

**SPECIFICATION**

**TITLE OF THE INVENTION**

CONNECTION SYSTEM OF BUILDING FACILITY DEVICE MANAGING SYSTEM,  
5 CONNECTION METHOD OF BUILDING FACILITY DEVICE MANAGING SYSTEM, AND  
CONNECTION PROGRAM OF BUILDING FACILITY DEVICE MANAGING SYSTEM

**TECHNICAL FIELD**

The present invention relates to a connection system of  
10 a building facility device managing system, a connection method of  
a building facility device managing system, and a connection program  
of a building facility device managing system, which connect the  
building facility device managing system for managing a plurality  
of building facility monitoring devices with an IP network device  
15 managing system for managing an IP network monitoring device such  
as a router and a personal computer. More particularly, the present  
invention relates to a connection system of a building facility  
device managing system, a connection method of a building facility  
device managing system, and a connection program of a building  
20 facility device managing system, which can coordinate operation of  
the building facility monitoring device connected to the building  
facility device managing system with operation of the IP network  
monitoring device connected to the IP network device managing  
system.

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**BACKGROUND ART**

Generally, in building facility of a company or others, a building  
facility device managing system for integrally controlling a  
plurality of building facility monitoring devices for a plurality  
30 of air conditioners, lighting devices, door opening/closing devices,  
and others is installed via a network. Each building facility  
monitoring device and the building facility device managing system

are connected to each other via the Ethernet (Registered trademark) whose communication is generalized with using a communication protocol such as "BACnet" (Building Automation and Control Networking protocol: communication protocol standard for intelligent building network) and "Lontalk" (Local Operation Network: communication protocol standard for connecting a device such as a lighting device, a switch, and a temperature sensor mounted with a neuron chip for operation). On the other hand, in building facility of a company or others, a computer network has been structured along with development of a computer technology so that a lot of personal computers and IP monitoring cameras are connected to a server via an IP network such as LAN based on TCP/IP protocols. However, specifications of the BACnet and the Lontalk which are communication standards on the above-described building facility device managing system side are different from those of the TCP/IP protocols which are communication standard on the IP network device managing system side.

Note that Patent Document 1 described below is cited as a document describing a technique of performing network connection based on a different protocol. This Patent Document 1 describes a technique by which the SNMP protocol and the non-SNMP protocol are accessible from each other so that all devices in the network can be monitored and controlled by one monitoring control device, by providing: means for identifying that a signal of a SNMP protocol received from a transmission-source device connected to a network is to be converted into which non-SNMP protocol; means for converting the signal into the non-SNMP protocol used by a transmission-destination device connected to another network with reference to a conversion table prepared by the identifying means, and then, transmitting it to the transmission-destination device; means for identifying that a signal of the non-SNMP protocol received from the transmission-source device connected to the network is to

be converted into what type of the non-SNMP protocol; and means for converting the signal into the SNMP protocol used by the transmission-destination device connected to the network with reference to the conversion table provided by the identifying means, and then, transmitting it to the transmission-destination device.

**Prior Art Document**

**Patent Document**

Patent Document 1: Japanese Patent Application Laid-Open Publication No. 3366228

**DISCLOSURE OF THE INVENTION**

**PROBLEMS TO BE SOLVED BY THE INVENTION**

As the technique described in the above-described Patent Document 1, it is described that a SNMP protocol and a non-SNMP protocol are converted into a non-SNMP protocol used by a transmission-destination device connected to another network with reference to the conversion table between the SNMP protocol and the non-SNMP protocol in order to connect between the networks based on different protocols. However, the building facility device managing system and the IP network device managing system are not coordinated with each other while they control a plurality of individual devices, and therefore, there is a problem that it is difficult to provide building-facility users with advanced building environment.

This problem will be specifically explained as follows. In an IP monitoring camera used as a device for security, image monitoring and operation can be performed from only a terminal device of the building facility device managing system installed in a security guards room or others, and therefore, control such as zoom control and pan control of the IP monitoring camera with using a computer screen installed in other division such as a general affairs department of a company cannot be performed. For example, there

is a failure that, even if smoke is detected by a smoke detector which is a disaster-prevention device, fire or others cannot be checked from the building facility device managing system with operating the IP monitoring camera, and there is a problem that it is difficult to provide building-facility users with the advanced building environment under which variously-installed building facility monitoring devices are utilized.

A preferred aim of the present invention is to solve problems caused by the above-described conventional techniques, which is to provide a connection system of a building facility device managing system, a connection method of a building facility device managing system, and a connection program of a building facility device managing system, which can coordinate operation of a building facility monitoring device managed by a building facility device managing system with operation of an IP network device managed by an IP network managing system.

#### **MEANS FOR SOLVING THE PROBLEMS**

In order to achieve the above-described preferred aim, the present invention has a first feature of a connection system of a building facility device managing system, which connects a building facility device managing system with an IP network monitoring device managing system, the building facility device managing system being for managing a building facility monitoring device installed in a building with using a BACnet or Lontalk protocol, the IP network device managing system being for managing an IP network monitoring device with using an IP protocol, so as to coordinate the building facility monitoring device with the IP network monitoring device. In the connection system, the IP network device managing system includes: a management database in which statuses of the building facility monitoring device and of the IP network monitoring device and parameter information of the IP protocol and the BACnet or Lontalk protocol are stored; a monitoring-device-status managing

unit which stores the parameter information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol into the management database with being numbered when the status which is a state of the IP network monitoring device has been

5 changed; and a coordinated-packet-generation transmitting/receiving unit which receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the management database to transmit it

10 to the building facility device managing system. The monitoring-device-status managing unit executes a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored in the management database, the first step of providing the parameter

15 information unique for the BACnet or Lontalk protocol to the changed status and storing it. The coordinated-packet-generation transmitting/receiving unit executes a second step when receiving an inquiry command of a status of a specific IP network monitoring device from the building facility device managing system, the second

20 step of acquiring the status and the parameter information of the specific IP network monitoring device for which the inquiry has been received, acquired from the management database, and of generating the packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building

25 facility device managing system, and executes a third step when receiving an operation command of the status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and the parameter information of the specific IP network monitoring device

30 for which the operation command has been received, acquired from the management database, and of generating the packet of the BACnet or Lontalk protocol based on the acquired status and parameter

information to transmit it to the building facility device managing system.

Also, the present invention has a second feature of a connection method of a building facility device managing system for a computer system, which connects a building facility device managing system with an IP network device managing system, the building facility device managing system being for managing a building facility monitoring device installed in a building with using a BACnet or Lontalk protocol, the IP network device managing system being for managing the IP network monitoring device with using an IP protocol, which coordinates the building facility monitoring device with the IP network monitoring device, and in which the IP network managing system includes: a management database in which statuses of the building facility monitoring device and of the IP network monitoring device and the parameter information of an IP protocol and a BACnet or Lontalk protocol are stored; a monitoring-device-status managing unit which stores the parameter information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol into the management database with being numbered when the status which is a state of the IP network monitoring device has been changed; and an coordinated-packet-generation transmitting/receiving unit which receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the management database to transmit it to the building facility device managing system. In the connection method, the monitoring-device-status managing unit is made to execute a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored in the management database, the first step of providing the parameter information unique for the BACnet or Lontalk protocol to the changed status and storing

it. The coordinated-packet-generation transmitting/receiving unit is made to execute a second step when receiving an inquiry command of a status of a specific IP network monitoring device from the building facility device managing system, the second step of  
5 acquiring the status and the parameter information of the specific IP network monitoring device for which the inquiry has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device  
10 managing system, and is made to execute a third step when receiving an operation command of the status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and the parameter information of the specific IP network monitoring device for which the operation  
15 command has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system.

Further, the present invention has a third feature of a  
20 connection program of a building facility device managing system for a computer system, which connects a building facility device managing system with an IP network device managing system, the building facility device managing system being for managing a building facility monitoring device installed in a building with  
25 using the BACnet or Lontalk protocol, the IP network device managing system being for managing an IP network monitoring device with using the IP protocol, which coordinates the building facility monitoring device with the IP network monitoring device, and in which the IP network device managing system includes: a management database in  
30 which statuses of the building facility monitoring device and of the IP network monitoring device and the parameter information of the IP protocol and the BACnet or Lontalk protocol are stored; a

monitoring-device-status managing unit which stores the parameter information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol stored with being numbered, stored into the management database when the status which  
5 is a state of the IP network monitoring device has been changed; and an coordinated-packet-generation transmitting/receiving unit which receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the  
10 management database to transmit it to the building facility device managing system. In the connection program, the monitoring-device-status managing unit is made to execute a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored  
15 in the management database, the first step of providing the parameter information unique for the BACnet or Lontalk protocol to the changed status and storing it. The coordinated-packet-generation transmitting/receiving unit is made to execute a second step when receiving an inquiry command of a status of a specific IP network  
20 monitoring device from the building facility device managing system, the second step of acquiring the status and the parameter information of the specific IP network monitoring device for which the inquiry has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the  
25 acquired status and parameter information to transmit it to the building facility device managing system, and is made to execute a third step when receiving an operation command of the status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and  
30 the parameter information of the specific IP network monitoring device for which the operation command has been received, acquired from the management database, and of generating a packet of the

BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system.

#### **EFFECTS OF THE INVENTION**

5           The connection system of the building facility device managing system according to the present invention, the connection method of the building facility device managing system thereto, and the connection program of the building facility device managing system thereto can coordinate the operation of the building facility  
10 monitoring device with the operation of the IP network monitoring device, which have different protocols from each other, by making the monitoring-device-status managing unit execute a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored  
15 in the management database, the first step of providing parameter information unique for the BACnet or Lontalk protocol to the changed status and storing it, and by making the coordinated-packet-generation transmitting/receiving unit execute a second step of acquiring the status and the parameter information  
20 of the specific IP network monitoring device for which an inquiry has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system, and by making it execute  
25 a third step when receiving the operation command of the status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and the parameter information of the specific IP network monitoring device for which the operation command has been received, acquired  
30 from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing

system.

### **BRIEF DESCRIPTIONS OF THE DRAWINGS**

FIG. 1 is a diagram illustrating a computer system connected  
5 with a building facility device managing system and an IP network  
device managing system according to an embodiment of the present  
invention;

FIG. 2 is a diagram illustrating a schematic configuration  
of the IP network device managing system according to the present  
10 embodiment;

FIGs. 3A to 3C are diagrams for describing a packet data  
monitored by the building facility device managing system according  
to the present embodiment;

FIGs. 4A to 4C are diagrams for describing a packet data  
15 monitored by the IP network device managing system according to the  
present embodiment;

FIG. 5 is a diagram illustrating a process flow of a  
monitoring-device-status managing unit according to the present  
embodiment;

20 FIG. 6 is a diagram illustrating a process flow of a  
coordinated-packet-generation transmitting/receiving unit  
according to the present embodiment; and

FIGs. 7A and 7B are diagrams for describing a management  
database according to the present embodiment.

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### **BEST MODE FOR CARRYING OUT THE INVENTION**

Hereinafter, an embodiment of a connection system of a  
building facility device managing system according to the present  
invention, a connection method of a building facility device  
30 managing system thereto, and a connection program of a building  
facility device managing system thereto will be described in detail  
with reference to drawings.

[Configuration]

As illustrated in FIG. 1, a computer system in which an facility device managing system for controlling a plurality of building facility monitoring devices to be an object of the present invention and an IP network device managing system such as a personal computer are connected to each other is configured of: a building facility device managing system 103 which is a computer connected to building facility monitoring devices 101 including an air conditioner, a lighting device, and a smoke detector which is a disaster-prevention device and a managing computer 104 for a system administrator via a communication line 102 such as BACnet; an IP network device managing system 108 which is a computer connected to IP network monitoring devices 106 such as a lot of personal computers, routers, and IP monitoring cameras via a communication line of an IP network; and a communication line 105 which connects the IP network device managing system 108 and the building facility device managing system 103. The IP network device managing system 108 is configured of: a management database (DB) 401 in which an item (parameter information) contained in an IP network communication protocol and an item (parameter information) contained in a BACnet or Lontalk communication protocol; a monitoring-device-status managing unit 301 which manages a status (state) of the IP network monitoring device 106 when receiving an SNMP protocol and which stores the parameter information for filling a difference in a specification from the BACnet protocol into the management database 401 with being numbered when the status has been changed; and an coordinated-packet-generation transmitting/receiving unit 302 which receives a command signal from the building facility device managing system 103 and which generates a packet of the BACnet protocol based on the device information acquired from the management database 401 to transmit it.

As illustrated in FIG. 2, the IP network device managing system 108 is configured so that the monitoring-device-status managing unit 301 executes a function "a" of always receiving the status of the IP network monitoring device 106, a function "b" of  
5 determining whether the status received by the function "a" has been changed or not, and a function "c" of updating a status of the device stored in the management database 401 when the changing is determined by the function "b", and so that the coordinated-packet-generation transmitting/receiving unit 302 executes a function "d" of always  
10 receiving the command signal from the building facility device managing system 103, a function "e" of reading the status of the IP network monitoring device from the management database 401 when it is determined by the function "d" that the command has been received, a function "f" of generating the status of the IP network  
15 monitoring device read by the function "e" in response to the command signal to transmit it to the building facility device managing system 103, and a function "g" of transmitting an operation signal to the IP network monitoring device 106.

As illustrated in FIG. 3A, for monitoring packet data of  
20 the building facility monitoring device monitored by the building facility device managing system 103, one record is formed of respective items which are, for example,: "Instance No." which is an ID (identifier) provided commonly to and uniquely for the both systems of the building facility device managing system 103 and the  
25 IP network device managing system 108 in order to identify the building facility monitoring device 101 by the building facility device managing system 103 and the IP network device managing system 108; "Status" indicating a numerical value (flag 0: stop, 1: activation) for indicating an operating state of the building  
30 facility monitoring device 101; "Parameter" indicating a type of a parameter held by the building facility monitoring device 101; "Object Type" indicating a type of an object defined on the

managements of the both systems; and "Preset Temperature" indicating upper and lower preset temperature values of an air conditioner, and others. More specifically, as illustrated in FIG. 3B, for a lighting having the "Instance No. 11", the "Status" is set as "1" (activation), the "Parameter" is set as "power", the "Object Type" is set as "1" (which is the type provided to the "lighting"), and the "Preset Temperature" is set as "blank". For a lighting having the "Instance No. 12", the "Status" is set as "0" (stop), the "Parameter" is set as "power", the "Object Type" is set as "1" (the "lighting"), and the "Preset Temperature" is set as "blank". For a disaster-prevention device having the "Instance No. 21", the "Status" is set as "1" (activation), the "Parameter" is set as "power", the "Object Type" is set as "2" (which is the type provided to the "disaster-prevention device"), and the "Preset Temperature" is set as "blank". For an air conditioner having the "Instance No. 31", the "Status" is set as "1" (activation), the "Parameter" is set as "power", the "Object Type" is set as "3" (which is the type provided to the "air conditioner"), and the "Preset Temperature" is set as "28" degrees Celsius. A monitoring packet signal is expressed as, for example, "33, 1, power, 3, 28" as illustrated in FIG. 3C.

As illustrated in FIG. 4A, for packet data of the IP network monitoring device 106 monitored by the IP network device managing system 108, one record is formed of respective items which are, for example, : "Host Name" of the building facility monitoring device 101 managed by the building facility device managing system 103; "Status" which is a numerical value (flag) for indicating an operating state of the building facility monitoring device 101; and "Camera Zoom" indicating a numerical value for controlling zoom of the IP monitoring camera. More specifically, as illustrated in FIG. 4B, for a personal computer having the "Host Name" of "name1.co.jp", the "Status" is set as "0, 1" (stop or activation), and the "Camera

Zoom" is set as "blank". For a router having the "Host Name" of "name6.co.jp", the "Status" is set as "0, 1" (stop or activation), and the "Camera Zoom" is set as "blank". For an IP monitoring camera having the "Host Name" of "cameral.co.jp", the "Status" is set as  
5 "1" (activation), and the "Camera Zoom" is set as "1" (zoom-in). A monitoring packet signal is expressed as, for example, "cameral.co.jp, 1, 1" as illustrated in FIG. 4C.

As illustrated in FIG. 7A, for the management database 401, one record is formed of respective items (parameter information)  
10 which are: "Host Name" of the building facility monitoring device 101 managed by the building facility device managing system 103; "Status" indicating a numerical value (flag 0: stop, 1: activation) for indicating a state of the building facility monitoring device 101 managed by the building facility device managing system 103;  
15 "Parameter" indicating a type of a parameter held by the building facility monitoring device 101; "Object Type" indicating a type of an object defined on the managements of the both systems; "Instance No." which is an ID (identifier) provided commonly to and uniquely for the both systems of the building facility device managing system  
20 103 and the IP network device managing system 108 in order to identify the building facility monitoring device 101 by the building facility device managing system 103 and the IP network device managing system 108; "Camera Zoom" indicating a numerical value for controlling zoom of the IP monitoring camera; and "Preset Temperature" indicating  
25 a temperature set in an air conditioner. More specifically, as illustrated in FIG. 7B, on the building facility monitoring device side, for a lighting having the "Host Name" of "blank" because it is not the building facility monitoring device, the "Status" is stored as "1" (activation), the "Parameter" is stored as "power",  
30 the "Object Type" is stored as "1", the "Instance No." is stored as "11", the "Camera Zoom" and the "Preset Temperature" are stored as "blank" because it is the IP network monitoring device. For a

disaster-prevention device having the "Host Name" of "blank" because it is not the building facility monitoring device, the "Status" is stored as "0" (stop), the "Parameter" is stored as "power", the "Object Type" is stored as "1", the "Instance No." is stored as "12", the "Camera Zoom" and the "Preset Temperature" are stored as "blank" because it is the IP network monitoring device. For an air conditioner having the "Host Name" of "blank" because it is not the building facility monitoring device, the "Status" is stored as "1" (activation), the "Parameter" is stored as "power", the "Object Type" is stored as "1", the "Instance No." is stored as "13", and the "Camera Zoom" and the "Preset Temperature" are stored as "blank" because it is the IP network monitoring device. On the IP network monitoring device side, for a personal computer having the "Host Name" of "name1.co.jp", the "Status" is stored as "1" (activation), the "Parameter" is stored as "blank" because it is not the building facility, the "Object Type" is stored as "4" (which is the type provided uniformly onto the IP network side), the "Instance No." is stored as "40", and the "Camera Zoom" and the "Preset Temperature" are stored as "blank" because it is out of an object to be managed. For an IP monitoring camera having the "Host Name" of "camera1.co.jp", the "Status" is stored as "1" (activation), the "Parameter" is stored as "blank" because it is not the building facility, the "Object Type" is stored as "4", the "Instance No." is stored as "46", the "Camera Zoom" is stored as "1" (zoom-out), and the "Preset Temperature" is stored as "blank" because it is out of an object to be managed.

That is, the management database 401 according to the present embodiment stores data whose one record is formed of the respective items (parameter information) which are: the "Host Name" contained in the IP network protocol; the "Status" indicating the state of the monitoring device contained in the protocol of the building facility monitoring device; the "Parameter" indicating the

type of the parameter of the monitoring device contained in the protocol of the building facility monitoring device; the "Object Type" of the monitoring device contained in the protocol of the building facility monitoring device in order to identify either the building facility monitoring device or the IP network monitoring device; the "Instance No." provided individually as the identifier in order to identify each of individual building facility monitoring devices and IP network monitoring devices; and the "Camera Zoom" and the "Preset Temperature" for controlling individually the IP network monitoring devices, and is configured to register each packet item used for a packet signal of the building facility device managing system and the IP network device managing system.

In the embodiment, note that the lighting, the air conditioner, and the disaster-prevention device (fire detector, smoke detector) are cited as the object devices monitored by the building facility device managing system, and the personal computer, the router, and others are cited as the object devices managed by the IP network device managing system. However, the devices to be objected in the present invention are not limited to these devices, and, for example, a lock device of the building, and an opening/closing (monitoring) device of a window or a door thereof, and other devices may be the objects, and therefore, in accordance with the object devices, a logical name to be stored in the management database 401 can be also added, or panning can be also added as another operation of the IP monitoring camera.

#### [Operation]

Incidentally, in the computer system which achieves the connection system of the building facility device managing system, the connection method of the building facility device managing system, and the connection program of the building facility device managing system according to the present embodiment configured as described above, when the status of the IP network monitoring device

is changed, the operation is performed so as to store this status change together with the newly-provided "Parameter" and "Instance No." by making the monitoring-device-status managing unit 301 execute steps as illustrated in FIG. 5, the steps including: a step

5 "A01" of activating a resident service for receiving a packet containing a status change signal from the IP network monitoring device 106; when a packet containing the status change signal is transmitted from the IP network monitoring device 106 or when the packet containing the status change signal is received by the

10 resident service of the step A01, a step "A02" of receiving the status change signal received from the IP network monitoring device 106 by the connection program 201 of the building facility device managing system of the IP network device managing system 108; a step

15 "A03" of extracting the information of the object IP network monitoring device received by the step A02 based on the Host name and of reading the information from the management database 401; a step "A04" of comparing the received status indicating whether the device status is changed or not which is read by the step A03 with the read status, of determining whether or not, and of returning

20 to the step A02 if no change is determined; if the change is determined in the step A04, a step "A05" of overwriting (updating) the status of the IP network monitoring device whose status has been changed into the newest status over the management database 401; and a step "A06" of newly numbering the "Parameter" and the "Instance

25 No." for the building facility device managing system which are not contained in the packet of the IP network monitoring device whose status has been changed and of newly numbering the "Parameter" and the "Instance No." which are the items not contained in the received packet for the record of the IP network monitoring device whose

30 status has been changed, the record stored in the management database 401, of storing them in the management database 401, and of terminating the process.

Therefore, for example, when power supply of a specific personal computer is turned off so that it is turned into a stop state, the monitoring-device-status managing unit 301 according to the present embodiment can store the stop state ("Status")  
5 indicating the power-supply OFF of this specific personal computer and the numbered "Parameter" and "Instance No." in the management database 401, and can also perform similarly to other IP network monitoring devices.

Next, the computer system including the connection system  
10 of the building facility device managing system according to the present embodiment is operated, when inquiry for the IP network monitoring device is issued from the building facility device managing system, so as to read the "Status" of the corresponding device from the management database 401, and besides, so as to  
15 generate an inquiry packet for the building facility device managing system 103 with the read "Status" together with the "Parameter" and the "Object Type" (also including the items of the "Camera Zoom" and the "Preset Temperature" depending on the device) to transmit it by making the coordinated-packet-generation  
20 transmitting/receiving unit 302 execute steps as illustrated in FIG. 6, the steps including: a step "B01" of activating a resident service for receiving a packet containing an inquiry command signal or an operation command signal for the device operation from the building facility device managing system 103; when the packet containing the  
25 inquiry command signal is transmitted from the building facility monitoring device 101, a step "B02" of receiving the packet containing the inquiry command signal by the IP network monitoring device managing system 108 with using the resident service of the step B01; a step "B03" of determining whether the received packet  
30 contains the inquiry command signal or not; if it is determined in the step B03 that the status inquiry command signal to the IP network monitoring device 106 is contained, a step "B04" of reading the

"Status" of the objective IP network monitoring device 106 from the management database 401; a step "B05" of generating a packet for the building facility device managing system 103 based on the "Status" read by the step B04; and a step "B06" of transmitting the packet for the building facility device managing system 103 which has been generated by the step B05 to the building facility device managing system.

Subsequently, the operation of the IP network monitoring device is instructed by making the coordinated-packet-generation transmitting/receiving unit 302 according to the present embodiment execute steps when it is determined in the step B03 that the status inquiry signal to the IP network monitoring device 106 is not contained, the steps including: a step "B07" of determining whether the operation command signal to the IP network monitoring device 106 is contained in the received packet or not and of terminating the process if it is determined that the operation command signal is not contained; if it is determined in the step B07 that the operation command signal is contained, a step "B08" of reading the "Status" of the corresponding device from the management database 401; a step "B09" of generating a command packet for the building facility device managing system 103 with the "Status" of the objective IP network monitoring device read by the step B08 together with the "Parameter" and the "Object Type" (also including the items of the "Camera Zoom" and the "Preset Temperature" depending on the device); and Step B10 which transmits the instruction packet generated by the Step B09 to the IP network device managing system 108.

The computer system including the connection system of the building facility device managing system according to the present embodiment can coordinate the building facility device managing system with the IP network device managing system by, when the "Status" indicating the state of the IP network monitoring device

106 is changed as illustrated in FIG. 5, storing the Status change based on the IP network monitoring device 106 into the management database 401 with adding the "Parameter" and the "Instance No." for the building facility device managing system 103 executed by the  
5 monitoring-device-status managing unit 301, and besides, when the IP network monitoring device inquiry command or the IP network monitoring device operation command is received from the building facility device managing system 103 as illustrated in FIG. 6, by generating a packet with adding the inquiry command or the operation  
10 command to the "Parameter" and the "Instance No." for the building facility device managing system 103 to be stored in the management database 401 executed by the coordinated-packet-generation transmitting/receiving unit 302.

This coordination will be specifically described as follows. For  
15 example, in a case that the power supply to the personal computer which is the IP network monitoring device is turned off, the monitoring-device-status managing unit 301 registers the power-supply OFF (state: "Status") of this specific personal computer into the management database 401 by executing the process  
20 illustrated in FIG. 5, and, when the building facility device managing system 103 transmits the signal based on the instruction from the managing computer 104 of the system administrator, the coordinated-packet-generation transmitting/receiving unit 302 transmits the power-supply OFF (state: "Status") of the personal  
25 computer to the building facility device managing system 103 by executing the process at the upper stage of FIG. 6, so that the administrator of the managing computer 104 connected to the building facility device managing system 103 which has received this state can turn off the power supply to the air conditioner  
30 and the lighting which are the building facility monitoring devices in a room where the corresponding personal computer is located with using the building facility device managing system 103, or can make

the building facility device managing system 103 instruct the coordinated-packet-generation transmitting/receiving unit 302 to perform the operation of the zoom-in, the panning, or others of the IP monitoring camera which is the IP network monitoring device  
5 by executing the process illustrated in FIG. 6 when the smoke detector for disaster prevention which is the building facility monitoring device detects smoke.

As another example, in the computer system including the connection system of the building facility device managing system  
10 according to the present embodiment, in a case that restart of the router which is the IP network monitoring device is required because failure occurs in the router, the building facility device managing system 103 can instruct the coordinated-packet-generation transmitting/receiving unit 302 to perform the stop and restart  
15 operations for the router by executing the process illustrated in FIG. 6. In a case that the IP network device managing system 108 detects increase of a temperature of the same router up to a predetermined temperature or higher, the monitoring-device-status managing unit 301 registers the fact of the predetermined  
20 temperature or higher into the management database 401 by executing the process described in FIG. 5, and the coordinated-packet-generation transmitting/receiving unit 302 transmits the temperature anomaly of the router to the building facility device managing system 103 by executing the process at the  
25 upper stage in FIG. 6, so that the administrator of the managing computer 104 connected to the building facility device managing system 103 which has received this temperature anomaly can control a temperature of an air conditioner which is the building facility device in a room where the corresponding personal computer is located  
30 with using the building facility device managing system 103.

#### **Symbol Explanation**

101 building facility monitoring device,

102 communication line,  
103 building facility device managing system,  
104 managing computer,  
105 communication line,  
5 106 IP network monitoring device,  
108 IP network device managing system,  
201 connection program of a building facility device  
managing system,  
301 monitoring-device-status managing unit,  
10 302 coordinated-packet-generation transmitting/receiving  
unit, and  
401 management database

**CLAIMS**

1. A connection system of a building facility device managing system which connects a building facility device managing system with an IP network device managing system, the building facility device managing system being for managing a building facility monitoring device installed in a building with using a BACnet or Lontalk protocol, the IP network device managing system being for managing an IP network monitoring device with using an IP protocol, so that the building facility monitoring device is coordinated with the IP network monitoring device,

the IP network device managing system including:

a management database in which statuses of the building facility monitoring device and of the IP network monitoring device and parameter information of the IP protocol and the BACnet or Lontalk protocol are stored;

a monitoring-device-status managing unit which stores the parameter information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol into the management database with being numbered when the status which is a state of the IP network monitoring device has been changed; and

a coordinated-packet-generation transmitting/receiving unit which receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the management database to transmit it to the building facility device managing system,

the monitoring-device-status managing unit executing a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored in the management database, the first step of providing the parameter information unique for the BACnet or Lontalk protocol to

the changed status and storing it, and

the coordinated-packet-generation transmitting/receiving unit executing:

a second step when receiving an inquiry command of a status  
5 of a specific IP network monitoring device from the building facility  
device managing system, the second step of acquiring the status and  
the parameter information of the specific IP network monitoring  
device for which the inquiry has been received, acquired from the  
management database, and of generating the packet of the BACnet or  
10 Lontalk protocol based on the acquired status and parameter  
information to transmit it to the building facility device managing  
system; and

a third step when receiving an operation command of the  
status of the specific IP network monitoring device from the building  
15 facility device managing system, the third step of acquiring the  
status and the parameter information of the specific IP network  
monitoring device for which the operation command has been received,  
acquired from the management database, and of generating the packet  
of the BACnet or Lontalk protocol based on the acquired status and  
20 parameter information to transmit it to the building facility device  
managing system.

2. A connection method of a building facility device managing  
system for a computer system which connects a building facility  
25 device managing system with an IP network device managing system,  
the building facility device managing system being for managing  
a building facility monitoring device installed in a building with  
using a BACnet or Lontalk protocol, the IP network device managing  
system being for managing the IP network monitoring device with using  
30 an IP protocol, which coordinates the building facility monitoring  
device with the IP network monitoring device, and in which the IP  
network managing system includes: a management database in which

statuses of the building facility monitoring device and of the IP network monitoring device and the parameter information of an IP protocol and a BACnet or Lontalk protocol are stored; a monitoring-device-status managing unit which stores the parameter  
5 information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol into the management database with being numbered when the status which is a state of the IP network monitoring device has been changed; and an coordinated-packet-generation transmitting/receiving unit which  
10 receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the management database to transmit it to the building facility device managing system,

15 the monitoring-device-status managing unit being made to execute a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored in the management database, the first step of providing the parameter information unique for the BACnet or Lontalk  
20 protocol to the changed status and storing it, and

the coordinated-packet-generation transmitting/receiving unit being made to execute:

a second step when receiving an inquiry command of a status of a specific IP network monitoring device from the building facility  
25 device managing system, the second step of acquiring the status and the parameter information of the specific IP network monitoring device for which the inquiry has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter  
30 information to transmit it to the building facility device managing system; and

a third step when receiving an operation command of the

status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and the parameter information of the specific IP network monitoring device for which the operation command has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system.

3. A connection program of a building facility device managing system for a computer system, which connects a building facility device managing system with an IP network device managing system, the building facility device managing system being for managing a building facility monitoring device installed in a building with using the BACnet or Lontalk protocol, the IP network device managing system being for managing an IP network monitoring device with using the IP protocol, which coordinates the building facility monitoring device with the IP network monitoring device, and in which the IP network device managing system includes: a management database in which statuses of the building facility monitoring device and of the IP network monitoring device and the parameter information of the IP protocol and the BACnet or Lontalk protocol are stored; a monitoring-device-status managing unit which stores the parameter information for filling a difference in a specification between the IP protocol and the BACnet or Lontalk protocol stored with being numbered, stored into the management database when the status which is a state of the IP network monitoring device has been changed; and an coordinated-packet-generation transmitting/receiving unit which receives a command from the building facility device managing system and which generates a packet of the BACnet protocol based on the status and the parameter information acquired from the management database to transmit it to the building facility device

managing system,

the monitoring-device-status managing unit being made to execute a first step when the status received with using the IP protocol from the IP network monitoring device has been changed from the status stored in the management database, the first step of providing the parameter information unique for the BACnet or Lontalk protocol to the changed status and storing it, and

the coordinated-packet-generation transmitting/receiving unit being made to execute:

a second step when receiving an inquiry command of a status of a specific IP network monitoring device from the building facility device managing system, the second step of acquiring the status and the parameter information of the specific IP network monitoring device for which the inquiry has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system; and

a third step when receiving an operation command of the status of the specific IP network monitoring device from the building facility device managing system, the third step of acquiring the status and the parameter information of the specific IP network monitoring device for which the operation command has been received, acquired from the management database, and of generating a packet of the BACnet or Lontalk protocol based on the acquired status and parameter information to transmit it to the building facility device managing system.