PROBLEMS TO BE SOLVED BY THE INVENTION

[0004]

A cloud service that uses a cloud infrastructure is one form of service provided by a service provider. A cloud infrastructure is an infrastructure that provides a device such as a server or an edge using virtualization technology. There may exist similar cloud infrastructures for different types thereof. For this reason, when a service provider is to provide a cloud service, it is necessary to select a cloud infrastructure that meets a demand of the service provider. Furthermore, it is necessary to allocate a resource to a device of the selected cloud infrastructure. A technique of allocating a resource from an orchestrator is known. However, selecting a cloud infrastructure and allocating a resource has in the past involved human work, thus limiting efficiency of work involved in enabling a service provider to provide a cloud service thereby increasing the cost of operating a system that includes a cloud infrastructure.

[0005]

In view of the abovementioned problems, embodiments of the invention seek to reduce an operation cost by improving efficiency of work involved in enabling a service provider to provide a service.

SOLUTION TO PROBLEM

[0006]

In order to solve the problems described above, according to a first aspect of the invention, an ICT resource management device for managing a physical node and a virtual node as ICT resources includes: a configuration information management part configured to manage physical layer configuration information and virtual layer configuration information, wherein the physical layer configuration information is information on a configuration of the physical node in a physical layer and the virtual layer configuration information is information on a configuration of the virtual node in a virtual layer; a service infrastructure selection part configured to select, in response to a request for a configuration change concerning a connection of a device that uses a service to the physical node, a service infrastructure that meets ~~a~~ conditions included in the request from a plurality of service infrastructures that realize the service; a layer mapping part configured to perform a mapping between the physical layer and the virtual layer; a blueprint creation part configured to create, in response to the request

for a configuration change, a blueprint based on the physical layer configuration information, the virtual layer configuration information, the selected service infrastructure, and mapping information that results from the mapping, wherein the blueprint is design information of an infrastructure that is required for the configuration change; and an orchestrator part configured to perform, based on the blueprint, orchestration of the virtual layer by accessing and executing a program that is capable of being operated through ~~an~~ a southbound API, wherein the service infrastructure selection part is further configured to select the service infrastructure that meets the conditions by referencing service management information that manages a service using a plurality of types of management items, the plurality of types of management items including types of management items corresponding to the conditions, and wherein the service management information is configured to store information on the plurality of types of management items including: a type of the service; an identifier of a service infrastructure that realizes the service; a used application; a charge; a quality; a provided area; an identifier of an ICT resource that operates when the service is provided; and a connected service identifier that identifies, when the service has another service connected thereto, said another service.

[0007]

According to a third aspect of the invention, an ICT resource management method of an ICT resource management device that manages a physical node and a virtual node as ICT resources includes the steps, that are implemented by the ICT resource management device, of: collecting physical layer configuration information and virtual layer configuration information, wherein the physical layer configuration information is information on a configuration of the physical node in a physical layer and the virtual layer configuration information is information on a configuration of the virtual node in a virtual layer; selecting, in response to a request for a configuration change concerning a connection of a device that uses a service to the physical node, a service infrastructure that meets ~~a~~ conditions included in the request from a plurality of service infrastructures that realize the service, wherein the service infrastructure is selected by referencing service management information that manages a service using a plurality of types of management items, the plurality of types of management items including types of management items corresponding to the conditions; performing a mapping between the physical layer and the virtual layer; creating, in response to the

request for a configuration change, a blueprint based on the physical layer configuration information, the virtual layer configuration information, the selected service infrastructure, and mapping information that results from the mapping, wherein the blueprint is design information of an infrastructure that is required for the configuration change; and performing, based on the blueprint, orchestration of the virtual layer by accessing and executing a program that is capable of being operated through ~~an~~ a southbound API, wherein the service management information is configured to store information on the plurality of types of management items including: a type of the service; an identifier of a service infrastructure that realizes the service; a used application; a charge; a quality; a provided area; an identifier of an ICT resource that operates when the service is provided; and a connected service identifier that identifies, when the service has another service connected thereto, said another service.

[0008]

According to each of the first and third aspects of the invention, (a) an optimum service infrastructure that meets a requirement of a service provider is selected without involving human work and (b) orchestration is performed to allocate a resource to an ICT resource in the selected service infrastructure.

Thus, efficiency of work involved in enabling a service provider to provide a service may be improved, thereby reducing an operation cost.

CLAIMS

1. An ICT resource management device for managing a physical node and a virtual node as ICT resources, the ICT resource management device comprising:

a configuration information management part configured to manage physical layer configuration information and virtual layer configuration information, wherein the physical layer configuration information is information on a configuration of the physical node in a physical layer and the virtual layer configuration information is information on a configuration of the virtual node in a virtual layer;

a service infrastructure selection part configured to select, in response to a request for a configuration change concerning a connection of a device that uses a service to the physical node, a service infrastructure that meets ~~a~~ conditions included in the request from a plurality of service infrastructures that realize the service;

a layer mapping part configured to perform a mapping between the physical layer and the virtual layer;

a blueprint creation part configured to create, in response to the request for a configuration change, a blueprint based on the physical layer configuration information, the virtual layer configuration information, the selected service infrastructure, and mapping information that results from the mapping, wherein the blueprint is design information of an infrastructure that is required for the configuration change; and

an orchestrator part configured to perform, based on the blueprint, orchestration of the virtual layer by accessing and executing a program that is capable of being operated through ~~an~~ a southbound API,

wherein the service infrastructure selection part is further configured to select the service infrastructure that meets the conditions by referencing service management information that manages a service using a plurality of types of management items, the plurality of types of management items including types of management items corresponding to the conditions, and

wherein the service management information is configured to store information on the plurality of types of management items including:

a type of the service;

an identifier of a service infrastructure that realizes the service;

a used application;

a charge;

a quality;

a provided area;

an identifier of an ICT resource that operates when the service is provided; and

a connected service identifier that identifies, when the service has another service connected thereto, said another service.

~~2. The ICT resource management device according to claim 1, wherein the service infrastructure selection part is further configured to select the service infrastructure that meets the condition by referencing service management information that manages a service using a plurality of types of management items, the plurality of types of management items including a type of management item corresponding to the condition.~~

~~3~~2. An ICT resource management method of an ICT resource management device that manages a physical node and a virtual node as ICT resources, the ICT resource management method comprising the steps, implemented by the ICT resource management device, of:

collecting physical layer configuration information and virtual layer configuration information, wherein the physical layer configuration information is information on a configuration of the physical node in a physical layer and the virtual layer configuration information is information on a configuration of the virtual node in a virtual layer;

selecting, in response to a request for a configuration change concerning a connection of a device that uses a service to the physical node, a service infrastructure that meets ~~a~~ condition~~s~~ included in the request from a plurality of service infrastructures that realize the service, wherein the service infrastructure is selected by referencing service management information that manages a service using a plurality of types of management items, the plurality of types of management items including types of management items corresponding to the conditions;

performing a mapping between the physical layer and the virtual layer;

creating, in response to the request for a configuration change, a blueprint based on the physical layer configuration information, the virtual layer configuration information, the selected service infrastructure, and mapping information that results

from the mapping, wherein the blueprint is design information of an infrastructure that is required for the configuration change; and

performing, based on the blueprint, orchestration of the virtual layer by accessing and executing a program that is capable of being operated through ~~an~~ a southbound API,

wherein the service management information is configured to store information on the plurality of types of management items including:

a type of the service;

an identifier of a service infrastructure that realizes the service;

a used application;

a charge;

a quality;

a provided area;

an identifier of an ICT resource that operates when the service is provided; and

a connected service identifier that identifies, when the service has another service connected thereto, said another service.

~~4~~3. An ICT resource management program for causing a computer to serve as an ICT resource management device according to claim 1 ~~or 2~~.