US009742713B2

(12) **United States Patent**
Spiegel et al.

(10) **Patent No.: US 9,742,713 B2**
(45) **Date of Patent: *Aug. 22, 2017**

(54) **APPARATUS AND METHOD FOR MAINTAINING A MESSAGE THREAD WITH OPT-IN PERMANENCE FOR ENTRIES**

(71) Applicant: **Snapchat, Inc.**, Venice, CA (US)

(72) Inventors: **Evan Spiegel**, Venice, CA (US); **Timothy Sehn**, Marina Del Rey, CA (US)

(73) Assignee: **Snap Inc.**, Venice, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/274,610**

(22) Filed: **May 9, 2014**

(65) **Prior Publication Data**

US 2014/0359032 A1 Dec. 4, 2014

Related U.S. Application Data

(63) Continuation-in-part of application No. 13/906,261, filed on May 30, 2013.

(51) **Int. Cl.**
G06F 15/16 (2006.01)
H04L 12/58 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 51/16*** (2013.01)

(58) **Field of Classification Search**
CPC G06Q 10/107; H04L 12/58; H04L 12/581; H04L 12/5885; H04L 51/00; H04L 51/04; H04L 51/16; H04L 51/18; H04L 51/22; H04L 51/32; H04L 51/34; H04L 63/0428; H04L 51/30
USPC 709/206
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,999,932 A * 12/1999 Paul G06Q 10/107
6,154,764 A 11/2000 Nitta et al.
6,167,435 A * 12/2000 Druckenmiller et al. 709/206
6,204,840 B1 3/2001 Petelycky et al.
6,216,141 B1 4/2001 Straub et al.
6,310,694 B1 10/2001 Okimoto et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2887596 A1 6/2016
WO 2014/194262 A2 12/2014
WO 2016/007285 A1 1/2016

OTHER PUBLICATIONS

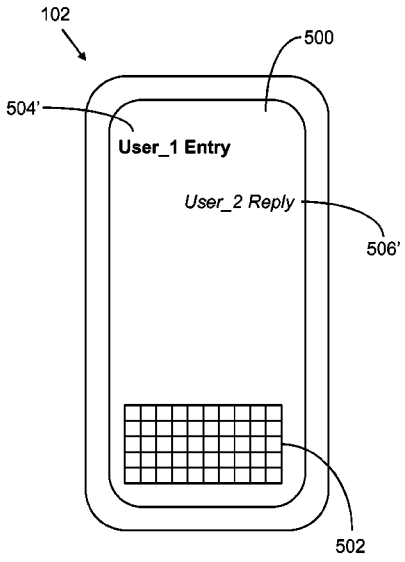
Sewers, Paul. "Snapchat for iOS lets you send photos to friends and set how long they're visible for". May 7, 2012. <http://thenextweb.com/apps/2012/05/07/snapchat-for-ios-lets-you-send-photos-to-friends-and-set-how-long-theyre-visible-for/#!xCjrp>. pp. 1-5.*
(Continued)

Primary Examiner — Christopher Biagini
(74) *Attorney, Agent, or Firm* — Cooley LLP

(57) **ABSTRACT**

A server has a processor and a memory storing a message thread module with instructions executed by the processor to maintain a message thread between users of client devices. Message thread state changes are queued at the server. The message thread is revised based upon the message thread state changes to form shared message thread state. The shared message thread state is stored. The shared message thread state is supplied in response to a request for the message thread from a user.

10 Claims, 7 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

6,484,196 B1 * 11/2002 Maurille 709/206
6,665,531 B1 12/2003 Soderbacka et al.
6,724,403 B1 4/2004 Santoro et al.
6,757,713 B1 * 6/2004 Ogilvie et al. 709/206
6,898,626 B2 5/2005 Ohashi
7,124,164 B1 10/2006 Chemtob
7,149,893 B1 12/2006 Leonard et al.
7,203,380 B2 4/2007 Chiu et al.
7,243,163 B1 * 7/2007 Friend G06F 17/30575 707/E17.032
7,356,564 B2 4/2008 Hartselle et al.
7,519,670 B2 4/2009 Hagale et al.
7,856,449 B1 * 12/2010 Martino G06F 17/3089 707/781
8,001,204 B2 8/2011 Burtner et al.
8,098,904 B2 1/2012 Ioffe et al.
8,112,716 B2 2/2012 Kobayashi
8,276,092 B1 9/2012 Narayanan et al.
8,279,319 B2 10/2012 Date
8,312,086 B2 11/2012 Velusamy et al.
8,312,097 B1 11/2012 Siegel et al.
8,379,130 B2 2/2013 Forutanpour et al.
8,405,773 B2 3/2013 Hayashi et al.
8,418,067 B2 4/2013 Cheng et al.
8,428,453 B1 4/2013 Spiegel et al.
8,471,914 B2 6/2013 Sakiyama et al.
8,560,612 B2 10/2013 Kilmer et al.
8,687,021 B2 4/2014 Bathiche et al.
8,744,523 B2 6/2014 Fan et al.
8,775,972 B2 7/2014 Spiegel
8,788,680 B1 7/2014 Naik
8,797,415 B2 8/2014 Arnold
8,856,349 B2 10/2014 Jain et al.
8,914,752 B1 12/2014 Spiegel
9,026,943 B1 5/2015 Spiegel
9,037,577 B1 5/2015 Saylor et al.
9,083,770 B1 7/2015 Dröse et al.
9,098,832 B1 8/2015 Scardino
9,225,897 B1 12/2015 Sehn
9,237,202 B1 1/2016 Sehn
9,276,886 B1 3/2016 Samaranayake
9,396,354 B1 7/2016 Murphy et al.
9,407,712 B1 8/2016 Sehn
9,407,816 B1 8/2016 Sehn
2002/0047868 A1 4/2002 Miyazawa
2002/0087884 A1 * 7/2002 Shacham H04L 63/0442 726/8
2002/0122659 A1 9/2002 McGrath et al.
2002/0144154 A1 * 10/2002 Tomkow H04L 12/5875 726/1
2003/0016247 A1 1/2003 Lai et al.
2003/0052925 A1 3/2003 Daimon et al.
2003/0126215 A1 7/2003 Udell et al.
2003/0164856 A1 9/2003 Prager et al.
2004/0027371 A1 2/2004 Jaeger
2004/0111467 A1 6/2004 Willis
2004/0243531 A1 12/2004 Dean
2005/0078804 A1 4/2005 Yomoda
2005/0097176 A1 5/2005 Schatz et al.
2005/0104976 A1 5/2005 Currans
2005/0114783 A1 5/2005 Szeto
2005/0122405 A1 6/2005 Voss et al.
2005/0193340 A1 9/2005 Amburgey et al.
2005/0193345 A1 9/2005 Klassen et al.
2005/0198128 A1 9/2005 Anderson et al.
2005/0223066 A1 10/2005 Buchheit et al.
2006/0114338 A1 6/2006 Rothschild
2006/0270419 A1 11/2006 Crowley et al.
2007/0040931 A1 2/2007 Nishizawa
2007/0064899 A1 3/2007 Boss et al.
2007/0073823 A1 3/2007 Cohen et al.
2007/0082707 A1 4/2007 Flynt et al.
2007/0192128 A1 8/2007 Celestini
2007/0214216 A1 9/2007 Carrer et al.
2007/0233801 A1 10/2007 Eren et al.
2007/0243887 A1 10/2007 Bandhole et al.
2007/0255456 A1 11/2007 Funayama
2008/0025701 A1 1/2008 Ikeda
2008/0033930 A1 2/2008 Warren
2008/0055269 A1 3/2008 Lemay et al.
2008/0104503 A1 5/2008 Beall et al.
2008/0207176 A1 * 8/2008 Brackbill H04M 1/7255 455/413
2008/0222545 A1 9/2008 Lemay et al.
2008/0256446 A1 10/2008 Yamamoto
2008/0266421 A1 10/2008 Takahata et al.
2008/0270938 A1 10/2008 Carlson
2008/0313346 A1 12/2008 Kujawa et al.
2009/0006565 A1 1/2009 Velusamy et al.
2009/0015703 A1 1/2009 Kim et al.
2009/0024956 A1 1/2009 Kobayashi
2009/0040324 A1 2/2009 Nonaka
2009/0042588 A1 2/2009 Lottin et al.
2009/0058822 A1 3/2009 Chaudhri
2009/0079846 A1 3/2009 Chou
2009/0132453 A1 5/2009 Hangartner et al.
2009/0132665 A1 5/2009 Thomsen et al.
2009/0160970 A1 6/2009 Fredlund et al.
2009/0265647 A1 10/2009 Martin et al.
2010/0082693 A1 4/2010 Hugg et al.
2010/0131880 A1 5/2010 Lee et al.
2010/0131895 A1 5/2010 Wohlert
2010/0156933 A1 6/2010 Jones et al.
2010/0159944 A1 * 6/2010 Pascal et al. 455/456.1
2010/0161831 A1 6/2010 Haas et al.
2010/0185665 A1 7/2010 Horn et al.
2010/0214436 A1 8/2010 Kim et al.
2010/0223128 A1 9/2010 Dukellis et al.
2010/0223343 A1 9/2010 Bosan et al.
2010/0257196 A1 10/2010 Waters et al.
2010/0281045 A1 11/2010 Dean
2010/0306669 A1 12/2010 Della Pasqua
2011/0004071 A1 1/2011 Faiola et al.
2011/0040783 A1 2/2011 Uemichi et al.
2011/0040804 A1 2/2011 Peirce et al.
2011/0050909 A1 3/2011 Ellenby et al.
2011/0050915 A1 3/2011 Wang et al.
2011/0102630 A1 5/2011 Rukes
2011/0145564 A1 6/2011 Moshir et al.
2011/0184980 A1 7/2011 Jeong et al.
2011/0197194 A1 8/2011 D'Angelo et al.
2011/0202968 A1 8/2011 Nurmi
2011/0211534 A1 9/2011 Schmidt et al.
2011/0213845 A1 9/2011 Logan et al.
2011/0273575 A1 11/2011 Lee
2011/0283188 A1 11/2011 Farrenkopf et al.
2011/0320373 A1 12/2011 Lee et al.
2012/0028659 A1 2/2012 Whitney et al.
2012/0062805 A1 3/2012 Candelore
2012/0108293 A1 5/2012 Law et al.
2012/0110096 A1 5/2012 Smarr et al.
2012/0113143 A1 5/2012 Adhikari et al.
2012/0113272 A1 5/2012 Hata
2012/0131507 A1 5/2012 Sparandara et al.
2012/0131512 A1 5/2012 Takeuchi et al.
2012/0143760 A1 6/2012 Abulafia et al.
2012/0150978 A1 6/2012 Monaco et al.
2012/0166971 A1 6/2012 Sachson et al.
2012/0169855 A1 7/2012 Oh
2012/0173991 A1 7/2012 Roberts et al.
2012/0176401 A1 7/2012 Hayward et al.
2012/0184248 A1 7/2012 Speede
2012/0200743 A1 8/2012 Blanchflower et al.
2012/0210244 A1 8/2012 deFrancisco Lopez et al.
2012/0212632 A1 8/2012 Mate et al.
2012/0220264 A1 8/2012 Kawabata
2012/0233000 A1 9/2012 Fisher et al.
2012/0236162 A1 9/2012 Imamura
2012/0239761 A1 9/2012 Linner et al.
2012/0250951 A1 10/2012 Chen
2012/0278387 A1 11/2012 Garcia et al.
2012/0278692 A1 11/2012 Shi
2012/0281129 A1 11/2012 Wang et al.
2012/0299954 A1 11/2012 Wada et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2012/0304080	A1	11/2012	Wormald et al.	
2012/0307096	A1	12/2012	Ford et al.	
2012/0323933	A1	12/2012	He et al.	
2013/0050260	A1	2/2013	Reitan	
2013/0057587	A1	3/2013	Leonard et al.	
2013/0059607	A1	3/2013	Herz et al.	
2013/0060690	A1	3/2013	Oskolkov et al.	
2013/0063369	A1	3/2013	Malhotra et al.	
2013/0067027	A1	3/2013	Song et al.	
2013/0071093	A1	3/2013	Hanks et al.	
2013/0085790	A1	4/2013	Palmer et al.	
2013/0128059	A1	5/2013	Kristensson	
2013/0145286	A1	6/2013	Feng et al.	
2013/0169822	A1	7/2013	Zhu et al.	
2013/0173729	A1	7/2013	Starenky et al.	
2013/0182133	A1	7/2013	Tanabe	
2013/0185131	A1	7/2013	Sinha et al.	
2013/0194301	A1	8/2013	Robbins et al.	
2013/0198176	A1	8/2013	Kim	
2013/0222323	A1	8/2013	McKenzie	
2013/0227476	A1	8/2013	Frey	
2013/0232194	A1	9/2013	Knapp et al.	
2013/0263031	A1	10/2013	Oshiro et al.	
2013/0265450	A1	10/2013	Barnes, Jr.	
2013/0290443	A1	10/2013	Collins et al.	
2013/0344896	A1	12/2013	Kirmse et al.	
2013/0346877	A1	12/2013	Borovoy et al.	
2014/0011538	A1	1/2014	Mulcahy et al.	
2014/0032682	A1	1/2014	Prado et al.	
2014/0047045	A1	2/2014	Baldwin et al.	
2014/0047335	A1	2/2014	Lewis et al.	
2014/0049652	A1	2/2014	Moon et al.	
2014/0052485	A1	2/2014	Shidfar	
2014/0052633	A1	2/2014	Gandhi	
2014/0057660	A1	2/2014	Wager	
2014/0122658	A1	5/2014	Haeger et al.	
2014/0122787	A1	5/2014	Shalvi et al.	
2014/0129953	A1	5/2014	Spiegel	
2014/0143143	A1	5/2014	Fasoli et al.	
2014/0149519	A1	5/2014	Redfern et al.	
2014/0155102	A1	6/2014	Cooper et al.	
2014/0173457	A1	6/2014	Wang et al.	
2014/0189592	A1	7/2014	Benchenaa et al.	
2014/0201527	A1*	7/2014	Krivorot	G06F 21/6209 713/168
2014/0207679	A1	7/2014	Cho	
2014/0214471	A1	7/2014	Schreiner, III	
2014/0279436	A1	9/2014	Dorsey et al.	
2014/0280537	A1	9/2014	Pridmore et al.	
2014/0282096	A1	9/2014	Rubinstein et al.	
2014/0298210	A1	10/2014	Park et al.	
2014/0317302	A1	10/2014	Naik	
2014/0325383	A1	10/2014	Brown et al.	
2014/0359024	A1	12/2014	Spiegel	
2015/0046278	A1	2/2015	Pei et al.	
2015/0116529	A1	4/2015	Wu et al.	
2015/0172534	A1	6/2015	Miyaka	
2016/0006927	A1	1/2016	Sehn	

OTHER PUBLICATIONS

Fajman, R. "RFC 2298: An Extensible Message Format for Message Disposition Notifications". IETF Network Working Group, Mar. 1998. pp. 1-28.*

IVisit, "iVisit Mobile Getting Started", Dec. 4, 2013, iVisit, pp. 1-16.

Melanson, Mike, "This text message will self destruct in 60 seconds", available on Feb. 11, 2011, retrieved from readwrite.com on Feb. 18, 2015, link: http://readwrite.com/2011/02/11/this_text_message_will_self_destruct_in_60_seconds, referred to hereinafter as Read-Write.

International Search Report and Written Opinion issued to international patent application No. PCT/US2015/037251, Sep. 29, 2015, 7 pgs.

Shein, "Ephemeral Data", Communications of the ACM, vol. 56, No. 9, Sep. 2013, pp. 20-22.

Snapchat, "How Snaps Are Stored and Deleted", May 9, 2013, 3 pgs.

International Search Report and Written Opinion issued to International Patent Application No. PCT/US2014/040346, Mar. 23, 2015, 9 pgs.

Fajman, "An Extensible Message Format for Message Disposition Notifications", Request for Comments: 2298, National Institutes of Health, Mar. 1998, 28 pgs.

Supplementary European Search Report issued to EP Application No. 14804343.3, Sep. 29, 2016, 11 pgs.

Voxer Business, "Android Getting Started Guide", Feb. 1, 2014, 18 pgs.

* cited by examiner

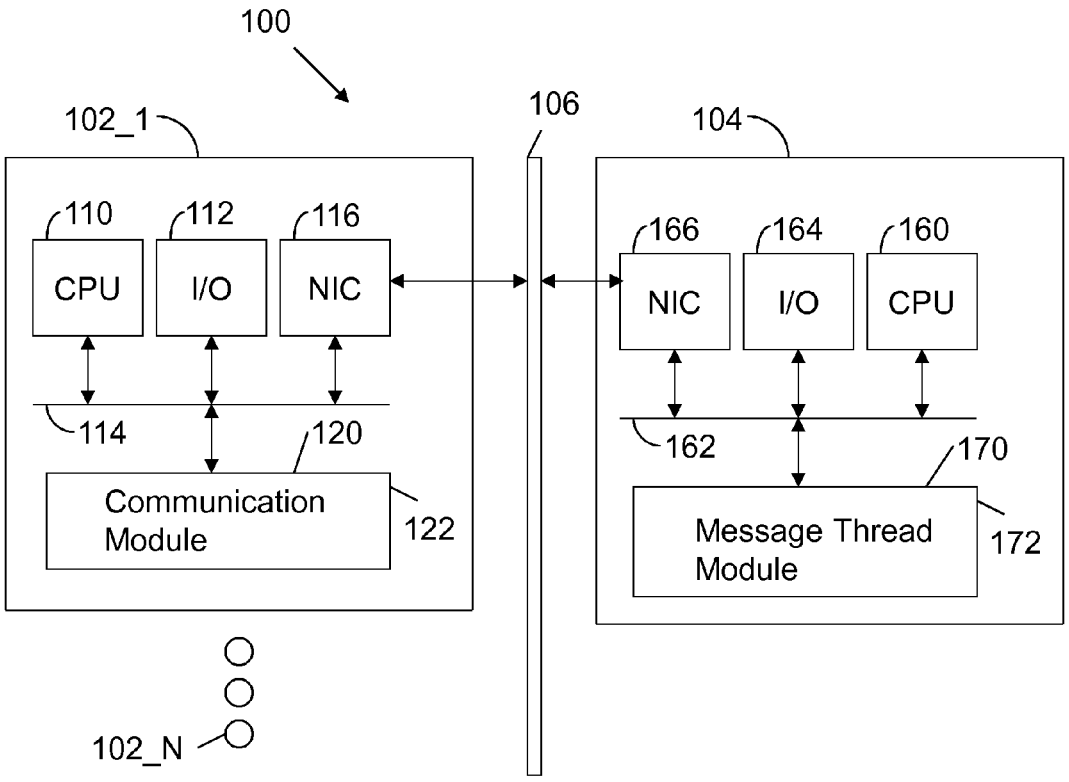

100
102_1
106
104
110
112
116
CPU
I/O
NIC
114
120
Communication Module
122
166
164
160
NIC
I/O
CPU
162
170
Message Thread Module
172
102_N

FIG. 1

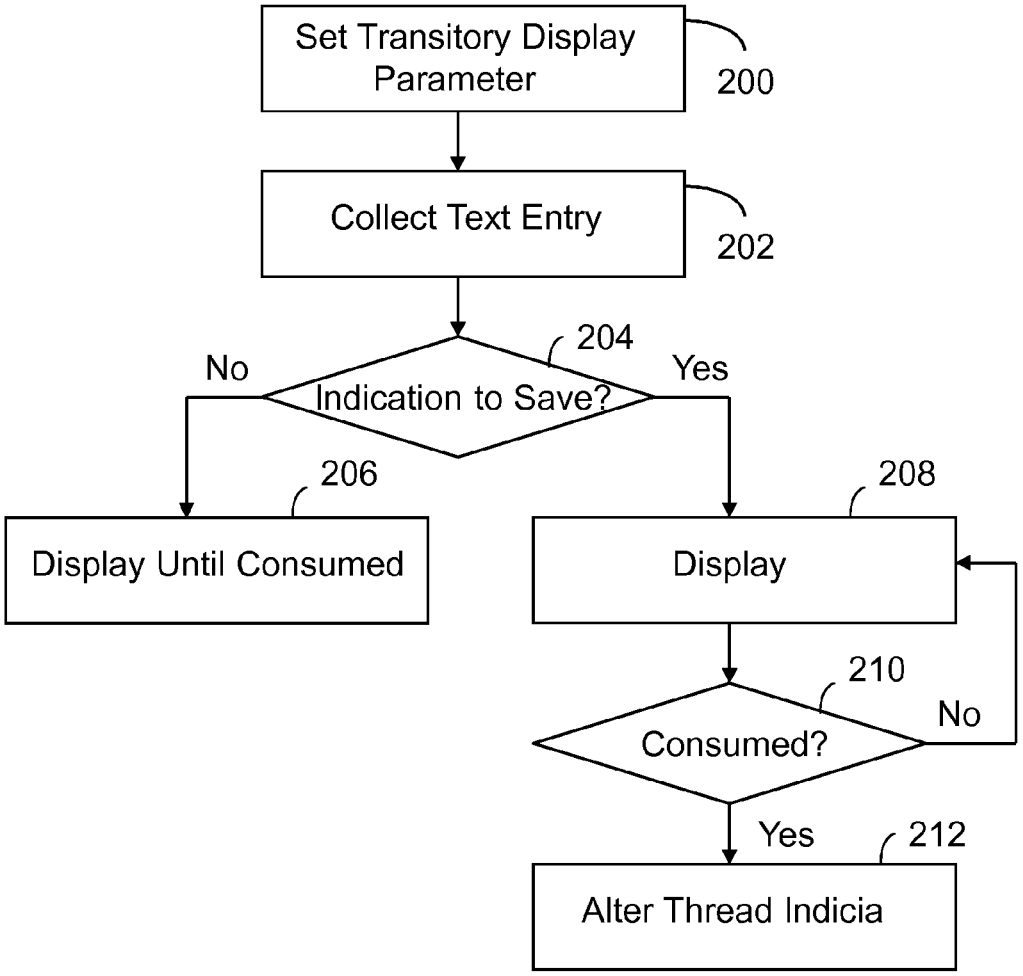

Set Transitory Display Parameter
200
Collect Text Entry
202
204
No
Indication to Save?
Yes
206
208
Display Until Consumed
Display
210
No
Consumed?
Yes
212
Alter Thread Indicia

FIG. 2

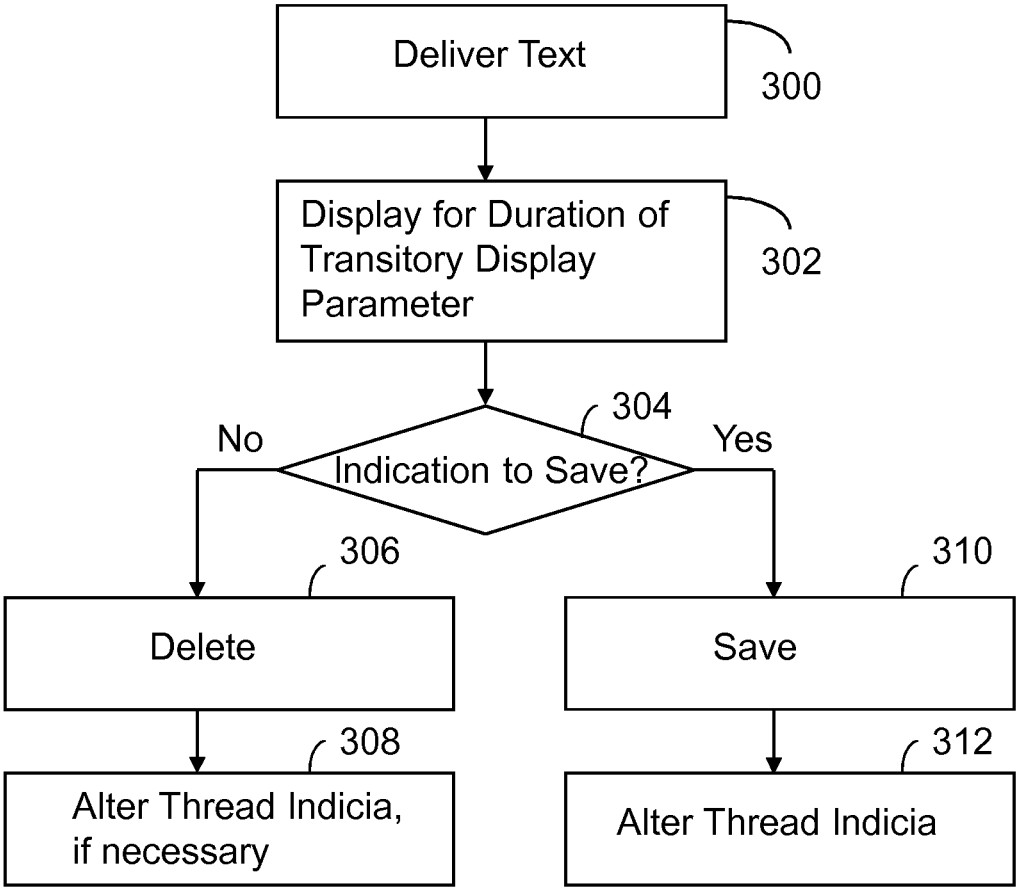

Deliver Text
300
Display for Duration of Transitory Display Parameter
302
304
No
Indication to Save?
Yes
306
310
Delete
Save
308
312
Alter Thread Indicia, if necessary
Alter Thread Indicia

FIG. 3

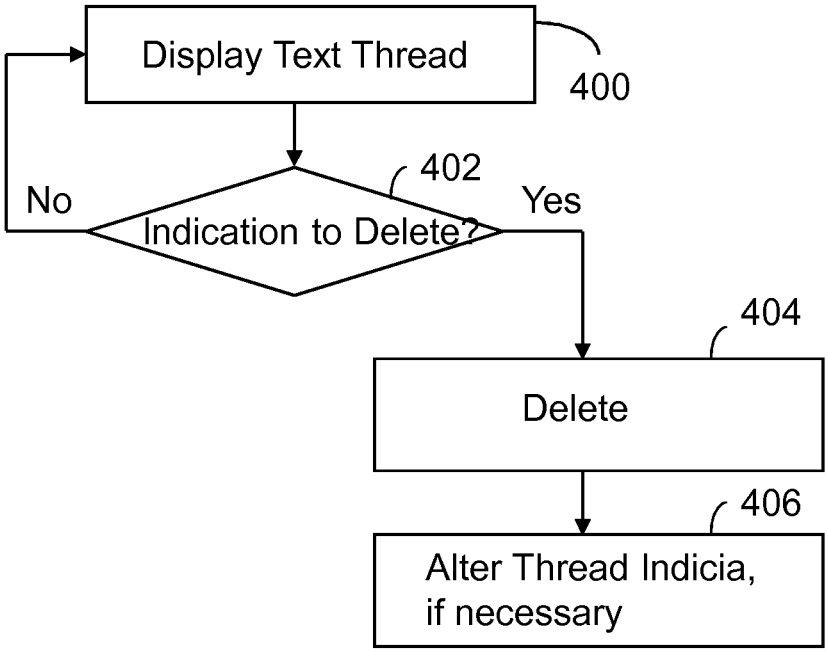

Display Text Thread
400
402
No
Indication to Delete?
Yes
404
Delete
406
Alter Thread Indicia,
if necessary

FIG. 4

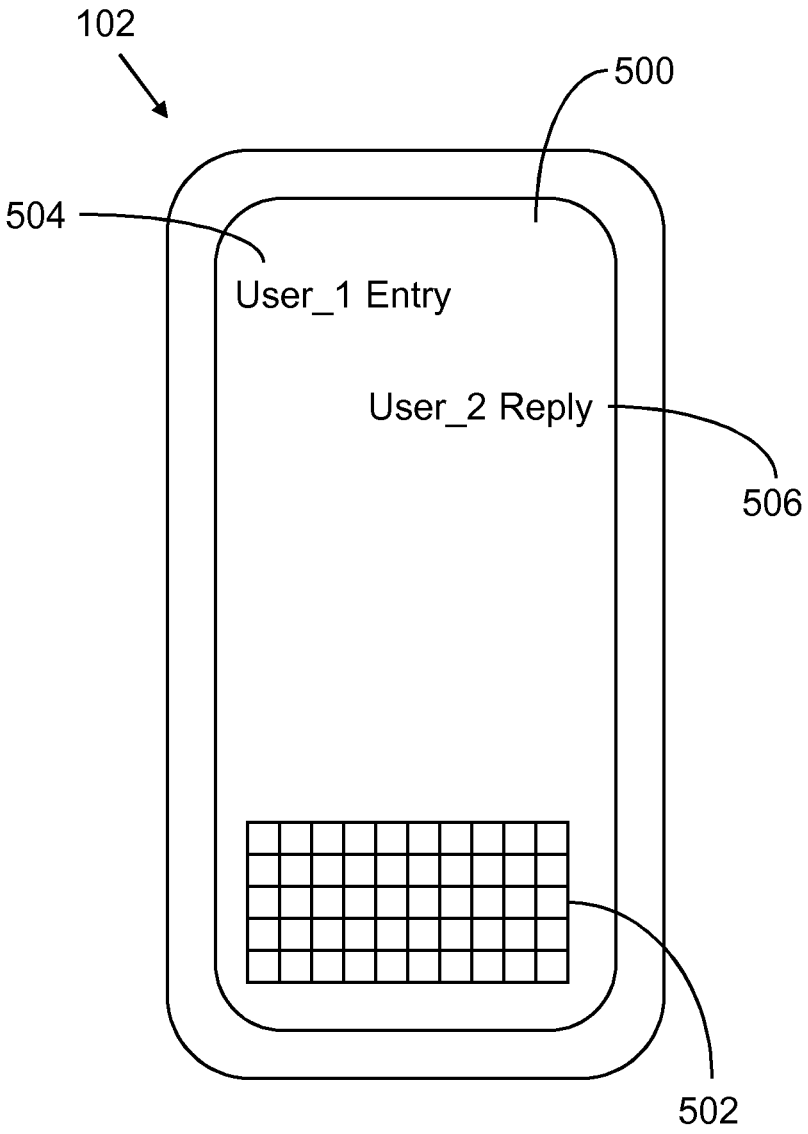


FIG. 5

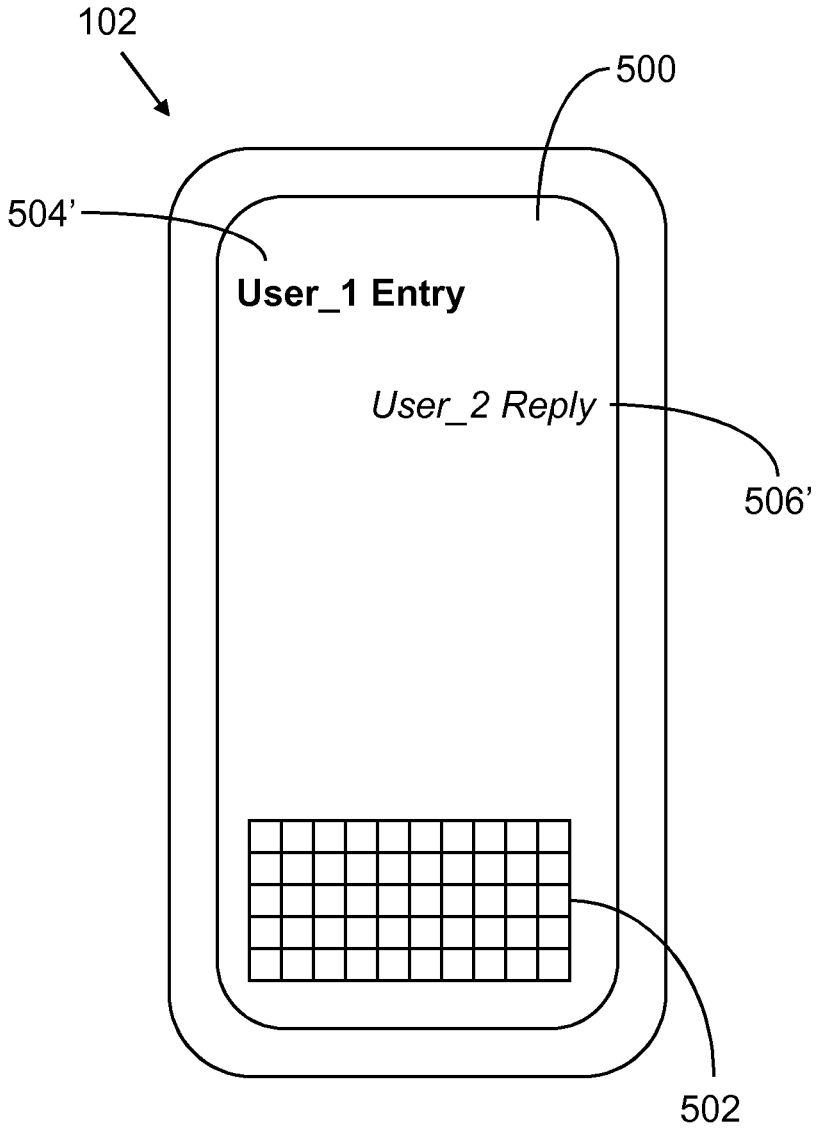


FIG. 6

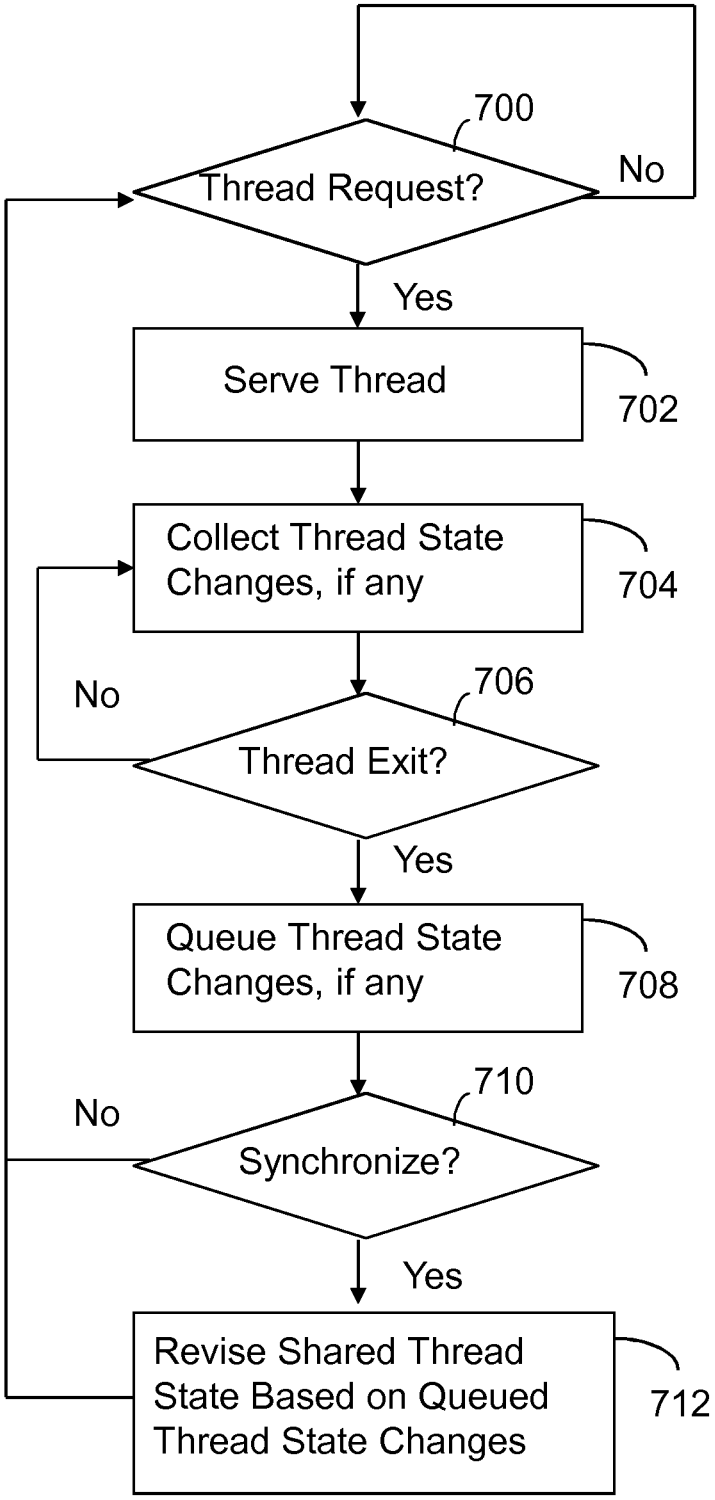

700
Thread Request?
No
Yes
Serve Thread
702
Collect Thread State Changes, if any
704
No
706
Thread Exit?
Yes
Queue Thread State Changes, if any
708
710
No
Synchronize?
Yes
Revise Shared Thread State Based on Queued Thread State Changes
712

FIG. 7

APPARATUS AND METHOD FOR MAINTAINING A MESSAGE THREAD WITH OPT-IN PERMANENCE FOR ENTRIES

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. Ser. No. 13/906,261, filed May 30, 2013.

FIELD OF INVENTION

This invention relates generally to communications in a networked environment. More particularly, this invention relates to maintaining a message thread with opt-in permanence for entries.

BACKGROUND OF THE INVENTION

Communications between individuals are increasingly digitized and transmitted via the Internet. Individuals are communicating through text messages, email messages, voice mail messages and the like. In the case of a text message between two individuals a conversation thread is maintained. Each individual contributes text to a chronologically listed record of the communications between the two individuals. With each new communication, a new entry is added to the communication thread. Either individual can review the conversation thread at any time and edit it locally in the messaging client.

Maintaining a complete and precise record of a sequence of communication may inhibit the spontaneity of an interaction. For example, when one has a conversation with an individual, it is typically not recorded and therefore the exchange may be more candid.

A live conversation between two individuals may be memorialized with notes, but in this case there is visual feedback indicating when one individual is recording information, which allows the other individual to clarify a point or otherwise alter the direction of the conversation.

Storing the entire contents of a digital conversation may also make it difficult to surface the most important information. It is a case of information overload. Selectively saving certain communications in an ephemeral conversation thread allows the user to quickly recall or reference important aspects of the thread.

In view of the foregoing, it would be desirable to have a digital communication mechanism that more naturally mimics the types of interactions to which individuals are accustomed.

SUMMARY OF THE INVENTION

A server has a processor and a memory storing a message thread module with instructions executed by the processor to maintain a message thread between users of client devices. The message thread module serves a message thread with a new text entry to a client device in response to a request for the message thread from a user. Message thread state change is collected from the client device, where the message thread state change represents an indication to automatically delete the new text entry of the message thread after the duration of a transitory display period on the client device unless an indication of a gesture applied to a display screen presenting the new text entry of the message thread is received from the client device during the transitory display period. The message thread state change is queued at the server along with additional message thread state changes associated with the collecting operation performed for additional users associated with the message thread. The message thread is revised based upon the message thread state change and the additional message thread state changes to form a single shared message thread state. The shared message thread state is stored. The single shared message thread state is supplied in response to a request for the message thread from a user.

BRIEF DESCRIPTION OF THE FIGURES

The invention is more fully appreciated in connection with the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. **1** illustrates a system configured in accordance with an embodiment of the invention.

FIG. **2** illustrates message generation processing utilized in accordance with an embodiment of the invention.

FIG. **3** illustrates message consumption processing utilized in accordance with an embodiment of the invention.

FIG. **4** illustrates message thread review processing utilized in accordance with an embodiment of the invention.

FIG. **5** illustrates a first message thread displayed in accordance with an embodiment of the invention.

FIG. **6** illustrates the message thread of FIG. **5** with altered parameters associated with entries of the message thread.

FIG. **7** illustrates asynchronous batch mode processing performed in accordance with an embodiment of the invention.

Like reference numerals refer to corresponding parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** illustrates a system **100** configured in accordance with an embodiment of the invention. The system **100** includes a set of client devices **102_1** through **102_N** and at least one server **104** connected via a network **106**, which may be any wired or wireless network.

Each client device **102** may be a computer, tablet, Smartphone and the like with standard components, such as a central processing unit **110** connected to input/output devices **112** via a bus **114**. The input/output devices **112** may include a touch display, keyboard, mouse and the like. A network interface circuit **116** is also connected to the bus **114** to provide connectivity with network **106**.

A memory **120** is also connected to the bus **114**. The memory **120** stores standard components, such as a communication module **122**. The communication module **122** may be a text message module that supports Short Message Service (SMS) texting. Alternately, the communication module **122** may be a browser, which supports access to an email server. Alternately, the communication module **122** may be a telephony interface that supports telephone interactions, such as voice messages.

Server **104** also includes standard components, such as a central processing unit **160** connected to input/output devices **164** via a bus **162**. A network interface circuit **166** is also connected to the bus **162**. Further, a memory **170** is connected to the bus **162**. The memory **170** stores modules of executable instructions to implement disclosed operations. For example, the memory **170** may store a message thread module **172**, which maintains a thread of communications between at least two individuals. The thread of communications may be a text message thread, an email

with a sequence of returned communications or a voice mail file with a sequence of returned communications.

The configuration of system **100** is exemplary. The system **100** may include multiple servers **104** and a variety of communication devices to support various forms of digital communication.

FIG. **2** illustrates processing operations associated with an embodiment of the message thread module **172**. In particular, the figure illustrates message generation processing utilized in accordance with an embodiment of the invention. By way of example, operations will be discussed in the context of text messaging.

Initially, a transitory display parameter is set **200**. The transitory display parameter may be set as a default value (e.g., a 3 second viewing period) or it may be set through user input. The notion associated with the transitory display parameter is that all message entries will be deleted after the transitory display parameter time expires and therefore message entries are transitory, unless an individual opts-in for message entry permanence.

The next operation of FIG. **2** is to collect a text entry **202**. The text entry collection process is terminated when an individual indicts that the text entry should be sent. At this point it is determined if there was an indication to save the text entry **204**. The indication may be in the form of a gesture applied to the screen where the text is entered. Alternately, the indication may be based upon a specified key or combination of keys on a keyboard used to enter the text.

If there is no indication to save the entry (**204**—No), then the text is displayed in the thread associated with the sender and the recipient. When the recipient reads or otherwise consumes the entry, the entry is deleted from the thread associated with the sender **206**.

If there is an indication to save the entry (**204**—Yes), then the entry is displayed in its original form in the thread associated with the sender and the recipient. A check is periodically made to determine if the entry has been read by the recipient **210**. If not (**210**—No), the entry continues to be displayed in its original form. If so (**210**—Yes), indicia associated with the thread is altered **212**. That is, after the recipient reads the entry the nature of the entry will be altered on the sending side and the receiving side. If the recipient does not provide an indication to save the entry, then the indicia of the entry on the sending side thread will be altered to indicate that only one of the two parties (the sender) has saved the entry. If the recipient provides an indication to save the entry, then the indicia of the entry on the sending side and the receiving side is altered to indicate that both of the parties have saved the entry. In an alternate embodiment, the message may be restored in the sender side thread if the recipient provides an indication to save the message. This restoration in the sender side thread includes indicia that the recipient saved the message, although the sender originally declined to do so.

The operations of FIG. **2** are performed by the message thread module **172** operating in conjunction with a client device **102**. That is, operations such as collecting a text entry **202** and identifying an indication to save **204** are performed at the client device **102**, with the results of the operations passed and processed to the message thread module **172**. Similarly, the display until consumed operation **206**, display operation **208** and altering of thread indicia **212** are manifested at the client device **102** in response to information supplied by the message thread module **172**.

FIG. **3** illustrates message consumption processing operations performed in accordance with an embodiment of the invention. The message thread module **172** coordinates the delivery of the text to the recipient **300**. The text is displayed for the duration of the transitory display parameter **302**. That is, the message thread module **172** directs the client device **102** to display the text for the duration of the transitory display parameter. Alternately, the text may be displayed until it is actively deleted or the user scrolls past it without saving it.

It is determined whether there is an indication to save the entry **304** during the duration of the transitory display parameter. If not (**304**—No), the message is deleted **306** from the recipient's thread. Thread indicia of the sender is altered, if necessary **308**. That is, if the sender elected to preserve the entry, then indicia associated with the entry would be altered to indicate that the sender preserved the entry, but the recipient did not.

If there is an indication to save the entry (**304**—Yes), the entry is saved in the recipient's thread **310**. The thread indicia are altered **312** to at least indicate that the recipient has saved the entry. If the sender also saved the entry, then the sender's indicia and the recipient's indicia reflect that both entities have saved the message.

FIG. **4** illustrates thread review processing that may be performed in accordance with an embodiment of the invention. Initially, a text thread is displayed to a user **400**. The text thread is between the user and one or more other users. As the user scrolls through the text thread, individual entries may be deleted. If so (**402**—Yes), the individual entry is deleted **404**. If necessary, indicia associated with the entry on another device is altered **406**. For example, if another user had saved the entry and the present user had saved the entry initially, then the indicia associated with the entry on the two client devices would indicate that both parties saved the entry. After one party deletes the entry, the indicia associated with the entry for the other party indicates that only a single party has saved the entry.

FIG. **5** illustrates a client device **102** with a display screen **500** and a keyboard **502**. The display screen **500** displays a thread including a first entry **504** from a first user and a second entry **506** from a second user. The first entry **504** is persisted in response to a gesture applied to the display screen **500**. The second entry **506** is also persisted in response to a gesture applied to the display screen **500**.

FIG. **6** illustrates updated indicia indicating different states of entry preservation. Entry **504'** is in bold to reflect that both the sender and the recipient persisted the entry. Entry **506'** is italicized to indicate that the reply was preserved by the recipient, but not the sender.

Thus, in this example, a parameter in the form of varying fonts is altered to reflect the persistence of an entry. Other parameters may be used, such as a separate graphic indicative of the preservation states. Alternately, the parameter may be in the form of a number where a 1 indicates that only the user of the client device has saved the entry and where the number 2 indicates that two parties have saved the entry. Larger numbers may be used in the event of a group message. A text color scheme may also be used to indicate preservation states.

In one embodiment, the message thread module **172** is configured to eliminate the ability to copy/paste a conversation? This prevents aspects of the conversation from being taken out of context. In addition, this feature keeps the record of the "saved" communications consistent.

Thus, it will be appreciated that the disclosed techniques allow for a digital communication mechanism that more naturally mimics the types of interactions to which individuals are accustomed. That is, individual utterances (entries)

are transitory in nature, unless a user opts-in to preserve an utterance. Opting-in to preserve an utterance may result in feedback that allows a counter-party to know that another has preserved the entry.

In addition to providing a more natural communication flow, the invention may provide a more condensed communication thread where only perceived important entries are preserved. This can be advantageous in connection with the use of a mobile device, which has a small screen and therefore a limited ability to display information. This may also be advantageous as it reduces the amount of information that needs to be communicated across a network.

The invention has been disclosed in the context of text communications. However, the same techniques may be applied to email communications or threaded voicemail or multimedia communications.

This disclosure has discussed real time updates to a message thread. An embodiment of the invention reduces computation demand by utilizing batch mode asynchronous processing. The message thread module **172** may be configured to implement such operations, as shown in FIG. **7**. Initially, a request for a message thread is received **700**. The message thread is associated with two or more users, any of which may request the message thread. The request is typically in response to an indication of a new text entry in the message thread. The message thread is served **702**. Message thread state change, if any, is collected **704**. The message thread state change represents an indication to automatically delete the new text entry of the message thread after the duration of a transitory display period on the client device unless an indication of a gesture applied to a display screen presenting the new text entry is received from the client device during the transitory display period. The state change may be queued at the server instantaneously or when the user exits the message thread (**706**—Yes). State changes, if any, are queued by the server **708**. It should be appreciated that the queued messages may include message thread state change from the recently served message thread and/or additional message thread state changes from previously and subsequently served message threads to other users associated with the message thread.

A synchronization condition may then be applied **710**. The synchronization condition may be a specified time of day. For example, batch mode asynchronous processing may be performed in the middle of the night when there is typically low demand on computational resources. If the synchronization condition is satisfied (**710**—Yes), the shared thread state is revised based on queued thread state changes **712**. That is, the message thread is revised based upon all message thread state change associated with the message thread to produce new shared message thread state, which may be persistently stored until the next synchronization event. The new shared message thread state is supplied **702** in response to a request for the message thread from a user (**700**—Yes).

Techniques of the invention may be used in connection with non-textual communications, such as a thread of exchanged photographs. Further, the techniques of the invention may be used in connection with a variety of user inputs, such as a mouse click associated with a desktop computer, a gesture applied to a controller associated with a game console, a shaking motion applied to a mobile device and the like.

An embodiment of the present invention relates to a computer storage product with a non-transitory computer readable storage medium having computer code thereon for performing various computer-implemented operations. The media and computer code may be those specially designed and constructed for the purposes of the present invention, or they may be of the kind well known and available to those having skill in the computer software arts. Examples of computer-readable media include, but are not limited to: magnetic media, optical media, magneto-optical media and hardware devices that are specially configured to store and execute program code, such as application-specific integrated circuits ("ASICs"), programmable logic devices ("PLDs") and ROM and RAM devices. Examples of computer code include machine code, such as produced by a compiler, and files containing higher-level code that are executed by a computer using an interpreter. For example, an embodiment of the invention may be implemented using JAVA®, C++, or other object-oriented programming language and development tools. Another embodiment of the invention may be implemented in hardwired circuitry in place of, or in combination with, machine-executable software instructions.

The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that specific details are not required in order to practice the invention. Thus, the foregoing descriptions of specific embodiments of the invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed; obviously, many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, they thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the following claims and their equivalents define the scope of the invention.

The invention claimed is:

1. A server, comprising:

a processor; and

a memory storing a message thread module with instructions executed by the processor to maintain a message thread between users of client devices by

serving a message thread with a new text entry to a client device in response to a request for the message thread from a user;

collecting message thread state change from the client device, wherein the message thread state change represents an indication to automatically delete the new text entry of the message thread after the duration of a transitory display period on the client device unless an indication of a gesture applied to a display screen presenting the new text entry of the message thread is received from the client device during the transitory display period, wherein the transitory display period is a single digit number of seconds, and absence of the indication of the gesture causes the indication to automatically delete the new text entry such that the new text entry is only viewed once for the single digit number of seconds;

queuing the message thread state change at the server along with additional message thread state changes associated with the collecting operation performed for additional users and corresponding additional client devices associated with the message thread;

revising the message thread based upon the message thread state change and the additional message thread state changes to form shared message thread

state, wherein revising includes asynchronous batch mode processing in response to a satisfied synchronization condition;

storing persistently the shared message thread state until a next synchronization event; and

supplying the shared message thread state in response to a request for the message thread from a user that occurs after the next synchronization event and supplying the message thread with the new text entry in response to a request for the message thread from a user that occurs before the next synchronization event.

2. The server of claim **1** wherein queuing is performed in response to a user exit from a message thread.

3. The server of claim **1** wherein the message thread module includes instructions executed by the processor to delete the new text entry from a thread associated with a sender after the new text entry is viewed by the user.

4. The server of claim **1** wherein the message thread module includes instructions executed by the processor to alter a parameter associated with the new text entry in response to the indication.

5. The server of claim **4** wherein the parameter is a font parameter associated with the new text entry.

6. The server of claim **4** wherein the parameter is a supplemental indicator associated with the new text entry.

7. The server of claim **4** wherein the parameter indicates that a sender and the user persisted the new text entry.

8. The server of claim **1** wherein the message thread module includes instructions executed by the processor to restore the new text entry in a message thread associated with a sender of the new text entry on a display associated with the sender if the server receives an indication that the user applied a gesture to the display screen associated with the user during the transitory display period.

9. A method implemented by a server with a processor and a memory storing instructions executed by the processor to maintain a first message thread and a second message thread between a first user and a second user by:

directing, by the server, a second client device to display a text entry of the second message thread for a duration of a transitory display period, wherein the text entry is from the first user and is presented on a second display screen associated with the second client device of the second user, and wherein the first user generates the text entry with a first indication to preserve the text entry in the first message thread, wherein the first indication is a first gesture applied to a first display screen of a first client device associated with the first user that is received by the server as the first indication;

automatically deleting at the server the text entry of the second message thread for the second user after the duration of the transitory display period unless a second indication of a second gesture applied to the second display screen presenting the text entry of the message thread on the second client device associated with the second user is received at the server during the transitory display period, in which case the text entry of the message thread is maintained by the server for the second message thread and the server provides feedback to the first user that the text entry of the second message thread is preserved;

modifying, at the direction of the server, the text entry of the first message thread associated with the first user on the first display screen associated with the first user if the server receives the second indication that the second user applied the second gesture to the second display screen associated with the second user during the transitory display period, wherein modifying includes the server providing first indicia indicating that only the first user provided the first indication, and that there was no second indication and therefore only the first user preserved the text entry or second indicia in response to the first indication and the second indication to indicate that both the first user and the second user preserved the text entry; and

asynchronous batch mode processing of state change associated with the first message thread and the second message.

10. The method of claim **9** wherein the transitory display period is a single digit number of seconds.

* * * * *