METHOD AND SYSTEM FOR BEAM INDICATION IN WIRELESS NETWORK

TECHNICAL FIELD

[01] This patent document is directed generally to wireless communications.

BACKGROUND

[02] Mobile communication technologies are moving the world toward an increasingly connected and networked society. The rapid growth of mobile communications and advances in technology have led to greater demand for capacity and connectivity. Other aspects, such as energy consumption, device cost, spectral efficiency, and latency are also important to meeting the needs of various communication scenarios. Various techniques, including new ways to provide higher quality of service, longer battery life, and improved performance are being discussed.

SUMMARY

[03] This patent document describes, among other things, techniques for indicating beam information that can be used on access links, backhaul links, and control links.

[04] In one aspect, a method of data communication is disclosed. The method includes receiving, by a network node, a beam indication for access links from a wireless communication node, the access links comprising at least one of a first forwarding link from the network node to a wireless communication device, or a second forwarding link from the wireless communication device to the network node, and performing a communication using at least one of the access links. The method may further include receiving, by the network node, a beam indication for backhaul links from the wireless communication node, the backhaul links comprising at least one of a third forwarding link from the wireless communication node to the network node, or a fourth forwarding link from the network node to the wireless communication node, and performing a communication using at least one of the backhaul links.

[04a] The method may further include receiving, by the network node, a beam indication for control links from the wireless communication node, the control links comprising at least one of a first control link from the wireless communication node to a network node, or a second control link from the network node to the communication node, and performing a communication using at least one of the control links.

[05] In another aspect, a method of data communication is disclosed. The method includes receiving, by a network node, from a wireless communication node, a configuration information that indicates information associated with a number of beams

configured for the network node on access links, wherein the configuration information includes at least one of: a list of beam patterns; or an ordered sequence of beam information to be used sequentially by the network node on access links, wherein each beam pattern includes an ordered sequence of beam information to be sequentially used by the network node on the access links.

[06] In another example, a wireless communication apparatus comprising a processor configured to implement an above-described method is disclosed.

[07] In another example, a computer storage medium having code for implementing an above-described method stored thereon is disclosed.

[08] These, and other, aspects are described in the present document.

BRIEF DESCRIPTION OF THE DRAWING

[09] FIG. 1 shows an example of a wireless communication system based on some example embodiments of the disclosed technology.

[010] FIG. 2 is a block diagram representation of a portion of an apparatus based on some embodiments of the disclosed technology.

[011] FIG. 3 shows an example of a network controlled repeater.

[012] FIG. 4 shows an example of a unified numbering mechanism for beams of NCR on access links based on some implementations of the disclosed technology.

[013] FIG. 5 shows an example of a group numbering mechanism for beams of NCR on the access link based on some implementations of the disclosed technology.

[014] FIG. 6 shows example indices for wider beam and narrow beam based on some implementations of the disclosed technology.

[015] FIG. 7 shows examples of separate numbering mechanism for beams of access links based on some implementations of the disclosed technology.

[016] FIG. 8 shows an example list of beam patterns based on some implementations of the disclosed technology.

[017] FIG. 9 shows an example of an ordered sequence of beam IDs based on some implementations of the disclosed technology.

[018] FIG. 10 shows an example of a process for wireless communication based on some example embodiments of the disclosed technology.

[019] FIG. 11 shows another example of a process for wireless communication based on some example embodiments of the disclosed technology.

DETAILED DESCRIPTION

[020] Section headings are used in the present document only for ease of understanding and do not limit scope of the embodiments to the section in which they are described. Furthermore, while embodiments are described with reference to 5G examples, the disclosed techniques may be applied to wireless systems that use protocols other than 5G or 3GPP protocols.

CLAIMS

What is claimed is:

1. A method of wireless communication, comprising:

receiving, by a network node, a beam indication for access links from a wireless communication node, the access links comprising at least one of a first forwarding link from the network node to a wireless communication device, or a second forwarding link from the wireless communication device to the network node;

receiving, by the network node, a beam indication for backhaul links from the wireless communication node, the backhaul links comprising at least one of a third forwarding link from the wireless communication node to the network node, or a fourth forwarding link from the network node to the wireless communication node; and

performing a communication using at least one of the access links or the backhaul links.

2. The method of claim 1, further comprising:

receiving, by the network node, a beam indication for control links from the wireless communication node, the control links comprising at least one of a first control link from the wireless communication node to a network node, or a second control link from the network node to the wireless communication node; and

performing a communication using at least one of the control links.

3. The method of any of claims 1-2, wherein the wireless communication node receives beamforming capability information from the network node or an operations administration and maintenance (OAM) unit, wherein the beamforming capability information includes at least one of: a number of beams available for the network node; indices or identities of beams available for the network node; type of beams available for the network node; widths of beams available for the network node; directions of beams available for the network node; or a location of the network node, wherein the beamforming capability information is defined with a granularity, wherein the granularity is at least one of: per network node or per link.

4. The method of claim 1, wherein the beam indication for the access links is associated with indices or identities of beams for the network node on the access links.

5. The method of claim 1, wherein the beam indication for the access links for the network node on the access links is associated with a plurality of indices or identities of a set of reference signals.

6. The method of claim 5, wherein the reference signals include at least one of a channel state information reference signal (CSI-RS), a synchronization signal block (SSB), a demodulation reference signal (DMRS), or a sounding reference signal (SRS).

7. The method of claim 1, wherein the beam indication for the backhaul links is associated with: indices or identities of beams for the network node on the backhaul links or a plurality of indices or identities of a set of reference signals.

8. The method of claim 1, wherein beam information associated with the backhaul links is identical to beam information of control links.

9. The method of claim 1, wherein the wireless communication node uses: an additional signaling dedicated for the backhaul links to indicate beam information.

10. The method of claim 1, wherein the wireless communication node uses an additional signaling for determining that a transmission configuration indicator (TCI) state is for beam information associated with the backhaul links.

11. A method of wireless communication, comprising:

receiving, by a network node, from a wireless communication node, a configuration information that indicates information associated with a number of beams configured for the network node on access links,

wherein the configuration information includes at least one of: a list of beam patterns; or an ordered sequence of beam information to be used sequentially by the network node on access links, wherein each beam pattern includes an ordered sequence of beam information to be sequentially used by the network node on the access links.

12. The method of claim 11, wherein the beam information is associated with at least one of indices or identities of beams, a source reference signal identity (RS ID), or a TCI state ID.

13. The method of claim 11, wherein a signaling of the configuration information is indicated via at least one of radio resource control (RRC), medium access control-control element (MAC CE), or downlink control information (DCI).

14. The method of claim 11, wherein all beam patterns in the list are sequentially numbered with indices or identities.

15. An apparatus for wireless communication comprising a processor that is configured to carry out the method of any of claims 1 to 14.