[DESCRIPTION]

[Title]

INFORMATION PROCESSING APPARATUS, COMMUNICATION SYSTEM, INFORMATION PROCESSING METHOD, AND PROGRAM

[Technical Field]

[0001]

The present invention relates to an information processing apparatus, a communication system, an information processing method, and a program. More particularly, the invention relates to an information processing apparatus, a communication system, and an information processing method for exchanging information by wireless communication, as well as a program for causing a computer to execute the information processing method.

[Background Art]

[0002]

In the past, multiple information processing apparatuses exchanging information (frames) therebetween by wireless communication have used a system to set a transmission inhibition time for averting collisions between their transmissions. For example, a data source station transmits a frame (RTS frame) for requesting the transmission of data to another station and for requesting other stations to set a transmission inhibition time. Thereafter, the station as the destination of the data transmits a frame (CTS frame) to enable the data transmission. What has been studied in implementing this system is how to add to the CTS frame

the information regarding the power for transmitting the data. There have been proposed systems that enable data to be transmitted with the power determined on the basis of the information about the data transmitting power, the information being added to the frame by the data source station (e.g., see PTL 1).

[Citation List]

[Patent Literature]

[0003]

[PTL 1]

JP 2004-533158T

[Summary]

[Technical Problem]

[0004]

A problem with the existing technology outlined above is that the technology lets the RTS frame and other information be transmitted with predetermined power and does not provide suitable control over the transmitting power. Presumably, the existing technology may leave the RTS frame transmitted with excess transmitting power. Thus there is a possibility that the transmission inhibition time may be set over a wider range of stations than necessary. With the existing technology above, the transmission inhibition time is not set appropriately, which leads to a drop in the efficiency of utilization of communication resources.

[0005]

Embodiments of the present invention improve the

efficiency of utilization of communication resources by suitably setting the transmission inhibition time.

[Solution to Problem]

[0006]

According to a first aspect of the present invention, there is provided an information processing apparatus including a control part configured to perform control to transmit a frame for requesting the transmission of data to an information processing apparatus as a destination of the data and for requesting information processing apparatuses other than the information processing apparatus as the destination to set a transmission inhibition time, the frame being transmitted with transmitting power determined on the basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame. This provides an advantageous effect of determining, on the basis of the surrounding environment information, the power for transmitting the frame for requesting the transmission of the data to the information processing apparatus as the destination and for requesting information processing apparatuses other than the destination information processing apparatus to set the transmission inhibition time.

[0007]

In an embodiment of the first aspect of the present invention, the control part may perform control to transmit a communication end frame for notifying the end of communication of the data and for requesting the transmission inhibition time to be canceled, the communication end frame being transmitted with the transmitting power determined on

the basis of the surrounding environment information. This provides an advantageous effect of determining the power for transmitting the communication end frame on the basis of the surrounding environment information.

[0008]

In an embodiment of the first aspect of the present invention, the control part may perform control to transmit the communication end frame using the transmitting power determined on the basis of transmitting power information transmitted from the information processing apparatus as the destination and of the surrounding environment information. This provides an advantageous effect of determining the transmitting power for the communication end frame on the basis of the transmitting power information transmitted from the information processing apparatus as the destination and of the surrounding environment information.

[0009]

According to a second aspect of the present invention, there is provided an information processing apparatus including a control part configured to perform control to transmit a frame for enabling an information processing apparatus as a source of data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set a transmission inhibition time, the frame being transmitted with transmitting power determined on the basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame. This provides an advantageous effect of determining, on the basis of the surrounding environment

information, the power for transmitting the frame for enabling the information processing apparatus as the source of data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set the transmission inhibition time.

[0010]

In an embodiment of the second aspect of the present invention, the control part may perform control to transmit the frame in which information regarding the transmitting power is stored. This provides an advantageous effect of transmitting the frame having the transmitting power information stored therein.

[0011]

In an embodiment of the second aspect of the present invention, the control part may perform control to transmit a communication end frame for notifying the end of communication of the data and for requesting the transmission inhibition time to be canceled, the communication end frame being transmitted with the transmitting power determined on the basis of the surrounding environment information. This provides an advantageous effect of determining the transmitting power for the communication end frame on the basis of the surrounding environment information.

[0012]

According to a third aspect of the present invention, there is provided an information processing apparatus including a control part configured to perform control to transmit a frame for enabling the own information processing apparatus to transmit data and for requesting other

information processing apparatuses to set a transmission inhibition time, the frame being transmitted with transmitting power determined on the basis of surrounding environment information regarding an environment surrounding the own information processing apparatus. This provides an advantageous effect of determining, on the basis of the surrounding environment information, the power for transmitting the frame for enabling the own information processing apparatus to transmit the data and for requesting other information processing apparatuses to set the transmission inhibition time.

[0013]

In an embodiment of the third aspect of the present invention, the control part may perform control to transmit a communication end frame for notifying the end of communication of the data and for requesting the transmission inhibition time to be canceled, the communication end frame being transmitted with the transmitting power determined on the basis of the surrounding environment information. This provides an advantageous effect of determining the power for transmitting the communication end frame on the basis of the surrounding environment information.

[0014]

In an embodiment of the third aspect of the present invention, the control part may, in the case of transmitting data, perform control to transmit the frame using the transmitting power determined on the basis of the surrounding environment information and of destination surrounding environment information regarding an environment surrounding the information processing apparatus as the destination of

the data. This provides an advantageous effect of determining the transmitting power on the basis of the destination surrounding environment information and the surrounding environment information in the case of transmitting the data.

[0015]

In an embodiment of the third aspect of the present invention, the control part may perform control to transmit a communication end frame for notifying the end of communication of the data and for requesting the transmission inhibition time to be canceled, the communication end frame being transmitted with the transmitting power determined on the basis of the destination surrounding environment information and the surrounding environment information. This provides an advantageous effect of determining the power for transmitting the communication end frame on the basis of the destination surrounding environment information and the surrounding environment information.

[0016]

According to a fourth aspect of the present invention, there is provided a communication system including: a first information processing apparatus including a first control part configured to perform control to transmit a frame for requesting the transmission of data to an information processing apparatus as a destination of the data and for requesting information processing apparatuses other than the information processing apparatus as the destination to set a transmission inhibition time, the frame being transmitted with transmitting power determined on the basis of first surrounding environment information regarding an environment surrounding the first information processing apparatus; and a

second information processing apparatus including a second control part configured to perform control to transmit a frame for enabling the information processing apparatus as a source of the data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set a transmission inhibition time, the frame being transmitted with transmitting power determined on the basis of second surrounding environment information regarding an environment surrounding the second information processing apparatus. This provides an advantageous effect of determining, on the basis of the surrounding environment information, the power for transmitting the frame for requesting the transmission of data to the information processing apparatus as the destination of the data and for requesting information processing apparatuses other than the information processing apparatus as the destination to set the transmission inhibition time. Also provided is an advantageous effect of determining, on the basis of the surrounding environment information, the power for transmitting the frame for enabling the information processing apparatus as the source of data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set the transmission inhibition time.

[0016a]

According to a fifth aspect of the present invention, there is provided an information processing method including: a control procedure for performing control to transmit a frame for requesting the transmission of data to an

information processing apparatus as a destination of the data and for requesting information processing apparatuses other than the information processing apparatus as the destination to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame.

[00016b]

According to a sixth aspect of the present invention, there is provided an information processing method including: a control procedure for performing control to transmit a frame for enabling an information processing apparatus as a source of data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame.

[00016c]

According to a seventh aspect of the present invention, there is provided an information processing method including: a control procedure for performing control to transmit a frame for enabling an own information processing apparatus to transmit data and for requesting other information processing apparatuses to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the own information processing

apparatus.

[00016d]

According to an eighth aspect of the present invention, there is provided a program for causing a computer to execute a control procedure for performing control to transmit a frame for requesting the transmission of data to an information processing apparatus as a destination of the data and for requesting information processing apparatuses other than the information processing apparatus as the destination to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame.

[00016e]

According to a ninth aspect of the present invention, there is provided a program for causing a computer to execute a control procedure for performing control to transmit a frame for enabling an information processing apparatus as a source of data to transmit the data and for requesting information processing apparatuses other than the information processing apparatus as the source to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the information processing apparatus transmitting the frame.

[00016f]

According to a tenth aspect of the present invention, there is provided a program for causing a computer to execute a control procedure for performing control to transmit a

frame for enabling an own information processing apparatus to transmit data and for requesting other information processing apparatuses to set a transmission inhibition time, the frame being transmitted with transmitting power determined on a basis of surrounding environment information regarding an environment surrounding the own information processing apparatus.

[Advantageous Effects of Invention]

[0017]

Embodiments of the present invention provide the advantageous effect of improving the efficiency of utilization of communication resources by suitably setting the transmission inhibition time. There may be other advantageous effects derived from but not covered by this description.

[Brief Description of Drawings]

[0018]

[Fig. 1]

Fig. 1 is a schematic diagram depicting a typical configuration of a communication system 10 embodying the present technology.

[Fig. 2]

Fig. 2 is a schematic diagram depicting a typical