

# Radiocommunication Study Groups



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**English only**

**VOCABULARY**

## **Institute of Electrical and Electronics Engineers (IEEE)**

### **VOCABULARY TERMS RELATED TO IEEE 802.16**

#### **1 Background**

In the Chairman's Report (Document 5D/790) of the 8th meeting of ITU-R Working Party 5D (WP 5D), Chapter 6 addresses the "Workplan for new Terms and Definitions related to IMT." According to this workplan, the expectation of Ad Hoc Vocabulary is to draft a Report ("IMT.VOC") "based on input from ITU Members, External Organizations and Documents prepared in WP 5D." Contributions are expected for consideration at Meeting #9.

Accordingly, this contribution provides material toward the development of IMT.VOC.

#### **2 Discussion**

In Annexes 1 and 2, respectively, IEEE provides a list of terms and definitions included in IEEE Std 802.16-2009 and its amendment IEEE Std 802.16j. Both of these standards are included in the Global Core Specifications of the draft revision of Recommendation ITU-R M.1457-9.

Annex 3 contains terms and definitions included in the draft P802.16m/D8. This document is a draft amendment of IEEE Std 802.16; the completed amendment is expected to be submitted for consideration as an IMT-Advanced radio interface technology.

#### **3 Proposal**

We propose that the terms and definitions in Annexes 1, 2, and 3 be considered for inclusion in IMT.VOC, recognizing that many of the terms and definitions may be unsuitable in a general IMT vocabulary.

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## ANNEX 1

### **Terms from IEEE Std 802.16-2009**

**3.1 active base station (BS):** A BS that is informed of the mobile station (MS) capabilities, security parameters, service flows, and full medium access control layer (MAC) context information. For macro diversity handover (MDHO), the MS transmits/receives data to/from all active BSs in the diversity set.

**3.2 adaptive antenna system (AAS):** An array of antennas and associated signal processing that together is able to change its antenna radiation pattern dynamically to adjust to noise environment, interference and multipath.

**3.3 adaptive modulation:** A system's ability to communicate with another system using multiple burst profiles and a system's ability to subsequently communicate with multiple systems using different burst profiles.

**3.4 adjacent subcarrier allocation:** A permutation where the subcarriers are located adjacent to each other.

**3.5 anchor base station (BS):** For macro diversity handover (MDHO) or fast BS switching (FBSS) supporting mobile stations (MSs), a BS where the MS is registered, is synchronized, performs ranging, and monitors the downlink (DL) for control information. For FBSS supporting MSs, the anchor BS is the serving BS that is designated to transmit/receive data to/from the MS at a given frame.

**3.6 Authenticator:** Authenticator functionality is part of AAA Services, which is included in the NCMS. An authenticator is an entity at one end of a point-to-point link that facilitates authentication of a supplicant (MS) attached to the other end of that link. It can enforce authentication before allowing access to services that are accessible to the supplicant. The authenticator incorporates an AAA client functionality that enables it to communicate with AAA backend infrastructure (AAA based Authentication Server). The AAA server provides the Authenticator with authentication and authorization services over AAA protocols. The authenticator function contains a Key Distributor and may also include a Key Receiver function.

**3.7 automatic repeat request (ARQ) block:** A distinct unit of data that is carried on an ARQ-enabled connection. Such a unit is assigned a sequence number and is managed as a distinct entity by the ARQ state machines. Block size is a parameter negotiated during connection establishment.

**3.8 backbone network:** A communication mechanism by which two or more base stations (BSs) communicate to each other. It may also include communication with other networks. The method of communication for backbone networks is outside the scope of this standard.

**3.9 bandwidth stealing:** The use, by a subscriber station (SS), of a portion of the bandwidth allocated in response to a bandwidth request (BR) for a connection to send a BR or data for any of its connections.

**3.10 base station (BS):** A generalized equipment set providing connectivity, management, and control of the subscriber station (SS). *See also:* **active base station (BS), anchor base station (BS), neighbor base station (BS), serving base station (BS), target base station (BS).**

**3.11 base station (BS) receive/transmit transition gap (RTG):** A gap between the last sample of the uplink (UL) burst and the first sample of the subsequent downlink (DL) burst at the antenna port

of the BS in a time division duplex (TDD) transceiver. This gap allows time for the BS to switch from receive (Rx) to transmit (Tx) mode. During this gap, the BS is not transmitting modulated data but simply allowing the BS transmitter carrier to ramp up and the Tx/Rx antenna switch to actuate. Not applicable for frequency division duplex (FDD) systems.

**3.12 base station (BS) transmit/receive transition gap (TTG):** A gap between the last sample of the downlink (DL) burst and the first sample of the subsequent uplink (UL) burst at the antenna port of the BS in a time division duplex (TDD) transceiver. This gap allows time for the BS to switch from transmit (Tx) to receive (Rx) mode. During this gap, the BS is not transmitting modulated data but simply allowing the BS transmitter carrier to ramp down, the Tx/Rx antenna switch to actuate, and the BS receiver section to activate. Not applicable for frequency division duplex (FDD) systems.

**3.13 basic connection:** Connection that is established during subscriber station (SS) initial ranging and used to transport delay-intolerant medium access control layer (MAC) management messages.

**3.14 broadband:** Having instantaneous bandwidths greater than around 1 MHz and supporting data rates greater than about 1.5 Mb/s.

**3.15 broadband wireless access (BWA):** Wireless access in which the connection(s) capabilities are broadband.

**3.16 broadcast connection:** The management connection used by the base station (BS) to send medium access control layer (MAC) management messages on a downlink (DL) to all subscriber stations (SSs). The broadcast connection is identified by a well-known connection identifier (CID). A fragmentable broadcast connection is a connection that allows fragmentation of broadcast MAC management messages.

**3.17 burst profile:** Set of parameters that describe the uplink (UL) or downlink (DL) transmission properties associated with an interval usage code. Each profile contains parameters such as modulation type, forward error correction (FEC) type, preamble length, guard times, etc. *See also:* **interval usage code.**

**3.18 channel identifier (ChID):** An identifier used to distinguish between multiple uplink (UL) channels, all of which are associated with the same downlink (DL) channel.

**3.19 concatenation:** The act of combining multiple medium access control layer (MAC) protocol data units (PDUs) into a single physical layer (PHY) service data unit (SDU).

**3.20 connection:** A unidirectional mapping between base station (BS) and subscriber station (SS) medium access control layer (MAC) peers. Connections are identified by a connection identifier (CID). The MAC defines two kinds of connections: management connections and transport connections. *See also:* **connection identifier (CID).**

**3.21 connection identifier (CID):** A 16-bit value that identifies a transport connection or an uplink (UL)/ downlink (DL) pair of associated management connections [i.e., belonging to the same subscriber station (SS)] to equivalent peers in the medium access control layer (MAC) of the base station (BS) and SS. The CID address space is common (i.e., shared) between UL and DL and partitioned among the different types of connections. Security associations (SAs) also exist between keying material and CIDs. *See also:* **connection.**

**3.22 DC subcarrier:** In an orthogonal frequency division multiplexing (OFDM) or orthogonal frequency division multiple access (OFDMA) signal, the subcarrier whose frequency would be equal to the radio frequency (RF) center frequency of the station.

**3.23 diversity set:** A list of active base stations (BSs) to the mobile station (MS). The diversity set is managed by the MS and BSs and is applicable to macro diversity handover (MDHO) and fast BS switching (FBSS).

**3.24 downlink (DL):** The direction from the base station (BS) to the subscriber station (SS).

**3.25 downlink burst transition gap (DLBTG):** The gap included on the trailing edge of each allocated downlink (DL) burst so that ramp-down can occur and delay-spread can clear receivers.

**3.26 downlink channel descriptor (DCD):** A medium access control layer (MAC) message that describes the physical layer (PHY) characteristics of a downlink (DL) channel.

**3.27 downlink interval usage code (DIUC):** An interval usage code specific to a downlink (DL).  
*See also: interval usage code.*

**3.28 downlink map (DL-MAP):** A medium access control layer (MAC) message that defines burst start times for both time division multiplex and time division multiple access (TDMA) by a subscriber station (SS) on the downlink (DL).

**3.29 dynamic frequency selection (DFS):** The ability of a system to switch to different physical radio frequency (RF) channels based on channel measurement criteria to conform to particular regulatory requirements.

**3.30 dynamic service:** The set of messages and protocols that allow the base station (BS) and subscriber station (SS) to add, modify, or delete the characteristics of a service flow.

**3.31 fast base station switching (FBSS):** Base station (BS) switching that utilizes a fast switching mechanism to improve link quality. The mobile station (MS) is only transmitting/receiving data to/from one of the active BS (anchor BS) at any given frame. The anchor BS can change from frame to frame depending on the BS selection scheme.

**3.32 fixed wireless access:** Wireless access application in which the locations of the base station (BS) and subscriber station (SS) are fixed in location during operation.

**3.33 frame:** A structured data sequence of fixed duration used by some physical layer (PHY) specifications. A frame may contain both an uplink (UL) subframe and a downlink (DL) subframe.

**3.34 frequency assignment (FA):** A logical assignment of downlink (DL) center frequency and channel bandwidth programmed to the base station (BS).

**3.35 frequency assignment (FA) index:** A network-specific logical FA index assignment. FA index assignment is used in combination with operator-specific configuration information provided to the mobile station (MS) in a method outside the scope of this standard.

**3.36 frequency division duplex (FDD):** A duplex scheme in which uplink (UL) and downlink (DL) transmissions use different frequencies but are typically simultaneous.

**3.37 frequency offset index:** An index number identifying a particular subcarrier in an orthogonal frequency division multiplexing (OFDM) or orthogonal frequency division multiple access (OFDMA) signal, which is related to its subcarrier index. Frequency offset indices may be positive or negative.

**3.38 group key encryption key (GKEK):** A random number generated by the base station (BS) or a network entity [e.g., an authentication and service authorization (ASA) server] used to encrypt the group traffic encryption keys (GTEKs) sent in broadcast messages by the BS to mobile stations (MSs) in the same multicast group.

**3.39 handover (HO):** The process in which a mobile station (MS) migrates from the air-interface provided by one base station (BS) to the air-interface provided by another BS. A break-before-make

HO is where service with the target BS starts after a disconnection of service with the previous serving BS. A makebefore-break HO is where service with the target BS starts before disconnection of the service with the previous serving BS.

**3.40 initial ranging connection:** A management connection used by the subscriber station (SS) and the base station (BS) during the initial ranging process. The initial ranging connection is identified by a well-known connection identifier (CID). This CID is defined as a constant value within the protocol since an SS has no addressing information available until the initial ranging process is complete.

**3.41 interval usage code:** A code identifying a particular burst profile that can be used by a downlink (DL) or uplink (UL) transmission interval.

**3.42 Location Based Services (LBS):** Services that are based on location data of the MS and/or BS in a network of IEEE 802.16 devices. Examples in location sensitized applications, emergency call origination tracking, equipment tracking etc.

**3.43 macro diversity handover (MDHO):** The process in which an mobile station (MS) migrates from the air-interface provided by one or more base stations (BSs) to the air-interface provided by one or more other BSs. This process is accomplished in the downlink (DL) by having two or more BSs transmitting the same medium access control layer (MAC) or physical layer (PHY) protocol data unit (PDU) to the MS so that diversity combining can be performed by the MS. In the uplink (UL), it is accomplished by having two or more BSs receiving (demodulating, decoding) the same PDU from the MS so that diversity combining of the received PDU can be performed among the BSs.

**3.44 management connection:** A connection used for transporting medium access control layer (MAC) management messages or standards-based messages required by the MAC. *For MAC management messages, see also: basic connection, primary management connection, broadcast connection, initial ranging connection. For standards-based messages required by the MAC, see also: secondary management connection.*

**3.45 minislot:** A unit of uplink (UL) bandwidth allocation equivalent to  $n$  physical slots (PSs), where  $n = 2^m$  and  $m$  is an integer ranging from 0 through 7.

**3.46 mobile station (MS):** A station in the mobile service intended to be used while in motion or during halts at unspecified points. An MS is always a subscriber station (SS) unless specifically excepted otherwise in this standard.

**3.47 multicast polling group:** A group of zero or more subscriber stations (SSs) that are assigned a multicast address for the purposes of polling.

**3.48 multiple input multiple output (MIMO):** A system employing at least two transmit (Tx) antennas and at least two receive (Rx) antennas to improve the system capacity, coverage, or throughput.

**3.49 neighbor base station (BS):** For any mobile station (MS), a BS (other than the serving BS) whose downlink (DL) transmission can be received by the MS.

**3.50 Operator ID:** Operator ID is an identifier of the network provider. The Operator ID is contained in the Base Station ID.

**3.51 orderly power-down procedure:** The procedure that the mobile station (MS) performs when powering down, for example, as directed by user input or as prompted by a automatic power-down mechanism.

**3.52 packing:** The act of combining multiple service data units (SDUs) from a higher layer into a single medium access control layer (MAC) protocol data unit (PDU).

**3.53 Paging Controller:** Paging controller is a unit that belongs to the idle mode services in the NCMS. The paging controller retains the MS state and operational parameters and/or administers paging activity for the MS while in idle mode.

**3.54 payload header suppression (PHS):** The process of suppressing the repetitive portion of payload headers at the sender and restoring the headers at the receiver.

**3.55 Payload Header Suppression field (PHSF):** A string of bytes representing the header portion of a protocol data unit (PDU) in which one or more bytes are to be suppressed (i.e., a snapshot of the uncompressed PDU header inclusive of suppressed and unsuppressed bytes).

**3.56 payload header suppression index (PHSI):** An 8-bit value that references the payload header suppression (PHS) rule.

**3.57 payload header suppression mask (PHSM):** A bit mask indicating which bytes in the Payload Header Suppression field (PHSF) to suppress and which bytes to not suppress.

**3.58 payload header suppression size (PHSS):** The length of the suppressed field in bytes. This value is equivalent to the number of bytes in the Payload Header Suppression field (PHSF) and also the number of valid bits in the payload header suppression mask (PHSM).

**3.59 payload header suppression valid (PHSV):** A flag that tells the sending entity to verify all bytes that are to be suppressed.

**3.60 physical slot (PS):** A unit of time, dependent on the physical layer (PHY) specification, for allocating bandwidth.

**3.61 point-to-point (PtP):** A mode of operation whereby a link exists between two network entities.

**3.62 primary management connection:** A connection that is established during initial subscriber station (SS) ranging and used to transport delay-tolerant medium access control layer (MAC) management messages.

**3.63 Privacy Key Management (PKM) Protocol:** A client/server model between the base station (BS) and subscriber station (SS) that is used to secure distribution of keying material.

**3.64 protocol data unit (PDU):** The data unit exchanged between peer entities of the same protocol layer.

**3.65 quality of service (QoS) parameter set:** A parameter set associated with a service flow identifier (SFID). The contained traffic parameters define scheduling behavior of uplink (UL) or downlink (DL) flows associated with transport connections.

**3.66 radio frequency (RF) center frequency:** The center of the frequency band in which a base station (BS) or subscriber station (SS) is intended to transmit.

**3.67 scanning interval:** A time period intended for the mobile station (MS) to monitor neighbor base stations (BSs) to determine the suitability of the BSs as targets for handover (HO).

**3.68 secondary management connection:** A connection that may be established during subscriber station (SS) registration that is used to transport standards-based [e.g, Simple Network Management Protocol (SNMP), Dynamic Host Configuration Protocol (DHCP)] messages.

**3.69 security association (SA):** The set of security information that a base station (BS) and one or more of its client subscriber stations (SSs) share in order to support secure communications. This

shared information includes traffic encryption keys (TEKs) and cipher block chaining (CBC) initialization vectors (IVs).

**3.70 security association identifier (SAID):** An identifier shared between the base station (BS) and subscriber station (SS) that uniquely identifies a security association (SA). The SAID is unique within MS. The uniqueness of this identifier shall be guaranteed by {MS MAC Address, SAID} pair.

**3.71 service access point (SAP):** The point in a protocol stack where the services of a lower layer are available to its next higher layer.

**3.72 service data unit (SDU):** The data unit exchanged between two adjacent protocol layers. On the downward direction, it is the data unit received from the previous higher layer. On the upward direction, it is the data unit sent to the next higher layer.

**3.73 service flow (SF):** A unidirectional flow of medium access control (MAC) service data units (SDUs) on a connection that is provided a particular quality of service (QoS).

**3.74 service flow identifier (SFID):** A 32-bit quantity that uniquely identifies a service flow to the subscriber station (SS).

**3.75 serving base station (BS):** For any mobile station (MS), the BS with which the MS has most recently completed registration at initial network-entry or during a handover (HO).

**3.76 STC layer:** OFDMA Space Time Coding information-flow fed to the STC encoder as an input. The number of STC layers in a system with vertical encoding is one, while in horizontal encoding, it depends on the number of encoding/modulation paths. This term may be used interchangeably with the word *layer* when used in the context of OFDMA STC.

**3.77 STC stream:** OFDMA Space Time Coding information path encoded by the STC encoder that is passed to subcarrier mapping and sent through one antenna, or passed on to the beamformer. The number of STC streams in both vertical and horizontal encoding systems is the same as the number of output paths of the STC encoder. This term may be used interchangeably with the word *stream* when used in the context of OFDMA STC.

**3.78 subcarrier index:** An index number identifying a particular used subcarrier in an orthogonal frequency division multiplexing (OFDM) or orthogonal frequency division multiple access (OFDMA) signal. Subcarrier indices are greater than or equal to zero.

**3.79 subscriber station (SS):** A generalized equipment set providing connectivity between subscriber equipment and a base station (BS).

**3.80 subscriber station receive/transmit gap (SSRTG):** The minimum receive-to-transmit turnaround gap. SSRTG is measured from the time of the last sample of the received burst to the first sample of the transmitted burst at the antenna port of the SS.

**3.81 subscriber station transmit/receive gap (SSTTG):** The minimum transmit-to-receive turnaround gap. SSTTG is measured from the time of the last sample of the transmitted burst to the first sample of the received burst at the antenna port of the SS.

**3.82 target base station (BS):** The BS with which a mobile station (MS) intends to be registered at the end of a handover (HO).

**3.83 time division duplex (TDD):** A duplex scheme where uplink (UL) and downlink (DL) transmissions occur at different times but may share the same frequency.

**3.84 time division multiple access (TDMA) burst:** A contiguous portion of the uplink (UL) or downlink (DL) using physical layer (PHY) parameters, determined by the downlink interval usage

code (DIUC) or uplink interval usage code (UIUC), that remain constant for the duration of the burst. TDMA bursts are

separated by preambles and are separated by gaps in transmission if subsequent bursts are from different transmitters.

**3.85 time division multiplexing (TDM) burst:** A contiguous portion of a TDM data stream using physical layer (PHY) parameters, determined by the downlink interval usage code (DIUC), that remain constant for the duration of the burst. TDM bursts are not separated by gaps or preambles.

**3.86 transport connection:** A connection used to transport user data. It does not include any traffic over the basic, primary, or secondary management connections. A fragmentable transport connection is a connection that allows fragmentation of service data units (SDUs).

**3.87 transport connection identifier (CID):** A unique identifier taken from the CID address space that uniquely identifies the transport connection. All user data traffic is carried on transport connections, even for service flows that implement connectionless protocols, such as Internet Protocol (IP). An active or admitted service flow [identified by a service flow identifier (SFID)] maps to a Transport CID assigned by the base station (BS).

**3.88 turbo decoding:** Iterative decoding, using soft inputs and soft outputs.

**3.89 type/length/value (TLV):** A formatting scheme that adds a tag to each transmitted parameter containing the parameter type (and implicitly its encoding rules) and the length of the encoded parameter.

**3.90 U Interface:** The management and control interface that exists between the SS and the BS over the air interface.

**3.91 uplink (UL):** The direction from a subscriber station (SS) to the base station (BS).

**3.92 uplink channel descriptor (UCD):** A medium access control layer (MAC) message that describes the physical layer (PHY) characteristics of an uplink (UL).

**3.93 uplink interval usage code (UIUC):** An interval usage code specific to an uplink (UL).

**3.94 uplink map (UL-MAP):** A set of information that defines the entire access for a scheduling interval.

**3.95 user data:** Protocol data units (PDUs) of any protocol above a service-specific convergence sublayer (CS) received over the CS service access point (SAP).

**3.96 wireless access:** End-user radio connection(s) to core networks.

## ANNEX 2

### Terms from IEEE Std 802.16j-2009

- 3.97 access link:** A radio link between an MR-BS or RS and an MS, or between an MR-BS or RS and a subordinate RS during network entry. The access link is either an uplink or downlink.
- 3.98 access RS:** A relay station that serves as an access station.
- 3.99 access station:** A station that provides a point of access into the network for an MS or RS. An access station can be a base station (BS), relay station (RS), or multihop relay BS (MR-BS).
- 3.100 centralized scheduling:** A mode of operation applicable to multihop relay where a multihop relay BS (MR-BS) determines the bandwidth allocations and generates the corresponding MAPs [or dictates the information used by relay stations (RSs) to generate their MAPs] for all access and relay links in the MR-cell.
- 3.101 distributed scheduling:** A mode of operation applicable to multihop relay where the MR-BS and each RS in the MR-cell (with or without information from the MR-BS) determine the bandwidth allocations and generate the corresponding MAPs for the access link to/from their subordinate SSs and/or relay links to/ from their subordinate RSs.
- 3.102 DL access zone:** A portion of the DL subframe in the MR-BS/RS frame used for MR-BS/RS to MS or RS (except TTR RS in TDD mode) transmission. The DL access zone may consist of the entire downlink subframe, depending on the method used to separate the transmissions on the access and relay links.
- 3.103 DL relay zone:** A portion of the DL subframe in the MR-BS/RS frame used for MR-BS/RS to RS transmission. A frame may have no DL relay zone, depending on the method used to separate the transmissions on the access and relay links.
- 3.104 infrastructure station:** An MR-BS or RS.
- 3.105 intermediate RS:** A relay station that is located on a path between an MR-BS and an access RS.
- 3.106 management tunnel CID (MT-CID):** An identifier taken from the connection identifier (CID) space managed by an MR-BS that uniquely identifies a management tunnel connection between the MR-BS and an access RS.
- 3.107 MR-BS frame:** Frame structure for DL transmission/UL reception by MR-BS.
- 3.108 multihop relay base station (MR-BS):** A generalized equipment set providing connectivity, management, and control of relay stations and subscriber stations. *See also: base station (BS), relay station (RS).*
- 3.109 non-transparent RS:** A relay station that transmits DL frame-start preamble, FCH, MAP message(s) and channel descriptor (DCD/UCD) messages.
- 3.110 relay link (R-link):** A radio link between an MR-BS and an RS or between a pair of RSs. This can be a relay uplink or downlink.
- 3.111 relay station (RS):** A generalized equipment set, dependent on a multihop relay base station (MR-BS) providing connectivity, to other RSs or subscriber stations (SS). An RS may also provide management and control of subordinate RSs or SSs. The air interface between an RS and an SS is

identical to the air interface between a BS and an SS. *See also:* **multihop relay base station (MR-BS)**, **base station (BS)**, **subscriber station (SS)**.

**3.112 relay zone:** A portion of a frame used for the relay link.

**3.113 round trip delay (RTD):** The round trip delay time between communicating stations (i.e. such as between an RS and its superordinate station).

**3.114 RS frame:** Frame structure for DL/UL transmission/reception by RS.

**3.115 RS receive/transmit transition gap (RSRTG):** The minimum receive-to-transmit turnaround gap required at an RS. RSRTG is measured from the time of the last sample of the received burst to the first sample of the transmitted burst at the antenna port of the RS.

**3.116 RS transmit/receive transition gap (RSTTG):** The minimum transmit-to-receive turnaround gap required at an RS. RSTTG is measured from the time of the last sample of the transmitted burst to the first sample of the received burst at the antenna port of the RS.

**3.117 scheduling RS:** A relay station that serves as a scheduling station; i.e., a non-transparent RS with unique BSID and operating in distributed scheduling mode.

**3.118 scheduling station:** In centralized scheduling mode, the scheduling station is always the MR-BS. In distributed scheduling mode, the scheduling station of a given MS/RS is the first station along the route to the MR-BS that transmits MAPs; i.e., either a non-transparent RS or the MR-BS itself.

**3.119 security zone (SZ):** A group consisting of one or more RSs and the MR-BS that share key material for the protection of MAC management messages produced and processed by members of the group.

**3.120 security zone key (SZK):** A group key shared by the MR-BS and a group of RSs within the same security zone. The SZK is a head of key hierarchy used to satisfy the security requirements such as integrity protection for MAC management messages within a defined security zone.

**3.121 simultaneous transmit and receive (STR) relaying:** A relay mechanism where transmission to subordinate station(s) and reception from the superordinate station, or transmission to the superordinate station and reception from subordinate station(s) are performed simultaneously.

**3.122 STR RS:** A non-transparent relay station capable of performing STR relaying.

**3.123 time-division transmit and receive (TTR) relaying:** A relay mechanism where transmission to subordinate station(s) and reception from the superordinate station, or transmission to the superordinate station and reception from subordinate station(s) is separated in time.

**3.124 transparent RS:** A relay station that does not transmit DL frame-start preamble, FCH, MAP message(s) or channel descriptor (DCD/UCD) messages.

**3.125 transparent zone:** A portion of the DL subframe in the MR-BS/RS frame for an RS operating in the transparent mode used for MR-BS/RS to MS transmission. A DL subframe may, or may not, have a transparent zone.

**3.126 TTR RS:** A non-transparent relay station that performs TTR relaying.

**3.127 tunnel CID (T-CID):** An identifier taken from the connection identifier (CID) space that uniquely identifies a transport tunnel connection.

**3.128 UL access zone:** A portion of the UL subframe in the MR-BS/RS frame used for MS or RS (except TTR RS in TDD mode) to MR-BS/RS transmission. A frame may have no UL access zone, or the UL access zone may consist of the entire uplink subframe, depending on the method used to separate the transmissions on the access and relay links.

**3.129 UL relay zone:** A portion of the UL subframe in the MR-BS/RS frame used for RS to MR-BS/RS transmission. A frame may have no UL relay zone, or the UL relay zone may consist of the entire uplink subframe, depending on the method used to separate the transmissions on the access and relay links.

## ANNEX 3

### **Terms from IEEE P802.16m/D8**

- 3.97 AAI subframe:** A structured data sequence of predefined duration used by the Advanced Air Interface specification.
- 3.98 advanced base station (ABS):** A base station that supports the Advanced Air Interface protocol defined in Clause 16.
- 3.99 advanced mobile station (AMS):** A subscriber station capable of performing the 12.5 WirelessMAN-OFDMA TDD Release 1 subset of mobile station (MS) features and functions additionally implementing the Advanced Air Interface protocol defined in Clause 16.
- 3.100 advanced relay station (ARS):** A relay station that supports the Advanced Air Interface protocol defined in Clause 16.
- 3.101 superframe:** A structured data sequence of fixed duration used by the Advanced Air Interface specifications. A superframe is comprised of four frames.
- 3.102 primary carrier:** An OFDMA carrier on which an ABS and an AMS/MS exchange traffic and full PHY/MAC control information defined in the Advanced Air Interface specification. Further, the primary carrier is used for control functions for proper AMS/MS operation, such as network entry. Each AMS shall have only one carrier it considers to be its primary carrier in a cell.
- 3.103 secondary carrier:** An OFDMA carrier that an AMS may use to exchange traffic with an ABS, based on allocation commands and rules received over the primary carrier of that ABS.. The secondary carrier may also include control signaling to support multi-carrier operation.
- 3.104 fully configured carrier:** A carrier for which all control channels including synchronization, broadcast, multicast and unicast control signaling are configured. Further, information and parameters regarding multi-carrier operation and the other carriers can also be included in the control channels.
- 3.105 partially configured carrier:** A downlink only carrier configured with control channels to support downlink transmission.
- 3.106 physical resource unit (PRU):** The basic resource allocation unit that consists of 18 adjacent subcarriers in consecutive symbols in the same AAI subframe.
- 3.107 distributed resource unit (DRU):** The resource allocation unit of the same size as the PRU that has undergone the subband partitioning and miniband permutation, assigned to distributed allocation and will be submitted to the subcarrier permutation in DL and tile permutation in UL.
- 3.108 contiguous resource unit (CRU):** The resource allocation unit of the same size as the PRU that has undergone the subband partitioning and miniband permutation, assigned to contiguous allocation and will bypass subcarrier permutation in DL and tile permutation in UL. Also known as a localized resource unit.
- 3.109 logical resource unit (LRU):** the generic name of logical units for distributed and localized resource allocations.
- 3.110 transmission time interval (TTI):** The duration of the transmission of the physical layer encoded packet over the radio air interface and is equal to an integer number of AAI subframes. The default TTI is 1 AAI subframe.

- 3.111 MIMO layer:** An information path fed to the MIMO encoder as an input. A MIMO layer represents one channel coding block.
- 3.112 MIMO stream:** Each information path encoded by the MIMO encoder that is passed to the precoder
- 3.113 horizontal encoding:** Indicates transmitting multiple MIMO layers over multiple antennas. The number of MIMO layers is more than 1. The number of MIMO streams is same as the number of MIMO layers in this case.
- 3.114 vertical encoding:** Indicates transmitting a single MIMO layer over multiple antennas. The number of MIMO layers is always 1.
- 3.115 multi-layer encoding:** The number of MIMO streams is same as the number of MIMO layers in this case.
- 3.116 resource unit:** A granular unit in frequency and time, described by the number of OFDMA subcarriers and OFDMA symbols
- 3.117 single user MIMO (SU-MIMO):** A MIMO transmission scheme in which a single MS is scheduled in one RU
- 3.118 multi-user MIMO (MU-MIMO):** A MIMO transmission scheme in which multiple MSs are scheduled in one RU, by virtue of spatial separation of the transmitted signals
- 3.119 Time-division transmit and receive (TTR) relaying:** a relay mechanism where transmission to subordinate station(s) and reception from the superordinate station, or transmission to the superordinate station and reception from subordinate station(s) is separated in time.
- 3.120 AAI (DL/UL) Access Zone:** An integer multiple of subframes located in the MZone of the ABS frame or ARS frame, where an ABS or ARS transmit to the AMSs or receive from AMSs.
- 3.121 AAI (DL/UL) Relay Zone:** An integer multiple of subframes located in the MZone of the ABS frame, where an ABS transmit to the ARSs and/or AMSs or receive from ARSs and AMSs, or ARS frame, where an ARS transmit to the ABS or receive from ABS.
- 3.122 ARS transmit/receive transition gap (ARSTTG):** The minimum transmit-to-receive turnaround gap required at an ARS. ARS-TTG is measured from the time of the last sample of the transmitted burst to the first sample of the received burst at the antenna port of the ARS.
- 3.123 ARS receive/transmit transition gap (ARSRTG):** The minimum receive-to-transmit turnaround gap required at an ARS. ARS-RTG is measured from the time of the last sample of the received burst to the first sample of the transmitted burst at the antenna port of the ARS.
- 3.124 relative delay (RD):** The delay of neighbor DL signals relative to the serving/attached BS.
- 3.125 round trip delay (RTD):** The time required for a signal or packet to transfer from a MS to a BS and back again.
- 3.126 Macro hotzone ABS:** An ABS with smaller transmission power/cell size than that of macro ABS's, typically deployed by service provider and operated on service provider backhaul.
- 3.127 frame index:** The frame order within a Superframe (i.e. the 1st, 2nd, 3rd, or 4th frame of Superframe).
- 3.128 Femto ABS:** an ABS with low transmit power, typically installed by a subscriber in the home, SOHO, or enterprise to provide the access to closed or open group of users as configured by the subscriber and/or the access provider. A Femto ABS is typically connected to the service providers network via a broadband connection.

**3.129 OSG Femto ABS:** a femto ABS accessible to any AMS.

**3.130 closed subscriber group (CSG):** a set of subscribers authorized by the Femto ABS owner or the network service provider, for accessing CSG femto ABS.

**3.131 CSG Femto ABS:** CSG-Closed or CSG-Open Femto ABS.

**3.132 CSG-Closed Femto ABS:** a femto ABS accessible only to the AMSs, which are in its CSG(s), except for emergency services. AMSs which are not the members of the CSG(s), should not try to access CSG-Closed Femto ABSs.

**3.133 CSG-Open Femto ABS:** a femto ABS primarily accessible to the AMSs that belong to its CSG(s), while other AMSs, outside CSG(s), may also access such Femto ABS, and will be served at lower priority. CSG-Open Femto ABS will provide service to such AMSs as long as the QoS of AMSs in its CSG(s) is not compromised.

**3.134 WirelessMAN OFDMA R1 Reference System:** a network compliant with the WirelessMAN-OFDMA capabilities as specified in subclause 12.5 WirelessMAN-OFDMA TDD Release 1

**3.135 WirelessMAN-OFDMA Advanced co-existing System:** an ABS and/or AMS that also implements LZone functionality compliant with 12.5 WirelessMAN-OFDMA TDD Release 1

**3.136 R1 MS:** A mobile station compliant with the WirelessMAN-OFDMA R1 Reference System

**3.137 R1 BS:** A base station compliant with the WirelessMAN-OFDMA R1 Reference System

**3.138 LZone:** A positive integer number of consecutive subframes during which an ABS communicates with RSs or R1 MSs, and where an ARS or an RS communicates with one or more R1 MSs.

**3.139 MZone:** A positive integer number of consecutive subframes during which an ABS communicates with one or more ARSs or AMSs, and where an ARS communicates with one or more ARSs or AMSs.

**3.140 Mixed Mode ABS:** An ABS with an operating Lzone and operating Mzone.

**3.141 default service flow:** A service flow which is established automatically without DSA procedure after successful registration procedure. QoS parameters for the default service flow are predefined.

**3.142 Simultaneous transmit and receive (STR) relaying:** a relay mechanism where transmission to subordinate station(s) and reception from the superordinate station, and transmission to the superordinate station and reception from subordinate station(s) are performed simultaneously.

**3.143 Macro ABS:** an ABS with high transmit power. A Macro ABS is directly connected to the service providers network.

**3.144 Single Radio MS:** A multimode MS/AMS that operates with only a single transmitting radio and with one or more receiving radios at any given time.

**3.145 Dual Radio MS:** A multimode MS/AMS that can have both radios (transmitting and receiving) active at the same time. A Dual Radio MS/AMS can simultaneous transmit and receive on both radios (for e.g.

WiMAX and 3GPP). A Dual Radio MS/AMS may behave as a Single Radio MS by operating in Single Radio Mode

**3.146 Multi Radio MS:** A multimode MS/AMS that can have multiple radios (transmitting and receiving) active at the same time. A Multi Radio MS/AMS can simultaneous transmit and receive on multiple radios (for e.g. WiMAX and 3GPP). A Multi Radio MS/AMS may behave as a Single Radio MS by operating in Single Radio Mode

**3.147 Frame Number:** In WirelessMAN-OFDMA, the frame number is a 24-bit number transmitted in every frame. Frame numbers are not necessarily synchronized across base stations. In WirelessMAN-AAI, the frame number is obtained by concatenating the 12-bit superframe number (transmitted in every superframe) and the 2-bit frame index. Superframe numbers are synchronized across base stations.

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