WHAT IS CLAIMED IS:

1. A method for monitoring plural apparatus (20), the method to be implemented by a system which includes a server-end device (1), an administration-end device (2) that is in communication with the server-end device (1), at least one primary device (11) that is adapted to communicate with the server-end device (1), and plural secondary devices (12) that are adapted to communicate with the at least one primary device (11) and that are respectively connected with the plural apparatus (20), the at least one primary device (11) and the plural secondary devices (12) being each a wireless device having a device identifier, the method comprising steps of:

A) by the server-end device (1) after receiving a connection request from the administration-end device (2), establishing at least one primary wireless communication link respectively between the server-end device (1) and the at least one primary device (11);

B) by the administration-end device (2), for each of the at least one primary device (11), determining subset information which indicates a subset of the plural secondary devices (12) that includes at least one secondary device (12) which is to communicate with the server-end device (1) through the primary device (11), the primary device (11) serving as a dominating

device for the at least one secondary device (12), each of the at least one secondary device (12) serving as a subject device for the primary device (11);

C) by each of the at least one primary device (11) according to the subset information determined by the administration-end device (2), establishing at least one first temporary wireless communication link respectively between the primary device (11) and the at least one subject device (12) of the primary device (11), and measuring communication quality of the at least one first temporary wireless communication link that has been established;

D) by the server-end device (1) in response to receiving an assistant-setting request from the administration-end device (2), designating at least one of the plural secondary devices (12) as at least one assistant device (13) based on the assistant-setting request;

E) by the server-end device (1), for each of the at least one assistant device, sending a measurement signal to the assistant device in order to initiate establishment of at least one second temporary wireless communication link respectively between the assistant device and at least another one of the at least one subject device of the dominating device of the assistant device;

F) by each of the at least one assistant device

in response to receiving the measurement signal, establishing the at least one second temporary wireless communication link respectively between the assistant device and the at least another one of the at least one subject device of the dominating device of the assistant device, measuring communication quality of said at least one second temporary wireless communication link, and sending, to the dominating device of the assistant device, a link message that indicates, for each of said at least one second temporary wireless communication link, the communication quality of the second temporary wireless communication link thus measured;

G) by each of the at least one primary device (11), sending, to the server-end device (1), a reporting message that indicates, for each link among the at least one first temporary wireless communication link that was established by the primary device (11) and any second temporary wireless communication link that is indicated in any link message the primary device (11) has received, the communication quality of the link, the reporting message further indicating, for each device among the primary device (11) and the at least one subject device of the primary device (11), the device identifier of the device and a physical location of the device;

H) by the server-end device (1) after step G),

establishing a network topology with respect to the at least one primary device (11) and the plural secondary devices (12) based on the reporting message(s) received from the at least one primary device, wherein each of the plural secondary devices (12) serves as one of: one of the at least one assistant device; a tail device that is to be directly linked to one of the at least one assistant device; and a branch device that is to be directly linked to the dominating device of the secondary device (12);

I) by the server-end device (1), generating and storing a set of routing parameters that corresponds to the network topology thus established and that specifies plural transmission routes respectively related to the plural secondary devices (12), each of the transmission routes being between the respective one of the secondary devices (12) and the dominating device of the respective one of the secondary devices (12);

J) by the server-end device (1), sending the set of routing parameters thus generated to the at least one primary device (11) and to the plural secondary devices (12), in order to construct, based on the set of routing parameters, a device network composed of the at least one primary device (11) and the plural secondary devices (12) in accordance with the network topology thus established; and

K) by each of the plural secondary device (12) after step J), receiving a working report from the apparatus (20) that is connected with the secondary device (12), and transmitting the working report to the dominating device of the secondary device (12) along the transmission route that corresponds to the secondary device (12), in order for the dominating device to forward the working report to the server-end device (1), the working report indicating an apparatus identifier of the apparatus (20) and a working state of the apparatus (20).

2. The method of claim 1, wherein step A) includes sub-steps of:

A-1) for each of the at least one primary device (11), receiving primary connection information from the primary device (11), the primary connection information indicating the device identifier of the primary device (11), a physical location of the primary device (11) and a network address of the primary device (11); and

A-2) in response to receiving the connection request, for each of the at least one primary device (11), establishing the primary wireless communication link between the server-end device (1) and the primary device (11) based on the connection request and the primary connection information received from the

primary device (11).

3. The method of claim 1, wherein step C) includes following sub-steps that are to be performed by each of the at least one primary device (11):

C-1) for each of the at least one subject device of the primary device (11), receiving secondary connection information from the subject device, the secondary connection information indicating the device identifier of the subject device, a physical location of the subject device, a network address of the subject device, and a number of data packets that the subject device has previously sent to the primary device (11); and

C-2) based on the subset information determined by the administration-end device (2), for each of the at least one subject device of the primary device (11), establishing the first temporary wireless communication link between the primary device (11) and the subject device based on the secondary connection information received from the subject device.

4. The method of claim 1, the method further comprising following steps that are to be performed with respect to each of the at least one primary device (11):

L) by the server-end device (1), determining

whether a status message is received from the primary device (11) within a predetermined time period, the status message indicating, for each of the at least one subject device of the primary device (11), whether the transmission route related to the subject device is functional; and

M) by the server-end device (1) when it is determined that the status message is not received from the primary device (11) within the predetermined time period, and when the at least one primary device (11) includes plural primary devices (11),

determining that the primary device (11) is a disconnected primary device;

selecting, based on the set of routing parameters and from a group consisting of the plural primary devices (11) except the disconnected primary device and the plural secondary devices (12) except the at least one subject device of the disconnected primary device, one device to serve as a bridge device;

selecting, based on the set of routing parameters and from the at least one subject device of the disconnected primary device, one secondary device to serve as a substitutive primary device, each of the rest of said at least one subject device serving as a disconnected secondary device when said at least one subject device includes plural secondary devices (12); and

generating a new set of routing parameters based on the set of routing parameters stored in the server-end device (1), and storing the new set of routing parameters thus generated to replace the set of routing parameters that is originally stored, the new set of routing parameters specifying at least one transmission route respectively related to the at least one subject device of the disconnected primary device, each of the at least one transmission route passing through the substitutive primary device and the bridge device.

5. The method of claim 4, the method further comprising, subsequent to step M), following steps that are to be performed with respect to each of the disconnected primary device(s):

N) by the server-end device (1), sending the new set of routing parameters to each of the plural primary devices (11) except the disconnected primary device and each of the plural secondary devices (12) except the at least one subject device of the disconnected primary device;

O) by the bridge device corresponding to the disconnected primary device in response to receiving the new set of routing parameters, establishing, based on the new set of routing parameters, a wireless communication link between said bridge device and the

substitutive primary device that corresponds to the disconnected primary device, and sending the new set of routing parameters to said substitutive primary device; and

P) when the at least one subject device of the disconnected primary device includes at least one disconnected secondary device, by the substitutive primary device corresponding to the disconnected primary device in response to receiving the new set of routing parameters, for each of the at least one disconnected secondary device, establishing a wireless communication link between said substitutive primary device and the disconnected secondary device based on the new set of routing parameters, and sending the new set of routing parameters to the disconnected secondary device.

6. The method of claim 5, wherein:

in step O), the bridge device is to establish the wireless communication link between the bridge device and the substitutive primary device by

sending, based on the new set of routing parameters and to the substitutive primary device, a linking message that indicates the device identifier of the substitutive primary device, in order for the substitutive primary device to send to the bridge device, in response to receiving the linking message,

linking information that indicates the network address of the substitutive primary device, and

establishing the wireless communication link between the bridge device and the substitutive primary device using the network address indicated in the linking information received from the substitutive primary device; and

in step P), the substitutive primary device is to establish the wireless communication link between the substitutive primary device and the disconnected secondary device by

sending, based on the new set of routing parameters and to the disconnected secondary device, a linking message that indicates the device identifier of the disconnected secondary device, in order for the disconnected secondary device to send to the substitutive primary device, in response to receiving said linking message, linking information that indicates the network address of the disconnected secondary device, and

establishing the wireless communication link between the substitutive primary device and the disconnected secondary using the network address indicated in the linking information received from the disconnected secondary device.

7. The method of claim 4, further comprising

following step that is to be performed with respect to each of the at least one primary device (11), the status message from which is determined in step L) as being received within the predetermined time period:

N) by the server-end device (1), for each of the at least one subject device of the primary device (11) that is not one of the at least one assistant device,

determining whether the subject device is in connection with the primary device (11) based on the status message received from the primary device (11); and

when it is determined that the subject device is not in connection with the primary device (11), determining that the subject device (12) is a missing device; and

the method further comprising following steps that are to be performed when a missing device is determined in step N):

O) by the server-end device (1), sending, to the administration-end device (2), an error message that indicates the device identifier and the physical location of the missing device;

P) by the administration-end device (2) in response to receiving the error message, sending, to the server-end device (1), replacement information that indicates the device identifier of the missing device, a device identifier of a substitutive device,

a physical location of the substitutive device and a network address of the substitutive device, the substitutive device being a wireless device; and

Q) by the server-end device (1) in response to receiving the replacement information, generating and storing a new set of routing parameters based on the set of routing parameters stored in the server-end device (1) by replacing the missing device with the substitutive device.

8. The method of claim 7, the method further comprising following steps that are to be performed subsequent to step Q) when a missing device is determined in step N):

R) by the server-end device (1), sending the new set of routing parameters generated in step Q) to the at least one primary device (11) and the plural secondary devices (12) except the missing device;

S) by one device among the at least one primary device (11) and the plural secondary devices (12) that once established a wireless communication link between the one device and the missing device, sending, based on said new set of routing parameters and in response to receiving said new set of routing parameters, to the substitutive device that corresponds to the missing device, a linking message that indicates the device identifier of said substitutive device;

T) by the substitutive device corresponding to the missing device, sending, in response to receiving the linking message, to the one device, linking information indicating the network address of the substitutive device; and

U) by the one device in response to receiving the linking information, establishing a wireless communication link between the one device and the substitutive device by using the network address indicated in the linking information, and sending said new set of routing parameters to the substitutive device.

9. The method of claim 4, further comprising following step that is to be performed with respect to each of the at least one primary device (11), the status message from which is determined in step L) as being received within the predetermined time period:

N) by the server-end device (1), for each of at least one assistant device that is a subject device of the primary device (11), determining whether the assistant device is a disconnected assistant device by determining whether the assistant device is in connection with the primary device (11) based on the status message received from the primary device (11);

the method further comprising following steps that are to be performed when a disconnected assistant

device is determined in step N):

O) by the server-end device (1), instructing the primary device (11) to, for each of at least one tail device that was linked to the disconnected assistant device as specified in the set of routing parameters stored in the server-end device (1), sending a contact signal to the tail device, in order for the tail device to send, to the primary device (11), a response signal that is to be forwarded to the server-end device (1), the contact signal indicating the device identifier of the tail device, the response signal indicating the device identifier and the network address of the tail device;

P) by the server-end device (1), determining whether a number of the response signal received through the primary device (11) exceeds a threshold; and

Q) when it is determined that the number of the response signal(s) exceeds the threshold, by the server-end device (1),

selecting, based on the set of routing parameters stored in the server-end device (1) and from a group consisting of the at least one primary device (11) and the plural secondary devices (12) except the disconnected assistant device and except the at least one tail device that corresponds to the disconnected assistant device, one device to serve as a bridge

device;

selecting, based on the set of routing parameters stored in the server-end device (1) and from the at least one tail device that corresponds to the disconnected assistant device, one secondary device to serve as a substitutive assistant device, each of the rest of said at least one tail device serving as a disconnected secondary device when said at least one tail device includes plural secondary devices (12); and

generating a new set of routing parameters based on the set of routing parameters stored in the server-end device (1), and storing the new set of routing parameters thus generated to replace the set of routing parameters that is originally stored, said new set of routing parameters specifying at least one transmission route respectively related to the at least one tail device that corresponds to the disconnected assistant device, each of said at least one transmission route passing through the substitutive assistant device and the bridge device that corresponds to the disconnected assistant device.

10. The method of claim 9, the method further comprising following steps that are to be performed subsequent to step Q) when a disconnected assistant device is determined in step N):

R) by the server-end device (1), sending the new

set of routing parameters generated in step Q) to the at least one primary device (11) and the plural secondary devices (12) except the disconnected assistant device and except the at least one tail device that corresponds to the disconnected assistant device;

S) by the bridge device corresponding to the disconnected assistant device in response to receiving said new set of routing parameters, establishing, based on said new set of routing parameters, a wireless communication link between said bridge device and the substitutive assistant device that corresponds to the disconnected assistant device, and sending said new set of routing parameters to the substitutive assistant device through the wireless communication link thus established;

T) when the at least one tail device corresponding to the disconnected assistant device includes at least one disconnected secondary device, by the substitutive assistant device corresponding to the disconnected assistant device in response to receiving said new set of routing parameters, for each of said at least one disconnected secondary device, establishing a wireless communication link between the substitutive assistant device and the disconnected secondary device based on said new set of routing parameters, and sending said new set of routing parameters to the disconnected secondary device through the wireless communication

link thus established.

11. The method of claim 9, further comprising following steps that are to be performed when a disconnected assistant device is determined in step N) and when it is determined in step P) that the number of the response signal(s) received through the primary device (11) does not exceed the threshold:

R) by the server-end device (1), sending, to the administration-end device (2), an error message that indicates the device identifier and the physical location of the disconnected assistant device;

S) by the administration-end device (2) in response to receiving the error message, sending, to the server-end device (1), replacement information that indicates the device identifier of the disconnected assistant device, a device identifier of a substitutive device, a physical location of the substitutive device and a network address of the substitutive device, the substitutive device being a wireless device; and

T) by the server-end device (1) in response to receiving the replacement information, generating and storing a new set of routing parameters based on the set of routing parameters stored in the server-end device (1) by replacing the disconnected assistant device with the substitutive device.

12. The method of claim 11, the method further comprising following steps that are to be performed subsequent to step T) when a disconnected assistant device is determined in step N):

U) by the server-end device (1), sending the new set of routing parameters generated in step T) to the at least one primary device (11) and the plural secondary devices (12) except the disconnected assistant device and except the at least one tail device that corresponds to the disconnected assistant device;

V) by the dominating device of the disconnected assistant device in response to receiving said new set of routing parameters, sending, based on said new set of routing parameters, to the substitutive device that corresponds to the disconnected assistant device, a linking message that indicates the device identifier of said substitutive device;

W) by the substitutive device corresponding to the disconnected assistant device in response to receiving the linking message, sending to the dominating device of the disconnected assistant device, linking information that indicates the network address of the substitutive device; and

X) by the dominating device of the disconnected assistant device in response to receiving the linking information, establishing a wireless communication

link between the dominating device and the substitutive device by using the network address indicated in the linking information, and sending said new set of routing parameters to the substitutive device.

13. The method of claim 9, the method further comprising following step that is to be performed subsequent to step Q) when a disconnected assistant device is determined in step N), when it is determined in step P) that the number of the response signal(s) exceeds the threshold, and when the response signal is not received from each of the at least one tail device corresponding to the disconnected assistant device:

R) by the server-end device (1), determining that each of at least one of the at least one tail device, the response signal sent from which is not received, is a missing device;

wherein the method further comprises following steps that are to be performed when a missing device is determined in step R):

S) by the server-end device (1), sending, to the administration-end device (2), an error message that indicates the device identifier and the physical location of the missing device;

T) by the administration-end device (2) in response to receiving the error message, sending, to the server-end device (1), replacement information

that indicates the device identifier of the missing device, a device identifier of a substitutive device, a physical location of the substitutive device and a network address of the substitutive device, the substitutive device being a wireless device;

U) by the server-end device (1) in response to receiving the replacement information, generating a new set of routing parameters based on the set of routing parameters stored in the server-end device (1) by replacing the missing device with the substitutive device, and storing the new set of routing parameters thus generated to replace the set of routing parameters that is originally stored;

V) by the server-end device (1), sending the new set of routing parameters generated in step U) to the at least one primary device (11) and the plural secondary devices (12) except the missing device;

W) by the substitutive assistant device corresponding to the disconnected assistant device, establishing, in response to receiving said new set of routing parameters, a wireless communication link between the substitutive assistant device and the substitutive device based on said new set of routing parameters, and sending said new set of routing parameters to the substitutive device through the wireless communication link thus established.