Claims

1. A wireless communication device applicable to a wireless communication system having a plurality of wireless communication devices, the wireless communication device comprising:

a wireless section configured to execute a communication task in which the wireless communication device transmits and receives a wireless signal to and from another wireless communication device;

a storage section configured to store schedule information indicative of a time when the communication task related to the plurality of wireless communication devices is permitted to be executed;

a communication control section configured to control execution of the communication task of the wireless section based on the schedule information;

a response confirmation section configured to confirm a reception response from the another wireless communication device with the wireless signal; and

a schedule modification section configured to determine, from the reception response confirmed by the response confirmation section, whether or not a total duration for the schedule information exceeds a maximum update cycle needed to execute all communication tasks recorded in the schedule information, and if the total duration is determined to be exceeding the maximum update cycle, to determine that a communication error is involved in a transmission origin for the schedule information and modify the schedule information stored in the storage section,

wherein the schedule modification section allots a communication task between the wireless communication

device and a device having a wireless communication path to the wireless communication device to a time in the schedule information,

wherein the schedule information further includes information on a bypass path on the wireless communication path for each time allotted to the communication task, and

when a communication error occurs in an adjacent wireless communication device on the wireless communication path, the schedule modification section replaces the communication task of the device having the communication error with the communication task of the device on the bypass path, based on information on the bypass path.

2. The wireless communication device according to claim 1, characterized by further comprising:

an external network section configured to connect to an external network; and

a setting reception section configured to provide a setting function related to execution of the communication task via the external network.

3. The wireless communication device according to claim 2, characterized in that the setting reception section accepts a setting of the maximum update cycle needed to execute all communication tasks recorded in the schedule information.

4. The wireless communication device according to claim 2, characterized in that the setting reception section accepts a setting of a maximum update cycle for an error occurrence which is a maximum update cycle involving a case of a communication error in the wireless communication device, and

the schedule modification section determines whether a maximum duration including a time needed to replace the communication task exceeds the maximum update cycle for the error occurrence when a communication error occurs in the adjacent wireless communication device on the wireless communication path.

5. The wireless communication device according to claim 4, characterized in that the schedule modification section increases a number of communication cycles used to make a determination for the communication error to an extent that the maximum duration is equal to or shorter than the maximum update cycle for the error occurrence.

6. The wireless communication device according to any one of claims 3 to 5, characterized in that the setting reception section presents at least one of the total duration calculated by the schedule modification section, the maximum duration, and the number of communication cycles used for determination for the communication error.

7. The wireless communication device according to claim 1, characterized in that the response confirmation section determines that the wireless communication device with the communication error has been restored to a communication enabled state, and

the schedule modification section replaces the communication task for the device on the bypass path with a communication task for the device determined to have been restored as a result of reception of a fixed-cycle transmission resumed by the restored device.

8. A wireless communication system comprising the wireless communication device according to any one of claims 1 to 7.

9. A method used for a wireless communication device applicable to a wireless communication system having a plurality of wireless communication devices, the wireless communication method being characterized by comprising:

executing a communication task of transmitting and receiving a wireless signal to and from the another wireless communication device;

storing schedule information indicative of a time when the communication task related to the plurality of wireless communication devices is permitted to be executed;

controlling execution of the communication task for the wireless signal based on the schedule information;

confirming a reception response from the another wireless communication device with the wireless signal;

determining, from the reception response confirmed, whether or not a total duration for the schedule information exceeds a maximum update cycle needed to execute all communication tasks recorded in the schedule information, and if the total duration is determined to be exceeding the maximum update cycle, determining that a communication error is involved in a transmission origin for the schedule information and modifying the stored schedule information;

alloting a communication task between the wireless communication device and a device having a wireless communication path to the wireless communication device to a time in the schedule information, wherein the schedule information further includes information on a bypass path

on the wireless communication path for each time allotted to the communication task; and

when a communication error occurs in an adjacent wireless communication device on the wireless communication path, replacing the communication task of the device having the communication error with the communication task of the device on the bypass path, based on information on the bypass path.