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(54) **CONFIGURATION INFORMATION**

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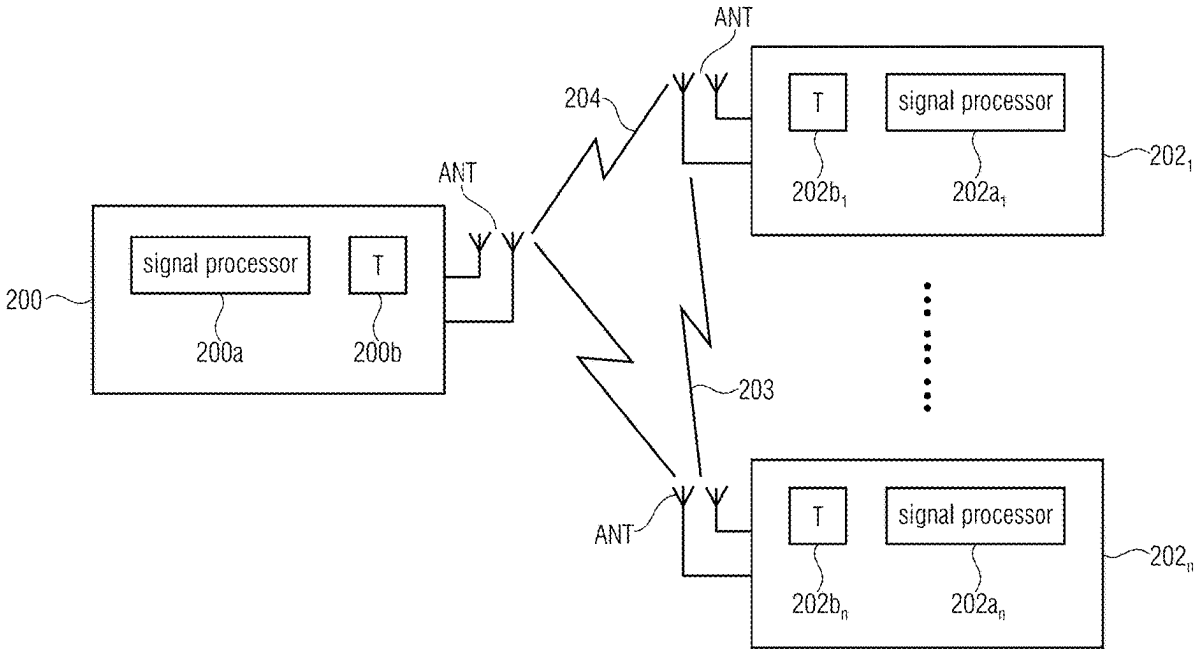
CPC ***H04W 72/535*** (2023.01)

(57) **ABSTRACT**

Embodiments provide a network entity configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system. The network entity is configured for using a wireless interface of the network entity for the communication. The network entity comprises a control unit configured for processing configuration information indicating a change of an availability of the resource. The control unit is configured for adapting the configuration based on the configuration information to react on the change of the availability.



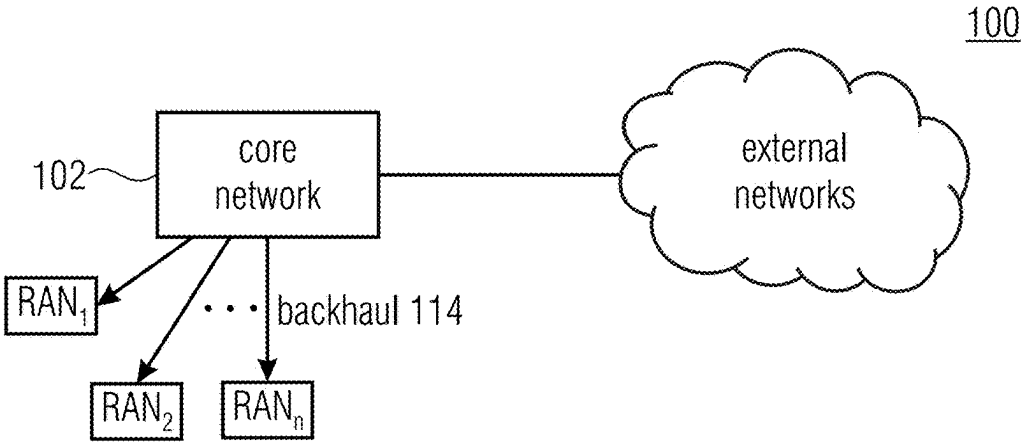
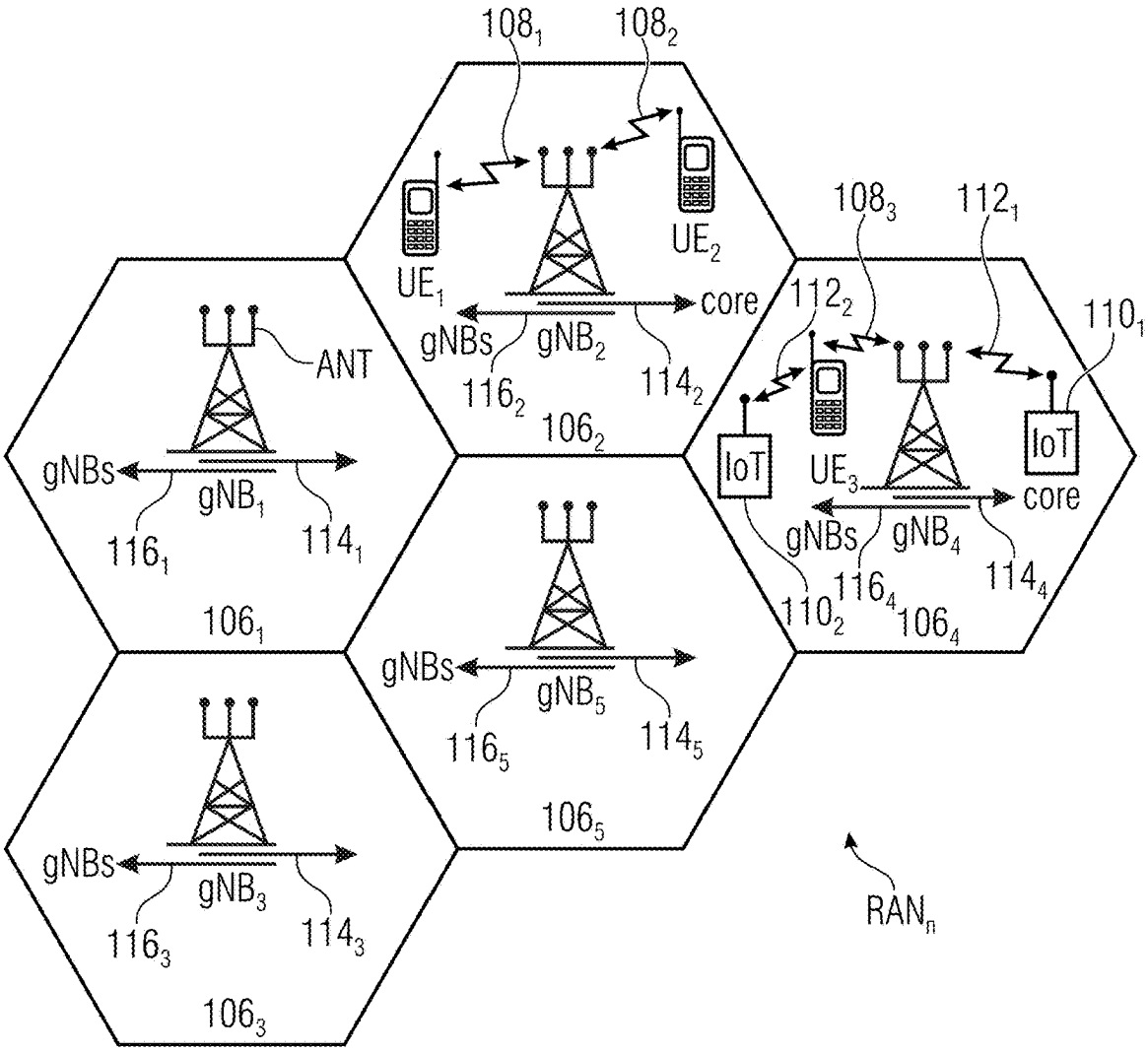

100
102
core network
external networks
RAN1
backhaul 114
RAN2
RANn

Fig. 1A


108₁
108₂
UE₁
UE₂
core
gNBs
gNB₂
116₂
114₂
106₂
ANT
gNBs
gNB₁
116₁
114₁
106₁
108₃
112₁
112₂
110₁
IoT
IoT
UE₃
core
gNBs
gNB₄
110₂
116₄
114₄
106₄
gNBs
gNB₅
116₅
114₅
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gNBs
gNB₃
116₃
114₃
106₃
RANn

Fig. 1B

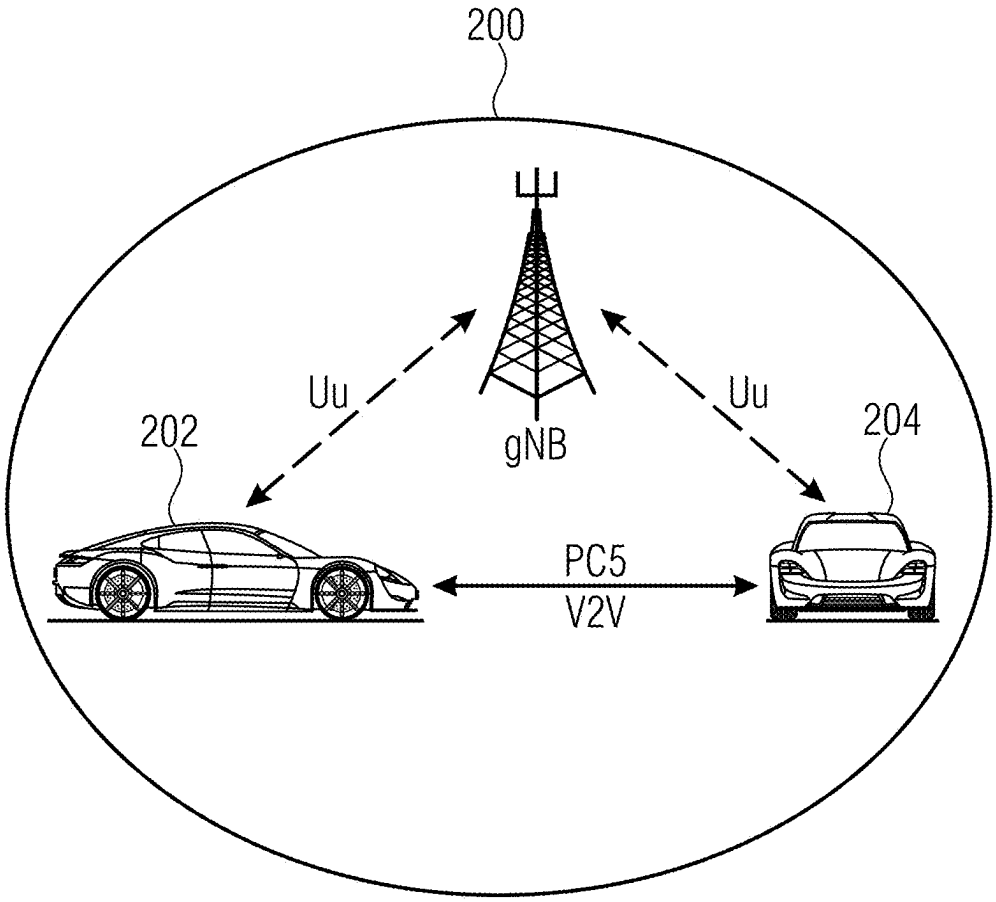

Fig. 2

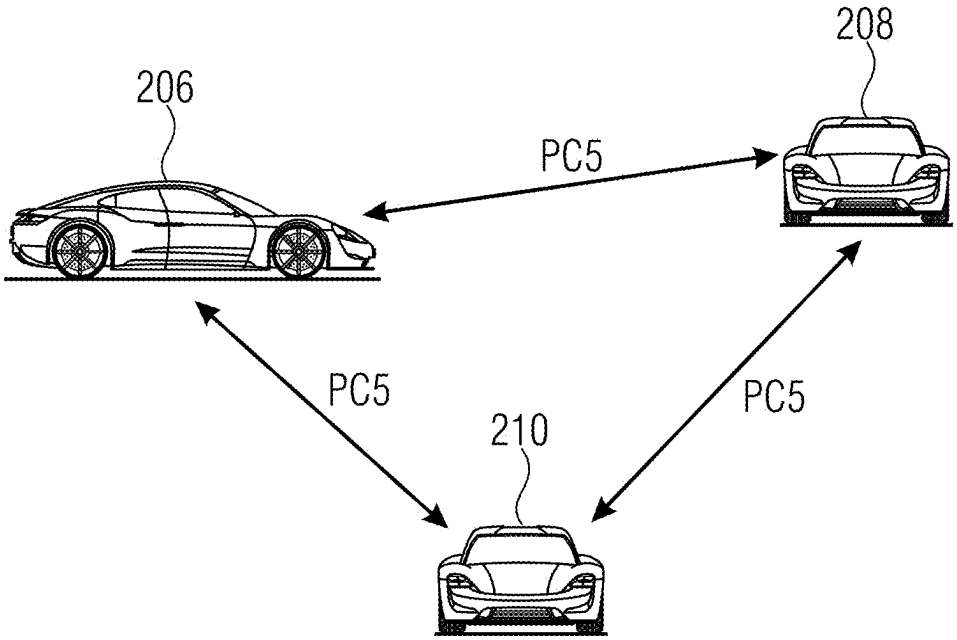

Fig. 3

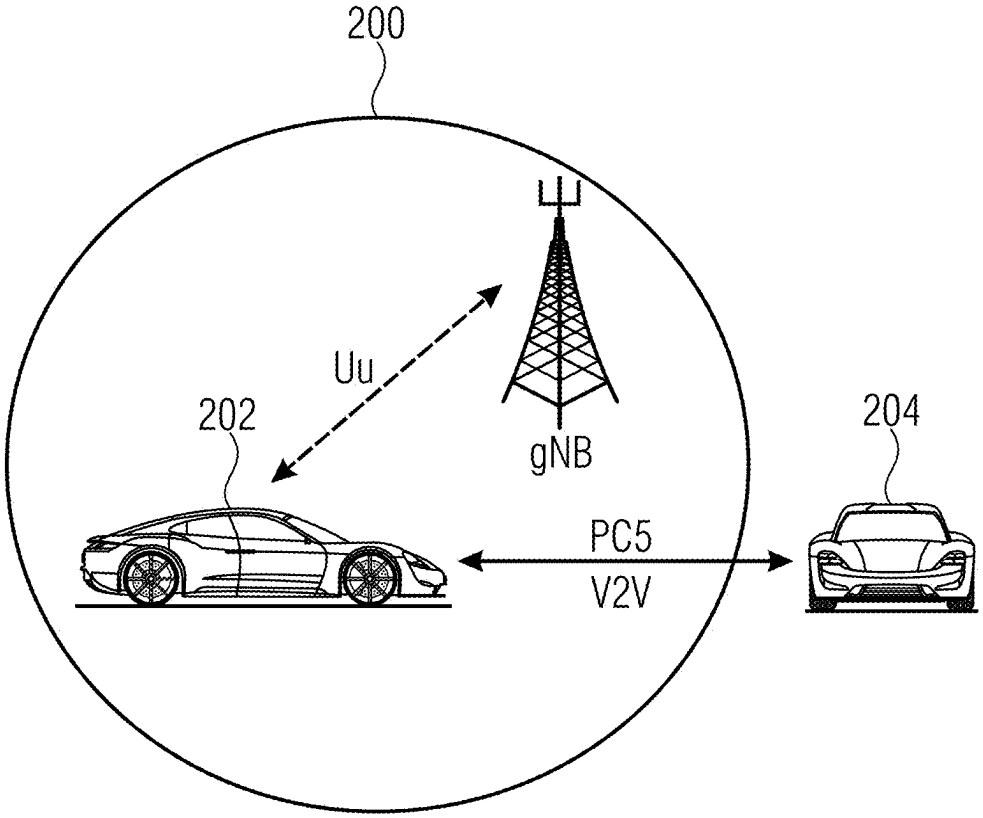

Fig. 4

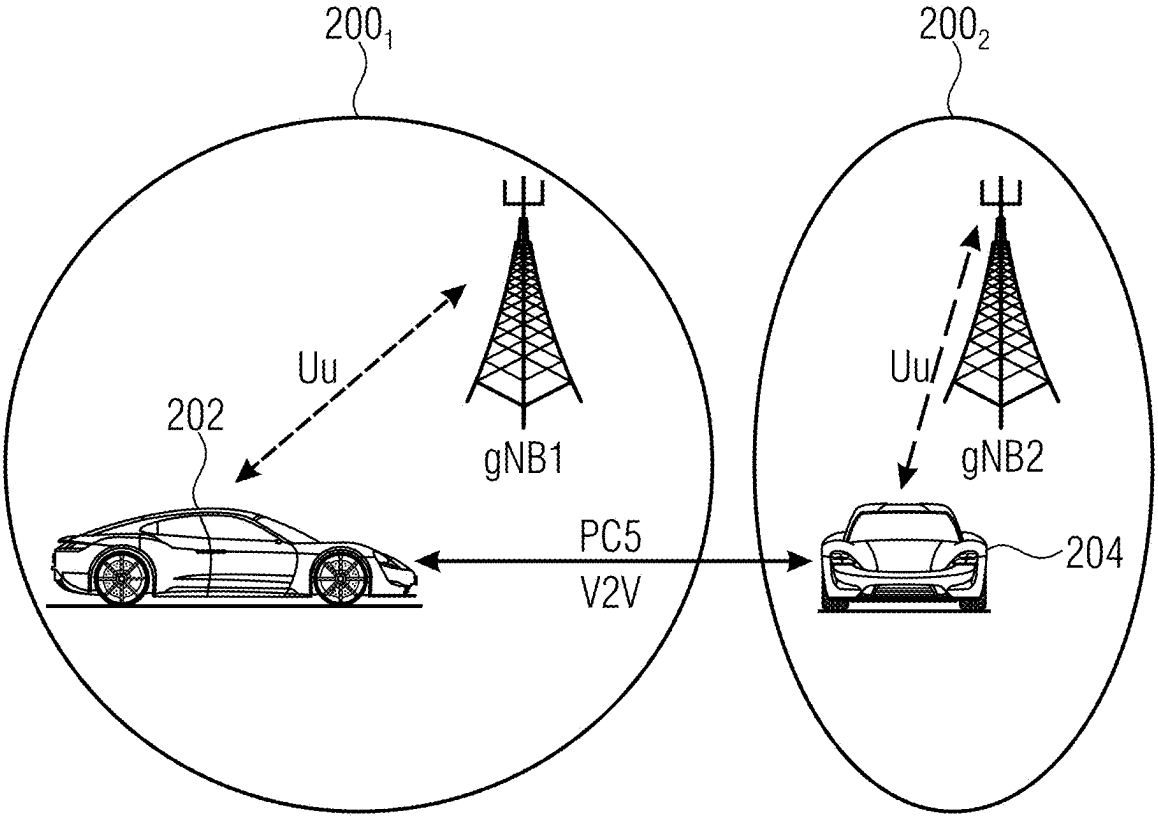

Fig. 5

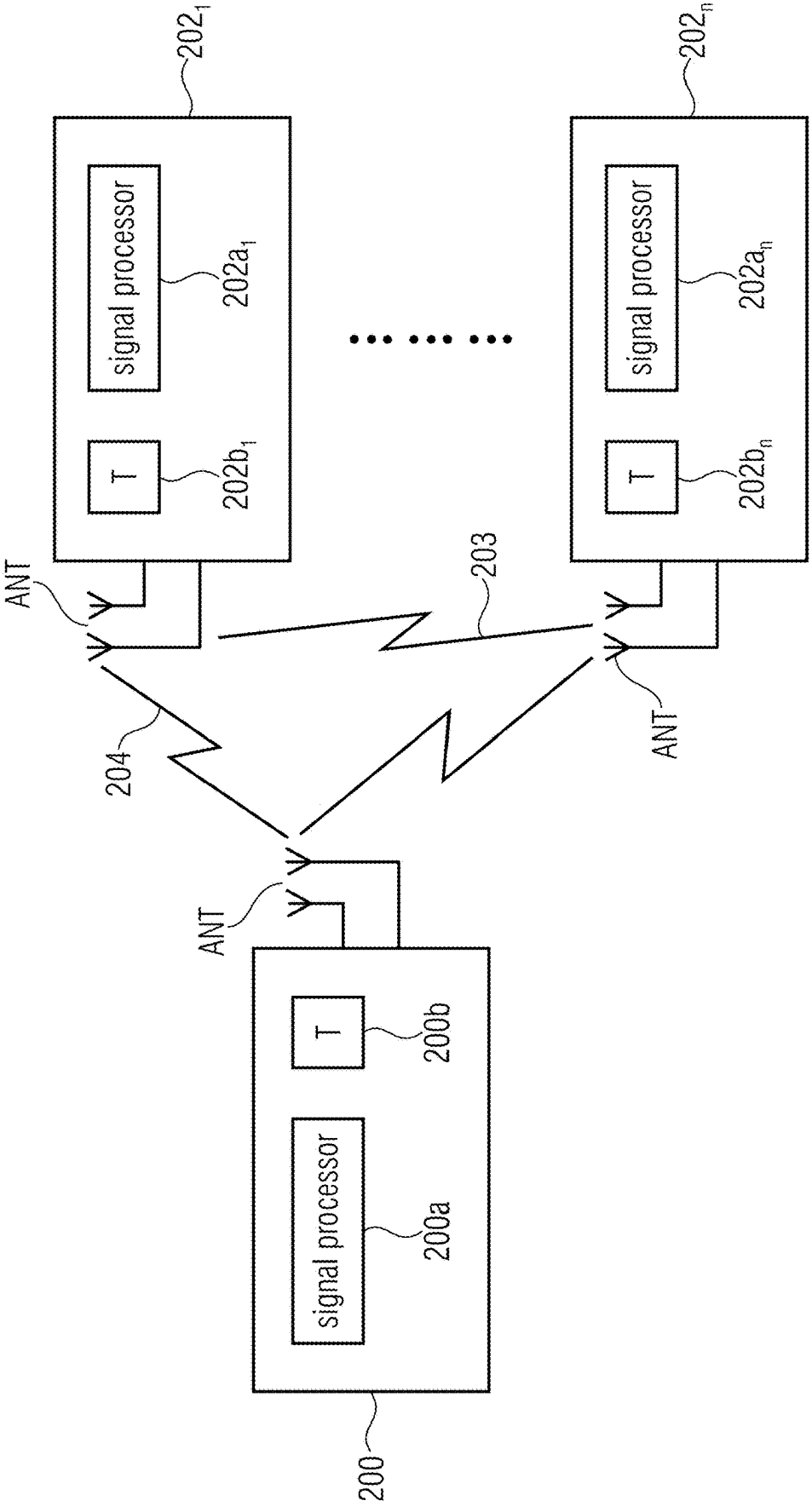
202$_1$
202$_n$
signal processor
202a$_1$
signal processor
202a$_n$
T
202b$_1$
T
202b$_n$
ANT
203
ANT
204
ANT
T
200b
signal processor
200a
200

Fig. 6

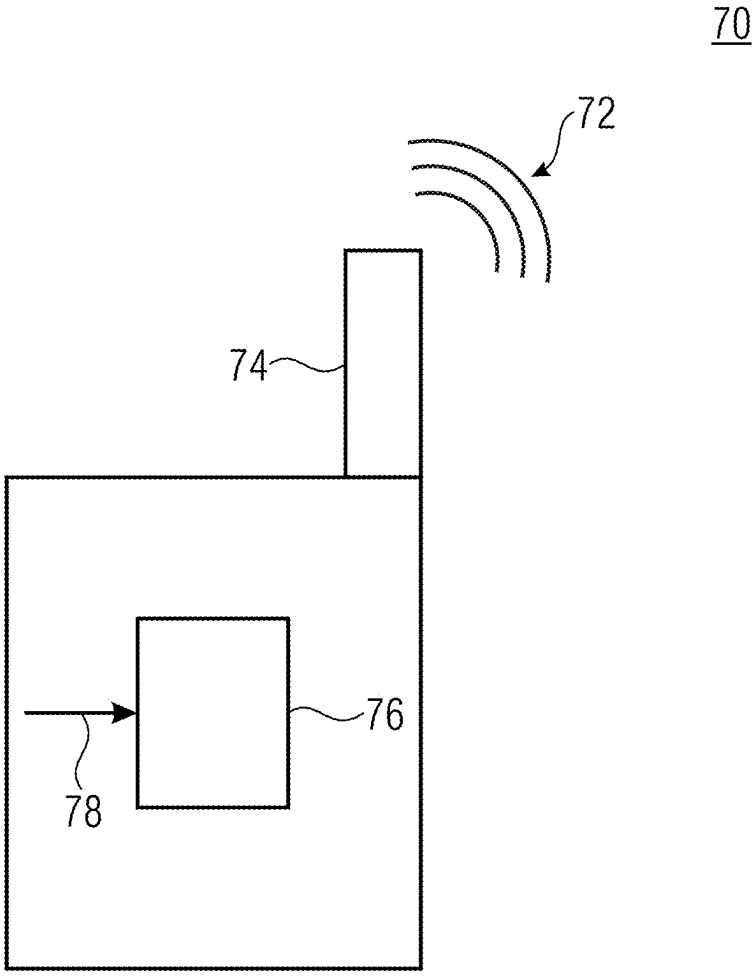

Fig. 7

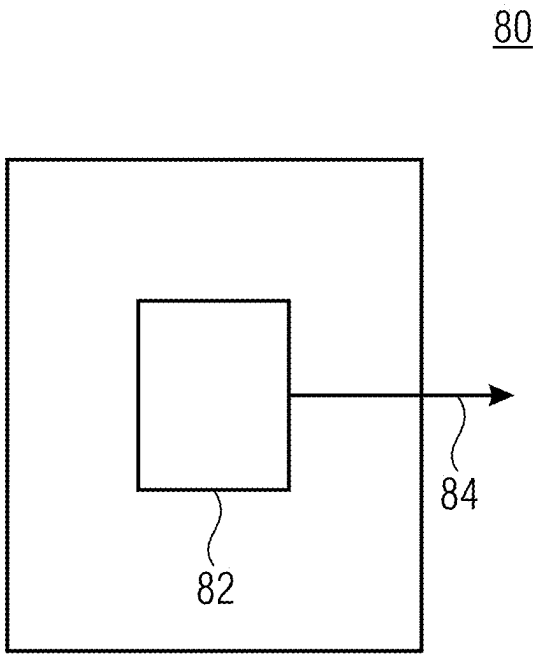

Fig. 8

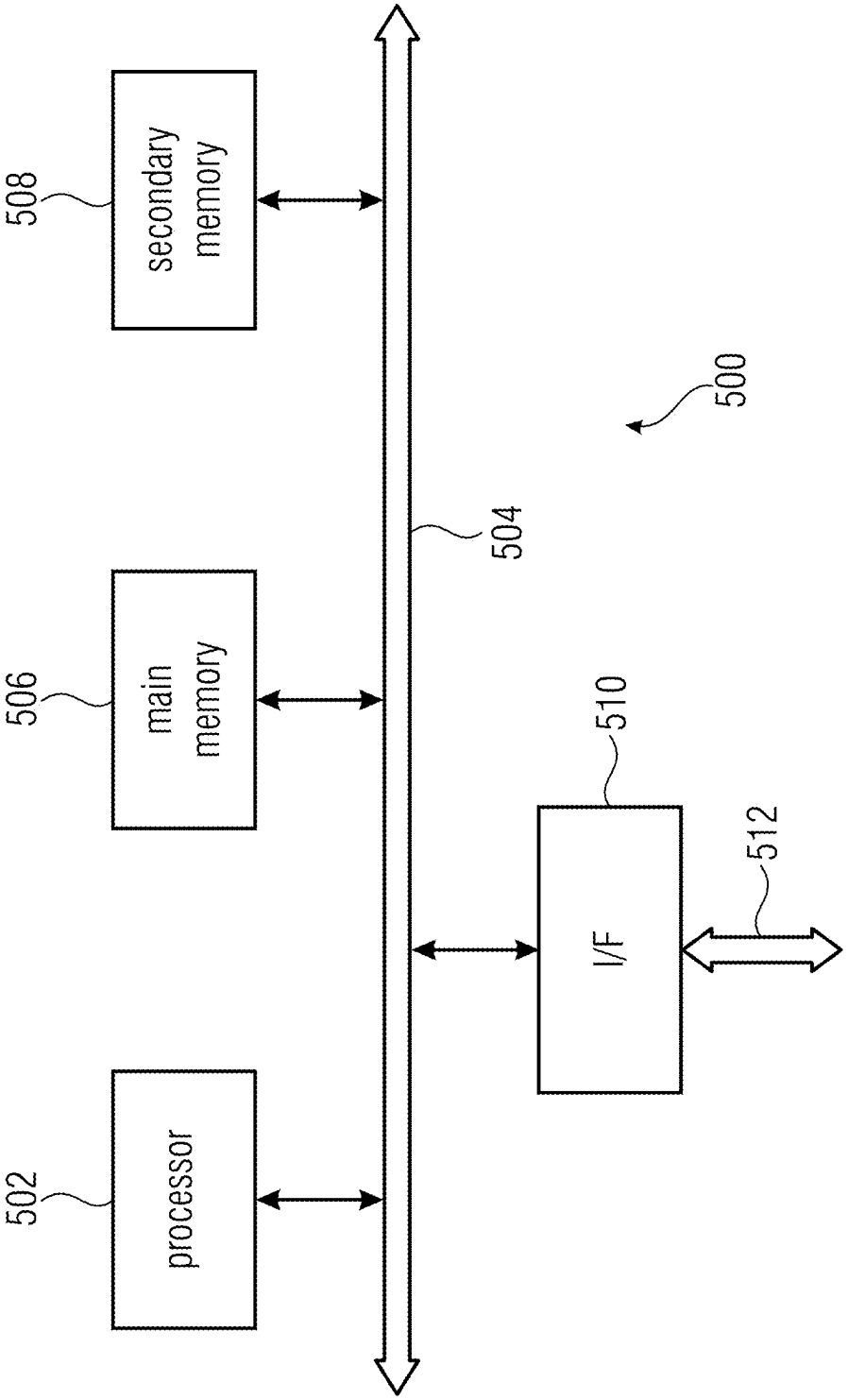
500
502
processor
504
506
main memory
508
secondary memory
510
I/F
512

Fig. 9

CONFIGURATION INFORMATION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of copending International Application No. PCT/EP2023/081339, filed Nov. 9, 2023, which is incorporated herein by reference in its entirety, and additionally claims priority from European Application No. 22206969.2, filed Nov. 11, 2022, which is also incorporated herein by reference in its entirety.

[0002] Embodiments of the present application relate to the field of wireless communication, and more specifically, to wireless communication in a wireless communication system, the communication relying on the use of resources. Some embodiments relate to configuration information (CI) that allows to mitigate the effects of communication resource limitations.

BACKGROUND OF THE INVENTION

[0003] FIG. **1** is a schematic representation of an example of a terrestrial wireless network **100** including, as is shown in FIG. **1** (*a*), a core network **102** and one or more radio access networks RAN**1**, RAN**2**, ... RANN. FIG. **1** (*b*) is a schematic representation of an example of a radio access network RANn that may include one or more base stations gNB**1** to gNB**5**, each serving a specific area surrounding the base station schematically represented by respective cells **1061** to **1065**. The base stations are provided to serve users within a cell. The term base station, BS, refers to a gNB in 5G networks, an eNB in UMTS/LTE/LTE-A/LTE-A Pro, or just a BS in other mobile communication standards. A user may be a stationary device or a mobile device.

[0004] The wireless communication system may also be accessed by mobile or stationary IoT devices which connect to a base station or to a user. The mobile devices or the IoT devices may include physical devices, ground based vehicles, such as robots or cars, aerial vehicles, such as manned or unmanned aerial vehicles (UAVs), the latter also referred to as drones, buildings and other items or devices having embedded therein electronics, software, sensors, actuators, or the like as well as network connectivity that enables these devices to collect and exchange data across an existing network infrastructure. FIG. **1** (*b*) shows an exemplary view of five cells, however, the RANn may include more or less such cells, and RANn may also include only one base station. FIG. **1** (*b*) shows two users UE**1** and UE**2**, also referred to as user equipment, UE, that are in cell **1062** and that are served by base station gNB**2**. Another user UE**3** is shown in cell **1064** which is served by base station gNB**4**. The arrows **1081**, **1082** and **1083** schematically represent uplink/downlink connections for transmitting data from a user UE**1**, UE**2** and UE**3** to the base stations gNB**2**, gNB**4** or for transmitting data from the base stations gNB**2**, gNB**4** to the users UE**1**, UE**2**, UE**3**. Further, FIG. **1** (*b*) shows two IoT devices **1101** and **1102** in cell **1064**, which may be stationary or mobile devices. The IoT device **1101** accesses the wireless communication system via the base station gNB**4** to receive and transmit data as schematically represented by arrow **1121**. The IoT device **1102** accesses the wireless communication system via the user UE**3** as is schematically represented by arrow **1122**. The respective base station gNB**1** to gNB**5** may be connected to the core network **102**, e.g., via the S1 interface, via respective backhaul links **1141** to **1145**, which are schematically represented in FIG. **1** (*b*) by the arrows pointing to "core". The core network **102** may be connected to one or more external networks. Further, some or all of the respective base station gNB**1** to gNB**5** may connected, e.g., via the S1 or X2 interface or the XN interface in NR, with each other via respective backhaul links **1161** to **1165**, which are schematically represented in FIG. **1** (*b*) by the arrows pointing to "gNBs".

[0005] For data transmission a physical resource grid may be used. The physical resource grid may comprise a set of resource elements to which various physical channels and physical signals are mapped. For example, the physical channels may include the physical downlink, uplink and sidelink shared channels (PDSCH, PUSCH, PSSCH) carrying user specific data, also referred to as downlink, uplink and sidelink payload data, the physical broadcast channel (PBCH) carrying for example a master information block (MIB), the physical downlink shared channel (PDSCH) carrying for example a system information block (SIB), the physical downlink, uplink and sidelink control channels (PDCCH, PUCCH, PSSCH) carrying for example the downlink control information (DCI), the uplink control information (UCI) and the sidelink control information (SCI). For the uplink, the physical channels, or more precisely the transport channels according to 3GPP, may further include the physical random access channel (PRACH or RACH) used by UEs for accessing the network once a UE is synchronized and has obtained the MIB and SIB. The physical signals may comprise reference signals or symbols (RS), synchronization signals and the like. The resource grid may comprise a frame or radio frame having a certain duration in the time domain and having a given bandwidth in the frequency domain. The frame may have a certain number of subframes of a predefined length, e.g., 1 ms. Each subframe may include one or more slots of 12 or 14 OFDM symbols depending on the cyclic prefix (CP) length. All OFDM symbols may be used for DL or UL or only a subset, e.g., when utilizing shortened transmission time intervals (sTTI) or a mini-slot/non-slot-based frame structure comprising just a few OFDM symbols.

[0006] The wireless communication system may be any single-tone or multicarrier system using frequency-division multiplexing, like the orthogonal frequency-division multiplexing (OFDM) system, the orthogonal frequency-division multiple access (OFDMA) system, or any other IFFT-based signal with or without CP, e.g., DFT-s-OFDM. Other waveforms, like non-orthogonal waveforms for multiple access, e.g., filter-bank multicarrier (FBMC), generalized frequency division multiplexing (GFDM) or universal filtered multi carrier (UFMC), may be used. The wireless communication system may operate, e.g., in accordance with the LTE-Advanced pro standard or the NR (5G), New Radio, standard.

[0007] The wireless network or communication system depicted in FIG. **1** may by a heterogeneous network having distinct overlaid networks, e.g., a network of macro cells with each macro cell including a macro base station, like base station gNB**1** to gNB**5**, and a network of small cell base stations (not shown in FIG. **1**), like femto or pico base stations.

[0008] In addition to the above described terrestrial wireless network also non-terrestrial wireless communication networks exist including spaceborne transceivers, like sat-

ellites, and/or airborne transceivers, like unmanned aircraft systems. The non-terrestrial wireless communication network or system may operate in a similar way as the terrestrial system described above with reference to FIG. **1**, for example in accordance with the LTE-Advanced Pro standard or the NR (5G), new radio, standard.

[0009] In mobile communication networks, for example in a network like that described above with reference to FIG. **1**, like an LTE or 5G/NR network, there may be UEs that communicate directly with each other over one or more sidelink (SL) channels, e.g., using the PC5 interface. UEs that communicate directly with each other over the sidelink may include vehicles communicating directly with other vehicles (V2V communication), vehicles communicating with other entities of the wireless communication network (V2X communication), for example roadside entities, like traffic lights, traffic signs, or pedestrians. Other UEs may not be vehicular related UEs and may comprise any of the above-mentioned devices. Such devices may also communicate directly with each other (D2D communication) using the SL channels.

[0010] When considering two UEs directly communicating with each other over the sidelink, both UEs may be served by the same base station so that the base station may provide sidelink resource allocation configuration or assistance for the UEs. For example, both UEs may be within the coverage area of a base station, like one of the base stations depicted in FIG. **1**. This is referred to as an "in-coverage" scenario. Another scenario is referred to as an "out-of-coverage" scenario. It is noted that "out-of-coverage" does not mean that the two UEs are not within one of the cells depicted in FIG. **1**, rather, it means that these UEs

[0011] may not be connected to a base station, for example, they are not in an RRC connected state, so that the UEs do not receive from the base station any sidelink resource allocation configuration or assistance, and/or

[0012] may be connected to the base station, but, for one or more reasons, the base station may not provide sidelink resource allocation configuration or assistance for the UEs, and/or

[0013] may be connected to the base station that may not support NR V2X services, e.g., GSM, UMTS, LTE base stations.

[0014] When considering two UEs directly communicating with each other over the sidelink, e.g., using the PC5 interface, one of the UEs may also be connected with a BS, and may relay information from the BS to the other UE via the sidelink interface. The relaying may be performed in the same frequency band (in-band-relay) or another frequency band (out-of-band relay) may be used. In the first case, communication on the Uu and on the sidelink may be decoupled using different time slots as in time division duplex, TDD, systems.

[0015] FIG. **2** is a schematic representation of an in-coverage scenario in which two UEs directly communicating with each other are both connected to a base station. The base station gNB has a coverage area that is schematically represented by the circle **200** which, basically, corresponds to the cell schematically represented in FIG. **1**. The UEs directly communicating with each other include a first vehicle **202** and a second vehicle **204** both in the coverage area **200** of the base station gNB. Both vehicles **202**, **204** are connected to the base station gNB and, in addition, they are connected directly with each other over the PC5 interface. The scheduling and/or interference management of the V2V traffic is assisted by the gNB via control signaling over the Uu interface, which is the radio interface between the base station and the UEs. In other words, the gNB provides SL resource allocation configuration or assistance for the UEs, and the gNB assigns the resources to be used for the V2V communication over the sidelink. This configuration is also referred to as a mode **1** configuration in NR V2X or as a mode **3** configuration in LTE V2X.

[0016] FIG. **3** is a schematic representation of an out-of-coverage scenario in which the UEs directly communicating with each other are either not connected to a base station, although they may be physically within a cell of a wireless communication network, or some or all of the UEs directly communicating with each other are to a base station but the base station does not provide for the SL resource allocation configuration or assistance. Three vehicles **206**, **208** and **210** are shown directly communicating with each other over a sidelink, e.g., using the PC5interface. The scheduling and/or interference management of the V2V traffic is based on algorithms implemented between the vehicles. This configuration is also referred to as a mode 2 configuration in NR V2X or as a mode 4 configuration in LTE V2X. As mentioned above, the scenario in FIG. **3** which is the out-of-coverage scenario does not necessarily mean that the respective mode 2 UEs (in NR) or mode 4 UEs (in LTE) are outside of the coverage **200** of a base station, rather, it means that the respective mode 2 UEs (in NR) or mode 4 UEs (in LTE) are not served by a base station, are not connected to the base station of the coverage area, or are connected to the base station but receive no SL resource allocation configuration or assistance from the base station. Thus, there may be situations in which, within the coverage area **200** shown in FIG. **2**, in addition to the NR mode 1 or LTE mode 3 UEs **202**, **204** also NR mode 2 or LTE mode 4 UEs **206**, **208**, **210** are present.

[0017] Naturally, it is also possible that the first vehicle **202** is covered by the gNB, i.e. connected with Uu to the gNB, wherein the second vehicle **204** is not covered by the gNB and only connected via the PC5 interface to the first vehicle **202**, or that the second vehicle is connected via the PC5 interface to the first vehicle **202** but via Uu to another gNB, as will become clear from the discussion of FIGS. **4** and **5**.

[0018] FIG. **4** is a schematic representation of a scenario in which two UEs directly communicating with each, wherein only one of the two UEs is connected to a base station. The base station gNB has a coverage area that is schematically represented by the circle **200** which, basically, corresponds to the cell schematically represented in FIG. **1**. The UEs directly communicating with each other include a first vehicle **202** and a second vehicle **204**, wherein only the first vehicle **202** is in the coverage area **200** of the base station gNB. Both vehicles **202**, **204** are connected directly with each other over the PC5 interface.

[0019] FIG. **5** is a schematic representation of a scenario in which two UEs directly communicating with each, wherein the two UEs are connected to different base stations. The first base station gNB**1** has a coverage area that is schematically represented by the first circle **2001**, wherein the second station gNB**2** has a coverage area that is schematically represented by the second circle **2002**. The UEs directly communicating with each other include a first

vehicle **202** and a second vehicle **204**, wherein the first vehicle **202** is in the coverage area **2001** of the first base station gNB**1** and connected to the first base station gNB**1** via the Uu interface, wherein the second vehicle **204** is in the coverage area **2002** of the second base station gNB**2** and connected to the second base station gNB**2** via the Uu interface.

[0020] Based thereon, consider a wireless communication system (WCS) comprised of entities equipped with the means to communicate via a radio access network (RAN). In certain situations, even a very carefully designed and deployed WCS might experience scenarios in which not all of the entities (e.g. user equipment (UE) devices) can establish communication links with other entities or cannot establish or maintain links which satisfy requested quality of service, QoS parameters. This could result from one or more of the following examples:

[0021] inadequate coverage in remote, isolated, blocked, shaded or otherwise strongly attenuated environments; a reduced availability or a complete unavailability of communication resources; access link limitations; backhaul link limitations; control channel limitations; or an imbalance in the uplink and downlink. Generally speaking, the first set refers to coverage whilst all other sets refer to service—hence the terms "in coverage" (IC), "out of coverage" (OOC), "in service" (IS) and "out of service" (OOS).

[0022] In list form, resource limitations refer to the reduced availability or the complete unavailability of:

[0023] Access link (e.g. Uu, NTN, sidelink, SSBs, Wi-Fi)

[0024] Backhaul link

[0025] Relay link

[0026] Control channel (in access or backhaul link)

[0027] Link imbalance (downlink versus uplink)

[0028] A RIS

[0029] one or more symbols,

[0030] one or more time slots or subframes or frames,

[0031] one or more frequencies or carriers or subchannels or group of subchannels,

[0032] one or more subcarriers, e.g., for transmission of IoT messages like NB-IoT, LoRA etc.

[0033] one or more interfaces,

[0034] one or more channels e.g., a control channel, a user data channel or any other channel for a dedicated purpose

[0035] one or more resource block sets, RB sets,

[0036] one or more frequency bands, like unlicensed subbands,

[0037] one or more bandwidth parts,

[0038] one or more resource pools,

[0039] one or more LBT sub-bands,

[0040] one or more spatial resources, e.g., using spatial multiplexing, directional beams etc.

[0041] one or more than one resource,

[0042] a sub-channel,

[0043] a sub-band,

[0044] Furthermore, the device, e.g., a UE, may be communicating with another network entity, wherein the other network entity or destination entity comprises one or more of the following:

[0045] a further base station, BS,

[0046] a roadside unit, RSU,

[0047] an orbital side unit (equivalent of a roadside unit, where satellites or airplanes pass by and can exchange information with the RSU)

[0048] a mobile BS mounted on a land or water vehicle e.g., a car, bus, train, ship/vessel, submarine or on a container loaded thereon or on any piece of equipment mounted on or attached to the vehicle

[0049] a mobile BS mounted on a non-terrestrial/airborne vehicle or device e.g., an aircraft, UAV, balloon, rocket, satellite or any other object/device moving/floating in 3D-space without being in touch with the surface of a planet or a liquid on the planet (e.g. water of a lake or the sea)

[0050] a further UE,

[0051] a Customer Premises Equipment, CPE

[0052] an IoT device,

[0053] a broadcast tower like one used for digital audio (radio) or Television (video) broadcast

[0054] a relay device,

[0055] a further relay device,

[0056] a core network,

[0057] function located somewhere in the communication network, e.g., a UPF, LMF, AMF, SMF etc.

[0058] an application server connected to the core network,

[0059] an aggregation node for e.g., storage, processing (fusion, decision making, computing outputs) or forwarding of sensor data, messages, retransmissions, AIM, measurements reports, configurations etc.,

[0060] a data base.

[0061] In such scenarios, a UE that relies on another network entity (e.g. a basestation (BS)) to provide it with configuration information—information that includes parameter settings such as power, frequency, modulation, channel number, carrier assignment, time-frequency assignment, pattern characteristics and the such like—is unlikely to obtain such information from the other network entity due to one or more of the conditions listed above.

[0062] A problem arising in known networks relates to degradation of, interruption in, drop of or unavailability of a communication link due to shortage of communication resources below a level suitable for a needed, selected, targeted mode of operation of a communication link with its associated parameters and metrics.

SUMMARY

[0063] According to an embodiment, a network entity configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system and for using a wireless interface of the network entity for the communication may have: a control unit configured for processing configuration information indicating a change of an availability of the resource; wherein the control unit is configured for adapting the configuration based on the configuration information to react on the change of the availability.

[0064] According to another embodiment, a network entity configured for operating in a wireless communication system may have: a control unit configured for processing configuration information indicating a change in an availability of the resource; wherein the control unit is configured for reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an

acknowledging, and combinations thereof related to the availability; and for providing a result thereof to the wireless communications system.

[0065] According to another embodiment, a network entity configured for a communication in a wireless communication system may have: a control unit configured for generating configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system; wherein the network entity is configured for providing the configuration information to the wireless communication system and/or the different network entity.

[0066] According to another embodiment, a wireless communication system providing wireless communication between different entities of the wireless communication system according to a configuration, the communication using a resource of the wireless communication system, may have: a first entity being configured for providing, to at least one member of the wireless communication system, configuration information indicating a change of an availability of a resource of the wireless communication system; a second entity that is configured for adapting the configuration based on the configuration information to mitigate an effect of the change of the availability on at least one entity of the wireless communication system.

[0067] According to another embodiment, a method for operating a network entity configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system and for using a wireless interface of the network entity for the communication, may have the steps of: processing, with a control unit of the network entity, configuration information indicating a change of an availability of the resource; adapting the configuration based on the configuration information to react on the change of the availability.

[0068] According to another embodiment, a method for operating a network entity configured for operating in a wireless communication system may have the steps of: processing, using a control unit of the network entity, configuration information indicating a change in an availability of the resource; reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an acknowledging, and combinations thereof related to the availability; and providing a result thereof to the wireless communications system.

[0069] According to another embodiment, a method for operating a network entity configured for a communication in a wireless communication system may have the steps of: generating configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system using a control unit of the network entity; providing the configuration information to the wireless communication system and/or the different network entity.

[0070] Another embodiment relates to a non-transitory digital storage medium having a computer program stored thereon to perform any of the inventive methods when said computer program is run by a computer.

[0071] A finding of the present invention is that reliability of communication in a wireless communication system may be improved when compared to known systems and maybe significantly improved by making unexpected changes in the wireless communication system expected for the network entity, e.g., a UE such that it can react on a changed availability of a resource with respect to a change in the past, the present or in future. According to the present invention, the network entity is provided with configuration information that indicates the change of the availability that would elsewise be, within the implemented (known) communication standard be unknown to the network entity.

[0072] It is noted that the information in the above section is only for enhancing the understanding of the background of the invention and therefore it may contain information that does not form conventional technology and is already known to a person of ordinary skill in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0073] Embodiments of the present invention will be detailed subsequently referring to the appended drawings, in which:

[0074] FIG. **1** shows a schematic representation of an example of a wireless communication system;

[0075] FIG. **2** is a schematic representation of an in-coverage scenario in which UEs directly communicating with each other are connected to a base station;

[0076] FIG. **3** is a schematic representation of an out-of-coverage scenario in which UEs directly communicating with each other receive no SL resource allocation configuration or assistance from a base station;

[0077] FIG. **4** is a schematic representation of a partial out-of-coverage scenario in which some of the UEs directly communicating with each other receive no SL resource allocation configuration or assistance from a base station;

[0078] FIG. **5** is a schematic representation of an in-coverage scenario in which UEs directly communicating with each other are connected to different base stations;

[0079] FIG. **6** is a schematic representation of a wireless communication system comprising a transceiver, like a base station or a relay, and a plurality of communication devices, like UEs, according to an embodiment;

[0080] FIG. **7** shows a schematic block diagram of a network entity using configuration information according to an embodiment; and

[0081] FIG. **8** shows a schematic block diagram of a network entity providing configuration information according to an embodiment; and

[0082] FIG. **9** illustrates an example of a computer system on which units or modules as well as the steps of the methods described in accordance with the inventive approach may execute.

DETAILED DESCRIPTION OF THE INVENTION

[0083] Equal or equivalent elements or elements with equal or equivalent functionality are denoted in the following description by equal or equivalent reference numerals.

[0084] In the following description, a plurality of details are set forth to provide a more thorough explanation of embodiments of the present invention. However, it will be apparent to one skilled in the art that embodiments of the present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form rather than in detail in order to avoid obscuring embodiments of the present invention. In addition, features of the different

embodiments described hereinafter may be combined with each other, unless specifically noted otherwise.

[0085] A wireless communication system as described above serves only as an example of a system that may benefit from the advantages obtained by the present invention. Embodiments are not limited to terrestrial networks but also cover non-terrestrial networks or combinations thereof. Alternatively or in addition, terminals, base stations and/or other network entities may but are not required to be mobile and may, thus, be individually, in groups or globally within the communication system be stationary.

[0086] In list form, known configuration information can contain the present and future availability or unavailability relating to:

[0087] Spatial resources

[0088] Temporal resources

[0089] Spectral resources

[0090] Coverage

[0091] Beams

[0092] Service provided by gNB, sidelink, satellite, RIS, repeater

[0093] Embodiments of the present invention may be implemented in a wireless communication system or network as depicted in FIGS. **1** to **5** including a transceiver, like a base station, gNB, or relay, and a plurality of communication devices, like user equipment's, UEs. FIG. **6** is a schematic representation of a wireless communication system comprising a transceiver **200**, like a base station or a relay, and a plurality of communication devices **2021** to **202***n*, like UEs. The UEs might communicated directly with each other via a wireless communication link or channel **203**, like a radio link (e.g., using the PC5 interface (sidelink)). Further, the transceiver and the UEs **202** might communicate via a wireless communication link or channel **204**, like a radio link (e.g., using the uU interface). The transceiver **200** might include one or more antennas ANT or an antenna array having a plurality of antenna elements, a signal processor **200***a* and a transceiver unit **200***b*. The UEs **202** might include one or more antennas ANT or an antenna array having a plurality of antennas, a processor **202***a***1** to **202***an*, and a transceiver (e.g., receiver and/or transmitter) unit **202***b***1** to **202***b*n. The base station **200** and/or the one or more UEs **202** may operate in accordance with the inventive teachings described herein.

[0094] According to an embodiment, a network entity is configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system and for using a wireless interface of the network entity for the communication, the network entity comprising a control unit configured for processing configuration information indicating a change of an availability of the resource. The configuration information may be available for or transmitted to the network entity, e.g., wirelessly received, (pre-) configured, stored thereon, or the like. The control unit is configured for adapting the configuration based on the configuration information to react on the change of the availability.

[0095] According to an embodiment the network entity is a user equipment, UE, that is configured for adapting the configuration to change its behavior in the wireless communication system based on the change of the availability of the resource.

[0096] According to an embodiment the change relates to an anomalous availability of the resource and/or a significant change of the availability.

[0097] According to an embodiment the configuration information leads the anomalous change to be an expected situation for the network entity.

[0098] According to an embodiment the anomalous availability relates to at least one of:

[0099] a time, e.g., being a start, end, period/interval/duration or change of state or change of trend, related to at least one of:

[0100] an availability and/or non-availability of the resource;

[0101] an occurrence of a blockage event blocking at least a part of the communication;

[0102] an occurrence of an outage event and/or an outage period of the communication;

[0103] an occurrence of an interference event and/or a jamming event influencing the communication;

[0104] an occurrence of an energy related state and/or a power related state of the communication; e.g., low battery state, recharging time, estimated remaining energy, transmit power constraints due to EIRP restrictions, multi-band operation, interference constraints

[0105] a resource is subject to

[0106] a decrease below a threshold of at least one parameter relevant for the communication,

[0107] an increase above a threshold of at least one parameter relevant for the communication,

[0108] a maintain within or outside a corridor of values of at least one parameter relevant for the communication,

[0109] maintain within or outside a region or area of validity of at least one parameter relevant for the communication with respect to a metric, e.g., coverage, capacity, data rate, reliability, latency]

[0110] a particular distribution, e.g., of parameters and/or states across a dimensions of at least one parameter relevant for the communication using the resource, e.g., in time, frequency, space, directions, location, etc.

[0111] a constraint related to the resource in view of at least one of:

[0112] a provided data volume;

[0113] an allocated spectrum and/or resource block (RB);

[0114] a modulation and coding scheme (MCS) used for the communication;

[0115] a block size used for the communication

[0116] a size of a message, a volume such as data volume or a size of a folder/file and/or a number of messages, e.g., per unit time and/or unit of opportunity

[0117] a change of any above, e.g., states/values or trends (increase→decrease, decrease→increase)

[0118] a particular or repeated pattern, a distribution, a statistic, a state, a value and/or a trend of occurrence

[0119] According to an embodiment the configuration information relates to an availability of the resource; or wherein the configuration information relates to an at least partial unavailability of the resource.

[0120] According to an embodiment configuration information indicates the change of the availability for a past, present and/or future instance of time.

[0121] According to an embodiment the control unit is configured for processing the configuration information to obtain a processing result that indicates an at least partial and/or at least temporal unavailability of the resource for the communication; and wherein the control unit is configured for controlling the network entity to avoid the communication using the resource based on the processing result.

[0122] According to an embodiment the control unit is configured for processing the configuration information to obtain a processing result that indicates a restored availability of the resource for the communication and/or that indicates an established availability of the resource; and wherein the control unit is configured for controlling the network entity to postpone the communication using the resource based on the processing result until the availability of the resource for the communication is restored or established.

[0123] According to an embodiment the configuration relates to at least one of:

[0124] a transmission, a reception, and combinations thereof provided by the network entity as the communication;

[0125] a measurement, a logging, a reporting an acknowledging, and combinations thereof to be provided by the network entity;

[0126] a transmission and/or a reception of at least one preconfigured signal such as a test signal, of at least one preconfigured reference signal, and/or of at least one preconfigured message such as a test message;

[0127] a performing of a procedure of transmission of at least one signal and/or a procedure of reception of at least one signal and processing thereof, e.g., beam sweeping, frequency sweep.

[0128] According to an embodiment the resource comprises at least one of:

[0129] an access link resource, a sidelink resource, a relay link resource and/or a backhaul link resource;

[0130] a temporal, spectral, sequential (spreading sequence) and/or spatial communication resource;

[0131] a transport channel, a positioning channel, a control channel and/or a data channel;

[0132] a transmission/reception beam represented by a beam-ID, SSB, CSI-RS, a beam sweep and/or a coordinated beam constellation;

[0133] a propagation channel component such as a line-of-sight, LOS, non-line-of-sight, NLOS, obstructed line-of-sight, OLOS, a dominant or specific multi-path component, (MPC;

[0134] a service or connectivity provided by another network entity such as a gNB, core network, access network, repeater, RIS, satellite;

[0135] a quality of service, Qos, related to communication metrics such as coverage, capacity, latency and/or jitter

[0136] According to an embodiment the configuration information comprises at least one of:

[0137] information indicating at least one trigger indicating to start or stop a particular action/behaviour of the device;

[0138] information indicating at least one event which is relevant to the communication scenario;

[0139] information indicating at least one condition which describes e.g., the communication scenario, status values/messages of the UE or other network devices;

[0140] information indicating a combination or sequence thereof indicating at least one of:

[0141] a state, e.g., of a state machine

[0142] a status, e.g., of a report, action, confirmation or acknowledgment

[0143] a period, of a parameter being below/above a threshold or within a range OR a certain state/status is given/valid/invalid

[0144] an event,

[0145] a request of an action, observation and/or measurement

[0146] a report relating to an action, observation and/or measurement

[0147] an action, e.g., of stopping a counter, continuing until something else happens

[0148] a procedure, to:

[0149] start/pause/continue/end;

[0150] activate/deactivate; and/or

[0151] confirm/acknowledge, e.g., of actions, reports, status

[0152] According to an embodiment the configuration information comprises information indicating an event or trigger; wherein based on the processing, the control unit is configured for controlling the network entity responsive to the event or trigger to at least one of:

[0153] starting, stopping, resetting and/or halting of at least one counter and/or count-down timer;

[0154] capturing, freezing, storing, forwarding a current and/or future, e.g., anticipated state and/or configuration;

[0155] an automatic (re)-configuration of the network device and/or its behaviour after a trigger, after an event occurred and/or after a condition is met;

[0156] starting, halting, delaying, restarting and/or preparing to start a procedure or mode of operation of the network entity,

[0157] changing from one procedure, routine or mode of operation into another one;

[0158] determining or selecting a mode of operation and/or a transmission/reception strategy;

[0159] discovering, observing, detecting, monitoring and/or tracing an events and/or a parameter related to any of the above configuration information and/or associated actions, triggers, configuration variants thereof; as an example a UE may be observing pattern of availability of one or more beams based on RS or beam-ID and determining or reporting future availability, based on this another device e.g., a gNB or RIS can be configured to go/remain in particular configuration states such that a certain coverage/capacity requirement of a particular UE is fulfilled)

[0160] preparing a transmission and/or reception of at least one of a report, a message, control data and user data; for preparing of a future, e.g., subsequent or next connection availability events.

[0161] Although having a related or even similar meaning, some differences may be formulated, at least in connection with some embodiments, relating to the term event, condition/state and trigger. For example, an event may be under-

stood, in some context, a something that happens—e.g. a loss of service, a loss of coverage, a power failure

[0162] Compared hereto, a condition may relate to a particular state—e.g. the Signal-to-interference-plus-noise-ratio (SINR) which is below some amount, the Reference Signal Received Power (RSRP)/Reference Signal Received Quality (RSRQ)/RSSI (Received Signal Strength Indicator)/Round Trip Delay (RTD) which is below/above a predefined value and/or within a range of values or the like. A trigger may be understood, for example, as a result of a particular event occurring.

[0163] According to an embodiment the network entity is configured for obtaining the configuration information based on at least one of:

[0164] as a pre-set or pre-configured information, e.g. by default, factory settings, recently updated

[0165] based on a past or last used, present or future mode of operation or a change in the mode of operation, e.g. from Uu to sidelink, from sidelink to Uu, from Uu to NTN, from NTN to Uu, from SL to NTN or from NTN to SL. as information provided by the wireless communication system or network

[0166] as information provided by a database, e.g. connected to the RAN as an entity

[0167] as information provided via an alternative radio access network, RAN, e.g. Wi-Fi, Bluetooth or the like

[0168] as information provided by a remote UE and/or a group leader UE

[0169] According to an embodiment the network entity is configured for obtaining the configuration information as one of a plurality of configuration information.

[0170] According to an embodiment the network entity is configured for receiving at least one of the plurality of configuration information by receiving and processing a wireless signal.

[0171] According to an embodiment the network entity is configured for obtaining a first configuration information that causes the control unit to control the network entity into an operation mode supported by a wireless communication system controller such as a gNB, e.g., via a radio resource control, RRC, message;

[0172] wherein the network entity is configured for obtaining a second configuration information that causes the control unit to control the network entity into one of different behaviors within the operation mode.

[0173] According to an embodiment the network entity is configured for receiving at least a part of the first configuration information by receiving a radio resource control, RRC, message; wherein the network entity is configured for obtaining at least a part of the second configuration information by receiving a transmission control information, TCI.

[0174] According to an embodiment the network entity is a user equipment, UE.

[0175] According to an embodiment the configuration information is a first configuration information; wherein the control unit is configured for generating the first configuration information and/or for generating a second configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system; wherein the network entity is configured for providing the first configuration information and/or the second first configuration information to the wireless communication system and/or the different network entity.

[0176] According to an embodiment a network entity configured for operating in a wireless communication system comprises a control unit configured for processing configuration information indicating a change in an availability of the resource; wherein the control unit is configured for reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an acknowledging, and combinations thereof related to the availability; and for providing a result thereof to the wireless communications system.

[0177] According to an embodiment a network entity configured for a communication in a wireless communication system comprises: a control unit configured for generating configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system; wherein the network entity is configured for providing the configuration information to the wireless communication system and/or the different network entity.

[0178] According to an embodiment the network entity is a user equipment, UE configured for wirelessly providing the configuration information using a wireless interface of the network entity.

[0179] According to an embodiment the network entity is a base station, gNB, configured for wirelessly providing the configuration information using a wireless interface of the network entity.

[0180] According to an embodiment the configuration information is a first configuration information and wherein the resource is a first resource; wherein the network entity is configured for a communication in the wireless communication system according to a configuration using a same or different second resource of the wireless communication system and for using a wireless interface of the network entity for the communication; wherein the control unit is configured for processing second configuration information indicating a change of an availability of the second resource; wherein the control unit is configured for adapting the configuration based on the second configuration information to react on the change of the availability.

[0181] According to an embodiment a wireless communication system is provided, providing wireless communication between different entities of the wireless communication system according to a configuration, the communication using a resource of the wireless communication system, the wireless communication system comprising a first entity such as a UE, gNB, database or data storage being configured for providing, to at least one member of the wireless communication system, configuration information indicating a change of an availability of a resource of the wireless communication system; and a second entity that is configured for adapting the configuration based on the configuration information to mitigate an effect of the change of the availability on at least one entity of the wireless communication system.

[0182] According to an embodiment the first entity is a network entity according to an embodiment described herein, in particular a network entity to use configuration information; and/or the second entity is a network entity according to an embodiment, in particular a network entity to provide configuration information.

[0183] According to an embodiment a method for operating a network entity configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system and for using a wireless interface of the network entity for the communication comprises processing, with a control unit of the network entity, configuration information indicating a change of an availability of the resource; adapting the configuration based on the configuration information to react on the change of the availability.

[0184] According to an embodiment a method for operating a network entity configured for operating in a wireless communication system comprises processing, using a control unit of the network entity, configuration information indicating a change in an availability of the resource; reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an acknowledging, and combinations thereof related to the availability; and providing a result thereof to the wireless communications system.

[0185] According to an embodiment a method for operating a network entity configured for a communication in a wireless communication system comprises generating configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system using a control unit of the network entity; and providing the configuration information to the wireless communication system and/or the different network entity.

[0186] According to an embodiment a computer readable digital storage medium is provided, having stored thereon a computer program having a program code for performing, when running on a computer, a method described herein.

[0187] FIG. **7** shows a schematic block diagram of a network entity **70** according to an embodiment. Network entity **70** may operate, for example, as a UE, a base station, an IoT device, e.g., as described as a communication partner of the device and/or in connection with wireless network **100** or **200**, but, alternatively or in addition, may operate as a different device or entity of a wireless communication system, e.g., a satellite, an airplane, or the like.

[0188] The network entity **70** is configured for a communication in a wireless communication system, e.g., by transmitting and/or receiving a wireless signal **72**. The network entity **70** may comprise a wireless interface **74**, e.g., having one or more antenna elements that are grouped into one or more antenna panels or antenna arrays. Optionally but not necessarily, the network entity **70** may be configured for implementing a beam forming technique, e.g., transmitting wireless signal **72** into a first direction with a higher transmission power when compared to a different direction and/or receiving a wireless signal from a first direction with a higher sensitivity when compared to a different direction.

[0189] According to an implementation that may be realized in addition to the features described for network entity **70** or that may provide for an alternative implementation of the network entity **70**, the network entity **70** is configured for operating in a wireless communication system and comprises the control unit **76** configured for processing the configuration information **78** indicating a change in an availability of the resource used for communication. The control unit **76** is configured for reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an acknowledging, and combinations thereof related to the availability; and for providing a result thereof to the wireless communications system. That is, the change may lead to a reaction comprising a measurement, logging, reporting and/or acknowledging.

[0190] The communication in the wireless communication system may be organized according to a configuration that instructs a use of a resource of the wireless communication system. A configuration may include or relate to at least one of a transmission, a reception, or combinations thereof provided by the network entity as the communication. Alternatively or in addition, the configuration may relate to a measurement, a logging, a reporting, an acknowledging and/or combinations thereof to be provided by the network entity. Alternatively or in addition, the configuration may relate to a transmission and/or a reception of at least one preconfigured signal, e.g., a test signal, of at least one preconfigured reference signal and/or of at least one preconfigured message such as a test message. Alternatively or in addition, the configuration may relate to a performing of a procedure of transmission of at least one signal and/or a procedure of reception of at least one signal and processing thereof, e.g., beam sweeping, performing a frequency sweep or the like. For example, the configuration may indicate, describe or instruct a behavior of the network entity on how to perform its communication. For communication, a resource of the wireless communication system that is used may relate to a time resource, a frequency resource, a code resource but is not limited hereto. For example, a resource may not only relate to a resource element in the time-frequency grid but may also relate to a coverage, a service to be used or provided and/or other usable parts of a wireless communication system, amongst them:

[0191] an access link resource, a sidelink resource, a relay link resource and/or a backhaul link resource;

[0192] a temporal, spectral, sequential (spreading sequence) and/or spatial communication resource;

[0193] a transport channel, a positioning channel, a control channel and/or a data channel;

[0194] a transmission/reception beam represented by a beam-ID, SSB, CSI-RS, a beam sweep and/or a coordinated beam constellation;

[0195] a propagation channel component such as a line-of-sight, LOS, non-line-of-sight, NLOS, obstructed line-of-sight, OLOS, a dominant or specific multi-path component, (MPC;

[0196] a service or connectivity provided by another network entity such as a gNB, a core network, an access network, a repeater, a reconfigurable intelligent surface, RIS, or a satellite;

[0197] a quality of service, Qos, related to communication metrics such as coverage, capacity, latency and/or jitter

[0198] The network entity **70** comprises a control unit **76**, e.g., an adapted implementation of a processor **202** or a different processing unit. The control unit **76** is configured for processing configuration information **78** that indicates a change of an availability of the resource. The control unit **76** is configured for adapting the configuration based on the configuration information to react on the change of the availability. The change may presently occur or may be an event to occur in future. However, this does not preclude to changing an event in the past.

[0199] By processing the configuration information, a possibly unexpected change in the availability of the

resource becomes known and/or expected for the network entity **70** such that it can adapt its behavior, i.e., configuration. Embodiments of the present invention go beyond a rejection or acknowledgement of a grant of resources or a schedule of further communication. Such an adaptation of a grant of resources is considered to be a straightforward solution that is not unexpected for a network entity as it has knowledge about how to behave in a positive or negative response to a request. Embodiments provide for a solution, for example, on how to react in case of an availability or unavailability, e.g., a sudden unavailability of a link or other resources.

[0200] For example, the network entity **70** being implemented as a user equipment may be configured for adapting the configuration to change its behavior in the wireless communication system based on the change of the availability of the resource. For example, if communication is directed to or relayed via a network entity that is only discontinuously available, e.g., as being during sometimes out-of-sight and during other times in-range or providing a line-of-sight path, by use of the configuration information, the network entity **70** may become aware of those circumstances and may, for example, accumulate information to be transmitted to such entity until it again becomes available to thereby avoid, at least in parts, unnecessary transmissions. On the other hand, requests for re-transmissions or the like may be avoided as network entity **70** may be aware of the fact that although reception is expected, the other entity was unable to transmit and that a request for retransmission is possibly of low benefit or even useless.

[0201] Embodiments of the present invention in particular relate to an anomalous availability of the resource and/or a significant change of the availability. According to embodiments, the configuration information may lead the anomalous change of the availability to be an expected situation for the network entity. For example, the anomalous availability may relate to at least of:

[0202] a time, e.g., being or indicating a start, an end, a period, an interval, a duration and/or a change of state or change of trend and/or related to at least one of:

[0203] an availability and/or non-availability of the resource;

[0204] an occurrence of a blockage event blocking at least a part of the communication;

[0205] an occurrence of an outage event and/or an outage period of the communication;

[0206] an occurrence of an interference event and/or a jamming event influencing the communication;

[0207] an occurrence of an energy related state and/or a power related state of the communication; Examples include a low battery state, a recharging time, an estimated remaining energy, one or more transmit power constraints due to EIRP restrictions, multi-band operation and/or interference constraints;

[0208] a Resources are subject to

[0209] a decrease below a threshold of at least one parameter relevant for the communication,

[0210] an increase above a threshold of at least one parameter relevant for the communication,

[0211] a maintain within or outside a corridor of values of at least one parameter relevant for the communication,

[0212] maintain within or outside a region or area of validity of at least one parameter relevant for the communication with respect to a metric; examples may include a coverage, a capacity, a data rate, a reliability and/or a latency

[0213] a particular distribution of a parameter and/or states across a dimensions, e.g., a physical unit, of at least one parameter relevant for the communication using the resource; examples may include a time, a frequency, a space, a direction, a location, etc.

[0214] a constraint related to the resource in view of at least one of:

[0215] a provided data volume;

[0216] an allocated spectrum and/or resource block (RB);

[0217] a modulation and coding scheme (MCS) used for the communication;

[0218] a block size used for the communication

[0219] a size of a message, a volume such as data volume or size of a folder/file or payload data and/or a number of messages, e.g., per unit time and/or unit of opportunity

[0220] a change of any above, e.g., a state a value and/or a trend of change such as increase→decrease, decrease→increase and/or a rate of change

[0221] a particular or repeated pattern, a distribution, a statistic, a state, a value and/or a trend of occurrence

[0222] One specific but nevertheless non-limiting example of the present invention, is a network entity such as a UE located, e.g., in a canyon and communicating with a moving satellite such that a Los-connection to the satellite is possibly interrupted by the canyon structure leading to an anomalous degradation of the link. With the knowledge, provided through the use of configuration information, of when the connection will be interrupted and/or possibly be interrupted in future, the network entity and/or the satellite may be aware of times during which the other entity is in range and may accordingly adapt their communication, amongst them: not transmitting a signal when the other entity is not reachable, avoiding re-transmissions or requests for that entity during that times and/or preparing communication for times during which communication is possible, e.g., reserving resources, collecting data to be transmitted and the like.

[0223] The configuration information may be stored or available in the network entity **70** and/or may be received by use of external signaling, e.g., using a wireless signal, e.g., from a network coordinator or cell coordinator such as a base station, from another peer, e.g., using a sidelink or by use of different interfaces including wired, optical and/or wireless interfaces.

[0224] Known or state-of-the-art (SOTA) wireless communication systems are designed such that they explore the availability of communication partners, e.g., availability of a cellular network or a Wi-Fi access point, then to measure or test a propagations environment using training sequences e.g. reference symbols transmitted by at least one of the communication partners, followed by a communication access procedure, configuration/negotiation of the link and network parameters and finally use a standardized communication procedure to transfer/exchange control and user data over the wireless link.

[0225] Due to the fact that the propagation channel might change in quality or availability to support a targeted or requested quality or reliability of wireless communication, methods of link adaptation and signalling of requested or

available link parameters (data rate, latency) have been introduced in many wireless systems. Such wireless systems generally rely on currently known properties of the communication channel and the assumption that within link adaptation loop control delay such properties remain. Following this rational slowly varying changes of the channel conditions can be followed and the transmission scheme adapted accordingly.

[0226] In case of fluctuations in channel properties e.g., fast fading, sporadic or localized crosslink interference a variety of mitigation and compensation schemes have be introduced, among these are diversity schemes like spreading in time or frequency, antenna diversity and packet retransmission, packet duplication or channel codes are SOTA techniques to handle statistical fluctuations in channel properties. That is, in case of an such anomalous event occurring, there is not performed an adaption of a configuration but the communication scheme is designed to tolerate such events at least to some extent.

[0227] Still, the common base of all of these known schemes is that a certain kind of minimum level of communication can be maintained.

[0228] When such a minimum level of communication is lost, the wireless communication protocol starts timers and either waits and probes if the link quality recovers or continues a predefined mode of operation to reach the other communication by e.g., k-repetitions or starting a scan for other available communication resources with the communication partner e.g., in case of a link failure on a particular transmit-receive beam pair. In the case of prearranged alternative link options, an automatic link-failure recovery procedure can be activated which allows a faster link recovery due to a priori knowledge of alternative link options and a configuration to start a link failure recovery (LFR) procedure when certain conditions are met.

[0229] In case none of the above is successful, a device operated in known systems usually concludes the non-availability of coverage or service and starts triggers to re-enter the network discovery mode. Such behaviour can be observed with any cellular phone when operated in poorly covered areas e.g. mountainous terrain. In this example, when the device has completed yet another network scan process through which the device identifies the availability of a network, a random-access procedure can be initiated. Depending on the time duration between the loss of connection and the (re-) establishment of the other link or the determination of communication related parameters e.g., session ID, end-to-end encryption might have exceeded a predefined period of non-activity and a communication session must therefore be (re-) started from the beginning.

[0230] When compared to such known systems, the solution provided by the disclosed embodiments may provide means to handle communication interruptions and reduce the time needed for the (re-) establishment of communication(s), session(s) etc. significantly. This may be achieved through the use of configuration information relating to past, current and/or future occurrences of communication resource shortage/changes, so far not successfully covered by the above explained SOTA mechanisms. This also includes solutions to collect respective information allowing to generate such configuration information.

[0231] In order to address the problem described in connection with known systems, embodiments provide a technical solution to address the drawbacks, in particular in connection with a loss of communication but not limited hereto.

[0232] For example, when considering a wireless communication system, WCS, comprised of at least one but advantageously at least two UEs and with reference to the scenario described in connection with known systems, three scenarios may be identified:

Scenario	Tag line	Description
A	Both UEs (still) in	the UEs are both (still) "in coverage" and "in service" of the RAN.
B	Remote UE out	a first UE is "in coverage" but "out of service" and a second UE is both "in coverage" and "in service"
C	Both UEs out	Both a first and a second UE are "out of coverage" and "out of service".

[0233] With reference to Scenarios A, B and C, Scenario A depicts a WCS use case in which the at least two UEs are both IC and IS of the RAN. This could be considered to be an ideal situation or a reference situation since during this mode of operation, configuration information pertaining to communication resources is readily available not only for the present conditions but perhaps also for anticipated, expected or planned future conditions.

[0234] In contrast Scenario B depicts a WCS use case in which only one UE is IS even though both are IC. In a known state-of-the-art WCS, the out-of-service, OOS, UE is unaware of when, where and how communication resources will become or are expected to become available in the future. The OOS UE might therefore use its own resources in an unnecessary and/or ineffective manner. This could have the effect of at least reducing its battery capacity or creating interference to other users.

[0235] In Scenario C, in which both UEs are both OOC and OOS, the negative consequences of Scenario are exasperated even further which could result in even greater levels of interference and a degradation of service quality for other users.

[0236] The technical solution provided by embodiments attempts to alleviate the deleterious effects described in Scenarios B and C referred to as anomalous changes of an availability of a resource by ensuring that the UEs are provided with configuration information using one or more of the following methods or sources of information:

[0237] Pre-set or preconfigured (e.g. by default, factory settings, recently updated), e.g., stored in an internal or external memory

[0238] Based on a former, e.g., the last used mode of operation or the mode of operation or a change in the mode of operation (e.g. from Uu to sidelink, from

sidelink to Uu, from Uu to NTN, from NTN to Uu, from SL to NTN or from NTN to SL)

[0239] Provided by the network/WCS, e.g., via a wireless or wired signal or message

[0240] Provided by a database (e.g. connected to the RAN as an entity), the information provided directly or indirectly (via a different entity) via a wireless or wired signal or message

[0241] Provided via an alternative RAN (e.g. Wi-Fi, Bluetooth)

[0242] Provided by a remote UE or a group leader UE or a different network entity

[0243] For example, the configuration information may be provided in the form of an Assisting Information Message AIM, wherein the one or more AIMs may include one or more of the following:

[0244] resource allocation related assistance information, like

[0245] resource patters

[0246] resource pools

[0247] available and/or excluded radio resources

[0248] information about particular frame structures, e.g., (pseudo)-TDD slot structures on FDD bands, sub-band full duplex, SBFD, configurations, almost blank subframes, ABS, in one or more FDD or TDD bands to be used for SL-communication

[0249] a sub-band full duplex, SBFB, configuration indication

[0250] link related assistance information, like

[0251] temporal (current and future), availability/unavailability, readiness of connectivity opportunities (e.g. windows of opportunity to see a satellite or satellite constellation areas), shortage or plentifulness of resources

[0252] timing advance assistance information

[0253] Doppler assistance information

[0254] distance related assistance information,

[0255] geographical area related assistance information,

[0256] group related assistance information,

[0257] UE pair related assistance information,

[0258] relay/repeater related assistance information,

[0259] capability information of a device transmitting or receiving the AIM,

[0260] requested information by the device transmitting or receiving the AIM about capability information to be provided by the UE,

[0261] a distress message header with wakeup, configuration state activation trigger function or priority purpose (e.g. transmitting an emergency message containing distress ID, requested action, location, UE-ID etc.).

[0262] The described three scenarios A, B and C above can be considered as example connectivity states of two UEs within the same coverage area and connected to the same RAN network e.g. via a satellite access link or a concatenated satellite backhaul link (scenario A).

[0263] While devices or entities (e.g. UEs) may be connected to the network via a gNB, their configuration and therefore their behaviour can be configured and controlled within the configuration framework.

[0264] Configuration in this context can be understood on different levels. For example, on a first level wherein the device is configured to support a particular feature to respond to signals/messages it will receive later; and on a second level wherein the device is configured in particular states which are valid within a framework of a feature. Examples for such configurations are not limited to include:

[0265] 1^{st} level configuration: for example, a configuration of a device into a mode supported by a gNB/network. This may be done via RRC messaging and is therefore usually of larger message size and is relatively slow.

[0266] 2^{nd} level configuration: for example, a configuration of relationships between reference symbols (RS), channels etc. via the transmission control information (TCI) which is using a highly compressed self-referencing messaging space.

[0267] According to embodiments a single level of configuration, two levels of configurations or even a higher number of levels may be used to cause the network entity to adapt its configuration, e.g., at least three, at least four, at least five, at least ten or even more. Different levels of the plurality of configuration information may comprise a different granularity or accuracy with regard to one or more parameters or a sequence of them. As an alternative or in addition, different levels of the plurality of configuration information may comprise different levels of priority, i.e., a configuration information of higher priority may lead to an adjustment or to discard or drop configuration information, at least for a same parameter, action or behaviour, available at a lower priority. However, as a further alternative or even in addition, an different levels of configuration information may be obtained, received or processed from different sources. Different sources may be understood, for example, as being received or retrieved from a same entity at different instances of times, e.g., by receiving different signals. This does not preclude to obtain, e.g., a first level of configuration information without receiving a signal, e.g., from an internal memory and a second level of configuration information, e.g., of higher priority, from a different source, e.g., by receiving a wireless signal. As long as the second level of configuration is unavailable, the network entity might still rely on the possibly pre-configured first level of configuration information.

[0268] For example, when a device/UE loses connectivity to the gNB/CU/access network or other network elements (e.g. other devices or the core network) connectivity to other devices can be maintained such that the further connectivity can be used to obtain configuration information from or via the device belonging to the remaining connection.

[0269] In the context of some embodiments related to this invention, the configuration information (CI) may consist of or may comprise information about and/or is associated with transmission/reception configurations relating to a particular kind of shortage of communication resources, in particular an anomalous shortage the CI can be communicated/provided via any available/remaining communication link.

[0270] The CI may refer to scarce/reduced or abundant/plentiful/sufficient resources and their past, current and future availability/non-availability.

[0271] Configuration may refer to one or more of:

[0272] Transmission, reception, and combinations thereof, e.g., provided by the network entity as part of the communication

[0273] Measuring/logging/reporting/acknowledging, and combinations thereof provided by the network entity

[0274] Transmission, reception of preconfigured (test or reference) signals/messages

[0275] Performing a procedure of transmission, reception of signals and processing thereof e.g., beam sweeping, frequency sweep,

[0276] Resources referred to in connection with embodiments may comprise one or more of:

[0277] Access link, sidelink or backhaul link resources

[0278] Temporal, spectral, spatial communication resources

[0279] Transport, positioning, control or data channels

[0280] Transmission beams (beam-IDs, beam sweeps, coordinated beam constellations)

[0281] Propagation channel components e.g., line-of-sight (LOS), non-line-of-sight (NLOS), obstructed line-of-sight (OLOS), dominant or specific multi-path components (MPC)

[0282] Service/connectivity provided by gNB, core network, access network, repeater, RIS, satellite

[0283] Quality of service (QOS) related to metrics like coverage, capacity, latency, jitter

[0284] An indication of availability of such a resource may refer to at least one of:

[0285] Time being a start, end, period/interval/duration or change of:

[0286] Availability or non-availability of resources

[0287] Occurrence of blockage event

[0288] Occurrence of outage events or periods

[0289] Occurrence of interference or jamming events

[0290] Occurrence of energy or power related states e.g., low battery state, recharging time, estimated remaining energy, transmit power constraints due to EIRP restrictions, multi-band operation, interference constraints

[0291] Resources may be subject to

[0292] decrease of a parameter below a threshold,

[0293] increase of a parameter above a threshold,

[0294] maintain a parameter within or outside a corridor of values

[0295] maintain a parameter within or outside a region or area of validity with respect to a metric e.g., coverage, capacity, data rate, reliability, latency

[0296] a particular distribution across the dimensions of resources in e.g., time, frequency, space, directions, location, etc.

[0297] Resources may be constrained by:

[0298] Data volume

[0299] Allocated spectrum, resource blocks (RB)

[0300] Modulation and coding scheme (MCS)

[0301] Block size

[0302] Message size/message volume/number of messages (per unit time or unit of opportunity)

[0303] the change of the availability may relate, e.g., to a change of any above states/values or trends (increase→decrease, decrease→increase)

[0304] the availability may relate, e.g., to a particular or repeated patterns of occurrence, distribution, statistic, states, values or trends

[0305] Said examples of the availability advantageously match the respective resource. That is, for example, an availability of an access link may more relate to an availability or blockage event whilst a resource QoS may more relate to a block size or MCS when compared to the allocated spectrum, not precluding such an association.

[0306] As an alternative or in addition, the configuration information may further contain at least one of:

[0307] a trigger

[0308] an event

[0309] a condition

[0310] a combination or sequence of any of the above (including combinations of several triggers, events, conditions), e.g., indicating one or more of a:

[0311] state,

[0312] status,

[0313] period,

[0314] event,

[0315] request,

[0316] report,

[0317] action,

[0318] procedure, to:

[0319] start/pause/continue/end

[0320] activate/deactivate

[0321] confirm/acknowledge.

[0322] Among actions/procedures requested or activated by e.g. a trigger or event are:

[0323] starting/stopping/resetting/halting of counters or count-down timers

[0324] capturing, freezing, storing, forwarding current and future (anticipated) states and configurations

[0325] automatic (re)-configuration after a trigger/event occurred, or condition is met

[0326] starting/halting/delaying/restarting/preparing to start a procedure or mode of operation,

[0327] changing from one procedure, routine or mode of operation into another one

[0328] determining or selecting a mode of operation, a transmission/reception strategy

[0329] discovering/observing/detecting/monitoring/tracing events or parameters related to any of the above CI and associated actions, triggers, configuration variants thereof (example: UE is observing pattern of availability of one or more beams based on RS or beam-ID and determining or reporting future availability, based on this another device e.g., a gNB or RIS can be configured to go/remain in particular configuration states such that a certain coverage/capacity requirement of a particular UE is fulfilled)

[0330] prepare reports/messages/control or user data transmissions/receptions to be ready to be transmitted/received at one of the next/future connection availability events.

[0331] Embodiments described above relate to a network entity that adapts its configuration based on configuration information. Embodiments also relate to obtaining, collecting and/or providing such configuration information.

[0332] FIG. **8** shows a schematic block diagram of a network entity **80** according to an embodiment. The network entity **80**, e.g., being also in accordance with the features described in connection with network entity **70** or being a different network entity, is configured for a communication in a wireless communication system. The network entity **80** comprises a control unit **82** that is configured for generating configuration information **84** indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system. The configuration information **84** may comprise at least a part of the configuration information **78** and/or may comprise different configuration information

described herein. The network entity **80** is configured for providing the configuration information **84** to the wireless communication system and/or the different network entity. It may, according to an embodiment, use the configuration information for an own purpose as described in connection with network entity **70**.

[0333] However, when compared to the network entity **70**, the network entity providing the configuration information is not necessarily required to communicate in the WCS by use of the RAN and/or the communication scheme. The network entity **80**, may, for example, operate as a sensor or other measurement and/or logging device providing respective data or information, e.g., based on its configuration and/or upon request. The configuration information **84** may be provided to other devices by use of a wired, optical and/or wireless (radio) interface and a respective signal. For example, providing the configuration information **84** to a memory using a wired signal, the memory accessible to the network entity **70** via a RAN may allow to implement the network entity **80** without a wireless interface such as wireless interface **74**.

[0334] Various elements and features of the present invention may be implemented in hardware using analog and/or digital circuits, in software, through the execution of instructions by one or more general purpose or special-purpose processors, or as a combination of hardware and software. For example, embodiments of the present invention may be implemented in the environment of a computer system or another processing system. FIG. **9** illustrates an example of a computer system **500**. The units or modules as well as the steps of the methods performed by these units may execute on one or more computer systems **500**. The computer system **500** includes one or more processors **502**, like a special purpose or a general-purpose digital signal processor. The processor **502** is connected to a communication infrastructure **504**, like a bus or a network. The computer system **500** includes a main memory **506**, e.g., a random-access memory (RAM), and a secondary memory **508**, e.g., a hard disk drive and/or a removable storage drive. The secondary memory **508** may allow computer programs or other instructions to be loaded into the computer system **500**. The computer system **500** may further include a communications interface **510** to allow software and data to be transferred between computer system **500** and external devices. The communication may be in the form of electronic, electromagnetic, optical, or other signals capable of being handled by a communications interface. The communication may use a wire or a cable, fiber optics, a phone line, a cellular phone link, an RF link and other communications channels **512**.

[0335] The terms "computer program medium" and "computer readable medium" are used to generally refer to tangible storage media such as removable storage units or a hard disk installed in a hard disk drive. These computer program products are means for providing software to the computer system **500**. The computer programs, also referred to as computer control logic, are stored in main memory **506** and/or secondary memory **508**. Computer programs may also be received via the communications interface **510**. The computer program, when executed, enables the computer system **500** to implement the present invention. In particular, the computer program, when executed, enables processor **502** to implement the processes of the present invention, such as any of the methods described herein. Accordingly, such a computer program may represent a controller of the computer system **500**. Where the disclosure is implemented using software, the software may be stored in a computer program product and loaded into computer system **500** using a removable storage drive, an interface, like communications interface **510**.

[0336] The implementation in hardware or in software may be performed using a digital storage medium, for example cloud storage, a floppy disk, a DVD, a Blue-Ray, a CD, a ROM, a PROM, an EPROM, an EEPROM or a FLASH memory, having electronically readable control signals stored thereon, which cooperate (or are capable of cooperating) with a programmable computer system such that the respective method is performed. Therefore, the digital storage medium may be computer readable.

[0337] Some embodiments according to the invention comprise a data carrier having electronically readable control signals, which are capable of cooperating with a programmable computer system, such that one of the methods described herein is performed.

[0338] Generally, embodiments of the present invention may be implemented as a computer program product with a program code, the program code being operative for performing one of the methods when the computer program product runs on a computer. The program code may for example be stored on a machine-readable carrier.

[0339] Other embodiments comprise the computer program for performing one of the methods described herein, stored on a machine-readable carrier. In other words, an embodiment of the inventive method is, therefore, a computer program having a program code for performing one of the methods described herein, when the computer program runs on a computer.

[0340] A further embodiment of the inventive methods is, therefore, a data carrier (or a digital storage medium, or a computer-readable medium) comprising, recorded thereon, the computer program for performing one of the methods described herein. A further embodiment of the inventive method is, therefore, a data stream or a sequence of signals representing the computer program for performing one of the methods described herein. The data stream or the sequence of signals may for example be configured to be transferred via a data communication connection, for example via the Internet. A further embodiment comprises a processing means, for example a computer, or a programmable logic device, configured to or adapted to perform one of the methods described herein. A further embodiment comprises a computer having installed thereon the computer program for performing one of the methods described herein.

[0341] In some embodiments, a programmable logic device (for example a field programmable gate array) may be used to perform some or all of the functionalities of the methods described herein. In some embodiments, a field programmable gate array may cooperate with a microprocessor in order to perform one of the methods described herein. Generally, the methods are performed by any hardware apparatus.

[0342] While this invention has been described in terms of several advantageous embodiments, there are alterations, permutations, and equivalents, which fall within the scope of this invention. It should also be noted that there are many alternative ways of implementing the methods and compositions of the present invention. It is therefore intended that the following appended claims be interpreted as including

all such alterations, permutations, and equivalents as fall within the true spirit and scope of the present invention.

ABBREVIATIONS

Abbreviation	Definition
2G	second generation
3G	third generation
3GPP	third generation partnership project
3PC	third-party controller
4G	fourth generation
5G	fifth generation
5GC	5G core network
AAS	active antenna system
AAU	advanced antenna unit
ACLR	adjacent channel leakage ratio
ADC	analogue-to-digital converter
AF	application function
AP	access point
ARQ	automatic repeat request
AU	antenna unit
BER	bit-error rate
BLER	block-error rate
BP	behaviour plane
BS	basestation transceiver
BT	Bluetooth
BTS	basestation transceiver
CA	carrier aggregation
CBR	channel busy ratio
CC	component carrier
CCO	coverage and capacity optimization
CHO	conditional handover
CLI	cross-link interference
CLI-RSS	cross-link interference received signal
CP	control plane
CP1	control plane 1
CP2	control plane 2
CPRI	common public radio interface
CSI-RS	channel state information reference signal
CU	central/centralized unit
D2D	device-to-device
DAPS	dual active protocol stack
DAC	digital-to-analogue converter
DC-CA	dual-connectivity carrier aggregation
DECT	digitally enhanced cordless telephony
DL	downlink
Abbreviation	Definition
DMRS	demodulation reference signal
DOA	direction of arrival
DRB	data radio bearer
DT	digital twin
DU	distributed unit
ECGI	e-UTRAN cell global identifier
E-CID	enhanced cell ID
eCPRI	enhanced CPRI
eNB	evolved Node b
EN-DC	e-UTRAN-New Radio dual connectivity
EUTRA	enhanced UTRA
E-UTRAN	enhanced UTRA network
FSS	frequency-selective surface
gNB	next generation NodeB
GNSS	global navigation satellite system
GPS	global positioning system
GSO	geostationary orbit
HAPS	high-altitude platforms
HARQ	hybrid ARQ
IAB	integrated access and backhaul
IC	in-coverage
ID	identity / identification
IF	intermediate frequency
IS	in-service
IIOT	industrial internet of things
KPI	key-performance indicator
LTE	long-term evolution
MCG	master cell group
MCS	modulation coding scheme

-continued

ABBREVIATIONS

Abbreviation	Definition
MDT	minimization of drive tests
MIMO	multiple-input / multiple-output
MLR	measure, log and report
MLRD	MLR device
MNO	mobile network operator
MR-DC	multi-rat dual connectivity
NCGI	new radio cell global identifier
NEF	network exposure function
NG	next generation
ng-eNB	next generation eNB
NG-RAN	either a gNB or an NG-eNB
NGSO	non-geostationary orbit
NIC	network interface connection
NR	new radio
NR-U	NR unlicensed
NTN	non-terrestrial network
OAM	operation and maintenance
OEM	original equipment manufacturer
OOC	out-of-coverage
OOS	out-of-service
OTT	over-the-top
ORAN	see open RAN
Open RAN	open radio access network
PCI	physical cell identifier
PDCP	packet data convergence protocol
PER	packet error rate
PHY	physical
PLMN	public land mobile network
QCL	quasi colocation
RA	random access
RACH	random access channel
RAN	radio access network
RAT	radio access technology
RF	radio frequency
RIM	radio access network information
RIM-RS	rim reference signal
RIS	reconfigurable intelligent surface
RISC	RIS controller
RLC	radio link control
RLF	radio link failure
RLM	radio link monitoring
RP	reception point
R-PLMN	registered public land mobile network
RRC	radio resource control
RRU	remote radio unit
RS	reference signal
RSRP	reference signal received power
RSRQ	reference signal received quality
RSSI	received signal strength indicator
RSTD	reference signal time difference
RTOA	relative time of arrival
RTT	round trip time
RU	radio unit
SA	standalone
SCEF	service capability exposure function
SCG	secondary cell group
SDU	service data unit
SIB	system information block
SINR	signal-to-interference-plus-noise ratio
SIR	signal-to-interference ratio
SL	sidelink
SL-BC	sidelink broadcast
SNR	signal-to-noise ratio
SON	self-organising network
SOTA	state-of-the-art
SRS	sounding reference signal
SS	synchronization signal
SSB	synchronization signal block
SSID	service set identifier
SS-PBCH	sounding signal / physical broadcast
TAC	tracking area code
TB	transmission block

-continued

ABBREVIATIONS

Abbreviation	Definition
TDD	time division duplex
TN	terrestrial network
TSG	technical specification group
UAV	unmanned airborne vehicle
UE	user equipment
UL	uplink
UP	user plane
URLLC	ultra-reliable low latency communication
UTRAN	universal trunked radio access network
Uu	UE can use NR radio access
V2X	vehicle-to-everything
VoIP	voice over internet protocol
VRAN	virtual ran
WI	work item
WLAN	wireless local area network

1. A network entity configured for a communication in a wireless communication system according to a configuration using a resource of the wireless communication system and for using a wireless interface of the network entity for the communication, the network entity comprising:

a control unit configured for processing configuration information indicating a change of an availability of the resource;

wherein the control unit is configured for adapting the configuration based on the configuration information to react on the change of the availability.

2. The network entity of claim **1**, wherein the network entity is a user equipment, UE, that is configured for adapting the configuration to change its behavior in the wireless communication system based on the change of the availability of the resource.

3. The network entity of claim **1**, wherein the change relates to an anomalous availability of the resource and/or a significant change of the availability.

4. The network entity of claim **3**, wherein the configuration information leads the anomalous change to be an expected situation for the network entity.

5. The network entity of claim **3**, wherein the anomalous availability relates to at least one of:

a time related to at least one of:

an availability and/or non-availability of the resource;

an occurrence of a blockage event blocking at least a part of the communication;

an occurrence of an outage event and/or an outage period of the communication;

an occurrence of an interference event and/or a jamming event influencing the communication;

an occurrence of an energy related state and/or a power related state of the communication;

a resource is subject to

a decrease below a threshold of at least one parameter relevant for the communication,

an increase above a threshold of at least one parameter relevant for the communication,

a maintain within or outside a corridor of values of at least one parameter relevant for the communication,

maintain within or outside a region or area of validity of at least one parameter relevant for the communication with respect to a metric,

a particular distribution across a dimensions of at least one parameter relevant for the communication using the resource

a constraint related to the resource in view of at least one of:

a provided data volume;

an allocated spectrum and/or resource block (RB);

a modulation and coding scheme (MCS) used for the communication;

a block size used for the communication

a size of a message, a volume and/or a number of messages, e.g., per unit time and/or unit of opportunity

a change of any above

a particular or repeated pattern, a distribution, a statistic, a state, a value and/or a trend of occurrence.

6. The network entity of claim **1**, wherein the configuration information relates to an availability of the resource; or

wherein the configuration information relates to an at least partial unavailability of the resource.

7. The network entity of claim **1**, wherein the configuration information indicates the change of the availability for a past, present and/or future instance of time.

8. The network entity of claim **1**, wherein the control unit is configured for processing the configuration information to acquire a processing result that indicates an at least partial and/or at least temporal unavailability of the resource for the communication; and

wherein the control unit is configured for controlling the network entity to avoid the communication using the resource based on the processing result.

9. The network entity of claim **1**, wherein the control unit is configured for processing the configuration information to acquire a processing result that indicates a restored availability of the resource for the communication and/or that indicates an established availability of the resource; and

wherein the control unit is configured for controlling the network entity to postpone the communication using the resource based on the processing result until the availability of the resource for the communication is restored or established.

10. The network entity of claim **1**, wherein the configuration relates to at least one of:

a transmission, a reception, and combinations thereof provided by the network entity as the communication;

a measurement, a logging, a reporting an acknowledging, and combinations thereof to be provided by the network entity;

a transmission and/or a reception of at least one preconfigured signal such as a test signal, of at least one preconfigured reference signal, and/or of at least one preconfigured message such as a test message;

a performing of a procedure of transmission of at least one signal and/or a procedure of reception of at least one signal and processing thereof, e.g., beam sweeping, frequency sweep.

11. The network entity of claim **1**, wherein the resource comprises at least one of:

an access link resource, a sidelink resource, a relay link resource and/or a backhaul link resource;

a temporal, spectral, sequential (spreading sequence) and/or spatial communication resource;

a transport channel, a positioning channel, a control channel and/or a data channel;

a transmission/reception beam represented by a beam-ID, SSB, CSI-RS, a beam sweep and/or a coordinated beam constellation;

a propagation channel component such as a line-of-sight, LOS, non-line-of-sight, NLOS, obstructed line-of-sight, OLOS, a dominant or specific multi-path component, (MPC;

a service or connectivity provided by another network entity;

a quality of service, Qos, related to communication metrics such as coverage, capacity, latency and/or jitter.

12. The network entity of claim **1**, wherein the configuration information comprises at least one of:

information indicating at least one trigger indicating to start or stop a particular action/behaviour of the device;

information indicating at least one event which is relevant to the communication scenario;

information indicating at least one condition which describes e.g., the communication scenario, status values/messages of the UE or other network devices;

information indicating a combination or sequence thereof indicating at least one of:

a state, e.g., of a state machine,

a status, e.g., of a report, action, confirmation or acknowledgment,

a period, of a parameter being below/above a threshold or within a range OR a certain state/status is given/valid/invalid,

an event,

a request of an action, observation and/or measurement,

a report relating to an action, observation and/or measurement,

an action, e.g., of stopping a counter, continuing until something else happens,

a procedure, to:

start/pause/continue/end;

activate/deactivate; and/or

confirm/acknowledge, e.g., of actions, reports, status.

13. The network entity of claim **1**, wherein the configuration information comprises information indicating an event or trigger; wherein based on the processing, the control unit is configured for controlling the network entity responsive to the event or trigger to at least one of:

starting, stopping, resetting and/or halting of at least one counter and/or count-down timer;

capturing, freezing, storing, forwarding a current and/or future, e.g., anticipated state and/or configuration;

an automatic (re)-configuration of the network device and/or its behaviour after a trigger, after an event occurred and/or after a condition is met;

starting, halting, delaying, restarting and/or preparing to start a procedure or mode of operation of the network entity,

changing from one procedure, routine or mode of operation into another one;

determining or selecting a mode of operation and/or a transmission/reception strategy;

discovering, observing, detecting, monitoring and/or tracing an events and/or a parameter related to any of the above configuration information and/or associated actions, triggers, configuration variants thereof;

preparing a transmission and/or reception of at least one of a report, a message, control data and user data; for preparing of a future connection availability events.

14. The network entity of claim **1**, wherein the network entity is configured for acquiring the configuration information based on at least one of:

as a pre-set or pre-configured information;

based on a past, present or future mode of operation or a change in the mode of operation;

as information provided by the wireless communication system;

as information provided by a database;

as information provided via an alternative radio access network, RAN,

as information provided by a remote UE and/or a group leader UE.

15. The network entity of claim **1**, wherein the network entity is configured for acquiring the configuration information as one of a plurality of configuration information.

16. The network entity of claim **15**, wherein the network entity is configured for receiving at least one of the plurality of configuration information by receiving and processing a wireless signal.

17. The network entity of claim **15**, wherein the network entity is configured for acquiring a first configuration information that causes the control unit to control the network entity into an operation mode supported by a wireless communication system controller, e.g., via a radio resource control, RRC, message;

wherein the network entity is configured for acquiring a second configuration information that causes the control unit to control the network entity into one of different behaviors within the operation mode.

18. The network entity of claim **17**, wherein the network entity is configured for receiving at least a part of the first configuration information by receiving a radio resource control, RRC, message; wherein the network entity is configured for acquiring at least a part of the second configuration information by receiving a transmission control information, TCI.

19. The network entity of claim **1**, being a user equipment, UE.

20. The network entity of claim **1**, wherein the configuration information is a first configuration information; wherein the control unit is configured for generating the first configuration information and/or for generating a second configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system;

wherein the network entity is configured for providing the first configuration information and/or the second first configuration information to the wireless communication system and/or the different network entity.

21. A network entity configured for operating in a wireless communication system, the network entity comprising:

a control unit configured for processing configuration information indicating a change in an availability of the resource;

wherein the control unit is configured for reacting on the change of the availability by performing by at least one of a measurement, a logging, a reporting, an acknowl-

edging, and combinations thereof related to the availability; and for providing a result thereof to the wireless communications system.

22. A network entity configured for a communication in a wireless communication system, the network entity comprising:

a control unit configured for generating configuration information indicating a change of an availability of a resource of the wireless communication system for a different network entity of the wireless communication system;

wherein the network entity is configured for providing the configuration information to the wireless communication system and/or the different network entity.

23. The network entity of claim **22**, being a user equipment, UE configured for wirelessly providing the configuration information using a wireless interface of the network entity.

24. The network entity of claim **22**, being a base station, gNB, configured for wirelessly providing the configuration information using a wireless interface of the network entity.

25. The network entity of claim **22**, wherein the configuration information is a first configuration information and wherein the resource is a first resource; wherein the network entity is configured for a communication in the wireless communication system according to a configuration using a same or different second resource of the wireless communication system and for using a wireless interface of the network entity for the communication;

wherein the control unit is configured for processing second configuration information indicating a change of an availability of the second resource;

wherein the control unit is configured for adapting the configuration based on the second configuration information to react on the change of the availability.

26. A wireless communication system providing wireless communication between different entities of the wireless communication system according to a configuration, the communication using a resource of the wireless communication system, the wireless communication system comprising:

a first entity being configured for providing, to at least one member of the wireless communication system, configuration information indicating a change of an availability of a resource of the wireless communication system;

a second entity that is configured for adapting the configuration based on the configuration information to mitigate an effect of the change of the availability on at least one entity of the wireless communication system.

27. The wireless communication system of claim **26**, wherein the first entity is a network entity according to claim **1** or **21**; and/or wherein the second entity is a network entity according to claim **22**.

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