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(54) Title: WIRELESS INTERFACE SHARING

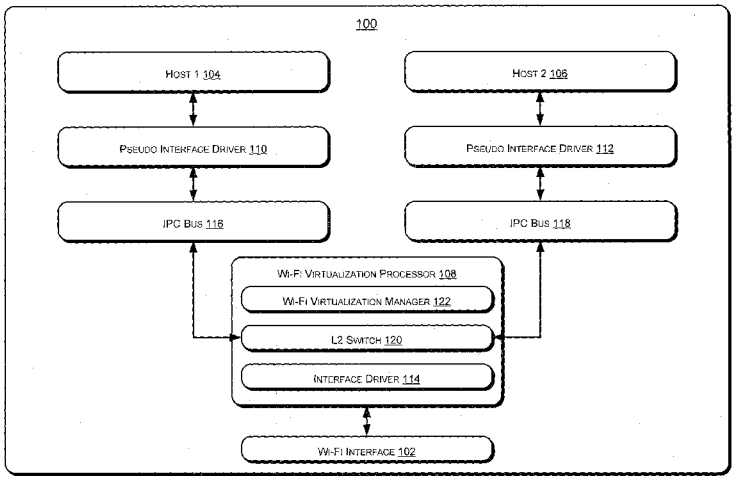

Figure 1

(57) Abstract: Described herein are methods and system for sharing a wireless interface (102) among various multiple host processors in a multi-processor computing system (100) to provide simultaneous access of a wireless network to the host processors. In one implementation the multi-host computing system (100), comprises a wireless interface (102) configured to connect to at least one of a plurality of wireless networks; and a wireless network access virtualization (WNAV) processor (108) communicatively coupled to the wireless interface (102), wherein the WNAV processor (108) is configured to multiplex data packets received from the plurality of hosts, transmit the multiplexed data packets to at least one of the plurality of wireless networks through the wireless interface (102), receive data packets from one of the plurality of wireless network through the wireless interface (102) and route the data packets to each of the plurality of hosts based on a media access control (MAC) address associated with each of the plurality of hosts.

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AMENDED CLAIMS
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1. A multi-host computing system (100), comprising:

a plurality of hosts each associated with a media access control (MAC) address, wherein each of the plurality of hosts comprise a pseudo interface driver;

a wireless interface (102), communicatively coupled to the plurality of hosts of concurrently through respective pseudo interface driver and configured to connect to at least one of a plurality of wireless networks by making at least one association with an access point of the at least one of the plurality of wireless networks; and

a wireless network access virtualization (WNAV) processor (108) communicatively coupled to the wireless interface (102) and the respective pseudo interface driver, wherein the WNAV processor (108) is configured to:

multiplex data packets received from the plurality of hosts through the respective pseudo interface driver;

transmit the multiplexed data packets to the access point of the at least one of the plurality of wireless networks through the wireless interface (102);

receive data packets from the access point of the at least one of the plurality of wireless network through the wireless interface (102); and

route the received data packets to each of the plurality of hosts through the respective pseudo interface driver based on the MAC address associated with the each of the plurality of hosts.

2. The multi-host computing system (100), as claimed in claim 1, wherein the wireless interface (102) is configured to support a plurality of MAC addresses so as to exchange packets between the plurality of hosts and at least one of the plurality of wireless networks.

3. The multi-host computing system (100), as claimed in claim 1, wherein the WNAV processor (108) further comprises a L2 switch (120) configured to parse the received data packets from at least one of the plurality of wireless networks to determine a MAC address, wherein the MAC address is indicative of a host from amongst the plurality of hosts for which the received data packets are destined.

4. The multi-host computing system (100), as claimed in claim 3, wherein the WNAV processor (108) further comprises a Wi-Fi virtualization manager (122) configured to:

AMENDED SHEET (ARTICLE 19)

maintain configuration settings of each of the plurality of hosts with respect to the access point of the at least one of the plurality of wireless networks; and

determine a system configuration setting, based in part on the maintained configuration settings, to connect to the access point through the wireless interface (102).

5. The multi-host computing system (100), as claimed in claim 3, wherein the wireless interface (102) is configured to operate in a promiscuous mode so as to exchange data packets corresponding to the plurality of hosts.
6. The multi-host computing system (100), as claimed in claim 5, wherein the L2 switch (120) is further configured to drop data packets based on MAC addresses associated with the data packets, wherein the MAC addresses are not associated with the plurality of hosts and wherein the wireless interface (102) is in the promiscuous mode.
7. The multi-host computing system (100), as claimed in claim 3, wherein the L2 switch (120) is further configured to forward at least one of multi-cast messages and broadcast messages to each of the plurality of hosts, based in part on a message subscription setting of each of the plurality of hosts.
8. The multi-host computing system (100), as claimed in claim 1, wherein the wireless interface (102) is configured as a dedicated wireless interface (102) with respect to each of the plurality of hosts, so as to enable each of the plurality of hosts to control the wireless interface (102) independently with respect to the other hosts of the plurality of hosts through respective pseudo interface driver.
9. The multi-host computing system (100), as claimed in claim 1, wherein WNAV processor is configured as a multi-root aware device with respect to the each of the plurality of hosts.
10. The multi-host computing system (100), as claimed in claim 1, wherein the system further comprises an inter processor communication bus configured to transfer data between the WNAV processor (108) and at least one of the plurality of hosts.
11. The multi-host computing system (100), as claimed in claim 1, wherein the WNAV processor (108) is configured as at least one of a Peripheral Component Interconnect Express (PCIe) device, Peripheral Component Interconnect (PCI) device, a non PCIe compliant device and a non-PCI compliant device with respect to at least one of the plurality of hosts.

12. The multi-host computing system (100), as claimed in claim 1, wherein the WNAV processor (108) is further configured to:

receive data packets from a first host from amongst the plurality of hosts;

parse the received data packets to determine a destination MAC address, wherein the destination MAC address is of a second host from amongst the plurality of hosts; and

forward the received data packets to the second host over an inter processor communication bus, based in part on the determined destination MAC address.

13. A method for sharing a wireless interface (102) amongst a plurality of hosts of a multi-host computing system (100), the method comprising:

configuring the wireless interface (102) by the plurality of hosts, each of the plurality of hosts having a pseudo interface driver to assign a unique media access control (MAC) address to the wireless interface (102) by each of the plurality of hosts;

transmitting a plurality of association requests to an access point of a wireless network to connect the plurality of hosts with the wireless network, based in part on the unique MAC address assigned by each of the plurality of hosts; and

routing received data packets to at least one of the of the plurality of hosts through respective pseudo interface driver, based in part on the unique MAC address assigned by each of the plurality of hosts associated with the received data packets.

14. The method as claimed in claim 13, wherein the method further comprises sending a positive acknowledgement to the access point on receipt of a data packet addressed to at least one of the of the plurality of hosts.

15. The method as claimed in claim 13, wherein the method further comprises:

configuring the wireless interface (102) with plurality of MAC addresses to exchange packets between plurality of hosts and at least one of the plurality of wireless networks;

parsing the received data packets from at least one of the plurality of wireless networks to determine a MAC address, wherein the MAC address is indicative of a host from amongst the plurality of hosts for which the received data packets are destined; and

forwarding the data packets to the destined host.

16. The method as claimed in claim 13, wherein the method further comprises:

configuring the wireless interface (102) to operate in a promiscuous mode so as to exchange packets corresponding to the plurality of hosts;

parsing the received data packets from at least one of the plurality of wireless networks to determine a MAC address, wherein the MAC address is indicative of a host from amongst the plurality of hosts for which the received data packets are destined;

dropping received packets from the wireless network, on determining the received packets not to be addressed to at least one of the of the plurality of hosts, based in part on the MAC address associated with the received data packets; and

forwarding the data packets to the destined host from amongst the plurality of hosts.

17. A method for sharing a wireless interface (102) amongst a plurality of hosts of a multi-host computing system (100), the method comprising::

configuring the wireless interface (102) by one of a host from amongst the plurality of hosts and a wireless network access virtualization (WNAV) processor (108) to assign a unique MAC address to the wireless interface (102), wherein each of the plurality of hosts includes a pseudo interface driver to communicate with the wireless interface (102);

transmitting an association request to an access point of a wireless network with information about the presence of the plurality of hosts connecting each of the plurality of hosts with one of the plurality of the wireless networks through the unique MAC address, wherein the information indicates MAC addresses of each of the plurality of hosts associated with the wireless interface (102); and

routing data packets received at the unique MAC address to at least one of the of the plurality of hosts through respective pseudo interface driver, based in part on the MAC address of each of the plurality of hosts associated with the received data packets.

18. The method as claimed in claim 17, wherein the method further comprises sending a positive acknowledgement to the access point on receipt of a data packet addressed to at least one of the of the plurality of hosts.

19. The method as claimed in claim 17, wherein the method further comprises:

configuring the wireless interface (102) with plurality of MAC addresses to exchange packets between plurality of hosts and at least one of the plurality of wireless networks;

parsing the received data packets from at least one of the plurality of wireless networks to determine a MAC address, wherein the MAC address is indicative of a host from amongst the plurality of hosts for which the received data packets are destined; and

forwarding the data packets to the destined host.

20. The method as claimed in claim 17, wherein the method further comprises:

configuring the wireless interface (102) to operate in a promiscuous mode so as to exchange packets corresponding to the plurality of hosts;

parsing the received data packets from at least one of the plurality of wireless networks to determine a MAC address, wherein the MAC address is indicative of a host from amongst the plurality of hosts for which the received data packets are destined;

dropping received packets from the wireless network, on determining the received packets not to be addressed to at least one of the of the plurality of hosts, based in part on the MAC address associated with the received data packets; and

forwarding the data packets to the destined host from amongst the plurality of hosts.

STATEMENT UNDER ARTICLE 19

In response to the objections raised in the International Searching Report (ISR), the Applicant has amended the original independent claims 1, 13, and 18.

The original independent claims 1, 13, and 18 are amended as independent claims 1, 13 and 18, respectively. The basis of amendments in the amended independent claims is as follows:

1. For amended claim 1:

In amended claim 1, *a plurality of hosts each associated with a media access control (MAC) address, wherein each of the plurality of hosts comprise a pseudo interface driver; a wireless interface (102), communicatively coupled to the plurality of hosts of concurrently through respective pseudo interface driver and configured to connect to at least one of a plurality of wireless networks by making at least one association with an access point of the at least one of the plurality of wireless networks;* ... The amendments to the claim 1 are based on the Fig. 1, the description of Fig. 1 in paragraphs [0033]-[0039], and paragraphs [0030]-[0031] of the as filed specification.

2. For amended claim 13:

In amended claim 13, *configuring the wireless interface (102) by the plurality of hosts, each of the plurality of hosts having a pseudo interface driver to assign* a unique *media access control (MAC) address to the wireless interface (102) by each of the plurality of hosts; transmitting a plurality of association requests to an access point of a wireless network... routing received data packets ... through respective pseudo interface driver.* The amendments to the claim 13 are based on the Fig. 1, the description of Fig. 1

in paragraphs [0033]-[0039], and paragraphs [0030], [0059]-[0066] of the as filed specification.

3. For amended claim 18:

In amended claim 18, *configuring the wireless interface (102) by one of a host from amongst the plurality of hosts and a wireless network access virtualization (WNAV) processor (108) to assign a unique MAC address to the wireless interface (102), wherein each of the plurality of hosts includes a pseudo interface driver to communicate with the wireless interface (102); transmitting an association request to an access point of a wireless network with information about the presence of the plurality of hosts,... routing received data packets... through respective pseudo interface driver,...* The basis of addition is based on the Fig. 1, the description of Fig. 1 in paragraphs [0033]-[0039], and paragraphs [0030], [0031], [0067]-[0074] of the as filed specification.

It can be inferred from the cited paragraphs that each of the plurality of hosts access the wireless interface independently through their respective pseudo interface drivers and the wireless interface makes at least one association with an access point for exchange of data packets.

The Applicant believes that the scope of the amended claims is within the scope of the original claims, and no new subject matter is added in the amended claims. The Applicant also believes that the amended claims involve an inventive step with respect to the cited prior art documents D1 in the ISR.