METHOD, APPARATUS AND DEVICE FOR RACK INSTALLATION AND CONFIGURATION IN PRIVATE NETWORK, COMPUTER STORAGE MEDIUM, AND COMPUTER PROGRAM PRODUCT

CROSS-REFERENCE TO RELATED APPLICATION

[0001] Embodiments of the disclosure are based on and claim priority of Chinese patent application No. 202211175257.1, filed on September 26, 2022, with a title of “method, apparatus, and device for configuring private network rack, and computer storage medium”, the entire content of which is hereby introduced into this application as a reference.

TECHNICAL FIELD

[0002] Embodiments of the disclosure relate to but are not limited to the field of network communication technology, and in particular to a method for rack installation and configuration in a private network, an apparatus for rack installation and configuration in a private network, a device for rack installation and configuration in a private network, a computer storage medium and a computer program product.

BACKGROUND

[0003] Currently, there is only a design for rack installation and configuration in a cloud resource pool, which relates to servers, storage, networking and security devices.

[0004] The related art for private network rack installation and configuration involves a small number of device types, cannot be widely applied to installation and configuration of private network devices in different scenarios and cannot be quickly replicated to service requirement scenarios for private network users in different industries, which leads to a low working efficiency of the related art for installation and configuration of a private network system.

SUMMARY

[0005] A method for rack installation and configuration in a private network, an apparatus for rack installation and configuration in a private network, a device for rack installation and configuration in a private network, a computer storage medium and a computer program product are provided in embodiments of the present disclosure.

WHAT IS CLAIMED IS:

1. A method for rack installation and configuration in a private network, the method comprising:

determining private network deployment requirement information according to a private network service requirement, deploying device hardware characteristics, and an environmental resource situation of a machine room, wherein the private network deployment requirement information comprises at least one of a device security requirement, a device hardware requirement, or a device environment requirement;

obtaining a deployed rack by deploying a plurality of devices to be deployed on corresponding target racks according to the private network deployment requirement information; and

obtaining the rack installation and configuration in the private network by adjusting installation and configuration of the deployed rack according to device hardware characteristics of the devices to be deployed and a specification requirement of user rack installation and configuration.

2. The method of claim 1,

wherein determining the private network deployment requirement information according to the private network service requirement, the deploying device hardware characteristics, and the environmental resource situation of the machine room comprises:

determining the device security requirement according to the private network service requirement, wherein the device security requirement comprises at least one of a disaster recovery requirement, an air supply mode security requirement, or an electromagnetic security requirement;

determining the device hardware requirement according to the deploying device hardware characteristics, wherein the device hardware requirement comprises at least one of: a power consumption requirement or a power type requirement of the devices to be deployed; and

determining the device environment requirement according to the environmental resource situation of the machine room, wherein the device environment requirement comprises at least one of a rack size limit or a machine room load-bearing limit.

3. The method of claim 2, wherein obtaining the deployed rack by deploying the plurality of devices to be deployed on the corresponding target racks according to the private network

deployment requirement information comprises:

deploying devices to be deployed that have the disaster recovery requirement and are of a same device type on different target racks respectively, wherein a number of devices of each device type deployed on each target rack is less than or equal to a disaster recovery ratio of a total number of devices of each device type;

deploying devices to be deployed that have the air supply mode security requirement and different air supply modes on different target racks respectively, wherein each of different target racks achieves the air supply mode security requirement; and

deploying devices to be deployed that have the electromagnetic security requirement and different electromagnetic types on different target racks respectively, wherein each of different target racks achieves the electromagnetic security requirement.

4. The method of claim 2, wherein obtaining the deployed rack by deploying the plurality of devices to be deployed on the corresponding target racks according to the private network deployment requirement information comprises:

in response to determining that the device to be deployed is deployed on a currently selected target rack, and a sum of a post-deployment power consumption requirement and a reserved power consumption requirement of the currently selected target rack is greater than a rack power consumption setting value, deploying the device to be deployed on a new target rack; and

deploying devices to be deployed that have the power type requirement and different power types on different target racks or different areas of a same target rack respectively, wherein each of different target racks achieves the power type requirement.

5. The method of claim 1 or 2, wherein obtaining the deployed rack by deploying the plurality of devices to be deployed on the corresponding target racks according to the private network deployment requirement information comprises:

in response to determining that the device to be deployed is deployed on a currently selected target rack, and a sum of an occupied space and a reserved space of the currently selected target rack is greater than a rack size limit, deploying the device to be deployed on a new target rack; and

in response to determining that the device to be deployed has been deployed on the currently selected target rack, and a sum of a post-deployment weight and a reserved weight of

the currently selected target rack exceeds a preset load-bearing limit of the machine room, deploying the device to be deployed on a new target rack.

6. The method of claim 1 or 2, wherein obtaining the deployed rack by deploying the plurality of devices to be deployed on the corresponding target rackss according to the private network deployment requirement information comprises:

deploying each of the devices to be deployed on one of a plurality of target racks in sequence according to the private network deployment requirement information and a deployment priority;

for each of the devices to be deployed, deploying the device to be deployed on a first target rack according to the device security requirement; and

in response to determining that there is a device to be deployed on the first target rack that does not meet the device hardware requirement and the device environment requirement, deploying the device to be deployed on a second target rack.

7. The method of claim 1 or 2, wherein obtaining the rack installation and configuration in the private network by adjusting installation and configuration of the deployed rack according to device hardware characteristics of the devices to be deployed and the specification requirement of user rack installation and configuration comprises:

obtaining an adjusted configuration by adjusting installation and configuration of the deployed rack within a same rack according to the device hardware characteristics of the device to be deployed, wherein the device hardware characteristics comprises at least one of a power supply mode, an air supply mode, or a device weight; and

obtaining the rack installation and configuration in the private network by adjusting the installation and configuration adjusted again according to the specification requirement of user rack installation and configuration.

8. An apparatus for rack installation and configuration in a private network, comprising:

a determination module, configured to determine private network deployment requirement information according to a private network service requirement, deploying device hardware characteristics, and an environmental resource situation of a machine room, wherein the private network deployment requirement information comprises at least one of a device security requirement, a device hardware requirement, or a device environment requirement;

a deployment module, configured to obtain a deployed rack by deploying a plurality of

devices to be deployed on corresponding target racks according to the private network deployment requirement information;

an adjustment module, configured to obtain the rack installation and configuration in the private network by adjusting installation and configuration of the deployed rack according to device hardware characteristics of the device to be deployed and a specification requirement of user rack installation and configuration.

9. The apparatus of claim 8, wherein the determination module is further configured to:

determine the device security requirement according to the private network service requirement, wherein the device security requirement comprises at least one of a disaster recovery requirement, an air supply mode security requirement, or an electromagnetic security requirement;

determine the device hardware requirement according to the deploying device hardware characteristics, wherein the device hardware requirement comprises at least one of: a power consumption requirement or a power type requirement of the devices to be deployed; and

determine the device environment requirement according to the environmental resource situation of the machine room, wherein the device environment requirement comprises at least one of a rack size limit or a machine room load-bearing limit.

10. The apparatus of claim 9, wherein the deployment module is further configured to:

deploy devices to be deployed that have the disaster recovery requirement and are of a same device type on different target racks respectively, wherein a number of devices of each device type deployed on each target rack is less than or equal to a disaster recovery ratio of a total number of devices of each device type;

deploy devices to be deployed that have the air supply mode security requirement and different air supply modes on different target racks respectively, wherein each of different target racks achieves the air supply mode security requirement; and

deploying devices to be deployed that have the electromagnetic security requirement and different electromagnetic types on different target racks respectively, wherein each of different target racks achieves the electromagnetic security requirement.

11. The apparatus of claim 9, wherein the deployment module is further configured to:

in response to determining that the device to be deployed is deployed on a currently selected target rack, and a sum of a post-deployment power consumption requirement and a

reserved power consumption requirement of the currently selected target rack is greater than a rack power consumption setting value, deploy the device to be deployed on a new target rack; and

deploy devices to be deployed that have the power type requirement and different power types on different target racks or different areas of a same target rack respectively, wherein each of different target racks achieves the power type requirement.

12. The apparatus of claim 8 or 9, wherein the deployment module is further configured to:

in response to determining that the device to be deployed is deployed on a currently selected target rack, and a sum of an occupied space and a reserved space of the currently selected target rack is greater than a rack size limit, deploy the device to be deployed on a new target rack; and

in response to determining that the device to be deployed has been deployed on the currently selected target rack, and a sum of a post-deployment weight and a reserved weight of the currently selected target rack exceeds a preset load-bearing limit of the machine room, deploy the device to be deployed on a new target rack.

13. The apparatus of claim 8 or 9, wherein the deployment module is further configured to:

deploy each of the devices to be deployed on one of a plurality of target racks in sequence according to the private network deployment requirement information and a deployment priority;

for each of the devices to be deployed, deploy the device to be deployed on a first target rack according to the device security requirement; and

in response to determining that there is a device to be deployed on the first target rack that does not meet the device hardware requirement and the device environment requirement, deploy the device to be deployed on a second target rack.

14. The apparatus of claim 8 or 9, wherein the adjustment module is further configured to:

obtain an adjusted configuration by adjusting installation and configuration of the deployed rack within a same rack according to the device hardware characteristics of the device to be deployed, wherein the device hardware characteristics comprises at least one of a power supply mode, an air supply mode, or a device weight; and

obtain the rack installation and configuration in the private network by adjusting the installation and configuration adjusted again according to the specification requirement of user rack installation and configuration.

15. A device for rack installation and configuration in a private network, comprising a processor, a memory, a communication interface and a communication bus, wherein the processor, the memory and the communication interface communicate with each other via the communication bus;

the memory is configured to store at least one executable instruction, wherein the executable instruction causes the processor to perform operations of the method for rack installation and configuration in a private network according to any one of claims 1 to 7.

16. A computer readable storage medium for storing at least one executable instruction which, when executed by a device for rack installation and configuration in a private network, causes the processor to perform operations of the method for rack installation and configuration in a private network according to any one of claims 1 to 7.

17. A computer program product, comprising computer instructions, which, when executed by a computer device, cause the computer device to perform operations of the method for rack installation and configuration in a private network according to any one of claims 1 to 7.