

A SYSTEM, APPARATUS AND METHOD FOR WIRELESS FILE TRANSFER

FIELD OF INVENTION

- 5 The present invention relates to the field of digital data transfer over short ranges.

BACKGROUND

Advances in wireless communications technologies have led to faster rates of wireless
10 data transfer and lower incidences of interrupted wireless communications. However, it
is evident that there have been more advances especially in relation to data transfer
rates in the field of long range wireless communications (for example, 4G
telecommunication networks, WiMax networks and so forth) compared to short range
wireless communications (for example, Wi-Fi, Bluetooth, NFC and so forth).

15 In this regard, since only devices which include 4G or WiMax chipsets are able to
communicate using 4G or WiMax networks respectively, this excludes a huge number
of devices which form a substantial majority of existing devices currently in use by the
public at large. As such, the substantial majority of existing devices are only able to
20 communicate wirelessly using either older wireless telecommunications networks or
short range wireless communications.

It should also be noted that the volume of digital data being generated and
subsequently transmitted is increasing. Reasons for the increase include, for example,
25 ease in taking digital photographs (most mobile phones include a camera module),
ease in creating videos (most mobile phones include a video camera module),
increases in the resolution of pictures taken by digital cameras (thus bigger files are
generated), increases in a sharing culture on digital platforms and so forth.

30 In addition, the existing devices currently in use by the public at large only have one
wireless channel for short range communication. For instance, a mobile phone only has
a Bluetooth (RTM) or Wi-Fi connection (not both simultaneously) for data transfer, a
non-wireless enabled digital camera operationally connected with a Flu-card memory

card by Trek 2000 International Ltd only has a Wi-Fi connection, all only have a single wireless channel for communications.

Based on the situation as described in the preceding paragraphs, it would be desirable if a rate of wireless communications for the substantial majority of existing devices could be improved without having to modify the existing devices in any physical manner such that the substantial majority of existing devices are not obsolete in an environment where the high speed transfer of high volumes of digital data is the norm.

10 SUMMARY

In a first aspect, there is provided a system for wireless file transfer between a host device and at least one secondary device using one of three wireless protocols. The three wireless protocols are: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols. Preferably, the first wireless communication protocols is selected from, for example, Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol is TransferJet (RTM).

20 The system includes a host device configured to use the first wireless communication protocol for wireless communications, the host device including a switching means for selecting one of three modes of file transfer. A first mode involves file transfer using only the first wireless communication protocol, a second mode involves file transfer using only the second wireless protocol and a third mode involves file transfer using both the first wireless protocol and the second wireless protocol concurrently. The switching means is either a toggle apparatus or a first digital switch, and the switching means is controlled by the host device. Preferably, when the switching means is a digital switch, the selected mode is one with a highest data transmission rate of the three modes during wireless communications, the highest data transmission rate being ascertained over a pre-determined period.

The system also includes a memory card configured to be operationally connected to the host device and configured to use the second wireless communication protocol for wireless communications, and at least one secondary device being able to

communicate with the host device using both the first and the second wireless communication protocols.

5 The host device and the at least one secondary device may be, for example, a portable storage device, a tablet computer, a notebook computer, a mobile phone, a digital camera and so forth.

10 It is advantageous that when the file transfer is carried out using the third mode, multiple files are transferred in accordance with file size and a single file greater than a pre-determined size is transferred in accordance with fragment size of fragments from a broken up single file. During the file transfer, it is preferable that files of smallest file size are transferred using the first wireless communication protocol in an ascending order and files of biggest file size are transferred using the second wireless communication protocol in a descending order. Similarly, it is preferable that fragments
15 of smallest size are transferred using the first wireless communication protocol in an ascending order and fragments of biggest size are transferred using the second wireless communication protocol in a descending order. It is preferable that file transfer is carried out using the second wireless communication protocol if a single file of less than the pre-determined size is to be transferred.

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The memory card preferably includes a microcontroller and a second digital switch, the second digital switch being controlled by the host device to toggle wireless communications from the memory card, and a state of the second digital switch depends on a state of the switching means.

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In a second aspect, there is provided a method for wireless file transmission from a host device to at least one secondary device using one of three wireless protocols. The three wireless protocols are: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols. Preferably,
30 the first wireless communication protocol is selected from, for example, Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol is TransferJet (RTM).

The method includes determining if the host device is able to communicate with the at least one secondary device using both the first and the second wireless communication protocols; selecting both the first and the second wireless communication protocols for file transmission; determining a number of files to be transferred; and transmitting
5 either multiple files in accordance with file size or a single file more than a pre-determined size broken up into at least two fragments in accordance with fragment size.

It is preferable that files of smallest file size are transmitted using the first wireless communication protocol in an ascending order and files of biggest file size are
10 transmitted using the second wireless communication protocol in a descending order. Similarly, it is preferable that fragments of smallest size are transmitted using the first wireless communication protocol in an ascending order and fragments of biggest size are transmitted using the second wireless communication protocol in a descending order.

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In the method, the host device and the at least one secondary device may be, for example, a portable storage device, a tablet computer, a notebook computer, a mobile phone, a digital camera and so forth.

20 In a third aspect, there is provided a method for wireless file reception to at least one secondary device from a host device using one of three wireless protocols. The three wireless protocols are: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols. It is preferable that the first wireless communication protocol is selected from, for example,
25 Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol is TransferJet (RTM).

The method includes determining if the host device is able to communicate with the at least one secondary device using both the first and the second wireless communication
30 protocols; selecting both the first and the second wireless communication protocols for file reception; and receiving either multiple files in accordance with file size or at least two fragments from a broken up single file more than a pre-determined size in accordance with fragment size.

Preferably, files of smallest file size are received using the first wireless communication protocol in an ascending order and files of biggest file size are received using the second wireless communication protocol in a descending order. Similarly, it is preferable that fragments of smallest size are received using the first wireless communication protocol in an ascending order and fragments of biggest size are received using the second wireless communication protocol in a descending order.

In the method, the host device and the at least one secondary device may be, for example, a portable storage device, a tablet computer, a notebook computer, a mobile phone, a digital camera and so forth.

In a final aspect, there is provided an apparatus for storing a plurality of digital files, the apparatus using a first wireless communication protocol for wireless communications and being configured to be operationally connected to a memory card using a second wireless communication protocol for wireless communications. The apparatus preferably includes a switching means for selecting one of three modes of file transfer, a first mode involving file transfer using only the first wireless communication protocol, a second mode involving file transfer using only the second wireless communication protocol and a third mode involving file transfer using both the first wireless communication protocol and the second wireless communication protocol concurrently. Preferably, the first wireless communication protocols is selected from, for example, Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol is TransferJet (RTM).

The apparatus can be, for example, a portable storage device, a tablet computer, a notebook computer, a mobile phone, a digital camera and the like.

It is preferable that the switching means is either a toggle apparatus or a digital switch. When the switching means is a digital switch, the selected mode is one with a highest data transmission rate of the three protocols during wireless communications, the highest data transmission rate being ascertained over a pre-determined period.

In the apparatus, when the file transfer is carried out using the third mode, multiple files are transferred in accordance with file size and a single file greater than a pre-

determined size is transferred in accordance with fragment size of fragments from a broken up single file. Preferably, files of smallest file size are transferred using the first wireless communication protocol in an ascending order and files of biggest file size are transferred using the second wireless communication protocol in a descending order.

5 Similarly, it is preferable that fragments of smallest size are transferred using the first wireless communication protocol in an ascending order and fragments of biggest size are transferred using the second wireless communication protocol in a descending order. It is preferable that file transfer is carried out using the second wireless communication protocol if a single file of less than the pre-determined size is to be

10 transferred.

DESCRIPTION OF FIGURES

In order that the present invention may be fully understood and readily put into practical

15 effect, there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative figures.

Figure 1 shows a schematic view of a system of the present invention.

20 Figure 2 shows a process flow of a method of data transmission of the present invention.

Figure 3 shows a process flow of a method of data reception of the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

25 The present invention relates to a system, method and apparatus for wireless file transfer. Some advantages of the invention, which will be evident from the disclosure of the subsequent paragraphs, include providing a highest rate of data transfer between devices due to the availability of multiple data channels for data transfer.

30 Referring to Figure 1, there is provided a system 20 for wireless file transfer between a host device 22 and at least one secondary device 24, 26. The host device 22 and the at least one secondary device 24, 26 can each be, for example, a portable storage device, a tablet computer, a notebook computer, a mobile phone, a digital camera and

the like. The host device 22 and the at least one secondary device 24, 26 may be identical devices.

In the system 20, the wireless file transfer uses one of three wireless protocols, the three wireless protocols selected from a first wireless communication protocol 28, a second wireless communication protocol 30 and a combination 28, 30 of the aforementioned protocols. The first wireless communication protocol 28 is selected from, for example, Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol 30 is a wireless communication protocol known as TransferJet (RTM) with parameters such as, a short range of less than 5 cm (close-to physical contact), a need for direct line of sight to enable data transfer, transfer rate of 375 Mbps, and centre frequency of 4.48 GHz on bandwidth 560 Mhz. It is appreciated that there may be instances when either the first wireless communication protocol 28 or the second wireless communication protocol 30 is unavailable due to circumstances such as, for example, signal interference, line of sight obstruction, equipment failure, bandwidth overload, failure in pairing devices and so forth.

The system 20 includes the host device 22 which is configured to use the first wireless communication protocol 28 for wireless communications. The host device 22 includes a wireless communications module 32 which employs the first wireless communication protocol 28 for wireless communications. A memory card 36 is configured to be operationally connected to the host device 22. The memory card 36 is configured to use the second wireless communication protocol 30 for wireless communications independently when the memory card 36 is supplied with power. Independent wireless communications for the memory card 36 using the second wireless communication protocol 30 is controlled by a microcontroller 35 of the memory card 36. The microcontroller 35 of the memory card 36 also enables the host device 22 to use the second wireless communication protocol 30 for wireless communications. This will be described further in subsequent paragraphs. The memory card 36 can be in a form factor of, for example, SD card, mini-SD card, micro-SD card and so forth. The memory card 36 also includes a storage module 33 and a wireless communications component 31 which employs the second wireless communication protocol 30 for wireless communications.

The microcontroller 35 of the memory card 36 includes a digital switch 37. The digital switch 37 is controlled by a controller 40 of the host device 22 and allows the controller 40 to either access content from the storage module 33 (digital switch 37 selects a memory interface) or use the wireless communications component 31 (digital switch 37 selects a wireless communications interface). When the controller 40 of the host device 22 is able to access content from the storage module 33, the content from the storage module 33 can be read and/or wirelessly transmitted using the first wireless communication protocol 28. In such an instance, the memory card 36 is also able to transmit content from the storage module 33 independently using the second wireless communication protocol 30 via the wireless communications component 31. However, it preferable that the content in the storage module 33 is "read-only" in such an instance to avoid file allocation table (FAT) corruption when the host device 22 and the microcontroller 35 are accessing the storage module 33 simultaneously.

The host device 22 also includes a switching means 34 for selecting a wireless communication protocol amongst the three protocols. The switching means 34 is only usable when the digital switch 37 of the memory card 36 selects use of the wireless communications component 31 as otherwise, the second wireless communication protocol 30 is unavailable. The switching means 34 is either a toggling device or a second digital switch. The switching means 34 can be controlled by the controller 40. The toggling device may be for manually selecting one of three modes of file transfer – a first mode involves file transfer using only the first wireless communication protocol 28, a second mode involves file transfer using only the second wireless protocol 30 and a third mode involves file transfer using both the first wireless communication protocol 28 and the second wireless communication protocol 30 concurrently.

When the switching means 34 is the second digital switch, the second digital switch may be configured to select the mode with a highest data transmission rate of the three modes during wireless communications, the highest data transmission rate being ascertained over a pre-determined period. The controller 40 is able to control both the second digital switch and the digital switch 37 of the memory card 36. The controller 40 can be coupled to an input interface 41 to allow a user to provide instructions to the controller 40. The input interface 41 can be, for example, a touch screen enabled LCD display screen, a display screen with a keyboard, a display screen with a mouse, a

series of toggle switches, or any combination of the aforementioned. The second digital switch can be coupled to a motion sensor such that deliberate motion (typically jerky movements) of the host device 22 is able to cause a mode to be changed to another mode.

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It should be appreciated that when the switching means 34 selects a particular mode, the controller 40 consequently controls the first digital switch 37 to be at a pre-determined state of that particular mode. When the switching means 34 selects the first mode of file transfer using only the first wireless communication protocol 28, the first digital switch 37 is consequently controlled by a controller 40 of the host device 22 and allows the controller 40 to access content from the storage module 33 (digital switch 37 selects a memory interface). When the switching means 34 selects the second mode of file transfer using only the second wireless protocol 30, the first digital switch 37 is consequently controlled by a controller 40 of the host device 22 and allows the controller 40 to use the wireless communications component 31 (digital switch 37 selects a wireless communications interface). Finally, when the switching means 34 selects the third mode of file transfer using both the first wireless communication protocol 28 and the second wireless communication protocol 30 concurrently, the first digital switch 37 is consequently controlled by a controller 40 of the host device 22 and allows the controller 40 to access content from the storage module 33 (digital switch 37 selects a memory interface).

The determination of the data transmission rate can be carried out by "pinging" the at least one secondary device 24, 26 and getting a response from the at least one secondary device 24, 26. If there is no response from the at least one secondary device 24, 26 for a particular communication protocol, it can be determined by the controller 40 of the host device 22 that the particular communication protocol is not available. The pre-determined period is, for example, thirty seconds, forty-five seconds or any time period less than one minute.

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The host device 22 can also include a memory module 42, whereby a file(s) being transferred in the various modes of the host device 22 is stored in the memory module 42, the memory card 36 or both.

The system 20 also includes at least one secondary device 24, 26. Each secondary device 24, 26 is able to communicate with the host device 22 using both the first 28 and the second 30 wireless communication protocols. In Figure 1, the at least one secondary device 24, 26 is shown to be identical to the host device 22. However, the at least one secondary device 24, 26 can differ from the host device 22.

In the system 20, when the second wireless communication protocol 30 is not available between the host device 22 and the at least one secondary device 24, 26, file transfer from the host device 22 is carried out using the first mode. Similarly, when the first wireless communication protocol 28 is not available between the host device 22 and the at least one secondary device 24, 26, file transfer from the host device 22 is carried out using the second mode.

When multiple file transfer is carried out using the third mode, the multiple files are transferred in accordance with file size. Files of smallest file size are transferred using the first wireless communication protocol 28 in an ascending order of file size and files of biggest file size are transferred using the second wireless communication protocol 30 in a descending order of file size. File transfer is carried out using the second wireless communication protocol 30 when a single file less than a pre-determined size of for example, 10MB remaining from amongst multiple files are transferred.

It is also possible for a large single file (for example, more than 10MB) to be broken up into at least two fragments prior to transmission at the host device 22 and re-combined at the secondary device 24, 26. Assuming that the large single file is broken up into two fragments of different byte sizes, the smaller fragment would be transmitted using the first wireless communication protocol 28 while the bigger fragment would be simultaneously transmitted using the second wireless communication protocol 30. The breaking up of the large single file is carried out by the controller 40 of the host device 22 in a manner which ensures that the time used for transmitting the smaller and bigger fragments are completed in a similar time duration.

In the system 20, when file transfer is carried out using the third mode, it should be appreciated that the file(s) is transferred in a shorter amount of time compared to if only either of the first 28 or the second 30 wireless communication protocols is utilized.

Referring to Figure 2, there is shown a process flow for a method for wireless file transmission 60 from the host device 22 to at least one secondary device 24, 26 using one of three wireless protocols, the three wireless protocols being the first wireless communication protocol 28, the second wireless communication protocol 30 and a combination of the aforementioned protocols. It should be appreciated that the method 60 is run by the controller 40 of the host device 22. The first wireless communication protocol 28 is selected from, for example, Wi-Fi, Bluetooth (RTM), infra-red and the like. The second wireless communication protocol 30 is a wireless communication protocol known as TransferJet (RTM) with parameters such as, a short range of less than 5 cm (close-to physical contact), a need for direct line of sight to enable data transfer, transfer rate of 375 Mbps, and centre frequency of 4.48 GHz on bandwidth 560 Mhz. It is appreciated that there may be instances when either the first wireless communication protocol 28 or the second wireless communication protocol 30 is unavailable due to circumstances such as, for example, signal interference, line of sight obstruction, equipment failure, bandwidth overload, failure in pairing devices and so forth.

The method 60 includes determining if the host device 22 is able to communicate with the at least one secondary device 24, 26 using both the first 28 and the second 30 wireless communication protocols (62). The determination of an availability of a wireless communication protocol can be by "pinging" the at least one secondary device 24, 26 and getting a response from the at least one secondary device 24, 26. If there is no response from the at least one secondary device 24, 26 for a communication protocol, it can be determined by the controller 40 of the host device 22 that the particular communication protocol is not available. If only one communication protocol is available, then wireless file transfer is carried out using the available wireless communication protocol (64). If both the first 28 and the second 30 wireless communication protocols are available, then both the first 28 and the second 30 wireless communication protocols are used concurrently (66) for file transmission from the host device 22.

In the method 60, the files being transmitted are stored in the memory module 42, the memory card 36 or both. If only a single file is being transmitted (67), the controller 40

determines if the single file is larger than a pre-determined size such as, for example, 10MB (69). If the file is less than the pre-determined size, the file is transmitted using the second wireless protocol 30. If the file is greater than the pre-determined size, the controller 40 breaks up the single file into at least two fragments of different byte sizes (73). The smaller fragments are transmitted using the first wireless communication protocol 28 in ascending order of fragment size (75) while the larger fragments are transmitted using the second wireless communication protocol 30 in descending order of fragment size (77).

If multiple files are being transmitted, the controller 40 then determines individual file sizes of the files which are being transferred (68). Files of smallest file size are transmitted using the first wireless communication protocol 28 in an ascending order of file size (70) and files of biggest file size are transmitted using the second wireless communication protocol 30 in a descending order of file size (72).

In the method 60, when file transmission is carried out using both the first 28 and the second 30 wireless communication protocols, it should be appreciated that the file(s) is transmitted in a shorter amount of time compared to if only either of the first 28 or the second 30 wireless communication protocols is utilized.

Referring to Figure 3, there is shown a process flow for a method for wireless file reception 80 to at least one secondary device 24, 26 from a host device 22 using one of three wireless protocols, the three wireless protocols being the first wireless communication protocol 28, the second wireless communication protocol 30 and a combination of the aforementioned protocols. It should be appreciated that the method 80 is run by a controller of the at least one secondary device 24, 26. The first wireless communication protocol 28 is selected from, for example, Wi-Fi, Bluetooth (RTM), infrared and the like. The second wireless communication protocol 30 is a wireless communication protocol known as TransferJet (RTM) with parameters such as, a short range of less than 5 cm (close-to physical contact), a need for direct line of sight to enable data transfer, transfer rate of 375 Mbps, and centre frequency of 4.48 GHz on bandwidth 560 Mhz. It is appreciated that there may be instances when either the first wireless communication protocol 28 or the second wireless communication protocol 30 is unavailable due to circumstances such as, for example, signal interference, line of

sight obstruction, equipment failure, bandwidth overload, failure in pairing devices, and so forth.

5 The method 80 includes determining if the host device 22 is able to communicate with the at least one secondary device 24, 26 using both the first 28 and the second 30 wireless communication protocols (82). If only one communication protocol is available, then wireless file reception is carried out using the available wireless communication protocol (84). If both the first 28 and the second 30 wireless communication protocols are available, then both the first 28 and the second 30 wireless communication
10 protocols are used concurrently (86) for file reception.

Files or file fragments of smallest size are received using the first wireless communication protocol 28 in an ascending order of file size (90) and files or file fragments of biggest size are received using the second wireless communication
15 protocol 30 in a descending order of file size (92).

In the method 80, when the file reception is carried out using both the first 28 and the second 30 wireless communication protocols, it should be appreciated that the file(s) is received in a shorter amount of time compared to if only either of the first 28 or the
20 second 30 wireless communication protocols is utilized.

Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations or modifications in details of design or construction may be made
25 without departing from the present invention.

CLAIMS

1. A system for wireless file transfer between a host device and at least one secondary device using one of three wireless protocols, the three wireless protocols selected from a group comprising: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols, the system including:
- 5 a host device configured to use the first wireless communication protocol for wireless communications, the host device including a switching means for selecting one of three modes of file transfer;
- 10 a memory card configured to be operationally connected to the host device and configured to use the second wireless communication protocol for wireless communications; and
- at least one secondary device being able to communicate with the host device using both the first and the second wireless communication protocols,
- 15 wherein a first mode involves file transfer using only the first wireless communication protocol, a second mode involves file transfer using only the second wireless protocol and a third mode involves file transfer using both the first wireless protocol and the second wireless protocol concurrently.
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2. The system of claim 1, wherein the host device and the at least one secondary device are an apparatus selected from a group comprising: a portable storage device, a tablet computer, a notebook computer, a mobile phone and a digital camera.
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3. The system of either claim 1 or 2, wherein the switching means is either a toggle apparatus or a first digital switch, the switching means being controlled by the host device.
4. The system of claim 3, wherein when the switching means is a digital switch, the selected mode is one with a highest data transmission rate of the three modes during wireless communications, the highest data transmission rate being ascertained over a pre-determined period.
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5. The system of any one of claims 1 to 4, wherein when the file transfer is carried out using the third mode, multiple files are transferred in accordance with file size and a single file greater than a pre-determined size is transferred in accordance with fragment size of fragments from a broken up single file.

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6. The system of claim 5, wherein files of smallest file size are transferred using the first wireless communication protocol in an ascending order of size and files of biggest file size are transferred using the second wireless communication protocol in a descending order of size.

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7. The system of claim 5, wherein fragments of smallest size are transferred using the first wireless communication protocol in an ascending order of size and fragments of biggest size are transferred using the second wireless communication protocol in a descending order of size.

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8. The system of any one of claims 5 to 7, wherein file transfer is carried out using the second wireless communication protocol if a single file of less than the pre-determined size is to be transferred.

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9. The system of any one of claims 1 to 8, wherein the first wireless communication protocols is selected from a group comprising: Wi-Fi, Bluetooth (RTM) and infra-red.

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10. The system of any one of claims 1 to 9, wherein the second wireless communication protocol is TransferJet (RTM).

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11. The system of claim 3, wherein the memory card includes a microcontroller and a second digital switch, the second digital switch being controlled by the host device to toggle wireless communications from the memory card.

12. The system of claim 11, wherein a state of the second digital switch depends on a state of the switching means.

13. A method for wireless file transmission from a host device to at least one secondary device using one of three wireless protocols, the three wireless protocols selected from a group comprising: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols, the method including:
- 5 determining if the host device is able to communicate with the at least one secondary device using both the first and the second wireless communication protocols; selecting both the first and the second wireless communication protocols for file transmission;
- 10 determining a number of files to be transferred; and transmitting either multiple files in accordance with a file size or a single file more than a pre-determined size broken up into at least two fragments in accordance with a fragment size.
- 15 14. The method of claim 13, wherein files of smallest file size are transmitted using the first wireless communication protocol in an ascending order of size and files of biggest file size are transmitted using the second wireless communication protocol in a descending order of size.
- 20 15. The method of claim 13, wherein fragments of smallest size are transmitted using the first wireless communication protocol in an ascending order of size and fragments of biggest size are transmitted using the second wireless communication protocol in a descending order of size.
- 25 16. The method of any one of claims 13 to 15, wherein the first wireless communication protocols is selected from a group comprising: Wi-Fi, Bluetooth (RTM) and infra-red.
- 30 17. The method of any one of claims 13 to 16, wherein the second wireless communication protocol is TransferJet (RTM).
18. The method of any one of claims 13 to 17, wherein the host device and the at least one secondary device are an apparatus selected from a group comprising: a

portable storage device, a tablet computer, a notebook computer, a mobile phone and a digital camera.

19. A method for wireless file reception to at least one secondary device from a
5 host device using one of three wireless protocols, the three wireless protocols selected from a group comprising: a first wireless communication protocol, a second wireless communication protocol and a combination of the aforementioned protocols, the method including:

10 determining if the host device is able to communicate with the at least one secondary device using both the first and the second wireless communication protocols;
selecting both the first and the second wireless communication protocols for file reception; and

15 receiving either multiple files in accordance with file size or at least two fragments from a broken up single file more than a pre-determined size in accordance with fragment size.

20. The method of claim 19, wherein files of smallest file size are received using the first wireless communication protocol in an ascending order of size and files of biggest file size are received using the second wireless communication protocol in a
20 descending order of size.

21. The method of claim 19, wherein fragments of smallest size are received using the first wireless communication protocol in an ascending order of size and fragments of biggest size are received using the second wireless communication protocol in a
25 descending order of size.

22. The method of any one of claims 19 to 21, wherein the first wireless communication protocols is selected from a group comprising: Wi-Fi, Bluetooth (RTM) and infra-red.
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23. The method of any one of claims 19 to 22, wherein the second wireless communication protocol is TransferJet (RTM).

24. The method of any one of claims 19 to 23, wherein the host device and the at least one secondary device are an apparatus selected from a group comprising: a portable storage device, a tablet computer, a notebook computer, a mobile phone and a digital camera.

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25. An apparatus for storing a plurality of digital files, the apparatus using a first wireless communication protocol for wireless communications and being configured to be operationally connected to a memory card, the memory card using a second wireless communication protocol for wireless communications, the apparatus including
10 a switching means for selecting one of three modes of file transfer, wherein a first mode involves file transfer using only the first wireless communication protocol, a second mode involves file transfer using only the second wireless communication protocol and a third mode involves file transfer using both the first wireless communication protocol and the second wireless communication protocol concurrently.

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26. The apparatus of claim 25 being selected from a group comprising: a portable storage device, a tablet computer, a notebook computer, a mobile phone and a digital camera.

20 27. The apparatus of either claim 25 or 26, wherein the switching means is either a toggle apparatus or a digital switch.

28. The apparatus of claim 27, wherein when the switching means is a digital switch, the selected mode is one with a highest data transmission rate of the three
25 protocols during wireless communications, the highest data transmission rate being ascertained over a pre-determined period.

29. The apparatus of any one of claims 25 to 28, wherein when the file transfer is carried out using the third mode, multiple files are transferred in accordance with file
30 size and a single file greater than a pre-determined size is transferred in accordance with fragment size of fragments from a broken up single file.

30. The apparatus of claim 29, wherein files of smallest file size are transferred using the first wireless communication protocol in an ascending order of size and files

of biggest file size are transferred using the second wireless communication protocol in a descending order of size.

5 31. The apparatus of claim 29, wherein fragments of smallest size are transferred using the first wireless communication protocol in an ascending order of size and fragments of biggest size are transferred using the second wireless communication protocol in a descending order of size.

10 32. The apparatus of any one of claims 29 to 31, wherein file transfer is carried out using the second wireless communication protocol if a single file of less than the pre-determined size is to be transferred.

15 33. The apparatus of any one of claims 25 to 32, wherein the first wireless communication protocols is selected from a group comprising: Wi-Fi, Bluetooth (RTM) and infra-red.

34. The apparatus of any one of claims 25 to 33, wherein the second wireless communication protocol is TransferJet (RTM).