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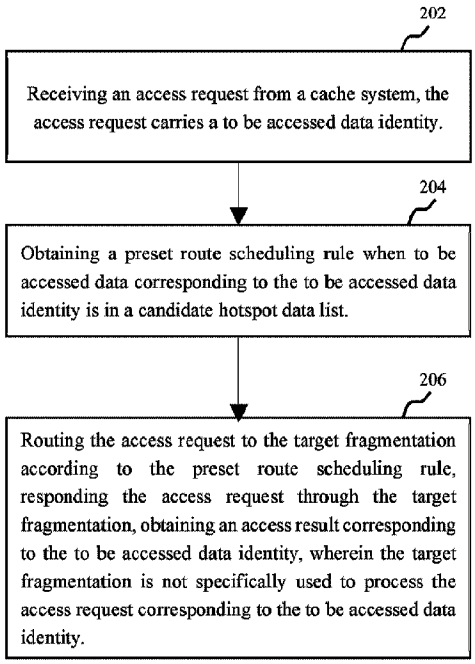
(72) **Inventeurs/Inventors:**
DUAN, TAO, CN;
WANG, FAN, CN;
LUO, YUE, CN;
CHEN, DONG, CN;
YU, WENHUA, CN

(73) **Propriétaire/Owner:**
10353744 CANADA LTD., CA

(74) **Agent:** HINTON, JAMES W.

(54) **Titre : METHODE D'ACCES AUX DONNEES D'UNE BORNE D'UN SYSTEME DE MEMOIRE CACHE, APPAREIL, DISPOSITIF INFORMATIQUE ET SUPPORT DE STOCKAGE**

(54) **Title: CACHE SYSTEM HOTSPOT DATA ACCESS METHOD, APPARATUS, COMPUTER DEVICE AND STORAGE MEDIUM**



(57) **Abrégé/Abstract:**
The present invention discloses to cache system hotspot data access method, apparatus, computer device, and storage medium. The method comprises: receiving an access request from a cache system, the access request carries a to be accessed data

CA 3128540 C 2024/01/02

(11)(21) 3 128 540

(13) C

(57) **Abrégé(suite)/Abstract(continued):**
identity; obtaining a pre- set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list; and routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity. By adopting the present method to disperse hotspot key's traffic on the fragmentation to achieve hotspot key's evenly access and improve cache system access efficiency.

ABSTRACT

The present invention discloses to cache system hotspot data access method, apparatus, computer device, and storage medium. The method comprises: receiving an access request from a cache system, the access request carries a to be accessed data identity; obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list; and routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity. By adopting the present method to disperse hotspot key's traffic on the fragmentation to achieve hotspot key's evenly access and improve cache system access efficiency.

Date Reçue/Date Received 2021-10-18

CACHE SYSTEM HOTSPOT DATA ACCESS METHOD, APPARUTUS, COMPUTER DEVICE AND STORAGE MEDIUM

Field

[0001] The present disclosure relates to the field of computer technology, particularly to a cache system hotspot data access method, an apparatus, a computer device, and a storage medium.

Background

[0002] Redis is a currently widely used distributed K-V (key-value pairs) cache system, when accessing to this system, calculating a fragmentation according to a key's hash (hash function) to store and obtain this K-V, however, in the actual application, during some rush hours, there are many requests accessing to the same key (may correspond to some promotion goods, hotspot news, hotspot comments, etc.), this key can be referred as the hotspot key, according to the hash of this hotspot key, all the access requests will fall in the same fragmentation and severely increase the load of this fragmentation, then resulting in a long response time and low access efficiency.

Invention Content

[0003] Based on this, it is necessary to provide a cache system hotspot data access method, an apparatus, a computer device, and a storage medium to tackle the above-mentioned technical problems, wherein the method can disperse the hotspot key's traffic on the fragmentation and achieve hotspot key's evenly access and improve cache system access efficiency.

[0004] A cache system hotspot data access method comprises:

[0005] Receiving an access request from a cache system, the access request carries a to be accessed data identity;

Date Reçue/Date Received 2021-10-18

[0006] Obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list;

[0007] Routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0008] In an implementation, before receiving the access request of the cache system, comprising: obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity; obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation; traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; generating a candidate hotspot data list according to the candidate hotspot data.

[0009] In an implementation, the cache system hotspot data access method also comprises: obtaining pre-set expiration time corresponding to each candidate hotspot data; removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0010] In an implementation, after receiving the access request of the cache system, also comprising: obtaining a pre-set counter; responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity; if the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list; if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

Date Reçue/Date Received 2021-10-18

[0011] In an implementation, the cache system hotspot data access method also comprises: if the current access times reaches the access times threshold, obtaining a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation; traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation; obtaining current counter status corresponding to the pre-set counter; setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

[0012] In an implementation, when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list, comprising: obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; if existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0013] In an implementation, the cache system hotspot data access method also comprises: if to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity; responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0014] A cache system hotspot data access's apparatus comprises:

[0015] An access request receiving module configured to receive an access request of a cache system, wherein the access request carries a to be accessed data identity;

[0016] A route rule obtaining module configured to obtain a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate

Date Reçue/Date Received 2021-10-18

hotspot data list;

[0017] An access result generation module configured to route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0018] A computer device, including a memory, a processor and a computer program stored in the memory and ran on the processor configured to achieve the following steps when the processor executes the computer program:

[0019] Receiving an access request from a cache system, the access request carries a to be accessed data identity;

[0020] Obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list;

[0021] Routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0022] A computer readable storage medium stored with a computer program configured to achieve the following steps when the processor executes the computer program:

[0023] Receiving an access request from a cache system, the access request carries a to be accessed data identity;

Date Reçue/Date Received 2021-10-18

[0024] Obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list;

[0025] Routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0026] The above-mentioned cache system hotspot data access method, apparatus, computer device and storage medium, receiving an access request from a cache system, the access request carries a to be accessed data identity; obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list; and routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity. Therefore, the target fragmentation can be specifically used to process the access requests corresponding to the other access data identities, wherein the access data corresponding to the other access data identities may not be hotspot data, so according to the route scheduling rule, the access request corresponding to the hotspot data can be routed to the fragmentation corresponding to non-hotspot data, the fragmentation traffic corresponding to the hotspot data can be shared by the fragmentation corresponding to the non-hotspot data, so as to achieve the evenly access to the hotspot data.

Drawing Description

[0027] Figure 1 is an application environment diagram of the cache system hotspot data access method in an implementation;

Date Reçue/Date Received 2021-10-18

[0028] Figure 2 is a process diagram of the cache system hotspot data access method in an implementation;

[0029] Figure 3 is a process diagram of the cache system hotspot data access method in an implementation;

[0030] Figure 4 is a process diagram of the cache system hotspot data access method in another implementation;

[0031] Figure 5 is a process diagram of the cache system hotspot data access method in an implementation;

[0032] Figure 6 is a process diagram of the cache system hotspot data access method in an implementation;

[0033] Figure 7 is a process diagram of the candidate hotspot data list's matching step in an implementation;

[0034] Figure 8 is a process diagram of the cache system hotspot data access method in an implementation;

[0035] Figure 9 is a structural diagram of the cache system hotspot data access apparatus in an implementation;

[0036] Figure 10 is an internal structure of a computer device in an implementation;

[0037] Figure 11 is an internal structure of a computer device in an implementation.

Date Reçue/Date Received 2021-10-18

Specific implementation methods

[0038] In order to make clearer application purposes, technical solutions, and advantages, the present disclosure is further explained in detail with a particular embodiment thereof, and with reference to the drawings. It shall be appreciated that these descriptions are only intended to be illustrative, but not to limit the scope of the disclosure thereto.

[0039] The cache system hotspot data access method provided by the present application can be applied in the application environment as shown in Figure 1. Wherein, terminal 102 communicates with server 104 through the network. Among them, the terminal 102 can be used but not limit to a variety of personal computers, laptops, smart phones, tablets and portable wearable devices, the server 104 can be achieved by an independent server or a server cluster composed of plural servers.

[0040] Specifically, the terminal 120 obtains the access request from the cache system, the access request carries the to be accessed data identity and the access request is sent to server 104 through the network connection, after the server 104 receives the cache system access request, obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list, routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0041] In another implementation, the server 104 receives the access request from the cache system, the access request carries the to be accessed data identity, obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list, routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request

Date Reçue/Date Received 2021-10-18

corresponding to the to be accessed data identity.

[0042] In an implementation, as shown in Figure 2, a cache system hotspot access method is provided, this method is applied in the terminal or the server in Figure 1 as an illustration, comprising following steps:

[0043] Step 202, receiving an access request from a cache system, the access request carries a to be accessed data identity;

[0044] Wherein, cache system (Redis) is the current enterprise widely used distributed K-V (key-value pairs) cache system, in a distributed system, the cache plays an important role and acts as hotpot cache or full cache, during the process of using the cache, usually many fragmentations are used which can not only increase the cache capacity, but also disperse the server's pressure where the cache system is located, so that the better support capability for the cache system service is provided.

[0045] Wherein, the access request of the cache system is used to request access to the cache system, which can be generated through performing trigger operations on the access control set by the relevant business access application, the operation can be but not limited to click operation, voice operation, timing events and so on. Among them, the access request carries the to be accessed data identity, the to be accessed data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the to be accessed data identity.

[0046] Step 204, obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list.

[0047] Wherein, in an actual application, during some rush hours, there will be many requests frequently accessing to the same data, such as accessing to the same key, wherein, the key can correspond to some promotion products, hotspot news, hotspot comments and so on in an

Date Reçue/Date Received 2021-10-18

application, and these requests will be instantly gathered in a fragmentation, which will affect the request and the response time on this fragmentation, but for those fragmentations with less access request data, the traffic of the cache request will be less.

[0048] Therefore, after receiving the access request, judging whether the to be accessed data corresponding to the to be accessed data identity is the hotspot data, if the to be accessed data is hotspot data, to avoid the failure response due to the massive access requests, the access request corresponding to the hotspot data can be dispersed to each fragmentation to achieve hotspot data's evenly access.

[0049] Specifically, after receiving the access request from the cache system, obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data, determining of whether the to be accessed data corresponding to the to be accessed data identity is hotspot data in the access request by matching with the candidate hotspot data list, if the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, which means the to be accessed data is hotspot data that needs to be evenly accessed, obtaining pre-set route scheduling rule, wherein the pre-set route scheduling rule here is pre-set for evenly accessing that can be determined and obtained based on service requirements, actual application scenarios or product requirements.

[0050] In another implementation, if to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, which means the to be accessed data is not hotspot data without much capacities, this access request can be processed just through the default fragmentation corresponding to the to be accessed data identity, therefore, determining the matched default fragmentation according to the to be accessed data identity, responding the access request through this default fragmentation, obtaining the correspondingly access result. Wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity, the access requests corresponding to the different access data identities can be processed by different default fragmentations.

Date Reçue/Date Received 2021-10-18

[0051] Step 206, routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0052] Wherein the target fragmentation here is used to process this access request's fragmentation through the pre-set route scheduling rule, which means the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity, the target fragmentation can be specifically used to process the access requests corresponding to other access data identities, the access data corresponding to this other access data identities may not be the hotspot data, therefore, so according to the route scheduling rule, the access request corresponding to the hotspot data can be routed to the fragmentation corresponding to non-hotspot data, the fragmentation traffic corresponding to the hotspot data can be shared by the fragmentation corresponding to the non-hotspot data, so as to achieve the evenly access to the hotspot data.

[0053] Specifically, after obtaining the pre-set route scheduling rule, the access request can be routed to the target fragmentation according to the pre-set route scheduling rule, the target fragmentation here can pre-load each hotspot data, when the access request corresponding to the to be accessed data identity is routed to this target fragmentation, the target fragmentation responds this access request directly and obtains the access result corresponding to the to be accessed data identity.

[0054] In another implementation, the target fragmentation does not pre-load each hotspot data but records the access times of the access request corresponding to the to be accessed data identity through the pre-set counter, when the access times reaches the pre-set access times threshold, then loading each hotspot data through the target fragmentation, when the target fragmentation completes the loading of hotspot data, the access request corresponding to the to be accessed data identity can be routed to the target fragmentation according to the pre-set

Date Reçue/Date Received 2021-10-18

route scheduling rule, the target fragmentation responds this access request directly and obtains the access result corresponding to the to be accessed data identity.

[0055] When the access times does not reach the pre-set access times threshold, determining of whether the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

[0056] In a specific implementation, assuming a distributed system composed of 10 groups of candidate fragmentations (1-10), a hotspot key will only be routed to the candidate fragmentation 1 according to the default HASH rule, if there are 10000 access requests concurrently accessing to this hotspot key, the candidate fragmentation 1 will instantly have 10000 access requests, but through the present application's cache system hotspot access method, the 10 groups of candidate fragmentations will all temporarily load this hotspot key, if there are 10000 access requests concurrently accessing to this hotspot key, the concurrent access requests will be dispersed to the 10 groups of fragmentations according to the pre-set route scheduling rule, basically each group of candidate fragmentations only has 1000 access requests, therefore, the candidate fragmentation will only has 1/10 of the original traffic.

[0057] In the above-mentioned cache system hotspot data access method, receiving an access request from a cache system, the access request carries a to be accessed data identity; obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list; routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity. Therefore, the target fragmentation can be specifically used to process the access requests corresponding to the other access data identities, wherein the access data corresponding to the other access data identities may not be

Date Reçue/Date Received 2021-10-18

hotspot data, so according to the route scheduling rule, the access request corresponding to the hotspot data can be routed to the fragmentation corresponding to non-hotspot data, the fragmentation traffic corresponding to the hotspot data can be shared by the fragmentation corresponding to the non-hotspot data, so as to achieve the evenly access to the hotspot data.

[0058] In an implementation, as shown in Figure 3, before receiving the access request of the cache system, comprising:

[0059] Step 302, obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity.

[0060] Step 304, obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

[0061] Step 306, traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data.

[0062] Step 308, generating a candidate hotspot data list according to the candidate hotspot data.

[0063] Among them, before receiving the access request of the cache system, all the candidate fragmentations can collect all candidate hotpot data, then pre-loading all candidate hotspot data and combining all successfully loaded candidate hotspot data to a candidate hotspot data list, when receiving the access request of the cache system, judging whether the to be accessed data corresponding to the to be accessed data identity included in the access request is in the candidate hotspot data list, if yes, determining the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule, responding to this access request through the target fragmentation and obtaining the access result.

[0064] Specifically, obtaining candidate hotspot data, the candidate hotspot data includes

Date Reçue/Date Received 2021-10-18

correspondingly candidate hotspot data identity, wherein the obtaining of the candidate hotspot data can be through massive web crawling, data crawling or access records of various popular websites, and the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

[0065] Furthermore, obtaining all candidate fragmentations, then all candidate fragmentations form a candidate fragmentation set, traversing all candidate fragmentations, each fragmentation loads the candidate hotspot data, when each candidate fragmentation successfully loads the candidate hotspot data, a candidate hotspot data list is composed of the candidate hotspot data, which means the candidate hotspot data joins the candidate hotpot data list.

[0066] In an implementation, as shown in Figure 4, the cache system hotspot data access method also comprises:

[0067] Step 402, obtaining pre-set expiration time corresponding to each candidate hotspot data.

[0068] Step 404, removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0069] When loading the candidate hotspot data in each candidate fragmentation, meanwhile, the pre-set expiration time corresponding to candidate hotspot data needs to be set, generally the pre-set expiration time is not very long and just can pass the peak access period. Wherein the pre-set expiration time corresponding to each candidate hotspot data can be obtained according to business requirements, actual application scenarios, product requirements and so on, the pre-set expiration time corresponding to each candidate hotspot data can be the same and can be different. To avoid wasting resources, when reaching the pre-set expiration time,

Date Reçue/Date Received 2021-10-18

removing the candidate hotspot data corresponding to the reached pre-set expiration time from the candidate hotspot data list, updating the candidate hotspot data list and obtaining the updated candidate hotspot data list.

[0070] In a specific implementation, before receiving the access request of the cache system, collecting the hotspot key in advance, cyclically traversing all the candidate fragmentations, each candidate fragmentation loads the hotspot key once, meanwhile, the pre-set expiration time is set, generally the pre-set expiration time is not very long and just can pass the peak access period. When the scheduler completes the loading action, the hotspot key will be updated to the candidate hotpot data list.

[0071] Furthermore, when the cache system access is in process, the business system needs to access the hotspot key to obtain the pre-set route scheduling rule. Due to the pre-loading of the hotspot key, the candidate hotpot data list is already updated, therefore, the access request is routed to the other target fragmentations by using pre-set route scheduling rules such as random, polling, or the most recently non-used route scheduling rules. If the hotspot key is expired, the candidate hotspot data list will also remove this hotspot key.

[0072] In an implementation, as shown in Figure 5, after receiving the access request of the cache system, also comprising:

[0073] Step 502, obtaining a pre-set counter.

[0074] Step 504, responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity.

[0075] Step 506, if the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

Date Reçue/Date Received 2021-10-18

[0076] Step 508, if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

[0077] Wherein, if each candidate fragmentation does not pre-load each hotspot data before receiving the access request of the cache system, but with the increase of some hotspot data access, when triggering a pre-set threshold, then each fragmentation completes loading to hotpot data. Specifically, obtaining the pre-set counter, wherein the pre-set counter is used to record the times of the access times of the hotspot data, for example, the pre-set counter here is used to record the access times of the access request corresponding to the to be accessed data identity, responding to the access request through the pre-set counter, then obtaining the current access times corresponding to the to be accessed data identity.

[0078] Furthermore, determining of whether the to be accessed data corresponding to the to be accessed data identity has triggered a pre-set threshold, which can specifically be obtaining the access times threshold, determining of whether the to be accessed data has triggered the pre-set threshold according to the access times threshold and the current access times, if the current access times does not reach the access threshold, which means the access times of this to be accessed data does not reach the pre-set threshold and there are not many access times, then determining of whether the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, if determining of the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering the step of obtaining pre-set route scheduling rule.

[0079] In an implementation, as shown in Figure 6, the cache system hotspot data access method also comprises:

[0080] Step 602, if the current access times reaches the access times threshold, obtaining a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

Date Reçue/Date Received 2021-10-18

[0081] Step 604, traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation.

[0082] Step 606, obtaining current counter status corresponding to the pre-set counter.

[0083] Step 608, setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

[0084] If the current access times reaches the access times threshold, which means the access times of the to be accessed data reaches the access times threshold and there are many access times, therefore, obtaining all the fragmentations, then all candidate fragmentations form a candidate fragmentation set, traversing all candidate fragmentations, each fragmentation loads the candidate hotspot data and obtains the current counter status corresponding to the pre-set counter, when each candidate fragmentation successfully loads the candidate hotspot data, setting the current counter status to be current expiration status, when setting the pre-set counter to be expiration status, then the counter is no longer counting.

[0085] In a specific implementation, before the access of the cache system, the hotspot key is not pre-loaded. When the cache system access is in process, the hotspot key needs to be accessed, because the hotspot key does not exist in the candidate hotspot data list, the cache system routes the request to the matched candidate fragmentation 1 according to the hotspot key, wherein the candidate fragmentation 1 is specifically used to process this hotspot key. Among them, whenever accessing this hotspot key, the pre-set counter will increase one count in the memory, the pre-set counter is effective in the initial stage, when the pre-set counter reaches or exceeds the pre-set threshold, the counter will trigger all candidate fragmentations to complete this dynamic loading of the hotspot KEY.

[0086] When completing the dynamic loading of the hotspot KEY, then setting the counter of this hotspot KEY to be expiration status, the counter is no longer counting, and adding the

Date Reçue/Date Received 2021-10-18

hotspot KEY to the candidate hotspot data list, at this time, the candidate hotspot data list is already updated, therefore, using the pre-set route scheduling rules such as random, polling, or the most recently non-used route scheduling rules, routing the hotspot key to the target fragmentation.

[0087] In an implementation, as shown in Figure 7, when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list, comprising:

[0088] Step 702, obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity.

[0089] Step 704, if existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0090] According to whether the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, judging whether the to be accessed data is the hotspot data, if to be accessed data is the hotspot data, to avoid the failure response due to the massive access requests, the access request corresponding to the hotspot data can be dispersed to each fragmentation to achieve hotspot data's evenly access.

[0091] Specifically, after receiving the access request from the cache system, obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data, determining of whether the to be accessed data corresponding to the to be accessed data identity is hotspot data in the access request by matching with the candidate hotspot data list, if the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, which means the to be accessed data is hotspot data that needs to be evenly accessed.

Date Reçue/Date Received 2021-10-18

[0092] Wherein, determining whether the to be accessed data is in the candidate hotspot data list according to whether the candidate hotspot data identity is the same as the to be accessed data identity, if existing the same candidate hotspot data identity as the to be accessed data identity, which means existing the same candidate hotspot data as to be accessed data in the candidate hotspot data list, determining of the to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, which means the to be accessed data corresponding to the to be accessed data identity is hotspot data, to avoid the failure accesses, therefore, hotspot data's evenly access is needed.

[0093] In an implementation, as shown in Figure 8, the cache system hotspot data access method also comprises:

[0094] Step 802, if to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity.

[0095] Step 804, responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0096] Specifically, if to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, which means the to be accessed data is not hotspot data without much capacities, this access request can be processed just through the default fragmentation corresponding to the to be accessed data identity, therefore, determining the matched default fragmentation according to the to be accessed data identity, responding the access request through this default fragmentation, obtaining the correspondingly access result. Wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity, the access requests corresponding to the different access data identities can be processed by different default fragmentations.

Date Reçue/Date Received 2021-10-18

[0097] In a specific implementation, a cache system hotspot data access method is provided, specifically comprising as following steps:

[0098] 1. Obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity.

[0099] 2. Obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

[0100] 3. Traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data.

[0101] 4. Generating a candidate hotspot data list according to the candidate hotspot data.

[0102] 5. Obtaining pre-set expiration time corresponding to each candidate hotspot data.

[0103] 6. Removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0104] 7. Receiving the access request of the cache system, the access request carries the to be accessed data identity.

[0105] 8. Obtaining a pre-set counter.

[0106] 9. Responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity.

[0107] 10. If the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the

Date Reçue/Date Received 2021-10-18

candidate hotspot data list.

[0108] 11. If determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, obtaining the pre-set route scheduling rule.

[0109] 11-1. Obtaining candidate hotspot data list, if to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity.

[0110] 11-2. If existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0111] 12. Routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0112] 13. If the current access times reaches the access times threshold, obtaining a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

[0113] 14. Traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation.

[0114] 15. Obtaining current counter status corresponding to the pre-set counter.

[0115] 16. Setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

Date Reçue/Date Received 2021-10-18

[0116] 17. If to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity.

[0117] 18. Responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0118] Although the above-mentioned steps in the flowchart are shown in sequence as indicated by the arrows, these steps are not necessarily executed in the order indicated by the arrows. Unless explicitly instruction in this article, there is no strict order in which these steps can be performed, and they can be performed in any other orders. In addition, at least parts of the appended drawings in the steps can include more sub steps or multiple stages, these sub steps or stages are not necessarily completed at the same time but can be executed in different time, the execution order of these sub steps or stages is also not necessarily in sequence order but can be performed alternately with the other steps or sub steps of other steps or at least one part of the other stages.

[0119] In an implementation, as shown in Figure 9, a cache system hotspot data access apparatus 900 is provided, comprising: access request receiving module 902, roue rule obtaining module 904, and access result generation module 906, wherein:

[0120] An access request receiving module 902 configured to receive an access request of a cache system, wherein the access request carries a to be accessed data identity.

[0121] A route rule obtaining module 904 configured to obtain a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list.

Date Reçue/Date Received 2021-10-18

[0122] An access result generation module 906 configured to route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0123] In an implementation, the cache system hotspot data access apparatus 900 is also used for obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity, obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation, traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data, generating a candidate hotspot data list according to the candidate hotspot data.

[0124] In an implementation, the cache system hotspot data access apparatus 900 is also used for obtaining pre-set expiration time corresponding to each candidate hotspot data, removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0125] In an implementation, the cache system hotspot data access apparatus 900 is also used for obtaining a pre-set counter, responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity, if the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list; if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

[0126] In an implementation, the cache system hotspot data access apparatus 900 is also used for obtaining a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate

Date Reçue/Date Received 2021-10-18

fragmentation, traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation, obtaining current counter status corresponding to the pre-set counter, setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

[0127] In an implementation, route rule obtaining module 904 is also used for obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity, if existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0128] In an implementation, the cache system hotspot data access apparatus 900 is also used if the to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity, responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0129] For the specific limitation of the cache system hotspot data access apparatus can refer to the above-mentioned the cache system hotspot data access method, which will not be repeated here. Each module of the above data cache apparatus can be achieved fully or partly by software, hardware, and their combinations. The above modules can be embedded in the processor or independent of the processor in computer device and can store in the memory of computer device in form of software, so that the processor can call and execute the operations corresponding to the above modules.

[0130] In an implementation, a computer device is provided to be a server and whose internal structure diagram is shown in Figure 10. The computer device includes a processor, a memory,

Date Reçue/Date Received 2021-10-18

a network interface, and a database connected through a system bus. The processor of the computer device is configured to provide calculation and control capabilities. The memory of computer device includes non-volatile storage medium and internal memory. The memory of non-volatile storage medium has operation system, computer programs and database. The internal memory provides an environment for the operation system and computer program running in a non-volatile storage medium. The network interface of the computer device is used to communicate with an external terminal through a network connection. The computer program is executed by the processor to implement a cache system hotspot data access method.

[0131] In an implementation, a computer device is provided to be a server and whose internal structure diagram is shown in Figure 11. The computer device includes a processor, a memory, a network interface, and a database connected through a system bus. The processor of the computer device is configured to provide calculation and control capabilities. The memory of computer device includes non-volatile storage medium and internal memory. The memory of non-volatile storage medium has operation system, computer programs and database. The internal memory provides an environment for the operation system and computer program running in a non-volatile storage medium. The network interface of the computer device is used to communicate with an external terminal through a network connection. The computer program is executed by the processor to implement a cache system hotspot data access method. The computer device's display monitor can be LCD monitor or electronic ink display monitor, the input apparatus of the computer device can be the touch layer on the display monitor, also can be button, trackball, or touchpad, and can be the external keyboard, touchpad, or mouse, etc.

[0133] The skilled in the art can understand that the structure shown in Figure 10 and Figure 11 is only partial structural diagram related this application solution and not constitute limitation to the computer device applied on the current application solution, the specific computer device can include more or less components than what is shown in the figure, or combinations of some components or different components to what is shown in the figure.

Date Reçue/Date Received 2021-10-18

[0134] In an implementation, the processor performs the following steps when executing the computer program: obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity, obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation, traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data, generating a candidate hotspot data list according to the candidate hotspot data.

[0135] In an implementation, the processor performs the following steps when executing the computer program: obtaining pre-set expiration time corresponding to each candidate hotspot data, removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0136] In an implementation, the processor performs the following steps when executing the computer program: obtaining a pre-set counter, responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity, if the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list; if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

[0137] In an implementation, the processor performs the following steps when executing the computer program: obtaining a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation, traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation, obtaining current counter status corresponding to the pre-set counter, setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

[0138] In an implementation, the processor performs the following steps when executing the computer program: obtaining a candidate hotspot data list, wherein the candidate hotspot list

Date Reçue/Date Received 2021-10-18

includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity, if existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0139] In an implementation, the processor performs the following steps when executing the computer program: if the to be accessed data corresponding to the to be accessed data identity is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity, responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0140] In an implementation, a computer readable storage medium stored with a computer program configured to achieve the following steps when the processor executes the computer program: receiving an access request from a cache system, the access request carries a to be accessed data identity; obtaining a pre-set route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list; routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.

[0141] In an implementation, the processor performs the following steps when executing the computer program: obtaining candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity, obtaining candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation, traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data, generating a candidate hotspot data list according to the candidate hotspot data.

Date Reçue/Date Received 2021-10-18

[0142] In an implementation, the processor performs the following steps when executing the computer program: obtaining pre-set expiration time corresponding to each candidate hotspot data, removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time, obtaining the updated candidate hotspot data list.

[0143] In an implementation, the processor performs the following steps when executing the computer program: obtaining a pre-set counter, responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity, if the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list; if determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

[0144] In an implementation, the processor performs the following steps when executing the computer program: obtaining a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation, traversing each candidate fragmentation, loading the to be accessed data through each candidate fragmentation, obtaining current counter status corresponding to the pre-set counter, setting the current counter status to current expiration status, determining of the pre-set counter is no longer counting.

[0145] In an implementation, the processor performs the following steps when executing the computer program: obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity, if existing the same candidate hotspot data identity as the to be accessed data identity, determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.

[0146] In an implementation, the processor performs the following steps when executing the computer program: if the to be accessed data corresponding to the to be accessed data identity

Date Reçue/Date Received 2021-10-18

is not in the candidate hotspot data list, determining the correspondingly default fragmentation according to the to be accessed data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the to be accessed data identity, responding the access request through the default fragmentation, obtaining access result corresponding to the to be accessed data identity.

[0147] The skilled in the art can understand that all or partial of procedures from the above-mentioned methods can be performed by computer program instructions through related hardware, the mentioned computer program can be stored in a non-volatile material computer readable storage medium, this computer can include various implementation procedures from the abovementioned methods when execution. Any reference to the memory, the storage, the database, or the other media used in each implementation provided in current application can include non-volatile and/or volatile memory. Non-volatile memory can include read-only memory (ROM), programable ROM (PROM), electrically programmable ROM (EPRPMD), electrically erasable programmable ROM (EEPROM) or flash memory. Volatile memory can include random access memory (RAM) or external cache memory. As an instruction but not limited to, RAM is available in many forms such as static RAM (SRAM), dynamic RAM (DRAMD), synchronous DRAM (SDRAM), dual data rate SDRAM (DDRSDRAM), enhanced SRAM (ESDRAM), synchronal link (Synchlink) DRAM (SLDRAM), memory bus (Rambus), direct RAM (RDRAM), direct memory bus dynamic RAM (DRDRAM), and memory bus dynamic RAM (RDRAM), etc.

[0148] The technical features of the above-mentioned implementations can be randomly combined, for concisely statement, not all possible combinations of technical features in the abovementioned implementations are described. However, if there are no conflicts in the combinations of these technical features, it shall be within the scope of this descriptions.

[0149] The above-mentioned implementations are only several implementations in this disclosure and the description is more specific and detailed but cannot be understood as the

Date Reçue/Date Received 2021-10-18

limitation of the scope of the invention patent. Evidently those ordinary skilled in the art can make various modifications and variations to the disclosure without departing from the spirit and scope of the disclosure. Therefore, the appended claims are intended to be construed as encompassing the described embodiment and all the modifications and variations coming into the scope of the disclosure.

Date Reçue/Date Received 2021-10-18

Claims:

1. A device for cache system hotspot data access comprising:

an access request receiving module configured to receive an access request of a cache system, wherein the access request carries a access data identity;

a route rule obtaining module configured to obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list;

an access result generation module configured to:

route the access request to the target fragmentation according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

2. The device of claim 1 further configured to:

obtain a candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtain a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generate a candidate hotspot data list according to the candidate hotspot data.

3. The device of any one of claims 1 to 2 further configured to:

Date Reçue/Date Received 2023-08-02

obtain a pre-set expiration time corresponding to each candidate hotspot data;

remove the corresponding candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtain the updated candidate hotspot data list.

4. The device of any one of claims 1 to 3 further configured to:

obtain a pre-set counter;

respond to the access request through the pre-set counter;

obtain current access times corresponding to the access data identity;

determine whether to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold; and

enter obtaining the pre-set route scheduling rule if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

5. The device of any one of claims 1 to 4 further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

Date Reçue/Date Received 2023-08-02

determine the pre-set counter is no longer counting.

6. The device of any one of claims 1 to 5 further configured to:

obtain a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determine, if existing the same candidate hotspot data identity as the access data identity, the to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

7. The device of any one of claims 1 to 6 wherein the user word vector generating module is further configured to:

Determine, if the to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

8. The device of any one of claims 1 to 7 further configured to:

receive an access request from a cache system, the access request carries a access data identity;

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list; and

Date Reçue/Date Received 2023-08-02

route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

9. The device of any one of claims 1 to 8 wherein the cache system is a distributed key-value pair cache system.

10. The device of any one of claims 1 to 9 wherein a plurality of the fragmentations of the cache system are used.

11. The device of any one of claims 1 to 10 wherein, the access request of the cache system is used to request access to the cache system, the accesses request generated through performing at least on trigger operation on the access control set by the relevant business access application, the trigger operation comprises one or more of a click operation, voice operation, and timing events.

12. The device of any one of claims 1 to 11 wherein the access request comprises one or more of the access data identity, the access data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the access data identity.

13. The device of any one of claims 1 to 12 wherein a plurality of requests frequently accesses the same key and wherein the requests are instantly gathered in a fragmentation.

14. The device of any one of claims 1 to 13 further configured to:

judge whether the to be accessed data corresponds to the access data identity is the hotspot data; and

Date Reçue/Date Received 2023-08-02

disperse the access request corresponding to the hotspot data to each fragmentation to achieve hotspot data's evenly access if the to be accessed data is hotspot data.

15. The device of claim 14 wherein the dispersion comprises:

obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data;

determining of whether the to be accessed data corresponding to the access data identity is hotspot data in the access request by matching with the candidate hotspot data list;

obtaining pre-set route scheduling rule if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, wherein the pre-set route scheduling rule is pre-set for evenly accessing that can be determined and obtained based on one or more of service requirements, actual application scenarios and product requirements.

16. The device of any one of claims 14 to 15 wherein the access request is processed through the default fragmentation corresponding to the access data identity.

17. The device of any one of claims 1 to 16 wherein the target fragmentation is used to process the fragmentation of the access request through the pre-set route scheduling rule.

18. The device of any one of claims 1 to 17 wherein the target fragmentation is used to process the access requests corresponding to at least one accessed data identity, wherein the access data corresponding to the accessed data identity is not the hotspot data.

Date Reçue/Date Received 2023-08-02

19. The device of claim 18 wherein according to the route scheduling rule, the access request corresponding to the hotspot data is routed to the fragmentation corresponding to non-hotspot data, and wherein the fragmentation traffic corresponding to the hotspot data is shared by the fragmentation corresponding to the non-hotspot data.

20. The device of any one of claims 18 to 19 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation pre-loads each hotspot data, when the access request corresponding to the access data identity is routed to the target fragmentation, wherein the target fragmentation responds to the access request directly and obtains the access result corresponding to the access data identity.

21. The device of any one of claims 1 to 19 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation records the access times of the access request corresponding to the access data identity through the pre-set counter, and when the access times reaches a pre-set access times threshold, loads each hotspot data through the target fragmentation, and when the target fragmentation completes the loading of hotspot data, the access request corresponding to the access data identity is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation responds this access request directly and obtains the access result corresponding to the access data identity and when the access times does not reach the pre-set access times threshold, determines whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

22. The device of any one of claims 1 to 21 wherein receiving the access request further comprises:

Date Reçue/Date Received 2023-08-02

obtaining the candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtaining the candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generating a candidate hotspot data list according to the candidate hotspot data.

23. The device of any one of claims 1 to 22 wherein the candidate fragmentations:

collect the candidate hotspot data

pre-load the candidate hotspot data;

combine successfully loaded candidate hotspot data to a candidate hotspot data list;

judge whether the to be accessed data corresponding to the access data identity included in the access request is in the candidate hotspot data list;

determine, if the judging results in a yes, the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain the access result.

Date Reçue/Date Received 2023-08-02

24. The device of claim 23 wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, and wherein the obtaining of the candidate hotspot data is through one or more of massive web crawling, data crawling and access records of at least one website, and wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

25. The device of any one of claims 1 to 24 wherein accessing the cache system hotspot data further comprises:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

26. The device of claim 25 wherein the pre-set expiration time corresponding to candidate hotspot data is set while the loading the candidate hotspot data in each candidate fragmentation.

27. The device of any one of claims 25 to 26 the pre-set expiration time is just past a peak access period.

28. The device of any one of claims 25 to 27 wherein the pre-set expiration time corresponding to each candidate hotspot data is obtained according to one or more of business requirements, actual application scenarios, and product requirements.

29. The device of any one of claims 25 to 28 wherein the candidate hotspot data corresponding to the reached pre-set expiration time is removed from the candidate hotspot data list when reaching the pre-set expiration time.

Date Reçue/Date Received 2023-08-02

30. The device of any one of claims 25 to 29 wherein a hotspot key is collected before the access request of the cache system is received.

31. The device of any one of claims 25 to 30 wherein the hotspot key is removed if it is expired.

32. The device of any one of claims 1 to 31 wherein receiving the access request of the cache system further comprises:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

determining whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold;

entering obtaining the pre-set route scheduling rule, if the determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

33. The device of any one of claims 1 to 32 further configured to:

obtaining a candidate fragmentation set if the current access times reaches the access times threshold wherein the candidate fragmentation set includes at least one candidate fragmentation.

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain a current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

Date Reçue/Date Received 2023-08-02

determine if the pre-set counter is no longer counting.

34. The device of any one of claims 1 to 33 wherein the accessing the to be accessed data corresponding to the access data identity in a candidate hotspot data list further comprises:

obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determining if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if existing the same candidate hotspot data identity as the access data identity.

35. The device of any one of claims 1 to 34 further configured to:

determine, if to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

36. A system for cache system hotspot data access comprising:

an access request receiving module configured to receive an access request of a cache system, wherein the access request carries a access data identity;

a route rule obtaining module configured to obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list;

an access result generation module configured to:

Date Reçue/Date Received 2023-08-02

route the access request to the target fragmentation according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

37. The system of claim 36 further configured to:

obtain a candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtain a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generate a candidate hotspot data list according to the candidate hotspot data.

38. The system of any one of claims 36 to 37 further configured to:

obtain a pre-set expiration time corresponding to each candidate hotspot data;

remove the corresponding candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtain the updated candidate hotspot data list.

39. The system of any one of claims 36 to 38 further configured to:

obtain a pre-set counter;

respond to the access request through the pre-set counter;

Date Reçue/Date Received 2023-08-02

obtain current access times corresponding to the access data identity;

determine whether to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold; and

enter obtaining the pre-set route scheduling rule if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

40. The system of any one of claims 36 to 39 further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

determine the pre-set counter is no longer counting.

41. The system of any one of claims 36 to 40 further configured to:

obtain a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determine, if existing the same candidate hotspot data identity as the access data identity, the to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

Date Reçue/Date Received 2023-08-02

42. The system of any one of claims 36 to 41 wherein the user word vector generating module is further configured to:

Determine, if the to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

43. The system of any one of claims 36 to 42 further configured to:

receive an access request from a cache system, the access request carries a access data identity;

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list; and

route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

44. The system of any one of claims 36 to 43 wherein the cache system is a distributed key-value pair cache system.

45. The system of any one of claims 36 to 44 wherein a plurality of the fragmentations of the cache system are used.

Date Reçue/Date Received 2023-08-02

46. The system of any one of claims 36 to 45 wherein, the access request of the cache system is used to request access to the cache system, the accesses request generated through performing at least on trigger operation on the access control set by the relevant business access application, the trigger operation comprises one or more of a click operation, voice operation, and timing events.

47. The system of any one of claims 36 to 46 wherein the access request comprises one or more of the access data identity, the access data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the access data identity.

48. The system of any one of claims 36 to 47 wherein a plurality of requests frequently accesses the same key and wherein the requests are instantly gathered in a fragmentation.

49. The system of any one of claims 36 to 48 further configured to:

judge whether the to be accessed data corresponds to the access data identity is the hotspot data; and

disperse the access request corresponding to the hotspot data to each fragmentation to achieve hotspot data's evenly access if the to be accessed data is hotspot data.

50. The system of claim 49 wherein the dispersion comprises:

obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data;

determining of whether the to be accessed data corresponding to the access data identity is hotspot data in the access request by matching with the candidate hotspot data list;

Date Reçue/Date Received 2023-08-02

obtaining pre-set route scheduling rule if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, wherein the pre-set route scheduling rule is pre-set for evenly accessing that can be determined and obtained based on one or more of service requirements, actual application scenarios and product requirements.

51. The system of any one of claims 49 to 50 wherein the access request is processed through the default fragmentation corresponding to the access data identity.

52. The system of any one of claims 36 to 51 wherein the target fragmentation is used to process the fragmentation of the access request through the pre-set route scheduling rule.

53. The system of any one of claims 36 to 52 wherein the target fragmentation is used to process the access requests corresponding to at least one access data identity, wherein the access data corresponding to the access data identity is not the hotspot data.

54. The system of claim 53 wherein according to the route scheduling rule, the access request corresponding to the hotspot data is routed to the fragmentation corresponding to non-hotspot data, and wherein the fragmentation traffic corresponding to the hotspot data is shared by the fragmentation corresponding to the non-hotspot data.

55. The system of any one of claims 53 to 54 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation pre-loads each hotspot data, when the access request corresponding to the access data identity is routed to the target fragmentation, wherein the target fragmentation responds to the access request directly and obtains the access result corresponding to the access data identity.

Date Reçue/Date Received 2023-08-02

56. The system of any one of claims 36 to 54 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation records the access times of the access request corresponding to the access data identity through the pre-set counter, and when the access times reaches a pre-set access times threshold, loads each hotspot data through the target fragmentation, and when the target fragmentation completes the loading of hotspot data, the access request corresponding to the access data identity is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation responds this access request directly and obtains the access result corresponding to the access data identity and when the access times does not reach the pre-set access times threshold, determines whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

57. The system of any one of claims 36 to 56 wherein receiving the access request further comprises:

obtaining the candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtaining the candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

Date Reçue/Date Received 2023-08-02

generating a candidate hotspot data list according to the candidate hotspot data.

58. The system of any one of claims 36 to 57 wherein the candidate fragmentations:

collect the candidate hotspot data

pre-load the candidate hotspot data;

combine successfully loaded candidate hotspot data to a candidate hotspot data list;

judge whether the to be accessed data corresponding to the access data identity included in the access request is in the candidate hotspot data list;

determine, if the judging results in a yes, the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain the access result.

59. The system of claim 58 wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, and wherein the obtaining of the candidate hotspot data is through one or more of massive web crawling, data crawling and access records of at least one website, and wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

60. The system of any one of claims 36 to 59 wherein accessing the cache system hotspot data further comprises:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

Date Reçue/Date Received 2023-08-02

removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

61. The system of claim 60 wherein the pre-set expiration time corresponding to candidate hotspot data is set while the loading the candidate hotspot data in each candidate fragmentation.

62. The system of any one of claims 60 to 61 the pre-set expiration time is just past a peak access period.

63. The system of any one of claims 60 to 62 wherein the pre-set expiration time corresponding to each candidate hotspot data is obtained according to one or more of business requirements, actual application scenarios, and product requirements.

64. The system of any one of claims 60 to 63 wherein the candidate hotspot data corresponding to the reached pre-set expiration time is removed from the candidate hotspot data list when reaching the pre-set expiration time.

65. The system of any one of claims 60 to 64 wherein a hotspot key is collected before the access request of the cache system is received.

66. The system of any one of claims 60 to 65 wherein the hotspot key is removed if it is expired.

67. The system of any one of claims 36 to 66 wherein receiving the access request of the cache system further comprises:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

Date Reçue/Date Received 2023-08-02

determining whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold;

entering obtaining the pre-set route scheduling rule, if the determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

68. The system of any one of claims 36 to 67 further configured to:

obtaining a candidate fragmentation set if the current access times reaches the access times threshold wherein the candidate fragmentation set includes at least one candidate fragmentation.

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain a current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

determine if the pre-set counter is no longer counting.

69. The system of any one of claims 36 to 68 wherein the accessing the to be accessed data corresponding to the access data identity in a candidate hotspot data list further comprises:

obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determining if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if existing the same candidate hotspot data identity as the access data identity.

Date Reçue/Date Received 2023-08-02

70. The system of any one of claims 36 to 69 further configured to:

determine, if to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

71. A method for cache system hotspot data access comprising:

receiving an access request of a cache system, wherein the access request carries a access data identity;

obtaining a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list;

routing the access request to the target fragmentation according to the pre-set route scheduling rule;

responding to the access request through the target fragmentation; and

obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

72. The method of claim 71 further comprising:

obtaining a candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtaining a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation;

Date Reçue/Date Received 2023-08-02

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generating a candidate hotspot data list according to the candidate hotspot data.

73. The method of any one of claims 71 to 72 further comprising:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

removing the corresponding candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

74. The method of any one of claims 71 to 73 further comprising:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

determining whether to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold; and

entering obtaining the pre-set route scheduling rule if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

75. The method of any one of claims 71 to 74 further comprising:

Date Reçue/Date Received 2023-08-02

obtain a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

determine the pre-set counter is no longer counting.

76. The method of any one of claims 71 to 75 further comprising:

obtain a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determine, if existing the same candidate hotspot data identity as the access data identity, the to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

77. The method of any one of claims 71 to 76 further comprising:

Determining, if the to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

responding to the access request through the default fragmentation; and

obtaining access result corresponding to the access data identity.

Date Reçue/Date Received 2023-08-02

78. The method of any one of claims 71 to 77 further comprising:

receiving an access request from a cache system, the access request carries a access data identity;

obtaining a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list; and

routing the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

79. The method of any one of claims 71 to 78 wherein the cache system is a distributed key-value pair cache system.

80. The method of any one of claims 71 to 79 wherein a plurality of the fragmentations of the cache system are used.

81. The method of any one of claims 71 to 80 wherein, the access request of the cache system is used to request access to the cache system, the accesses request generated through performing at least on trigger operation on the access control set by the relevant business access application, the trigger operation comprises one or more of a click operation, voice operation, and timing events.

82. The method of any one of claims 71 to 81 wherein the access request comprises one or more of the access data identity, the access data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the access data identity.

Date Reçue/Date Received 2023-08-02

83. The method of any one of claims 71 to 82 wherein a plurality of requests frequently accesses the same key and wherein the requests are instantly gathered in a fragmentation.

84. The method of any one of claims 71 to 83 further comprises:

judging whether the to be accessed data corresponds to the access data identity is the hotspot data; and

dispersing the access request corresponding to the hotspot data to each fragmentation to achieve hotspot data's evenly access if the to be accessed data is hotspot data.

85. The method of claim 84 wherein the dispersion comprises:

obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data;

determining of whether the to be accessed data corresponding to the access data identity is hotspot data in the access request by matching with the candidate hotspot data list;

obtaining pre-set route scheduling rule if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, wherein the pre-set route scheduling rule is pre-set for evenly accessing that can be determined and obtained based on one or more of service requirements, actual application scenarios and product requirements.

86. The method of any one of claims 84 to 85 wherein the access request is processed through the default fragmentation corresponding to the access data identity.

87. The method of any one of claims 71 to 86 wherein the target fragmentation is used to process the fragmentation of the access request through the pre-set route scheduling rule.

Date Reçue/Date Received 2023-08-02

88. The method of any one of claims 71 to 87 wherein the target fragmentation is used to process the access requests corresponding to at least one access data identity, wherein the access data corresponding to the access data identity is not the hotspot data.

89. The method of claim 88 wherein according to the route scheduling rule, the access request corresponding to the hotspot data is routed to the fragmentation corresponding to non-hotspot data, and wherein the fragmentation traffic corresponding to the hotspot data is shared by the fragmentation corresponding to the non-hotspot data.

90. The method of any one of claims 88 to 89 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation pre-loads each hotspot data, when the access request corresponding to the access data identity is routed to the target fragmentation, wherein the target fragmentation responds to the access request directly and obtains the access result corresponding to the access data identity.

Date Reçue/Date Received 2023-08-02

91. The method of any one of claims 71 to 89 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation records the access times of the access request corresponding to the access data identity through the pre-set counter, and when the access times reaches a pre-set access times threshold, loads each hotspot data through the target fragmentation, and when the target fragmentation completes the loading of hotspot data, the access request corresponding to the access data identity is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation responds this access request directly and obtains the access result corresponding to the access data identity and when the access times does not reach the pre-set access times threshold, determines whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

92. The method of any one of claims 71 to 91 wherein receiving the access request further comprises:

obtaining the candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtaining the candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

Date Reçue/Date Received 2023-08-02

generating a candidate hotspot data list according to the candidate hotspot data.

93. The method of any one of claims 71 to 92 wherein the candidate fragmentations:

collect the candidate hotspot data

pre-load the candidate hotspot data;

combine successfully loaded candidate hotspot data to a candidate hotspot data list;

judge whether the to be accessed data corresponding to the access data identity included in the access request is in the candidate hotspot data list;

determine, if the judging results in a yes, the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain the access result.

94. The method of claim 93 wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, and wherein the obtaining of the candidate hotspot data is through one or more of massive web crawling, data crawling and access records of at least one website, and wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

95. The method of any one of claims 71 to 94 wherein accessing the cache system hotspot data further comprises:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

Date Reçue/Date Received 2023-08-02

removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

96. The method of claim 95 wherein the pre-set expiration time corresponding to candidate hotspot data is set while the loading the candidate hotspot data in each candidate fragmentation.

97. The method of any one of claims 95 to 96 the pre-set expiration time is just past a peak access period.

98. The method of any one of claims 95 to 97 wherein the pre-set expiration time corresponding to each candidate hotspot data is obtained according to one or more of business requirements, actual application scenarios, and product requirements.

99. The method of any one of claims 95 to 98 wherein the candidate hotspot data corresponding to the reached pre-set expiration time is removed from the candidate hotspot data list when reaching the pre-set expiration time.

100. The method of any one of claims 95 to 99 wherein a hotspot key is collected before the access request of the cache system is received.

101. The method of any one of claims 95 to 100 wherein the hotspot key is removed if it is expired.

102. The method of any one of claims 71 to 101 wherein receiving the access request of the cache system further comprises:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

Date Reçue/Date Received 2023-08-02

determining whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold;

entering obtaining the pre-set route scheduling rule, if the determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

103. The method of any one of claims 71 to 102 further comprising:

obtaining a candidate fragmentation set if the current access times reaches the access times threshold wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation;

loading the to be accessed data through each candidate fragmentation;

obtaining a current counter status corresponding to the pre-set counter;

setting the current counter status to current expiration status; and

determining if the pre-set counter is no longer counting.

104. The method of any one of claims 71 to 103 wherein the accessing the to be accessed data corresponding to the access data identity in a candidate hotspot data list further comprises:

obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determining if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if existing the same candidate hotspot data identity as the access data identity.

Date Reçue/Date Received 2023-08-02

105. The method of any one of claims 71 to 104 further comprising:

determining, if to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

responding to the access request through the default fragmentation; and

obtaining access result corresponding to the access data identity.

106. A computer equipment for cache system hotspot data access comprising a computer readable physical memory and a processor communicatively connected to the memory wherein the processor is configured to execute a computer program stored on the memory and wherein the processor when executing the computer program is configured to:

receive an access request of a cache system, wherein the access request carries a access data identity;

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list;

route the access request to the target fragmentation according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

107. The computer equipment of claim 106 wherein the processor is further configured to:

Date Reçue/Date Received 2023-08-02

obtain a candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtain a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generate a candidate hotspot data list according to the candidate hotspot data.

108. The computer equipment of any one of claims 106 to 107 wherein the processor is further configured to:

obtain a pre-set expiration time corresponding to each candidate hotspot data;

remove the corresponding candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtain the updated candidate hotspot data list.

109. The computer equipment of any one of claims 106 to 108 wherein the processor is further configured to:

obtain a pre-set counter;

respond to the access request through the pre-set counter;

obtain current access times corresponding to the access data identity;

determine whether to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold; and

Date Reçue/Date Received 2023-08-02

enter obtaining the pre-set route scheduling rule if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

110. The computer equipment of any one of claims 106 to 109 wherein the processor is further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

determine the pre-set counter is no longer counting.

111. The computer equipment of any one of claims 106 to 110 wherein the processor is further configured to:

obtain a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determine, if existing the same candidate hotspot data identity as the access data identity, the to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

112. The computer equipment of any one of claims 106 to 111 wherein the processor is further configured to:

Date Reçue/Date Received 2023-08-02

determine, if the to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

113. The computer equipment of any one of claims 106 to 112 wherein the processor is further configured to:

receive an access request from the cache system, the access request carries a access data identity;

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list; and

route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

114. The computer equipment of any one of claims 106 to 113 wherein the cache system is a distributed key-value pair cache system.

115. The computer equipment of any one of claims 106 to 114 wherein a plurality of the fragmentations of the cache system are used.

Date Reçue/Date Received 2023-08-02

116. The computer equipment of any one of claims 106 to 115 wherein, the access request of the cache system is used to request access to the cache system, the accesses request generated through performing at least on trigger operation on the access control set by the relevant business access application, the trigger operation comprises one or more of a click operation, voice operation, and timing events.

117. The computer equipment of any one of claims 106 to 116 wherein the access request comprises one or more of the access data identity, the access data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the access data identity.

118. The computer equipment of any one of claims 106 to 117 wherein a plurality of requests frequently accesses the same key and wherein the requests are instantly gathered in a fragmentation.

119. The computer equipment of any one of claims 106 to 118 wherein the processor is further configured to:

judge whether the to be accessed data corresponds to the access data identity is the hotspot data; and

disperse the access request corresponding to the hotspot data to each fragmentation to achieve hotspot data's evenly access if the to be accessed data is hotspot data.

120. The computer equipment of claim 119 wherein the dispersion comprises:

obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data;

Date Reçue/Date Received 2023-08-02

determining of whether the to be accessed data corresponding to the access data identity is hotspot data in the access request by matching with the candidate hotspot data list;

obtaining pre-set route scheduling rule if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, wherein the pre-set route scheduling rule is pre-set for evenly accessing that can be determined and obtained based on one or more of service requirements, actual application scenarios and product requirements.

121. The computer equipment of any one of claims 119 to 120 wherein the access request is processed through the default fragmentation corresponding to the access data identity.

122. The computer equipment of any one of claims 106 to 121 wherein the target fragmentation is used to process the fragmentation of the access request through the pre-set route scheduling rule.

123. The computer equipment of any one of claims 106 to 122 wherein the target fragmentation is used to process the access requests corresponding to at least one accessed data identity, wherein the access data corresponding to the accessed data identity is not the hotspot data.

124. The computer equipment of claim 123 wherein according to the route scheduling rule, the access request corresponding to the hotspot data is routed to the fragmentation corresponding to non-hotspot data, and wherein the fragmentation traffic corresponding to the hotspot data is shared by the fragmentation corresponding to the non-hotspot data.

Date Reçue/Date Received 2023-08-02

125. The computer equipment of any one of claims 123 to 124 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation pre-loads each hotspot data, when the access request corresponding to the access data identity is routed to the target fragmentation, wherein the target fragmentation responds to the access request directly and obtains the access result corresponding to the access data identity.

126. The computer equipment of any one of claims 106 to 124 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation records the access times of the access request corresponding to the access data identity through the pre-set counter, and when the access times reaches a pre-set access times threshold, loads each hotspot data through the target fragmentation, and when the target fragmentation completes the loading of hotspot data, the access request corresponding to the access data identity is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation responds this access request directly and obtains the access result corresponding to the access data identity and when the access times does not reach the pre-set access times threshold, determines whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

127. The computer equipment of any one of claims 106 to 126 wherein receiving the access request further comprises:

obtaining the candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

Date Reçue/Date Received 2023-08-02

obtaining the candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generating a candidate hotspot data list according to the candidate hotspot data.

128. The computer equipment of any one of claims 106 to 127 wherein the candidate fragmentations:

collect the candidate hotspot data

pre-load the candidate hotspot data;

combine successfully loaded candidate hotspot data to a candidate hotspot data list;

judge whether the to be accessed data corresponding to the access data identity included in the access request is in the candidate hotspot data list;

determine, if the judging results in a yes, the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain the access result.

Date Reçue/Date Received 2023-08-02

129. The computer equipment of claim 128 wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, and wherein the obtaining of the candidate hotspot data is through one or more of massive web crawling, data crawling and access records of at least one website, and wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

130. The computer equipment of any one of claims 106 to 129 wherein accessing the cache system hotspot data further comprises:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

131. The computer equipment of claim 130 wherein the pre-set expiration time corresponding to candidate hotspot data is set while the loading the candidate hotspot data in each candidate fragmentation.

132. The computer equipment of any one of claims 130 to 131 the pre-set expiration time is just past a peak access period.

133. The computer equipment of any one of claims 130 to 132 wherein the pre-set expiration time corresponding to each candidate hotspot data is obtained according to one or more of business requirements, actual application scenarios, and product requirements.

134. The computer equipment of any one of claims 130 to 133 wherein the candidate hotspot data corresponding to the reached pre-set expiration time is removed from the candidate hotspot data list when reaching the pre-set expiration time.

Date Reçue/Date Received 2023-08-02

135. The computer equipment of any one of claims 130 to 134 wherein a hotspot key is collected before the access request of the cache system is received.

136. The computer equipment of any one of claims 130 to 135 wherein the hotspot key is removed if it is expired.

137. The computer equipment of any one of claims 106 to 136 wherein receiving the access request of the cache system further comprises:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

determining whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold;

entering obtaining the pre-set route scheduling rule, if the determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

138. The computer equipment of any one of claims 106 to 137 wherein the processor is further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold wherein the candidate fragmentation set includes at least one candidate fragmentation.

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain a current counter status corresponding to the pre-set counter;

Date Reçue/Date Received 2023-08-02

set the current counter status to current expiration status; and

determine if the pre-set counter is no longer counting.

139. The computer equipment of any one of claims 106 to 138 wherein the accessing the to be accessed data corresponding to the access data identity in a candidate hotspot data list further comprises:

obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determining if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if existing the same candidate hotspot data identity as the access data identity.

140. The computer equipment of any one of claims 106 to 139 wherein the processor is further configured to:

determine, if to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

141. A computer readable physical memory having stored upon it a computer program when executed by a computer configured to:

receive an access request of a cache system, wherein the access request carries a access data identity;

Date Reçue/Date Received 2023-08-02

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list;

route the access request to the target fragmentation according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

142. The memory of claim 141 wherein the computer is further configured to:

obtain a candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtain a candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generate a candidate hotspot data list according to the candidate hotspot data.

143. The memory of any one of claims 141 to 142 wherein the computer is further configured to:

obtain a pre-set expiration time corresponding to each candidate hotspot data;

remove the corresponding candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtain the updated candidate hotspot data list.

Date Reçue/Date Received 2023-08-02

144. The memory of any one of claims 141 to 143 wherein the computer is further configured to:

obtain a pre-set counter;

respond to the access request through the pre-set counter;

obtain current access times corresponding to the access data identity;

determine whether to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold; and

enter obtaining the pre-set route scheduling rule if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

145. The memory of any one of claims 141 to 144 wherein the computer is further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold, wherein the candidate fragmentation set includes at least one candidate fragmentation;

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain current counter status corresponding to the pre-set counter;

set the current counter status to current expiration status; and

determine the pre-set counter is no longer counting.

Date Reçue/Date Received 2023-08-02

146. The memory of any one of claims 141 to 145 wherein the computer is further configured to:

obtain a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determine, if existing the same candidate hotspot data identity as the access data identity, the to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

147. The memory of any one of claims 141 to 146 wherein the computer is further configured to:

determine, if the to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

148. The memory of any one of claims 141 to 147 wherein the computer is further configured to:

receive an access request from the cache system, the access request carries a access data identity;

obtain a pre-set route scheduling rule when to be accessed data corresponding to the access data identity is in a candidate hotspot data list; and

Date Reçue/Date Received 2023-08-02

route the access request to the target fragmentation according to the pre-set route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the access data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the access data identity.

149. The memory of any one of claims 141 to 148 wherein the cache system is a distributed key-value pair cache system.

150. The memory of any one of claims 141 to 149 wherein a plurality of the fragmentations of the cache system are used.

151. The memory of any one of claims 141 to 150 wherein, the access request of the cache system is used to request access to the cache system, the accesses request generated through performing at least on trigger operation on the access control set by the relevant business access application, the trigger operation comprises one or more of a click operation, voice operation, and timing events.

152. The memory of any one of claims 141 to 151 wherein the access request comprises one or more of the access data identity, the access data identity is used to uniquely identify the to be accessed data, and correspondingly access result can be obtained according to the access data identity.

153. The memory of any one of claims 141 to 152 wherein a plurality of requests frequently accesses the same key and wherein the requests are instantly gathered in a fragmentation.

154. The memory of any one of claims 141 to 153 wherein the computer is further configured to:

judge whether the to be accessed data corresponds to the access data identity is the hotspot data; and

Date Reçue/Date Received 2023-08-02

disperse the access request corresponding to the hotspot data to each fragmentation to achieve hotspot data's evenly access if the to be accessed data is hotspot data.

155. The memory of claim 154 wherein the dispersion comprises:

obtaining the candidate hotspot data list, wherein the candidate hotspot data list includes at least one candidate hotspot data;

determining of whether the to be accessed data corresponding to the access data identity is hotspot data in the access request by matching with the candidate hotspot data list;

obtaining pre-set route scheduling rule if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, wherein the pre-set route scheduling rule is pre-set for evenly accessing that can be determined and obtained based on one or more of service requirements, actual application scenarios and product requirements.

156. The memory of any one of claims 154 to 155 wherein the access request is processed through the default fragmentation corresponding to the access data identity.

157. The memory of any one of claims 141 to 156 wherein the target fragmentation is used to process the fragmentation of the access request through the pre-set route scheduling rule.

158. The memory of any one of claims 141 to 157 wherein the target fragmentation is used to process the access requests corresponding to at least one accessed data identity, wherein the access data corresponding to the accessed data identity is not the hotspot data.

Date Reçue/Date Received 2023-08-02

159. The memory of claim 158 wherein according to the route scheduling rule, the access request corresponding to the hotspot data is routed to the fragmentation corresponding to non-hotspot data, and wherein the fragmentation traffic corresponding to the hotspot data is shared by the fragmentation corresponding to the non-hotspot data.

160. The memory of any one of claims 158 to 159 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation pre-loads each hotspot data, when the access request corresponding to the access data identity is routed to the target fragmentation, wherein the target fragmentation responds to the access request directly and obtains the access result corresponding to the access data identity.

161. The memory of any one of claims 141 to 159 wherein the access request is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation records the access times of the access request corresponding to the access data identity through the pre-set counter, and when the access times reaches a pre-set access times threshold, loads each hotspot data through the target fragmentation, and when the target fragmentation completes the loading of hotspot data, the access request corresponding to the access data identity is routed to the target fragmentation according to the pre-set route scheduling rule, wherein the target fragmentation responds this access request directly and obtains the access result corresponding to the access data identity and when the access times does not reach the pre-set access times threshold, determines whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list, if determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

162. The memory of any one of claims 141 to 161 wherein receiving the access request further comprises:

Date Reçue/Date Received 2023-08-02

obtaining the candidate hotspot data, wherein the candidate hotspot data includes correspondingly hotspot data identity;

obtaining the candidate fragmentation set, wherein the candidate fragmentation set includes at least one candidate fragmentation.

traversing each candidate fragmentation, so that the candidate fragmentation loads the candidate hotspot data; and

generating a candidate hotspot data list according to the candidate hotspot data.

163. The memory of any one of claims 141 to 162 wherein the candidate fragmentations:

collect the candidate hotspot data

pre-load the candidate hotspot data;

combine successfully loaded candidate hotspot data to a candidate hotspot data list;

judge whether the to be accessed data corresponding to the access data identity included in the access request is in the candidate hotspot data list;

determine, if the judging results in a yes, the target fragmentation from the candidate fragmentations according to the pre-set route scheduling rule;

respond to the access request through the target fragmentation; and

obtain the access result.

Date Reçue/Date Received 2023-08-02

164. The memory of claim 163 wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, and wherein the obtaining of the candidate hotspot data is through one or more of massive web crawling, data crawling and access records of at least one website, and wherein the candidate hotspot data includes correspondingly candidate hotspot data identity, the different candidate hotspot data correspond to the different candidate hotspot data identity.

165. The memory of any one of claims 141 to 164 wherein accessing the cache system hotspot data further comprises:

obtaining a pre-set expiration time corresponding to each candidate hotspot data;

removing the correspondingly candidate hotspot data from the candidate hotspot data list when reaching the pre-set expiration time; and

obtaining the updated candidate hotspot data list.

166. The memory of claim 165 wherein the pre-set expiration time corresponding to candidate hotspot data is set while the loading the candidate hotspot data in each candidate fragmentation.

167. The memory of any one of claims 165 to 166 the pre-set expiration time is just past a peak access period.

168. The memory of any one of claims 165 to 167 wherein the pre-set expiration time corresponding to each candidate hotspot data is obtained according to one or more of business requirements, actual application scenarios, and product requirements.

169. The memory of any one of claims 165 to 168 wherein the candidate hotspot data corresponding to the reached pre-set expiration time is removed from the candidate hotspot data list when reaching the pre-set expiration time.

Date Reçue/Date Received 2023-08-02

170. The memory of any one of claims 165 to 169 wherein a hotspot key is collected before the access request of the cache system is received.

171. The memory of any one of claims 165 to 170 wherein the hotspot key is removed if it is expired.

172. The memory of any one of claims 141 to 171 wherein receiving the access request of the cache system further comprises:

obtaining a pre-set counter;

responding to the access request through the pre-set counter;

obtaining current access times corresponding to the access data identity;

determining whether the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if the current access times does not reach an access times threshold;

entering obtaining the pre-set route scheduling rule, if the determining of to be accessed data corresponding to the access data identity is in the candidate hotspot data list.

173. The memory of any one of claims 141 to 172 wherein the computer is further configured to:

obtain a candidate fragmentation set if the current access times reaches the access times threshold wherein the candidate fragmentation set includes at least one candidate fragmentation.

traverse each candidate fragmentation;

load the to be accessed data through each candidate fragmentation;

obtain a current counter status corresponding to the pre-set counter;

Date Reçue/Date Received 2023-08-02

set the current counter status to current expiration status; and

determine if the pre-set counter is no longer counting.

174. The memory of any one of claims 141 to 173 wherein the accessing the to be accessed data corresponding to the access data identity in a candidate hotspot data list further comprises:

obtaining a candidate hotspot data list, wherein the candidate hotspot list includes each candidate hotspot data, each candidate hotspot data includes correspondingly candidate hotspot data identity; and

determining if the to be accessed data corresponding to the access data identity is in the candidate hotspot data list if existing the same candidate hotspot data identity as the access data identity.

175. The memory of any one of claims 141 to 174 wherein the computer is further configured to:

determine, if to be accessed data corresponding to the access data identity is not in the candidate hotspot data list, the correspondingly default fragmentation according to the access data identity, wherein the default fragmentation is specifically used to process the access request corresponding to the access data identity;

respond to the access request through the default fragmentation; and

obtain access result corresponding to the access data identity.

Date Reçue/Date Received 2023-08-02

DRAWINGS

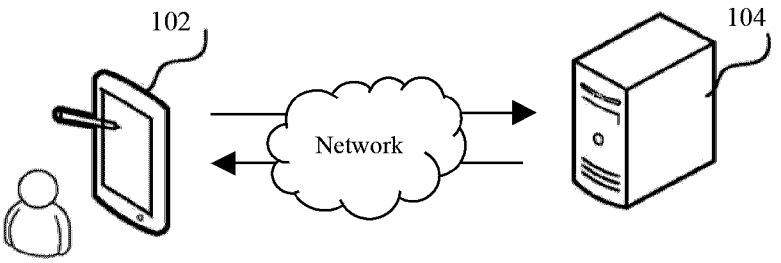


Figure 1

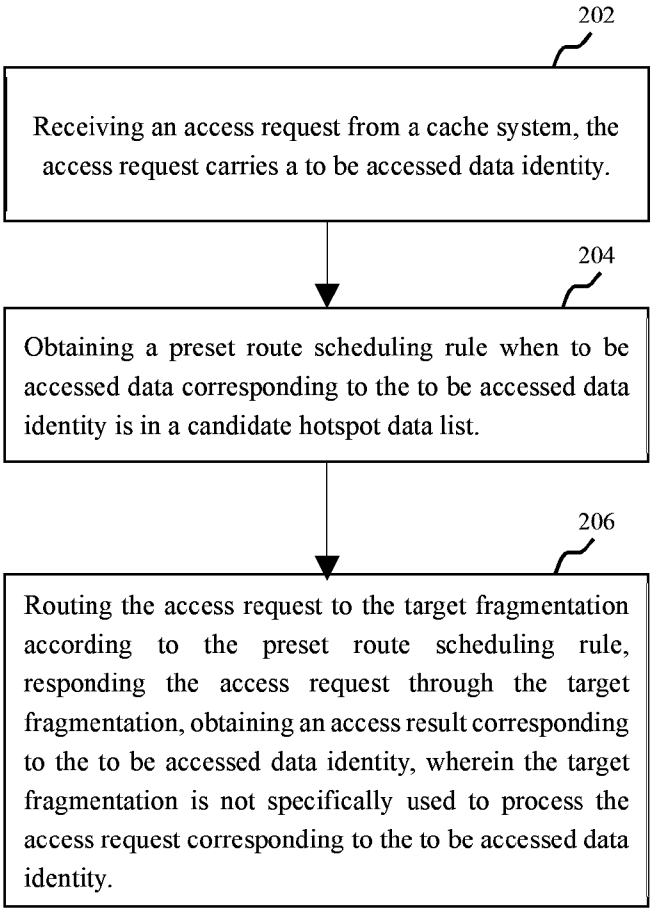


Figure 2

Date Reçue/Date Received 2021-10-18

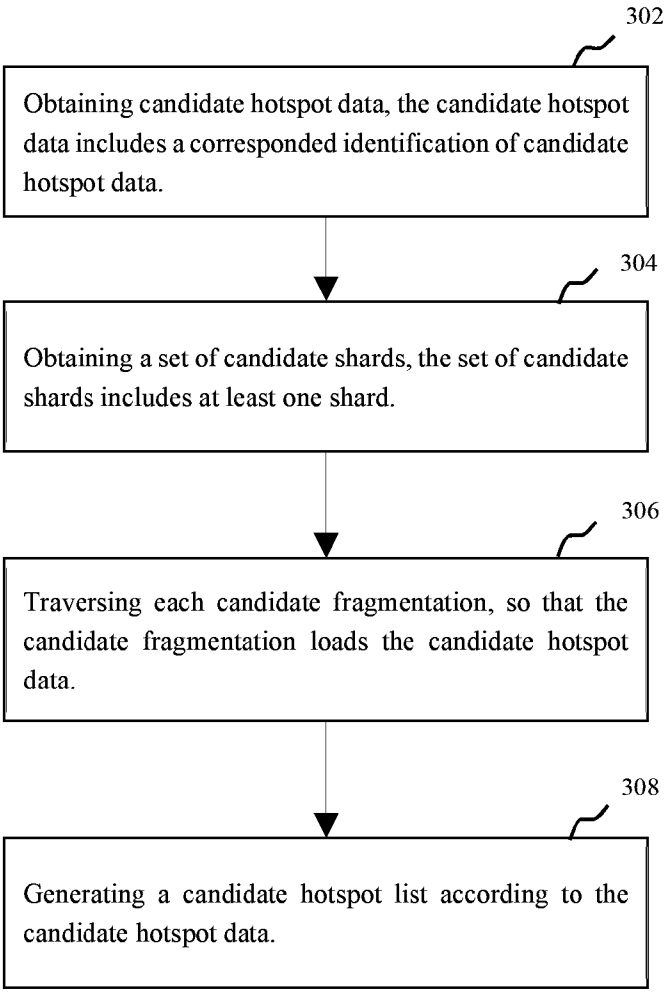


Figure 3

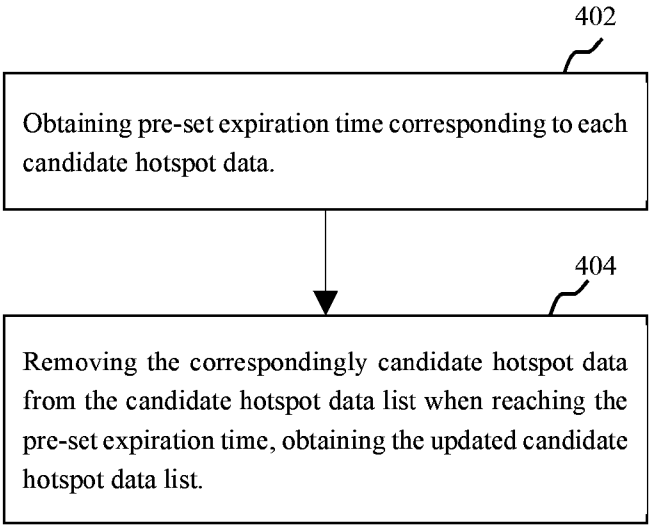


Figure 4

Date Reçue/Date Received 2021-10-18

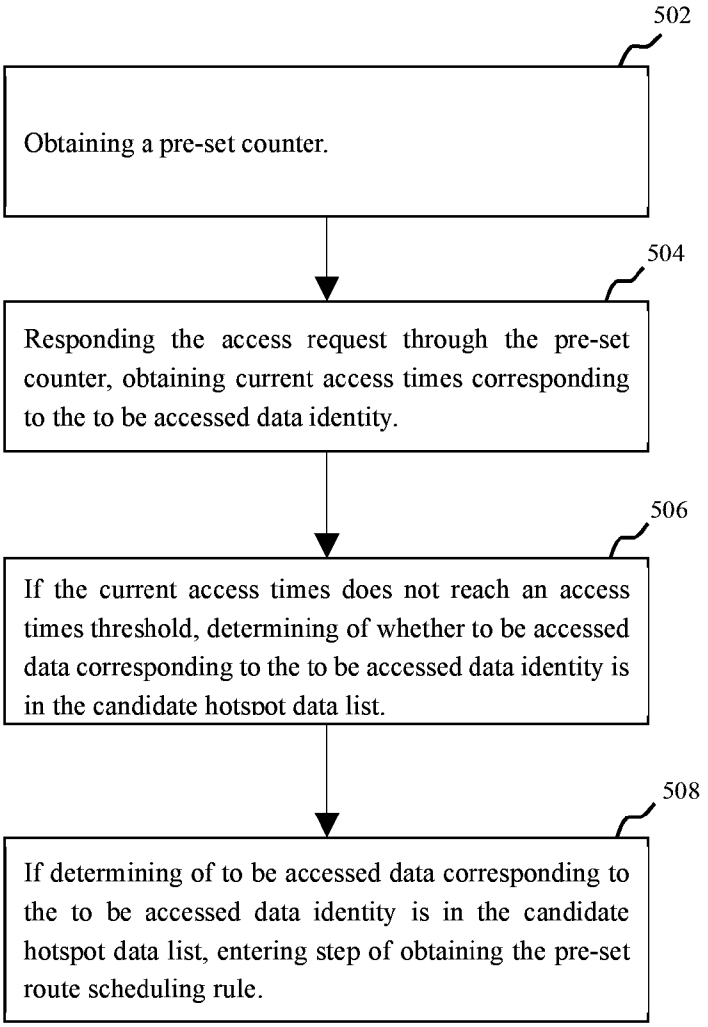

502
Obtaining a pre-set counter.
504
Responding the access request through the pre-set counter, obtaining current access times corresponding to the to be accessed data identity.
506
If the current access times does not reach an access times threshold, determining of whether to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list.
508
If determining of to be accessed data corresponding to the to be accessed data identity is in the candidate hotspot data list, entering step of obtaining the pre-set route scheduling rule.

Figure 5

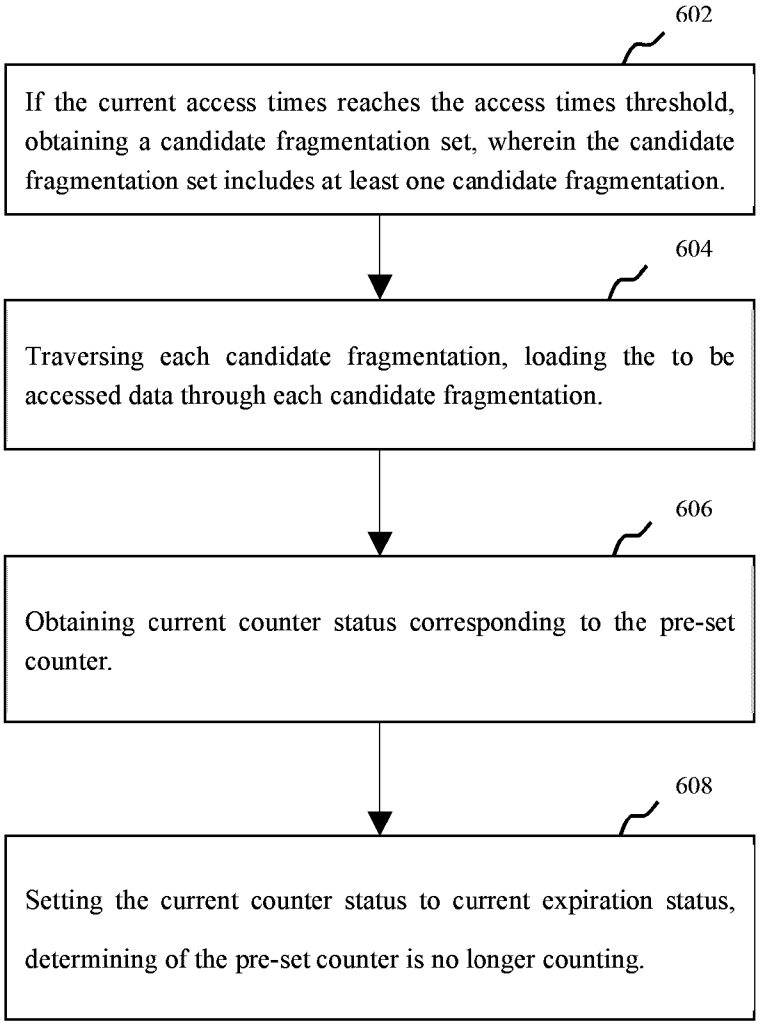


Figure 6

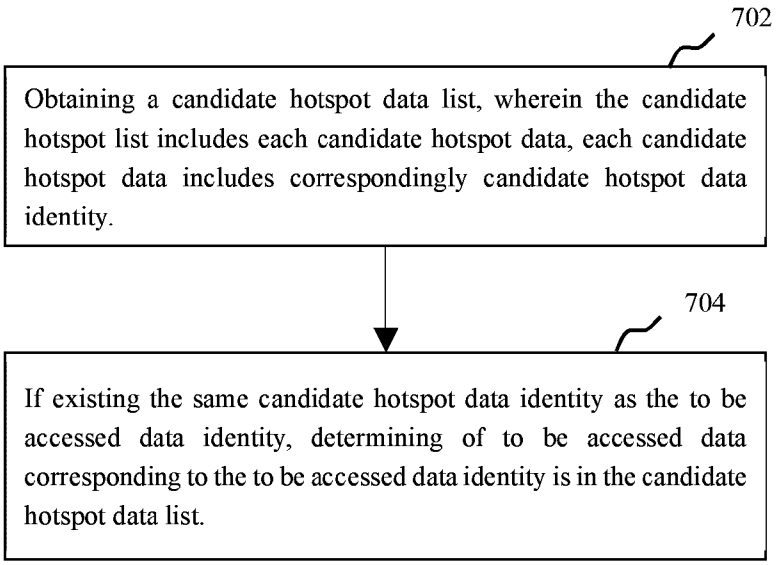


Figure 7

Date Reçue/Date Received 2021-10-18

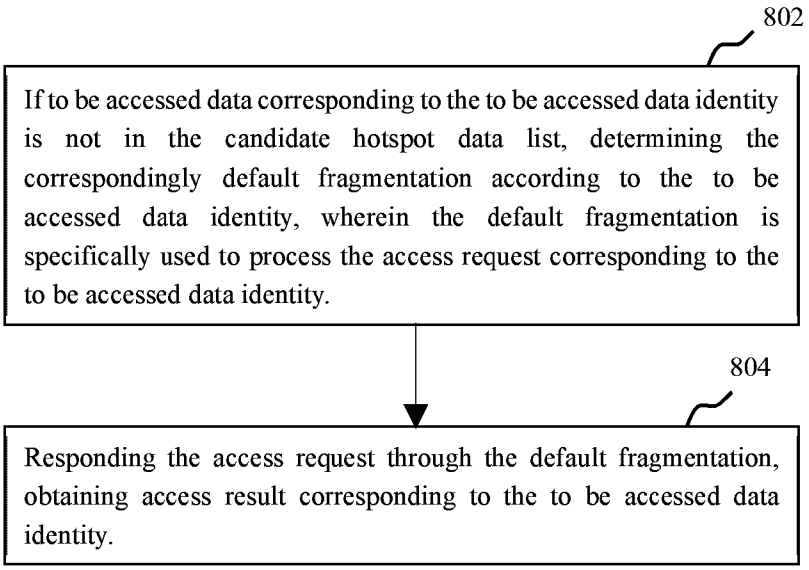


Figure 8

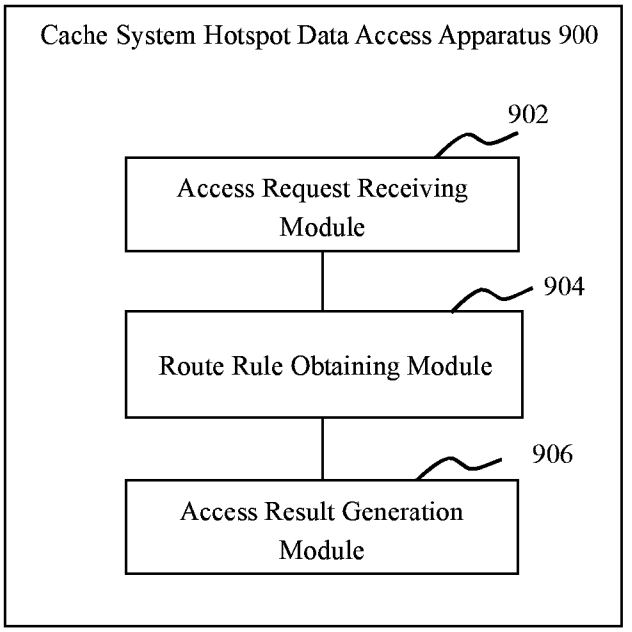


Figure 9

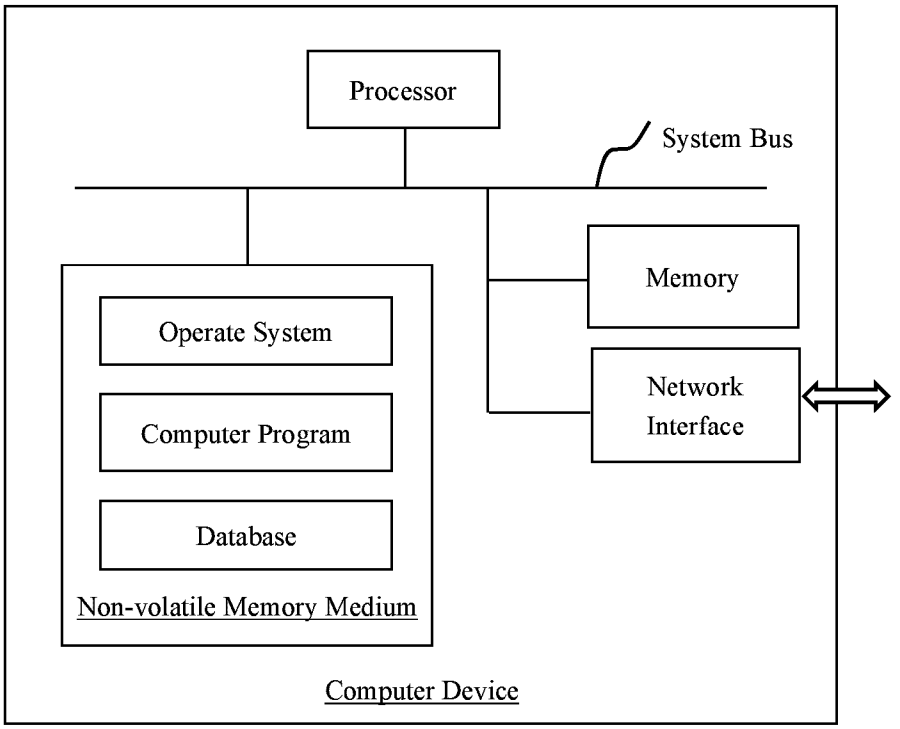


Figure 10

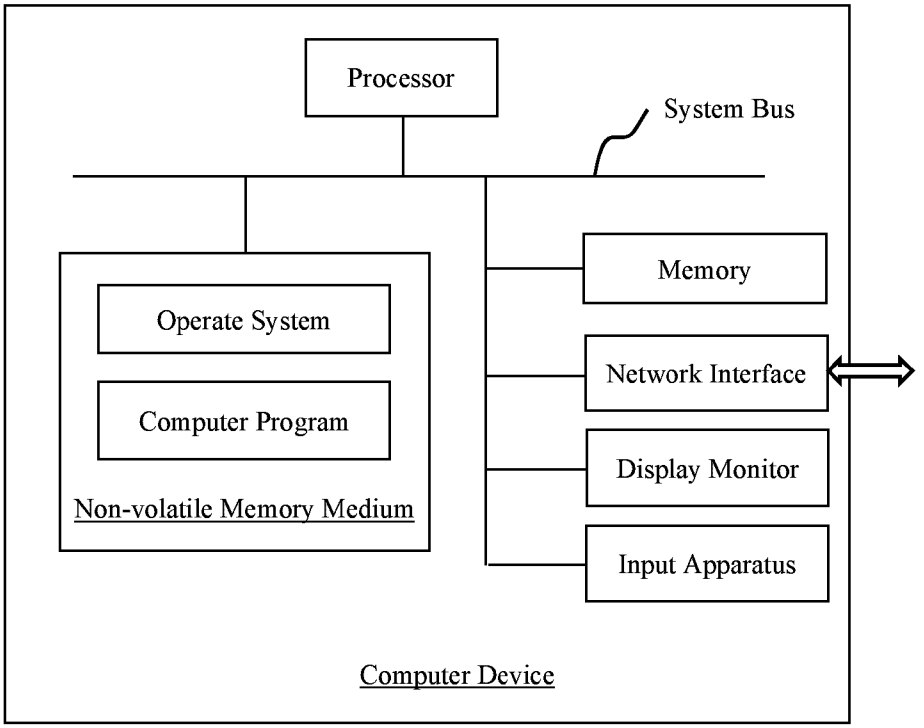
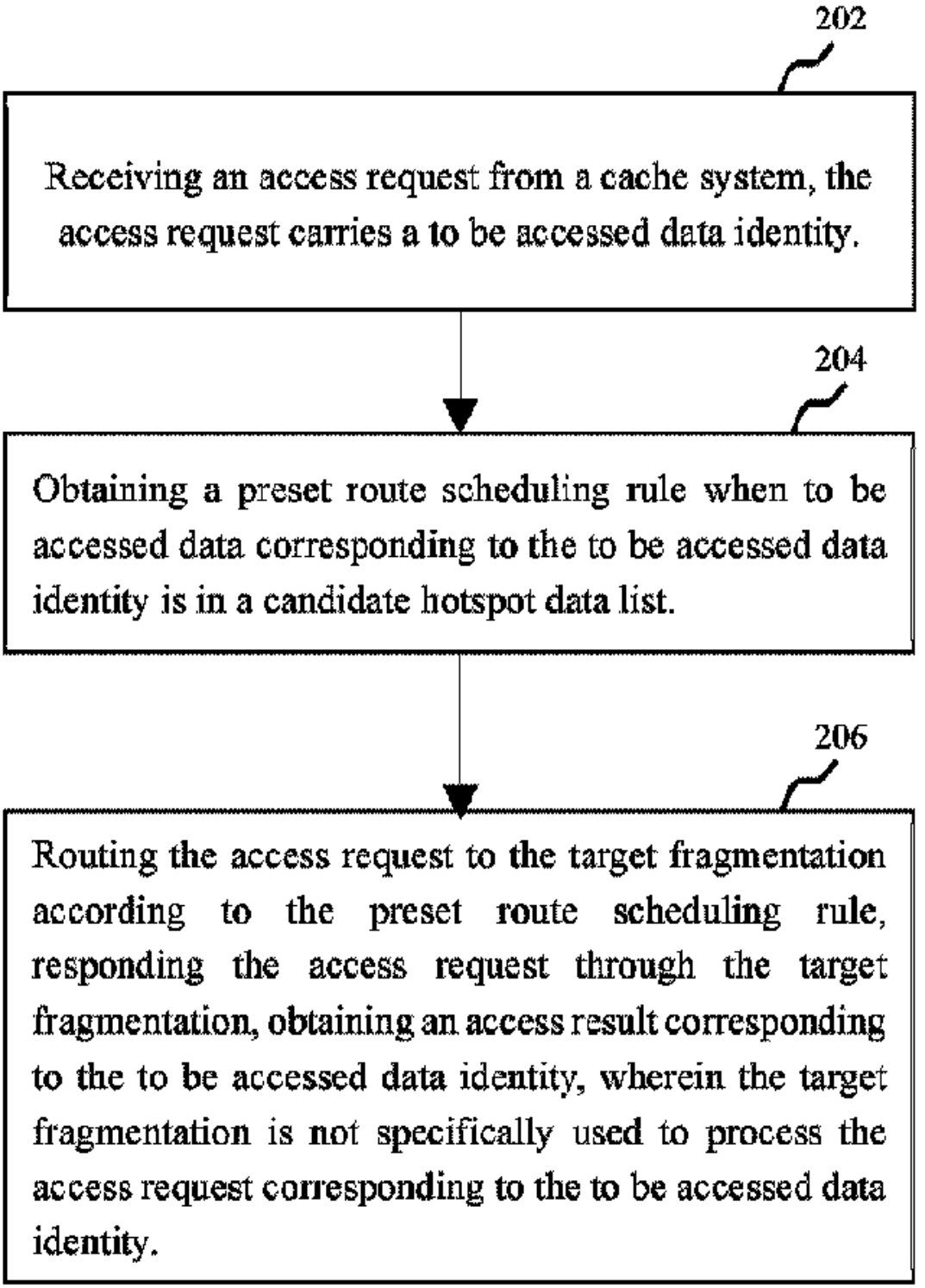


Figure 11

Date Reçue/Date Received 2021-10-18


202
Receiving an access request from a cache system, the access request carries a to be accessed data identity.
204
Obtaining a preset route scheduling rule when to be accessed data corresponding to the to be accessed data identity is in a candidate hotspot data list.
206
Routing the access request to the target fragmentation according to the preset route scheduling rule, responding the access request through the target fragmentation, obtaining an access result corresponding to the to be accessed data identity, wherein the target fragmentation is not specifically used to process the access request corresponding to the to be accessed data identity.