CLAIMS

What is claimed is:

1. A data access method, wherein the method comprises:

assigning, by a Remote Direct Memory Address (RDMA) control service based on user information and a corresponding connection relationship between a switch and a first instance defined by a user, an address segment to the first instance;

building, by the RDMA control service, an access control list based on the address segment assigned to the first instance, wherein the access control list is used for allowing access between different first instances defined by the user and forbidding access between first instances defined by the user and first instances defined by another user; and

sending, by the RDMA control service, the access control list to a switch control service, such that the switch control service configures the access control list for the switch.

2. The method according to claim 1, wherein before the assigning, by an RDMA control service, an address segment to the first instance, the method further comprises:

receiving, by the RDMA control service, a multicast packet carrying information about a network port of a second instance that is sent by the second instance through the network port;

sending, by the RDMA control service, a query request to a machine deployment control service based on the information about the network port that is carried in the multicast packet, to query for deployment information of the second instance; and

receiving, by the RDMA control service, the deployment information returned by the machine deployment control service based on the query request, and determining a corresponding connection relationship between the second instance and the switch based on the deployment information.

3. The method according to claim 2, wherein the method further comprises:

storing, by the RDMA control service, the corresponding connection relationship between the second instance and the switch into a relationship table.

4. The method according to claim 3, wherein the method further comprises:

receiving, by the RDMA control service, an address assignment request sent by an instance control service based on the first instance; and

querying, by the RDMA control service, for a corresponding connection relationship between the first instance and the switch based on the address assignment request.

5. The method according to claim 4, wherein the assigning, by an RDMA control service based on user information and a corresponding connection relationship between a switch and a first instance defined by a user, an address segment to the first instance comprises:

invoking, by the RDMA control service based on the user information carried in the address assignment request and the corresponding connection relationship between the first instance and the switch that is acquired through query, an address assignment service to assign the address segment to the first instance.

6. The method according to claim 4, wherein the querying, by the RDMA control service, for a corresponding connection relationship between the first instance and the switch based on the address assignment request comprises:

querying, by the RDMA control service based on identification information of the first instance carried in the address assignment request, the relationship table storing the corresponding connection relationship between the second instance and the switch, to acquire the corresponding connection relationship between the first instance and the switch.

7. The method according to claim 4, wherein the building, by the RDMA control service, an access control list based on the address segment assigned to the first instance comprises:

building, by the RDMA control service, the access control list based on the address segment assigned to the first instance and identification information of a cluster to which the first instance belongs that is carried in the address assignment request, wherein the access control list is used for controlling access between different first instances belonging to a same cluster.

8. The method according to claim 4, wherein after the sending, by the RDMA control service, the access control list to a switch control service, the method further comprises:

returning, by the RDMA control service to the instance control service, the address segment assigned by the address assignment service for the first instance, such that the instance control service starts the first instance to acquire from an image service an image file matching a specification of the first instance, and configures, based on the image file, the address segment assigned by the address assignment service for the first instance.

9. The method according to claim 1, wherein the method further comprises:

receiving, by the RDMA control service, a second instance release request sent by an instance control service based on a first instance release request sent by a user;

reclaiming, by the RDMA control service based on the second instance release request, an address of a to-be-released instance corresponding to instance identification information carried in the second instance release request, and configuring, through the switch control service, the switch connected to the to-be-released instance such that a network port of the switch connected to the to-be-released instance is disconnected from other network ports; and

returning, by the RDMA control service to the instance control service, a release result of the to-be-released instance requested by the second instance release request, such that the instance control service returns the to-be-released instance to an inventory and returns a release success message to the user.

10. A data access apparatus, wherein the apparatus comprises:

an assignment module configured to assign, based on user information and a corresponding connection relationship between a switch and a first instance defined by a user, an address segment to the first instance;

a building module configured to build an access control list based on the address segment assigned to the first instance, wherein the access control list is used for allowing access between different first instances defined by the user and forbidding access between first instances defined by the user and first instances defined by another user; and

a first sending module configured to send the access control list to a switch control service, such that the switch control service configures the access control list for the switch.

11. The apparatus according to claim 10, wherein before the assignment module, the apparatus further comprises:

a first receiving module configured to receive a multicast packet carrying information about a network port of a second instance that is sent by the second instance through the network port;

a second sending module configured to send a query request to a machine deployment control service based on the information about the network port that is carried in the multicast packet, to query for deployment information of the second instance; and

a determining module configured to receive the deployment information returned by the machine deployment control service based on the query request, and determine a corresponding connection relationship between the second instance and the switch based on the deployment information.

12. The apparatus according to claim 11, wherein the apparatus further comprises:

a storage module configured to store the corresponding connection relationship between the second instance and the switch into a relationship table.

13. The apparatus according to claim 12, wherein the apparatus further comprises:

a second receiving module configured to receive an address assignment request sent by an instance control service based on the first instance; and

a query module configured to query for a corresponding connection relationship between the first instance and the switch based on the address assignment request.

14. The apparatus according to claim 13, wherein the assignment module is specifically configured to:

invoke, based on the user information carried in the address assignment request and the corresponding connection relationship between the first instance and the switch that is acquired through query, an address assignment service to assign the address segment to the first instance.

15. The apparatus according to claim 13, wherein the query module is specifically configured to:

query, based on identification information of the first instance carried in the address assignment request, the relationship table storing the corresponding connection relationship between the second instance and the switch, to acquire the corresponding connection relationship between the first instance and the switch.

16. The apparatus according to claim 13, wherein the building module is specifically configured to:

build the access control list based on the address segment assigned to the first instance and identification information of a cluster to which the first instance belongs that is carried in the address assignment request, wherein the access control list is used for controlling access between different first instances belonging to a same cluster.

17. The apparatus according to claim 13, wherein after the first sending module, the apparatus further comprises:

a first returning module configured to return, to the instance control service, the address segment assigned by the address assignment service for the first instance, such that the instance control service starts the first instance to acquire from an image service an image file matching a specification of the first instance, and configures, based on the image file, the address segment assigned by the address assignment service for the first instance.

18. The apparatus according to claim 10, wherein the apparatus further comprises:

a second receiving module configured to receive a second instance release request sent by an instance control service based on a first instance release request sent by a user;

a release module configured to reclaim, based on the second instance release request, an address of a to-be-released instance corresponding to instance identification information carried in the second instance release request, and configure, through the switch control service, the switch connected to the to-be-released instance such that a network port of the switch connected to the to-be-released instance is disconnected from other network ports; and

a second returning module configured to return, to the instance control service, a release result of the to-be-released instance requested by the second instance release request, such that the instance control service returns the to-be-released instance to an inventory and returns a release success message to the user.

19. A data access system, wherein the system comprises:

an RDMA control service that assigns, based on user information and a corresponding connection relationship between a switch and a first instance defined by a user, an address segment to the first instance, build an access control list based on the address segment assigned to the first instance, wherein the access control list is used for allowing

access between different first instances defined by the user and forbidding access between first instances defined by the user and first instances defined by another user, and send the access control list to a switch control service; and

the switch control service that configures the access control list for the switch based on the received access control list.

20. The system according to claim 19, wherein the first instance comprises an adapter, and the adapter integrates a network port, wherein the network port is an enhanced Ethernet–based RDMA network port.