
METHOD FOR CONTROLLING USER USAGE OF RESOURCES, DEVICE, MEDIUM AND EQUIPMENT

The present application claims priority to Chinese Patent Application No. 201810054007.X filed to the SIPO on Jan. 19, 2018 and entitled “METHOD AND DEVICE FOR CONTROLLING USER USAGE OF RESOURCES”, the disclosure of which is incorporated herein by reference in its entirety.

Technical Field of the present invention

Embodiments of the present invention relate to, but are not limited to, the technical field of the Internet, and in particular to a method for controlling user usage of resources, a device, a medium and an equipment.

Background of the present invention

Cloud storage systems provide various resources, and different users access and use various resources provided by the cloud storage systems. Due to the limited processing capacity of the cloud storage systems, if users greatly increase the visit traffic within a short period of time, the processing capacity of the cloud storage systems may be greatly consumed, or even the cloud storage systems may break down. As a result, the cloud storage systems cannot provide services normally, and the normal access of other users is directly affected.

Summary of the present invention

The overview of the theme detailed herein will be given below. The overview is not intended to limit the protection scope of the claims.

Herein, the method for controlling user usage of resources includes steps of:

setting a resource usage threshold in a unit time for a user;

monitoring amount of resources used by the user as reported by each node module; and

determining, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time, and allocating the amount

of available resources to the node modules, N being a positive integer.

The method for controlling user usage of resources is further characterized in that:

the setting a resource usage threshold in a unit time for a user includes: setting, for the user, resource usage thresholds of different resource types in a unit time;

the monitoring the amount of resources used by the user as reported by each node module includes: monitoring the amount of resources of different resource types used by the user as reported by each node module; and

the determining, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time includes: determining, according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

The method for controlling user usage of resources is further characterized in that:

before allocating the amount of available resources to node modules, the method further includes: counting the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time; and

the allocating the amount of available resources to the node modules: allocating the amount of available resources to different node modules according to the proportion.

The method for controlling user usage of resources is further characterized in that:

the method further includes: after the node module acquires, from the central module, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detecting amount of resources used by the user in a unit time, and rejecting the user's access after the amount of resources used by the user in a unit time exceeds the amount of available resources in this unit time.

The method for controlling user usage of resources is further characterized in that:

the determining, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time includes: increasing the

amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

In the embodiments of the present invention, the device for controlling user usage of resources includes a central device, the central device including:

a setup module configured to set a resource usage threshold in a unit time for a user;

a monitor module configured to monitor amount of resources used by the user as reported by each node module; and

an allocation module configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time, and allocate the amount of available resources to the node modules, N being a positive integer.

The device for controlling user usage of resources is further characterized in that:

the setup module is further configured to set, for the user, resource usage thresholds of different resource types in a unit time;

the monitor module is further configured to monitor the amount of resources of different resource types used by the user as reported by each node module; and

the allocation module is further configured to determine, according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

The device for controlling user usage of resources is further characterized in that:

the device further includes a counting module configured to count the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time; and

the allocation module is configured to allocate the amount of available resources to different node modules according to the proportion.

The device for controlling user usage of resources is further characterized in that:

the device further includes a node device configured to: acquire, from the central device, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detect amount of resources used by the user in a unit time, and reject the user's access after the amount of resources used by the user in a unit time exceeds the amount of available resources in this unit time.

The device for controlling user usage of resources is further characterized in that:

the allocation module is configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time by the following method: increasing the amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

The computer readable storage medium provided in the embodiments of the present invention store computer programs that, when executed by a processor, implement the steps in the method described above.

The computer equipment provided in the embodiments of the present invention includes a memory, a processor and computer programs that are stored on the memory and runnable on the processor, the processor implementing the steps in the method described above when executing the programs.

In the embodiments of the present invention, the central module monitors the amount of resources on each node module used by the user in real time and dynamically adjusts the amount of resources allocated to each node module, so that the node module prohibits the user from continuously using resources when the amount of resources on this node module used by the user exceeds the usage amount set by the central node. Accordingly, the user can be prevented from consuming the system resources without limitation, and the system is always in a resource surplus state, the system can always provide services normally, so that the system is prevented

from resource exhaustion and breakdown.

Brief Description of the Drawings

The accompanying drawings described herein are used for providing the further understanding of the embodiments of the present invention and constitute a part of the present application. Schematic embodiments in the embodiments of the present invention and description thereof are used for explaining the embodiments of the present invention, and do not constitute any improper limitations to the embodiments of the present invention. In the accompanying drawings:

Fig. 1 is a flowchart of a method for controlling user usage of resources according to Embodiment 1; and

Fig. 2 is a flowchart of a method for controlling user usage of resources according to Embodiment 2.

Detailed Description of the present invention

The embodiments of the present invention will be further described below by specific implementations with reference to the accompanying drawings.

Embodiment 1

Fig. 1 is a flowchart of the method for controlling user usage of resources in this embodiment. The method includes the following steps.

Step 101: A resource usage threshold in a unit time is set for a user.

Step 102: The amount of resources used by the user as reported by each node module is monitored.

Step 103: The amount of available resources for the user in each unit time in N unit times subsequent to the current time is determined according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, and the amount of available resources is allocated to node modules, N being a positive integer.

The method further includes a step 104: after a node module acquire, from a central module, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detecting the amount of resources used by the user in a unit time, and rejecting the

user's access after the amount of resources used by the user in a unit time exceeds the amount of available resources in this unit time.

By this method, the user can be prevented from consuming resources in the system without limitation, and the system is always in a resource surplus state, the system can always provide services normally, so that the system is prevented from resource exhaustion and breakdown.

In the step 103, the determining, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, the amount of available resources for the user in each unit time in N unit times subsequent to the current time specifically includes: increasing the amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

In the step 103, before allocating the amount of available resources to node modules, the method further includes: counting the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time; and, the allocating the amount of available resources to node modules includes: allocating the amount of available resources to different node modules according to the above proportion. Specifically, when the counted proportion of the amount of resources on a node module used by the user in a preset period of time before the current time is large, a large proportion of the amount of available resources is correspondingly allocated to this node module. In this method, the subsequent allocation of available resources is determined according to the history of resource access on each node module, so that the resource allocation is more reasonable.

Embodiment 2

Compared with Embodiment 1, in Embodiment 2, the access control of resources of different resource types is also taken into consideration.

Fig. 2 is a flowchart of the method for controlling user usage of resources in this embodiment. The method includes the following steps.

Step 201: Resource usage thresholds of different resource types in a unit time are set for a

user.

Step 202: The amount of resources of different resource types used by the user as reported by each node module is monitored.

Step 203: The amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time is determined according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, and the amount of available resources is allocated to the node modules, N being a positive integer.

The method further includes a step 204: after a node module acquires, from a central module, the amount of available resources of each resource type for the user in each time unit in N unit times subsequent to the current time, detecting the amount of resources of each resource type used by the user in a unit time, and after the amount of resources of at least one resource type used by the user in a unit time exceeds the amount of available resources of this resource type in this unit time, rejecting the user's access to resources of this resource type .

In the step 103, the determining, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, the amount of available resources for the user in each time unit in N unit times subsequent to the current time specifically includes: increasing the amount of available resources of each resource type for the user in each unit time by one resource usage threshold of the corresponding resource type, subtracting the amount of resources of the corresponding resource type used by the user from the amount of available resources of each resource type for the user after the reported amount of resources of each resource type used by the user is received from the node module, and allocating the updated amount of available resources of each resource type for the user as the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

In the step 203, before allocating the amount of available resources to the node modules, the method further includes: counting the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time. The allocating the amount of available resources to node modules includes: allocating the amount of available resources to different node modules according to the proportion. In this method, the subsequent

allocation of available resources is determined according to the history of resource access on each node module, so that the resource allocation is more reasonable.

Embodiment 3

Corresponding to Embodiment 1, the device for controlling user usage of resources in Embodiment 3 includes a central device. The central device includes:

a setup module configured to set a resource usage threshold in a unit time for a user;

a monitor module configured to monitor amount of resources used by the user as reported by each node module; and

an allocation module configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time, and allocate the amount of available resources to the node modules, N being a positive integer.

The central device further includes a counting module configured to count the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time. The allocation module is configured to allocate the amount of available resources to different node modules according to the proportion.

The allocation module is configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, the amount of available resources for the user in each unit time in N unit times subsequent to the current time by the following method: increasing the amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

The device for controlling user usage of resources further includes a node device configured to: acquire, from a central device, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detect the amount of resources used by the user in a unit time, and reject the user's access after the amount of resources used by the user in a unit

time exceeds the amount of available resources in this unit time.

Embodiment 4

Corresponding to Embodiment 2, the device for controlling user usage of resources in Embodiment 4 includes a central device. The central device includes:

a setup module configured to set, for the user, resource usage thresholds of different resource types in a unit time;

a monitor module configured to monitor the amount of resources of different resource types used by the user as reported by each node module; and

an allocation module configured to determine, according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time, and allocate the amount of available resources to node modules, N being a positive integer.

The central device further includes a counting module configured to count the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time. The allocation module is configured to allocate the amount of available resources to different node modules according to the proportion.

The allocation module is configured to determine, according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time by the following method: increasing the amount of available resources of each resource type for the user in each unit time by one resource usage threshold of the corresponding resource type, subtracting the amount of resources of the corresponding resource type used by the user from the amount of available resources of each resource type for the user after the reported amount of resources of each resource type used by the user is received from the node module, and allocating the updated amount of available resources of each resource type for the user as the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

The device for controlling user usage of resources further includes a node device configured

to: acquire, from a central module, the amount of available resources of each resource type for the user in each time unit in N unit times subsequent to the current time, detect the amount of resources of each resource type used by the user in a unit time, and after the amount of resources of at least one resource type used by the user in a unit time exceeds the amount of available resources of this resource type in this unit time, reject the user's access to resources of this resource type.

It should be understood by a person of ordinary skill in the art that, modifications or equivalent replacements can be made to the technical solutions in the embodiments of the present invention without departing from the spirit and scope of the technical solutions of the present invention, and these modifications or equivalent replacements shall fall into the scope defined by the appended claims.

It should be understood by a person of ordinary skill in the art that, all or some of the steps in the methods described above and the functional modules/units in the systems and devices described above may be implemented as software, firmware, hardware and proper combinations thereof. In the hardware implementation, the division of the functional modules/units mentioned above does not necessarily correspond to the division of physical components. For example, one physical component may have multiple functions, or one function or step may be cooperatively executed by a number of physical components. Some or all of the components may be implemented as software executed by processors such as digital signal processors or microprocessors, or implemented as hardware, or implemented as integrated circuits such as application-specific integrated circuits. Such software may be distributed on computer-readable mediums, and the computer-readable mediums may include computer storage mediums (or non-temporary mediums) and communication mediums (or temporary mediums). As well-known to a person of ordinary skill in the art, the term computer storage medium includes volatile or non-volatile and removable or non-removable mediums implemented in any method or technology used for storing information (e.g., computer-readable instructions, data structures, program modules or other data). The computer storage mediums include, but not limited to, RAMs, ROMs, EEPROMs, flash memories or other memory technologies, CD-ROMs, digital video disks (DVDs) or other optical disk storages, magnetic cassettes, magnetic tapes, magnetic disk storages or other magnetic storage devices, or any other mediums which can be used to store

desired information and can be accessed by computers. In addition, as well-known to a person of ordinary skill in the art, the communication mediums generally contain computer-readable instructions, data structures, program modules or other data in modulation data signals such as carriers or other transmission mechanisms, and may include any information transfer mediums.

Industrial Applicability

Herein, the central module monitors the amount of resources on each node module used by the user in real time and dynamically adjusts the amount of resources allocated to each node module, so that the node module prohibits the user from continuously using resources when the amount of resources on this node module used by the user exceeds the usage amount set by the central node. Accordingly, the user can be prevented from consuming resources in the system without limitation, the system is always in a resource surplus state, the system can always provide services normally, and the system is prevented from resource exhaustion and breakdown.

CLAIMS

1. A method for controlling user usage of resources, executed by a center device, comprising steps of:

setting, by a setup module, a resource usage threshold in a unit time for a user;

monitoring, by a monitor module, amount of resources used by the user as reported by each node module; and

determining, by an allocation module, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time, and allocating the amount of available resources to the node modules, N being a positive integer;

the node module prohibits the user from continuously using resources when the amount of resources on the node module used by the user exceeds the usage amount set by the central node;

wherein, the determining, by the allocation module, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time comprises: increasing the amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

2. The method for controlling user usage of resources according to claim 1, wherein,

the setting, by a setup module, a resource usage threshold in a unit time for a user comprises: setting, by the setup module, for the user, resource usage thresholds of different resource types in a unit time;

the monitoring, by a monitor module, the amount of resources used by the user

as reported by each node module comprises: monitoring, by the monitor module, the amount of resources of different resource types used by the user as reported by each node module; and

the determining, by an allocation module, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time comprises: determining, by the allocation module, according to the resource usage threshold of each resource type in a unit time for the user and the amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

3. The method for controlling user usage of resources according to claim 1, wherein,

before allocating the amount of available resources to node modules, the method further comprises: counting, by a counting module, the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time; and

the allocating the amount of available resources to the node modules comprises: allocating, by the allocation module, the amount of available resources to different node modules according to the proportion.

4. The method for controlling user usage of resources according to claim 1, wherein,

the method further comprises: after the node module acquires, from the central module, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detecting amount of resources used by the user in a unit time, and rejecting the user's access after the amount of resources used by the user in a unit time exceeds the amount of available resources in the unit time.

5. A device for controlling user usage of resources, comprising a central device, the central device comprising:

a setup module configured to set a resource usage threshold in a unit time for a user;

a monitor module configured to monitor amount of resources used by the user as reported by each node module; and

an allocation module configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time, and allocate the amount of available resources to the node modules, N being a positive integer;

the node module prohibits the user from continuously using resources when the amount of resources on the node module used by the user exceeds the usage amount set by the central node;

wherein, the allocation module is configured to determine, according to the resource usage threshold in a unit time for the user and the amount of resources on each node module used by the user, amount of available resources for the user in each unit time in N unit times subsequent to the current time by the following method: increasing the amount of available resources for the user in each unit time by one resource usage threshold, subtracting the amount of resources used by the user from the amount of available resources for the user after the reported amount of resources used by the user is received from the node module, and allocating the updated amount of available resources for the user as the amount of available resources for the user in each unit time in N unit times subsequent to the current time.

6. The device for controlling user usage of resources according to claim 5, wherein,

the setup module is further configured to set, for the user, resource usage thresholds of different resource types in a unit time;

the monitor module is further configured to monitor the amount of resources of different resource types used by the user as reported by each node module; and

the allocation module is further configured to determine, according to the resource usage threshold of each resource type in a unit time for the user and the

amount of resources of each resource type on each node module used by the user, the amount of available resources of each resource type for the user in each unit time in N unit times subsequent to the current time.

7. The device for controlling user usage of resources according to claim 5, wherein,

the device further comprises a counting module configured to count the proportion of the amount of resources on each node module used by the user in a preset period of time before the current time; and

the allocation module is configured to allocate the amount of available resources to different node modules according to the proportion.

8. The device for controlling user usage of resources according to claim 5, wherein,

the device further comprises a node device configured to: acquire, from the central device, the amount of available resources for the user in each unit time in N unit times subsequent to the current time, detect amount of resources used by the user in a unit time, and reject the user's access after the amount of resources used by the user in a unit time exceeds the amount of available resources in the unit time.

9. A computer-readable storage medium storing computer programs that, when executed by a processor, implement the steps in the method according to any one of claims 1 to 4.

10. A computer equipment, comprising a memory, a processor and computer programs that are stored on the memory and runnable on the processor, the processor implementing the steps in the method according to any one of claims 1 to 4 when executing the programs.