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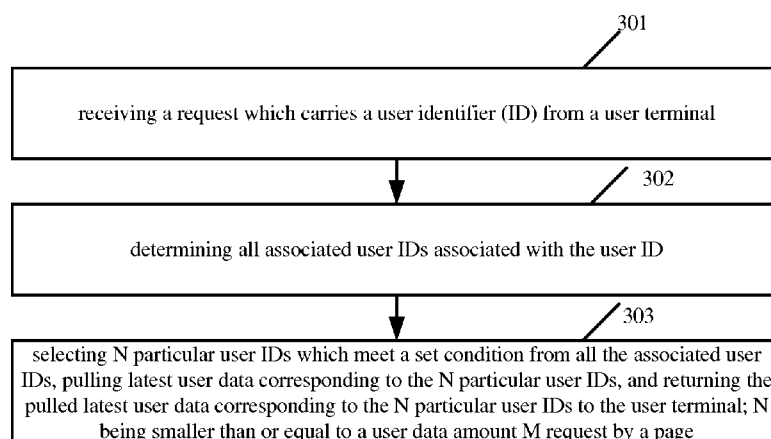


Fig. 3

(57) Abstract: A data processing method and apparatus are described. The method includes: receiving a request which carries a user identifier (ID) from a user terminal; determining all associated user IDs associated with the user ID; selecting N particular user IDs which meet a set condition from all the associated user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal; wherein N is smaller than or equal to a user data amount M requested by a page. The data processing method and apparatus can save data transmission bandwidth resources during a page request.



DATA PROCESSING METHOD AND APPARATUS

This application claims the benefit of priority from Chinese Patent Application, No. 201310003705.4, filed on January 6, 2013, the entire contents of which are hereby incorporated by reference.

5 Field of the Disclosure

The present disclosure relates to internet technology, and more particularly to a data processing method and apparatus.

Background

10 In the internet technology, user generated content (UGC) is a new manner in which a user uses the internet. Comparing with only focusing on download previously, the so-called UGC lays equal stress on both of download and upload. At present, community network, video sharing and microblogging are main application forms of UGC. Taking the microblogging as an example, an existed processing manner for the microblogging will be described hereinafter.

15 One microblogging user at most has 2000 listening users. For convenience of description, the listening users can be called as idols (Uins). A microblogging home page corresponding to a microblogging user can display at most 70 pieces of microblogging messages in accordance with a time order. One piece of microblogging message is corresponding to one microblogging user, that is to say, the 70 pieces of microblogging
20 messages displayed in the microblogging home page corresponding to the microblogging user are published by at most 70 Uins.

Summary

One embodiment of the present disclosure provides a data processing method and apparatus, which can save data transmission bandwidth resources during a page request.

25 A data processing method includes:

receiving a request which carries a user identifier (ID) from a user terminal;

determining all associated user IDs associated with the user ID;

selecting N particular user IDs which meet a set condition from all the associated user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal;
5 wherein N is smaller than or equal to a user data amount M requested by a page.

A data processing apparatus includes a receiving module, a determining module and a processing module, wherein

the receiving module is configured to receive a request which carries a user identifier (ID) from a user terminal;

10 the determining module is configured to determine all associated user IDs associated with the user ID;

the processing module comprises a selecting unit and a data processing unit;

the selecting unit is configured to select N particular user IDs which meet a set condition from all the associated user IDs determined by the determining module;

15 the data processing unit is configured to pull latest user data corresponding to the N particular user IDs, and return the latest user data corresponding to the N particular user IDs to the user terminal; N is smaller than or equal to a user data amount M requested by a page.

A data processing apparatus includes a processor and a memory; wherein the
20 processor and the memory are connected with each other via an internal bus; the memory stores a set of instructions for performing a data processing method, the set of instructions to direct the processor to perform acts of:

receiving a request from a user terminal; wherein the request carries a user identifier (ID) and a user data amount M requested by a page;

25 determining all associated user IDs associated with the user ID;

selecting N particular user IDs which meet a set condition from all the associated user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal; wherein N is smaller than or equal to M.

It can be seen from the above technical solution, in the present disclosure, when receiving the request from the user terminal, selecting N particular user IDs which meet the set condition from all the associated user IDs associated with the user, pulling latest user data corresponding to only the N particular user IDs, and returning the latest user data corresponding to only the N particular user IDs to the user terminal, N being smaller than or equal to the user data amount M requested by the page, comparing with pulling latest user data corresponding to all the associated user IDs associated with the user, this can save bandwidth resources and costs.

Brief Description of Drawings

10 Fig. 1 shows a diagram of a microblogging message processing architecture;

Fig. 2 is a schematic diagram showing processing microblogging messages for a microblogging home page;

Fig. 3 is a flow chart of a data processing method provided in one embodiment of the present disclosure;

15 Fig. 4 is an implementation flow chart of pulling user data provided in one embodiment of the present disclosure;

Fig. 5 is a flow chart of selecting user IDs provided in one embodiment of the present disclosure;

20 Fig. 6 shows a schematic diagram of an application architecture provided in one embodiment of the present disclosure;

Fig. 7a shows a schematic diagram of corresponding relationship between microblogging message publish time and microblogging user IDs provided in one embodiment of the present disclosure;

25 Fig. 7b is a schematic diagram of a queue of the microblogging user IDs arranged according to the microblogging message publish time provided in one embodiment of the present disclosure;

Fig. 8 is a schematic diagram of a data processing apparatus provided in one embodiment of the present disclosure;

Fig. 9 is a schematic diagram of a data processing apparatus provided in one

embodiment of the present disclosure.

Detailed Description

For simplicity and illustrative purposes, the present disclosure is described by referring mainly to examples thereof. In the following description, numerous specific
5 details are set forth in order to provide a thorough understanding of the present disclosure. It will be readily apparent however, that the present disclosure may be practiced without limitation to these specific details. In other instances, some methods and structures have not been described in detail so as not to unnecessarily obscure the present disclosure. Throughout the present disclosure, the terms “a” and “an” are intended to denote at least
10 one of a particular element. As used herein, the term “includes” means includes but not limited to, the term “including” means including but not limited to. The term “based on” means based at least in part on.

Referring to Fig. 1, Fig. 1 shows a diagram of a microblogging message processing architecture. Microblogging messages published by microblogging users are discretely
15 distributed in underlying devices (referred to as underlying svr). For example, in Fig. 1, an underlying device 1 is only responsible for microblogging messages published by microblogging users numbered from 1 to 1000; an underlying device 2 is only responsible for microblogging messages published by microblogging users numbered from 1001 to 2000; an underlying device 3 is only responsible for microblogging messages published
20 by microblogging users numbered from 2001 to 3000 and so on until an underlying device N. When a microblogging home page corresponding to a microblogging user numbered 1 needs to display microblogging messages, the microblogging user sends a home page reading request to an interface machine connected with the underlying devices through a client terminal. After the interface machine receives the home page reading
25 request, the interface machine finds out 2000 Uins corresponding to the microblogging user numbered 1, and then sends the home page reading request to the underlying devices which are responsible for microblogging messages published by the 2000 Uins, respectively. After receiving the home page reading request, the underlying devices return a microblogging message published by each microblogging user of the 2000 Uins for
30 which the underlying devices are responsible to the interface machine. After the interface machine receives the microblogging messages published by the 2000 Uins returned by the

underlying devices, the interface machine arranges the microblogging messages published by the 2000 Uins in a descending order according to microblogging message publish time, selects and returns microblogging messages published by the first 70 idols to the microblogging home page for displaying, specifically as shown in Fig. 2.

5 It can be seen based on the above description, in the above process of microblogging message processing, in order to display the 70 pieces of microblogging messages on the microblogging home page, it needs to obtain the microblogging messages published by the 2000 Uins and select the latest 70 pieces of microblogging messages for displaying by traversing the microblogging messages published by the 2000 Uins. The remaining 1930
10 pieces of microblogging messages are not displayed, that is to say, the obtaining of the remaining 1930 pieces of microblogging messages is useless. However, the obtaining of the remaining 1930 pieces of microblogging messages needs bandwidth resources, and this obviously will waste a lot of bandwidth resources.

Referring to Fig. 3, Fig. 3 is a flow chart of a data processing method provided in one embodiment of the present disclosure. As shown in Fig. 3, the data processing
15 method can include following steps.

Step 301: receiving a request which carries a user identifier (ID) from a user terminal.

Taking a microblogging application as an example, for any one microblogging user
20 terminal, the microblogging user terminal needs to send the request to a server before displaying a microblogging home page, so as to obtain user data needed to be displayed from the server. In order to facilitate the microblogging user terminal to obtain the user data needed to be displayed, the user ID corresponding to the microblogging user terminal is generally carried in the sent request.

25 Step 302: determining all associated user IDs associated with the user ID.

In the present disclosure, a relationship chain of each user ID can be preset in advance. The relationship chain marks all user IDs associated with the user ID. Still taking the microblogging application as an example, one microblogging user ID usually has at most 2000 associated listening user IDs, based on this, when setting a relationship
30 chain of one microblogging user ID in the present disclosure, the 2000 listening user IDs of the microblogging user ID can be set into the relationship chain of the microblogging

user ID as associated users of the microblogging user ID.

Based on the description of presetting the relationship chain of each user ID, after receiving the request, the step 302 can further include: according to the user ID carried in the request, finding a relationship chain corresponding to the user ID from the preset relationship chains, taking all user IDs marked in the relationship chain as all user IDs associated with the user ID carried in the request (recorded as associated user IDs).

Ste 303: selecting N particular user IDs which meet a set condition from all the associated user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal; N being smaller than or equal to a user data amount M requested by a page.

Here, the term “pulling” refers to “obtaining”, for example, “pulling latest user data” refers to “obtaining latest user data”. Still taking the microblogging application as an example, one microblogging page can display at most 70 pieces of microblogging messages, but the microblogging user ID has at most 2000 associated user IDs; in the step 303, by presetting the condition, selecting N such as equal to 70 or less than 70 particular user IDs which meet the set condition from the 2000 associated user IDs, pulling latest user data corresponding to only the N particular user IDs rather than pulling latest user data corresponding to all the 2000 associated user IDs, this can reduce the amount of user data and save bandwidth resources.

To this, the process shown in Fig. 3 is completed.

It should be noted, in the present disclosure, as an embodiment, in the above step 303, pulling latest user data corresponding to the N particular user IDs can be realized through a process shown in Fig. 4.

Referring to Fig. 4, Fig. 4 is an implementation flow chart of pulling user data provided in one embodiment of the present disclosure. As shown in Fig. 4, the process can include following steps.

Step 401: determining underlying devices which manage the N particular user IDs from all the underlying devices (svr).

Usually, each user ID and all user data of each user ID are managed by one underlying device. The amount of the underlying devices can be set when networking,

and this will not be repeated here.

Step 402: identifying a number L of the determined underlying devices.

Step 403: dividing the request into L request packets, and sending the L request packets to the L determined underlying devices; each of the request packets carrying at least one of the N particular user IDs; the particular user IDs carried in each of the request packets are essentially user IDs managed by the underlying devices to which the request packets is sent.

Taking a value of N to be 70 as an example, if the L identified in the step 402 is 3, 30 user IDs of the 70 user IDs are managed by the underlying device 1, 30 user IDs of the 70 user IDs are managed by the underlying device 2, and the remaining 10 user IDs is managed by the underlying device 3; then in the step 403, the request received in the above step 301 can be divided into following 3 request packets: a request packet 1, a request packet 2 and a request packet 3, the request packet 1 carries the 30 user IDs which are managed by the underlying device 1 and is sent to the underlying device 1, the request packet 2 carries the 30 user IDs which are managed by the underlying device 2 and is sent to the underlying device 2, and the request packet 3 carries the 10 user IDs which are managed by the underlying device 3 and is sent to the underlying device 3.

Step 404: receiving user data returned by the L underlying devices; user data returned by each of the L underlying devices being the latest user data corresponding to particular user IDs carried in the request packet received by each of the L underlying devices.

To this, the latest user data corresponding to the N particular user IDs can be pulled through the process shown in Fig. 4. Still taking the microblogging application as an example, a microblogging home page of one microblogging user ID can display at most 70 pieces of microblogging messages, but the microblogging user ID has at most 2000 associated user IDs; through the process shown in Fig. 4, N such as equal to 70 or less than 70 user IDs which meet the set condition are selected from the 2000 user IDs, the request packets are sent to only the underlying devices which are responsible for managing the N user ID rather than to all the underlying devices which are responsible for managing the 2000 user IDs. This can reduce the load of the underlying devices, reduce the amount of the sent request packets, save the expensive bandwidth resources,

save the cost of the underlying device, and can make the underlying devices not require expansion for a long time.

Further, in the present disclosure, as an embodiment, in the above step 303, selecting N particular user IDs which meet a set condition from all the determined associated user IDs can include a process shown in Fig. 5.

Referring to Fig. 5, Fig. 5 is a flow chart of selecting user IDs provided in one embodiment of the present disclosure. As shown in Fig. 5, the process can include following steps.

Step 501: sending all the determined associated user IDs to a default network device which is configured to record action behaviors corresponding to any user ID.

Here, the default network device can be a machine, and can also be other realization forms, and this is not specifically limited.

Step 502: receiving N user IDs returned by the network device, the N user IDs returned by the network device being particular user IDs which are selected by the network device from all the received associated user IDs and whose action behaviors meet a set condition.

To this, the process shown in Fig. 5 is completed. In order to facilitate the understanding of the processes of Figs. 4-5, taking applying the data processing method in a microblogging application as an example, in combination with the processes shown in Figs. 4-5, one embodiment of the present disclosure shows an application architecture, the details are shown in Fig. 6 and will not be repeated here.

It should be noted, in the present disclosure, the user data corresponding to the user ID are user-generated content (UGC); based on this, the action behaviors corresponding to the user ID can be updating time or publishing time of the UGC; the action behaviors meeting a set condition includes: updating time or publishing time of the UGC is the latest.

As an embodiment of the present disclosure, in actual implementations, the UGC can be a microblogging message; based on this, in the above step 501, the action behaviors corresponding to the user ID at least includes microblogging message publish time, and in the step 502, the action behaviors meeting a set condition can include: microblogging

message publish time is latest.

Taking the UGC to be a microblogging message in an actual implementation as an example, the process shown in Fig. 5 is described in described in following.

In a microblogging application, one microblogging user ID has at most 2000
5 associated listening user IDs, then based on the step 501 in the process shown in Fig. 5,
2000 associated user IDs associated with one microblogging user ID can be sent to the
default network device. After the default network device receives the 2000 user IDs, the
default network device selects microblogging message publish time corresponding to the
2000 user IDs from all the recorded user IDs, specifically shown in Fig. 7a. Then, the
10 default network device sequentially arranges the selected microblogging message publish
time of the 2000 user IDs according to the microblogging message publish time, and the
result of the arrangement is shown in Fig. 7b. In Fig. 7b, one user ID whose
microblogging message publish time is the latest is arranged at the top, others follow and
so on. Taking a value of N to be 70 as an example, then the network device selects the
15 first 70 user IDs from the queue shown in Fig. 7b.

It should be noted, the above description that the UGC is a microblogging message
is just an example, and is not to limit the present disclosure. In the present disclosure, the
UGC can also be a message published or updated by an instant messaging application
space; accordingly, in the above step 501, the action behaviors corresponding to the user
20 ID at least includes the instant messaging application space's message publishing or
updating time, and in the step 502, the action behaviors meeting a set condition can
include: updating time is latest or publishing time is latest.

Referring to Fig. 8, Fig. 8 is a schematic diagram of a data processing apparatus
provided in one embodiment of the present disclosure. As shown in Fig. 8, the apparatus
25 can include a receiving module 810, a determining module 820 and a processing module
830.

The receiving module 810 is configured to receive a request which carries a user
identifier (ID) from a user terminal.

The determining module 820 is configured to determine all associated user IDs
30 associated with the user ID.

The processing module 830 includes a selecting unit 831 and a data processing unit

832.

The selecting unit 831 is configured to select N particular user IDs which meet a set condition from all the associated user IDs determined by the determining module.

5 The data processing unit 832 is configured to pull latest user data corresponding to the N particular user IDs, and return the latest user data corresponding to the N particular user IDs to the user terminal; N is smaller than or equal to a user data amount M requested by a page.

10 In the present disclosure, the selecting unit 831 can select N particular user IDs which meet a set condition from all the associated user IDs determined by the determining module through following steps:

sending all the associated user IDs to a default network device which is configured to record action behaviors corresponding to any user ID;

15 receiving N user IDs returned by the network device, the N user IDs returned by the network device being particular user IDs which are selected by the network device from all the received associated user IDs and whose action behaviors meet a set condition.

As an embodiment of the present disclosure, the user data corresponding to the user ID are user-generated content (UGC).

the action behaviors corresponding to the user ID can be updating time or publishing time of the UGC.

20 the action behaviors meeting a set condition includes: updating time or publishing time of the UGC is the latest.

As an embodiment of the present disclosure, the UGC is a microblogging message or a message published by an instant messaging application space.

25 In the present disclosure, the data processing unit can pull latest user data corresponding to the N particular user IDs through following steps:

determining underlying devices which manage the N particular user IDs from all the underlying devices (svr);

identifying a number L of the determined underlying devices, dividing the request into L request packets, and sending the L request packets to the L determined underling

devices; each of the request packets carrying at least one of the N particular user IDs;

receiving user data returned by the L underlying devices; user data returned by each of the L underlying devices being the latest user data corresponding to particular user IDs carried in the request packet received by each of the L underlying devices.

5 To this, the apparatus shown in Fig. 8 is completed.

It can be seen from the above technical solution, in the present disclosure, when receiving the request from the user terminal, selecting N particular user IDs which meet the set condition from all the associated user IDs associated with the user, pulling latest user data corresponding to only the N particular user IDs, and returning the latest user data corresponding to only the N particular user IDs to the user terminal, N being smaller than or equal to the user data amount M requested by the page, comparing with pulling latest user data corresponding to all the associated user IDs associated with the user, this can save bandwidth resources and costs.

Fig. 9 is a schematic diagram of a data processing apparatus provided in one embodiment of the present disclosure. Referring to Fig. 9, the data processing apparatus may include a memory 901 and a processor 902.

The memory 901 may be configured to store a receiving instruction, a determining instruction, a selecting instruction and a data processing instruction.

The processor 902 may be configured to communicate with the memory 901, execute the receiving instruction, the determining instruction, the selecting instruction and the data processing instruction to respectively execute operations of the above receiving module, the determining module, the selecting unit and the data processing unit.

In various embodiments, a hardware module may be implemented mechanically or electronically. For example, a hardware module may comprise dedicated circuitry or logic that is permanently configured (e.g., as a special-purpose processor, such as a field programmable gate array (FPGA) or an application-specific integrated circuit (ASIC)) to perform certain operations. A hardware module may also comprise programmable logic or circuitry (e.g., as encompassed within a general-purpose processor or other programmable processor) that is temporarily configured by software to perform certain operations. It will be appreciated that the decision to implement a hardware module mechanically, in dedicated and permanently configured circuitry, or in temporarily configured circuitry

(e.g., configured by software) may be driven by cost and time considerations.

What has been described and illustrated herein are examples of the disclosure along with some variations. The terms, descriptions and figures used herein are set forth by way of illustration only and are not meant as limitations. Many variations are possible
5 within the scope of the disclosure, which is intended to be defined by the following claims -- and their equivalents -- in which all terms are meant in their broadest reasonable sense unless otherwise indicated.

What is Claimed is:

1. A data processing method comprising:

receiving a request which carries a user identifier (ID) from a user terminal;

determining all associated user IDs associated with the user ID;

5 selecting N particular user IDs which meet a set condition from all the associated user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal; wherein N is smaller than or equal to a user data amount M requested by a page.

2. The method of claim 1, wherein the selecting N particular user IDs which meet a
10 set condition from all the associated user IDs comprises:

 sending all the associated user IDs to a default network device which is configured to record action behaviors corresponding to any user ID;

 receiving N user IDs returned by the network device; wherein the N user IDs returned by the network device are the particular user IDs which are selected by the
15 network device from all the received associated user IDs and whose action behaviors meet the set condition.

3. The method of claim 2, wherein the user data corresponding to the user ID are user-generated content (UGC);

 the action behaviors corresponding to the user ID are updating time or publishing
20 time of the UGC;

 the action behaviors meeting the set condition comprises: the updating time or publishing time of the UGC is the latest.

4. The method of claim 3, wherein the UGC is a microblogging message or a message published by an instant messaging application space.

25 5. The method of claim 1, wherein the pulling latest user data corresponding to the N particular user IDs comprises:

 determining underlying devices which manage the N particular user IDs from all the underlying devices (svr);

identifying a number L of the determined underlying devices, dividing the request into L request packets, and sending the L request packets to the L determined underlying devices; wherein each of the request packets carries at least one of the N particular user IDs;

5 receiving user data returned by the L underlying devices; wherein the user data returned by each of the L underlying devices is the latest user data corresponding to particular user IDs carried in the request packet received by each of the L underlying devices.

6. A data processing apparatus comprising a receiving module, a determining module
10 and a processing module, wherein

the receiving module is configured to receive a request which carries a user identifier (ID) from a user terminal;

the determining module is configured to determine all associated user IDs associated with the user ID;

15 the processing module comprises a selecting unit and a data processing unit;

the selecting unit is configured to select N particular user IDs which meet a set condition from all the associated user IDs determined by the determining module;

the data processing unit is configured to pull latest user data corresponding to the N particular user IDs, and return the latest user data corresponding to the N particular user
20 IDs to the user terminal; N is smaller than or equal to a user data amount M requested by a page.

7. The apparatus of claim 6, wherein the selecting unit is further configured to,

send all the associated user IDs to a default network device which is configured to record action behaviors corresponding to any user ID;

25 receive N user IDs returned by the network device; wherein the N user IDs returned by the network device are the particular user IDs which are selected by the network device from all the received associated user IDs and whose action behaviors meet the set condition.

8. The apparatus of claim 7, wherein the user data corresponding to the user ID are
30 user-generated content (UGC);

the action behaviors corresponding to the user ID are updating time or publishing time of the UGC;

the action behaviors meeting the set condition comprises: the updating time or publishing time of the UGC is the latest.

5 9. The apparatus of claim 8, wherein the UGC is a microblogging message or a message published by an instant messaging application space.

10. The apparatus of claim 6, wherein the data processing unit is configured to,

determine underlying devices which manage the N particular user IDs from all the underlying devices (svr);

10 identify a number L of the determined underlying devices, divide the request into L request packets, and send the L request packets to the L determined underlying devices; wherein each of the request packets carries at least one of the N particular user IDs;

receive user data returned by the L underlying devices; wherein the user data returned by each of the L underlying devices is the latest user data corresponding to
15 particular user IDs carried in the request packet received by each of the L underlying devices.

11. A data processing apparatus comprising a processor and a memory; wherein the processor and the memory are connected with each other via an internal bus; the memory stores a set of instructions for performing a data processing method, the set of instructions
20 to direct the processor to perform acts of:

receiving a request from a user terminal; wherein the request carries a user identifier (ID) and a user data amount M requested by a page;

determining all associated user IDs associated with the user ID;

selecting N particular user IDs which meet a set condition from all the associated
25 user IDs, pulling latest user data corresponding to the N particular user IDs, and returning the latest user data corresponding to the N particular user IDs to the user terminal; wherein N is smaller than or equal to M.

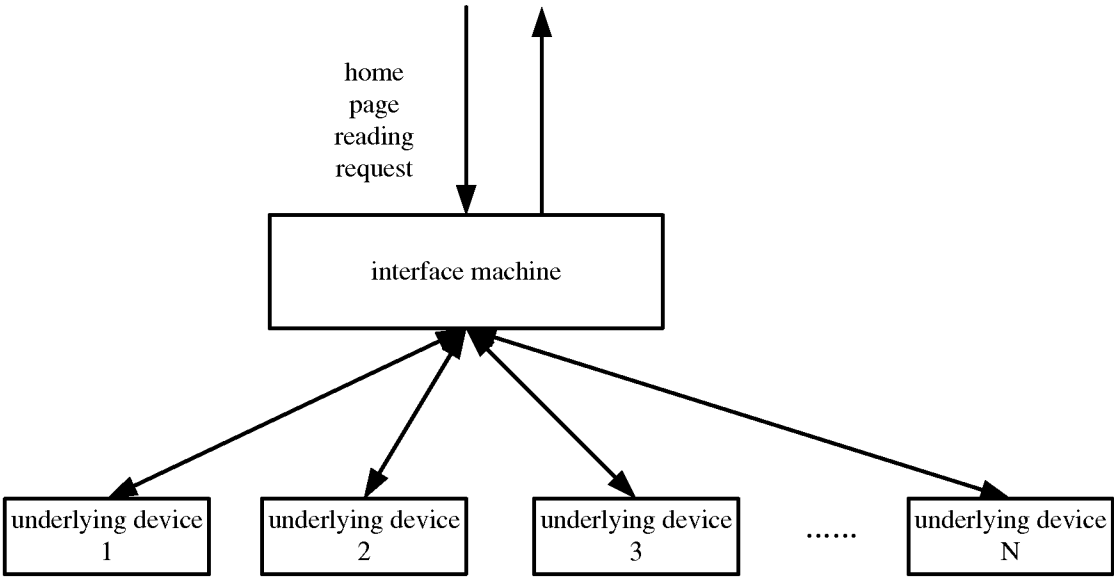


Fig. 1

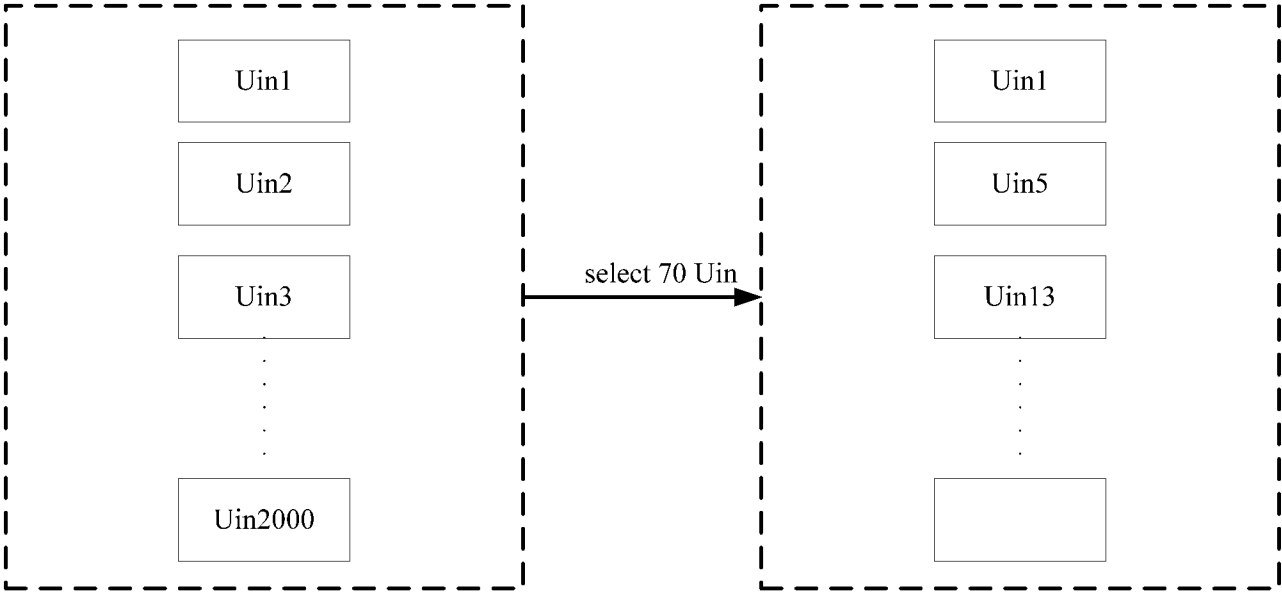


Fig. 2

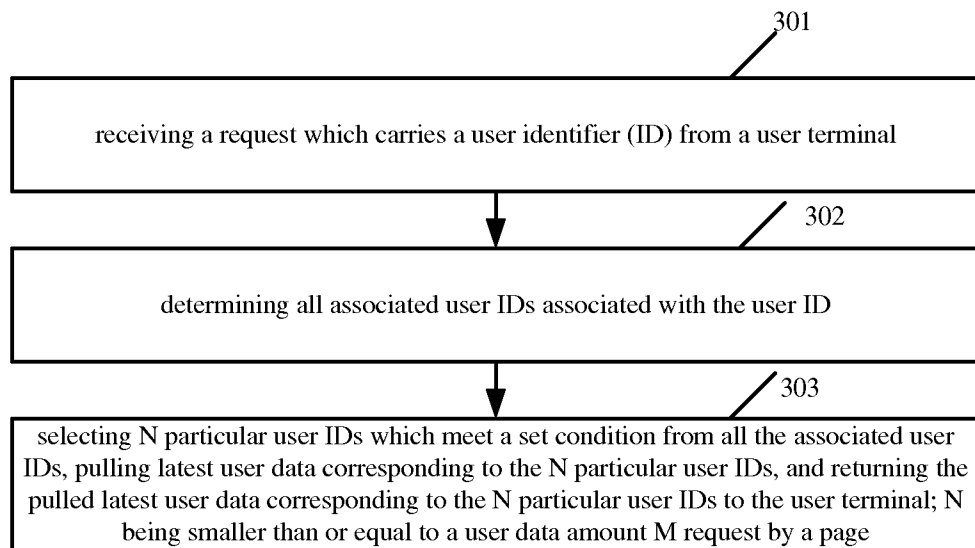


Fig. 3

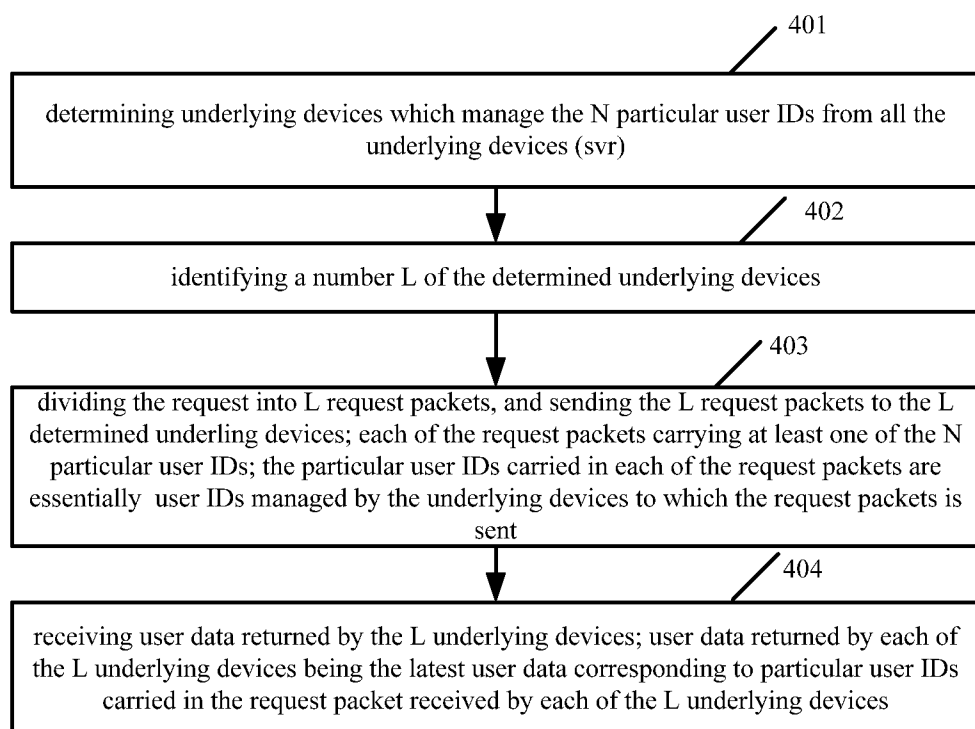


Fig. 4

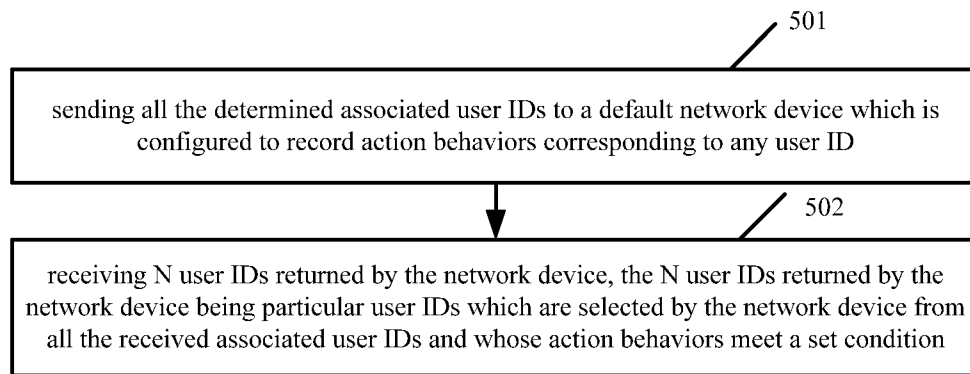


Fig. 5

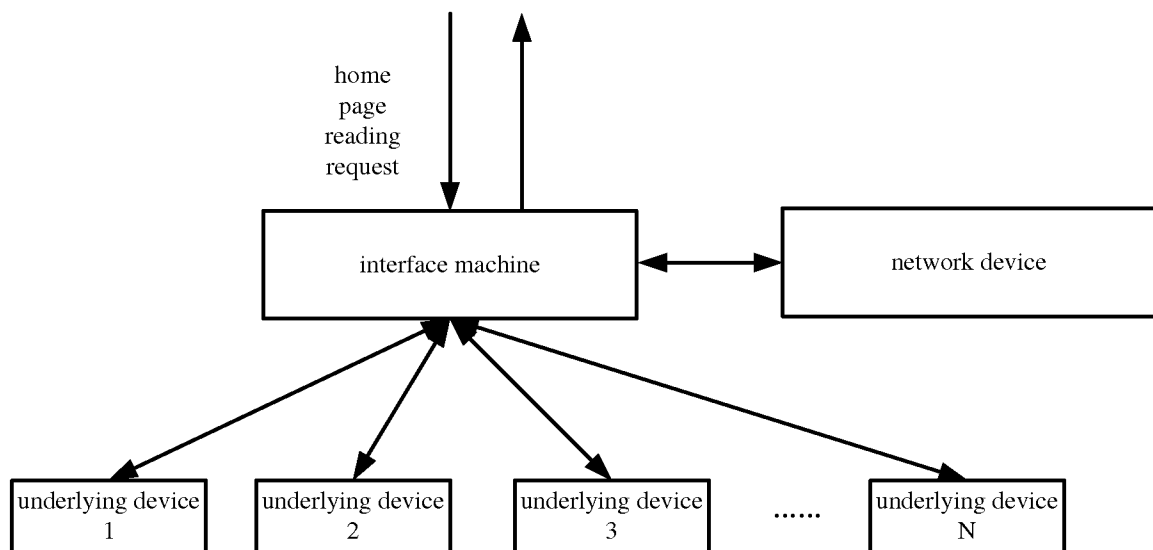


Fig. 6

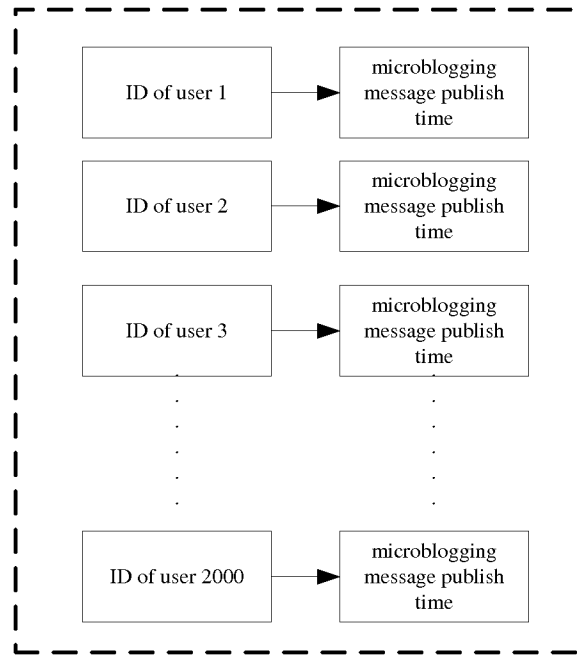


Fig. 7a

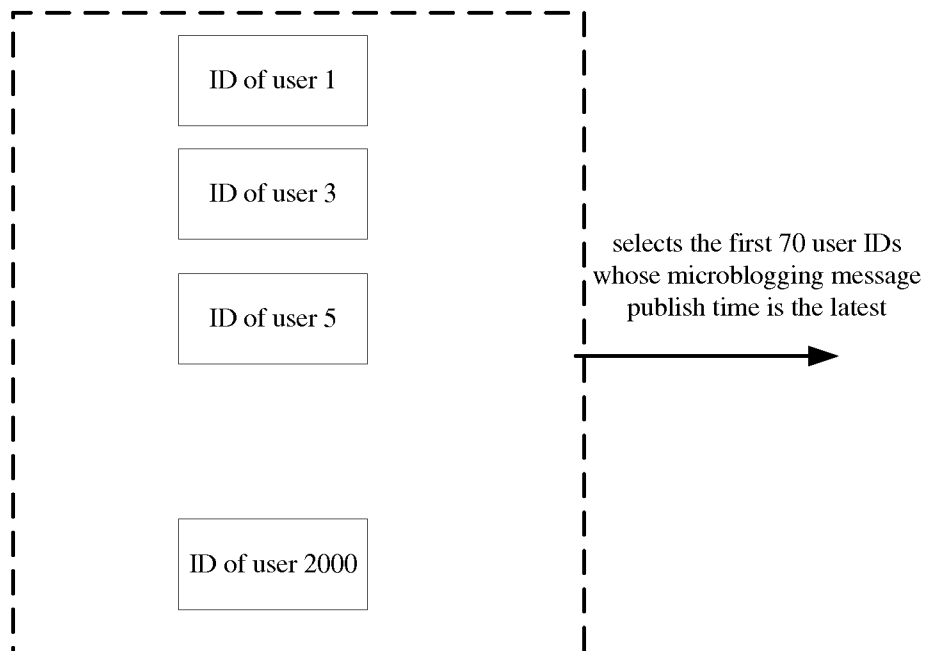


Fig. 7b

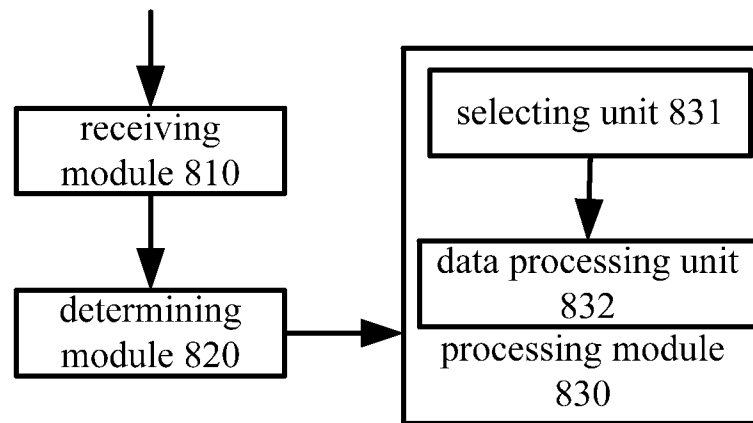


Fig. 8

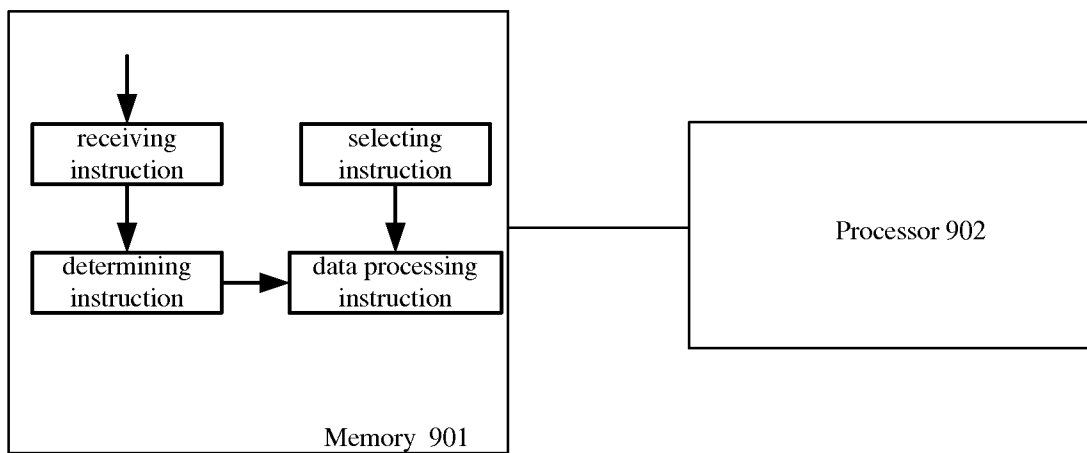


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2014/070137

A. CLASSIFICATION OF SUBJECT MATTER

G06F 17/30 (2006.01) i

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)

IPC: G06F/-

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)

CNABS,CNKI,DWPI: twitter, micro blog, microblog, UGC, update, refresh, efficien+ , optimiz+, boost+, accelerat+, underlying device

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 102387182 A (TENCENT TECHNOLOGY SHENZHEN CO LTD) 21 March 2012 (21.03.2012) description, paragraphs [0039]-[0104]	1-11
A	WO 2012068561 A2 (WAL-MART STORES INC) 24 May 2012 (24.05.2012) the whole document	1-11

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

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“E” earlier application or patent but published on or after the international filing date	“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
“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)	“&” document member of the same patent family
“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	

Date of the actual completion of the international search
10 March 2014 (10.03.2014)Date of mailing of the international search report
20 Mar. 2014 (20.03.2014)Name and mailing address of the ISA/CN
The State Intellectual Property Office, the P.R.China
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China
100088
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2014/070137

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 102387182 A	21.03.2012	None	
WO 2012068561 A2	24.05.2012	WO 2012068561 A3	12.07.2012