DESCRIPTION

Title of Invention: **DEVICE MANAGEMENT SYSTEM AND DEVICE MANAGEMENT SERVICE PROVIDING METHOD**

Technical Field

The present disclosure relates to a device management service providing method for managing a device installed in a building by using a network.

Background Art

A system that manages, via a network, air conditioner information of an air conditioner installed in a building has been proposed (for example, PTL 1 (Japanese Patent No. 6160789)). In PTL 1, the air conditioner is connected to an information mediation device, the information mediation device is connected to an information management apparatus via the network, and the information management apparatus manages the air conditioner information.

Summary of Invention

Technical Problem

A management apparatus connected via a network has many advantages, such as being capable of using management records of devices installed in other buildings or devices of other users and being capable of centralized management of the devices disposed in the other buildings. However, constant control of the devices by the management apparatus via the network may be inefficient in some cases. An extreme case is a case where the network is disconnected, in which case, device control becomes unavailable.

Solution to Problem

A device management system according to a first aspect includes a device, a control terminal, and a management apparatus. The device is disposed in a building. The control terminal is connected to the device. "Connected to the device" includes a case of being built in and connected to the device. The management apparatus is connected to the control terminal via a network. Both the control terminal and the management apparatus are configured to be capable of acquiring a control command that is created by a user. (a) The control command that is created by the user is acquired by either one or both of the control terminal and the management apparatus. (b) On the basis of the control command that is acquired in (a), control of the device is shared and executed in either one or both of the control terminal and the management apparatus.

In the device management system according to the first aspect, since both the control terminal and the management apparatus can acquire and execute the control command, the user can cause the control command to be shared and executed in either one or both of the control terminal and the management apparatus.

In an embodiment of the above device management system, (c) the control terminal and the management apparatus register the control command that is acquired in (a).

In an embodiment of the above device management system, the management apparatus (d) determines whether the control command that is acquired in (a) is to be executed in the management apparatus or to be executed in the control terminal. (b1) The control command is executed in the management apparatus if it is determined that the control command is to be executed in the management apparatus in (d). (e) The control command is transmitted to the control terminal if it is determined that the control command is to be executed in the control terminal in (d). (b2) The control terminal executes the control command that is transmitted from the management apparatus in (e).

In the device management system according to the above embodiment, since the control command is executed by being allocated to the management apparatus and the control terminal, the control command can be executed efficiently.

In an embodiment, the above device management system includes a plurality of devices and a plurality of control terminals. The plurality of devices are installed in a building. The plurality of control terminals are each connected to a corresponding device among the devices. (d1) If it is determined that a device or devices that is/are a target or targets of the control command belongs to a single control terminal among the control terminals in (d), the management apparatus determines that the control command is to be executed in the control terminal, and, if it is determined that the devices that are targets of the control command belong to the plurality of control terminals in (d), the management apparatus determines that the control command is to be executed in the management apparatus.

In the device management system according to the above embodiment, since the control command related to the single control terminal is to be executed in the control terminal, and the control command related to the plurality of control terminals is to be executed in the management apparatus, the control command can be executed smoothly.

In an embodiment of the above device management system, while the control terminal is executing control of the device on the basis of the control command, if an execution time of the control is longer than a predetermined time, the control terminal cancels execution of the control of the device based on the control command. In addition, the management apparatus executes the control of the device based on the control command.

In the device management system according to the above embodiment, since the management apparatus executes the control command if the control terminal takes an extremely long time to execute the control command, the time for executing the control command can be shortened.

In an embodiment of the above device management system, (d2) even if the management apparatus determines that the device that is a target of the control command belongs to a single control terminal among the control terminals in the (d1), the management apparatus determines that control based on the control command is to be executed in the management apparatus if execution of the control based on the control command in the control terminal is estimated to be longer than a predetermined time.

In the device management system according to the above embodiment, since the management apparatus executes even the control command that belongs to the single control terminal, execution of the control command can be prevented from taking an extremely long time.

In an embodiment of the above device management system, (g) the control terminal or/and the management apparatus acquire data of the device or data related to the device as device data. (h) The control terminal or/and the management apparatus that acquire the device data determine whether an event has occurred on the basis of the device data. (b3) If it is determined that the event has occurred in (h), the control terminal or/and the management apparatus execute the control command.

The device management system according to the above embodiment can execute the control command upon the event that occurs in response to acquisition of the device data.

In an embodiment of the above device management system, (g) the control terminal or/and the management apparatus acquire data of the device or data related to the device as device data. (h) The control terminal or/and the management apparatus that acquire the device data determine whether an event has occurred on the basis of the device data. (d3) If the event has occurred, the control terminal or/and the management apparatus that acquire the device data determine whether the control command is to be executed in the control terminal or the management apparatus. (b4) The control terminal or/and the management apparatus execute the control command that is determined to be executed in (d3).

In the device management system according to the above embodiment, if the event has occurred, since the control command is executed by being allocated to the management apparatus and the control terminal, the control command can be executed efficiently.

In an embodiment of the above device management system, (h2) subsequently to the determination of the event in the (h), the control terminal or/and the management apparatus determine whether a secondary event is caused to occur on the basis of the control command that is registered or a program that is defined by the system. (b5) If it is determined that the secondary event has occurred in (h2), the control terminal or/and the management apparatus execute the control command.

The device management system according to the above embodiment can execute the control command upon occurrence of the secondary event.

In an embodiment of the above device management system, (j) the event that is determined in the control terminal in (g) or the secondary event that is caused to occur in the control terminal in (h2) is transmitted to the management apparatus. (h3) On the basis of the event or the secondary event that is transmitted from the control terminal in (j), the management apparatus determines whether the control command that is registered is to be executed in the management apparatus. (b6) The management apparatus executes the control command that is determined to be executed in (h3).

The device management system according to the above embodiment can execute the control command in the management apparatus upon occurrence of the event or the secondary event in the control terminal.

In an embodiment of the above device management system, the management apparatus includes a database. (k) The management apparatus stores, in the database, the event or the secondary event related to the control command that is executed in (b3) to (b6).

In the device management system according to the above embodiment, since a history of the event or the secondary event is accumulated in the database, control can be performed so that the secondary event is caused to occur, for example, by using the database.

In an embodiment of the above device management system, both the management apparatus and the control terminal or the control terminals are capable of executing the control command in an identical form.

In the device management system according to the above embodiment, since both the management apparatus and the control terminal or the control terminals are capable of executing the control command in the identical form, a user's input in the identical form may suffice.

A device management service providing method according to a second aspect uses a device management system. The device management system includes a device, a control terminal, and a management apparatus. The control terminal is connected to the device. The management apparatus is connected to the control terminal via a network. Both the control

terminal and the management apparatus are configured to be capable of acquiring a control command that is created by a user. (a) The control command that is created by the user is acquired by either one or both of the control terminal and the management apparatus. (b) On the basis of the control command, control of the device is shared and executed in either one or both of the control terminal and the management apparatus.

In an embodiment of the above device management service providing method , both the management apparatus and the control terminal are capable of executing the control command in an identical form.

In the device management service providing method according to the above embodiment, since both the management apparatus and the control terminal are capable of executing the control command in the identical form, a user's input in the identical form may suffice.

Brief Description of Drawings

[Fig. 1] Fig. 1 is a diagram illustrating an overall configuration of a device management system 1.

[Fig. 2] Fig. 2 is a flowchart in which the device management system 1 executes a control command.

[Fig. 3] Fig. 3 is a flowchart illustrating the manner of execution of automatic control by a device management apparatus in a case where an event occurs.

[Fig. 4] Fig. 4 is a flowchart illustrating the manner of execution of automatic control by the device management apparatus in a case where a secondary event occurs.

[Fig. 5] Fig. 5 is a flowchart illustrating processing performed in a case where a control terminal requires a time longer than or equal to a predetermined time for executing a control command.

[Fig. 6] Fig. 6 is a flowchart illustrating processing performed in a case where the system 1 requires a time longer than or equal to the predetermined time for executing processing on a first execution mode.

Description of Embodiments

<First Embodiment>

(1) Overall Configuration

As illustrated in Fig. 1, a device management system 1 according to this embodiment