

CLAIMS

1. A wireless communication device including a wireless receiver receiving a transfer target data and a wireless transmitter transmitting the transfer target data received by the wireless receiver, the wireless communication device communicating with a plurality of different wireless communication devices identical to the wireless communication device in function,

the wireless communication device comprising:

a metrics calculation section that calculates successively a metrics value that is metrics as an index indicating a communication success rate with one of the different wireless communication devices based on an electric wave received by the wireless receiver from the one of the different wireless communication devices;

a table update section that updates a metrics value, which corresponds to the one of the different wireless communication devices transmitting the electric wave received by the wireless receiver, into a metrics value calculated by the metrics calculation section in a metrics table in which metrics values are associated with the respective different wireless communication devices, based on that the metrics calculation section calculates the metrics value; and

a transfer control section that determines a metrics count indicating how many metrics values in the metrics table are within a fulfilled communication range indicating a communication success rate being high when the wireless receiver receives a transfer target data,

the transfer control section transmitting the transfer target data from the wireless transmitter based on that the metrics count is within a transfer performable range predetermined, whereas not transmitting the transfer target data from the wireless transmitter based on that the metrics count is outside of the transfer performable range,

wherein the transfer performable range is assigned with an upper limit value.

2. The wireless communication device according to claim 1, wherein the transfer performable range is assigned with a lower limit value being equal to or greater than two.

3. The wireless communication device according to claim 1 or claim 2, wherein

the transfer target data is one of a plurality of transfer target data that are different mutually,

the wireless communication device further comprising:

a transfer-data storage processing section that stores, in a storage, data-identifying information that identifies the transfer target data transmitted by the transfer control section from the wireless transmitter,

wherein

the transfer control section determines whether the transfer target data received by the wireless receiver is to be transmitted from the wireless transmitter based on whether the data-identifying information corresponding to the transfer target data received by the wireless receiver is stored in the storage.

4. The wireless communication device according to claim 3,, further comprising:

a pre-total metrics update section updates a pre-total metrics value that is attached to a transfer target data from the different wireless communication device and received by the wireless receiver based on the metrics value in the metrics table and the pre-total metrics value received by the wireless receiver,

the pre-total metrics value being a value estimating a total of the metrics values relative to a data transfer route through which the transfer target data passes to reach the wireless communication device from when the transfer target data was transferred to when the transferred transfer target data reaches the wireless communication device; and

a pre-total metrics storage processing section that stores the pre-total metrics value updated by the pre-total metrics update section in the storage to be associated with the data-identifying information, each time the transfer control section transmits the transfer target data from the wireless transmitter,

wherein in cases that the data-identifying information corresponding to the

transfer target data received by the wireless receiver is stored in the storage, the transfer control section transmits the transfer target data from the wireless transmitter based on that the pre-total metrics value updated by the pre-total metrics update section is a value indicating the communication success rate being higher than a value of the pre-total metrics value stored in the storage before the pre-total metrics value is updated.

5. A wireless communication device including a wireless receiver receiving a transfer target data and a wireless transmitter transmitting the transfer target data received by the wireless receiver, the wireless communication device communicating with a plurality of different wireless communication devices identical to the wireless communication device in function,

the wireless communication device comprising:

a metrics calculation section that calculates successively a metrics value that is metrics as an index indicating a communication success rate with one of the different wireless communication devices based on an electric wave received by the wireless receiver from the one of the different wireless communication devices;

a table update section that updates a metrics value, which corresponds to the one of the different wireless communication devices transmitting the electric wave received by the wireless receiver, into a metrics value calculated by the metrics calculation section in a metrics table in which metrics values are associated with the respective different wireless communication devices, based on that the metrics calculation section calculates the metrics value; and

a transfer control section that determines a metrics count indicating how many metrics values in the metrics table are within a fulfilled communication range indicating a communication success rate being high when the wireless receiver receives a transfer target data,

the transfer control section transmitting the transfer target data from the wireless transmitter based on that the metrics count is within a transfer performable range predetermined, whereas not transmitting the transfer target data from the wireless transmitter based on that the metrics count is outside of the transfer

performable range,

wherein the transfer target data is one of a plurality of transfer target data that are different mutually,

the wireless communication device further comprising:

a transfer-data storage processing section that stores, in a storage, data-identifying information that identifies the transfer target data transmitted by the transfer control section from the wireless transmitter, wherein the transfer control section determines whether the transfer target data received by the wireless receiver is to be transmitted from the wireless transmitter based on whether the data-identifying information corresponding to the transfer target data received by the wireless receiver is stored in the storage;

a pre-total metrics update section updates a pre-total metrics value that is attached to a transfer target data from the different wireless communication device and received by the wireless receiver based on the metrics value in the metrics table and the pre-total metrics value received by the wireless receiver,

the pre-total metrics value being a value estimating a total of the metrics values relative to a data transfer route through which the transfer target data passes to reach the wireless communication device from when the transfer target data was transferred to when the transferred transfer target data reaches the wireless communication device; and

a pre-total metrics storage processing section that stores the pre-total metrics value updated by the pre-total metrics update section in the storage to be associated with the data-identifying information, each time the transfer control section transmits the transfer target data from the wireless transmitter,

wherein in cases that the data-identifying information corresponding to the transfer target data received by the wireless receiver is stored in the storage, the transfer control section transmits the transfer target data from the wireless transmitter based on that the pre-total metrics value updated by the pre-total metrics update section is a value indicating the communication success rate being higher than a value of the pre-total metrics value stored in the storage before the pre-total metrics value is updated.

6. The wireless communication device according to claim 5, wherein the transfer performable range is assigned with a lower limit value being equal to or greater than two.

7. The wireless communication device according to claim 5 or claim 6, wherein the transfer performable range is assigned with an upper limit value.

8. The wireless communication device according to any one of claims 4 to 7, wherein the pre-total metrics update section updates the pre-total metrics value received by the wireless receiver based on (i) the pre-total metrics value received by the wireless receiver and (ii) the metrics value that indicates the communication success rate being lowest among the metrics values that are included in the metrics table and within the fulfilled communication range.

9. The wireless communication device according to any one of claims 3 to 8, further comprising:

a hop count storage processing section, wherein in cases that a hop count attached to the transfer target data from the different wireless communication device is received by the wireless receiver along with the transfer target data and the transfer target data is transmitted by the transfer control section from the wireless transmitter, the hop count storage processing section is configured to

update the hop count received by the wireless receiver and store the updated hop count in the storage to be associated with the data-identifying information,

the hop count indicating how many times the transfer target data transferred from the different wireless communication device is transferred,

wherein in cases that the data-identifying information corresponding to the

transfer target data received by the wireless receiver is stored in the storage, the transfer control section transmits the transfer target data from the wireless transmitter based on that the hop count updated by the hop count storage processing section is smaller than the hop count stored in the storage before the hop count is updated.

10. The wireless communication device according to claim 3, wherein:

in cases that the data-identifying information corresponding to the transfer target data received by the wireless receiver is stored in the storage, the transfer control section does not transmit the transfer target data from the wireless transmitter; and

in cases that the data-identifying information corresponding to the transfer target data received by the wireless receiver is not stored in the storage, the transfer control section transmits the transfer target data from the wireless transmitter.

11. The wireless communication device according to any one of claims 1 to 10, wherein:

the wireless communication device and the different wireless communication devices are used in respective vehicles that are mutually different;

when the wireless receiver receives the transfer target data from the different wireless communication device, the transfer control section determines whether the different wireless communication device is present ahead in a heading direction of the wireless communication device; and

when the different wireless communication device is determined not to be present ahead in the heading direction of the wireless communication device, the transfer control section does not transmit the transfer target data from the wireless transmitter.

12. The wireless communication device according to any one of claims 1 to 10, wherein:

the wireless communication device and the different wireless communication

devices are used in respective vehicles that are mutually different;

when the wireless receiver receives the transfer target data from the different wireless communication device, the table update section determines whether the different wireless communication device is present ahead in a heading direction of the wireless communication device; and

when the different wireless communication device is determined not to be present ahead in the heading direction of the wireless communication device, the table update section does not update the metrics table based on the transfer target data received from the different wireless communication device.

13. The wireless communication device according to any one of claims 1 to 12, wherein

the metrics calculation section calculates the metrics value using at least one of (i) a distance between the wireless communication and the different wireless communication device, (ii) a last reception time of an electric wave received from the different wireless communication device, and (iii) a strength of the electric wave received from the different wireless communication device.

14. The wireless communication device according to claim 13, wherein the metrics calculation section calculates the metrics value using the last reception time of the electric wave received from the different wireless communication device.

15. A wireless communication device including a wireless receiver receiving a transfer target data and a wireless transmitter transmitting the transfer target data received by the wireless receiver, the wireless communication device communicating with a plurality of different wireless communication devices identical to the wireless communication device in function,

the wireless communication device comprising:

a metrics calculation section that calculates successively a metrics value that is metrics as an index indicating a communication success rate with one of the different

wireless communication devices based on an electric wave received by the wireless receiver from the one of the different wireless communication devices;

a table update section that updates a metrics value, which corresponds to the one of the different wireless communication devices transmitting the electric wave received by the wireless receiver, into a metrics value calculated by the metrics calculation section in a metrics table in which metrics values are associated with the respective different wireless communication devices, based on that the metrics calculation section calculates the metrics value; and

a transfer control section that determines a metrics count indicating how many metrics values in the metrics table are within a fulfilled communication range indicating a communication success rate being high when the wireless receiver receives a transfer target data,

the transfer control section transmitting the transfer target data from the wireless transmitter based on that the metrics count is within a transfer performable range predetermined, whereas not transmitting the transfer target data from the wireless transmitter based on that the metrics count is outside of the transfer performable range,

wherein

the metrics calculation section calculates the metrics value using a last reception time of an electric wave received from the different wireless communication device.