

CLAIMS

1. A first multi-link device configured to operate with a first plurality of affiliated stations, the first multi-link device comprising:
circuitry, which in operation, initiates setup of a block acknowledgement agreement
5 with a second multi-link device that is configured to operate with a second plurality of affiliated stations, wherein a link has been established between each station of the first plurality of stations and a corresponding station of the second plurality of stations; and
a transmitter, which in operation, transmits frames of a Traffic Identifier (TID) on one or more links to the second multi-link device based on the block acknowledgement
10 agreement, wherein the first plurality of stations are configured to share a common transmit buffer that stores the frames of the TID to be transmitted to the second multi-link device and a common transmit buffer control to manage the transmission of the frames over the one or more links, and wherein each of the first plurality of stations is configured to maintain a per-link transmit buffer control to manage the transmission of
15 the frames on a corresponding one of the one or more links.

2. The first multi-link device according to claim 1, wherein each of the first plurality of stations is configured to maintain a separate per-link transmit buffer to store the frames to be transmitted on the corresponding one of the one or more links.

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3. The first multi-link device according to claim 2, wherein the circuitry is configured to store the frames in the common transmit buffer until they are acknowledged by the second multi-link device as successfully received or until they are discarded at the end of a MAC Service Data Unit (MSDU) lifetime, the first plurality

of stations storing frames in the per-link transmit buffer only for the duration of a transmit opportunity (TXOP).

4. The first multi-link device according to claim 1, wherein the common transmit
5 buffer control is used to prevent overflow of a receive reordering buffer that is maintained by the second multi-link device due to a transmission of frames over the one or more links; the per-link transmit buffer control being used to prevent overflow of a block acknowledgment record maintained by each of the second plurality of stations due to transmission of the frames over the one of the one or more links.

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5. The first multi-link device according to claim 1, wherein the circuitry is configured to negotiate the block acknowledgement agreement with the second multi-link device by exchanging ADDBA action frames over the one of the one or more links, wherein a size of a block acknowledgment record maintained by each station of the
15 second plurality of stations is independently negotiated.

6. The first multi-link device according to claim 4, wherein a size of the receive reordering buffer that is managed by the second multi-link device is negotiated independently.

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7. The first multi-link device according to claim 1, wherein the circuitry is configured to transmit a BlockAckReq frame to the second multi-link device on the one of the one or more links to solicit a BlockAck frame, wherein the BlockAckReq frame is configured to indicate whether or not a starting point of a block acknowledgment

record maintained by one of the second plurality of stations should be replaced with a value of a Starting Sequence Number (SSN) carried in the BlockAckReq frame.

8. A method for multi-link communication, comprising:

- 5 initiating setup, at a first multi-link device, of a block acknowledgement agreement with a second multi-link device that is configured to operate with a second plurality of stations, the first multi-link device being configured to operate with a first plurality of stations, wherein a link has been established between each station of the first plurality of stations and a corresponding station of the second plurality of stations; and
- 10 transmitting frames of a Traffic Identifier (TID) on one or more links to the second multi-link device based on the block acknowledgement agreement, wherein the first plurality of stations are configured to share a common transmit buffer that stores the frames of the TID to be transmitted to the second multi-link device and a common transmit buffer control to manage the transmission of the frames over the
- 15 one or more links, and
- wherein each of the first plurality of stations is configured to maintain a per-link transmit buffer control to manage the transmission of the frames on a corresponding one of the one or more links.

- 20 9. The method according to claim 8, where in each of the first plurality of stations is configured to maintain a separate per-link transmit buffer to store the frames to be transmitted on the corresponding one of the one or more links.

10. The method according to claim 9, further comprising storing the frames in the
- 25 common transmit buffer until they are acknowledged by the second multi-link device

as successfully received or until they are discarded at the end of a MAC Service Data Unit (MSDU) lifetime, the first plurality of stations storing frames in the per-link transmit buffer only for the duration of a transmit opportunity (TXOP).

5 11. The method according to claim 8, wherein the common transmit buffer control is used to prevent overflow of a receive reordering buffer that is maintained by the second multi-link device due to a transmission of frames over the one or more links; the per-link transmit buffer control being used to prevent overflow of a block acknowledgment record maintained by each of the second plurality of stations due to
10 transmission of the frames over the one of the one or more links.

12. The method according to claim 8, further comprising negotiating the block acknowledgement agreement with the second multi-link device by exchanging ADDBA action frames over the one of the one or more links, wherein a size of a block
15 acknowledgment record maintained by each station of the second plurality of stations is independently negotiated.

13. The method according to claim 11, wherein a size of the receive reordering buffer that is managed by the second multi-link device is negotiated independently.
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14. The method according to claim 8, further comprising transmitting a BlockAckReq frame to the second multi-link device on the one of the one or more links to solicit a Block Acknowledgement frame, wherein the BlockAck Request frame is configured to indicate whether or not a starting point of a block acknowledgment record

maintained by one of the second plurality of stations should be replaced with a value of a Starting Sequence Number (SSN) carried in the Block AckReq frame.

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