CLAIMS

What is claimed is:

1. A network comprising:

a relay node (RN),

wherein the RN is configured to assign a plurality of resource blocks (RBs) allocated by an enhanced node B (ENB) for at least one user equipment (UE).

2. The network of claim 1, wherein the RN communicates with the UE and ENB using one of time-division and frequency-division duplexing.

3. The network of claim 2, wherein the RN receives signals from the UE and the ENB at a first transmission time interval (TTI) and transmits signals to the UE and the ENB at a second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

4. The network of claim 3, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs receive signals from the UE and ENB at the first TTI and wherein the plurality of RNs transmit signals to the UEs and ENB at the second TTI .

5. The network of claim 3, wherein the RN comprises two transmitters and two receivers or comprises two transceivers.

6. The network of claim 2, wherein the RN and the UE transmit and receive signals at a first transmission time interval (TTI), wherein the RN and the ENB transmit and receive signals at a second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

7. The network of claim 6, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs and respective UEs

communicate (transmit/receive signals) with one another at the first TTI and wherein the plurality of RNs and ENB communicate (transmit/receive signals) with one another at the second TTI.

8. The network of claim 6, wherein the RN comprises one transmitter and one receiver or comprises one transceiver.

9. The network of claim 2, wherein the RNs may transmit and receive signals at about the same transmission time interval (TTI) with a plurality of UEs.

10. The network of claim 2, wherein a "guard" time between a plurality of transmission time interval (TTIs) may be used to prevent substantial overlap between transmitted and received signals.

11. A network comprising:

an enhanced node B (ENB),

wherein the ENB is configured to allocate a plurality of resource blocks (RBs) for a relay node (RN), wherein the RBs are assigned for at least one user equipment (UE).

12. The network of claim 11, wherein the RN communicates with the UE and ENB using one of time-division and frequency-division duplexing.

13. The network of claim 12, wherein the RN receives signals from the UE and the ENB at a first transmission time interval (TTI) and transmits signals to the UE and the ENB at a second TTI, wherein the first TTI and the second TTI are alternating TTIs.

14. The network of claim 13, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs receive signals from the UE and ENB at the first TTI and wherein the plurality of RNs transmit signals to the UEs and ENB at the second TTI.

15. The network of claim 13, wherein the RN comprises two transmitters and two receivers or comprises two transceivers.

16. The network of claim 12, wherein the RN and the UE transmit and receive signals at a first transmission time interval (TTI), wherein the RN and the ENB transmit and receive signals at a second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

17. The network of claim 16, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs and respective UEs communicate (transmit/receive signals) with one another at the first TTI and wherein the plurality of RNs and ENB communicate (transmit/receive signals) with one another at the second TTI.

18. The network of claim 16, wherein the RN comprises one transmitter and one receiver or comprises one transceiver.

19. The network of claim 12, wherein the RNs may transmit and receive signals at about the same transmission time interval (TTI) with a plurality of UEs.

20. The network of claim 12, wherein a "guard" time between a plurality of transmission time interval (TTIs) may be used to prevent substantial overlap between transmitted and received signals.

21. A method for communicating in a network, comprising:

selecting a time-division (TD) communication mode; and

using resource scheduling based on the selected TD communication mode.

22. The method of claim 21, wherein the TD communication mode is a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

23. The method of claim 21, wherein the downlink communications are established at the first TTI between at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB), and wherein the uplink communications are established between the UE and the ENB and between the RN and at least a second UE within the same cell as the RN.

24. The method of claim 21, wherein the uplink communications at the second TTI are established between at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB), and wherein the downlink communications are established between the UE and the ENB and between the RN and at least a second UE within the same cell as the RN.

25. The method of claim 21, wherein the TD communication mode is a full-duplex mode, wherein a full resource scheduling (FRS) is used for relay link communications at a first transmission time interval (TTI), and wherein a PRS is used for access link communications at a second TTI.

26. The method of claim 21, wherein a plurality of resource blocks (RBs) are allocated for at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB); and wherein at least some of the resource blocks allocated to the RN are assigned to at least a second UE within the same cell as the RN.

27. The method of claim 26, wherein at least some of the RBs are reserved for Voice over IP (VoIP) services or other real-time services, and wherein the reserved RBs are not allocated to the RN, the first UE, or the second UE.

28. A method comprising:

exchanging signals between at least one relay node (RN) and at least one first user equipment (UE), between the RN and an enhanced node B (ENB), and between the ENB and at least one second UE at different times, using different frequencies, or both to reduce substantial interference between the signals.

29. The method of claim 28, wherein the signals are exchanged at different times, using different frequencies, or both when the RN and the second UE are relatively close to each other.

30. The method of claim 28, wherein the signals are exchanged at about the same time, using the same frequency, or both when the RN and the second UE are relatively far from each other.

31. The method of claim 28, wherein the signals are exchanged at about the same time and using different frequencies for a plurality of first UEs.

32. A user equipment (UE), comprising:

a component configured to receive an assignment from a relay node (RN) of a plurality of resource blocks (RBs) allocated by an enhanced node B (ENB).

33. The UE of claim 32, wherein the UE communicate with the RN using time-division (TD).

34. The UE of claim 33, wherein the UE transmits signals to the RN at a first transmission time interval (TTI) and receives signals from the RN at a second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

35. The UE of claim 33, wherein the RN and the UE transmit and receive signals at a first transmission time interval (TTI), wherein the RN and the ENB transmit and receive signals at a second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

What is claimed is:

1. A network comprising:

a relay node (RN),

wherein the RN is configured to assign a plurality of resource blocks (RBs) allocated by an enhanced node B (ENB) for at least one user equipment (UE),

wherein the RN is configured to communicate in a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

2. The network of claim 1, wherein the RN communicates with the UE and ENB using one of time-division and frequency-division duplexing.

3. The network of claim 2, wherein the RN receives signals from the UE and the ENB at the first TTI and transmits signals to the UE and the ENB at the second TTI, and wherein the first TTI and the second TTI are alternating TTIs.

4. The network of claim 3, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs receive signals from the UE

and ENB at the first TTI and wherein the plurality of RNs transmit signals to the UEs and ENB at the second TTI.

5. The network of claim 3, wherein the RN comprises two transmitters and two receivers or comprises two transceivers.

6. The network of claim 1, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs and respective UEs communicate (transmit/receive signals) with one another at the first TTI and wherein the plurality of RNs and ENB communicate (transmit/receive signals) with one another at the second TTI.

7. The network of claim 1, wherein the RN comprises one transmitter and one receiver or comprises one transceiver.

8. The network of claim 2, wherein a "guard" time between a plurality of transmission time interval (TTIs) may be used to prevent substantial overlap between transmitted and received signals.

9. A network comprising:

an enhanced node B (ENB),

wherein the ENB is configured to allocate a plurality of resource blocks (RBs) for a relay node (RN), wherein the RBs are assigned for at least one user equipment (UE),

wherein the ENB is configured to communicate in a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

10. The network of claim 9, wherein the RN communicates with the UE and ENB using one of time-division and frequency-division duplexing.

11. The network of claim 10, wherein the RN receives signals from the UE and the ENB at the first TTI and transmits signals to the UE and the ENB at the second TTI, wherein the first TTI and the second TTI are alternating TTIs.

12. The network of claim 11, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs receive signals from the UE and ENB at the first TTI and wherein the plurality of RNs transmit signals to the UEs and ENB at the second TTI.

13. The network of claim 11, wherein the RN comprises two transmitters and two receivers or comprises two transceivers.

14. The network of claim 9, further comprising:

a plurality of RNs in communication with the ENB, each of the RNs communicating with one or more separate UEs, wherein the plurality of RNs and respective UEs communicate (transmit/receive signals) with one another at the first TTI and wherein the plurality of RNs and ENB communicate (transmit/receive signals) with one another at the second TTI.

15. The network of claim 9, wherein the RN comprises one transmitter and one receiver or comprises one transceiver.

16. The network of claim 10, wherein a "guard" time between a plurality of transmission time interval (TTIs) may be used to prevent substantial overlap between transmitted and received signals.

17. A method for communicating in a network, comprising:

selecting a time-division (TD) communication mode; and

using resource scheduling based on the selected TD communication mode, wherein the TD communication mode is a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

18. The method of claim 17, wherein the downlink communications are established at the first TTI between at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB), and wherein the uplink communications are established between the UE and the ENB and between the RN and at least a second UE within the same cell as the RN.

19. The method of claim 17, wherein the uplink communications at the second TTI are established between at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB), and wherein the downlink communications are established between the UE and the ENB and between the RN and at least a second UE within the same cell as the RN.

20. The method of claim 17, wherein a plurality of resource blocks (RBs) are allocated for at least one relay node (RN) and at least a first user equipment (UE) in direct communication with an enhanced node B (ENB); and wherein at least some of the resource blocks allocated to the RN are assigned to at least a second UE within the same cell as the RN.

21. The method of claim 20, wherein at least some of the RBs are reserved for Voice over IP (VoIP) services or other real-time services, and wherein the reserved RBs are not allocated to the RN, the first UE, or the second UE.

22. A method comprising:

exchanging signals between at least one relay node (RN) and at least one first user equipment (UE), and further exchanging signals between the RN and an enhanced node B (ENB), and further exchanging signals between the ENB and at least one second UE to reduce substantial interference between the signals, wherein exchanging signals occurs in a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

23. A user equipment (UE), comprising:

a component configured to receive an assignment from a relay node (RN) of a plurality of resource blocks (RBs) allocated by an enhanced node B (ENB), wherein the component is configured to communicate in a half-duplex mode, wherein a full resource scheduling (FRS) is used for downlink communications and a partial resource scheduling (PRS) is used for uplink communications at a first transmission time interval (TTI), and wherein an FRS is used for uplink communications and a PRS is used for downlink communications at a second TTI.

24. The UE of claim 23, wherein the UE communicates with the RN using time-division (TD).

25. The UE of claim 24, wherein the UE transmits signals to the RN at the first TTI and receives signals from the RN at the second TTI, and wherein the first TTI and the second TTI are alternating TTIs.