CLAIMS

1. An apparatus for wireless communication, the apparatus comprising:

data generation logic configured to generate data to be transmitted to an access point and to determine that a size of the data exceeds a size of a first transmit opportunity (TX_OP);

data fragmentation logic configured to generate at least a first data fragment and a second data fragment based on the data, wherein a size of the first data fragment is selected based on the size of the first TX_OP; and

a wireless interface configured to transmit, during the first TX_OP, a first data packet to the access point, the first data packet including the first data fragment, wherein the first data packet is sent responsive to a frame received from the access point, and wherein the frame includes timing information corresponding to the size of the first TX_OP.

2. The apparatus of claim **1**, wherein:

the data generation logic is further configured to determine, based on a modulation and coding scheme, a threshold amount of data capable of being transmitted during the first TX_OP; and

the data fragmentation logic is further configured generate the first data fragment to have a size that is less than or equal to the threshold amount of data.

3. The apparatus of claim **1**, wherein the frame comprises a trigger frame, and wherein the wireless interface is further configured to:

receive, from the access point, a second trigger frame that includes second timing information corresponding to a second TX_OP; and transmit a second data packet that includes the second data fragment to the access point during the second TX_OP.

4. The apparatus of claim **1**, wherein the wireless interface is further configured to receive, from the access point, a block acknowledgement frame that includes a first uncompressed block acknowledgement bitmap or a first semicompressed block acknowledgement bitmap.

5. The apparatus of claim **4**, wherein the first uncompressed block acknowledgement bitmap or the first semicompressed block acknowledgement bitmap indicates that at least the first data fragment was received at the access point.

6. The apparatus of claim **4**, wherein the block acknowledgement frame includes the first uncompressed block acknowledgement bitmap, and wherein:

the block acknowledgement frame includes a frame control field, a duration/identification field, a receiver address field, a transmitter address field, a block acknowledgement control field, a block acknowledgement information field, and a frame check sequence field, and

the block acknowledgement control field includes an acknowledgement policy bit, a multi-traffic identifier bit, a bitmap compression bit, a set of reserved bits, and a set of multi-traffic identifier information bits.

7. The apparatus of claim **6**, wherein the block acknowledgement information field includes multiple sets of per station information bits, multiple sets of block acknowledge-

ment starting sequence control bits, and multiple uncompressed block acknowledgement bitmaps including the first uncompressed block acknowledgement bitmap and a second uncompressed block acknowledgement bitmap corresponding to another device.

8. The apparatus of claim **1**, wherein the wireless interface is further configured to transmit, to the access point during a second TX_OP, a second data packet that includes the second data fragment, and wherein the size of the second data fragment is larger than the size of the first data fragment.

9. The apparatus of claim **1**, wherein:

the data generation logic is further configured to generate the data to be transmitted to the access point by generating a first media access control (MAC) layer service data unit, and

the data fragmentation logic is further configured to generate the first data fragment by generating a first fragment of the first MAC layer service data unit and to generate the second data fragment by generating a second fragment of the first MAC layer service data unit.

10. The apparatus of claim **1**, wherein a size of the second data fragment is selected based on a size of a second TX_OP, wherein the size of the first data fragment is different from the size of the second data fragment, and wherein the wireless interface is further configured to transmit, during the second TX_OP, a second data packet to the access point, the second data packet including the second data fragment.

11. The apparatus of claim **10**, wherein the second data packet is sent responsive to a second frame received from the access point, wherein the second frame includes second timing information corresponding to the size of the second

TX_OP, and wherein the size of the second TX_OP is different from the size of the first TX_OP.

12. The apparatus of claim **10**, wherein the second data packet is sent responsive to a second frame received from the access point, and wherein the timing information of the frame indicates the size of the second TX_OP.

13. A method for wireless communication, the method comprising:

generating, at a first device, first data to be transmitted to an access point;

determining that a size of the first data exceeds a size of a first transmit opportunity (TX_OP);

generating at least a first data fragment and a second data fragment based on the first data, wherein a size of the first data fragment is selected based on the size of the first TX_OP; and

transmitting, during the first TX_OP, a first data packet from the first device to the access point, the first data packet including the first data fragment, wherein the first data packet is sent responsive to a frame received from the access point, and wherein the frame includes timing information corresponding to the size of the first TX_OP.

14. The method of claim **13**, wherein:

the first data packet includes a first physical layer protocol data unit,

a payload of the first physical layer protocol data unit includes a first MAC layer protocol data unit, and

the first MAC layer protocol data unit includes the first data fragment.

15. The method of claim **13**, further comprising transmitting a second data packet to the access point during a second

TX_OP, the second data packet including a second physical layer protocol data unit, a payload of the second physical layer protocol data unit including a second MAC layer protocol data unit, and the second MAC layer protocol data unit including the second data fragment.

16. The method of claim **15**, wherein the second physical layer protocol data unit includes an aggregated MAC layer protocol data unit that includes the second MAC layer protocol data unit, a third MAC layer protocol data unit, and a fourth MAC layer protocol data unit, and further comprising combining the second data fragment, a second MAC layer service data unit of the third MAC layer protocol data unit, and a first fragment of a third MAC layer service data unit of the fourth MAC layer protocol data unit to have a size that is less than or equal to a size of the second TX_OP.

17. The method of claim **13**, wherein:

the first data includes a second MAC layer service data unit,

the first data packet includes a first physical layer protocol data unit,

a payload of the first physical layer protocol data unit includes an aggregated MAC layer protocol data unit,

the aggregated MAC layer protocol data unit includes a first MAC layer protocol data unit and a second MAC layer protocol data unit,

the first MAC layer protocol data unit includes the first data fragment, and

the second MAC layer protocol data unit includes the second MAC layer service data unit.

18. The method of claim **13**, further comprising receiving, from the access point, a block acknowledgement frame that includes a first semicompressed block acknowledgement bitmap, and wherein:

the first semicompressed block acknowledgement bitmap indicates that the first data fragment was received by the access point, and

the first semicompressed block acknowledgement bitmap indicates a fragment number of the first data fragment in a set of bits of the first semicompressed block acknowledgement bitmap that is allotted for a sequence number corresponding to a first data unit.

19. The method of claim **18**, wherein:

the block acknowledgement frame includes a block acknowledgement control field and a block acknowledgement information field,

the block acknowledgement control field includes a bitmap compression bit and a set of reserved bits, and

the block acknowledgement information field includes a set of block acknowledgement starting sequence control bits and the first semicompressed block acknowledgement bitmap.

20. The method of claim **19**, wherein:

the bitmap compression bit has a first value,

one or more bits of the set of reserved bits indicate that the block acknowledgement frame includes the first semicompressed block acknowledgement bitmap,

the first semicompressed block acknowledgement bitmap includes a plurality of bits indicating one or more data fragment identifiers, and

each of the one or more data fragment identifiers corresponds to a data fragment of one of a plurality of data units corresponding to a particular block acknowledgement sequence.

21. The method of claim **19**, wherein:

the bitmap compression bit has a second value,

one or more bits of the set of reserved bits indicate that the block acknowledgement frame includes the first semi-compressed block acknowledgement bitmap, and

the first semicompressed block acknowledgement bitmap includes a compressed block acknowledgement bitmap and a set of fragment identification subfields.

22. The method of claim **21**, wherein:

the compressed block acknowledgement bitmap includes a plurality of bits indicating one or more non-fragmented data units were received by the access point from the first device, and

the set of fragment identification subfields includes a sequence identifier subfield and a data fragment identifier.

23. The method of claim **13**, further comprising receiving, from the access point, a block acknowledgement frame that includes a first semicompressed block acknowledgement bitmap and includes a second semicompressed block acknowledgement bitmap, and wherein the second semi-compressed block acknowledgement bitmap indicates one or more data fragments that were received by the access point from a second device.

24. The method of claim **23**, wherein:

the block acknowledgement frame includes a block acknowledgement control field and a block acknowledgement information field,

the block acknowledgement control field includes a bitmap compression bit and a set of reserved bits, and

the block acknowledgement information field includes a first set of per station information bits, a first set of block acknowledgement starting sequence control bits, the first semicompressed block acknowledgement bitmap, a second set of per station information bits, a second set of block acknowledgement starting

sequence control bits, and the second semicompressed block acknowledgement bitmap.

25. The method of claim **24**, wherein:

the bitmap compression bit has a first value,

one or more bits of the set of reserved bits indicate that the block acknowledgement frame includes at least one semicompressed block acknowledgement bitmap,

one or more reserved bits of the first set of per station information bits indicate an association identifier corresponding to the first device and a number of data fragments into which data units are divided by the first device,

the first semicompressed block acknowledgement bitmap includes a plurality of bits indicating a data fragment identifier of a data fragment, and

the data fragment corresponding to one of a plurality of data units corresponding to a particular block acknowledgement sequence.

26. The method of claim **24**, wherein:

the bitmap compression bit has a second value,

one or more bits of the set of reserved bits indicate that the block acknowledgement frame includes at least one semicompressed block acknowledgement bitmap,

one or more reserved bits of the first set of per station information bits indicate an association identifier corresponding to the first device,

the first semicompressed block acknowledgement bitmap includes a compressed block acknowledgement bitmap and a set of fragment identification subfields, and

the set of fragment identification subfields includes a first sequence identifier subfield and a data fragment identifier.

27. An apparatus for wireless communication, the apparatus comprising:

means for generating at least a first data fragment and a second data fragment based on data to be transmitted to an access point, wherein the first data fragment and the second data fragment are generated responsive to a size of the data exceeding a size of a transmit opportunity (TX_OP) associated with multiple devices, and wherein a size of the first data fragment is selected based on the size of the TX_OP; and

means for transmitting a data packet to the access point during the TX_OP, the data packet including the first data fragment, wherein the data packet is sent responsive to a frame received from the access point, and wherein the frame includes timing information corresponding to the size of the first TX_OP.

28. The apparatus of claim **27**, wherein the data packet is associated with uplink multi-user communication, wherein the data packet includes fragmentation information, and wherein the fragmentation information includes a sequence identifier (ID) number, a fragment number, and a more fragments indicator.

29. A non-transitory computer readable medium storing instructions that, when executed by a processor, cause the processor to:

generate, at a device, data to be transmitted to an access point;

determine that a size of the data exceeds a size of a transmit opportunity (TX_OP) associated with the device and one or more other devices;

generate at least a first data fragment and a second data fragment based on the data, wherein a size of the first data fragment is selected based on the size of the TX_OP; and

initiate transmission, during the TX_OP, of a data packet from the device to the access point, the data packet including the first data fragment, wherein the data packet is sent responsive to a frame received from the access point, and wherein the frame includes timing information corresponding to the size of the TX_OP.

30. The non-transitory computer readable medium of claim **29**, wherein the size of the first data fragment is less than a size of the second data fragment, wherein the size of the TX_OP corresponds to a duration of the TX_OP, and wherein the frame further includes synchronization information indicating starting times of one or more TX_OPs.