

CLAIMS

What is claimed is:

- 1.——_A method for wireless communication by a first access node, comprising:
 - _receiving, from a second access node, configuration signaling indicating a shared random access channel resource ~~and a~~, a backhaul random access channel preamble format, and a number of symbols in the backhaul random access channel preamble format, the backhaul random access channel preamble format differing from an access random access channel preamble format;
 - , and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; transmitting, to the second access node, a backhaul random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and
 - _establishing a backhaul link with the second access node based at least in part on the backhaul random access message.
- 2.——_The method of claim 1, wherein receiving the configuration signaling further comprises:
 - _receiving the configuration signaling indicating a plurality of different backhaul random access channel occasions within the shared random access channel resource.
- 3.——_The method of claim 2, further comprising:
 - _selecting a first backhaul random access channel occasion from the plurality of different backhaul random access channel occasions, wherein the backhaul random access message is transmitted within the first backhaul random access channel occasion.
- 4.——_The method of claim 3, wherein selecting the first backhaul random access channel occasion further comprises:
 - _identifying a number of downstream access nodes; and

_selecting the first backhaul random access channel occasion from the plurality of different backhaul random access channel occasions based at least in part on the number of downstream access nodes.

5.—The method of claim 2, wherein receiving the configuration signaling further comprises:

_receiving the configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.

6.—The method of claim 1, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.

7.—The method of claim 1, wherein ~~receiving the configuration signaling further comprises:~~

~~receiving the configuration signaling indicating a~~ the number of symbols in the backhaul random access channel preamble format, is fewer than the number of symbols ~~being fewer than a number of symbols~~ in the access random access channel preamble format.

8.—The method of claim 1, wherein ~~receiving the configuration signaling further comprises:~~

~~receiving the configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being the same as a number of symbols in the access random access channel preamble format.~~

9.—The method of claim 1, wherein transmitting the backhaul random access message further comprises:

_selecting a transmission power for the backhaul random access message based on a first parameter for received power, the first parameter for received power exceeding a second parameter for received power for an access random access message configured for transmission by a user equipment; and transmitting the backhaul random access message in accordance with the selected transmission power.

~~transmitting the backhaul random access message in accordance with the selected transmission power.~~

~~10.~~—~~9.~~ The method of claim 1, wherein transmitting the backhaul random access message further comprises:

_transmitting, via a plurality of antennas, the backhaul random access message as a beamformed transmission.

~~11.~~—~~10.~~ The method of claim 1, wherein the first access node is a mobile termination unit of an integrated access/backhaul (IAB).

~~12.~~—~~11.~~ A method for wireless communication by a first access node, comprising:
_transmitting, to a second access node, first configuration signaling indicating a shared random access channel resource ~~and~~, a backhaul random access channel preamble format;

, and a number of symbols in the backhaul random access channel preamble format; transmitting, to a user equipment, second configuration signaling indicating the shared random access channel resource and an access random access channel preamble format, the backhaul random access channel preamble format differing from the access random access channel preamble format; ~~and~~

, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; and monitoring the shared random access channel resource for at least one of a first random access message in accordance with the backhaul random access channel preamble format or a second random access message in accordance with the access random access channel preamble format.

~~13.~~—~~12.~~ The method of claim ~~12~~11, wherein monitoring the shared random access channel resource further comprises:

_receiving, from the second access node, the first random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and

_establishing a backhaul link with the second access node based at least in part on the first random access message.

~~14.~~—~~13.~~ The method of claim ~~13~~11, wherein monitoring the shared random access channel resource further comprises:

_receiving, from the user equipment, the second random access message in accordance with the access random access channel preamble format within the shared random access channel resource; and

_establishing an access link with the user equipment based at least in part on the second random access message.

15.—~~14.~~ The method of claim ~~14~~13, wherein receiving the second random access message in accordance with the access random access channel preamble format further comprises: _detecting, using an energy detection algorithm, a signal that includes the first random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; generating a modified signal by removing the first random access message from the signal; and processing the modified signal to obtain the second random access message.

~~generating a modified signal by removing the first random access message from the signal; and~~

~~processing the modified signal to obtain the second random access message.~~

16.—~~15.~~ The method of claim ~~15~~11, wherein ~~transmitting the first configuration signaling further comprises:~~

~~transmitting the first configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, is fewer than the number of symbols being fewer than a number of symbols in the access random access channel preamble format.~~

17.—~~16.~~ The method of claim ~~16~~11, wherein transmitting the first configuration signaling further comprises:

~~transmitting the first configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being the same as a number of symbols in the access random access channel preamble format.~~

18.—~~The method of claim 12, wherein transmitting the first configuration signaling further comprises:~~

~~_transmitting the first configuration signaling indicating a first parameter for received power for the first random access message, the first parameter for received power exceeding a second parameter for received power for the second random access message configured for transmission by the user equipment.~~

19.—~~17.~~ The method of claim ~~12~~11, wherein transmitting the first configuration signaling further comprises:

transmitting the first configuration signaling indicating a plurality of different backhaul random access channel occasions within the shared random access channel resource.

20.—~~18.~~ The method of claim ~~19~~17, wherein monitoring the shared random access channel resource further comprises:

receiving, from the first access node, the first random access message in accordance with the backhaul random access channel preamble format within a first backhaul random access channel occasion of the plurality of different backhaul random access channel occasions; and identifying information based at least in part on the first backhaul random access channel occasion.

~~identifying information based at least in part on the first backhaul random access channel occasion.~~

21.—~~19.~~ The method of claim ~~20~~18, wherein identifying the information further comprises:

identifying a number of downstream access nodes based at least in part on the first backhaul random access channel occasion.

22.—~~20.~~ The method of claim ~~19~~17, wherein transmitting the first configuration signaling further comprises:

transmitting the first configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.

23.—~~21.~~ The method of claim ~~12~~11, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.

24.—~~22.~~ The method of claim ~~12~~11, wherein the first access node is a distributed unit or a central unit of an integrated access/backhaul (IAB).

25.—~~23.~~ An apparatus for wireless communication by a first access node, comprising: means for receiving a processor; and memory coupled with the processor, the processor and memory configured to: receive, from a second access node, configuration signaling indicating a shared random access channel resource and a, a backhaul random access channel preamble format, and a number of symbols in the backhaul random access channel preamble format, the backhaul random access channel preamble format differing from an access random access channel preamble format; and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; transmit, to the second access node, a backhaul random access

message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and establish a backhaul link with the second access node based at least in part on the backhaul random access message.

24. The apparatus of claim 23, wherein the processor and memory are further configured to: receive the configuration signaling indicating a plurality of different backhaul random access channel occasions within the shared random access channel resource.

25. The apparatus of claim 24, wherein the processor and memory are further configured to: select a first backhaul random access channel occasion from the plurality of different backhaul random access channel occasions, wherein the backhaul random access message is transmitted within the first backhaul random access channel occasion.

26. The apparatus of claim 25, wherein the processor and memory are further configured to: identify a number of downstream access nodes; and select the first backhaul random access channel occasion from the plurality of different backhaul random access channel occasions based at least in part on the number of downstream access nodes.

27. The apparatus of claim 24, wherein the processor and memory are further configured to: receive the configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.

28. The apparatus of claim 23, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.

29. The apparatus of claim 23, wherein the number of symbols in the backhaul random access channel preamble format is fewer than the number of symbols in the access random access channel preamble format.

30. The apparatus of claim 23, wherein the processor and memory are further configured to: select a transmission power for the backhaul random access message based on a first parameter for received power, the first parameter for received power exceeding a second parameter for received power for an access random access message configured for transmission by a user equipment; and transmit the backhaul random access message in accordance with the selected transmission power.

31. The apparatus of claim 23, wherein the processor and memory are further configured to: transmit, via a plurality of antennas, the backhaul random access message as a beamformed transmission.

32. The apparatus of claim 23, wherein the first access node is a mobile termination unit of an integrated access/backhaul (TAB).

33. An apparatus for wireless communication by a first access node, comprising: a processor; and memory coupled with the processor, the processor and memory configured to: transmit, to a second access node, first configuration signaling indicating a shared random access channel resource, a backhaul random access channel preamble format, and a number of symbols in the backhaul random access channel preamble format; transmit, to a user equipment, second configuration signaling indicating the shared random access channel

resource and an access random access channel preamble format, the backhaul random access channel preamble format differing from the access random access channel preamble format, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; and monitor the shared random access channel resource for at least one of a first random access message in accordance with the backhaul random access channel preamble format or a second random access message in accordance with the access random access channel preamble format.

34. The apparatus of claim 33, wherein the processor and memory are further configured to: receive, from the second access node, the first random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and establish a backhaul link with the second access node based at least in part on the first random access message.

35. The apparatus of claim 33, wherein the processor and memory are further configured to: receive, from the user equipment, the second random access message in accordance with the access random access channel preamble format within the shared random access channel resource; and establish an access link with the user equipment based at least in part on the second random access message.

36. The apparatus of claim 35, wherein the processor and memory are further configured to: detect, using an energy detection algorithm, a signal that includes the first random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; generate a modified signal by removing the first random access message from the signal; and process the modified signal to obtain the second random access message.

37. The apparatus of claim 33, wherein the number of symbols in the backhaul random access channel preamble format is fewer than the number of symbols in the access random access channel preamble format.

38. The apparatus of claim 33, wherein the processor and memory are further configured to: transmit the first configuration signaling indicating a first parameter for received power for the first random access message, the first parameter for received power exceeding a second parameter for received power for the second random access message configured for transmission by the user equipment.

39. The apparatus of claim 33, wherein the processor and memory are further configured to: transmit the first configuration signaling indicating a plurality of different backhaul random access channel occasions within the shared random access channel resource.

40. The apparatus of claim 39, wherein the processor and memory are further configured to: receive, from the first access node, the first random access message in accordance with the backhaul random access channel preamble format within a first backhaul random access channel occasion of the plurality of different backhaul random access channel occasions; and identify information based at least in part on the first backhaul random access channel occasion.

41. The apparatus of claim 40, wherein the processor and memory are further configured to: identify a number of downstream access nodes based at least in part on the first backhaul random access channel occasion.

42. The apparatus of claim 39, wherein the processor and memory are further configured to: transmit the first configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.

43. The apparatus of claim 33, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.

44. The apparatus of claim 33, wherein the first access node is a distributed unit or a central unit of an integrated access/backhaul (IAB).

45. An apparatus for wireless communication by a first access node, comprising: means for receiving, from a second access node, configuration signaling indicating a shared random access channel resource, a backhaul random access channel preamble format, and a number of symbols in the backhaul random access channel preamble format, the backhaul random access channel preamble format differing from an access random access channel preamble format, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; means for transmitting, to the second access node, a backhaul random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and
_means for establishing a backhaul link with the second access node based at least in part on the backhaul random access message.

~~26.—The apparatus of claim 25, further comprising:
means for receiving the configuration signaling indicating a plurality of
different backhaul random access channel occasions within the shared random access channel
resource.~~

~~27.—The apparatus of claim 26, further comprising:
means for selecting a first backhaul random access channel occasion from the
plurality of different backhaul random access channel occasions, wherein the backhaul
random access message is transmitted within the first backhaul random access channel
occasion.~~

~~28.—The apparatus of claim 27, further comprising:
means for identifying a number of downstream access nodes; and~~

means for selecting the first backhaul random access channel occasion from the plurality of different backhaul random access channel occasions based at least in part on the number of downstream access nodes.

29.—The apparatus of claim 26, further comprising:

means for receiving the configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.

30.—The apparatus of claim 25, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.

31.—The apparatus of claim 25, further comprising:

means for receiving the configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being fewer than a number of symbols in the access random access channel preamble format.

32.—The apparatus of claim 25, further comprising:

means for receiving the configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being the same as a number of symbols in the access random access channel preamble format.

33.—The apparatus of claim 25, further comprising:

means for selecting a transmission power for the backhaul random access message based on a first parameter for received power, the first parameter for received power exceeding a second parameter for received power for an access random access message configured for transmission by a user equipment; and

means for transmitting the backhaul random access message in accordance with the selected transmission power.

34.—The apparatus of claim 25, further comprising:

means for transmitting, via a plurality of antennas, the backhaul random access message as a beamformed transmission.

35.—The apparatus of claim 25, wherein the first access node is a mobile termination unit of an integrated access/backhaul (IAB).

~~36.~~ ~~46.~~ An apparatus for wireless communication by a first access node, comprising:

~~means for transmitting, to a second access node, first configuration signaling indicating a shared random access channel resource and, a backhaul random access channel preamble format;~~

~~, and a number of symbols in the backhaul random access channel preamble format;~~ means for transmitting, to a user equipment, second configuration signaling indicating the shared random access channel resource and an access random access channel preamble format, the backhaul random access channel preamble format differing from the access random access channel preamble format; ~~and~~

~~, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format;~~ ~~and~~ means for monitoring the shared random access channel resource for at least one of a first random access message in accordance with the backhaul random access channel preamble format or a second random access message in accordance with the access random access channel preamble format.

~~37.~~ ~~47.~~ The apparatus of claim 36, further comprising:

~~means for receiving, from~~ ~~45, wherein the second access node, the first random access message in accordance with~~ number of symbols in the backhaul random access channel preamble format within the shared random access channel resource; ~~and~~

~~means for establishing a backhaul link with the second access node based at least~~ is fewer than the number of symbols in part on the first random access message.

~~38.~~ ~~The apparatus of claim 36, further comprising:~~

~~means for receiving, from the user equipment, the second random access message in accordance with the access random access channel preamble format within the shared random access channel resource; and,~~

~~means for establishing an access link with the user equipment based at least in part on the second random access message.~~

~~39.~~ ~~The apparatus of claim 38, further comprising:~~

~~means for detecting, using an energy detection algorithm, a signal that includes the first random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource;~~

~~means for generating a modified signal by removing the first random access message from the signal; and~~

means for processing the modified signal to obtain the second random access message.

~~40.~~ ~~48.~~ The apparatus of claim 36, further comprising:

~~means for transmitting the first configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being fewer than a number of symbols in the access random access channel preamble format.~~

41.—The apparatus of claim 36, further comprising:

~~means for transmitting the first configuration signaling indicating a number of symbols in the backhaul random access channel preamble format, the number of symbols being the same as a number of symbols in the access random access channel preamble format.~~

42.—The apparatus of claim 36, further comprising:

~~means for transmitting the first configuration signaling indicating a first parameter for received power for the first random access message, the first parameter for received power exceeding a second parameter for received power for the second random access message configured for transmission by the user equipment.~~

43.—The apparatus of claim 36, further comprising:

~~means for transmitting the first configuration signaling indicating a plurality of different backhaul random access channel occasions within the shared random access channel resource.~~

44.—The apparatus of claim 43, further comprising:

~~means for receiving, from the first access node, the first random access message in accordance with the backhaul random access channel preamble format within a first backhaul random access channel occasion of the plurality of different backhaul random access channel occasions; and~~

~~means for identifying information based at least in part on the first backhaul random access channel occasion.~~

45.—The apparatus of claim 44, further comprising:

~~means for identifying a number of downstream access nodes based at least in part on the first backhaul random access channel occasion.~~

46.—The apparatus of claim 43, further comprising:

~~means for transmitting the first configuration signaling indicating a prohibited backhaul random access channel occasion of the plurality of different backhaul random access channel occasions.~~

47. ~~The apparatus of claim 36, wherein the shared random access channel resource is a time and frequency resource useable for both access and backhaul communications.~~

48. ~~The apparatus of claim 36, wherein the first access node number of symbols in the backhaul random access channel preamble format is a distributed unit or a central unit of an integrated access/backhaul (IAB), fewer than the number of symbols in the access random access channel preamble format.~~

49. ~~An apparatus~~ A non-transitory computer readable medium storing code for wireless communication by at a first access node, the code comprising:

instructions executable by a processor;

~~memory coupled with the processor;~~

~~the processor and memory configured to:~~

~~_____ to: receive, from a second access node, configuration signaling indicating a shared random access channel resource and, a backhaul random access channel preamble format, and a number of symbols in the backhaul random access channel preamble format, the backhaul random access channel preamble format differing from an access random access channel preamble format;~~

~~_____, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; transmit, to the second access node, a backhaul random access message in accordance with the backhaul random access channel preamble format within the shared random access channel resource; and~~

~~_____ establish a backhaul link with the second access node based at least in part on the backhaul random access message.~~

50. ~~An apparatus~~ The non-transitory computer readable medium of claim 49, wherein the number of symbols in the backhaul random access channel preamble format is fewer than the number of symbols in the access random access channel preamble format.

51. A non-transitory computer readable medium storing code for wireless communication by at a first access node, the code comprising:

instructions executable by a processor;

~~memory coupled with the processor;~~

~~the processor and memory configured to:~~

———_transmit, to a second access node, first configuration signaling indicating a shared random access channel resource ~~and~~, a backhaul random access channel preamble format;

———, and a number of symbols in the backhaul random access channel preamble format; transmit, to a user equipment, second configuration signaling indicating the shared random access channel resource and an access random access channel preamble format, the backhaul random access channel preamble format differing from the access random access channel preamble format; ~~and~~

———, and the number of symbols in the backhaul random access channel preamble format being different than a number of symbols in the access random access channel preamble format; and monitor the shared random access channel resource for at least one of a first random access message in accordance with the backhaul random access channel preamble format or a second random access message in accordance with the access random access channel preamble format.

52. The non-transitory computer readable medium of claim 51, wherein the number of symbols in the backhaul random access channel preamble format is fewer than the number of symbols in the access random access channel preamble format.