

Claims

1. A method for scheduling a virtual machine, comprising:
obtaining energy consumption data of rack(s) and energy consumption data of host computers, wherein the rack(s) is/are used to place the host computers;
determining power consumption data of a virtual machine;
determining a target host computer corresponding to the virtual machine according to the energy consumption data of the rack(s), the energy consumption data of the host computers, and the power consumption data of the virtual machine; and
dispatching the virtual machine to the target host computer.
2. The method of claim 1, wherein the energy consumption data comprises power consumption data and electric heating data.
3. The method of claim 2, wherein determining the target host computer corresponding to the virtual machine according to the energy consumption data of the rack, the energy consumption data of the host computers, and the power consumption data of the virtual machine comprises:
determining first rack(s) having normal energy consumption according to the energy consumption data of the rack(s);
determining first host computer(s) with a normal energy consumption according to energy consumption data of host computer(s) placed on the first rack(s); and
determining the target host computer according to the energy consumption data of the first host computer(s) and power consumption data of the virtual machine.

4. The method of claim 3, wherein determining the target host computer according to the energy consumption data of the first host computer(s) and power consumption data of the virtual machine comprises:

determining weight value(s) of the first host computer(s) according to the power consumption data of the first host computer(s), wherein the power consumption data is inversely proportional to the weight value(s); and

obtaining the target host computer according to the weight value(s) of the first host computer(s) and the power consumption data of the virtual machine.

5. The method of claim 3, wherein the first rack(s) is/are rack(s) whose power consumption data does not exceed a first threshold and whose electric heating data does not exceed a second threshold; and the first host computer(s) is/are placed on the first rack(s), and having power consumption data that does not exceed a third threshold, electric heating data that does not exceed a fourth threshold, and a hardware detection result indicating a host computer to have no abnormality.

6. The method of claim 2, wherein: before determining the target host computer corresponding to the virtual machine according to the energy consumption data of the rack(s), the energy consumption data of the host computer(s), and the power consumption data of the virtual machine, the method further comprises:

determining whether the virtual machine is a preset virtual machine, wherein the preset virtual machine is a virtual machine that cannot be scheduled;

determining the target host computer corresponding to the virtual machine according to the energy consumption data of the rack(s), the energy consumption data of

the host computer(s), and the power consumption data of the virtual machine if the virtual machine is not a preset virtual machine; and

performing, if the virtual machine is a preset virtual machine, power-limiting processing on the preset virtual machine according to the power consumption data of the rack(s) and the host computer(s), and the power consumption data of the virtual machine.

7. The method of claim 2, wherein determining the power consumption data of the virtual machine comprises:

obtaining first power consumption data of the virtual machine through a correlation model, wherein the correlation model is used to characterize a correlation between feature parameters of the virtual machine;

obtaining second power consumption data of the virtual machine according to historical power consumption data and feature data of the virtual machine; and

determining the power consumption data of the virtual machine according to the first power consumption data and the second power consumption data.

8. The method of claim 7, wherein obtaining the first power consumption data of the virtual machine through the correlation model comprises:

obtaining a feature vector of the virtual machine and power consumption data of a host computer where the virtual machine is located; and

inputting the feature vector of the virtual machine and the power consumption data of the host computer where the virtual machine is located into the correlation model to obtain the first power consumption data.

9. The method of claim 7, wherein: before obtaining the first power consumption data of the virtual machine through the correlation model, the method further comprises:

constructing an initial model;

obtaining sample data by obtaining historical power consumption data of virtual machines, feature vectors of the virtual machines and historical power consumption data of host computers where the virtual machines are located; and

training the initial model using the sample data to obtain a correlation model.

10. The method of claim 2, wherein: after dispatching the virtual machine to the target host computer, the method further comprises:

obtaining historical sales rates of the host computers;

obtaining second host computer(s) satisfying a preset condition according to the historical sales rates; and

obtaining a shelf density of a rack based on power consumption data of the second host computer(s), a preset degree of reliability, and rated power consumption data of the rack, wherein the shelf density is used to characterize the number of host computers placed on the same rack.

11. The method of claim 10, wherein obtaining the shelf density of the rack based on the power consumption data of the second host computer(s), the preset degree of reliability, and the rated power consumption data of the rack, the method further comprises:

ranking the second host computer(s) according to the power consumption data in an ascending order;

obtaining third host computer(s) from the ranked second host computer(s) according to the preset degree of reliability;

obtaining maximum power consumption data from power consumption data of the third host computer(s); and

obtaining a ratio between the rated power consumption data of the rack and the maximum power consumption data to obtain the shelf density.

12. The method of claim 10, wherein obtaining the second host computer(s) satisfying the preset condition according to the historical sales rates comprises:

ranking the host computer(s) in a descending order of the historical sales rates; and

obtaining the second host computer(s) from the ranked host computer(s) according to a preset sales rate threshold.

13. A method for scheduling a virtual machine, comprising:

obtaining energy consumption data of a rack, energy consumption data of host computers and power consumption data of a virtual machine, wherein multiple host computers are placed in the rack;

determining a target host computer corresponding to the virtual machine based on the energy consumption data of the rack, the energy consumption data of the host computers and the power consumption data of the virtual machine;

dispatching the virtual machine to the host computer; and

obtaining a shelf density of the rack based on the energy consumption data of the rack and the energy consumption data of the host computers, wherein the shelf density is used to characterize a number of host computers placed on the same rack.

14. The method of claim 13, wherein obtaining the shelf density of the rack based on the energy consumption data of the rack and the energy consumption data of the host computers obtaining historical sales rates of the host computers comprises:

obtaining second host computer(s) satisfying a preset condition according to the historical sales rates; and

obtaining the shelf density of the rack based on power consumption data of the second host computer(s), a preset degree of reliability, and rated power consumption data of the rack.

15. A storage medium comprising: a stored program, wherein the program, when running, controls a device where the storage medium is located to perform the following steps: obtaining energy consumption data of a rack and energy consumption data of host computers, wherein the rack is used to place the host computers; determining power consumption data of a virtual machine; determining a target host computer corresponding to the virtual machine according to the energy consumption data of the rack, the energy consumption data of the host computers, and the power consumption data of the virtual machine; and dispatching the virtual machine to the target host computer.

16. A processor configured to run a program, wherein the program executes the following steps when running: obtaining energy consumption data of a rack and energy consumption data of host computers, wherein the rack is used to place the host computers; determining power consumption data of a virtual machine; determining a target host computer corresponding to the virtual machine according to the energy consumption data

of the rack, the energy consumption data of the host computers, and the power consumption data of the virtual machine; and dispatching the virtual machine to the target host computer.

17. A virtual machine scheduling system comprising:

a processor; and

a memory, coupled to the processor, and configured to provide the processor with instructions for processing the following processing steps: obtaining energy consumption data of a rack and energy consumption data of host computers, wherein the rack is used to place the host computers; determining power consumption data of a virtual machine; determining a target host computer corresponding to the virtual machine according to the energy consumption data of the rack, the energy consumption data of the host computers, and the power consumption data of the virtual machine; and dispatching the virtual machine to the target host computer.

Claims:

1. A method implemented by one or more computing devices, the method comprising:

obtaining energy consumption data of one or more racks and energy consumption data of a plurality of host computers, wherein the one or more racks are used to place the plurality of host computers;

determining power consumption data of a virtual machine;

determining a target host computer corresponding to the virtual machine according to the energy consumption data of the one or more racks, the energy consumption data of the plurality of host computers, and the power consumption data of the virtual machine;
and

dispatching the virtual machine to the target host computer;

obtaining historical sales rates of the plurality of host computers;

obtaining one or more second host computers satisfying a preset condition according to the historical sales rates; and

obtaining a shelf density of a rack based on power consumption data of the one or more second host computers, a preset degree of reliability, and rated power consumption data of the rack, wherein the shelf density is used to characterize a number of host computers placed on a same rack.

2. The method of claim 1, wherein energy consumption data of one of the plurality of host computers comprises power consumption data and electric heating data of the one of the plurality of host computers.

3. The method of claim 1, wherein determining the target host computer corresponding to the virtual machine according to the energy consumption data of the rack, the energy consumption data of the plurality of host computers, and the power consumption data of the virtual machine comprises:

determining at least one first rack having a first energy consumption according to the energy consumption data of the one or more racks;

determining one or more first host computers with a second energy consumption according to energy consumption data of corresponding host computers placed on the at least one first rack; and

determining the target host computer according to the energy consumption data of the one or more first host computers and the power consumption data of the virtual machine.

4. The method of claim 3, wherein determining the target host computer according to the energy consumption data of the one or more first host computers and the power consumption data of the virtual machine comprises:

determining one or more weight values of the one or more first host computers according to power consumption data of the one or more first host computers, wherein the power consumption data of the one or more first host computers is inversely proportional to the one or more weight values; and

obtaining the target host computer according to the one or more weight values of the one or more first host computers and the power consumption data of the virtual machine.

5. The method of claim 3, wherein the at least one first rack is a rack whose power consumption data does not exceed a first threshold and whose electric heating data does not exceed a second threshold; and the one or more first host computers are placed on the at least one first rack and having power consumption data that does not exceed a third threshold, electric heating data that does not exceed a fourth threshold, and a hardware detection result indicating a host computer to have no abnormality.

6. The method of claim 2, wherein: before determining the target host computer corresponding to the virtual machine according to the energy consumption data of the one or more racks, the energy consumption data of the plurality of host computers,

and the power consumption data of the virtual machine, the method further comprises:

determining whether the virtual machine is a preset virtual machine, wherein the preset virtual machine is a virtual machine that is not schedulable;

determining the target host computer corresponding to the virtual machine according to the energy consumption data of the one or more racks, the energy consumption data of the plurality of host computers, and the power consumption data of the virtual machine if the virtual machine is not the preset virtual machine; and

performing, if the virtual machine is the preset virtual machine, power-limiting processing on the preset virtual machine according to power consumption data of the one or more racks and the plurality of host computers, and the power consumption data of the virtual machine.

7. The method of claim 1, wherein determining the power consumption data of the virtual machine comprises:

obtaining first power consumption data of the virtual machine through a correlation model, wherein the correlation model is used to characterize a correlation between feature parameters of the virtual machine;

obtaining second power consumption data of the virtual machine according to historical power consumption data and feature data of the virtual machine; and

determining the power consumption data of the virtual machine according to the first power consumption data and the second power consumption data.

8. The method of claim 7, wherein obtaining the first power consumption data of the virtual machine through the correlation model comprises:

obtaining a feature vector of the virtual machine and power consumption data of a host computer where the virtual machine is located; and

inputting the feature vector of the virtual machine and the power consumption data of the host computer where the virtual machine is located into the correlation model to obtain the first power consumption data.

9. The method of claim 7, wherein: before obtaining the first power consumption data of the virtual machine through the correlation model, the method further comprises:

constructing an initial model;

obtaining sample data by obtaining historical power consumption data of virtual machines, feature vectors of the virtual machines and historical power consumption data of host computers where the virtual machines are located; and

training the initial model using the sample data to obtain the correlation model.

10. The method of claim 1, wherein obtaining the shelf density of the rack based on the power consumption data of the one or more second host computers, the preset degree of reliability, and the rated power consumption data of the rack, comprises:

ranking the one or more second host computers according to the power consumption data of the one or more second host computers in an ascending order;

obtaining one or more third host computers from the one or more ranked second host computers according to the preset degree of reliability;

obtaining maximum power consumption data from power consumption data of the one or more third host computers; and

obtaining a ratio between the rated power consumption data of the rack and the maximum power consumption data to obtain the shelf density.

11. The method of claim 1, wherein obtaining the one or more second host computers satisfying the preset condition according to the historical sales rates comprises:

ranking the plurality of host computers in a descending order of the historical sales rates; and

obtaining the one or more second host computers from the plurality of ranked host computers according to a preset sales rate threshold.

12. A system comprising:
one or more processors; and
memory storing executable instructions that, when executed by the one or more
processors, cause the one or more processors to perform acts comprising:

obtaining energy consumption data of a rack, energy consumption data of
multiple host computers and power consumption data of a virtual machine, wherein
multiple host computers are placed in the rack;

determining a target host computer corresponding to the virtual machine
based on the energy consumption data of the rack, the energy consumption data
of the multiple host computers and the power consumption data of the virtual
machine;

dispatching the virtual machine to the target host computer; and

obtaining a shelf density of the rack based on the energy consumption data
of the rack and the energy consumption data of the multiple host computers,
wherein the shelf density is used to characterize a number of host computers
placed on a same rack, and wherein obtaining the shelf density of the rack based
on the energy consumption data of the rack and the energy consumption data of
the host computers comprises:

obtaining historical sales rates of the multiple host computers;

obtaining one or more second host computers satisfying a preset
condition according to the historical sales rates; and

obtaining the shelf density of the rack based on power consumption
data of the one or more second host computers, a preset degree of
reliability, and rated power consumption data of the rack.

13. One or more computer readable media storing executable instructions that,
when executed by the one or more processors, cause one or more processors to perform
acts comprising:

obtaining energy consumption data of one or more racks and energy consumption

data of a plurality of host computers, wherein the one or more racks are used to place the plurality of host computers;

determining power consumption data of a virtual machine;

determining a target host computer corresponding to the virtual machine according to the energy consumption data of the one or more racks, the energy consumption data of the plurality of host computers, and the power consumption data of the virtual machine, wherein determining the target host computer corresponding to the virtual machine comprises:

determining one or more weight values of one or more first host computers according to power consumption data of the one or more first host computers, wherein the power consumption data of the one or more first host computers is inversely proportional to the one or more weight values; and

obtaining the target host computer according to the one or more weight values of the one or more first host computers and the power consumption data of the virtual machine; and

dispatching the virtual machine to the target host computer.

14. The one of or more computer readable media claim 15, wherein energy consumption data of one of the plurality of host computers comprises power consumption data and electric heating data of the one of the plurality of host computers.

15. The one of or more computer readable media claim 15, wherein determining the target host computer corresponding to the virtual machine according to the energy consumption data of the rack, the energy consumption data of the plurality of host computers, and the power consumption data of the virtual machine further comprises:

determining at least one first rack having a first energy consumption according to the energy consumption data of the one or more racks;

determining the one or more first host computers according to energy consumption data of corresponding host computers placed on the at least one first rack, the one or

more first host computers having a second energy consumption; and
determining the target host computer according to the energy consumption data of
the one or more first host computers and power consumption data of the virtual machine.

16. The one of or more computer readable media claim 15, wherein the at least
one first rack is a rack whose power consumption data does not exceed a first threshold
and whose electric heating data does not exceed a second threshold; and the one or
more first host computers are placed on the at least one first rack and having power
consumption data that does not exceed a third threshold, electric heating data that does
not exceed a fourth threshold, and a hardware detection result indicating a host computer
to have no abnormality.

17. The one of or more computer readable media claim 15, wherein: before
determining the target host computer corresponding to the virtual machine according to
the energy consumption data of the one or more racks, the energy consumption data of
the plurality of host computers, and the power consumption data of the virtual machine,
the method further comprises:

determining whether the virtual machine is a preset virtual machine, wherein the
preset virtual machine is a virtual machine that is not schedulable;

determining the target host computer corresponding to the virtual machine
according to the energy consumption data of the one or more racks, the energy
consumption data of the plurality of host computers, and the power consumption data of
the virtual machine if the virtual machine is not the preset virtual machine; and

performing, if the virtual machine is the preset virtual machine, power-limiting
processing on the preset virtual machine according to the power consumption data of the
one or more racks and the plurality of host computers, and the power consumption data
of the virtual machine.