 2 Additional Information (Depends on Code)

In this case, when the code value is one, only one speaker may be present in the session, and if the code value is two, it may be configured to refer to a case in which the speaking time for one person is exceeded. In this case, when the code is 2, a retry-after timer value is included in additional information, and no packet is transmitted until this timer expires.

Table 7 below summarizes the voice control protocol timer according to the preferred embodiment of the present invention. The start time and the end time of the timer are defined according to each condition. When the timer ends, the preset operation is configured to be performed, and the speaking time may be controlled according to the speech control protocol timer.

Timer name Start time Stop (reset) time point Expire Behavior Remarks End of RTP media timer (T3) At the end of RTP media When RTP media continues or this timer is Expire Judging that the RTP stream has ended, Idle Floor status Up to 6 seconds between 3-5 seconds Stop talking timer (T8) At the beginning of the talk burst At the end of the talk burst Determining sufficient talk time for the user, and sending Floor Revoke message to the user Differential setting by user group Floor revoked grace timer (T4) Expire of Stop talking timer Floor status is Idle and floor Idle packet is broadcast Between 2-3 seconds Inactivity timer (T7) At the end of the talk burst When receiving Floor Request message or RTP media Ended talk session Differential setting by user group Sender report timer (T9) Receive Floor Release message or expire 'end of RTP media timer' When an SR report is received from the UE which started the sender report timer I believe the SR report is lost Receiver report timer (T10) When MDS Sends RTCP SR When RR report is received from UE which started Receiver report timer I believe the SR report is lost Floor idle timer (T2) When sending the first Floor Idle message When receiving Floor Request message or when Talk burst starts or when Inactivity timer expires. Resend the Floor Idle message (transmission cycle uses an exponential back off algorithm (e.g. Fibonacci sequence)) Number of resends is between 1 and 100 (default: 9 times) Floor revoke timer (T5) When the Stop talking timer expires (When sending a Floor Revoke message) Expire City Resend Floor Revoke Messages Number of resends is between 1 and 10 (default: 3 times) Retry after timer (T6) When the Stop talking timer expires (When sending a Floor Revoke message) Give voice to the user who sent the Floor Request message Include this timer value in Floor Revoke messages between 5 and 30 seconds

Configuration of billing server section and other additional server sections

10 is a diagram showing the configuration of a charging information providing unit according to a preferred embodiment of the present invention.

Referring to FIG. 10, the billing information provider (MAS, MGCS Accounting Server) 1000 according to the present invention may include a billing information collector 1010, a billing information transmitter 1020, and an interlocking unit 130. have.

The charging information collection unit 1010 performs a charging CDR collection function. According to a preferred embodiment, for the PTT service, the MAS is configured to collect the billing CDRs from the PTT server unit (PTTS) at the end of every talk, and for the PTD service, the MAS is configured for the PTT server unit at the end of every file transfer. Collecting CDRs from PTTS). In addition, for the IM service, the MAS collects the charging CDRs from the PTT server unit (PTTS) at the completion of every IM message transmission, and the collected service-specific charging CDRs are configured to be stored / managed on a disk.

The billing information transmitter 1020 may perform a function of transmitting a billing CDR file. The MAS can make the collected charging CDR into a file according to a certain condition (number of collected CDRs, file size) and send it to the subscriber management server unit (WISE), and at the scheduled time, the file list file for the charging CDR file is promised. Must be sent to WISE.

The interlocking unit 1030 is a PTTS interlocking unit 1030 and a billing CDR file and a billing CDR file list for collecting a billing CDR in conjunction with a PTT server unit (PTTS) at a call processing intermediate or end point of a PTT / PTD / IM service. The WISE linkage unit 1033 for interworking with the subscriber management server unit (WISE) for file transfer may be included.

Also, a media gateway server (MGS) signal converter and a media converter, which are not shown in the drawing, may be included. Signal conversion unit Signaling conversion function for the call establishment request message transmitted from the PTT server unit (PTTS) or the call establishment request message from another network can be performed. When the media converter interworks with another network, the media converter may perform a conversion for voice traffic transmitted from another network subscriber or voice traffic transmitted to another network subscriber.

And the file conversion server unit according to a preferred embodiment of the present invention may include a file conversion unit and the linkage unit. The file conversion unit provides a file conversion function and may convert the content conversion unit according to the UE environment of the subscriber to be delivered for each content requested from the media distribution server unit (MDS). The file conversion server unit (FCS) can search for the UE environment of the subscriber and extract information with JUICE to know the UE environment of the subscriber, and if the file conversion is necessary as a result of linkage with the subscriber information server (JUICE), the content You can convert and save files by linking the File Converter specified by the operator according to the specified method (pre / post). The file conversion server unit FCS optionally selects a file converter without the help of the subscriber information server unit JUICE and performs file conversion according to the UE environment of the corresponding subscriber. Here, in case it is impossible to determine the performance and model of the user terminal, the file conversion server unit (FCS) manages the model of the UE and the data format that can be processed by the UE, and converts the file according to the needs of the service The server unit (FCS) may perform a function of bypassing to another media conversion server without directly involved in data contents.

The foregoing drawings and detailed description of the invention are merely exemplary of the invention, which are used for the purpose of illustrating the invention only and are intended to limit the scope of the invention as defined in the claims or in the claims. It is not. Therefore, those skilled in the art will understand that various modifications and equivalent other embodiments are possible therefrom. Therefore, the true technical protection scope of the present invention will be defined by the technical spirit of the appended claims.

As described above, the present invention has the effect of providing a group communication service including voice, data, messages, and the like by using a push-to-talk (PTT) method.

In addition, the present invention has an effect that can provide a group communication service by integrating the PTT service to the existing CDMA network.

In addition, the present invention has the effect of providing an efficient group communication network that can reduce the response latency.

Although described above with reference to a preferred embodiment of the present invention, those skilled in the art that various modifications of the present invention without departing from the spirit and scope of the invention described in the claims below And can be changed.

Patent Citations (2)

Publication number	Priority date	Publication date	Assignee	Title
KR20030047874A *	2000-03-03	2003-06-18	퀄컴 인코포레이티드	Method and apparatus for participating in group communication services in an existing communication system
KR20050108841A *	2004-05-13	2005-11-17	에스케이 텔레콤주식회사	Method and system for implementing of push-to-talk service by using sip and sdb for use in mobile data communication network
Family To Family Citations				

* Cited by examiner, † Cited by third party

Cited By (9)

Publication number	Priority date	Publication date	Assignee	Title
KR101178545B1	2011-07-18	2012-08-30	주식회사 코모바일	System, server and method for providing push-to-talk service using user datagram protocol
Family To Family Citations				
KR100839887B1 *	2006-05-19	2009-03-24	엘지전자 주식회사	Session invitation reservation method in sip based communication service
KR100948799B1 *	2006-08-07	2010-03-24	삼성전자주식회사	Apparatus and method for allocating resource for simplex transmission in wideband wireless communication system
KR101018189B1 *	2008-08-13	2011-02-14	(주)사이버텔브릿지	Method for servicing Internet Protocol Push-To-Talk
KR100939526B1 *	2009-05-11	2010-01-28	엘아이지넥스원 주식회사	Session initiation protocol registration method for ad-hoc network and gateway node for the same
KR101419288B1 *	2010-10-28	2014-08-13	에스케이텔레콤 주식회사	Packet service system and apparatus for presenting conference call service, and conference call service method thereof
KR102115024B1 *	2013-12-10	2020-05-26	에스케이텔레콤 주식회사	Method for transmitting of voice for gorup driving and apparatus for the same
KR101520319B1 *	2013-12-18	2015-06-16	(주)엔컴	System and method for providing ptt services using data network
KR101634947B1 *	2015-08-26	2017-01-10	주식회사 엔오디비즈웨어	Method of operating chatting application, method of operating chatting server, and method of operating chatting system

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
KR100692639B1	2007-03-13	Method and apparatus for providing group communications service
US7623469B2	2009-11-24	Service provision in a communication system
US7058042B2	2006-06-06	One-to-one communication
KR100810222B1	2008-03-07	METHOD AND SYSTEM FOR SERVICING FULL DUPLEX DIRECT CALL IN PoCPTT over Cellular

Publication	Publication Date	Title
JP4548773B2	2010-09-08	PT service restriction method
KR101278832B1	2013-06-25	METHOD AND TERMINAL APPARATUS AND SYSTEM FOR AN HOC PoC GROUP SESSION SETUP IN PoC SYSTEM
KR101179385B1	2012-09-03	Server and client in push to talk over cellular network and method for processing poc call based on answer mode using the same
US20060034195A1	2006-02-16	SIP message extension for push to watch service
JP2007534247A	2007-11-22	Group invitation
KR100610373B1	2006-08-09	Method and apparatus for processing user status for group communications service
KR20120067844A	2012-07-09	System for chatting service using embms and control method for user equipment, ebm-sc and service provider server of the system for chatting service using embms
KR100673318B1	2007-01-10	Method and apparatus for inviting offline subscriber for group communications service
KR100644379B1	2006-11-10	Method and apparatus for providing for ring back tone service
EP1380182B1	2012-05-30	One-to-one communication in a system having different control plane and user plane logical entities
KR100586014B1	2006-03-13	Method and system for transmitting and receiving instant message using wireless network
KR100578376B1	2006-05-11	Method and apparatus for authenticating user for group communications service
KR101252860B1	2013-04-09	Method for providing a media stored the poc box in poc system
KR100687761B1	2006-12-14	Wireless packet switching network system based on sip
KR100578385B1	2006-05-11	Method and apparatus for inviting offline subscriber for group communications service
KR100644396B1	2006-11-10	Method and apparatus for billing for group communications service
KR100687563B1	2006-12-13	Method and system for transmitting and receiving electrical file using wireless network
KR100644367B1	2006-11-10	Method and apparatus for providing for voice mail service
WO2009129728A1	2009-10-29	Broadcast/multicast method, apparatus and system
WO2009043280A1	2009-04-09	A method, equipment and system for identifying service type and establishing service according to the identifier
KR100493109B1	2005-06-02	Method and apparatus for supporting voice over ip in a mobile communication system

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
KR1020040063414A	2004-08-12	2004-08-12	Method and apparatus for providing group communications service

Applications Claiming Priority (1)

Application	Filing date	Title
KR1020040063414A	2004-08-12	Method and apparatus for providing group communications service

Legal Events

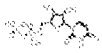
Date	Code	Title	Description
2004-08-12	A201	Request for examination	
2006-06-29	E902	Notification of reason for refusal	
2006-08-29	AMND	Amendment	
2006-12-28	E601	Decision to refuse application	
2007-01-10	J201	Request for trial against refusal decision	
2007-01-10	AMND	Amendment	
2007-02-26	B701	Decision to grant	
2007-03-02	GRNT	Written decision to grant	

Date	Code	Title	Description
2013-02-28	FPAY	Annual fee payment	**Payment date**: 20130304 **Year of fee payment**: 7
2014-02-28	FPAY	Annual fee payment	**Payment date**: 20140303 **Year of fee payment**: 8
2015-02-27	FPAY	Annual fee payment	**Payment date**: 20150302 **Year of fee payment**: 9
2016-02-29	FPAY	Annual fee payment	**Payment date**: 20160229 **Year of fee payment**: 10
2019-03-03	LAPS	Lapse due to unpaid annual fee	

Concepts

machine-extracted

Download Filter table

Name	Image	Sections	Count	Query match
communication		claims,abstract,description	77	0.000
corresponding		claims,abstract,description	44	0.000
compression		claims,description	13	0.000
RTP PEK		claims,description	11	0.000
biological transmission		claims,description	11	0.000
tocopherol		claims,description	6	0.000
tricalcium phosphate		claims,description	6	0.000
Uridine-5'-Diphosphate		claims,description	4	0.000
Vipera berus		claims,description	3	0.000
controlling effect		claims,description	2	0.000

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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
JASON D. RADACHY, MOYLES IP, LLC
1 ENTERPRISE DRIVE, SUITE 428
SHELTON, CONNECTICUT 06484
UNITED STATES OF AMERICA

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* **29 March 2023 (29.03.2023)**
Applicant's or agent's file reference **BKT004WO**	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. **PCT/US2023/060814**	International filing date *(day/month/year)* **18 January 2023 (18.01.2023)**
Applicant **BK TECHNOLOGIES INC.**	

1. ☑ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau preferably through ePCT, or on paper to:
   The International Bureau of WIPO, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland

   For more detailed instructions, *see PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the PCT Applicant's Guide, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45bis.1). The procedure for requesting supplementary international search is described in the PCT Applicant's Guide, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/US **Commissioner for Patents** **Mail Stop PCT, Attn: ISA/US** **P.O. Box 1450** **Alexandria, VA 22313-1450, United States of America** Facsimile No. **(571)273-8300**	Authorized officer **KIM, Harry** Telephone No. **571-272-4300**

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference **BKT004WO**		**FOR FURTHER ACTION** see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. **PCT/US2023/060814**	International filing date *(day/month/year)* **18 January 2023 (18.01.2023)**	(Earliest) Priority Date *(day/month/year)* **19 January 2022 (19.01.2022)**
Applicant **BK TECHNOLOGIES INC.**		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      ☑ the international application in the language in which it was filed.
      ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,
   ☑ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☑ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 2
      ☑ as suggested by the applicant.
      ☐ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2023/060814

A. CLASSIFICATION OF SUBJECT MATTER

IPC: H04W 4/08, 4/10, 8/20
CPC: H04W 4/08, 4/10, 8/20

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

CPC: H04W 4/10, 4/08, 8/20

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

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

(US-PGPUB; USPAT; EPO; JPO; DERWENT: (push adj2 talk adj2 cellular) AMD ((access$3 join$3) adj22 (talkgroup talk ADJ group group)) AND (84load$3 (down ADJ load$3))

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	US 2012/0036534 A1 (Balestrieri) 09 February 2012 (09.02.2012) (2012-02-09)	
X	entire document	1-12, 14-20 and 22-23
Y	entire document	13 and 21
	US 2017/0237600 A1 (Patel et al.) 17 August 2017 (17.08.2017) (2017-08-17)	
X	entire document	1-12, 14-20 and 22-23
Y	entire document	13 and 21
	US 2006/0252442 A1 (Nurmi) 09 November 2006 (09.11.2006) (2006-11-09)	
X	entire document	1-12, 14-20 and 22-23
Y	entire document	13 and 21
	2018/0278718 A1 (BROWN et al.) 27 September 2018 (27.09.2018) (2018-09-27)	
Y	entire document	13 and 21

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 February 2023 (28.02.2023)	**29 March 2023 (29.03.2023)**
Name and mailing address of the ISA/US **Commissioner for Patents** **Mail Stop PCT, Attn: ISA/US** **P.O. Box 1450** **Alexandria, VA 22313-1450, United States of America** Facsimile No. **(571)273-8300**	Authorized officer **KIM, Harry** Telephone No. **571-272-4300**

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
JASON D. RADACHY, MOYLES IP, LLC
1 ENTERPRISE DRIVE, SUITE 428
SHELTON, CONNECTICUT 06484
UNITED STATES OF AMERICA

Facsimile No.: 866-250-1636

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	**29 March 2023 (29.03.2023)**
Applicant's or agent's file reference **BKT004WO**	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2023/060814	**18 January 2023 (18.01.2023)**	**19 January 2022 (19.01.2022)**

International Patent Classification (IPC) or both national classification and IPC
IPC: H04W 4/08, 4/10, 8/20
CPC: H04W 4/08, 4/10, 8/20

Applicant
BK TECHNOLOGIES INC.

1. This opinion contains indications relating to the following items:

- [✓] Box No. I — Basis of the opinion
- [ ] Box No. II — Priority
- [ ] Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV — Lack of unity of invention
- [✓] Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI — Certain documents cited
- [ ] Box No. VII — Certain defects in the international application
- [ ] Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Commissioner for Patents **Mail Stop PCT, Attn: ISA/US** **P.O. Box 1450** **Alexandria, VA 22313-1450, United States of America** Facsimile No. **(571)273-8300**	**28 February 2023 (28.02.2023)**	**KIM, Harry** Telephone No. **571-272-4300**

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2023/060814

Box No. I **Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of:
   - [✓] the international application in the language in which it was filed.
   - [ ] a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. [ ] This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).

3. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
   - a. [ ] forming part of the international application as filed.
   - b. [ ] furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)).
     - [ ] accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.

4. [ ] With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.

5. Additional comments:

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-23	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-23	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	NONE	NO

2. Citations and explanations:

---------- **EXPLANATION** ----------

Claims 1-12, 14-20, 22 and 23 lacks novelty under PCT Article 33(2), as being anticipated by Nasir et al (US 2016/0065742 A\1).

Regarding claims 1, 10 and 18, Nasir teaches a method of managing access to a push-to-talk-over-cellular (POC) talkgroup (see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated wth the push-button telephone'. \n this case, Nasir's "conference call and see Abstract, "conference call groups" read on Applicant's "talkgroup'), the method comprising:

providing a control device configured to manage a first talkgroup (see Abstract, "implementing privacy control within conference call, and [0020], "the conference call server may add a user device to the conference call').

granting a first non-subscriber device access to the first talkgroup (also see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated wth the push-button telephone', see [0033], "For example, conference call server 220 may add user device 210 to a conference call. In some implementations, conference call server 220 may add user device 210 to the conference call at any time during the conference call. Additionally, or alternatively, conference call server 220 may add user device 210 to the conference call in response to one or more triggers, such as in response to receiving a create conference command from user device 210 (See, e.g., block 310), in response to receiving a request (e.g., an add command) from another user device 210 to add user device 210 to the conference call, in response to receiving a request from user device 210 to join the conference call (which may include, for example, a conference call identifier and/or password associated wth the conference call), in response to user device 210 accessing a website associated wth conference call server 220 and/or the conference call, in response to user device 210 calling a telephone number associated wth conference call server 220 and/or the conference call, etc', also see [0038], [0039] and [0044], "joining the conference call into conference call groups'), and

transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to access the first talkgroup (see [0040], "provide user device 210 an opportunity

to download and install conference call application 430 prior to, during, or

after joining the conference call'. \n this case, Nasirs "conference calf and see Abstract, "conference call groups" read on Applicant's "talkgroup').

Regarding claims 2, 9 and 17, Nasir teaches automatically revoking access of the first non-subscriber device to the first talkgroup after a predetermined period of time has elapsed (see [0056], "when the recording should begin (e.g., immediately, at a specified time, in response to a particular trigger such as a specified user device 210 foining the conference call, etc.),").

Regarding claims 4, 11 and 19, Nasir teaches setting a predetermined time via the first subscriber device; and automatically revoking access of the first non-subscriber device to the first talkgroup after

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

the predetermined period of time has elapsed (see [0056], "when the recording should begin (e.g., immediately, at a specified time, in response to a particular trigger such as a specified user device 210 joining the conference call, etc.),').

Regarding claims 5, 12 and 20, Nasir teaches the first non-subscriber device is a cellular device; and the first non-subscriber contact information is a first cellular telephone number (see [0019], "A user device participating in the conference call may display identification information corresponding to the user deviceS participating in the conference call (e.g., nameS, caller identitieS, telephone numberS, etc.), information regarding user devices joining or leaving the conference call, information relating to conference call groups, such as group names and the users belonging to each group').

Regarding claim 6, Nasir teaches the first non-subscriber device is one of a plurality of non-subscriber devices (see Fig.1, a plurality of non-subscriber devices); the granting the first non-subscriber device access to the first talkgroup comprises granting the plurality of non-subscriber devices access to the first talkgroup (also see [0029], "conference call server 220 may prompt user device 210 to join theconference call via a smart phone associated with the push-button telephone', see [0033], "For example, conference call server 220 may add user device 210 to a conference call. In some implementations, conference call server 220 may add user device 210 to the conference call at any time during the conference call. Additionally, or alternatively, conference call server 220 may add user device 210 to the conference call in response to one or more triggers, such as in response to receiving a create conference command from user device 210 (See, e.g., block 310), in response to receiving a request (e.g., an add command) from another user device 210 to add user device 210 to the conference call, in response to receiving a request from user device 210 to join the conference call (which may include, for example, a conference call identifier and/or password associated with the conference call), in response to user device 210 accessing a website associated with conference call server 220 and/or the conference call, in response to user device 210 calling a telephone number associated with conference call server 220 and/or the conference call, etc', also see [0038], [0039] and [0044], "joining the conference call into conference call groups'); and the transmitting the first communication comprises transmitting the first communication to each non- subscriber device of the plurality of non-subscriber devices (see Fig.1 for "transmitting

the first communication to each non-subscriber device of the plurality of non-subscriber devices').

Regarding claims 7, 15 and 23, Nasir teaches the first talkgroup is one of a plurality of talkgroups; and each talkgroup of the plurality of talkgroups is linked as part of a single virtual incident (see Fig.1, Fig.5A, Fig.5B, Fig.6, Fig.7A, Fig.7B, Fig.8, Fig.9A, Fig.9B, Fig.10, Fig.11 and Fig.12, for "the first talkgroup is one of a plurality of talkgroups; and each talkgroup of the plurality of talkgroups is linked as part of a single virtual incident').

Regarding claims 8 and 3, Nasir teaches a method of managing access to a push-to-talk-over-cellular (POC) talkgroup (see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated with the push-button telephone', \n this case, Nasir's "conference call and see Abstract, "conference call groups" read on Applicant's "talkgroup'), the method comprising:

providing a control device configured to manage a first talkgroup (see Abstract, "implementing privacy control within conference call, and [0020], "the conference call server may add a user device to the conference call');:

providing a first subscriber device (see Fig.1, for "providing a first subscriber device').

transmitting, from the first subscriber device to the control device, first non- subscriber contact information associated with a first non-subscriber device (see [0019], "A user device participating in the conference call may display identification information corresponding to the user deviceS participating in the conference call

(e.g., name&, caller identitieS, telephone numbersS, etc.), information regarding user devices joining or leaving the conference call, information relating to conference call groups, such as group names and the users belonging to each group', and see [0022], where Nasir further teaches "User device 210 may communicate a command and/or other types of information relating to a conference call to conference call server 220'. \n this case, Nasir's "conference call server 220' reads on Applicant's "the control device'); and

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

granting the first non-subscriber device access to the first talkgroup (also see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated wth the push-button telephone', see [0033], "For example, conference call server 220 may add user device 210 to a conference call. In some implementations, conference call server 220 may add user device 210 to the conference call at any time during the conference call. Additionally, or alternatively, conference call server 220 may add user device 210 to the conference call in response to one or more triggers, such as in response to receiving a create conference command from user device 210 (See, e.g., block 310), in response to receiving a request (e.g., an add command) from another user device 210 to add user device 210 to the conference call, in response to receiving a request from user device 210 to join the conference call (which may include, for example, a conference call identifier and/or password associated wth the conference call), in response to user device 210 accessing a website associated wth conference call server 220 and/or the conference call, in response to user device 210 calling a telephone number associated

wth conference call server 220 and/or the conference call, etc', also see [0038], [0039] and [0044], "joining the conference call into conference call groups').

Regarding claims 14 and 22, Nasir teaches the first non-subscriber device is one of a plurality of non-subscriber devices (see Fig.1, "the first non-subscriber device is one of a plurality of non-subscriber devices'); the transmitting, from the first subscriber device to the control device, first non-subscriber contact information associated with a first non-subscriber device comprises transmitting, from the first subscriber device to the control device, non-subscriber contact information associated with each non-subscriber device of the plurality of non-subscriber devices (see [0019], "A user device participating in the conference call may display identification information corresponding to the user deviceS participating in the conference call (e.g., nameS, caller identieS, telephone numberS, etc.), information regarding user devices joining or leaving the conference call, information relating to conference call groups, such as group names and the users belonging to each group', and see [0022], where Nasir further teaches "User device 210 may communicate a command and/or other types of information relating to a conference call to conference call server 220'. In this case, Nasir's "conference call server 220' reads on Applicant's "the control device'); and the granting the first non-subscriber device access to the first talkgroup comprises granting the plurality of non-subscriber devices access to the first talkgroup (also see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated wth the push-button telephone', see [0033], "For example, conference call server 220 may add user device 210 to a conference call. In some implementations, conference call server 220 may add user

device 210 to the conference call at any time during the conference call. Additionally, or alternatively, conference call server 220 may add user device 210 to the conference call in response to one or more triggers, such as in response to receiving a create conference command from user device 210 (See, e.g., block 310), in response to receiving a request (e.g., an add command) from another user device 210 to add user device 210 to the conference call, in response to receiving a request from user device 210 to join the conference call (which may include, for example, a conference call identifier and/or password associated with the conference call), in response to user device 210 accessing a website associated wth conference call server 220 and/or the conference call, in response to user device 210 calling a telephone number associated wth conference call server 220 and/or the conference call, etc', also see [0038], [0039] and [0044], "joining the conference call into conference call groups').

Regarding claim 16, Nasir teaches a non-transitory computer-readable storage medium comprising computer-executable instructions that, when executed by a computer (see [0091], "Device 1400 may perform these operations in response to processor 1420 executing software instructions stored in a computer-readable medium, such as memory 1430. A computer-readable medium may be defined as a non- transitory memory device. A memory device may include space within a single physical memory device or spread across multiple physical memory devices. The software instructions may be read into memory 1430 from another computer-readable medium or from another device. The software instructions stored in memory 1430 may cause

processor 1420 to perform processes described herein'), cause the computer to perform:

creating a first talkgroup for push-to-talk-over-cellular (POC) communication (see Fig.1, Fig.5A, Fig.5B, Fig.6, Fig.7A, Fig.7B, Fig.8, Fig.9A, Fig.9B, Fig.10, Fig.11 and Fig.12, for "creating a first talkgroup', and see [0023], "conference call server 220 may prompt user device 210 to join the conference call via

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

a smart phone associated with the push-button telephone'. \In this case, Nasir's "conference call and see Abstract, "conference call groups" read on Applicant's "talkgroup'):

receiving, from a first subscriber device, first non-subscriber contact information associated with a first non-subscriber device (see [0019], "A user device participating in the conference call may display identification information corresponding to the user deviceS participating in the conference call (e.g., nameS, caller identitieS, telephone numbersS, etc.), information regarding user devices joining or leaving the conference call, information relating to conference call groups, such as group names and the users belonging to each group', and see [0022], where Nasir further teaches "User device 210 may communicate a command and/or other types of information relating to a conference call to conference call server 220'. In this case, Nasir's "conference call server 220' reads on Applicant's "the control device'); and

granting the first non-subscriber device access to the first talkgroup (also see [0023], "conference call server 220 may prompt user device 210 to join the conference call via a smart phone associated wth the push-button telephone', see [0033], "For example, conference call server 220 may add user device 210 to a

conference call. In some implementations, conference call server 220 may add user device 210 to the conference call at any time during the conference call. Additionally, or alternatively, conference call server 220 may add user device 210 to the conference call in response to one or more triggers, such as in response to receiving a create conference command from user device 210 (See, e.g., block 310), in response to receiving a request (e.g., an add command) from another user device 210 to add user device 210 to the conference call, in response to receiving a request from user device 210 to join the conference call (which may include, for example, a conference call identifier and/or password associated wth the conference call), in response to user device 210 accessing a website associated wth conference call server 220 and/or the conference call, in response to user device 210 calling a telephone number associated wth conference call server 220 and/or the conference call, etc', also see [0038], [0039] and [0044], "joining the conference call into conference call groups').

Claims 13 and 21 lacks an inventive step under PCT Article 33(3), as being obvious over Nasir et al (US 2016/0065742 A1) in view Brown et al (US 2018/0278718 A').

Regarding claims 13 and 21, Nasir teaches claims 1-12, 14-20, 22 and 23. Nasir

does not specifically disclose the first non-subscriber device is a land mobile radio

(LMR) gateway; and the first non-subscriber contact information is an internet protocol address of the LMR gateway.

Brown teaches the first non-subscriber device is a land mobile radio (LMR) gateway (see Abstract, [0004], [0011], [0021], [0025], [0033], [0034], [0036], [0037], [0038], [0039], [0042], [0043], [0051], [0052], [0061], [0062] and Brown's claims 1 and 10, "push-to-talk (PTT)' and "LMR gateway'); and the first non-subscriber contact information is an internet protocol address of the LMR gateway (see [0039], "push-to-talk (PTT) and "IP address of an on-premises LMR gateway').

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to provide the teaching of Brown into the system of Nasir in order to provide an improved method, apparatus, and system for deploying a cloud-based broadband push-to-talk (PTT) configuration portal that allows a user anywhere in the world to deploy, configure, and monitor a hybrid broadband PTT and land mobile radio (LMR) integrated radio system and automatically and correspondingly configure broadband PTT and LMR radio system configurations so as to reduce configuration errors (see Brown, [0021]).

Claims **1-23 meet** the criteria set out in PCT Article 33(4), and thus **have** industrial applicability because the subject matter claimed can be made or used in industry.

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18431686
Filing Date	2024-02-02
First Named Inventor	John Marvin Suzuki et al.
Art Unit	2642
Examiner Name	Nghi H Ly
Attorney Docket Number	BKT004USCon

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10681506	B1	2020-06-09	Walker	
	2	7499720	B2	2009-03-03	Idnani	
	3	7529558	B1	2009-05-05	Blair et al.	
	4	7801494	B2	2010-09-21	Emrich et al.	
	5	7889726	B2	2011-02-15	Poikelkä et al.	
	6	8331971	B2	2012-12-11	Turcanu	
	7	9143902	B2	2015-09-22	Fu et al.	
	8	9787733	B2	2017-10-10	Poikselka et al.	

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	Attorney Docket Number	BKT004USCon

	9	9913300	B2	2018-03-06	Ayyasamy et al.	

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	1	20050233776	A1	2005-10-20	Allen et al.	
	2	20060252442	A1	2006-11-09	Nurmi	
	3	20070117552	A1	2007-05-24	Gobburu, et al	
	4	20120036534	A1	2012-02-09	Balestrieri	
	5	20150326523	A1	2015-11-12	Reilly, et al.	
	6	20160065742	A1	2016-03-03	Nasir, et al.	
	7	20170237600	A1	2017-08-17	Patel, et al.	
	8	20180227342	A1	2018-08-09	Bodilis	

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	Attorney Docket Number	BKT004USCon

	9	20180278718	A1	2018-09-27	Brown, et al.		

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	100692639	KR	B1	2007-03-13	Ji Hyun-wook et al.	English Translation Only	☒

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	INTL JOURNAL OF ELECTRONICS AND TELECOMMUNICATIONS, A Hybrid Extension for IP Multicasting in Push-to-talk over Cellular Systems, 2012, VOL. 58, NO. 1, 7 pgs., (PP. 77–83), http://ijet.pl/old_archives/2012/1/11.pdf	☐
	2	OPEN MOBILE ALLIANCE LTD., Push to talk over Cellular 2 Requirements, 2008, 95 pgs., https://www.openmobilealliance.org/release/PoC/V2_0-20080806-C/OMA-RD-PoC-V2_0-20080421-C.pdf	☐
	3	International Search Report and Written Opinion issued in PCT/US2023/060814 dated March 29, 2023, 9 pages.	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18431686
	Filing Date	2024-02-02
	First Named Inventor	John Marvin Suzuki et al.
	Art Unit	2642
	Examiner Name	Nghi H Ly
	Attorney Docket Number	BKT004USCon

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18431686
	Filing Date	2024-02-02
	First Named Inventor	John Marvin Suzuki et al.
	Art Unit	2642
	Examiner Name	Nghi H Ly
	Attorney Docket Number	BKT004USCon

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jason D. Radachy/	Date (YYYY-MM-DD)	2024-09-03
Name/Print	Jason D. Radachy	Registration Number	64360

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(54) 그룹 통신 서비스 제공 방법 및 장치

(57) 요약

본 발명은 그룹 통신 서비스 제공 방법 및 장치에 관한 것으로서, 보다 상세하게는 푸시 투 토크(PTT:Push-To-Talk) 방식을 이용하여 음성, 데이터, 메시지 등을 포함하는 그룹 통신 서비스를 제공하기 위한 방법 및 장치에 관한 것이다. 바람직한 실시예에 따른 그룹 통신 서비스 제공 장치는 패킷 데이터 서빙 노드를 통하여 결합한 단말기와 호 설정을 수행하고, 단말기와 바이너리 프로토콜에 따른 연동을 수행하기 위한 SIP 서버부; SIP 서버부에 연결되며, 단말기에 대응하는 그룹 리스트 정보를 관리하기 위한 그룹 리스트 관리부; 단말기가 그룹 리스트 관리부에 로그인한 후, 로그아웃하는 기간 동안, 단말기에 대응하는 가입자 상태 정보를 유지하기 위한 상태 관리 서버부; SIP 서버부에 의하여 설정된 호를 이용하여 PTT

서비스 및 PTD 서비스를 포함하는 그룹 통신 서비스에 대한 호 제어 및 세션 제어를 수행하는 PTT 서버부; 및 패킷 데이터 서빙 노드에 연결되며, 단말기에게 PTT 서비스 및 PTD 서비스에 대응하는 베어러 트래픽을 전송하기 위한 미디어 분배 서버부를 포함할 수 있다.

대표도

도 1b

특허청구의 범위

청구항 1.

그룹 통신 서비스를 제공하는 장치에 있어서,

패킷 데이터 서빙 노드를 통하여 결합한 사용자 단말기와 호 설정을 수행하고, 상기 사용자 단말기와 바이너리 프로토콜에 따른 연동을 수행하기 위한 SIP 서버부;

상기 SIP 서버부에 연결되며, 가입자가 상기 그룹 통신 서비스를 제공받기 위하여 설정한 그룹의 종류 정보 및 상기 설정된 각 그룹의 멤버에 대한 정보를 포함하는 상기 사용자 단말기에 대응하는 그룹 리스트 정보를 관리하기 위한 그룹 리스트 관리부;

상기 그룹 리스트 관리부에 연결되며, 상기 사용자 단말기가 상기 그룹 리스트 관리부에 로그인한 후, 로그아웃하는 기간 동안, 상기 단말기에 대응하는 가입자 상태 정보를 유지하기 위한 상태 관리 서버부;

상기 SIP 서버부에 연결되며, 상기 SIP 서버부에 의하여 설정된 호를 이용하여 PTT 서비스 및 PTD 서비스를 포함하는 그룹 통신 서비스에 대한 호 제어 및 세션 제어를 수행하는 PTT 서버부; 및

상기 패킷 데이터 서빙 노드에 연결되며, 상기 사용자 단말기에게 PTT 서비스 및 PTD 서비스에 대응하는 베어러 트래픽을 전송하기 위한 미디어 분배 서버부를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 2.

제1항에 있어서,

상기 그룹 통신 서비스를 제공하기 위한 그룹은

상기 사용자 단말기에 대응하며 디폴트로 미리 지정된 디폴트 그룹;

상기 사용자 단말기에 의하여 미리 지정되며 고정 멤버를 가지고 있는 선지정 그룹;

상기 사용자 단말기에 의하여 미리 지정되나 고정 멤버를 가지고 있지 아니한 채팅 그룹; 및

상기 사용자 단말기에 의하여 실시간으로 지정된 멤버와 그룹 통신을 하기 위한 애드호크 그룹을 포함하며,

상기 그룹 리스트 관리부에서 관리하는 그룹은 상기 디폴트 그룹, 상기 선지정 그룹 및 상기 채팅 그룹인 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 3.

제1항에 있어서,

상기 SIP 서버부는

가입자 최초 로그인시, 다이제스트 인증(Digest Authentication)을 수행하고, SIP 메시지를 전송하기 위한 프락시부;

전송된 SIP 메시지에 대한 재전송 기능을 수행하기 위한 재전송부;

미리 설정된 표준에 상응하여 압축을 수행하기 위한 압축부;

상기 바이너리 프로토콜에 따라 상기 단말기와 통신을 수행하고, 상기 SIP 메시지를 생성 및 해석하기 위한 프로토콜부

를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 4.

제1항에 있어서,

상기 그룹 리스트 관리부는

상기 사용자 단말기로부터 1차 인증 정보를 포함하는 등록 요청 메시지를 수신하면, 상기 등록 요청 메시지에 포함된 상기 1차 인증 정보를 추출한 상기 SIP 서버부로부터 상기 1차 인증 정보를 수신하고, 상기 1차 인증 정보를 이용하여 1차 인증을 수행하기 위한 가입자 인증부;

상기 사용자 단말기가 최초 등록한 경우, 상기 사용자 단말기의 가입자 정보를 저장 및 관리하며, 상기 가입자 정보를 상기 PTT 서버부로 제공하기 위한 가입자 정보 관리부;

상기 가입자가 설정한 그룹의 그룹 리스트 및 컨택 리스트에 대한 상기 그룹의 그룹명, 상기 그룹의 멤버, 상기 그룹의 멤버 ID 및 상기 그룹의 멤버의 상태 정보 중 적어도 하나를 포함하는 그룹 정보를 관리하기 위한 컨택 리스트 관리부; 및

그룹 통신을 요청받은 경우, 상기 요청을 허용하기 위한 리스트 및 상기 요청을 거부하기 위한 리스트를 관리하기 위한 액세스 리스트 관리부

를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치

청구항 5.

제4항에 있어서,

상기 1차 인증을 수행한 상기 그룹 리스트 관리부로부터 상기 사용자단말기의 발신번(IMSI) 및 IP주소를 포함하는 2차 인증 정보를 수신하면, 상기 2차 인증 정보를 이용하여 2차 인증을 수행한 후, 상기 인증 결과를 상기 그룹 리스트 관리부 및 상기 에스아이피 서버로 송신하기 위한 위치 관리 서버부를 더 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 6.

제1항에 있어서,

상기 상태 관리 서버부는

상기 사용자 단말기가 로그인한 후, 로그아웃할 때까지 상기 사용자 단말기에 대응하는 가입자 정보를 유지하기 위한 가입자 정보 유지부;

상기 가입자에 대한 등록, 재등록, 등록 취소 및 등록 해제에 따른 정보 변경을 수행하기 위한 가입자 정보 변경부;

가입자 등록 시, 해당 가입자의 정보를 저장하고, 가입자의 컨택 리스트에 대한 멤버들의 상태 정보를 제공하기 위한 정보 제공부를 포함하는 가입자 상태 관리부; 및

가입자 착신 시, 상기 SIP 서버부로부터 착신 가입자에 대한 아이피 어드레스 및 상태 정보 요청에 대한 응답을 수행하기 위한 쿼리 응답부

를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 7.

제2항에 있어서,

상기 PTT 서버부는

상기 디폴트 그룹, 상기 선지정 그룹 및 상기 채팅 그룹에 대한 통화 요청에 대하여 미리 설정된 방식에 따른 호 제어를 수행하며, 호를 요청한 발신자의 메시지를 통하여 해당 착신 멤버를 확인하고, 상기 그룹 리스트 관리부를 통하여 통화가 요청된 멤버에 대한 정보를 획득한 후, 해당 호에 대하여 미디어 자원 할당을 미디어 분배 서버부로 요청하여 미디어 자원을 할당하여 착신 메시지를 전송한 후, 그 응답을 기다리기 위한 타이머를 구동시키고, 재전송을 위한 명령을 재전송부로 송신하여 호를 제어하기 위한 호 제어부;

상기 호 제어부가 제어하는 호에 대하여 세션 제어(Session Control) 및 세션 관련 이벤트를 처리하기 위한 세션 제어부;

상기 PTD 서비스를 제공하는 호처리 기능을 수행하기 위한 PTD 세션 설정부; 및

상기 PTT 서비스 및 PTD 서비스에 대한 과금 CDR 생성하기 위한 과금 CDR 생성부를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 8.

제7항에 있어서,

상기 호 제어부는

통화가 요청된 멤버의 상태가 오프라인 상태인 경우, 상기 그룹 리스트 관리부로부터 수신한 문자 메시지 지정자를 이용하여 상기 멤버의 착신을 수행하기 위한 착신 전환부;

그룹 통화 도중, 특정 멤버만 호 종료를 할 수 있는 특정호 종료부;

상기 미디어 분배 서버부로부터 통화 세션에 참여한 모든 멤버가 일정 시간동안 트래픽 전송이 없음을 통보 받은 경우에는 해당 통화 세션을 종료하기 위한 세션 종료부;

통화 세션에 참여한 가입자가 특정 멤버를 통화에 추가로 초대할 경우, 해당 멤버를 세션에 추가하고 통화 세션에 참여시키기 위한 호 추가부; 및

최초에 통화를 요청한 멤버가 그룹 전체 호를 해제하기 위한 호 해제부를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 9.

제1항에 있어서,

상기 미디어 분배 서버부는

통화 세션의 생성 과정에서 상기 PTT 서버부로부터 자원 할당을 요청받는 경우, 상기 요청에 상응하여 자원을 할당하기 위한 미디어 세션 제어부;

상기 미디어를 분석, 복사 및 분배하며, PTT 베어러 트래픽 전송을 위해서는 RTP/UDP 프로토콜을 사용하고, PTD 베어러 트래픽 전송을 위해서는 MSRP/TCP 프로토콜을 사용하기 위한 미디어 분배부; 및

하나의 통화 세션에는 동일 시간에 하나의 발언권만이 허용되도록 제어하여, 가장 먼저 발언권을 요청한 사용자에게 통화 발언권을 부여하며, 상기 통화 발언권이 해제되기 전에 요청된 다른 발언권 요청은 무시하며, 통화 세션에 참여한 각 유저 및 발언권을 획득한 가입자의 상태 관리를 수행하기 위한 발언권 제어부

를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 10.

제9항에 있어서,

상기 미디어 세션 제어부는

발언권을 얻은 사용자로부터의 베어러 트래픽만을 수신하며, 발언권을 얻지 못한 사용자가 보내는 베어러 트래픽을 수신하는 경우, 이를 폐기하기 위한 트래픽 폐기부; 및

통화 세션에 참여한 멤버 중 특정 멤버의 통화 세션 탈퇴를 인식하고, 상기 탈퇴에 따른 실시간 미디어 세션 업그레이드를 수행하기 위한 업그레이드부

를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 11.

제1항에 있어서,

상기 PTT 서버부가 복수개인 경우, 상기 복수개의 PTT 서버부에 대한 로드를 분산하기 위한 로드 분산부가 더 포함되는 것을 특징으로 하는 그룹 통신망 서비스 제공 장치.

청구항 12.

그룹 통신 서비스를 제공하는 방법에 있어서,

SIP 서버부에서 패킷 데이터 서빙 노드를 통하여 결합한 사용자 단말기와 호 설정을 수행하고, 상기 사용자 단말기와 바이너리 프로토콜에 따른 연동을 수행하는 단계;

상기 SIP 서버부에 연결되며, 가입자가 상기 그룹 통신 서비스를 제공받기 위하여 설정한 그룹의 종류 정보 및 상기 설정된 각 그룹의 멤버에 대한 정보를 포함하는 상기 사용자 단말기에 대응하는 그룹 리스트 정보를 관리하기 위한 그룹 리스트 관리부에서, 상기 사용자 단말기에 대응하는 그룹 리스트 정보를 추출하여 상기 사용자 단말기로 제공하는 단계;

상기 그룹 리스트 관리부에 연결되며, 상기 사용자 단말기가 상기 그룹 리스트 관리부에 로그인한 후, 로그아웃하는 기간 동안, 상기 사용자 단말기에 대응하는 가입자 상태 정보를 유지하기 위한 상태 관리 서버부에서, 상기 그룹 리스트에 대응하는 멤버의 상태 정보를 추출하여 상기 사용자 단말기로 제공하는 단계;

상기 SIP 서버부에 연결되는 PTT 서버부에서, 상기 SIP 서버부에 의하여 설정된 호를 이용하여 PTT 서비스 및 PTD 서비스를 포함하는 그룹 통신 서비스에 대한 호 제어 및 세션 제어를 수행하는 단계; 및

상기 패킷 데이터 서빙 노드에 연결되는 미디어 분배 서버부에서, 상기 사용자 단말기에게 PTT 서비스 및 PTD 서비스에 대응하는 베어러 트래픽을 전송하는 단계를 포함하는 것을 특징으로 하는 그룹 통신망 서비스 제공 방법.

청구항 13.

제12항에 있어서,

상기 그룹 통신 서비스를 제공하기 위한 그룹은

상기 사용자 단말기에 대응하며 디폴트로 미리 지정된 디폴트 그룹;

상기 사용자 단말기에 의하여 미리 지정되며 고정 멤버를 가지고 있는 선지정 그룹;

상기 사용자 단말기에 의하여 미리 지정되나 고정 멤버를 가지고 있지 아니한 채팅 그룹; 및

상기 사용자 단말기에 의하여 실시간으로 지정된 멤버와 그룹 통신을 하기 위한 애드호크 그룹을 포함하며,

상기 그룹 리스트 관리부에서 관리하는 그룹은 상기 디폴트 그룹, 상기 선지정 그룹 및 상기 채팅 그룹인 것을 특징으로 하는 그룹 통신망 서비스 제공 방법.

명세서

발명의 상세한 설명

발명의 목적

발명이 속하는 기술 및 그 분야의 종래기술

본 발명은 그룹 통신 서비스 제공 방법 및 장치에 관한 것으로서, 보다 상세하게는 푸시 투 토크(PTT:Push-To-Talk) 방식을 이용하여 음성, 데이터, 메시지 등을 포함하는 그룹 통신 서비스를 제공하기 위한 방법 및 장치에 관한 것이다. 여기서, PTT(Push-To-Talk)는 일반 휴대폰의 대기시간에 비교할 때 상대적으로 매우 빠른 통신 서비스를 제공할 수 있는 즉석 통신 서비스를 지칭한다.

그러나 종래 기술에 의할 때, 기존에 존재하는 CDMA 망에 이러한 PTT 서비스를 접목할 수 있는 효과적인 기술이 부재한 문제점이 있다. 또한, 기존의 코드분할다중접속(CDMA) 통신망은 네트워크의 특성상 무전기처럼 응답 대기시간이 거의 없이 즉시 통화하는 것이 실질적으로 불가능한 문제점이 있다.

발명이 이루고자 하는 기술적 과제

본 발명은 상술한 문제점을 해결하기 위하여 안출한 것으로서, 푸시 투 토크(PTT:Push-To-Talk) 방식을 이용하여 음성, 데이터, 메시지 등을 포함하는 그룹 통신 서비스를 제공함에 그 목적이 있다. 여기서, 중소규모의 그룹을 지정할 수 있을 뿐 아니라, 1대1 통신을 수행할 수 있음은 물론이다.

또한, 본 발명의 다른 목적은 기존에 존재하는 CDMA 망에 PTT 서비스를 접목하여 그룹 통신 서비스를 제공함에 있다.

또한, 본 발명의 또 다른 목적은 응답 대기시간을 감소시킬 수 있는 효율적인 그룹 통신망을 제공함에 있으며, 그 외의 다른 목적인 하기에 설명한 실시예에서 보다 구체화될 것이다.

발명의 구성

상술한 목적들을 달성하기 위한 본 발명의 일측면에 따르면, 푸시 투 토크(PTT:Push-To-Talk) 방식을 이용하여 음성, 데이터, 메시지 등을 포함하는 그룹 통신 서비스를 제공하기 위한 방법 및 장치가 제공될 수 있다.

바람직한 실시예에 의할 때, 상기 그룹 통신 서비스 제공 장치는 패킷 데이터 서빙 노드를 통하여 결합한 단말기와 호 설정을 수행하고, 상기 단말기와 바이너리 프로토콜에 따른 연동을 수행하기 위한 SIP 서버부; 상기 SIP 서버부에 연결되며, 상기 단말기에 대응하는 그룹 리스트 정보를 관리하기 위한 그룹 리스트 관리부; 상기 단말기가 상기 그룹 리스트 관리부에 로그인한 후, 로그아웃하는 기간 동안, 상기 단말기에 대응하는 가입자 상태 정보를 유지하기 위한 상태 관리 서버부; 상기 SIP 서버부에 의하여 설정된 호를 이용하여 PTT 서비스 및 PTD 서비스를 포함하는 그룹 통신 서비스에 대한 호 제어 및 세션 제어를 수행하는 PTT 서버부; 및 상기 패킷 데이터 서빙 노드에 연결되며, 상기 단말기에게 PTT 서비스 및 PTD 서비스에 대응하는 베어러 트래픽을 전송하기 위한 미디어 분배 서버부를 포함할 수 있다.

바람직한 실시예에 의할 때, 상기 그룹 통신 서비스 제공 방법은 SIP 서버부에서 패킷 데이터 서빙 노드를 통하여 결합한 단말기와 호 설정을 수행하고, 상기 단말기와 바이너리 프로토콜에 따른 연동을 수행하는 단계; 상기 SIP 서버부에 연결되며, 상기 단말기에 대응하는 그룹 리스트 정보를 관리하기 위한 그룹 리스트 관리부에서, 상기 단말기에 대응하는 그룹 리스트 정보를 추출하여 상기 단말기로 제공하는 단계; 상기 그룹 리스트 관리부에 연결되며, 상기 단말기가 상기 그룹 리스트 관리부에 로그인한 후, 로그아웃하는 기간 동안, 상기 단말기에 대응하는 가입자 상태 정보를 유지하기 위한 상태 관리 서버부에서, 상기 그룹 리스트에 대응하는 멤버의 상태 정보를 추출하여 상기 단말기로 제공하는 단계; 및 상기 SIP 서버부에 연결되는 PTT 서버부에서, 상기 SIP 서버부에 의하여 설정된 호를 이용하여 PTT 서비스 및 PTD 서비스를 포함하는 그룹 통신 서비스에 대한 호 제어 및 세션 제어를 수행하고, 상기 패킷 데이터 서빙 노드에 연결되는 미디어 분배 서버부에서, 상기 단말기에게 PTT 서비스 및 PTD 서비스에 대응하는 베어러 트래픽을 전송하는 단계를 포함할 수 있다.

여기서, 상기 그룹 통신 서비스를 제공하기 위한 그룹은 상기 단말기에 대응하며 디폴트로 미리 지정된 디폴트 그룹; 상기 단말기에 의하여 미리 지정되며 고정 멤버를 가지고 있는 선지정 그룹; 상기 단말기 의하여 미리 지정되나 고정 멤버를 가지고 있지 아니한 채팅 그룹; 및 상기 단말기에 의하여 실시간으로 지정된 멤버와 그룹 통신을 하기 위한 애드호크 그룹을 포함하며, 상기 그룹 리스트 관리부에서 관리하는 그룹은 상기 디폴트 그룹, 상기 선지정 그룹 및 상기 채팅 그룹일 수 있다.

그리고 상기 SIP 서버부는 가입자 최초 로그인시, 다이제스트 인증(Digest Authentication)을 수행하고, SIP 메시지를 전송하기 위한 프락시부; 전송된 SIP 메시지에 대한 재전송 기능을 수행하기 위한 재전송부; 미리 설정된 표준에 상응하여 압축을 수행하기 위한 압축부; 상기 바이너리 프로토콜에 따라 상기 단말기와 통신을 수행하고, 상기 SIP 메시지를 생성 및 해석하기 위한 프로토콜부를 포함할 수 있다.

또한, 상기 그룹 리스트 관리부는 상기 사용자 단말기로부터 1차 인증 정보를 포함하는 등록 요청 메시지를 수신하면, 상기 등록 요청 메시지에 포함된 상기 1차 인증 정보를 추출한 상기 SIP 서버부로부터 상기 1차 인증 정보를 수신하고, 상기 1차 인증 정보를 이용하여 1차 인증을 수행하기 위한 가입자 인증부; 단말기가 최초 등록한 경우, 상기 단말기의 가입자 정보를 저장 및 관리하며, 상기 가입자 정보를 상기 PTT 서버부로 제공하기 위한 가입자 정보 관리부; 가입자가 설정한 그룹 리스트 및 컨택 리스트에 대한 그룹명, 그룹 멤버, 그룹 멤버 ID 및 그룹 멤버의 상태 정보 중 적어도 하나를 포함하는 그룹 정보를 관리하기 위한 컨택 리스트 관리부; 및 그룹 통신을 요청받은 경우, 상기 요청을 허용하기 위한 리스트 및 상기 요청을 거부하기 위한 리스트를 관리하기 위한 액세스 리스트 관리부를 포함할 수 있다. 여기서, 상기 1차 인증을 수행한 상기 그룹 리스트 관리부로부터 상기 단말기의 발신번 및 IP주소를 포함하는 2차 인증 정보를 수신하면, 상기 2차 인증 정보를 이용하여 2차 인증을 수행한 후, 상기 인증 결과를 상기 그룹 리스트 관리부 및 상기 에스아이피 서버로 송신하기 위한 상기 위치관리 서버부가 더 포함될 수 있다.

그리고 상기 상태 관리 서버부는 상기 단말기가 로그인한 후, 로그아웃할 때까지 상기 단말기에 대응하는 가입자 정보를 유지하기 위한 가입자 정보 유지부, 상기 가입자에 대한 등록, 재 등록, 등록 취소 및 등록 해제에 따른 정보 변경을 수행하기 위한 가입자 정보 변경부, 가입자 등록 시, 해당 가입자의 정보를 저장하고, 가입자의 상기 컨택 리스트에 대한 멤버들의 상태 정보를 제공하기 위한 정보 제공부를 포함하는 가입자 상태 관리부; 및 가입자 착신 시, 상기 SIP 서버부로부터 착신 가입자에 대한 아이피 어드레스 및 상태 정보 요청에 대한 응답을 수행하기 위한 쿼리 응답부를 포함할 수 있다.

또한, 상기 PTT 서버부는 상기 디폴트 그룹, 상기 선지정 그룹 및 상기 채팅 그룹에 대한 통화 요청에 대하여 미리 설정된 방식에 따른 호 제어를 수행하며, 호를 요청한 발신자의 메시지를 통하여 해당 착신 멤버를 확인하고, 상기 그룹 리스트 관리부를 통하여 통화가 요청된 멤버에 대한 정보를 획득한 후, 해당 호에 대하여 상기 미디어 자원 할당을 미디어 분배 서버부로 요청하여 미디어 자원을 할당하여 착신 메시지를 전송한 후, 그 응답을 기다리기 위한 타이머를 구동시키고, 재전송을 위한 명령을 재전송부로 송신하여 호를 제어하기 위한 호 제어부; 상기 호 제어부가 제어하는 호에 대하여 세션 제어(Session Control) 및 세션 관련 이벤트를 처리하기 위한 세션 제어부; 상기 PTD 서비스를 제공하는 호처리 기능을 수행하기 위한 PTD 세션 설정부; 상기 PTT 서비스 및 PTD 서비스에 대한 과금 CDR 생성하기 위한 과금 CDR 생성부를 포함할 수 있다. 여기서, 상기 호 제어부는 통화가 요청된 멤버의 상태가 오프라인 상태인 경우, 상기 그룹 리스트 관리부로부터 수신한 문자 메시지 지정자를 이용하여 상기 멤버의 착신을 수행하기 위한 착신 전환부; 그룹 통화 도중, 특정 멤버만 호 종료를 할 수 있는 특정호 종료부; 상기 미디어 분배 서버부로부터 통화 세션에 참여한 모든 멤버가 일정 시간동안 트래픽 전송이 없음을 통보 받은 경우에는 해당 통화 세션을 종료하기 위한 세션 종료부; 통화 세션에 참여한 가입자가 특정 멤버를 통화에 추가로 초대할 수 경우, 해당 멤버를 세션에 추가하고 통화 세션에 참여시키기 위한 호 추가부; 최초에 통화를 요청한 멤버가 그룹 전체 호를 해제하기 위한 호 해제부를 포함할 수 있다.

그리고 상기 미디어 분배 서버부는 통화 세션의 생성 과정에서 상기 PTT 서버부로부터 자원 할당을 요청받는 경우, 상기 요청에 상응하여 자원을 할당하기 위한 미디어 세션 제어부; 상기 미디어를 분석, 복사 및 분배하며, PTT 베어러 트래픽 전송을 위해서는 RTP/UDP 프로토콜을 사용하고, PTD 베어러 트래픽 전송을 위해서는 MSRP/TCP 프로토콜을 사용하기 위한 미디어 분배부; 하나의 통화 세션에는 동일 시간에 하나의 발언권만이 허용되도록 제어하여, 가장 먼저 발언권을 요청한 사용자에게 통화 발언권을 부여하며, 상기 통화 발언권이 해제되기 전에 요청된 다른 발언권 요청은 무시하며, 통화 세션에 참여한 각 유저 및 발언권을 획득한 가입자의 상태 관리를 수행하기 위한 발언권 제어부를 포함할 수 있다. 여기서, 상기 미디어 세션 제어부는 발언권을 얻은 사용자로부터의 베어러 트래픽만을 수신하며, 발언권을 얻지 못한 사용자가 보내는 베어러 트래픽을 수신하는 경우, 이를 폐기하기 위한 트래픽 폐기부; 및 통화 세션에 참여한 멤버 중 특정 멤버의 통화 세션 탈퇴를 인식하고, 상기 탈퇴에 따른 실시간 미디어 세션 업그레이드를 수행하기 위한 업그레이드부를 포함할 수 있다.

그리고 상기 PTT 서버부가 복수개인 경우, 상기 복수개의 PTT 서버부에 대한 로드를 분산하기 위한 로드 분산부가 더 포함될 수 있다.

이하, 본 발명의 바람직한 실시예에 따른 그룹 통신 서비스 제공 방법 및 장치의 구성을 첨부 도면을 참조하여 상세하게 설명하기로 하며, 첨부 도면을 참조하여 설명함에 있어 도면 부호에 상관없이 동일하거나 대응하는 구성 요소는 동일한 참조 번호를 부여하고 이에 대한 중복되는 설명은 생략하기로 한다.

<u>그룹 통신망 및 스택 구조</u>

이하, 도 1a에서는 본 발명의 바람직한 실시예에 따른 기존 통신망과의 연결 관계를 설명하고, 도 1b 및 1c에서는 본 발명의 바람직한 실시예에 따른 프로토콜 스택 구조를 설명하기로 한다. 그리고 도 2에서는 그룹 통신망의 구성을 설명하기로 한다.

도 1a는 본 발명의 바람직한 실시예에 따른 기존 통신망과의 연결 관계를 도시한 도면이고, 도 1b 및 도 1c는 본 발명의 바람직한 실시예에 따른 프로토콜 스택 구조를 도시한 도면이다.

본 발명에 따른 그룹 통신 방법은 기존의 통신망을 이용하여 제공되므로, 별도의 인프라 구축없이 그룹 통신 서비스를 제공할 수 있는 장점이 있다. 도 1a를 참조하면, 본 발명에 따른 사용자 단말기(UE, User Element)는 도면에 도시되지 아니한 중계 기지국(BTS)에 접속한 후, 기지국 제어기(BSC, Base Station Controller)(120) 및 패킷 제어 기능부(PCF)(130) 및 패킷 데이터 서빙 노드(PDSN)(140)를 거치거나, 기지국제어기(BSC)(120), 이동국제어기(MSC)(150) 및 명연동부

(IWF)(150)를 거쳐서 본 발명에 따른 그룹 통신망(300)에 접속할 수 있다. 상기 사용자 단말기(100)는 발신 사용자 단말기(110) 및 착신 사용자 단말기(120)로 구분되며, 발신 사용자 단말기(110)는 발언권을 획득한 한 개의 단말기를 지칭하고, 착신 사용자 단말기(120)는 한 개 또는 그 이상의 그룹(120-1, 120-2, 120-3,...)으로 이루어진 단말기를 지칭한다.

도 1b 및 도 1c를 참조하면, 본 발명의 바람직한 실시예에 따른 프로토콜 스택 구조가 도시되어 있다. 본 발명에 따른 그룹 통신망에서 제공할 수 있는 서비스는 PTT(Push-To-Talk) 서비스, IM(Instant Messaging) 서비스, PTD(Push-To-Data) 서비스를 포함할 수 있다. 이하, 각 서비스별로 프로토콜 스택 구조를 설명하기로 하며, 설명의 편의를 위하여 기지국 제어기(BSC, Base Station Controller) 및 패킷 제어 기능부(PCF) 및 패킷 데이터 서빙 노드(PDSN)를 통하여 그룹 통신망에 접속한 경우를 기준으로 설명하기로 한다.

도 1b의 (a)는 PTT 서비스에 있어서, 유저 플레인 상의 스택 구조를 도시한 도면이다. 바람직한 실시예에 의할 때, 모바일 단말과 미디어 분배 서버부는 RTP/RTCP 프로토콜을 이용하여 PTT 서비스를 제공할 수 있다.

도 1b의 (b)는 PTD 서비스에 있어서, 유저 플레인 상의 스택 구조를 도시한 도면이다. 바람직한 실시예에 의할 때, 모바일 단말과 SIP 서버부 및 PTT 서버부는 MSRP(Message Session Relay Protocol) 프로토콜을 이용하여 PTD 서비스를 제공할 수 있다.

도 1c의 (a)는 IM 서비스에 있어서, 유저 플레인 상의 스택 구조를 도시한 도면이다. 바람직한 실시예에 의할 때, 모바일 단말과 SIP 서버부 및 PTT 서버부는 SIP(Session Initiation Protocol), SDP(Session Description Protocol) 프로토콜을 이용하여 IM 서비스를 제공할 수 있다.

도 1c의 (b)는 시그널링 플레인 상에서의 스택 구조를 도시한 도면이다. 바람직한 실시예에 의할 때, 모바일 단말과 SIP 서버부 및 PTT 서버부는 SIP(Session Initiation Protocol), SDP(Session Description Protocol) 프로토콜을 이용하여 시그널링 메시지를 송수신할 수 있다.

도 2는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 구성을 도시한 도면이다.

사용자 단말기(UE)는 기존의 이동 통신망을 통하여 본 발명에 따른 그룹 통신망에 연결되며, 상기 그룹 통신망은 그룹 리스트 관리부(400), 상태 관리 서버부(500), SIP 서버부(600), PTT 서버부(700), 로드 분산부(800), 미디어 분배 서버부(900) 및 노드 관리 서버(MOMP)(310)를 포함할 수 있다.

그룹 리스트 관리부(GLMS, Group List Management Sever)(400)는 가입자 정보 관리, 컨택(Contact) 리스트 관리, 그룹 리스트 관리 및 액세스(Access) 리스트 관리를 수행하는 서버이다. 상태 관리 서버부(PS, Presence server)(500)는 가입자의 상태 정보를 관리하는 서버로, 그룹 리스트 관리부(MGCS)에 가입자가 로그인해서 로그아웃 할 때까지 해당 가입자의 상태 정보를 유지하는 기능을 수행한다. SIP 서버부(SIPS)(600)는 SIP Proxy 기능을 담당하는 서버로, SIP Digest 인증 및 SIP ignaling Compression(sigcomp) 기능을 수행하며, PTT 호 설정을 위하여 단말과 Binary Protocol 연동을 수행할 수 있다. PTT 서버부(PTTS, Push-To-Talk Server)(700)는 PTT/PTD 에 대한 호 제어 및 세션 제어를 담당하며, MGCS 서비스에 대한 과금 CDR을 생성하고, DCSP 와 연동하여 지능망 가입자에 대한 실시간 차감 기능을 수행하는 서버이다.

로드 분산부(LD, Load Distributor)(800)는 복수의 PTT 서버부에 대한 로드 분산을 담당하는 시스템이다. 미디어 분배 서버부(MDS)(900)는 PTT 및 PTD 서비스에 대한 베어러 트래픽을 전송하는 시스템으로, PTT의 경우, RTCP 프로토콜을 통하여 발언권 제어를 수행할 수 있다. 그리고 노드 관리 서버(MOMP)(310)는 본 발명에 따른 그룹 통신 서비스를 위한 각 노드의 형상정보, 장애정보, 성능 및 통계정보 관리를 수행할 수 있다. 그 외 상기 서비스 망에는 다음과 같은 부가 서버부를 더 포함할 수 있으며, 하기 표1에 정리되어 있다.

[표 1]

명칭	기능
데이터 서비스 제어 서버부(DSCP : Data Service Control Point)	본 발명에 따른 지능망 서비스 중 Data 서비스에 대한 처리를 총괄하여 제어하는 서버이다.
파일 변환 서버부(FCS : File Conversion Server)	가입자 정보 서버부(JUICE)와의 연동으로 미디어 분배 서버부(MDS)로부터 전송된 파일을 수신자의 단말에 맞게 변환하는 서버이다.

망연동부(IWF)	KTF 2G 데이터 서비스를 제공하는 장치이며, 단말과의 PPP 접속, 교환기와 No7/ISUP 연동을 제공하는 시스템이다.
가입자 정보 서버부(JUICE)	KTF 내의 가입자에 대한 모든 정보를 가지고 있는 DB. 가입자의 단말기 모델명, IMSI, 지능망 가입 여부, 가입된 요금제, MGCS 서비스 가입 여부, 메시지매니저 가입 여부 등 WISE 전산상에 등록되는 가입자의 모든 정보를 포함하는 시스템이다.
그룹 관리부(MagicN 서버)	MGCS 가입자의 Buddy 등록/삭제 및 그룹 생성/삭제 기능을 담당하고, 해당 Buddy로의 승인 절차를 수행하는 시스템이다.
과금 서버부(MAS)	PTTS 로부터 전송된 과금 CDR을 수집하여 WISE로 전송하는 기능을 담당한다.
타망 연동 서버부(MGS)	PTT 서비스를 위한 타 망과의 연동 기능을 담당하는 서버로 시그날링 게이트웨이 기능과 미디어 게이트웨이 기능을 담당한다.
위치 관리 서버부(IPLS :Internet Protocol Location Server)	1x 및 1xEV-DO 가입자의 위치 및 상태를 관리하고 LMSC의 AT Activation 요구를 받으면 DNS, SCMM 과 연동하며 AT를 Activation 시키는 기능을 수행하는 시스템이다.
패킷 데이터 서빙 노드 (PDSN)	KTF HPDN내에서 PCF와의 R-P Interface, 단말과의 PPP Interface, Home Agent와의 Mobile IP Interface 를 담당하는 시스템이다.
단문 메시지 서비스 센터(SMSC)	가입자 및 시스템을 대상으로 단문 메시지를 제공하고 이에 대한 과금 기능을 수행하는 시스템이다.
가입자 관리 서버부(WISE)	가입자 관리와 서비스통제, 과금 등을 수행하는 시스템이며, 상기 가입자 관리 서버부는 과금부(BS: Billing System) 및 고객 관리부(CS : Customer Care System)을 포함할 수 있다.

그룹 종류 및 관리

본 발명은 각 모바일 단말기 화면에 상대방이 수신할 수 있는 상태에 대한 정보 등 유저 인터페이스(UI, User Interface)를 제공하여, 편리한 그룹 통신을 위한 편리한 유저 인터페이스를 제공할 수 있다.

하기의 표2와 같이 본 발명에 따른 그룹은 디폴트 그룹, 선지정 그룹, 채팅 그룹 및 애드호크 그룹을 포함할 수 있다.

[표 2]

디폴트(Default) 그룹	디폴트로 미리 설정된 그룹
선지정(Pre-define) 그룹	사용자가 임의로 지정한 그룹으로 해당 그룹 내에 고정 멤버를 가지고 있는 그룹
채팅(Chat) 그룹	사용자가 임의로 지정한 그룹이며, 해당 그룹 내에 멤버는 가지고 있지 않은 그룹
애드 호크(Ad-hoc) 그룹	실시간으로 선택하는 그룹

디폴트(Default) 그룹은 단말 UI에서 관리하는 그룹들 중 특별히 해당 그룹을 선택하지 않고 단지 PTT 전용키를 조작하여 그룹 통화가 가능해지는 그룹을 말한다. 본 발명에 의할 때, 법인 가입자의 경우, 그룹 관리자를 지정하고, 상기 관리자가 아닌 일반 사용자는 그룹원에 대한 추가/삭제가 불가하며, 그룹 관리자만 그룹원에 대한 추가 삭제가 가능하도록 구성된다. 바람직한 실시예에 의할 때, 법인 가입자가 디폴트 그룹에 등록되어 있는 경우, 선지정 그룹을 디폴트 그룹으로 설정할 수 없고, 만약 디폴트 그룹에 등록되어 있지 않은 경우에는 일반 가입자와 마찬가지 방법으로 디폴트 그룹을 설정할 수 있다. 일반 가입자의 경우, 자신이 관리하는 선지정 그룹 중 하나를 디폴트 그룹으로 설정하여 관리할 수 있다. 만약, 일반 가입자가 디폴트 그룹 설정 없는 경우에는 단말과 서버는 가장 최상위의 그룹을 디폴트 그룹으로 인식하며, 법인 가입자의 디폴트 그룹은 해당 그룹원들이 모두 같은 디폴트 그룹을 자신의 단말 유저 인터페이스에 디스플레이된다. 그룹 리스트 관리부(GLMS)는 해당 가입자에 대한 디폴트 그룹 설정 정보를 단말과 일치시키며, 일반 가입자는 디폴트 그룹 변경 즉시 그룹 리스트 관리부(GLMS)로 변경 내용을 통보하도록 구성된다.

선지정(Pre-define) 그룹은 사용자가 임의로 지정한 그룹으로 해당 그룹 내에 고정 멤버를 가지고 있는 그룹이다. 가입자는 자신의 UI상에 존재하는 해당 그룹을 생성하고 삭제할 수 있으며, 해당 그룹의 멤버를 추가하고 삭제할 수 있다. 가입자의 선지정 그룹 생성/삭제 또는 그룹 멤버 추가/삭제 시, 단말은 즉시 그룹 리스트 관리부(GLMS)로 변 경 요청을 수행하여야 한다.

채팅(Chat) 그룹은 사용자가 임의로 지정한 그룹이며, 해당 그룹 내에 멤버는 가지고 있지 않은 그룹을 말한다. 사용자는 그룹 리스트 관리부(GMLS)로 채팅 그룹 생성을 요청하고, 일정 시간동안 해당 그룹 유지를 요청하게 된다. 채팅 그룹을 통하여 통화를 하고자하는 멤버는 채팅 그룹의 생성자로부터 문자 메시지(SMS noti.)를 수신 하고, 해당 채팅 그룹으로 참여(Join)하여야 채팅 그룹 통화를 수행할 수 있다. 그룹 리스트 관리부(GLMS) 는 특정 시간동안 채팅 그룹을 유지하고 있다가 해당 시간이 만료하면, 해당 채팅 그룹을 삭제할 수 있다.

애드호크(Ad-hoc) 그룹은 가입자가 단말 유저 인터페이스의 특정 그룹 및 Contact List 상에서 2명 이상의 버디를 선택하여 그룹통화를 요청할 경우 생기는 그룹으로, 평상시 그룹 리스트 관리부(GLMS)에서는 관리하고 있지 않은 그룹을 말한다. 가입자의 애드호크 그룹 통화 요청 시, PTT 서버부(PTTS)는 임시의 그룹을 설정하고 통화 세션이 유지되는 동안 관리할 수 있다.

제공 서비스 및 동작 절차

본 발명에 따른 그룹 통신 서비스는 PTT(Push-To-Talk) 서비스, IM(Instant Messaging) 서비스, PTD(Push-To-Data) 서비스를 포함할 수 있다. 여기서, 본 발명에 따른 그룹을 대상으로 하는 그룹 통신 서비스의 경우 복수개의 착신 단말기에서 각자의 단말기를 이용하여 발신 단말기의 음성을 청취할 수 있으므로 기존의 음성 통화가 가지는 1대1 통신의 한계를 극복할 수 있다,

PTT(Push-To-Talk) 서비스는 단방향(Half-duplex) 기반의 음성 통화 기능이며, 발언권 제어를 통하여 복수의 사용자 간에 음성 통화 서비스를 제공할 수 있다. 개별(1:1)통화 및 그룹(Default, Pre-define, Chat, Ad-hoc 그룹)통화가 가능하며, Session Mode로 동작할 수 있다. 여기서, PTT 서비스에 대해서는 한 가입자 당 하나의 세션만 지원하도록 제한되며, 상기 PTT 서비스와 함께 PTD 및 IM 서비스가 동시에 제공된다.

그리고 IM(Instant Messaging) 서비스는 양방향(Full-duplex) 기반의 인스턴스 메시징 서비스로, Pager Mode로 동작한다. 여기서, IM 서비스에 대하여 동시에 Multi 서비스 제공이 가능하며, 상술한 바와 같이 PTT 및 PTD 서비스와도 동시에 제공될 수 있다.

PTD(Push-To-Data) 서비스는 양방향(Full-duplex) 기반의 파일 전송 서비스로, TCP 기반의 세션 모드로 동작하며, 이종의 단말에 대하여 파일 변환(File conversion) 기능을 제공할 수 있다. 상기 PTD 서비스에 대하여 동시에 Multi 서비스 제공이 가능하며, PTT 및 IM 서비스도 동시에 제공될 수 있다.

그리고 본 발명은 각 서비스에 대하여 상태 정보를 제공할 수 있다, 여기서 상기 상태 정보 서비스는 가입자 자신의 상태 정보뿐만 아니라, 해당 가입자가 관리하는 버디 및 그룹 멤버에 대한 상태 정보도 제공할 수 있다. 또한, 상기 상태 정보 서비스는 LBS(Location Based Service)와 연동하여 가입자의 위치 기반 서비스를 제공할 수 있다. 이하, 도 3a 내지 도 3e를 참 참조하여 본 발명에 따른 그룹 통신 서비스 제공 동작 절차를 설명하기로 한다.

도 3a는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 로그인 방법을 나타낸 순서도이다.

본 발명에 따른 그룹 통신 서비스는 다이얼이나 전화 연결음 등을 거치지 아니하며, 기존의 휴대폰 통화와 비교하여 빠른 응답 시간을 가진 신속한 통신을 제공할 수 있으며, PTT(Push-To-Talk) 서비스, IM(Instant Messaging) 서비스, PTD (Push-To-Data) 서비스를 포함할 수 있다. 이와 같은 서비스를 제공받기 위한 그룹 통신망 로그인. 즉 인증 방법은 2차의 인증을 통하여 이루어질 수 있다. 이하, 도 3을 참조하여 설명하면 다음과 같다.

단계 S305에서, 그룹 통신을 위한 클라이언트 프로그램을 구동하면, 자동적으로 사용자 단말기는 그룹 리스트 관리부(GLMS)에게 자신의 Contact List 정보를 요청하여 수신받는다. (HTTP Request / Response)

단계 S310에서, 사용자 단말기는 SIP 서버부(SIPS)로 등록 요청 메시지(SIP REGISTER)를 전송하면, 단계 S315에서, SIP 서버부(SIPS)는 사용자 단말기로부터 수신받은 아이디(예를 들면, 헥사 아이디)와 패스워드를 가지고 그룹 리스트 관리부(GLMS)로 1차 인증을 요청한다. (Auth_Request)

단계 S320에서, 그룹 리스트 관리부(GLMS)는 다시 사용자 단말기의 발신번(IMSI) 및 IP주소를 가지고 위치관리 서버부(IPLS)로 인증 요청하고, 위치관리 서버부(IPLS)는 발신번/IP주소에 대해 DB값과 일치여부를 판단하여 2차 인증을 수행하고, 응답한다. (MS_Info_Request/MS_Info_Response)

단계 S325에서, 1차, 2차 인증을 모두 통과할 경우 그룹 리스트 관리부(GLMS)는 SIP 서버부(SIPS)로 성공 응답하면, 단계 S330에서, SIP 서버부(SIPS)는 상태관리 서버부(PS)에게 사용자 단말기의 인증 결과를 통보한다. (PLSP AddTuple_Request / AddTuple_Response)

그룹 리스트 관리부(GLMS)로부터 인증 결과가 성공(SIP 200 OK)인 경우, 단계 S335에서, 사용자 단말기는 그룹 리스트 관리부(GLMS)에게 Contact List 그룹 각각에 대해 멤버 정보를 요청한 후, 수신받는다.

단계 S340에서, 사용자 단말기는 각 그룹 멤버의 상태 정보를 알아내기 위해 SIP 서버부(SIPS)를 경유하여 상태관리 서버부(PS)로 요청한다. (SUBSCRIBE)

단계 S350에서, 상태관리 서버부(PS)는 그룹에 대한 구성멤버를 SIP 서버부(SIPS)를 경유하여 사용자 단말기에게 통보한다. (NOTIFY)

여기서, 복수개의 그룹이 존재하는 경우, 각각의 그룹별로 상기 단계 S340(그룹 멤버 정보 파악) 및 단계 S350(그룹 멤버의 상태 정보 파악)의 절차를 반복하도록 구성된다.

도 3b는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 로그아웃 방법을 나타낸 순서도이다.

단계 S405에서, 사용자 단말기는 SIP 서버부(SIPS)로 Logout을 요청한다. (REGISTER) 단계 S410에서, SIP 서버부(SIPS)는 상태관리 서버부(PS)로 사용자 단말기에 대한 에스아이피 위치 서비스(SIP Location Service) 관리대상에서 삭제토록 요청하고 결과을 응답받는다. 단계 S415에서, SIP 서버부(SIPS)는 Logout 완료 응답을 사용자 단말기로 통보한다.

도 3c는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 자기 상태 갱신 방법을 나타낸 순서도이다.

단계 S505에서, 사용자 단말기는 갱신 정보 명령(PUBLISH)를 사용하여, SIP 서버부(SIPS) 경유하여 상태관리 서버부(PS)에게 자기 상태 갱신을 요청한다.

단계 S510에서, 상태관리 서버부(PS)는 사용자 단말기에게 성공적으로 갱신되었음을 알린다.

단계 S515에서, 사용자 단말기는 각 그룹의 구성멤버를 알아내기 위해 SIP 서버부(SIPS)를 경유하여 상태관리 서버부(PS)로 요청한다. (SUBSCRIBE)

단계 S520에서, 상태관리 서버부(PS)는 조회 요청받은 그룹에 대한 구성 멤버를 그룹 리스트 관리부(GLMS)에게 요청하여 수신받는다. (SUBSCRIBE / NOTIFY)

단계 S525에서, 상태관리 서버부(PS)는 그룹 구성멤버에 대한 상태정보를, SIP 서버부(SIPS)를 경유하여 사용자 단말기에게 통보한다. (NOTIFY)

여기서, 복수개의 그룹이 존재하는 경우, 각각의 그룹별로 상기 단계 S515(그룹 멤버 상태 정보 요청), 단계 S520(그룹 멤버 정보 요청) 및 단계 S350(그룹 멤버의 상태 정보 제공)의 절차를 반복하도록 구성된다.

본 발명은 자기 상태 갱신뿐만 아니라, 상술한 방식으로 그룹 상태 갱신을 수행할 수 있다. 여기서, 자기 상태 및그룹 상태 갱신에 따른 요청 메시지는 미리 설정된 식별자를 이용하여 수행할 수 있다.

도 3d는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 그룹 상태 조회 방법을 나타낸 순서도이다.

단계 S605에서, 사용자 단말기1은 조회하고자 하는 그룹에 대해 SIP 서버부(SIPS)를 경유하여 상태관리 서버부(PS)에게 요청한다. (SUBSCRIBE) 이때 사용자 단말기1은 조회 그룹에 대해 향후 T초동안 지속적인 상태를 통보받을 수 있도록 요청할 수 있다. 단계 S610에서, 상태관리 서버부(PS)는 조회 요청받은 그룹에 대한 구성 멤버를 그룹 리스트 관리부(GLMS)에게 요청하여 수신받는다. (SUBSCRIBE / NOTIFY) 단계 S615에서, 상태관리 서버부(PS)는 그룹 리스트 관리

부(GLMS)로부터 수신한 멤버상태 정보를 자신이 갖고 있지 않을 경우 다른 상태관리 서버부(PS2)로 요청한다. (Qeury Presence / Response) 단계 S620에서, 상태관리 서버부(PS)는 자체 관리중인 멤버와 요청하여 수신받은 멤버에 대한 상태정보를 사용자 단말기1에게 통보한다. (NOTIFY)

사용자 단말기1에서 해제 시각을 특정시간(T)으로 설정하였고 그룹 멤버에 사용자 단말기2가 포함되어 있을 경우 해당 시간동안 사용자 단말기2가 상태 갱신할 때마다 사용자 단말기1에게 자동적으로 즉시 통보된다. 단계 S625에서, 사용자 단말기2가 상태 갱신하는 경우, 단계 S630에서, 다른 상태 관리 서버부(PS2)는 상태 관리 서버부(PS1)로 상태 변경을 알리면, 단계 S635에서, 사용자 단말기1에게 자동적으로 즉시 통보된다.

마찬가지로 그룹 멤버에 사용자 단말기3이 포함되어 있을 경우 해당 시간동안 사용자 단말기3이 상태 갱신할 때마다 사용자 단말기1에게 자동적으로 즉시 통보된다.

사용자 단말기3이 상태 갱신하는 경우, 단계 S640에서, 상태 관리 서버부(PS1)는 이를 인시하고, 단계 S645에서, 사용자 단말기1에게 자동적으로 즉시 통보된다.

도 3e는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 컨택 리스트 멤버 추가 방법을 나타낸 순서도이다.

단계 S705에서, 사용자 단말기1은 자신의 Contact List에 사용자 단말기2를 신규 추가하기 위해 Web Server에게 요청한다. (HTTP: AddContact) 단계 S710에서, 멤버 추가를 요청받은 Web Server는 단문메시지 형태로 SMSC를 경유하여 사용자 단말기2에게 승인 요청한다. 단계 S715에서, 단문메시지를 수신한 사용자 단말기2는 승인여부에 대해 수동으로 응답한다. 단문메시지의 URL Callback 기능을 이용하여 확인 또는 취소로 선택 가능하다. (승인시 HTTP: Accept_Request, 거절시 HTTP: Reject_Request)

단계 S720에서, 사용자 단말기2가 승인 시 결과를 통보받은 Web Server는 그룹 리스트 관리부(GLMS)로 사용자 단말기2를 사용자 단말기1의 Contact List에 추가하도록 요청한다. 단계 S725에서, Web Server는 단문메시지 형태로 SMSC를 경유하여 사용자 단말기1에게 사용자 단말기2로의 승인요청이 확인되었음을 통보한다.

단계 S730에서, 사용자 단말기1이 자신의 Contact List 정보를 재요청하면, Web Server는 사용자 단말기2를 추가한 리스트를 사용자 단말기1에게 통보한다. 단계 S735에서, 사용자 단말기1은 Contact List 구성멤버의 상태정보를, SIP 서버부(SIPS)를 경유하여 상태관리 서버부(PS)로 요청한다. (SUBSCRIBE) 단계 S740에서, 상태관리 서버부(PS)는 조회 요청받은 Contact List 중, 그룹에 대한 구성 멤버를 그룹 리스트 관리부(GLMS)에게 요청하여 수신받는다. (SUBSCRIBE / NOTIFY)

단계 S745에서, 상태관리 서버부(PS)는 가장 최근에 갱신된 Contact List 구성멤버 상태를, SIP 서버부(SIPS)를 경유하여 사용자 단말기1에게 통보한다. (NOTIFY) 여기서, 단문 메시지를 통하여 통보하는 경우를 기준으로 설명하였으나, 그 외 데이터 서비스를 통하여 통보할 수 있음은 당연하다.

그룹 리스트 관리부

도 4는 본 발명의 바람직한 실시예에 따른 그룹 리스트 관리부의 구성을 도시한 도면이다.

도 4를 참조하면, 상기 그룹 리스트 관리부는 가입자 등록부(410), 가입자 인증부(420), 가입자 정보 관리부(430), 컨택 리스트 관리부(440) 및 액세스 리스트 관리부(450)를 포함할 수 있다.

가입자 등록부(410)는 가입자가 그룹 리스트 관리부(GLMS) 서비스를 제공받기 위하여 등록을 시도할 경우, 해당 가입자에 대한 Contact list, Group list 및 Access list 정보를 제공하여 가입자 등록(Registration)을 수행할 수 있다. 가입자 등록부(410)는 등록을 시도한 가입자에 대한 가입자 정보를 저장하며, 재등록 및 등록 해제를 요청한 가입자에 대하여 재등록 및 등록 해제를 수행할 수 있다. 상기 가입자 등록부(410)는 등록 과정에서 해당 가입자로부터 등록 취소 요청에 대한 등록 취소 기능을 제공할 수 있다.

가입자 인증부(420)는 가입자 등록 시, HTTP Digest 인증을 통하여 서비스 인증을 수행할 수 있다. 여기서, 상기 가입자 인증부(420)는 불법 가입자에 대한 인증을 위하여 IPLS와 연동하도록 구성되며, 가입자 등록 시, 해당 가입자에 대한 인증을 수행할 수 있다. 그리고 가입자 인증부(420)는 인증에 실패한 가입자 리스트를 관리하여야 하고, 인증에 실패한 가입자에 대해서 그룹 리스트 관리부(GLMS) 서비스를 제공하지 않도록 구성된다.

가입자 정보 관리부(430) 최초 단말기를 본 발명에 따른 고객 관리 서버부에 등록한 경우, 상기 등록된 가입자 정보를 수신하여 저장하고 관리하는 기능을 수행하며, 바람직한 실시예에 의할 때, 상기 가입자 정보는 가입자의 Host ID, Hexa ID, 대화명, Answer mode, DND(Do-not-disturb) 등의 가입자 속성 등을 포함할 수 있다. 상기 가입자 정보는 가입자의 요청에 따라 실시간으로 갱신할 수 있음은 당연하다. 본 발명에서 Offline 가입자에 대한 SMS 메시지 착신을 위한 문자 메시지 지시(문자 메시지(SMS noti.) Indicator) 필드를 관리하여야 하며, 발신자의 초대에 대한 PTT 서버부(PTTS)의 착신 가입자에 대한 정보 요청 시, 상기 정보를 제공할 수 있다.

컨택 리스트 관리부(440)는 가입자가 설정한 그룹 및 Contact 리스트를 관리하는 기능을 수행할 수 있다. 여기서, 상기 그룹 리스트는 디폴트, 선지정 및 채팅 그룹 등의 정보를 저장 및 관리하며, 각각의 그룹 정보에는 그룹명, 그룹 멤버, 그룹 멤버 ID 및 그룹 멤버의 상태 정보 등을 포함할 수 있다. 여기서, 채팅 그룹은 그룹명만 존재하며, 실제로 채팅 서비스를 요청하는 경우, 그룹명 이외의 그룹 정보를 저장 및 관리하도록 구성된다. 여기서, 상기 Contact 리스트는 개인 또는 특정 가입자가 설정한 그룹명이 저장될 수 있다. 개인의 경우, 대화명, 상태 정보 및 위치 정보 등을 저장하며, 그룹의 경우, 그룹명, 그룹생성자명 등을 저장할 수 있다. 가입자의 그룹 및 contact 리스트 변경(추가 및 삭제) 요청에 대하여 실시간으로 갱신되며, 가입자의 요청에 의한 개인별, 그룹별 또는 Contact list별 정보를 전송할 수 있다.

액세스 리스트 관리부(450)는 각 단말기에서 발신자의 서비스 요청을 허용할지 여부에 대한 Access 리스트를 설정할 수 있고, 그룹 리스트 관리부(GLMS)는 상기 액세스 리스트를 관리할 수 있다.본 발명에 따른 액세스 리스트는 "Reject list"와 "Aaccept list"로 구분되며, 가입자의 등록 시, 그룹 리스트 관리부(GLMS)는 가입자에게 상기 액세스 리스트 정보를 전송할 수 있고, 가입자의 Access List 변경 요청 시, 상기 액세스 리스트를 실시간으로 갱신할 수 있다.

연동부(460)는 가입자 등록, 인증, 그룹 리스트 관리, contact 리스트 관리 및 Access list 관리를 위하여 SIPS와 연동하기 위한 SIPS 연동부(461), PTT/PTD 호처리 및 IM 서비스 제공을 위하여 PTT 서버부(PTTS)와 연동하기 위한 PTTS 연동부(463), 가입자의 상배 정보 변경을 위한 상태 정보 관리 서버부(PS)(465)를 포함할 수 있다. 그리고 상기 연동부(460)는 최초 가입자 등록 시, 가입자의 정보를 가져오기 위하여 가입자 관리 서버부(WISE)와 연동하기 위한 WISE 연동부(467), WISE 연동부(467)는 가입자 인증을 위하여 IPLS와 연동하기 위한 IPLS 연동부(468), 가입자의 버디/그룹 정보 변경 및 버디 승인 절차를 위하여 메직엔 서버와 연동을 수행하기 위한 그룹 등록 서버부와 연동하기 위한 연동부(469)를 포함할 수 있다.

IPLS 연동부(468)에 있어서, MDN(Mobile Directory Number)/IMSI(International Mobile Subscriber Identity)는 단말의 SIP Register Message에 포함된 값 또는 SIP Register값에 포함된 HexaID를 Key로 하여 그룹 리스트 관리부(GLMS) DB에서 추출한 값일 수 있다. 여기서, HexaID를 Key로 하여 추출한 경우, 단말에서 보낸 IMSI(혹은 MDN)값이 아닌 그룹 리스트 관리부(GLMS) DB에 HexaID와 Binding된 IMSI/MDN 값을 입력값으로 사용할 수 있으며, 이러한 절차로 최초 가입시 등록된 단말의 ID로 로긴했을 때에만 IPLS 연동은 승인되도록 구성될 수 있다. 따라서 타인의 단말에 발신자의 ID/Password 로 Registration를 수행한 경우, IPLS 연동실패(Subscriber IP Address Mismatch)로 처리되도록 구성될 수 있다.

<u>상태 관리 서버부</u>

도 5는 본 발명의 바람직한 실시예에 따른 상태 관리 서버부의 구성을 도시한 도면.

도 5를 참조하면, 본 발명에 따른 상태 관리 서버부(500)는 가입자 상태 관리부(510), 쿼리 응답부(520) 및 연동부(530)를 포함할 수 있다.

가입자 상태 관리부(510)는 가입자가 프로그램을 실행(Login)시킨 후, 프로그램을 종료(Logout)할 때까지의 가입자 정보를 유지하기 위한 가입자 정보 유지부(511), 가입자 등록, 재 등록, 등록 취소 및 등록 해제 등에 따른 정보 변경을 수행하기 위한 가입자 정보 변경부(513), 가입자 등록 시, 해당 가입자의 정보를 저장하고, 가입자의 Contact list에 대한 멤버들의 상태 정보를 제공하기 위한 정보 제공부(515), 저장, 관리되는 가입자 정보 및 상태 정보 필드를 관리 및 변경하기 위한 필드 관리부(517)를 포함할 수 있다. 본 발명에 따른 가입자 상태 관리부(510)는 이동통신망의 특성을 감안해 기존 이동통신망에 부하를 주지 않으면서 단말과 서버 사이의 가입자 및 그룹에 대한 상태정보를 동기화 할 수 있다.

쿼리 응답부(520)는 가입자 착신 시, SIP 서버부(SIPS)로부터 착신 가입자에 대한 IP address 및 상태 조회에 대한 응답을 수행할 수 있다.

연동부(530)는 가입자 등록 및 상태 정보 관리를 위한 SIPS와 연동 기능을 수행하기 위한 SIPS 연동부(531), 가입자 그룹 및 Contact list 관리를 위하여 GMLS와의 연동을 수행하기 위한 GMLS 연동부(532), 가입자의 상태 정보 갱신을 위하여 주기적으로 IPLS와 연동하기 위한 IPLS 연동부(533)를 포함할 수 있다, 여기서, 상기 IPLS 연동부(533)에 의한 연동 결과가 'AT부재'인 경우 상태 정보를 'OffLine'으로 갱신할 수 있다. 또한, 연동부(530)는 가입자의 위치 정보 갱신을 위하여 LBS와 연동을 수행하기 위한 LBS 연동부(534)를 더 포함할 수 있다.

SIP 서버부

도 6은 본 발명의 바람직한 실시예에 따른 SIP 서버부의 구성을 도시한 도면이다.

본 발명에 따른 SIP 서버부(600)는 프락시부(605), 재전송부(610), 응답부(615), 업그레이드부(620), 압축부(625), 프로토콜부(630), SDB부(635) 및 연동부(640)를 더 포함할 수 있다.

프락시부(605)는 SIP Proxy 및 Routing 기능을 수행하며, 가입자 최초 Login 시, Digest Authentication 기능을 수행할 수 있다. 상기 프락시부(605)는 착신 가입자에 대한 SIP 메시지를 전송하기 위하여 PS로 착신 IP 주소 조회 기능을 수행하며, Looped request에 대한 탐지기능 및 Loose routing 기능을 제공할 수 있다. 재전송부(610)는 전송된 SIP 메시지에 대한 재전송 기능을 수행하며, 바람직한 실시예에 의할 때, 재전송 타이머에 의한 상기 메시지를 재전송할 수 있고, 응답부(615)는 상태 관리 서버부로의 착신 가입자 IP 주소 조회 시, Offline 가입자에 대한 착신 메시지 전송 불가에 대한 결과를 PTT 서버부(PTTS)로 전송할 수 있다.

업그레이드부(620)는 H/W 플랫폼 변경없이 3GPP / 3GPP2 및 그 외 표준에 상응하여 부가 서비스를 업그레이드하는 기능을 수행할 수 있다. 예를 들면, 상기 업그레이드부(620)는 화상전화 시스템 및 패킷망 기반 교환기 CSCF(Call StateControl Function) 기능을 수행할 수 있도록 망을 업그레이드하는 기능을 수행한다.

압축부(625)는 최적의 압축율 및 미리 설정된 표준에 상응하여 압축을 수행하는 기능을 수행할 수 있다. 바라직한 실시예에 의할 때, 상기 압축부(625)는 SigComp(Signaling Compression)을 지원할 수 있다. 즉, 상기 압축부(625)는 UE(User Element)와의 SIP 연동 시, 메시지 Compression 기능인 SigComp의 종단점으로 동작하며, UE(User Element)와 SIPS 간 SIP 메시지에 대한 SigComp 메시지로의 압축(compression) 및 해제(decompression) 기능을 제공할 수 있다.

프로토콜부(630)는 Binary Protocol 수용하여, UE 와의 SIP 연동 시 Binary Protocol로 동작할 수 있다, 여기서, 프로토콜부(630)는 Binary Protocol 메시지에 대한 수신/해석 및 생성/전송을 수행하며, SIP 메시지별로 선택하여 Binary Protocol 메시지 또는 SIP 메시지 연동이 가능하도록 구성된다.

SDB부(635)는 CDMA 무선 네트웍 상에서 Binary Protocol 메시지를 common 채널(PCH/ACH)로 전송하는 SDB 기능을 사용하기 위하여 "SDB Indicator"를 전송하는 기능을 수행할 수 있다. 본 발명의 바람직한 실시예에 의할 때, "SDB Indicator" 필드를 사용하는 경우, IP Header field의 로드 분산부(LD)의 TOS 필드의 상위 2비트 사용하거나, IP Header field의 Option 필드 사용하도록 구성될 수 있다.

연동부(640)는 PTT/PTD/IM 호처리를 위하여 PTT 서버부(PTTS)와 연동하기 위한 PTTS 연동부(641). 가입자 등록, 인증 및 그룹 관리를 위해 그룹 리스트 관리부(GLMS)와 연동하기 위한 GLMS 연동부(643), 가입자 등록, 인증, Presence 관리와 함께, SIP 메시지의 라우팅 시, Domain으로부터 IP주소를 얻기 위해 DNS와 연동하여야 하며, 착신 UE의 Location 조회를 위하여 Presence Server와 연동하기 위한 PS 연동부(645)를 포함할 수 있다.

PTT 서버부

도 7은 본 발명의 바람직한 실시예에 따른 PTT 서버부의 구성을 도시한 도면이다.

도 7을 참조하면, 본 발명에 따른 PTT 서버부는 호제어부(710), 세션 제어부(720), IM 서비스 제공부(730), PTD 세션 설정부(740), 과금 CDR 생성부(750), 선불 과금 처리부(760), SMS 통신부(770) 및 연동부(780)를 포함할 수 있다.

호 제어부(Call Control)(710)는 1:1, 1:n PTT 음성 통화에 대한 호 제어를 수행한다. 호 제어부(710)는 그룹 통화의 경우, 디폴트, 채팅, 선지정, 및 Ad-hoc 그룹에 대한 통화 요청에 대하여 미리 설정된 방식에 따른 호 제어를 수행할 수 있다. 또한, 호 제어부(710)는 호를 요청한 발신자의 메시지를 통하여 해당 착신 멤버(들)을 확인하고, 그룹 리스트 관리부

(GLMS)를 통하여 통화가 요청된 멤버(들)에 대한 정보를 획득할 수 있다. 그리고 호 제어부(710)는 해당 호에 대한 미디어 자원 할당을 미디어 분배 서버부(MDS)로 요청하여 미디어 자원을 할당할 수 있다. 상기 호 제어부(710)는 착신 메시지를 전송한 후, 그 응답을 기다리기 위한 타이머를 구동시키고, 재전송을 위한 명령을 재전송부로 송신할 수 있다.

이러한 호 제어부(710)는 통화가 요청된 멤버(들)의 상태가 "Offline" 상태인 경우에는 그룹 리스트 관리부(GLMS)로부터 문자 메시지 지정자(예를 들면, 문자 메시지(SMS noti.) Indicator)를 수신하여 문자 메시지를 이용하여 착신을 수행하기 위한 착신 전환부(711), 그룹 통화 도중, 특정 멤버만 호 종료를 할 수 있는 특정호 종료부(712), 미디어 분배 서버부(MDS)로부터 통화 세션에 참여한 모든 멤버가 일정 시간(타이머)동안 트래픽 전송이 없음을 통보 받은 경우에는 해당 통화 세션을 종료하기 위한 세션 종료부(713), 통화 세션에 참여한 가입자가 특정 멤버를 통화에 추가로 초대할 수 경우, 해당 멤버를 세션에 추가하고 통화 세션에 참여시키기 위한 호 추가부(714)를 포함할 수 있다.

또한, 상기 호 제어부(705)는 초기에 통화 요청을 거부한 멤버라 할지라도, 본인의 의사에 의해서 해당 통화 세션이 유지되고 있는 동안에는 언제든 다시 통화에 참여하기 위한 재 추가부(715), 통화 세션이 설정된 후, 통화 세션 생성자 및 참여자의 상태정보를 상태 관리 서버(PS)에 알려 상태 정보를 변경하기 위한 상태 정보 제공부(716), 통화 세션 참여한 모든 참여자들에게 통화 세션에 참여한 멤버들 정보를 통보하기 위한 멤버 정보 제공부(717), 최초에 통화를 요청한 멤버가 그룹 전체 호를 해제하기 위한 호 해제부(718)을 더 포함할 수 있다.

세션 제어부(720)는 세션 제어(Session Control) 및 세션 관련 이벤트를 처리하는 기능을 수행할 수 있다. 상기 세션 제어부(720)는 각 통화 세션에 참여하고 있는 가입자들의 세션정보를 관리할 수 있으며, 특정 가입자가 이미 생성된 통화 세션에 추가로 참여를 원할 경우, 통화 세션에 참여할 수 있는 권한이 있는지를 확인하고, 권한이 있는 경우 통화 세션에 참여시키는 기능을 수행할 수 있다. 상기 세션 제어부(720)는 통화 세션에 참여하지 않은 멤버를 추가로 통화 세션에 참여하도록 요청할 경우, 호 제어부(710)의 제어에 따라 상기 멤버를 통화 세션에 참여하는 기능을 수행하며, 통화 세션에 추가로 참여한 가입자의 상태정보는 추가 참여 시점에 그룹 리스트 관리부(GLMS)에 보고되어 상태정보가 변경되도록 구성된다. 그리고 세션 제어부(720)는 통화 세션에 참여 중인 참여자가 통화 세션에서 탈퇴를 원할 경우, 통화 세션은 유지된 채, 해당 가입자만이 탈퇴할 수 있도록 구성되며, 탈퇴된 해당 가입자의 상태정보는 탈퇴된 시점에 그룹 리스트 관리부(GLMS)에 보고되어 상태정보가 변경될 수 있다.

즉석 메시지(IM, Instant Messaging) 서비스 제공부(730)는 SIP 메시지를 이용한 Pager Mode 기반의 IM 서비스를 제공할 수 있으며, PTT 서비스와 동시에 이루어질 수 있다.

PTD(Push-To-Data) 세션 설정부(740)는 PTD 서비스를 제공하는 호처리 기능을 수행하며, PTT 통화를 위한 그룹 세션 경우, 그 해당 그룹 멤버로 PTD를 전송하는 방법과 PTT 통화 그룹과 다른 멤버로 PTD를 전송하는 방법으로 호처리를 수행할 수 있다. PTD 호설정과 마찬가지로, PTD 세션을 해제하는 방법도 PTT 통화 그룹 멤버에 대한 PTD 세션 해제와 PTT 통화 그룹과 다른 멤버에 대한 PTD 세션 해제 방법을 각각 구현될 수 있으며, PTT 서비스와 동시에 이루어질 수 있다.

과금 CDR 생성부(750)는 PTT, PTD, IM 서비스에 대한 과금 CDR 생성 기능을 수행하며, PTT, PTD, IM의 동시 서비스 시에도 개별 과금 CDR을 생성하여 과금 서버부(MAS)로 전송할 수 있다. PTT 의 경우, 발언권 단위의 CDR을 생성하고 그룹 유형별 과금 CDR을 과금 서버부(MAS)로 전송하며, PTT 그룹 통화의 경우, 통화 세션에서 한 멤버의 발언 도중 추가로 참여 또는 탈퇴한 가입자에 대해서는 발언이 끝나 과금 CDR 생성될 때, 고려하지 않도록 구성된다. 또한, 과금 CDR 생성부(750)는 IM 과 PTD의 경우, 건당 과금 CDR을 생성하고, 그룹 전송의 경우 착신자로부터 착신 완료(200 OK) 응답을 수신한 가입자에 대한 과금 CDR 생성하여 과금 서버부(MAS)로 전송할 수 있다.

선불 과금 처리부(760)는 발신자가 지능망 가입자의 경우, 데이터 서비스 제어 서버부(DSCP)와 연동하여 실시간 선불 차감 기능을 수행할 수 있다. PTT 의 경우, 발언권을 요청한 가입자가 지능망 가입자일 경우에 데이터 서비스 제어 서버부(DSCP)로 잔액 정보를 요청하고 발언권을 해제할 때, 사용한 금액을 데이터 서비스 제어 서버부(DSCP)로 전송하여 실시간으로 차감할 수 있다. 만약, 지능망 가입자가 발언권을 획득하여 발언을 하는 도중 잔액이 소진되어 데이터 서비스 제어 서버부(DSCP)로부터 서비스 중단 메시지를 수신할 경우, PTT 서버부(PTTS)는 그 즉시 미디어 분배 서버부(MDS)로 해당 가입자에 대한 발언권 해제를 요청하여 더 이상 발언권을 허여하지 아니하나, 해당 가입자에 대해서 PTT 착신 서비스는 계속 유지시키도록 구성된다.

문자 메시지 송신부(760)는 Offline 가입자에 대한 착신 서비스를 위하여 단문 메시지와 같은 문자 메시지를 통하여 그룹 통신 서비스로의 접속 메시지를 송신할 수 있다.

그리고 연동부(780)는 그룹 리스트 관리부(GLMS), SIPS, 로드 분산부(LD), 미디어 분배 서버부(MDS), 과금 서버부(MAS) 및 타망 연동 서버부(MGS)와 연동하며, 그룹 리스트 관리부(GLMS) 서비스 시, 개별 가입자 정보 또는 그룹 정보를 가져오기 위하여 그룹 리스트 관리부(GLMS)와 연동할 수 있다. 또한, 상기 연동부(780)는 PTT 및 PTD 호처리를 위하여 로드 분산부(LD)를 통한 SIPS와의 연동될 수 있다. 또한, 상기 연동부(780)는 PTT/PTD 미디어 세션 설정 및 과금 정보를 송수신하기 위하여 미디어 분배 서버부(MDS), 일반 가입자에 대한 과금 CDR을 가입자 관리 서버(WISE)로 전송하기 위하여 과금 서버부(MAS)와의 연동이 가능하고, 실시간 과금 처리를 위하여 데이터 서비스 제어 서버부(DSCP) 및 Offline 상태의 가입자에 대한 문자 메시지 착신을 위하여 메시지 서비스 센터와 와의 연동이 가능하다.

로드 분산부

도 8은 본 발명의 바람직한 실시예에 따른 로드 분산부의 구성을 도시한 도면.

도 8을 참조하여, 본 발명의 바람직한 실시예에 따른 로드 분산부(LD, Load Distributor)의 구성을 설명하면, 상기 로드 분산부(LD, Load Distributor)(800)는 PTD 서비스 제공을 위해 미디어 분배 서버부(MDS)로부터 요청되는 각 컨텐츠 별로 전달할 가입자의 UE 환경에 상응하여 복수개의 PTT 서버부에 로드를 할당하는 기능을 수행한다.

상기 로드 분산부(800)는 가입자의 UE 환경을 알기 위해 JUICE로 해당 가입자의 UE 환경을 검색하고 정보를 추출하기 위한 환경 정보 추출부(810) 및 상기 환경 정보 추출부에서 추출한 정보에 따라 PTT 서버부를 선택하기 위한 PTTS 선택부(820)를 포함할 수 있다.

그리고 상기 로드 분산부(800)는 연동부(830)를 더 포함하며, 상기 연동부(800)는 미디어 분배 서버부(MDS) 로부터 특정 패킷에 대한 변환 요구를 받아, 이를 UE 환경에 맞게 변환하여 미디어 분배 서버부(MDS)로 되돌려주는 미디어 분배 서버부(MDS) 연동부 및 환경 정보, 가입자의 단말 환경을 추출하기 위한 JUICE 연동부를 포함할 수 있다.

미디어 분배 서버부 및 발언권 제어

도 9는 본 발명의 바람직한 실시예에 따른 미디어 분배 서버부의 구성을 도시한 도면이다. 이하, 미디어 분배 서버부와 발언권 제어 구조를 설명하기기로 한다.

도 9를 참조하면, 본 발명의 바람직한 실시예에 따른 미디어 분배 서버부(MDS, Media Distribution Server)(900)는 미디어 세션 제어부(910), 미디어 분배부(920), 발언권 제어부(930), 과금 정보 송신부(940), 이중화부(950), 연동부(960)를 포함할 수 있다.

미디어 세션 제어부(910)는 통화 세션의 생성 과정에서 PTT 서버부(PTTS)로부터 미디어 분배 서버부(MDS)에 자원 할당을 요청받는 경우, 상기 요청에 상응하여 자원을 할당하는 기능을 수행한다. 여기서, 초기 통화 세션에 할당된 미디어 분배 서버부(MDS)의 자원은 필요에 따라 확장 및 축소될 수 있다. 또한, 미디어 세션 제어부(910)는 발언권을 얻은 사용자로부터의 베어러 트래픽만을 수신하며, 만약 발언권을 얻지 못한 사용자가 보내는 베어러 트래픽을 수신하는 경우, 이를 폐기하기 위한 트래픽 폐기부(911) 및 통화 세션에 참여한 멤버 중 특정 멤버의 통화 세션 탈퇴를 인식하고, 상기 탈퇴에 따른 실시간 미디어 세션 업그레이드를 수행하기 위한 업그레이드부(913)을 포함할 수 있다.

미디어 분배부(920)는 미디어를 분석, 복사 및 분배하는 기능을 수행할 수 있다. 상기 미디어 분배부(920)는 미디어 분배 서버부(MDS)에 들어온 베어러 트래픽을 그 속성에 따라 미리 설정된 방식으로 구분 및 분석할 수 있다. 본 발명의 실시예에 의할 때, 상기 미디어 분배부(920)는 PTT 베어러 트래픽 전송을 위해서는 RTP/UDP 프로토콜을 사용하고, PTD 베어러 트래픽 전송을 위해서는 MSRP/TCP 프로토콜을 사용하며, 발언권 제어 및 QoS Feedback을 위해서는 RTCP 프로토콜을 사용한다. 여기서, 미디어 분배 서버부(MDS) 에 들어온 RTP 패킷은 발언권을 얻은 사용자를 제외한 통화 세션에 참여한 사용자만큼 복사된 후, 각 사용자의 목적지 IP를 기준으로 분배될 수 있다.

미디어 분배 서버부(MDS)에 들어온 TCP 패킷은 필요에 따라 파일 변환 서버부(FCS)와 연동하여 가입자 단말 환경에 적합하게 변환되어 분배되며, 미디어 채널을 통하여 음성 패킷과 파일 패킷의 전송이 동시에 이루어질 경우, 음성 품질에 영향을 주지 않도록 파일 패킷이 제공될 수 있다. 여기서, 미디어 분배 서버부(MDS) 는 특정 타이머를 이용하여, 미리 설정된 미디어 세션 내에서 특정 시간동안 미디어 트래픽이 전송되지 않을 경우, 해당 미디어 채널을 해제하도록 구성된다.

발언권 제어부(930)는 하나의 통화 세션에는 동일 시간에 하나의 발언권만이 허용되도록 제어할 수 있다. 발언권 제어부(930)는 가장 먼저 발언권을 요청한 사용자에게 통화 발언권을 부여하며, 상기 통화 발언권이 해제되기 전에 요청된 다른 발언권 요청은 무시하도록 구성된다. 또한, 상기 발언권 제어부는 현재, 발언권을 가진 사용자가 발언권 해제 메시지를 보낸 경우, 해당 통화 세션에서의 발언권을 해제한 후, 상기 해제 정보를 PTT 서버부로 송신하도록 구성된다. 여기서, 상기 미디어 분배 서버부(MDS)는 타이머를 이용하여 특정 멤버가 발언권을 획득한 후 일정 시간 이상을 사용하는 것을 제어하며, 발언권을 획득한 멤버가 발언권을 획득한 후, 일정 시간이상 무음인 상태를 유지할 경우 발언권 해제 등의 조치를 취하도록 구성된다. 또한, 발언권 제어부(930)는 PTT 세션에 참여한 각 유저 및 발언권을 획득한 유저의 상태 관리를 수행할 수 있다.

과금 정보 송신부(940)는 PTT Session에 참여한 각 발언권자의 발언권 단위로 과금정보를 생성하는 기능을 수행한다. 여기서, 상기 발언권 단위의 과금정보는 해당 발언권자의 발언권이 해제되면, PTT 서버부(PTTS)로 통보되도록 구성된다. 그리고 과금 정보 송신부(940)는 PTT 세션의 종료 시, 세션 과금정보를 생성하며, 세션 단위 과금정보는 해당 세션이 종료되면, PTT 서버부(PTTS)로 통보할 수 있다. 본 발명의 실시예에 의할 때, PTD 세션의 경우, 발언권자의 전송 건(그룹일 경우 그룹전송을 1건으로 봄) 단위로 과금정보를 생성하도록 구성될 수 있다. 그리고 PTD 서비스 건 단위 과금정보는 해당 PTD 세션이 종료되는 즉시 PTT 서버부(PTTS)로 통보되며, 지능망 가입자의 잔액 소진 등에 대하여 PTT 서버부(PTTS)와 연동하여 해당 발언권자에 대해 발언권 부여를 허락하지 아니하도록 구성된다.

이중화부(950)는 미디어 분배 서버부(MDS)가 복수 존재할 경우, 미디어 세션을 관리하는 기능을 수행할 수 있으며, 다수의 미디어 분배 서버부(MDS)에 대하여, 각각의 미디어 분배 서버부(MDS)가 동일한 부하를 분담할 수 있도록 Load sharing 기능을 제공할 수 있다. 여기서, 상기 이중화부를 다중화부로 구성할 수 있음은 당연하다.

연동부(960)는 PTT/PTD 호처리를 위하여 PTT 서버부(PTTS)와 연동하기 위한 PTTS 연동부(961) 및 PTD 서비스에 대해, 단말별 파일 변환을 위해 파일 변환 서버부(FCS)와 연동하기 위한 FCS 연동부(963)를 포함할 수 있다. 여기서, 상기 PTTS 연동부(961)는 PTT 서비스를 수행하는 경우, 사용자와 RTP/RTCP 연동하며, PTD 서비스를 수행하는 경우에는 TCP 연동을 하도록 구성된다.

본 발명의 실시예에 따른 발언권 제어 메시지 전송용 포맷은 RTCP APP 패킷을 사용할 수 있다. 하기의 표 3을 참조하면, 본 발명의 바람직한 실시예에 따른 발언권 제어 프로토콜 스택 및 발언권 제어 메시지가 정리되어 있다.

[표 3]

Layer	Protocol
Application	Floor control application(RTCP APP 형식)
Transport	UDP
Network	IP
Data	Link Network Access Protocol (IEEE802.3, Ethernet)
Physical Layer	10/100Base-T

[표 4]

메시지 종류	Subtype	Application-dependent data	비고 (MDS 기준)
Floor Request	0	없음	착신
Floor Grant	1	없음	발신
Floor Taken	2	CNAME / NAME	발신
Floor Deny	3	Reason code / Length / Reason Phrase	발신
Floor Release	4	Sequence number of last packet / Padding	착신
Floor Idle	5	없음	발신
Floor Revoke	6	Reason code / additional information	발신

여기서, 발언권 요청 메시지(Floor Request)는 단말에서 MDS에게 발언 허가를 요청하는 메시지이다. 발언권 허가 메시지(Floor Grant)는 MDS가 단말에게 발언권을 부여하는 메시지이다. 그리고 발언권 점유 메시지(Floor Taken)는 MDS가 단말에게 발언권이 이미 점유되어 있음을 알리는 메시지이다. 그리고 발언권 거절 메시지(Floor Deny)는 발언권을 요청한 UE에게 MDS가 발언권 요청이 거부되었음을 알리는 메시지이며, 하기 표 5와 같은 형식으로 구성될 수 있다.

[표 5]

ADD	Length (octets)	Description
Reason Code	1	발언권 거부 원인
Length	1	Reason Phrase의 길이
Reason Phrase	6	추가정보를 갖는 문자열 (없을 경우 0으로 채움)

여기서, 상기 코드값이 1인 경우는 이미 발언권이 점유된 경우를 나타내고, 코드값이 2인 경우, 서버부 내부 원인(Internal PTTS server error)을 나타내도록 지정할 수 있다.

발언권 해제 메시지(Floor Release)는 단말에서, MDS에게 단말의 발언권을 해제하였음을 알리는 메시지이고, 발언권 유휴 메시지(Floor Idle)는 MDS가 단말에게 현재 발언권이 점유되어 있지 않음을 알리는 메시지이다. 그리고 발언권 취소 메시지(Floor Revoke)는 MDS가 단말에게 기 부여한 발언 허가를 취소하는 메시지이며, 하기 표 6과 같은 형식으로 구성될 수 있다.

[표 6]

ADD	Length (octets)	Description
Reason Code	2	발언권 무효 원인
Additional information	2	추가 정보 (Code값에 따라 다름)

여기서, 상기 코드값이 1연 경우는 세션에 해당 발언권자 1인만 존재하는 경우를 나타내며, 2인 경우는 한 명에 대한 발언 시간이 초과하는 경우를 지칭하도록 구성할 수 있다. 여기서, 상기 코드(Reason Code)인 2인 경우, Additional information내에 retry-after 타이머 값을 포함하며 이 타이머가 만료되기 전에는 어떤 패킷도 전송 불가함을 지칭한다.

하기 표7를 본 발명의 바람직한 실시예에 따른 발언권제어 프로토콜 타이머를 정리한 표이다. 각 조건에 따라 타이머가 시작되는 시점과 종료되는 시점을 정의하며, 상기 타이머가 종료하는 경우, 미리 설정된 동작이 수행되도록 구성되며, 발언권 제어 프로토콜 타이머에 따라 발언 시간을 제어할 수 있다.

[표 7]

타이머명	Start 시점	Stop(reset) 시점	Expire 시 행동	비고
End of RTP media timer (T3)	RTP media의 종료시	RTP media의 계속시 또는 본 타이머가 Expire 시	RTP 스트림이 종료되었다고 판단하며, Floor상태를 Idle	3~5초 사이 최대 6초
Stop talking timer (T8)	Talk burst의 시작 판단시	Talk burst의 종료 판단시	해당사용자에 대해 충분한 발언시간 부여로 판단하며, 사용자에게 Floor Revoke 메시지 전송	사용자군별 차등 설정
Floor revoked grace timer (T4)	Stop talking timer의 Expire시		Floor 상태를 Idle로 하고, Floor Idle 패킷을 브로드캐스트 함	2~3초 사이
Inactivity timer (T7)	Talk burst의 종료 판단시	Floor Request 메시지 또는 RTP media의 수신시	Talk session을 종료함	사용자군별 차등 설정
Sender report timer (T9)	Floor Release 메시지 수신시 또는 'end of RTP media timer' expire시	Sender report timer를 시작한 UE로부터 SR report 수신시	SR report가 유실되었다고 판단	
Receiver report timer (T10)	MDS가 RTCP SR을 전송시	Receiver report timer를 시작한 UE로부터 RR report 수신시	SR report가 유실되었다고 판단	
Floor idle timer (T2)	첫번째 Floor Idle 메시지 전송시	Floor Request 메시지 수신시 또는 Talk burst의 시작 판단시 또는 Inactivity timer가 expire시	Floor Idle 메시지를 재전송 (전송 주기는 exponential back off 알고리즘(예: 피보나치 수열) 사용))	재전송 횟수는 1~100 사이 (디폴트: 9회)
Floor revoke timer (T5)	Stop talking timer의 expire시 (Floor Revoke 메시지 전송시)	Expire 시	Floor Revoke 메시지를 재전송	재전송 횟수는 1~10 사이 (디폴트: 3회)
Retry after timer (T6)	Stop talking timer의 expire시 (Floor Revoke 메시지 전송시)		Floor Request 메시지를 전송한 사용자에 대해 발언권 부여	5~30초 사이 본 타이머값을 Floor Revoke 메시지에 포함

<u>과금 서버부 및 그 외 부가 서버부의 구성</u>

도 10은 본 발명의 바람직한 실시예에 따른 과금 정보 제공부의 구성을 도시한 도면이다.

도 10을 참조하면, 본 발명에 따른 과금 정보 제공부(MAS, MGCS Accounting Server)(1000)는 과금 정보 수집부(1010), 과금 정보 전송부(1020), 연동부(130)를 포함할 수 있다.

과금 정보 수집부(1010)는 과금 CDR 수집 기능을 수행한다. 바람직한 실시예에 의할 때, PTT 서비스에 대하여 MAS는 매 발언권 종료시점마다 PTT 서버부(PTTS)로부터 과금 CDR을 수집하도록 구성되며, PTD 서비스에 대하여 MAS는 매 파일 전송 종료시점마다 PTT 서버부(PTTS)로부터 과금 CDR을 수집한다. 또한, IM 서비스에 대하여 MAS는 매 IM 메시지 전송 완료시점마다 PTT 서버부(PTTS)로부터 과금 CDR을 수집하며, 상기 집된 서비스별 과금 CDR은 디스크로 저장/관리되도록 구성된다.

과금 정보 전송부(1020)는 과금 CDR 파일을 전송하는 기능을 수행할 수 있다. MAS는 수집된 과금 CDR을 일정한 조건(수집CDR 개수, 파일사이즈)에 따라서 파일로 만들어 가입자 관리 서버부(WISE)로 전송할 수 있고, 미리 설정된 주기로 과금 CDR 파일에 대한 파일리스트파일을 약속한 시각에 WISE 로 전송하여야 한다.

연동부(1030)는 PTT/PTD/IM 서비스의 호처리 중간 또는 종료 시점에서 PTT 서버부(PTTS)와 연동하여 과금 CDR을 수집하기 위한 PTTS 연동부(1030) 및 과금 CDR 파일 및 과금 CDR 파일리스트 파일 전송을 위해 가입자 관리 서버부(WISE)와 연동하기 위한 WISE 연동부(1033)를 포함할 수 있다.

또한, 도면에 도시되지 아니한 미디어 게이트웨이 서버부(MGS, Media Gateway Server)시그널 변환부 및 미디어 변환부를 포함할 수 있다. 시그널 변환부 PTT 서버부(PTTS) 로부터 전달된 호 설정 요청 메시지 혹은 타망으로부터의 호 설정 요청 메시지에 대한 Signaling 변환 기능을 수행할 수 있다. 그리고 미디어 변환부는 타 망과의 연동 시, 타 망의 가입자로부터 전송되는 음성 트래픽 또는 타 망 가입자로 전송하는 음성 트래픽에 대한 변환을 수행할 수 있다.

그리고 본 발명의 바람직한 실시예에 따른 파일 변환 서버부파일 변환부 및 연동부를 포함할 수 있다. 파일 변환부는 파일 변환 기능을 제공하며, PTD 서비스 제공을 위해 미디어 분배 서버부(MDS)로부터 요청되는 각 컨텐츠 별로 전달할 가입자의 UE 환경에 대응하여 변환할 수 있다. 상기 파일 변환 서버부(FCS) 는 가입자의 UE 환경을 알기 위해 JUICE로 해당 가입자의 UE 환경을 검색하고 정보를 추출할 수 있으며, 가입자 정보 서버부(JUICE)와 연동 결과 파일 변환이 필요할 경우, 컨텐츠별로 운용자에 의해 지정된 File Converter 를 지정된 방식(사전/사후)에 따라 연동하여, 파일을 변환 및 저장할 수 있다. 상기 파일 변환 서버부(FCS)는 경우에 따라, 가입자 정보 서버부(JUICE)의 도움없이 자체적으로 File Converter를 선택하여 해당 가입자의 UE 환경에 맞게 파일 변환을 수행한다. 여기서, 상기 사용자 단말기의 성능 및 기종의 판단이 불가능한 경우에 대비하여, 파일 변환 서버부(FCS)는 UE의 기종과 해당 UE가 처리할 수 있는 데이터 형식을 관리하며, 서비스의 필요에 따라 파일 변환 서버부(FCS)는 직접적으로 데이터 내용에 관여치 않고, 다른 Media 변환 서버로 Bypassing해주는 기능을 수행할 수 있다.

상술(上述)한 도면과 발명의 상세한 설명은 단지 본 발명의 예시적인 것으로서, 이는 단지 본 발명을 설명하기 위한 목적에서 사용된 것이지 의미한정이나 특허청구범위에 기재된 본 발명의 범위를 제한하기 위하여 사용된 것은 아니다. 그러므로 본 기술분야의 통상의 지식을 가진 자라면 이로부터 다양한 변형 및 균등한 타 실시예가 가능하다는 점을 이해할 것이다. 따라서 본 발명의 진정한 기술적 보호 범위는 첨부된 특허청구범위의 기술적 사상에 의해 정해져야 할 것이다.

발명의 효과

이상에서 설명한 바와 같이, 본 발명은 푸시 투 토크(PTT:Push-To--lk) 방식을 이용하여 음성, 데이터, 메시지 등을 포함하는 그룹 통신 서비스를 제공할 수 있는 효과가 있다.

또한, 본 발명은 기존에 존재하는 CDMA 망에 PTT 서비스를 접목하여 그룹 통신 서비스를 제공할 수 있는 효과도 있다.

또한, 본 발명은 응답 대기시간을 감소시킬 수 있는 효율적인 그룹 통신망을 제공할 수 있는 효과도 있다.

상기에서는 본 발명의 바람직한 실시예를 참조하여 설명하였지만, 해당 기술분야에서 통상의 지식을 가진 자라면 하기의 특허 청구 범위에 기재된 본 발명의 사상 및 영역으로부터 벗어나지 않는 범위 내에서 본 발명을 다양하게 수정 및 변경시킬 수 있음을 이해할 수 있을 것이다.

도면의 간단한 설명

도 1a는 본 발명의 바람직한 실시예에 따른 기존 통신망과의 연결 관계를 도시한 도면.

도 1b 및 도 1c는 본 발명의 바람직한 실시예에 따른 프로토콜 스택을 도시한 도면.

도 2는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 구성을 도시한 도면.

도 3a는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 로그인 방법을 나타낸 순서도.

도 3b는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 로그아웃 방법을 나타낸 순서도.

도 3c는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 자기 상태 갱신 방법을 나타낸 순서도.

도 3d는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 그룹 상태 조회 방법을 나타낸 순서도.

도 3e는 본 발명의 바람직한 실시예에 따른 그룹 통신망의 컨택 리스트 멤버 추가 방법을 나타낸 순서도.

도 4는 본 발명의 바람직한 실시예에 따른 그룹 리스트 관리부의 구성을 도시한 도면.

도 5는 본 발명의 바람직한 실시예에 따른 상태 관리 서버부의 구성을 도시한 도면.

도 6은 본 발명의 바람직한 실시예에 따른 SIP 서버부의 구성을 도시한 도면.

도 7은 본 발명의 바람직한 실시예에 따른 PTT 서버부의 구성을 도시한 도면.

도 8은 본 발명의 바람직한 실시예에 따른 로드 분산부의 구성을 도시한 도면.

도 9는 본 발명의 바람직한 실시예에 따른 미디어 분배 서버부의 구성을 도시한 도면.

도 10은 본 발명의 바람직한 실시예에 따른 과금 정보 제공부의 구성을 도시한 도면.

<도면의 주요부분에 대한 부호의 설명>

100 : 사용자 단말기

310 : 노드 관리 서버(MOMP)

400 : 그룹 리스트 관리부

500 : 상태 관리 서버부

600 : SIP 서버부

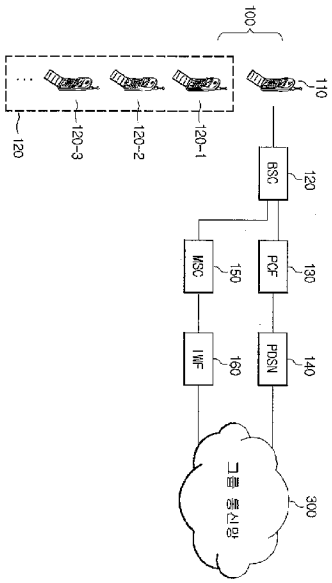
700 : PTT 서버부

800 : 로드 분산부

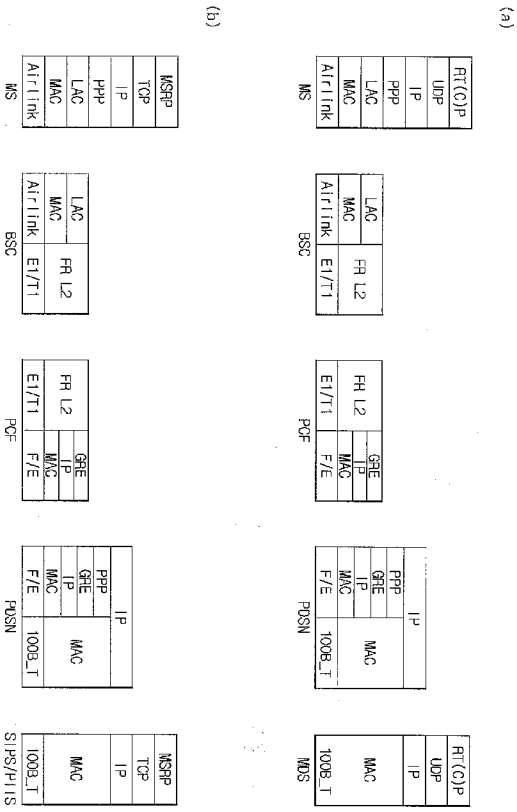
900 : 미디어 분배 서버부

도면

도면1a

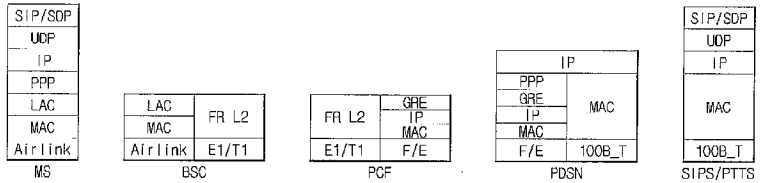

100
110
120-1
120-2
120-3
120
BSC
120
PCF
130
MSC
150
PDSN
140
IWF
160
그룹 통신망
300

도면1b

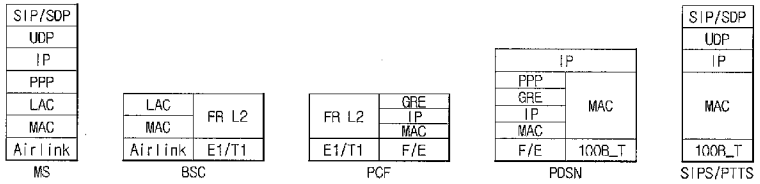

(a)
RT(C)P
UDP
IP
PPP
LAC
MAC
Airlink
MS
LAC
MAC
Airlink
FR L2
E1/T1
BSC
FR L2
E1/T1
GRE
IP
MAC
F/E
PCF
PPP
GRE
IP
MAC
F/E
IP
MAC
100B_T
PDSN
RT(C)P
UDP
IP
MAC
100B_T
MDS
(b)
MSRP
TCP
IP
PPP
LAC
MAC
Airlink
MS
LAC
MAC
Airlink
FR L2
E1/T1
BSC
FR L2
E1/T1
GRE
IP
MAC
F/E
PCF
PPP
GRE
IP
MAC
F/E
IP
MAC
100B_T
PDSN
MSRP
TCP
IP
MAC
100B_T
SIPS/PITS

도면1c

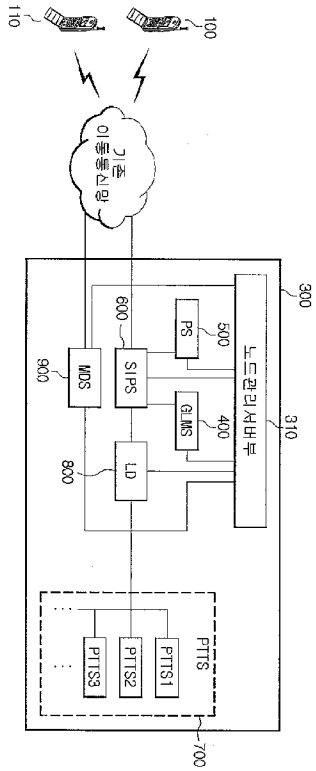
(a)


SIP/SDP
UDP
IP
PPP
LAC
MAC
Airlink
MS
LAC
MAC
Airlink
FR L2
E1/T1
BSC
FR L2
E1/T1
GRE
IP
MAC
F/E
PCF
IP
PPP
GRE
IP
MAC
F/E
MAC
100B_T
PDSN
SIP/SDP
UDP
IP
MAC
100B_T
SIPS/PTTS

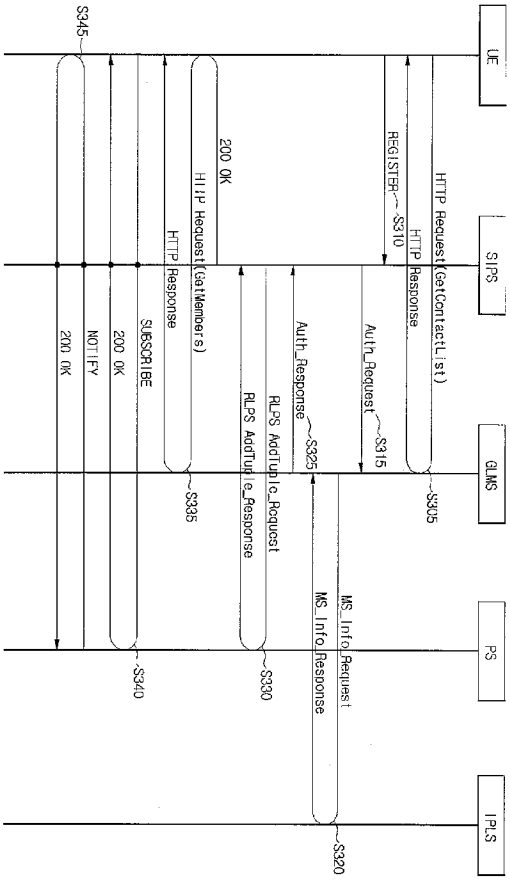
(b)


SIP/SDP
UDP
IP
PPP
LAC
MAC
Airlink
MS
LAC
MAC
Airlink
FR L2
E1/T1
BSC
FR L2
E1/T1
GRE
IP
MAC
F/E
PCF
IP
PPP
GRE
IP
MAC
F/E
MAC
100B_T
PDSN
SIP/SDP
UDP
IP
MAC
100B_T
SIPS/PTTS

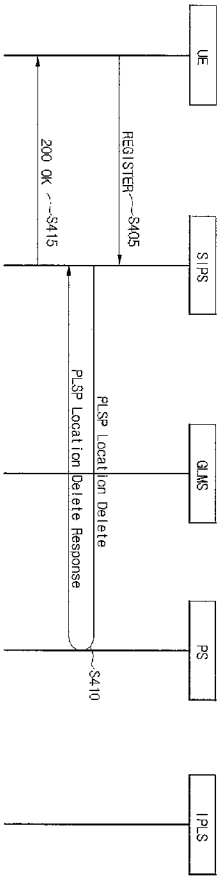
도면2


300
310
노드관리서버부
500
PS
400
GLMS
600
SIPS
800
LD
900
MDS
700
PTTS
PTTS1
PTTS2
PTTS3
기존
이동통신망
100
110

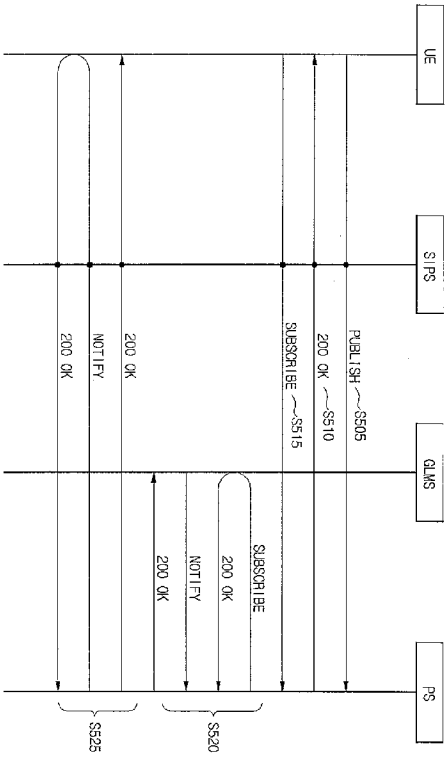
도면3a


UE
SIPS
GLMS
PS
IPLS
HTTP Request(GetContactList)
HTTP Response
REGISTER
S310
S305
Auth_Request
S315
Auth_Response
S325
MS_Info_Request
MS_Info_Response
S320
RLPS AddTuple_Request
RLPS AddTuple_Response
S330
HTTP Request(GetMembers)
HTTP Response
S335
200 OK
SUBSCRIBE
200 OK
S340
NOTIFY
200 OK
S345

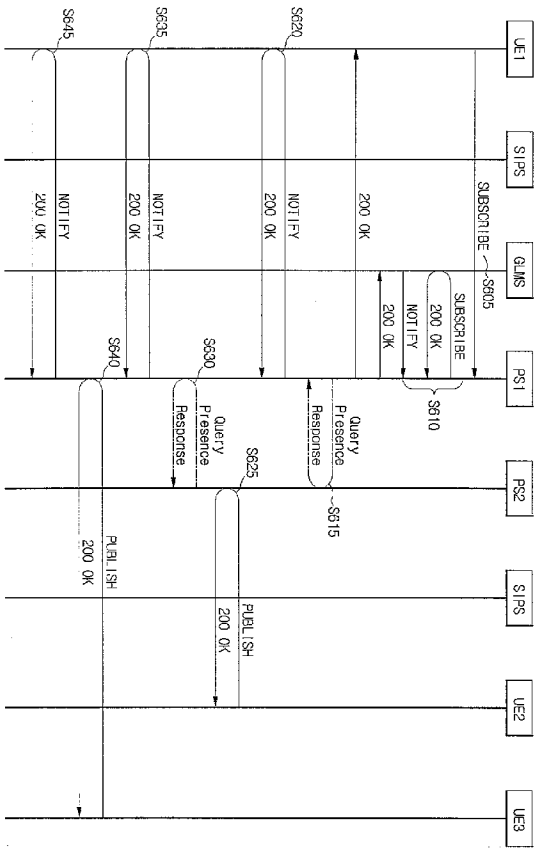
도면3b


UE
SIPS
GLMS
PS
IPLS
REGISTER
S405
PLSP Location Delete
S410
PLSP Location Delete Response
200 OK
S415

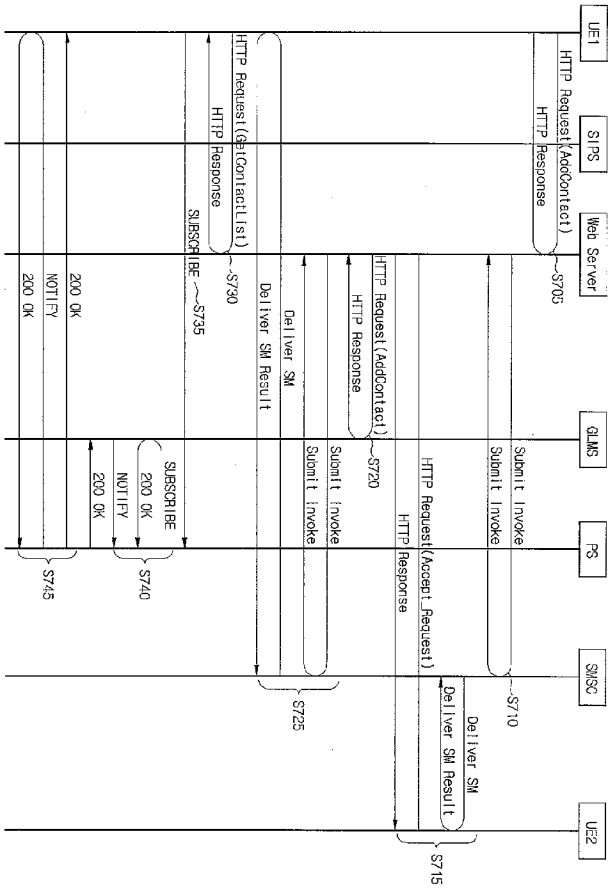
도면3c


UE
SIPS
GLMS
PS
PUBLISH
S505
200 OK
S510
SUBSCRIBE
S515
SUBSCRIBE
200 OK
NOTIFY
200 OK
S520
200 OK
NOTIFY
200 OK
S525

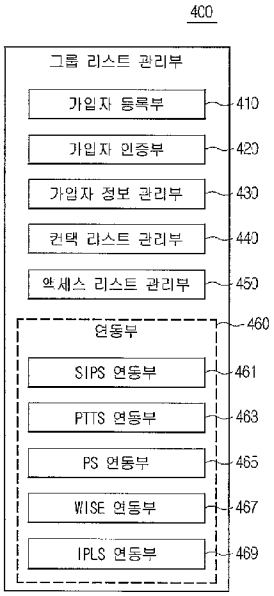
도면36


UE1
SIPS
GLMS
PS1
PS2
SIPS
UE2
UE3
SUBSCRIBE
S605
200 OK
NOTIFY
200 OK
SUBSCRIBE
200 OK
NOTIFY
200 OK
S610
Query Presence Response
S615
S620
Query Presence Response
S625
PUBLISH
200 OK
S630
NOTIFY
200 OK
S635
PUBLISH
200 OK
S640
NOTIFY
200 OK
S645

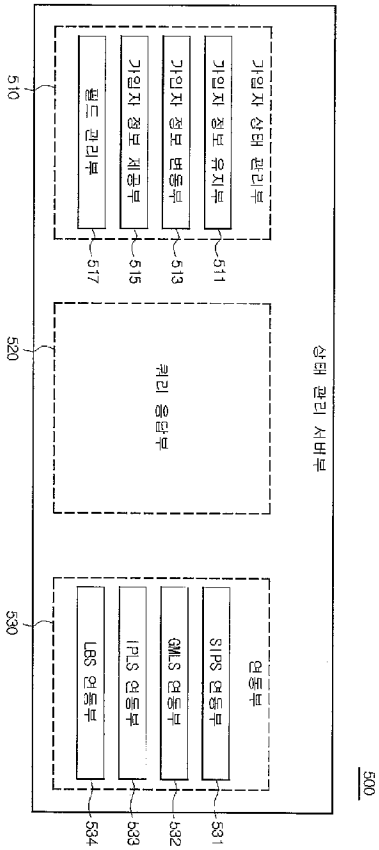
도면3e


UE1
S1PS
Web Server
GLMS
PS
SMSC
UE2
HTTP Request(AddContact)
HTTP Response
S705
Submit Invoke
Submit Invoke
S710
Deliver SM
Deliver SM Result
HTTP Request(Accept_Request)
HTTP Response
S715
HTTP Request(AddContact)
HTTP Response
S720
Submit Invoke
Submit Invoke
Deliver SM
Deliver SM Result
S725
HTTP Request(getContactList)
HTTP Response
S730
SUBSCRIBE
S735
SUBSCRIBE
200 OK
NOTIFY
200 OK
S740
200 OK
NOTIFY
200 OK
S745

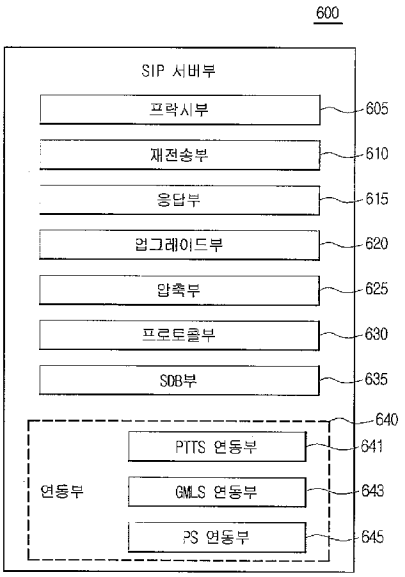
도면4


400
그룹 리스트 관리부
가입자 등록부
410
가입자 인증부
420
가입자 정보 관리부
430
컨택 리스트 관리부
440
액세스 리스트 관리부
450
연동부
460
SIPS 연동부
461
PTTS 연동부
463
PS 연동부
465
WISE 연동부
467
IPLS 연동부
469

도면5


500
상태 관리 서버부
가입자 상태 관리부
가입자 정보 유지부
511
가입자 정보 변동부
513
가입자 정보 제공부
515
필드 관리부
517
510
쿼리 응답부
520
연동부
SIPS 연동부
531
GMLS 연동부
532
IPLS 연동부
533
LBS 연동부
534
530

도면6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프로토콜부
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PS 연동부
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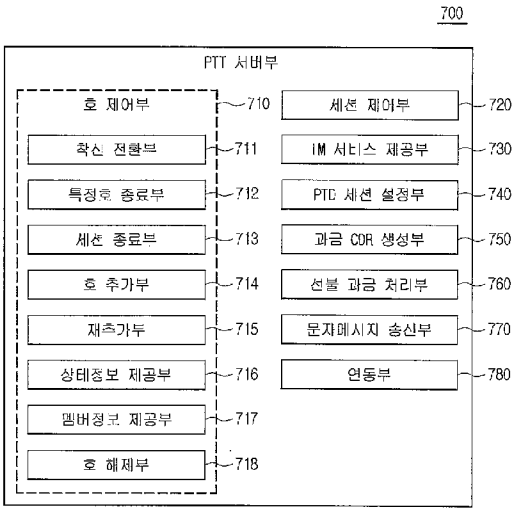
도면7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세션 종료부
713
호 추가부
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상태정보 제공부
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멤버정보 제공부
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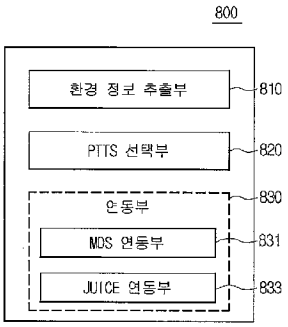
도면8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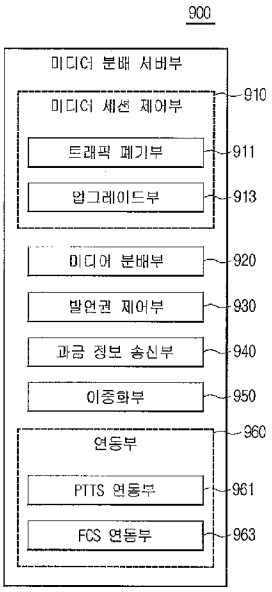
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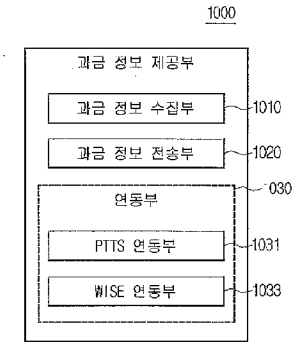
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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**09/03/2024 08:45:53 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2461	FILED BY	Dawn DeLuca
PATENT CENTER #	67017138	FILING DATE	02/02/2024
CUSTOMER #	26158	FIRST NAMED INVENTOR	John Marvin Suzuki
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Jason Radachy

Documents

TOTAL DOCUMENTS: 6

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
NPL_001 - A Hybrid Extension.pdf	7	Non Patent Literature	708 KB
FOR_001_KR100692639 English Translation.pdf	12	Foreign Reference	1037 KB
NPL_003_ISR-WO.pdf	9	Non Patent Literature	1207 KB
FOR_001_KR100692639.pdf	34	Foreign Reference	1346 KB
BKT004USCON_IDS.pdf	6	Information Disclosure Statement (IDS) Form (SB08)	1253 KB
NPL_002_Push to Talk Over Cellular 2 Requirements.pdf	95	Non Patent Literature	5343 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
NPL_001 - A Hybrid Extension.pdf	3FCEA6E2FC08E020C30C52145F9D9D4738E714B3822ECBD202CBB12B464DC50DAC7B82D152FF2D6E8D9BF48C90B2439603F8CF63FBDC320200EE3E6364900C19
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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/431,686	02/02/2024	John Marvin Suzuki	BKT004USCON

CONFIRMATION NO. 2461

26158
WOMBLE BOND DICKINSON (US) LLP
ATTN: IP DOCKETING
P.O. Box 570489
ATLANTA, GA 30357-0037

PUBLICATION NOTICE

OC000000073255891

Date Mailed: 05/31/2024

Title:SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Publication No.US-2024-0179496-A1
Publication Date:05/30/2024

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The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/431,686	02/02/2024		664	BKT004USCON	20	3

CONFIRMATION NO. 2461

FILING RECEIPT

OC000000068457311

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P.O. Box 570489
ATLANTA, GA 30357-0037

Date Mailed: 02/20/2024

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

John Marvin Suzuki, Rockville, MD;
Lorenzo Cruger, JR., Boynton Beach, FL;
James Lowell Teel, JR., Lynchburg, VA;

Applicant(s)

BK Technologies, Inc., West Melbourne, FL;

Power of Attorney: The patent practitioners associated with Customer Number 26158

Domestic Priority data as claimed by applicant

This application is a CON of 17/844,488 06/20/2022
which claims benefit of 63/300,899 01/19/2022

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
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If Required, Foreign Filing License Granted: 02/15/2024

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/431,686**

Projected Publication Date: 05/30/2024

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
18/431,686

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	64		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	280		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	320		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	* 0	x =	0	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x =	0			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	664		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**02/02/2024 05:50:05 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2461	FILED BY	Dawn DeLuca
PATENT CENTER #	64195394	AUTHORIZED BY	Jason Radachy
CUSTOMER #	26158	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	John Marvin Suzuki

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
DA / 090528	**E202422H50425771**	**Dawn DeLuca**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2111	UTILITY PATENT APPL. SEARCH FEE	280.00	1	280.00
4011	BASIC FILING FEE- UTILITY	64.00	1	64.00
2311	EXAMINATION OF ORIGINAL PATENT APPLICATION	320.00	1	320.00
			TOTAL AMOUNT:	**$664.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d)

and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

As the below named inventor, I hereby declare that:

This declaration is directed to:

[X] The attached application, or

[ ] United States application or PCT international application number _____

filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: James Lowell Teel Jr. Date (Optional): 6/20/2022

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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LEGAL NAME OF INVENTOR

Inventor: John Marvin Suzuki Date (Optional) : _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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[X] The attached application, or

[ ] United States application or PCT international application number _____

filed on _____.

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I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Lorenzo Cruger Jr. Date (Optional): Jun 28 2012

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

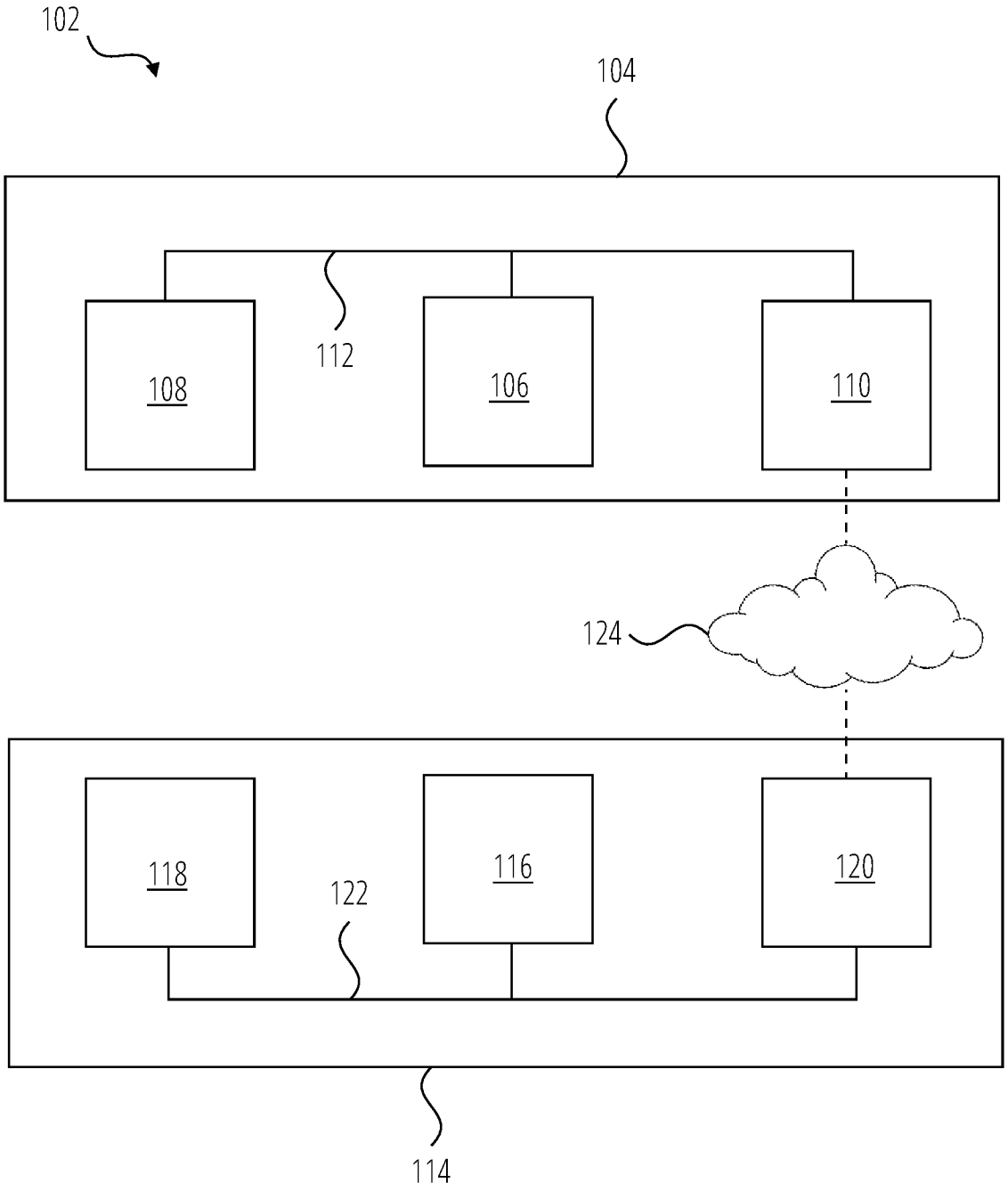


FIG. 1

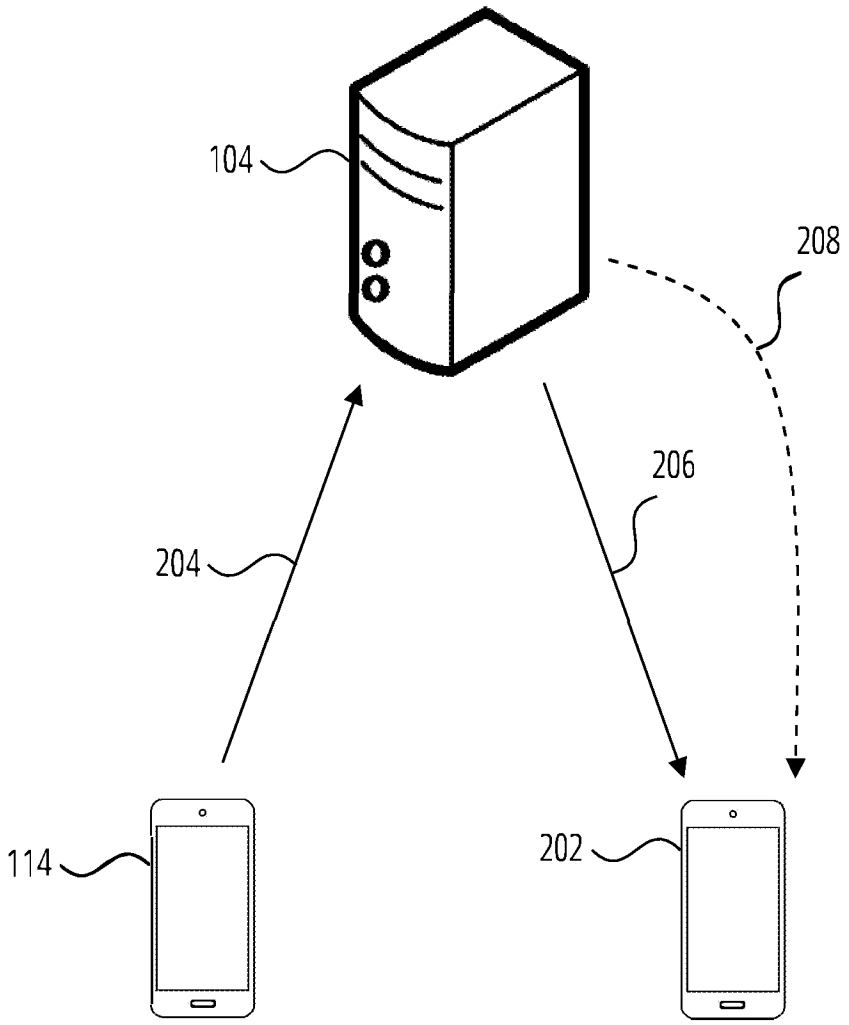


FIG. 2

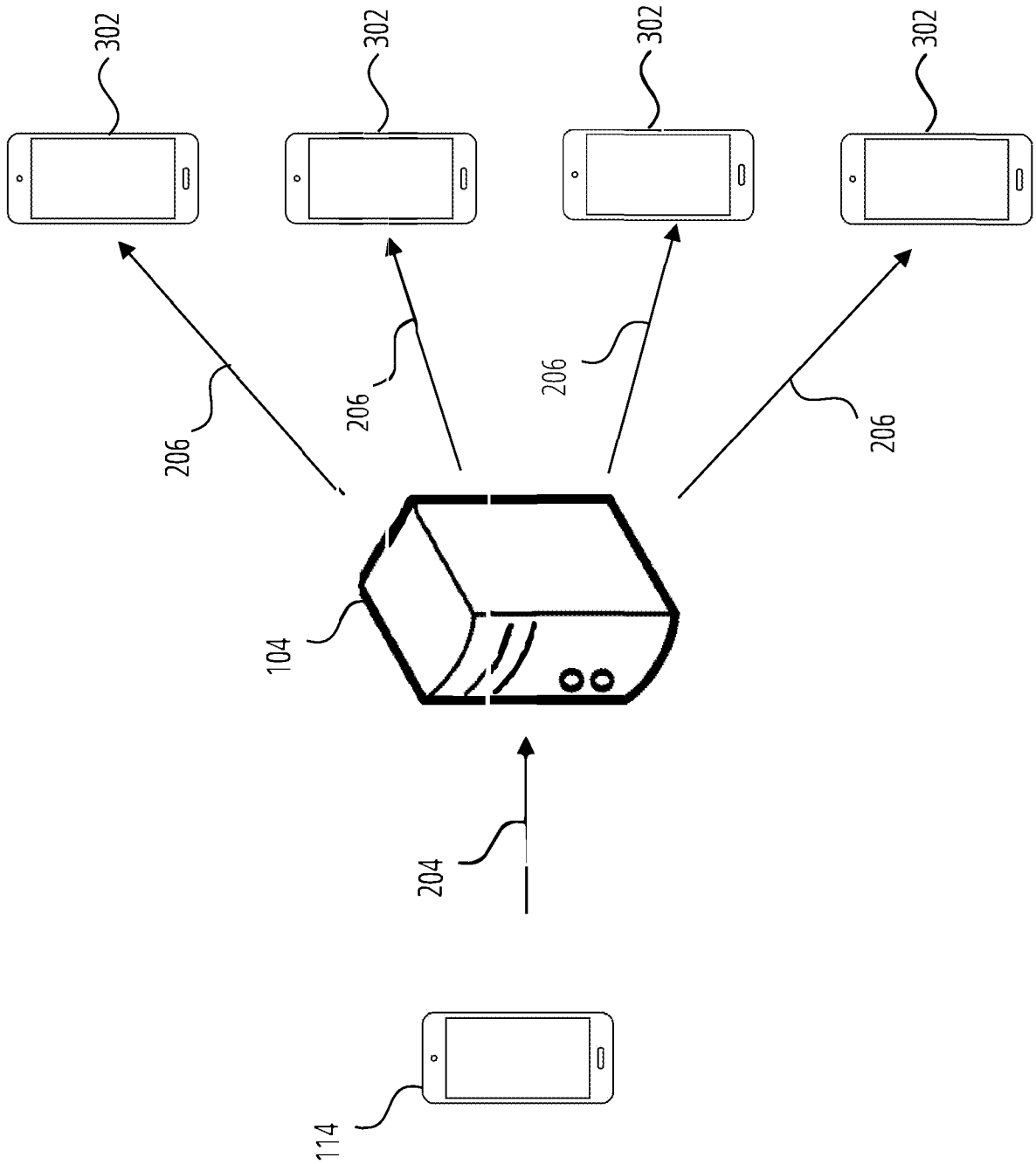
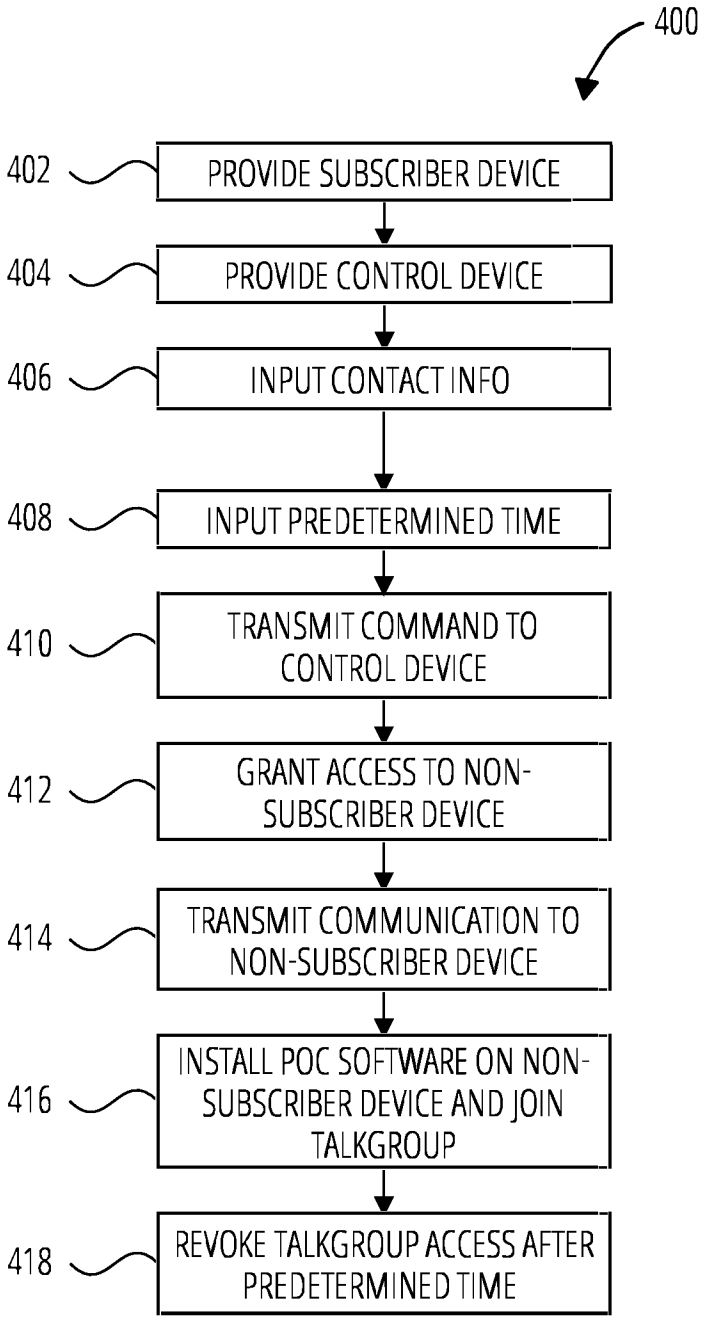


FIG. 3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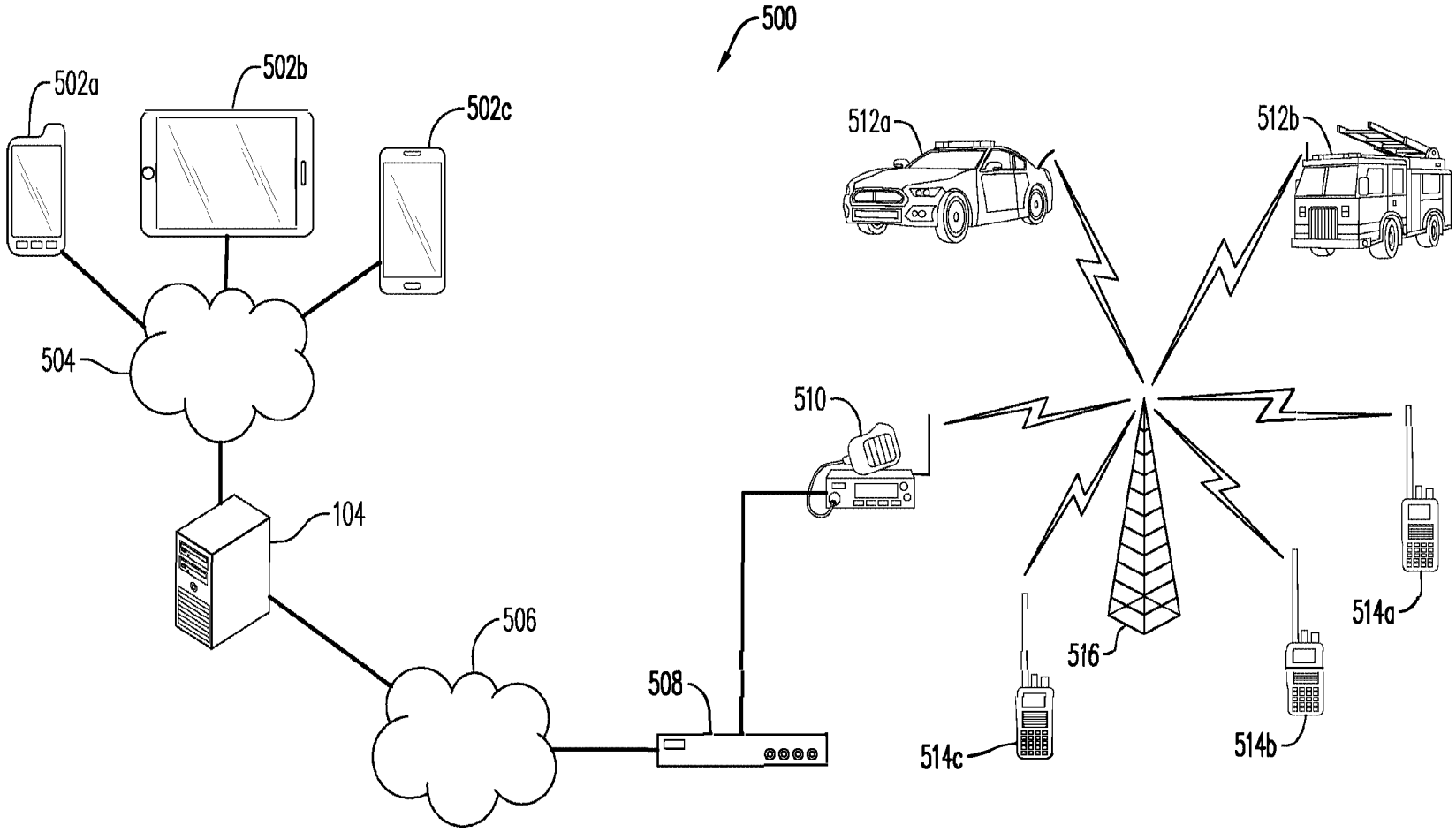
402
PROVIDE SUBSCRIBER DEVICE
404
PROVIDE CONTROL DEVICE
406
INPUT CONTACT INFO
408
INPUT PREDETERMINED TIME
410
TRANSMIT COMMAND TO CONTROL DEVICE
412
GRANT ACCESS TO NON-SUBSCRIBER DEVICE
414
TRANSMIT COMMUNICATION TO NON-SUBSCRIBER DEVICE
416
INSTALL POC SOFTWARE ON NON-SUBSCRIBER DEVICE AND JOIN TALKGROUP
418
REVOKE TALKGROUP ACCESS AFTER PREDETERMINED TIME

FIG. 4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512b
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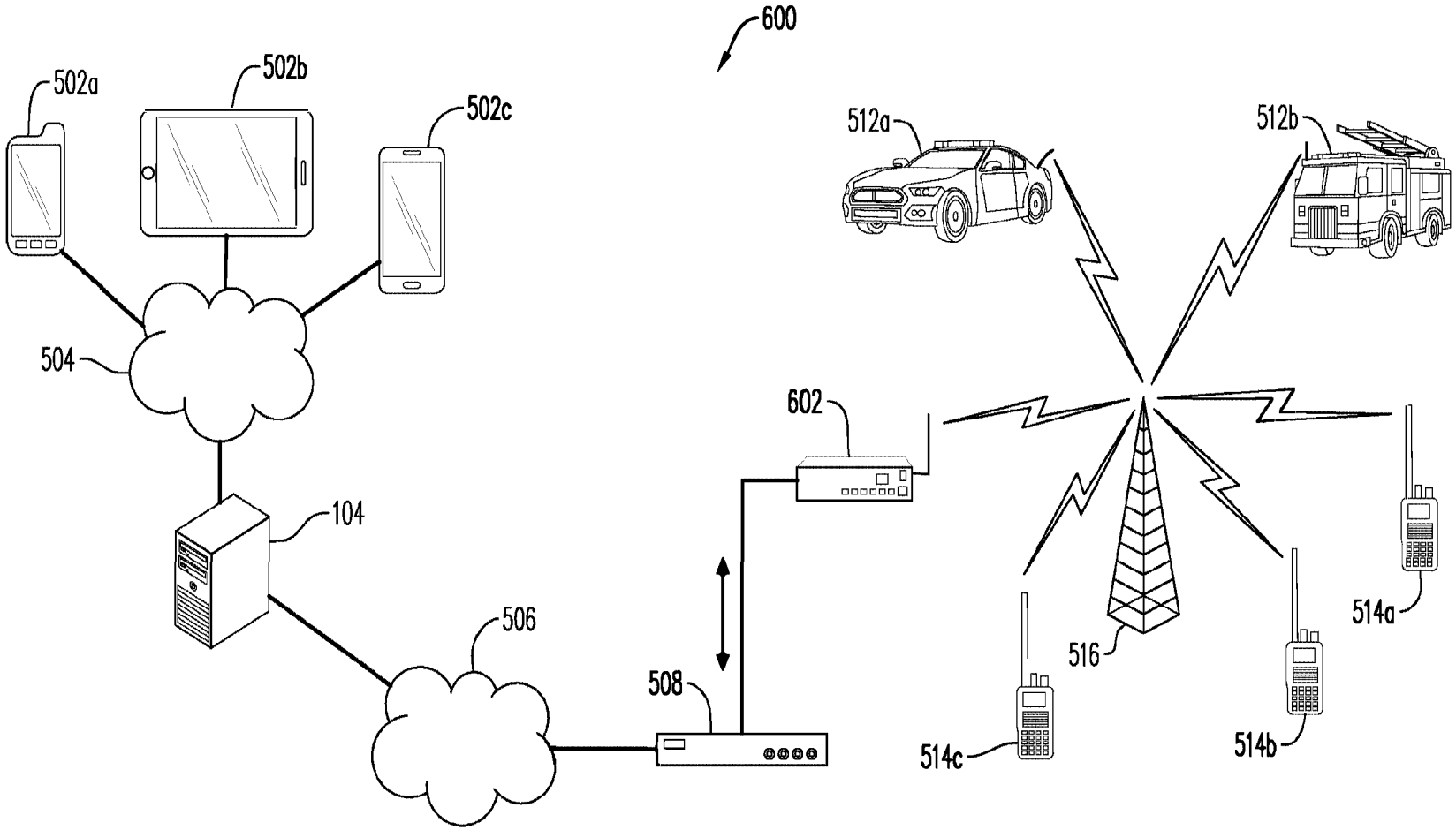
514c
516

FIG. 5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512b
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514a
514b
514c

FIG. 6

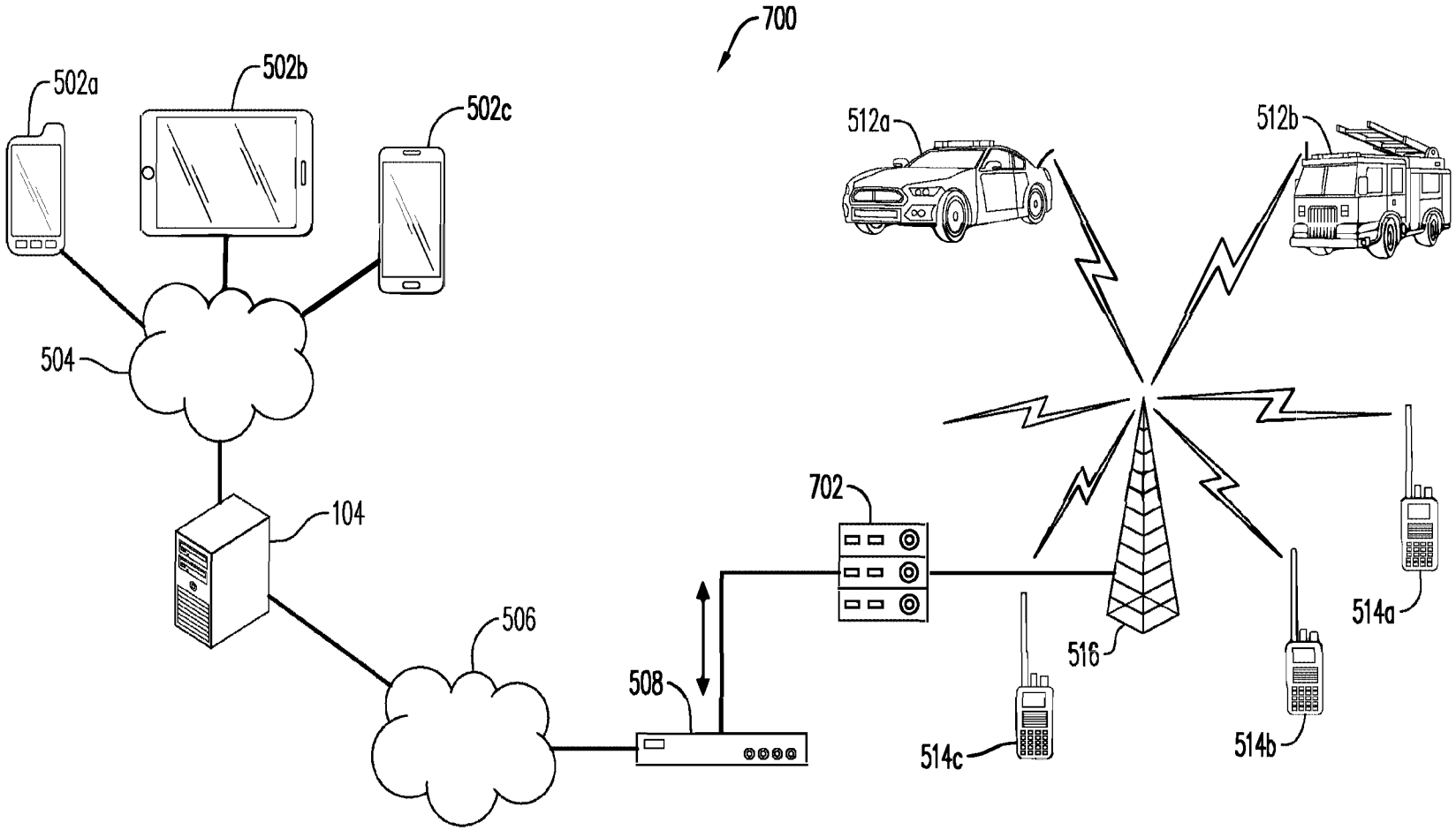
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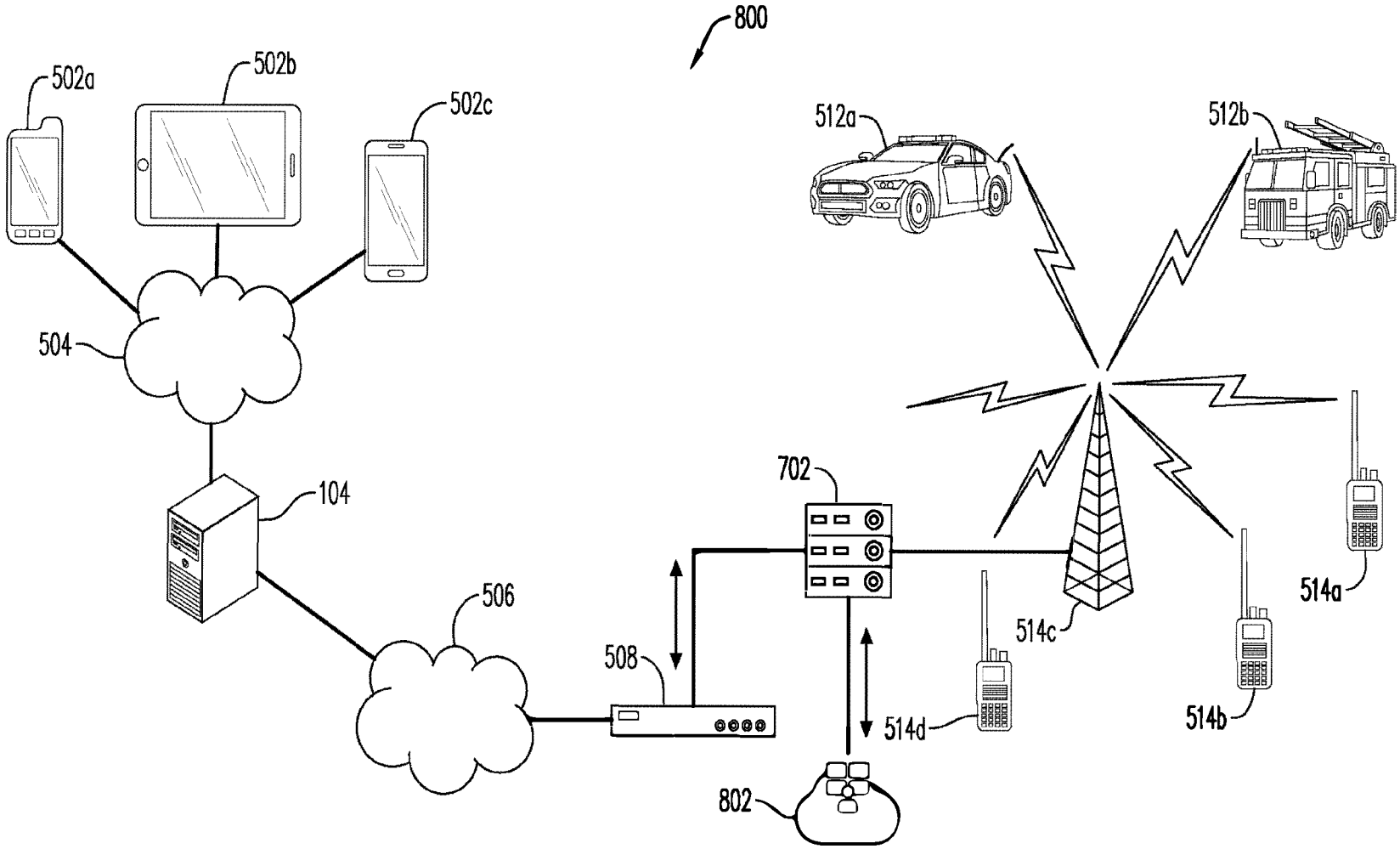
FIG. 7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502c
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702
802
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512b
514a
514b
514c
514d

FIG. 8

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Marvin	Suzuki	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Rockville	State/Province	MD	Country of Residence	US

Mailing Address of Inventor:

Address 1	14705 Carrolton Road		
Address 2			
City	Rockville	State/Province	MD
Postal Code	20853	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Lorenzo		Cruger	Jr.

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Boynton Beach	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	8218 Fiera Ridge Drive		
Address 2			
City	Boynton Beach	State/Province	FL
Postal Code	33473	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	James	Lowell	Teel	Jr.

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

City	Lynchburg	**State/Province**	VA	**Country of Residence**	US

Mailing Address of Inventor:

Address 1	118 Bethel Park Drive		
Address 2			
City	Lynchburg	**State/Province**	VA
Postal Code	24502	**Country**	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	26158	
Email Address	ipdocketing@wbd-us.com	Add Email Remove Email

Application Information:

Title of the Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK		
Attorney Docket Number	BKT004USCON	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	◯ US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	26158		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	17/844488	2022-06-20
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
17/844488	Claims benefit of provisional	63/300899	2022-01-19

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Remove

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

- (●) Assignee
- ( ) Legal Representative under 35 U.S.C. 117
- ( ) Joint Inventor
- ( ) Person to whom the inventor is obligated to assign.
- ( ) Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. [X]

Organization Name	BK Technologies, Inc.		
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Email Address			

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

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See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Jason D. Radachy/			Date (YYYY-MM-DD)	2024-02-02
First Name	Jason D.	Last Name	Radachy	Registration Number	64,360

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BKT004USCON
	Application Number	
Title of Invention	SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/AIA/82B (07-13)
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Application Number	Filing Date

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☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

BK Technologies Inc.

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	
Name	Scott Malmanger		
Title	Chief Financial Officer		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/431,686	**02/02/2024 05:50:05 PM Z ET**	**BKT004USCON**

Title of Invention

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	2461	FILED BY	Dawn DeLuca
PATENT CENTER #	64195394	FILING DATE	-
CUSTOMER #	26158	FIRST NAMED INVENTOR	John Marvin Suzuki
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Jason Radachy

Documents

TOTAL DOCUMENTS: 6

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
aia0014.pdf	9	Application Data Sheet	2174 KB
BKT004USCon application for filing 02Feb24-APP.TEXT.docx	18	Application body structured text document	34 KB
BKT004USCon application for filing 02Feb24.pdf	18	Auxiliary PDF of Application	123 KB
Declarations.pdf	3	Oath or Declaration filed	358 KB
BK Technologies POA.pdf	1	Power of Attorney	2036 KB
Drawings_for filing.pdf	8	Drawings-only black and white line drawings	869 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
aia0014.pdf	D693B919418ECE6D93F79EFC6F96362FF6C6BEEA5BEC6AD1FBAE71EECB3C61E2985D96DA3813570D2E6D13FCFF3191F55A392F65C1E0930E06C6D81D8F5DDA3D
BKT004USCon application for filing 02Feb24-APP.TEXT.docx	EA47BBC549C868D9D53286E739ECEC29D3DBC4641B3A886B695C5D40EE3FACEF309862657209AA7D51211F9FBB40EC083C6C25FDC3AA7A631E44E965F85D65E2
BKT004USCon application for filing 02Feb24.pdf	1CF5FF976735BABABAE711348B19B46D16D98EC42C4EEFEFF7070B38A49550E58D37839BD47D0D6C6708500D1582B359C1474A68FD042463AFA36A474AA9BB52
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BK Technologies POA.pdf	B584B2BB4AA3C4B0AC8BE1A5E8663FCFAD804BD8E804BDA6D25A7BC2AA8449E8547701DB0A9A870B241ED56495486C43B52D77D3B24B9DF13E8D854FB2022767
Drawings_for filing.pdf	F934AFEE2E4D0A721ACBB71C470F3CDC1C9431D5FE30EC80DF6111209BEE254EED46155374BE5228BDAD51477B1D0BE12C132EAB1297FF23DC29775DE6EE3DC5

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SYSTEM AND METHOD FOR MANAGING ACCESS TO A PUSH-TO-TALK-OVER-CELLULAR COMMUNICATION NETWORK

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation application of U.S. Application No. 17/844,488, filed June 20, 2022, which claims priority to U.S. Provisional Application No. 63/300,899 filed January 19, 2022, the entire contents of each of which are incorporated herein by reference.

BACKGROUND

[0002] Modern society relies on a number of different public safety agencies, such as fire departments, police departments, ambulance services, etc., to respond to emergency situations. In many situations, inter-agency coordination is critical to effectively responding and protecting the public. However, coordination may be hampered by the lack of communication interoperability between agencies. For example, different agencies may use different communication devices, or may operate on different channels and/or talkgroups. While steps have been made to standardize radio channels and talkgroups for public safety agencies, many times the lack of a common communications network and the unpredictable nature of public safety emergencies may still result in communication difficulties despite the efforts at standardization.

[0003] While it may be possible to set up customizable talkgroups for communication, such efforts may be prohibitively complex and time-consuming in an emergency situation. Additionally, such talkgroups would require management after the conclusion of the event to remove access to the talkgroup from devices where it is no longer needed, which may result in tedious and time-consuming management and record-keeping.

[0004] Recent years have seen the development of push-to-talk-over-cellular (POC) networks that may rival or surpass the coverage of traditional land mobile radio networks. Additionally, smartphones are widely owned and carried by many people, including public safety agency employees.

[0005] Accordingly, there may be a need for methods and systems to quickly and efficiently manage access to push-to-talk talkgroups, especially those that leverage the widespread availability of personal smartphones.

BRIEF SUMMARY

[0006] At least an exemplary embodiment of a method of managing access to a push-to-talk-over-cellular (POC) talkgroup may include providing a control device configured to provide a POC service and manage a first POC talkgroup. The method may further include controlling the control device to grant a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service. The method may further include transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service.

[0007] At least an exemplary method of managing access to a push-to-talk-over-cellular (POC) talkgroup may include providing a control device configured to manage a first talkgroup, providing a first subscriber device, transmitting, from the first subscriber device to the control device, first non-subscriber contact information associated with a first nonsubscriber device, and controlling control device to grant the first non-subscriber device access to the first talkgroup.

[0008] At least an exemplary embodiment of a method of managing access to a push-to-talk-over-cellular (POC) talkgroup may include providing a control device configured to provide a POC service and manage a first POC talkgroup. The method may further include granting a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service. The method may further include transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service. The method may further include controlling the first non-subscriber device use the POC software application to communicate with the first POC talkgroup via the POC service.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0009] A more particular description will be rendered by reference to exemplary embodiments that are illustrated in the accompanying figures. Understanding that these drawings depict exemplary embodiments and do not limit the scope of this disclosure, the exemplary embodiments will be

described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0010] FIG. 1 is a schematic block diagram of a system according to an exemplary embodiment;

[0011] FIG. 2 is a schematic diagram of a system according to an exemplary embodiment;

[0012] FIG. 3 is a schematic diagram of a system according to an exemplary embodiment;

[0013] FIG. 4 is a flowchart illustrating a method according to an exemplary embodiment;

[0014] FIG. 5 is a schematic diagram of a system according to an exemplary embodiment;

[0015] FIG. 6 is a schematic diagram of a system according to an exemplary embodiment;

[0016] FIG. 7 is a schematic diagram of a system according to an exemplary embodiment; and

[0017] FIG. 8 is a schematic diagram of a system according to an exemplary embodiment;

[0018] Various features, aspects, and advantages of the exemplary embodiments will become more apparent from the following detailed description, along with the accompanying drawings in which like numerals represent like components throughout the figures and detailed description. The various described features are not necessarily drawn to scale in the drawings but are drawn to aid in understanding the features of the exemplary embodiments.

[0019] The headings used herein are for organizational purposes only and are not meant to limit the scope of the disclosure or the claims. To facilitate understanding, reference numerals have been used, where possible, to designate like elements common to the figures.

DETAILED DESCRIPTION

[0020] Reference will now be made in detail to various exemplary embodiments. Each example is provided by way of explanation and is not meant as a limitation and does not constitute a definition of all possible embodiments. It is understood that reference to a particular "exemplary embodiment" of, e.g., a structure, assembly, component, configuration, method, etc. includes exemplary embodiments of, e.g., the associated features, subcomponents, method steps, etc. forming a part of the "exemplary embodiment."

[0021] FIG. 1 shows a schematic block drawings of an exemplary embodiment of a system 102 for managing access to a push-to-talk-over-cellular (POC) talkgroup. The system 102 may include a control device 104 and a first subscriber device 114 in communication with the control device 104. The control device 104 may be configured to perform administrative duties with respect to one or a plurality of POC talkgroups, including a first talkgroup. For example, the control device 104 may

control which non-subscriber devices have access to the talkgroups managed by the control device 104.

[0022] In an exemplary embodiment, the phrase “subscriber device" may refer to a device that subscribes to a service provided by an operator of the control device 104. For example, the operator of the control device 104 may provide a POC service for facilitating POC communication between various devices. In contrast, the phrase “non-subscriber device" may refer to a device that does not subscribe to the service provided by the operator of the control device 104. The non-subscriber device may subscribe to a different POC service than the service provided by the operator of the control device 104, or the non-subscriber device may not subscribe to any POC service at all and may not even have any POC software installed on the device. As explained further hereinbelow, at least an exemplary embodiment includes providing a link to download POC software compatible with the talkgroup(s) managed by the control device 104.

[0023] In an exemplary embodiment, the control device 104 may be a server that is accessible via communication over internet 124. The control device 104 may further include a control device processor 106, a control device memory 108, and a control device communication module 110, which may be mutually operably coupled to each other via a control device bus 112. The control device communication module 110 may include hardware components that allow the control device 104 to communicate with other devices, either locally or via a network such as the internet 124. For example, the control device communication module 110 may include an ethernet connection, wireless LAN connection, and/or other hardware configured for communication over the internet 124. The control device processor 106, the control device memory 108, and the control device communication module 110 may be mutually operably coupled via a control device bus 112. The control device memory 108 may be a non-transitory computer-readable medium or media that stores computer-executable instructions thereon. The computer-executable instructions stored in the control device memory 108 may be executed by the control device 104; in an exemplary embodiment, the computer-executable instructions may be executed by the control device processor 106. Once executed, the computer-executable instructions may cause the control device 104 to perform steps consistent with the processes and methods described herein below.

[0024] The first subscriber device 114 may be configured to communicate with the control device 104 via the internet 124. In various exemplary embodiments, the first subscriber device 114 may be a cellular telephone (e.g. a smart phone), a tablet computer, a laptop computer, or a desktop computer. Generally, the first subscriber device 114 may be used by a person with administrative

rights with respect to the first talkgroup. The first subscriber device 114 may include a subscriber device processor 116, a subscriber device memory 118, and a subscriber device communication module 120. Similar to the control device communication module 110 described above, the subscriber device communication module 120 may include hardware components that allow the first subscriber device 114 to communicate with the control device 104 via the internet 124. For example, the subscriber device communication module 120 may include an ethernet connection, wireless LAN connection, broadband cellular antenna and related hardware, and/or other hardware configured for communication over the internet 124. The subscriber device processor 116, the subscriber device memory 118, and the subscriber device communication module 120 may be mutually operably coupled via a subscriber device bus 122.

[0025] It will be understood that FIG. 1 is not intended to demonstrate a specific physical arrangement of the hardware of the control device 104 or the first subscriber device 114, but is instead intended as a conceptual representation to show what structures may be present in exemplary embodiments of the control device 104 and the first subscriber device 114. It will be further understood that the control device 104 and the first subscriber device 114 are not limited to the specifically illustrated connections between the components. For example, in exemplary embodiments, certain components may be operably coupled to the control device processor 106 or the subscriber device processor 116 without direct connection to other components.

[0026] FIG. 2 is a schematic diagram showing an exemplary embodiment of how the system 102 may be used to manage a POC talkgroup. For example, in an emergency incident, a first responder (hereinafter referred to as an administrator) such as a senior police officer or senior firefighter may have control of the first subscriber device 114. In the context of FIG. 2, the first subscriber device 114 is illustrated as a smartphone, but it will be understood that the disclosure is not limited to this. For example, in another exemplary embodiment, the first subscriber device 114 may be a tablet, laptop computer, desktop computer, or other device, and may be operated by a dispatcher or senior officer at a command post. The administrator may have administrative privileges with respect to a preexisting first talkgroup or may create a new first talkgroup on an ad hoc basis.

[0027] Another first responder (hereinafter referred to as a client), owning a first nonsubscriber device 202, may arrive on the scene and may need to communicate with other first responders. The first non-subscriber device 202 may be a device configured to communicate via a broadband cellular network, such as a cellular telephone (e.g. a smartphone) or a tablet computer. The administrator may send a command 204 to the control device 104 including first non-subscriber contact

information associated with the first non-subscriber device 202. The command may be entered via a software application running on the first subscriber device 114 and configured for interfacing with the control device 104. For example, the software application may have a user interface where the administrator can enter the first non-subscriber contact information. In some embodiments, entering the first non-subscriber contact information may be by manual entry of the first non-subscriber contact information. In some embodiments, entering non-subscriber contact information may be by selection of specific nonsubscriber contact information (e.g. associated with a specific non-subscriber device, such as the first non-subscriber device 202) from pre-entered non-subscriber contact information (e.g. by selection from a menu of pre-entered contact information). In some embodiments, the preentered contact information may include information (such as telephone numbers) from the administrator/subscriber's general contact list (e.g. on their cellphone and/or first subscriber device 114) and/or information from a non-subscriber list (for example, in a database or spreadsheet or otherwise on or available through the first subscriber device 114), which may include information built over time, such as non-subscribers that were previously invited to participate. The first non-subscriber contact information may be a cellular telephone number, email address, or other identifying information linked to the first non-subscriber device 202 and/or the client using the first non-subscriber device 202. The command 204 may further include instructions to grant the first non-subscriber device 202 access to the first talkgroup, and the command 204 may further indicate a predetermined period of time for access to the first talkgroup. The predetermined period of time may have a default value, or the predetermined period of time may be settable via first subscriber device 114.

[0028] In response to the command 204, the control device 104 may grant the first nonsubscriber device 202 access to the first talkgroup. Further, the control device 104 may send a first communication 206 to the first non-subscriber device 202 notifying it that access has been granted to first talkgroup. The first communication 206 may be a text message, email message, or message sent via another suitable communication protocol. The first communication 206 may include first configuration information associated with the first talkgroup. The first configuration information may include any information and/or parameters necessary for communicating via the first talkgroup. For example, the first configuration information may be a file for use by a software application on first non-subscriber device 202, such that the file may instruct the software application to display and/or communicate via the first talkgroup. Additionally, the first communication 206 may include a link for downloading a POC software application for POC communication. Thus, even if the first non-subscriber device 202 was not previously configured for POC communications, the first

communication 206 will provide the first non-subscriber device 202 with the means for accessing the first talkgroup to which it has been granted access.

[0029] After the predetermined period of time has expired, the control device 104 may revoke access of the first non-subscriber device 202 to the first talkgroup. In an exemplary embodiment, the control device 104 may be configured and/or programmed to revoke the access to the first talkgroup automatically with no human interaction required. In an exemplary embodiment, the control device 104 may send a second communication 208 to the first nonsubscriber device 202 instructing the first non-subscriber device 202 to remove the first talkgroup from the POC software on the first non-subscriber device 202. In an alternative exemplary embodiment, control device 104 may be configured such that the administrator can terminate the first talkgroup via an affirmative command entered into the first subscriber device 114. In another alternative exemplary embodiment, the control device 104 may be configured to terminate the first talkgroup after a predetermined period of no activity within the first talkgroup.

[0030] FIG. 3 is a schematic diagram showing another exemplary embodiment of how the system 102 may be used to manage a POC talkgroup. Similar to the embodiment shown in FIG. 2, in FIG. 3 the first subscriber device 114 may send the command 204 to the control device 104. The main difference between FIG. 2 and FIG. 3 is that in FIG. 3, there are a plurality of non-subscriber devices 302. Each of the plurality of non-subscriber devices 302 may have its own non-subscriber contact information, such as a cellular telephone number. Accordingly, the administrator may enter multiple telephone numbers into the software application on the first subscriber device 114, each telephone number corresponding to one of the plurality of non-subscriber devices 302. In some embodiments, entering the non-subscriber contact information may be by manual entry of the first non-subscriber contact information. In some embodiments, entering non-subscriber contact information (e.g. telephone numbers) may be by selection of specific non-subscriber contact information (e.g. associated with a specific non-subscribe device) from pre-entered non-subscriber contact information (e.g. by selection from a menu of pre-entered contact information, for example on the software application, such as subscribers previously invited to participate via the system or software application, and/or from the administrator's contact list on their first subscriber device 114, such as a cellphone). The control device 104 may then grant access to the first talkgroup to each of the plurality of non-subscriber devices 302 for the predetermined period of time, and the control device 104 may further send the first communication 206 to each of the plurality of non-subscriber devices 302. After the predetermined amount of time has expired, the control device 104 may revoke the access to the first talkgroup for each of the plurality of non-subscriber devices 302.

Alternatively, the first talkgroup may be terminated via an affirmative command or by lack of activity for a predetermined period of time.

[0031] The description above describes the control device 104 in terms of managing the first talkgroup. However, it will be understood that the disclosure is not limited to just a single talkgroup. For example, in an exemplary embodiment, the first talkgroup may be one of a plurality of talkgroups. In this situation, the first communication 206 from the control device 104 to the first non-subscriber device 202 or the plurality of non-subscriber devices 302 may include configuration information for each talkgroup of the plurality of talkgroups. Further, the control device 104 may grant access to one, several, or all of the talkgroups in the plurality of talkgroups to each of the first non-subscriber device 202 or the plurality of non-subscriber devices 302. Additionally, in an exemplary embodiment, multiple talkgroups may be linked together as part of a single virtual incident. Each individual talkgroup may be configured to facilitate communication between particular groups during an incident. For example, the multiple talkgroups may correspond to different types of responders at an incident, such as a talk group for fire personnel, a talkgroup for law enforcement personnel, a talkgroup for medical personnel, etc. Alternatively, the multiple talkgroups may be geographically based, such as all emergency personnel in a first geographic area, all emergency personnel in a second geographic area, etc. Similarly, once the predetermined time has expired, access to the plurality of talkgroups may be automatically revoked by the control device 104.

[0032] FIG. 4 is a flowchart illustrating an exemplary embodiment of a method for managing access to a POC talkgroup. In block 402, a subscriber device is provided. The subscriber device may be the first subscriber device 114 as described above. In block 404, a control device is provided. The control device may be the control device 104 as described above. The subscriber device and the control device may be configured to communicate via the internet.

[0033] In block 406, non-subscriber contact information is input into the subscriber device. In an exemplary embodiment, the non-subscriber contact information may be a cellular telephone number, email address, or other information that can identify a user. In some embodiments, inputting the first non-subscriber contact information may be by manual entry of the first nonsubscriber contact information. In some embodiments, inputting non-subscriber contact information may be by selection of specific non-subscriber contact information (e.g. associated with a specific non-subscriber) from pre-entered non-subscriber contact information (e.g. by selection from a menu of pre-entered contact information and/or from the administrator's contact list on their first subscriber

device 114, such as a cellphone). Additional methods of inputting non-subscriber contact information into the subscriber device are included within the scope herein. In block 408, a predetermined time for access to a talkgroup may be entered into the subscriber device.

[0034] In block 410, the subscriber device may transmit a command to the control device. The command may include the non-subscriber contact information, a list of one or more talkgroups to which access is to be granted, and/or the predetermined time. In block 412, the control device may then manage the desired talkgroup(s) to grant access to the device associated with the non-subscriber contact information.

[0035] In block 414, the control device may transmit a communication to the non-subscriber device. The communication may include a link to download a software application that can communicate with the POC talkgroup if the non-subscriber device does not already include the software, as well as information sufficient to populate the software application with the talkgroup(s).

[0036] In block 416, the non-subscriber device may install the POC software application, if necessary, and join the POC talkgroup. In block 418, the control device may revoke talkgroup access for the non-subscriber device after the predetermined time has elapsed. The control device may also transmit a communication to the non-subscriber device removing the talkgroup from the software application on the non-subscriber device. Additionally, the control device may transmit a communication to the non-subscriber device that includes instructions to delete the POC software application from the non-subscriber device.

[0037] In certain situations, it may be advantageous to join a whole group of land mobile radio (LMR) users to the talkgroup(s) managed by the control device 104. For example, a first jurisdiction may have an emergency situation that requires assistance from a fire department from a second jurisdiction. If the second jurisdiction fire department already has an LMR network and LMR devices configured for its members, it may be more efficient to simply join the entire LMR network to the talkgroups managed by the control device 104, instead of joining individual non-subscriber devices. FIG. 5 shows an exemplary embodiment of a system 500 for POC communication in such a situation.

[0038] In the system 500, there may be a predefined group of LMR users using devices such as mobile LMR devices 512a, 512b and handheld LMR devices 514a, 514b, 514c. Mobile LMR devices 512a, 512b and handheld LMR devices 514a, 514b, 514c may be in mutual communication via an LMR repeater system 516. The LMR repeater system 516 may further be in communication with a donor radio 510 operably coupled to an LMR gateway such as a radio gateway 508. The

radio gateway 508 may communicate with the donor radio 510 via tone signaling or a proprietary signaling regime. The donor radio 510 may be an LMR device similar to the mobile LMR device 512a or the handheld LMR device 514a and be specifically configured as an access point between the radio gateway 508 and the LMR repeater system 516. The radio gateway 508 may be configured to communicate with an IP network 506 (such as the Internet). The radio gateway 508 may be a purpose-built device specifically designed for communicating with LMR devices and IP networks, or, alternatively, the radio gateway 508 may be a general-use PC running software configured to serve as a gateway. The radio gateway 508 may be in communication with the control device 104 via the IP network 506. As described above, the control device 104 may manage one or more POC talkgroups 504, and POC devices 502a, 502b, 502c may be configured to communicate via the POC talkgroups 504. Thus, the system 500 allows for LMC-POC communication between, on one side, a preexisting group comprising mobile LMR devices 512a, 512b and handheld LMR devices 514a, 514b, 514c, and, on the other side, POC devices 502a, 502b, 502c, via the control device 104, the radio gateway 508, and the donor radio 510, thereby adding addition flexibility and utility to first responders' communications systems.

[0039] It will be understood that the systems and methods of the present disclosure are not limited to the system 500 shown in FIG. 5, and instead are broadly applicable to any LMR system that can be linked to an IP network 506. For example, FIG. 6 shows an embodiment of a system 600 in which the donor radio 510 of FIG. 5 is replaced by a P25 station 602 as the LMR gateway. The term P25 refers to the Project 25 suite of standards for interoperable digital two-way radio products. FIG. 7 shows an exemplary embodiment of a system 700 in which a P25 core 702 serves as the LMR gateway to the IP network 506. FIG. 8 shows an exemplary embodiment of a system 800 using the P25 core 702 along with the addition of a P25 console subsystem 802 for additional connectivity and functionality.

[0040] A common feature among the system 500, the system 600, the system 700, and the system 800 is that it allows for LMR device users to be invited to and join the POC talkgroups 504 managed by the control device 104. In at least an embodiment described above, the administrator may enter non-subscriber contact information for inviting a non-subscriber device. In contrast, in an embodiment using one of the system 500, the system 600, the system 700, and the system 800, the administrator may enter identifying information of the LMR gateway, such as an IP address. Once the IP address of the LMR gateway is entered, any LMR devices on the corresponding LMR network will have access to the POC talkgroups 504. Alternatively, depending on the capabilities of the specific LMR gateway being used, it may be possible to selectively limit access to the POC

talkgroups 504 to individual devices of the LMR network. Access to the POC talkgroups 504 may be terminated in the same fashion as described hereinabove, i.e., after passage of a predetermined time, an affirmative command by an administrator, or lack of activity in the POC talkgroups 504.

[0041] In the various embodiments described above, reference is made to non-subscriber devices. It will be understood that this is not meant to limit in any way the embodiments described above as only for use with non-subscriber devices. For example, it will be understood that other subscriber devices may also be invited to join talkgroups managed by the control device in addition to or as an alternative to the non-subscriber devices.

[0042] The exemplary embodiments of a method and system described above may provide significant advantages over conventional solutions. For example, certain emergency situations may require coordinated responses from several different agencies, possibly from multiple different jurisdictions. The agencies may each use different communication hardware, and/or may be configured to communicate on different talkgroups and channels, which could make coordination difficult. Embodiments of the system and method described above may allow users to quickly set up ad hoc talkgroups in the field for interagency communication, without required complicated administrative procedures. This would allow for more time and attention to be devoted to responding to the emergency situation. Additionally, automatically revoking access to the talkgroup after a predetermined period of time may help to reduce cluttered population of talkgroups and reduce the manpower required for administering a talkgroup. Further, automatically revoking access to talkgroups may help to maintain the integrity and security of agency talkgroups by reducing the likelihood of unauthorized access after the emergency situation has passed.

[0043] This disclosure, in various embodiments, configurations and aspects, includes components, methods, processes, systems, and/or apparatuses as depicted and described herein, including various embodiments, sub-combinations, and subsets thereof. This disclosure contemplates, in various embodiments, configurations and aspects, the actual or optional use or inclusion of, e.g., components or processes as may be well-known or understood in the art and consistent with this disclosure though not depicted and/or described herein.

[0044] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0045] In this specification and the claims that follow, reference will be made to a number of terms that have the following meanings. The terms "a" (or "an") and "the" refer to one or more of that entity, thereby including plural referents unless the context clearly dictates otherwise. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. Furthermore, references to "one embodiment", "some embodiments", "an embodiment" and the like are not intended to be interpreted as excluding the existence of additional embodiments that also incorporate the recited features. Approximating language, as used herein throughout the specification and claims, may be applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it is related. Accordingly, a value modified by a term such as "about" is not to be limited to the precise value specified. In some instances, the approximating language may correspond to the precision of an instrument for measuring the value. Terms such as "first," "second," "upper," "lower" etc. are used to identify one element from another, and unless otherwise specified are not meant to refer to a particular order or number of elements.

[0046] As used herein, the terms "may" and "may be" indicate a possibility of an occurrence within a set of circumstances; a possession of a specified property, characteristic or function; and/or qualify another verb by expressing one or more of an ability, capability, or possibility associated with the qualified verb. Accordingly, usage of "may" and "may be" indicates that a modified term is apparently appropriate, capable, or suitable for an indicated capacity, function, or usage, while considering that in some circumstances the modified term may sometimes not be appropriate, capable, or suitable. For example, in some circumstances an event or capacity can be expected, while in other circumstances the event or capacity cannot occur - this distinction is captured by the terms "may" and "may be."

[0047] As used in the claims, the word "comprises" and its grammatical variants logically also subtend and include phrases of varying and differing extent such as for example, but not limited thereto, "consisting essentially of" and "consisting of." Where necessary, ranges have been supplied, and those ranges are inclusive of all sub-ranges therebetween. It is to be expected that the appended claims should cover variations in the ranges except where this disclosure makes clear the use of a particular range in certain embodiments.

[0048] The terms "determine", "calculate" and "compute," and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0049] This disclosure is presented for purposes of illustration and description. This disclosure is not limited to the form or forms disclosed herein. In the Detailed Description of this disclosure, for example, various features of some exemplary embodiments are grouped together to representatively describe those and other contemplated embodiments, configurations, and aspects, to the extent that including in this disclosure a description of every potential embodiment, variant, and combination of features is not feasible. Thus, the features of the disclosed embodiments, configurations, and aspects may be combined in alternate embodiments, configurations, and aspects not expressly discussed above. For example, the features recited in the following claims lie in less than all features of a single disclosed embodiment, configuration, or aspect. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate embodiment of this disclosure.

[0050] Advances in science and technology may provide variations that are not necessarily expressed in the terminology of this disclosure although the claims would not necessarily exclude these variations.

CLAIMS

What is claimed is:

1. A method of managing access to a push-to-talk-over-cellular (POC) talkgroup, the method comprising:

providing a control device configured to:

provide a POC service; and

manage a first POC talkgroup;

controlling the control device to grant a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service; and

transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service.

2. The method of claim 1, further comprising automatically revoking access of the first non-subscriber device to the first POC talkgroup after a predetermined period of time has elapsed.

3. The method of claim 1, further comprising:

providing a first subscriber device; and

transmitting, from the first subscriber device to the control device, first non- subscriber contact information associated with the first non-subscriber device.

4. The method of claim 3, further comprising:

setting a predetermined time via the first subscriber device; and

automatically revoking access of the first non-subscriber device to the first POC talkgroup after the predetermined period of time has elapsed.

5. The method of claim 3, wherein:

the first non-subscriber device is a cellular device; and

the first non-subscriber contact information is a first cellular telephone number.

6. The method of claim 1, wherein:

the first non-subscriber device is one of a plurality of non-subscriber devices;

the granting the first non-subscriber device access to the first POC talkgroup comprises granting the plurality of non-subscriber devices access to the first POC talkgroup; and

the transmitting the first communication comprises transmitting the first communication to each non-subscriber device of the plurality of non-subscriber devices.

7. The method of claim 1, wherein:

the first POC talkgroup is one of a plurality of POC talkgroups; and

each POC talkgroup of the plurality of POC talkgroups is linked as part of a single virtual incident.

8. A method of managing access to a push-to-talk-over-cellular (POC) talkgroup, the method comprising:

providing a control device configured to:

provide a POC service; and manage a first POC talkgroup;

providing a first subscriber device;

transmitting, from the first subscriber device to the control device, first non-subscriber contact information associated with a first non-subscriber device; and

controlling the control device to grant the first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the first POC service.

9. The method of claim 8, further comprising automatically revoking access of the first non-subscriber device to the first POC talkgroup after a predetermined period of time has elapsed.

10. The method of claim 8, further comprising transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service.

11. The method of claim 8, further comprising:

setting a predetermined time via the first subscriber device; and

automatically revoking access of the first non-subscriber device to the first POC talkgroup after the predetermined period of time has elapsed.

12. The method of claim 8, wherein:

the first non-subscriber device is a cellular device; and

the first non-subscriber contact information is a first cellular telephone number.

13. The method of claim 8, wherein:

the first non-subscriber device is a land mobile radio (LMR) gateway; and

the first non-subscriber contact information is an internet protocol address of the LMR gateway.

14. The method of claim 8, wherein:

the first non-subscriber device is one of a plurality of non-subscriber devices;

the transmitting, from the first subscriber device to the control device, first non- subscriber contact information associated with a first non-subscriber device comprises transmitting, from the first subscriber device to the control device, non-subscriber contact information associated with each non-subscriber device of the plurality of non-subscriber devices; and

the granting the first non-subscriber device access to the first POC talkgroup comprises granting the plurality of non-subscriber devices access to the first POC talkgroup.

15. The method of claim 8, wherein:

the first POC talkgroup is one of a plurality of POC talkgroups; and

each POC talkgroup of the plurality of POC talkgroups is linked as part of a single virtual incident.

16. A method of managing access to a push-to-talk-over-cellular (POC) talkgroup, the method comprising:

providing a control device configured to:

provide a POC service; and

manage a first POC talkgroup;

granting a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service;

transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service; and

controlling the first non-subscriber device to install the POC software application and use the POC software application to communicate with the first POC talkgroup via the POC service.

17. The method of claim 16, further comprising automatically revoking access of the first non-subscriber device to the first POC talkgroup after a predetermined period of time has elapsed.

18. The method of claim 16, further comprising:

providing a first subscriber device; and

transmitting, from the first subscriber device to the control device, first non-subscriber contact information associated with the first non-subscriber device.

19. The method of claim 18, further comprising:

setting a predetermined time via the first subscriber device; and

automatically revoking access of the first non-subscriber device to the first POC talkgroup after the predetermined period of time has elapsed.

20. The method of claim 18, wherein:

the first non-subscriber device is a cellular device; and

the first non-subscriber contact information is a first cellular telephone number.

ABSTRACT

A method of managing access to a push-to-talk-over-cellular (POC) talkgroup may include providing a control device configured to provide a POC service and manage a first POC talkgroup. The method may further include controlling the control device to grant a first non-subscriber device access to the POC service and the first POC talkgroup such that the first non-subscriber device is permitted to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service. The method may further include transmitting, from the control device to the first non-subscriber device, a first communication including a link to download a POC software application configured to join the first POC talkgroup and communicate via the first POC talkgroup using the POC service.