SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0005]

With the above conventional technique, a connection to another group can be established while the connections among the wireless communication devices forming the same group are maintained.

[0006]

While the wireless communication devices are wirelessly connected, various kinds of applications might be executed among those wireless communication devices. For example, an application might be designated by a user operation both before and after wireless connection establishment. In this case, it would be convenient if an application desired by a user can be readily used both before and after wireless connection establishment, for example.

[0007]

~~The present technique has been~~ Embodiments of the present invention are developed in view of those circumstances, and aims to allow users to readily use desired applications.

SOLUTIONS TO PROBLEMS

[0008]

~~The present technique has been developed to solve the above problem, and a first aspect thereof is~~ Embodiments of the present invention provide a wireless communication device, a communication method for the wireless communication device, and a program for causing a computer to implement the method. ~~The wireless~~

~~communication device performs an inter-device wireless communication with another wireless communication device in accordance with the Wi-Fi (Wireless Fidelity) Direct specification, and includes a transmitting unit that incorporates information about the role of the wireless communication device into an action frame specified in the IEEE (Institute of Electrical and Electronic Engineers) 802.11 specification, and transmits the action frame.~~

According to a first aspect of the present invention, there is provided a wireless communication device performing an inter-device wireless communication with another wireless communication device in accordance with the Wi-Fi (Wireless Fidelity) Direct specification, the wireless communication device comprising a transmitting unit configured to incorporate information about a role of the wireless communication device into an action frame specified in the IEEE (Institute of Electrical and Electronic Engineers) 802.11 specification, and transmit the action frame.

With ~~this structure~~ the above aspect, an inter-device wireless communication can be performed with another wireless communication device in accordance with the Wi-Fi Direct specification, and information about the role of the wireless communication device can be incorporated into an action frame specified in the IEEE802.11 specification, and then be transmitted.

[0009]

In this first aspect, the transmitting unit may perform the transmission when the wireless communication device is P2P (Peer-to-Peer)-connected to the other wireless communication device. With this arrangement, the transmission can be performed when a P2P connection to another wireless communication device is maintained.

[0010]

In this first aspect, the information about the role of the wireless communication device may be information about one of a source and a sink that are compliant with the Wi-Fi Display specification. With this arrangement, information about a source or a sink compliant with the Wi-Fi Display specification can be incorporated into an action frame specified in the IEEE802.11 specification, and then be transmitted.

may include at least information about the existence or non-existence of compatibility with content protection compliant with the Wi-Fi Display specification. With this arrangement, capability information that includes at least information about the existence or non-existence of compatibility with content protection compliant with the Wi-Fi Display specification can be transmitted.

[0020]

~~A second aspect of the present technique is~~ Embodiments of the present invention provide a wireless communication device, a communication method for the wireless communication device, and a program for causing a computer to implement the method. ~~The wireless communication device includes: a communication unit that performs an inter-device wireless communication with another device discovered through a connection discovery process; and a control unit that operates a first application designated in the connection discovery process based on the timing of establishment of a connection of the inter-device wireless communication, wherein, when a second application is executed while the first application is being operated, the communication unit incorporates information about the second application into an action frame specified in the IEEE802.11 specification, and transmits the action frame.~~

According to a second aspect of the present invention, there is provided a wireless communication device comprising: a communication unit configured to perform an inter-device wireless communication with another device discovered through a connection discovery process; and a control unit configured to operate a first application designated in the connection discovery process based on timing of establishment of a connection of the inter-device wireless communication, wherein, when a second application is executed while the first application is being operated, the communication unit incorporates information about the second application into an action frame specified in the IEEE802.11 specification, and transmits the action frame.

With ~~this structure~~ the above aspect, an inter-device wireless communication can be performed with another device

discovered through a connection discovery process, a first application designated in the connection discovery process can be operated based on the timing of establishment of a connection of the inter-device wireless communication, and information about a second

incorporated into an action frame specified in the IEEE802.11 specification, and then be transmitted.

[0025]

In this second aspect, the first application may be DLNA (Digital Living Network Alliance). With this arrangement, DLNA designated in a connection discovery process can be operated.

[0026]

In this second aspect, the communication unit may transmit a FIN packet (finish packet) in TCP (Transmission Control Protocol) based on the timing of the start of operation of the second application. With this arrangement, a FIN packet in TCP can be transmitted based on the timing of a start of operation of the second application.

[0027]

~~A third aspect of the present technique is~~ Embodiments of the present invention provide a wireless communication device, a communication method for the wireless communication device, and a program for causing a computer to implement the method. ~~The wireless communication device performs an inter-device wireless communication with another wireless communication device in accordance with the Wi-Fi (Wireless Fidelity) Direct specification, and includes: a transmitting unit that incorporates information about the role of the wireless communication device into an action frame specified in the IEEE (Institute of Electrical and Electronic Engineers) 802.11 specification, and transmits the action frame; a display unit that displays image data; and a protocol switching unit that switches the protocol using the inter-device wireless communication.~~

According to a third aspect of the present invention, there is provided a wireless communication device performing an inter-device wireless communication with another wireless communication device in accordance with the Wi-Fi (Wireless Fidelity) Direct specification, the wireless communication device comprising: a transmitting unit configured to incorporate information about a role of the wireless communication device into an action frame specified in the IEEE (Institute of Electrical and Electronic Engineers) 802.11 specification, and transmit the action frame; a display unit configured to display image data; and a protocol switching unit configured to switch a protocol using the inter-device wireless communication.

With ~~this~~

~~structure~~the above aspect, an inter-device wireless communication can be performed with another wireless communication device in accordance with the Wi-Fi Direct specification, information about the role of the wireless communication device can be incorporated into an action frame specified in the IEEE802.11 specification and then be transmitted, image data can be displayed, and the protocol using the inter-device wireless communication can be switched.

[0028]

In this third aspect, the wireless communication device may further include an operation accepting unit that accepts a user operation, and the transmitting unit transmits the information about the role of the wireless communication device based on the timing of acceptance of a user operation for starting a communication of image data, the user operation having been accepted by the operation accepting unit. With this arrangement, information about the role of the wireless communication device can be transmitted based on the timing of acceptance of a user operation (a user operation for starting a communication of image data) accepted by the operation accepting unit.

[0029]

In this third aspect, the transmitting unit may transmit image data displayed on the display unit, by using the protocol switched by the protocol switching unit. With this arrangement, image data displayed on the display unit can be transmitted by using the protocol switched by the protocol switching unit.

[0030]

~~A fourth aspect of the present technique is~~ Embodiments of the present invention provide an

information processing device, an information processing method for the information processing device, and a program for causing a computer to implement the program. ~~The information processing device includes: a processor; and a memory storing a program to be executed by the processor. The program causes the processor to carry out: a first procedure to perform an inter-device wireless communication with another device in accordance with the Wi-Fi Direct specification; and a second procedure to incorporate information about the role of the wireless communication device using the information processing device into an action frame specified in the IEEE802.11 specification, and transmit the action frame.~~

According to a fourth aspect of the present invention, there is provided an information processing device comprising:

a processor; and a memory storing a program to be executed by the processor, wherein the program causes the processor to carry out: a first procedure to perform an inter-device wireless communication with another device in accordance with the Wi-Fi Direct specification; and a second procedure to incorporate information about a role of a wireless communication device using the information processing device into an action frame specified in the IEEE802.11 specification, and transmit the action frame.

With ~~this structure~~ the above aspect, an inter-device wireless communication can be performed with another device in accordance with the Wi-Fi Direct specification, and information about the role of the wireless communication device using the information processing device can be incorporated into an action frame specified in the IEEE802.11 specification, and then be transmitted.

[0031]

In this fourth aspect, the program may further cause the processor to carry out a signal processing procedure to process image data. With this arrangement, signal processing can be performed to process image data.

[0032]

In this fourth aspect, the program may further cause the processor to carry out a procedure to adjust power consumption in accordance with operation of the processor. With this arrangement, power consumption can be adjusted in accordance with operation of the processor.

EFFECTS OF THE INVENTION

[0033]

~~The present technique~~ Embodiments of the present invention can provide a great effect to allow users to readily use desired applications.

BRIEF DESCRIPTION OF DRAWINGS

[0034]

Fig. 1 is a diagram showing an example structure of a communication system 10 in a first embodiment of the present technique.

Fig. 2 is a block diagram showing an example functional structure of a first wireless communication device 100 in the first embodiment of the present technique.

Fig. 3 is a diagram schematically showing an example structure of a peer list 180 stored in the memory 150 in the first embodiment of the present technique.

Fig. 4 is a diagram showing an example display screen (a connection detail select screen 190) displayed on the display unit 170 of the first wireless communication device 100 in the first embodiment of the present technique.

Fig. 5 is a sequence chart showing an example communication process to be performed by each device on which the present technique is based.

Fig. 6 is a sequence chart showing an example communication process to be performed by each device on which the present technique is based.

Fig. 7 is a diagram schematically showing an example structure of the format of a frame to be