

WHAT IS CLAIMED IS:

1. ~~— A first device comprising:
at least one processor; and
at least one memory including computer program code;
wherein the at least one memory and the computer program code are configured to,
with the at least one processor, cause the first device to:
transmit, to a second device, a first configuration indicating at least one of the
following:
information about at least one candidate beam assigned to the second
device; or
a correspondence between the at least one candidate beam and a
plurality of transmission occasions, the plurality of transmission occasions allocated by the
first device for transmission from the second device to the first device while the second
device is in an inactive mode; and
detect, at the plurality of transmission occasions, transmissions from the
second device according to the first configuration.~~
2. ~~— The first device of claim 1, wherein the correspondence between the at least
one candidate beam and a plurality of transmission occasions indicates one of the following:
different candidate beams are corresponding to different subsets of the plurality of
transmission occasions; or
at least one of the transmission occasions is corresponding to more than one candidate
beam.~~
3. ~~The first device of claim 1, wherein the transmission occasions are periodic
resources; and
wherein the first configuration further indicates respective periodicity of the at least
one candidate beam.~~
4. ~~The first device of claim 1, wherein a first candidate beam of the plurality of
candidate beams is configured with a first periodicity, and a second candidate beam of the
plurality of candidate beams is configured with a different second periodicity.~~

~~5. The first device of claim 1, wherein the at least one memory and the computer program code are configured to, with the at least one processor, further cause the first device to:~~

~~at a transmission occasion of the plurality of transmission occasions that corresponds to more than one candidate beam, detect an indication of a target beam which is determined by the second device from the more than one candidate beam.~~

~~6. The first device of claim 1, wherein the at least one candidate beam comprises at least one of the following:~~

~~a last serving beam used by the second device, or~~

~~at least one neighboring beam of the last serving beam.~~

~~7. The first device of claim 1, wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the first device to:~~

~~transmit, to the second device, a second configuration indicating a further correspondence between at least one further candidate beam and the plurality of transmission occasions.~~

~~8. The first device of claim 1, wherein the first configuration is transmitted via one of the following:~~

~~a radio resource control release message, or~~

~~a system broadcast information signaling.~~

~~9. The first device of any of claims 1-8, wherein the first device is a network device, and the second device is a terminal device.~~

~~10. — A second device comprising:~~

~~at least one processor; and~~

~~at least one memory including computer program code;~~

~~wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the second device to:~~

~~receive, from a first device, a first configuration indicating at least one of the following:~~

~~information about at least one candidate beam assigned to the second~~

device; or

~~a correspondence between the at least one candidate beam and a plurality of transmission occasions, the plurality of transmission occasions allocated by the first device for transmission from the second device to the first device while the second device is in an inactive mode; and~~

~~in accordance with a determination that the second device is in an inactive mode and there is transmission to be transmitted from the second device to the first device, determine a target transmission occasion from the transmission occasions according to the first configuration; and~~

~~perform, at the target transmission occasion, the transmission from the second device to the first device.~~

~~11.—The second device of claim 10, wherein the correspondence between the at least one candidate beam and a plurality of transmission occasions indicates one of the following:~~

~~different candidate beams are corresponding to different subsets of the plurality of transmission occasions; or~~

~~at least one of the transmission occasions is corresponding to more than one candidate beam.~~

~~12.—The second device of claim 10, wherein the transmission occasions are periodic resources; and~~

~~wherein the first configuration further indicates respective periodicity of the at least one candidate beam.~~

~~13. The second device of claim 12, wherein a first candidate beam of the plurality of candidate beams is configured with a first periodicity, and a second candidate beam of the plurality of candidate beams is configured with a different second periodicity.~~

~~14.—The second device of claim 10, wherein the at least one memory and the computer program code are configured to, with the at least one processor, further cause the second device to determine the target transmission occasion by:~~

~~determining the target transmission occasion based on at least one of the following:~~

~~received signal strength of the at least one candidate beam; or~~

~~time differences between the current time point and transmission time points corresponding to the transmission occasions.~~

~~15. The second device of claim 10, wherein the at least one memory and the computer program code are configured to, with the at least one processor, further cause the second device to determine the target transmission occasion by:~~

~~determining one of the following as the target transmission occasion:~~

~~a transmission occasion corresponding to a candidate beam of the at least one candidate beam with the best received signal strength, or~~

~~a next transmission occasion corresponding to a candidate beam of the at least one candidate beam that supports an acceptable transmission from the second device to the first device.~~

~~16. The second device of claim 10, wherein the at least one memory and the computer program code are configured to, with the at least one processor, further cause the second device to:~~

~~according to a determination that the target transmission occasion corresponds to more than one candidate beam, determine a target beam from the more than one candidate beam; and~~

~~transmit, an indication of the target beam to the first device.~~

~~17. The second device of claim 10, wherein the at least one candidate beam comprises at least one of the following:~~

~~a last serving beam used by the second device, or~~

~~at least one neighboring beam of the last serving beam.~~

~~18. The second device of claim 10, wherein the at least one memory and the computer program code are configured to, with the at least one processor, further cause the second device to:~~

~~receive, from the first device, a second configuration indicating a further correspondence between at least one further candidate beam and the plurality of transmission occasions.~~

~~19. The second device of claim 10, wherein the first configuration is transmitted via~~

one of the following:

~~a radio resource control release message, or
a system broadcast information signaling.~~

~~20. The second device of any of claims 10-19, wherein the first device is a network device and the second device is a terminal device.~~

~~21. — A method, comprising:~~

~~transmitting, at a first device and to a second device, a first configuration indicating at least one of the following:~~

~~information about at least one candidate beam assigned to the second device;~~

~~or~~

~~a correspondence between the at least one candidate beam and a plurality of transmission occasions, the plurality of transmission occasions allocated by the first device for transmission from the second device to the first device while the second device is in an inactive mode; and~~

~~detecting, at the plurality of transmission occasions, transmissions from the second device according to the first configuration.~~

~~22. — The method of claim 21, wherein the correspondence between the at least one candidate beam and a plurality of transmission occasions indicates one of the following:~~

~~different candidate beams are corresponding to different subsets of the plurality of transmission occasions, or~~

~~at least one of the transmission occasions is corresponding to more than one candidate beam.~~

~~23. The method of claim 21, wherein the transmission occasions are periodic resources; and~~

~~wherein the first configuration further indicates respective periodicity of the at least one candidate beam.~~

~~24. The method of claim 21, wherein a first candidate beam of the plurality of candidate beams is configured with a first periodicity, and a second candidate beam of the plurality of candidate beams is configured with a different second periodicity.~~

~~25. The method of claim 21, further comprising:~~

~~at a transmission occasion of the plurality of transmission occasions that corresponds to more than one candidate beam, detecting an indication of a target beam which is determined by the second device from the more than one candidate beam.~~

~~26. The method of claim 21, wherein the at least one candidate beam comprises at least one of the following:~~

~~a last serving beam used by the second device, or
at least one neighboring beam of the last serving beam.~~

~~27. The method of claim 21, further comprising:~~

~~transmitting, to the second device, a second configuration indicating a further correspondence between at least one further candidate beam and the plurality of transmission occasions.~~

~~28. The method of claim 21, wherein the first configuration is transmitted via one of the following:~~

~~a radio resource control release message, or
a system broadcast information signaling.~~

~~29. The method of any of claims 21-28, wherein the first device is a network device, and the second device is a terminal device.~~

~~30. — A method, comprising:~~

~~receiving, at a second device and from a first device, a first configuration indicating at least one of the following:~~

~~information about at least one candidate beam assigned to the second device,
or~~

~~a correspondence between the at least one candidate beam and a plurality of transmission occasions, the plurality of transmission occasions allocated by the first device for transmission from the second device to the first device while the second device is in an inactive mode; and~~

~~in accordance with a determination that the second device is in an inactive mode and~~

~~there is transmission to be transmitted from the second device to the first device, determine a target transmission occasion from the transmission occasions according to the first configuration; and~~

~~performing, at the target transmission occasion, the transmission from the second device to the first device.~~

~~31. The method of claim 30, wherein the correspondence between the at least one candidate beam and a plurality of transmission occasions indicates one of the following:~~

~~different candidate beams are corresponding to different subsets of the plurality of transmission occasions, or~~

~~at least one of the transmission occasions is corresponding to more than one candidate beam.~~

~~32. The method of claim 30, wherein the transmission occasions are periodic resources; and~~

~~wherein the first configuration further indicates respective periodicity of the at least one candidate beam.~~

~~33. The method of claim 30, wherein a first candidate beam of the plurality of candidate beams is configured with a first periodicity, and a second candidate beam of the plurality of candidate beams is configured with a different second periodicity.~~

~~34. The method of claim 30, wherein determining the target transmission occasion comprises:~~

~~determining the target transmission occasion based on at least one of the following:~~

~~received signal strength of the at least one candidate beam, or~~

~~time differences between the current time point and transmission time points corresponding to the transmission occasions.~~

~~35. The method of claim 30, wherein determining the target transmission occasion comprising:~~

~~determining one of the following as the target transmission occasion:~~

~~a transmission occasion corresponding to a candidate beam of the at least one candidate beam with the best received signal strength, or~~

~~a next transmission occasion corresponding to a candidate beam of the at least one candidate beam that supports an acceptable transmission from the second device to the first device.~~

~~36. The method of claim 30, Further comprising:~~

~~according to a determination that the target transmission occasion corresponds to more than one candidate beam, determining a target beam from the more than one candidate beam; and~~

~~transmitting an indication of the target beam to the first device.~~

~~37. The method of claim 30, wherein the at least one candidate beam comprises at least one of the following:~~

~~a last serving beam used by the second device, or~~

~~at least one neighboring beam of the last serving beam.~~

~~38. The method of claim 30, further comprising:~~

~~receiving, from the first device, a second configuration indicating a further correspondence between at least one further candidate beam and the plurality of transmission occasions.~~

~~39. The method of claim 30, wherein the first configuration is transmitted via one of the following:~~

~~a radio resource control release message, or~~

~~a system broadcast information signaling.~~

~~40. The method of any of claims 30-39, wherein the first device is a network device and the second device is a terminal device.~~

~~41. — A first apparatus comprising means for:~~

~~transmitting, to a second apparatus, a first configuration indicating at least one of the following:~~

~~information about at least one candidate beam assigned to the second apparatus, or~~

~~a correspondence between the at least one candidate beam and a plurality of~~

~~transmission occasions, the plurality of transmission occasions allocated by the first apparatus for transmission from the second apparatus to the first apparatus while the second apparatus is in an inactive mode; and~~

~~detecting, at the plurality of transmission occasions, transmissions from the second apparatus according to the first configuration.~~

42. — A second apparatus comprising means for:

~~receiving, from a first apparatus, a first configuration indicating at least one of the following:~~

~~information about at least one candidate beam assigned to the second apparatus, or~~

~~a correspondence between the at least one candidate beam and a plurality of transmission occasions, the plurality of transmission occasions allocated by the first apparatus for transmission from the second apparatus to the first apparatus while the second apparatus is in an inactive mode; and~~

~~in accordance with a determination that the second apparatus is in an inactive mode and there is transmission to be transmitted from the second apparatus to the first apparatus, determine a target transmission occasion from the transmission occasions according to the first configuration; and~~

~~performing, at the target transmission occasion, the transmission from the second apparatus to the first apparatus.~~

43. — A computer readable medium comprising program instructions for causing an apparatus to perform at least the method of any of claims 21-29.

44. — A computer readable medium comprising program instructions for causing an apparatus to perform at least the method of any of claims 30-40.

1. A method, comprising:

transmitting, at a first device and to a second device, a message indicating an allocation of pre-configured physical uplink shared channel, PUSCH, resources in accordance with a configured grant-based scheme, the PUSCH resources allocated by the first device for transmission from the second device to the first device while the second device is in an inactive mode,

transmitting, at the first device and to the second device, a first configuration indicating:

information about candidate beams assigned to the second device, and
a correspondence between the candidate beams and a plurality of transmission occasions of the pre-configured PUSCH resources;

detecting, at one of the plurality of transmission occasions that corresponds to more than one candidate beam, a transmission from the second device according to the first configuration and an indication of a target beam which is determined by the second device from the more than one candidate beam.

2. The method of claim 1, wherein the correspondence between the at least one candidate beam and the plurality of transmission occasions indicates that different candidate beams are corresponding to different subsets of the plurality of transmission occasions.

3. The method of claim 1, wherein the transmission occasions are periodic resources; and
wherein the first configuration further indicates respective periodicity of the candidate beams.

4. The method of claim 2, wherein a first candidate beam of the candidate beams is configured with a first periodicity, and a second candidate beam of the candidate beams is configured with a different second periodicity.

5. The method of any of claims 1 to 4, wherein the first configuration is transmitted within a radio resource control, RRC, message instructing the second device to enter into the inactive mode, and the inactive mode is a RRC inactive mode.

6. The method of any of claims 1 to 5, wherein the first configuration indicates respective indexes of the candidate beams assigned to the second device.

7. A method, comprising:
receiving, at a second device and from a first device, a message indicating an allocation of pre-configured physical uplink shared channel, PUSCH, resources in accordance with a configured grant-based scheme, the PUSCH resources allocated by the first device for transmission from the second device to the first device while the second

device is in an inactive mode,

receiving, at the second device and from the first device, a first configuration indicating:

information about candidate beams assigned to the second device, and

a correspondence between the candidate beams and a plurality of transmission occasions of the pre-configured PUSCH resources; and

in accordance with a determination that the second device is in an inactive mode and there is transmission to be transmitted from the second device to the first device,

determining a target transmission occasion from the transmission occasions according to the first configuration, the target transmission occasion corresponding to more than one candidate beam;

performing, at the target transmission occasion, the transmission from the second device to the first device; and

transmitting at the target transmission occasion an indication of a target beam selected from the more than one candidate beam.

8. The method of claim 7, wherein the correspondence between the candidate beams and the plurality of transmission occasions indicates that different candidate beams are corresponding to different subsets of the plurality of transmission occasions.

9. The method of claim 7, wherein the transmission occasions are periodic resources; and

wherein the first configuration further indicates respective periodicity of the candidate beams.

10. The method of claim 7, wherein a first candidate beam of the candidate beams is configured with a first periodicity, and a second candidate beam of the candidate beams is configured with a different second periodicity.

11. The method of claim 7, wherein determining the target transmission occasion comprises:

determining the target transmission occasion based on at least one of the following:

received signal strength of the candidate beams, or

time differences between the current time point and transmission time points

corresponding to the transmission occasions.

12. The method of claim 7, wherein determining the target transmission occasion comprises:

determining one of the following as the target transmission occasion:

a transmission occasion corresponding to a candidate beam of the candidate beams with the best received signal strength, or

a next transmission occasion corresponding to a candidate beam of the candidate beams that supports an acceptable transmission from the second device to the first device.

13. The method of any of claims 7 to 12, the method comprising performing a subsequent transmission using a transmission occasion corresponding to the target beam.

14. The method of any of claims 7 to 13, wherein the first configuration is transmitted within a radio resource control, RRC, message instructing the second device to enter into the inactive mode, and the inactive mode is a RRC inactive mode.

15. The method of any of claims 7 to 14, wherein the first configuration indicates respective indexes of the candidate beams assigned to the second device.

16. The method of any of claims 7 to 15, wherein the determining the target transmission occasion is based on the selected target beam.

17. A first device comprising:

at least one processor; and

at least one memory including computer program code;

wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the first device to perform the method of any one of claims 1 to 6.

18. A second device comprising:

at least one processor; and

at least one memory including computer program code;

wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the second device to perform the method of any one of claims 7 to 16.

19. A computer readable medium comprising program instructions for causing an apparatus to perform at least the method of any of claims 1 to 16.