CLAIMS

1. An originator multi-link device (MLD) comprising:

circuitry, which in operation, establishes a multi-link Block Ack agreement for a plurality of links with a recipient MLD;

a transmitter which, in operation, transmits to the recipient MLD a plurality of MAC layer Protocol Data Units (MPDUs) with a common Traffic Identifier (TID) on one or more links among the plurality of links; and

a receiver which, in operation, receives one or more per-link Block Acks from the recipient MLD, each of the one or more per-link Block Acks indicating reception status of a subset of the plurality of MPDUs, the subset being transmitted on one of the one or more links.

2. The originator MLD according to claim 1, wherein the multi-link Block Ack agreement is established per TID by:

transmitting an Add Block Ack (ADDBA) Request frame on an enabled link; and

receiving an Add Block Ack (ADDBA) Response frame on the enabled link.

3. The originator MLD according to claim 1, wherein the circuitry, in operation, maintains a single common transmit buffer control to feed the plurality of MPDUs for transmission across the one or more links.

4. The originator MLD according to claim 3, wherein the single common transmit buffer control uses WinStart and WinSize for each block acknowledgement agreement, the WinStart indicating a starting sequence number of a common transmit window for the plurality of links, and the WinSize indicating a size of a receive reordering buffer maintained by the recipient MLD.

5. The originator MLD according to claim 4, wherein the circuitry, in operation, releases a common transmit buffer associated with a successfully received MPDU upon receiving the one or more per-link Block Acks containing a reception status of the successfully received MPDU.

6. The originator MLD according to claim 1, wherein the received one or more per-link Block Acks are consolidated to a Multi-link Block Ack scoreboard to determine which of the plurality of MPDUs needs retransmission.

7. The originator MLD according to claim 6, wherein the Multi-link Block Ack scoreboard comprises a bitmap comprising a plurality of bits, each bit indicating whether a corresponding MPDU is successfully received by the recipient MLD.

8. A transmission method by an originator multi-link device (MLD), the transmission method comprising:

establishing a multi-link Block Ack agreement for a plurality of links with a recipient MLD;

transmitting to the recipient MLD a plurality of MAC layer Protocol Data Units (MPDUs) with a common Traffic Identifier (TID) on one or more links among the plurality of links; and

receiving one or more per-link Block Acks from the recipient MLD, each of the one or more per-link Block Acks indicating reception status of a subset of the plurality of MPDUs, the subset being transmitted on one of the one or more links.

9. The transmission method according to claim 8, wherein the multi-link Block Ack agreement is established per TID by:

transmitting an Add Block Ack (ADDBA) Request frame on an enabled link; and

receiving an Add Block Ack (ADDBA) Response frame on the enabled link.

10. The transmission method according to claim 8, comprising:

maintaining a single common transmit buffer control to feed the plurality of MPDUs for transmission across the one or more links.

11. The transmission method according to claim 10, wherein the single common transmit buffer control uses WinStart and WinSize for each Block Ack agreement, the WinStart indicating a starting sequence number of a common transmit window for the plurality of links, and the WinSize indicating a size of a receive reordering buffer maintained by the recipient MLD.

12. The transmission method according to claim 11, comprising:

releasing a common transmit buffer associated with a successfully received MPDU upon receiving the one or more per-link Block Acks containing a reception status of the successfully received MPDU.

13. The transmission method according to claim 8, comprising:

consolidating the received one or more per-link Block Acks to a Multi-link Block Ack scoreboard to determine which of the plurality of MPDUs needs retransmission.

14. The transmission method according to claim 13, wherein the Multi-link Block Ack scoreboard comprises a bitmap comprising a plurality of bits, each bit indicating whether a corresponding MPDU is successfully received by the recipient MLD.