CLAIMS

What is claimed is:

1. A method for a first wireless transmit/receive unit (WTRU) to perform device-to-device (D2D) communication directly with a second WTRU, the method comprising:

determining a base pattern family to use for the D2D communication independent of a network, the base pattern family having a pre-defined duration with one or more transmission opportunities, a total number of which is specific to the base pattern family, wherein during each transmission opportunity the first WTRU transmits a data packet; and

selecting a base pattern from the base pattern family.

2. The method of claim 1, wherein the determining the base pattern family comprises:

determining a number of buffered data packets to be transmitted;

estimating a number of transmission opportunities required to transmit the buffered data packets in an upcoming scheduling period; and

choosing an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmission opportunities.

3. The method of claim 1, wherein the determining the base pattern family comprises:

determining whether the D2D communication is of a unicast, multicast, or broadcast nature; and

if the D2D communication is of a unicast nature with feedback, choosing an available base pattern family with a number of available transmission opportunities that allow for feedback transmissions from the second WTRU.

4. The method of claim 1, wherein the determining the base pattern family comprises:

determining whether the D2D communication is of a unicast, multicast, or broadcast nature; and

choosing an available base pattern family from a predefined set of base pattern families corresponding to the determined nature of D2D communication.

5. The method of claim 1, wherein the selecting the base pattern comprises:

determining there are one or more transmit WTRUs performing D2D communication adjacent to the first WTRU; and

choosing an available base pattern such that interference with base patterns of the one or more transmit WTRUs is minimized.

6. The method of claim 1, wherein the determining the base pattern family comprises:

determining the required number of transmissions in an upcoming scheduling period for the D2D communication, wherein the required number of transmissions is dependent on traffic type of the D2D communication; and

choosing an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmissions.

7. The method of claim 1, wherein the base pattern family is defined by a number of transmission opportunities available in a base pattern and a maximum overlap of the transmission opportunities between multiple base patterns within the base pattern family.

8. The method of claim 1, wherein the selecting the base pattern comprises a random selection.

9. The method of claim 1, wherein the selecting the base pattern comprises selecting the base pattern using one or more identifiers.

10. The method of claim 1, wherein the selecting the base pattern comprises making a selection based on a pseudo-random generator initialized with an identifier.

11. A wireless transmit/receive unit (WTRU) for performing device-to-device (D2D) communication directly with another WTRU, the WTRU comprising:

a scheduler configured to determine and select a base pattern family to use for the D2D communication independent of a network, the base pattern family having a pre-defined duration with one or more transmission opportunities, a total number of which is specific to the base pattern family, wherein during each transmission opportunity the first WTRU transmits a data packet.

12. The WTRU of claim 11, wherein the scheduler is further configured to:

determine a number of buffered data packets to be transmitted;

estimate a number of transmission opportunities required to transmit the buffered data packets in an upcoming scheduling period; and

choose an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmission opportunities.

13. The WTRU of claim 11, wherein the base pattern family is defined by a number of transmission opportunities available in a base pattern a maximum overlap of the transmission opportunities between multiple base patterns within the base pattern family.

14. The WTRU of claim 11, wherein the scheduler is further configured to:

determine whether the D2D communication is of a unicast, multicast, or broadcast nature; and

if the D2D communication is of a unicast nature, choose an available base pattern family with a number of available transmission opportunities that allow for feedback transmissions from the second WTRU.

15. The WTRU of claim 11, wherein the scheduler is further configured to:

determine that there are one or more transmit WTRUs performing D2D communication adjacent to the first WTRU; and

choose an available base pattern within the base pattern family such that interference with base patterns of the one or more transmit WTRUs is minimized.

16. The WTRU of claim 11, wherein the scheduler is further configured to:

determine the required number of transmissions in an upcoming scheduling period for the D2D communication, wherein the required number of transmissions is dependent on traffic type of the D2D communication; and

choose an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmissions.

17. The WTRU of claim 11, wherein the scheduler is further configured to:

determine whether the D2D communication is of a unicast, multicast, or broadcast nature; and

choose an available base pattern family from a predefined set of base pattern families corresponding to the determined nature of D2D communication

18. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family based on a random selection.

19. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family using on one or more identifiers.

20. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family based on a pseudo-random generator initialized with an identifier.

CLAIMS

What is claimed is:

1. A method for a first wireless transmit/receive unit (WTRU) to perform device-to-device (D2D) communication directly with a second WTRU, the method comprising:

determining a base pattern family to use for the D2D communication based on traffic conditions independent of a network, the base pattern family having a pre-defined duration with one or more transmission opportunities, a total number of which is specific to the base pattern family, wherein during each transmission opportunity the first WTRU transmits a data packet; and

selecting a base pattern from the base pattern family.

2. The method of claim 1, wherein the determining the base pattern family comprises:

determining a number of buffered data packets to be transmitted;

estimating a number of transmission opportunities required to transmit the buffered data packets in an upcoming scheduling period; and

choosing an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmission opportunities.

3. The method of claim 1, wherein the determining the base pattern family comprises:

determining whether the D2D communication is of a unicast, multicast, or broadcast nature; and

if the D2D communication is of a unicast nature with feedback, choosing an available base pattern family with a number of available transmission opportunities that allow for feedback transmissions from the second WTRU.

4. The method of claim 1, wherein the determining the base pattern family comprises:

determining whether the D2D communication is of a unicast, multicast, or broadcast nature; and

choosing an available base pattern family from a predefined set of base pattern families corresponding to the determined nature of D2D communication.

5. The method of claim 1, wherein the selecting the base pattern comprises:

determining there are one or more transmit WTRUs performing D2D communication adjacent to the first WTRU; and

choosing an available base pattern such that interference with base patterns of the one or more transmit WTRUs is minimized.

6. The method of claim 1, wherein the determining the base pattern family comprises:

determining the required number of transmissions in an upcoming scheduling period for the D2D communication, wherein the required number of transmissions is dependent on traffic type of the D2D communication; and

choosing an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmissions.

7. The method of claim 1, wherein the base pattern family is defined by a number of transmission opportunities available in a base pattern and a maximum overlap of the transmission opportunities between multiple base patterns within the base pattern family.

8. The method of claim 1, wherein the selecting the base pattern comprises a random selection.

9. The method of claim 1, wherein the selecting the base pattern comprises selecting the base pattern using one or more identifiers.

10. The method of claim 1, wherein the selecting the base pattern comprises making a selection based on a pseudo-random generator initialized with an identifier.

11. A wireless transmit/receive unit (WTRU) for performing device-to-device (D2D) communication directly with another WTRU, the WTRU comprising:

a scheduler configured to determine and select a base pattern family to use for the D2D communication based on traffic conditions independent of a network, the base pattern family having a pre-defined duration with one or more transmission opportunities, a total number of which is specific to the base pattern family, wherein during each transmission opportunity the first WTRU transmits a data packet.

12. The WTRU of claim 11, wherein the scheduler is further configured to:

determine a number of buffered data packets to be transmitted;

estimate a number of transmission opportunities required to transmit the buffered data packets in an upcoming scheduling period; and

choose an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmission opportunities.

13. The WTRU of claim 11, wherein the base pattern family is defined by a number of transmission opportunities available in a base pattern a maximum overlap of the transmission opportunities between multiple base patterns within the base pattern family.

14. The WTRU of claim 11, wherein the scheduler is further configured to:

determine whether the D2D communication is of a unicast, multicast, or broadcast nature; and

if the D2D communication is of a unicast nature, choose an available base pattern family with a number of available transmission opportunities that allow for feedback transmissions from the second WTRU.

15. The WTRU of claim 11, wherein the scheduler is further configured to:

determine that there are one or more transmit WTRUs performing D2D communication adjacent to the first WTRU; and

choose an available base pattern within the base pattern family such that interference with base patterns of the one or more transmit WTRUs is minimized.

16. The WTRU of claim 11, wherein the scheduler is further configured to:

determine the required number of transmissions in an upcoming scheduling period for the D2D communication, wherein the required number of transmissions is dependent on traffic type of the D2D communication; and

choose an available base pattern family with a number of available transmission opportunities corresponding to the required number of transmissions.

17. The WTRU of claim 11, wherein the scheduler is further configured to:

determine whether the D2D communication is of a unicast, multicast, or broadcast nature; and

choose an available base pattern family from a predefined set of base pattern families corresponding to the determined nature of D2D communication

18. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family based on a random selection.

19. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family using on one or more identifiers.

20. The WTRU of claim 11, wherein the scheduler is further configured to select a base pattern from the base pattern family based on a pseudo-random generator initialized with an identifier.