

Acronyms and Terms in Mobile Broadband

Acronym/ Term	Definition	Explanation	Web Resources
16QAM	16-level Quadrature Amplitude Modulation	A modulation method in which the amplitude of two quadrature waves is changed in order to represent the data signal. A constellation diagram is often used to represent this kind of modulation. In QAM the constellation points are usually arranged in a square grid with equal horizontal and vertical spacing, although other configurations are possible. The number of points in the grid is usually a power of 2 (2, 4, 8 etc.), and since QAM usually is square, the most common forms are 4-QAM (or QPSK), 16-QAM, 64-QAM, 128-QAM and 256-QAM. QPSK and 16-QAM are eg. used in current and future mobile radio systems like 3G/HSDPA, 4G/LTE and WiMAX/IEEE 802.16, while 64-QAM and 256-QAM are often used in digital cable television and cable modems.	
1G	First Generation mobile technology	Refers to the first automatic cellular telephone systems standardized in the late 1960s and 1970s. They are based on analogue technology, with possible digital signalling. NMT, TACS and AMPS are examples of 1G systems.	
2G	Second Generation mobile technology	Refers to the family of digital cellular telephone systems standardised in the 1980s and introduced in the 1990s. They introduced digital technology and carry both voice and data conversation. CDMA, TDMA and GSM are examples of 2G mobile networks.	
3G	Third Generation mobile technology	The generic term for the next generation of wireless mobile communications networks supporting enhanced services like multimedia and video. Most commonly, 3G networks are discussed as graceful enhancements of 2G cellular standards, like eg. GSM. The enhancements include larger bandwidth, more sophisticated compression techniques, and the inclusion of in-building systems. 3G networks will carry data at 144 kb/s, or up to 2Mb/s from fixed locations. 3G comprises mutually incompatible standards: UMTS FDD and TDD, CDMA2000, TD-CDMA and Mobile WiMAX.	
3GPP	Third Generation Partnership Project	Group of the standards bodies ARIB and TTC (Japan), CCSA (People's Republic of China), ETSI (Europe), T1 (USA) and TTA (Korea). Established in 1999 with the aim to produce and maintain the specifications for a third generation mobile communications system called UMTS. Note the 3GPP itself is not a standardization organization and that all produced standards must be ratified by a standardization organization. A permanent project support group called the 'Mobile Competence Centre (MCC)' is in charge of the day-to-day running of 3GPP. The MCC is based at the ETSI headquarters in Sophia Antipolis, France.	http://www.3gpp.org
3GPP2	Third Generation Partnership Project 2	A collaborative third generation (3G) telecommunications specifications-setting project comprising North American and Asian interests developing global specifications for ANSI/TIA/EIA-41 Cellular Radiotelecommunication Intersystem Operations network evolution to 3G and global specifications for the radio transmission technologies (RTTs) supported by ANSI/TIA/EIA-41. 3GPP2 was initiated as a result of the International Telecommunication Union's (ITU) International Mobile Telecommunications IMT-2000 initiative, covering high speed, broadband, and Internet Protocol (IP)-based mobile systems featuring network-to-network interconnection, feature/service transparency, global roaming and seamless services independent of location. 3GPP2 is a collaborative effort between five officially recognized Standards Development organisations (SDO): ARIB - Association of Radio Industries and Businesses (Japan), CCSA - China Communications Standards Association (China), TIA - Telecommunications Industry Association (North America), TTA - Telecommunications Technology Association (Korea) and TTC - Telecommunications Technology Committee (Japan).	http://www.3gpp2.org
4G	Fourth Generation (mobile system)	Term often used to denote future broadband mobile communications systems or standards with high mobility and bit rates beyond 100 Mb/s to follow 3G. Previously often referred to as 'systems beyond 3G' (B3G). The most advanced coming standards are 3GPP's LTE-Advanced and the IEEE 802.16m.	

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64QAM	64-level Quadrature Amplitude Modulation	A modulation method in which the amplitude of two quadrature waves is changed in order to represent the data signal. A constellation diagram is often used to represent this kind of modulation. In QAM the constellation points are usually arranged in a square grid with equal horizontal and vertical spacing, although other configurations are possible. The number of points in the grid is usually a power of 2 (2, 4, 8 etc.), and since QAM usually is square, the most common forms are 4-QAM (or QPSK), 16-QAM, 64-QAM, 128-QAM and 256-QAM. QPSK and 16-QAM are eg. used in current and future mobile radio systems like 3G/HSDPA, 4G/LTE and WiMax/IEEE 802.16, while 64-QAM and 256-QAM are often used in digital cable television and cable modems.	
A3	Algorithm 3	Authentication algorithm; used for authenticating the subscriber in GSM.	
A5	Algorithm 5	Cipher algorithm; used for enciphering/deciphering data in GSM.	
A8	Algorithm 8	Cipher key generator; used to generate the cryptographic key Kc in GSM.	
AAA	Authentication, Authorization and Accounting	Key functions to intelligently control access, enforce policies, audit usage, and providing the information necessary to do billing for services available on the Internet. The term AAA is used to denote an internet security service architecture that provides the AAA services. The architecture includes AAA servers and AAA protocols. The AAA protocols include RADIUS and DIAMETER. Defined in IETF RFC 2903.	http://www.ietf.org , http://tools.ietf.org/html/rfc4303
ADSL	Asymmetric Digital Subscriber Line	A data communications technology that enables faster data transmission over copper telephone lines than a conventional modem can provide. The access utilises the 1.1 MHz band and has the possibility to offer, depending on subscriber line length, downstream rates of up to 8 Mb/s. Upstream rates start at 64 kb/s and typically reach 256 kb/s but can go as high as 768 kb/s. Specified by ANSI T1.413 and by ITU-T recommendation G.992.1. A version called ADSL Lite providing up to 1.5 Mb/s downstream rates are specified as G.992.2	http://www.itu.int
AKA	Authentication and Key Agreement	A challenge-response based authentication cryptographic protocol that additionally also includes agreement on session key material. In the 3GPP sphere there exist several variants, including GSM AKA, UMTS AKA, EPC AKA, IMS AKA etc. Note that the 3GPP2 CDMA2000 system uses an AKA protocol almost identical to the UMTS AKA protocol. Specified in 3GPP TS 33.102.	http://www.3gpp.org/ftp/Specs/html-info/33102.htm
AMC	Adaptive Modulation and Coding	A technique used to match the modulation, coding and other signal and protocol parameters to the conditions on the radio link (eg. the path loss, the interference due to signals coming from other transmitters, the sensitivity of the receiver, the available transmitter power margin, etc.). EDGE and 3G/HSPA uses a rate adaptation algorithm that adapts the modulation and coding scheme (MCS) according to the quality of the radio channel, and thus the bit rate and robustness of data transmission. The process of link adaptation is dynamic and the signal and protocol parameters change as the radio link conditions change – for example in HSDPA in UMTS this can take place every 2 ms. In Mobile WiMAX, it also denotes an OFDMA subcarrier allocation method.	
AMPS	Advanced Mobile Phone System	A 1st generation (1G) analogue mobile phone system standard developed by Bell Labs, and introduced in America in 1983 and Australia in 1987. It was the primary analogue mobile phone system in North America through the 1980s and into the 2000s. From 18 February 2008, carriers in the US were no longer required to support AMPS and companies such as AT&T and Verizon have discontinued this service permanently. AMPS was discontinued in Australia in September 2000. AMPS was a FDMA/FDD based analogue system operating in the 800 MHz band in the US (uplink from 824-849 MHz and downlink from 869-894 MHz) providing 416 channels of 30 kHz each.	
AMR	Adaptive Multi Rate	A speech coding algorithm offering a wide range of data rates. Designed for use in 3G networks. The philosophy behind AMR is to lower the codec rate as the interference increases and thus enabling more error correction to be applied. The 12.2 kb/s mode is equivalent to the GSM Enhanced Full Rate (EFR) codec.	
ANDSF	Access Network Discovery Selection Function	Data management and control functionality necessary for providing network discovery and selection assistance data to the UE/MS as per operator policy. It is able to initiate data transfer to the UE based on network triggers and respond to requests from the UE. It is located in the subscriber's home operator network and the information to access it should either be configured on the UE or discovered by other means.	

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ARPU	Average Revenue Per User	It is a measure of the revenue generated by one customer phone, pager, etc., per month. The term is used by companies that offer subscription services to clients, eg. telephone carriers, Internet Service Providers, and Hosts etc. In mobile telephony, ARPU includes not only the revenues billed to the customer each month for usage, but also the revenue generated from incoming calls, payable within the regulatory interconnection regime.	
ASN	Access Service Network	Term used to denote the access network (AN) of Mobile WiMAX. The ASN provides means to connect mobile subscribers using OFDMA air link to IP backbone with session continuity. It comprises base stations (BS) and access gateways named ASN-GW. The ASN is a set of network functions including: Network discovery and selection, relay function for IP connectivity, radio resource management, quality of service, and admission control and policing, among others.	http://www.wimaxforum.org , http://www.ieee802.org/16
ATM	Asynchronous Transfer Mode	A high bandwidth, low-delay, connection-oriented, packet-like switching and multiplexing technique. ATM allocates bandwidth on demand, making it suitable for high-speed connections of voice, data and video services. Access speeds are up to 622 Mb/s and backbone networks currently operate at speeds as high as 2.5 Gb/s. Standardised by ITU-T [Newton03].	http://www.itu.int
ATPC	Automatic Transmit Power Control	A technical mechanism used within some networking devices in order to prevent too much unwanted interference between different wireless networks.	
AuC	Authentication Centre	The AuC is the authentication centre in 2G and 3G cellular networks. The AuC is co-located with a HLR. It is the network element that provides the authentication triplets for authenticating the subscriber.	
BE	Best Effort	Used to identify an IP network service where no priority is given to the traffic.	
BPSK	Binary Phase Shift Keying	A digital modulation scheme that conveys data by changing, or modulating, the phase of a reference signal (the carrier wave) using two levels.	
BRAS	Broadband Remote Access Server	A BRAS routes traffic to and from the digital subscriber line access multiplexers (DSLAM) on an Internet service provider's (ISP) network. The BRAS is in the core of an ISP's network. It aggregates user sessions from the access network.	
BS	Base Station	The equipment that facilitates wireless communication between user equipment (UE) and a network. The network can be that of any of the wireless communication technologies like GSM, CDMA, WLL, WAN, Wi-Fi, WiMAX etc. The base station is referred to as BTS or RBS for the GSM network, NodeB (NB) in 3G Networks, and eNodeB (eNB) for the LTE standard.	
BTS	Base Transceiver Station	The radio base station of a GSM network. It consists of one or more transmitter-receiver units, each serving one carrier frequency.	http://www.etsi.org
CAGR	Compound Annual Growth Rate	A business and investing specific term for the smoothed annualized gain of an investment over a given time period. It is not an accounting term, but is widely used, particularly in growth industries or to compare the growth rates of two investments because CAGR dampens the effect of volatility of periodic returns that can render arithmetic means irrelevant. CAGR is often used to describe the growth over a period of time of some element of the business, for example revenue.	
CAPEX	Capital expenditure	Expenditures used by a company to acquire or upgrade physical assets such as equipment, property, industrial buildings. In accounting, a capital expenditure is added to an asset account (ie. capitalized), thus increasing the asset's basis.	
CDF	Cumulative Distribution Function	In probability theory, the Cumulative Distribution Function completely describes the probability distribution of a real-valued random variable, X. It represents the probability that the random variable X takes on a value less than or equal to x.	
CDMA2000	Code Division Multiple Access 2000	A family of third-generation (3G) mobile telecommunications standards that use CDMA, a multiple access scheme for digital radio, to send voice, data, and signalling data (such as a dialled telephone number) between mobile phones and cell sites. It is the second generation of CDMA digital cellular. The CDMA2000 standards CDMA2000 1x, CDMA2000 1xEV-DO, and CDMA2000 1xEV-DV are approved radio interfaces for the ITU's IMT-2000 standard and a direct successor to 2G CDMA, IS-95 (cdmaOne). CDMA2000 is standardized by 3GPP2. CDMA2000 is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States, not a generic term like CDMA.	http://www.3gpp2.org

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CEPT	Conférence Européenne des Post et Telecommunications	The European Conference of Postal and Telecommunications Administration – CEPT – was established in 1959 by 19 countries, which expanded to 26 during its first ten years. Original members were the incumbent monopoly-holding postal and telecommunications administrations. CEPT's activities included co-operation on commercial, operational, regulatory and technical standardisation issues. In 1988 CEPT created ETSI, The European Telecommunications Standards Institute, into which all its telecommunication standardisation activities were transferred. In 1992 the postal and telecommunications operators created their own organisations, Post Europe and ETNO respectively. In conjunction with the European policy of separating postal and telecommunications operations from policy-making and regulatory functions, CEPT became a body of policy-makers and regulators. At the same time, Central and Eastern European Countries became eligible for membership of CEPT. With its 45 members CEPT now covers almost the entire geographical area of Europe.	http://www.cept.org/
CID	Connection ID	In WiMAX, a unidirectional mapping between MAC peers over the air interface.	http://www.wimaxforum.org , http://www.ieee802.org/16
CN	Core Network	Term used for core network nodes in cellular systems. CN nodes in GSM, UMTS and LTE include HLR/HSS/AuC, VLR/MSC, VLR/SGSN, SMSC, EIR, GGSN and MME.	
CoMP	Coordinated Multipoint transmission/reception	CoMP transmission means that several cells coordinate their transmission between themselves. CoMP is targeted mainly towards improving the performance for the cell edge users that suffer from interference. Interference can be combated either by using macro diversity or by letting the surrounding cells defer from transmitting any data at all at the instant when the cell edge user is scheduled by the controlling cell.	
COMP128		An infamous authentication and key agreement algorithm. The original COMP128 is an example implementation for the GSM A3 and A8 cryptographic functions. The COMP128 algorithm is fundamentally flawed and has been known to be so for more than a decade. The algorithm, which is an operator-specific algorithm (contained on the SIM card), is completely unsuitable for its designated tasks, yet it is still in use in several GSM/GPRS networks today.	
CPC	Cognitive Pilot Channel	Technique suggested for Cognitive Radio (CR) systems in which information on local spectrum usage is broadcast using a common, open channel. The term CPC is used by ETSI RRS, but also other CR standardization groups, like eg. IEEE 802.22 WRAN describe similar methods.	http://www.etsi.org
CPE	Customer Premises Equipment	Any terminal and associated equipment and inside wiring located at a subscriber's premises and connected with a carrier's telecommunication channel(s) at the demarcation point ('demarc'). The demarc is a point established in a building or complex to separate customer equipment from telephone company equipment. CPE generally refers to telephones, DSL modems or cable modems, or purchased set-top boxes for use with communication service providers' services. Also included are key phone systems and most private branch exchanges.	
CR	Cognitive Radio	A Cognitive Radio system is an 'intelligent' radio system that takes into account its knowledge about its environment and its communication needs and adapts its wireless transmissions in an optimal manner.	
CS	Convergence Sublayer	In WiMAX, a sub-layer of the MAC layer. Two variants exist, one for ATM and one for IP. The IP convergence sub-layer provides initial support for Ethernet IPv4 and IPv6, as well as payload header suppression, both generic and IP specific. It also contains full QoS support and future support for PPP, MPLS etc.	http://www.wimaxforum.org , http://www.ieee802.org/16
CS	Circuit Switched	A network that establishes a circuit (or channel) between nodes before they may communicate. This circuit is dedicated and cannot be used for other means until the circuit is cancelled/closed and a new one created. If no actual communication is taking place in this circuit then the channel remains idle.	
CSD	Circuit Switched Data	The original form of data transmission developed for time division multiple access (TDMA)-based mobile phone systems like GSM. CSD uses a single radio time slot to deliver 9.6 kb/s data transmission to the GSM Network and Switching Subsystem where it could be conveyed to the PSTN allowing direct calls to any dial-up service.	
CSN	Connectivity Service Network	The CSN represents a set of network functions that provide IP connectivity services to WiMAX subscribers. Some of the key functions of the CSN are: IP address management, connectivity to the Internet, CSN-anchored inter-ASN mobility, AAA proxy or server, QoS policy and admission control, and subscriber billing and inter-operator settlement.	http://www.wimaxforum.org , http://www.ieee802.org/16

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DAB	Digital Audio Broadcast	Terrestrial digital radio system, also called T-DAB developed by the Eureka 147 Project in the period 1986 – 1993. It offers near CD-quality sound, more stations and additional radio and data services. Standardized by ETSI and recognized by the ITU in 1994. Regular broadcast in several European countries. Operates in the frequency bands 47–68 MHz, 87.5–108 MHz, 174–240 MHz and 1452–1479.5 MHz. First transmissions from 1995. Is intended to replace conventional FM broadcast.	http://www.worlddab.org , http://www.eurekadab.org
D-AMPS	Digital Advanced Mobile Phone System	Second-generation (2G) mobile phone system, known as IS-54 and IS-136. It is used throughout the Americas, particularly in the United States and Canada. Often referred to as TDMA. D-AMPS has been competing against GSM and systems based on Code division multiple access (CDMA) for adoption by the network carriers, although it is now being phased out in favour of the GSM technology. IS-54 was standardised by EIA and TIA, later adopted by ANSI as ANSI/EIA/TIA-627.	http://www.ansi.org , http://www.tiaonline.org , http://www.eia.org
DC-HSDPA	Dual-Carrier HSDPA	Carrier aggregation on the downlink of HSPA, defined by 3GPP UMTS Release 8. The term Dual-Cell HSDPA is also used. In R8, only adjacent carriers can be combined, but future releases will also allow separate carriers in the same band and in different frequency bands. DC-HSDPA is the first step towards the more general multi-carrier HSDPA (MC-HSDPA).	http://www.3gpp.org
DCS-1800	Digital Cellular System 1800 MHz	Term previously used for GSM systems operating in the 1800 MHz band (1710–1785 MHz (UL), 1805–1880 MHz (DL)). Now, the term GSM-1800 is used.	
DD	Digital Dividend	Generally, the term used to denote the freed spectrum in the VHF/UHF bands when migrating from analogue to digital terrestrial broadcast. Commonly used only of the band 790–862 MHz, since this has been considered the most attractive to mobile broadband services.	
DECT	Digital Enhanced Cordless Telecommunication	Formerly called Digital European Cordless Telephone. An ETSI standard for digital portable phones, commonly used for domestic or corporate purposes. DECT is a cellular system with cell radii of 25 to 100 metres. DECT uses a net bit rate of 32 kb/s. It operates in the frequency band from 1880 to 1900 MHz. The band is divided into 10 carriers, each with 2 x 12 timeslots. It can serve a traffic density of approx. 10000 Erlang/km ² . The DECT physical layer is a combined frequency division multiple access (FDMA) / time division multiple access (TDMA) system using time division duplex (TDD) to separate traffic in the two directions.	http://www.etsi.org
DHCP	Dynamic Host Configuration Protocol	Dynamic Host Configuration Protocol (DHCP) is a client-server networking protocol. A DHCP server provides configuration parameters specific to the DHCP client host requesting, generally, information required by the client host to participate on an IP network. DHCP also provides a mechanism for allocation of IP addresses to client hosts. DHCP appeared as a standard protocol in October 1993. RFC 2131 provides the latest (March 1997) DHCP definition. The latest standard on a protocol describing DHCPv6, DHCP in an IPv6 environment, was published in July 2003 as RFC 3315.	http://www.ietf.org , http://tools.ietf.org/html/rfc2131 , http://tools.ietf.org/html/rfc3315
DiffServ	Differentiated Services	A method of trying to guarantee quality of service in large networks such as the Internet.	http://www.ietf.org
DL	Downlink	Term used to denote the transmission direction from the base station to the mobile station or user terminal.	
DL-MAP	Downlink Map	A term used in IEEE 802.16 networks to describe a MAC message that defines burst start times for both time division multiplex and time division multiple access by a subscriber station on the downlink.	http://www.wimaxforum.org , http://www.ieee802.org/16
DMB	Digital Multi-media Broadcast	Wireless Broadband technology based on the DAB (Digital Audio Broadcast) system.	
DoA	Direction of Arrival	In signal processing, direction of arrival denotes the direction from which usually a propagating wave arrives at a point.	

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DOCSIS	Data Over Cable Service Interface Specification	An international standard developed by CableLabs and contributing companies. DOCSIS defines the communications and operation support interface requirements for a data over cable system. It permits the addition of high-speed data transfer to an existing Cable TV (CATV) system. It is employed by many cable television operators to provide Internet access (see cable internet) over their existing hybrid fibre coaxial (HFC) infrastructure. The first DOCSIS specification was version 1.0, issued in March 1997, with revision 1.1 (adding Quality of Service (QoS) capabilities) following in April 1999. Because of increased demand for symmetric services such as IP telephony, DOCSIS was revised to enhance upstream transmission speeds; DOCSIS 2.0 was released in December 2001. Most recently, the specification was revised to significantly increase transmission speeds (this time both upstream and downstream) and introduce support for Internet Protocol version 6 (IPv6). This version, DOCSIS 3.0, was released in August 2006.	http://www.docsis.org/ , http://www.cablemodem.com/
DPI	Deep Packet Inspection	For network nodes not being end-points using non-header content typically the actual payload of a data packet, for some purpose. The packet passes an inspection point, searching for protocol non-compliance, viruses, spam, intrusions or predefined criteria to decide what actions to take on the packet, including collecting statistical information.	
DSL	Digital Subscriber Line	A family of technologies that provide a digital connection over the copper wires of the local telephone network. Its origin dates back to 1988, when an engineer at Bell research lab devised a way to carry a digital signal over the unused frequency spectrum. This allows an ordinary phone line to provide digital communication without blocking access to voice services. Bell's management, however, were not enthusiastic about it, as it was not as profitable as renting out a second line for those consumers who preferred to still have access to the phone when dialling out. This changed in the late 1990s when cable companies started marketing broadband Internet access. Realising that most consumers would prefer broadband Internet to a second dial out line, Bell companies rushed out the DSL technology that they had been sitting on for the past decade as an attempt to slow broadband Internet access uptake, to win market share against the cable companies. As of 2004, DSL provides the principal competition to cable modems for providing high speed Internet access to home consumers in Europe and North America. The reach-restraints (line length from Central Office to Subscriber) reduce as data rates increase, with technologies like VDSL providing short-range links (typically 'fibre to the curb' network scenarios). Example DSL technologies (sometimes called xDSL) include: ADSL (Asymmetric Digital Subscriber Line), HDSL (High Bit Rate Digital Subscriber Line), RADSL (Rate Adaptive Digital Subscriber Line), SDSL (Symmetric Digital Subscriber Line, a standardised version of HDSL), VDSL (Very high speed Digital Subscriber Line), G.SHDSL (ITU-T Standardised replacement for early proprietary SDSL).	
DVB	Digital Video Broadcasting	An international digital broadcast standard for TV, audio and data. DVB can be broadcast via satellite, cable or terrestrial systems. It has initially been used in Europe and the Far East.	http://www.dvb.org/
DVB-RCS	Digital Video Broadcasting, Return Channel via Satellite	An amendment to the DVB standard allowing two-way communication where the return channel is via the satellite link. DVB-RCS completed the 5th revision of the DVB standard in 2008.	http://www.dvb.org
Ecma	European Computer Manufacturers Association	Ecma International is an international membership-based standards organisation for information and communication systems. Named the European Computer Manufacturers Association (ECMA) until 1994, when it changed its name to express the organization's international reach. The name is no longer considered an acronym and no longer uses full capitalization. The organization was originally founded in 1961 to standardise computer systems in Europe. Membership is open to companies that produce, market or develop computer or communication systems in Europe.	http://www.ecma-international.org/
EDGE	Enhanced Data for GSM Evolution	A modulation method for GSM and IS-136 TDMA networks, standardized by ETSI, that allows for wireless data transfer up to 384 kb/s.	http://www.etsi.org , http://www.3gpp.org
EGC	Equal Gain Combining	Receiver diversity algorithm where all branches are added with the same gain.	
E-GSM	Extended GSM band	An extension of the original GSM-900 band adding 50 channels in 870-880 MHz (UL) and 915-925 MHz (DL)	
eMBMS	evolved Multi-media Broadcast Multicast Service	The MBMS service in LTE. A broadcasting service defined as part of the LTE-system, where some resources blocks are used to convey broadcast data.	http://www.3gpp.org

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eNB	evolved NodeB	The base station in LTE. Compared to the NodeB of 3G it also contains most of the functions from the radio network controller (RNC).	http://www.3gpp.org
EPC	Evolved Packet Core	An all-IP core network connecting the LTE RAN to an IP-network, eg. the Internet. It is planned to replace the GPRS Core Network used in GSM and UMTS. It consists of the Mobility Management Entity (MME), Serving Gateway (SGW) and PDN Gateway (PGW). The MME is the key control-node for the LTE access-network. The MME is responsible for idle mode UE (User Equipment) tracking and paging procedure including retransmissions. It is involved in the bearer activation/deactivation process and is also responsible for choosing the SGW for a UE at the initial attach and at time of intra-LTE handover involving Core Network (CN) node relocation. It is responsible for authenticating the user. The SGW routes and forwards user data packets, while also acting as the mobility anchor for the user plane during inter-eNodeB handovers and as the anchor for mobility between LTE and other 3GPP technologies. The PGW provides connectivity from the UE to external packet data networks by being the point of exit and entry of traffic for the UE.	http://www.3gpp.org
ePDG	Evolved Packet Data Gateway	Part of the Evolved Packet System performing different functions related to IP addresses, security and mobility.	
EPS	Evolved Packet System	The new PS-based wireless system specified by the 3GPP. It consists of the LTE RAN and the Evolved Packet Core (EPC). In daily speech the name LTE is often used for the EPS.	http://www.3gpp.org
EPS AKA	EPS Authentication and Key Agreement	The AKA protocol used in LTE. For authentication it is very similar to UMTS AKA and provides roughly the same level of identity assurance. The Key Agreement is based on the CK, IK keys which is transformed into a 256 bit wide KASME master key. From this basis a full key hierarchy is derived.	
ertPS	extended real-time Polling Service	In Mobile WiMAX, a scheduling mechanism which builds on the efficiency of both Unsolicited Grant Service (UGS) and real-time PS (rtPS). The BS provides unicast grants in an unsolicited manner like in UGS, thus saving the latency of a BR. However, whereas UGS allocations are fixed in size, ertPS allocations are dynamic.	http://www.wimaxforum.org http://www.ieee802.org/16
ETSI	European Telecommunication Standards Institute	A non-profit membership organization founded in 1988. The aim is to produce telecommunications standards to be used throughout Europe. The efforts are coordinated with the ITU. Membership is open to any European organization proving an interest in promoting European standards. It was eg. responsible for the making of the GSM standard. The headquarters are situated in Sophia Antipolis, France.	http://www.etsi.org
E-UTRAN/ eUTRAN	Evolved UTRAN	Term used by the 3GPP for the next generation UMTS Terrestrial Radio Access Network. It is developed as part of 3GPP's Long Term Evolution (LTE) and System Architecture Evolution (SAE) work. It was initiated in 2004, and first release of specifications was finished in 2008.	http://www.3gpp.org
EV-DO	Evolution-Data Optimized	A telecommunications standard for the wireless transmission typically for broadband Internet access. It uses multiplexing techniques including code division multiple access (CDMA) as well as time division multiple access (TDMA) to maximize both individual user's throughput and the overall system throughput. It is standardized by 3rd Generation Partnership Project 2 (3GPP2) as part of the CDMA2000 family of standards.	http://www.3gpp2.org
FCC	Federal Communication Commission (USA)	An independent United States government agency, directly responsible to US Congress. The FCC was established by the Communications Act of 1934 and is charged with regulating interstate and international communications by radio, television, wire, satellite and cable. The FCC's jurisdiction covers the 50 states, the District of Columbia, and US possessions. The FCC is directed by five Commissioners appointed by the President and confirmed by the Senate for 5-year terms, except when filling an unexpired term. The President designates one of the Commissioners to serve as Chairperson. Only three Commissioners may be members of the same political party. None of them can have a financial interest in any Commission-related business. As the chief executive officer of the Commission, the Chairman delegates management and administrative responsibility to the Managing Director. The Commissioners supervise all FCC activities, delegating responsibilities to staff units and Bureaus. The Commission staff is organized by function. There are six operating Bureaus and ten Staff Offices. The Bureaus' responsibilities include: processing applications for licenses and other filings; analyzing complaints; conducting investigations; developing and implementing regulatory programs; and taking part in hearings.	http://www.fcc.gov
FCH	Frame Control Header	In Mobile WiMAX, the FCH specifies the burst profile and the length of the DL-MAP. Each downlink interval begins with a preamble followed by the FCH, the DL MAP and the UL MAP. The DL-MAP and UL-MAP message defines the usage of the DL and UL intervals respectively.	http://www.wimaxforum.org http://www.ieee802.org/16

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FDD	Frequency Division Duplex	A method of separating the directions of a two-way communication link by using different frequencies in the two directions.	
FDMA	Frequency Division Multiple Access	The oldest and most important of the three main ways for multiple radio transmitters to share the radio spectrum. In FDMA, each transmitter is assigned a distinct frequency channel so that receivers can discriminate among them by tuning to the desired channel.	
FFSK	Fast Frequency Shift Keying	A variant of FSK, also called Minimum Shift Keying (MSK). It is a frequency modulation scheme in which digital information is transmitted through discrete frequency changes of a carrier wave. FFSK/MSK is a spectral efficient form of coherent binary FSK where the difference between the higher and lower frequencies is identical to half the bit rate.	
FFT	Fast Fourier Transform	FFTs are fast DFT Algorithms.	
FSO	Free Space Optics	A telecommunication technology that uses light propagating in free space to transmit data between two points. The technology is useful where the physical connection of the transmit and receive locations is difficult, eg. in cities where the laying of fibre optic cables is expensive. Free Space Optics is also used to communicate between spacecraft, since outside of the atmosphere there is little to distort the signal. The optical links usually use infrared laser light, although low-data-rate communication over short distances is possible using LEDs. IrDA is a very simple form of free-space optical communications. Distances up to the order of 10 km are possible, but the distance and data rate of connection is highly dependent on atmospheric conditions.	
FUSC	Full Usage of Subchannels	OFDMA subcarrier permutation techniques used in Mobile WiMAX where subchannels are made up of 48 data subcarriers distributed evenly throughout the entire frequency band.	http://www.wimaxforum.org , http://www.ieee802.org/16
GBR	Guaranteed Bit Rate	QoS term used for services requiring bit rate guarantees.	
GDP	Gross Domestic Product	GDP is defined as the total market value of all final goods and services produced within the country in a given period of time (usually a calendar year). GDP is one of the measures of national income and output for a given country's economy. It is also considered the sum of value added at every stage of production (the intermediate stages) of all final goods and services produced within a country in a given period of time, and it is given a money value.	
GEA	GPRS Encryption Algorithm	Security algorithm used in GPRS, performing encryption of the data stream over the radio interface. It is the GPRS counterpart of the A5 algorithm used in GSM.	http://www.3gpp.org
GERAN	GPRS/EDGE Radio Access Network	The Radio Access part of GSM/EDGE. More specifically: RF layer, Layer 1, 2 and 3, internal (Abis, Ater) and external (A, Gb) interfaces, conformance test specifications for all aspects of GERAN base stations and terminals and GERAN specific O&M specifications for the nodes in the GERAN. Specified by 3GPP.	http://www.3gpp.org
GGSN	Gateway GPRS Support Node	Interface between the GPRS wireless data network and other networks such as the Internet or private networks. It supports the edge routing function of the GPRS network. To external packet data networks the GGSN performs the task of an IP router. Firewall and filtering functionality, to protect the integrity of the GPRS core network, is also associated with the GGSN along with a billing function.	http://www.etsi.org , http://www.3gpp.org
GMSC	Gateway Mobile Switching Centre	The MSC that determines to which visited MSC the called subscriber is currently located. It also interfaces with the PSTN. All mobile-to-mobile calls and PSTN-to-mobile calls are routed through a GMSC. The term is only valid in the context of one call since any MSC may provide both the gateway function and the Visited MSC function.	http://www.3gpp.org
GMSK	Gaussian Minimum Shift Keying	Special variant of MSK in which the pulse form shaping is Gaussian. MSK is a spectral efficient form of binary coherent frequency shift keying (FSK) where the difference between the higher and lower frequencies is identical to half the bit rate.	
GPRS	General Packet Radio Service	An enhancement to the GSM mobile communication system that supports data packets. GPRS enables continuous flows of IP data packets over the system for such applications as web browsing and file transfer. Supports up to 160 kb/s gross transfer rate. Practical rates are from 12 to 48 kb/s.	http://www.etsi.org , http://www.3gpp.org
GSA	Global mobile Suppliers Association	A forum and representative for the leading GSM/3G suppliers worldwide. It is an organization created to meet suppliers' needs and represents in 2005 over 80% of GSM/3G market share globally. Membership is open to all suppliers of GSM/3G systems, devices, services, applications and solutions from across the entire supply chain.	http://www.gsacom.com

Acronym/ Term	Definition	Explanation	Web Resources
GSM	Global System for Mobile communications	A digital cellular phone technology system that is the predominant system in Europe, but is also used around the world. Development started in 1982 by CEPT and was transferred to the new organisation ETSI in 1988. Originally, the acronym was the group in charge, 'Group Special Mobile' but later the group changed its name to SMG. GSM was first deployed in seven countries in Europe in 1992. It operates in the 900 MHz and 1.8 GHz band in Europe and 1.9 GHz band in North America. GSM defines the entire cellular system, from the air interface to the network nodes and protocols. As of October 2006, there were more than 2.1 billion GSM users in more than 200 countries worldwide. The ubiquity of the GSM standard makes international roaming very common between mobile phone operators which enables phone users to access their services in many other parts of the world as well as in their own country. GSM differs significantly from its predecessors in that both signalling and speech channels are digital, which means that it is seen as a second generation (2G) mobile phone system. This fact has also meant that data communication was built into the system from very early on. GSM is an open standard which is currently developed by the 3GPP.	http://www.gsmworld.com/ , http://www.etsi.org , http://www.3gpp.org
GSM AKA	GSM Authentication and Key Agreement	The AKA protocol used in GSM and GPRS. It provides only assurance of the subscriber (no network or challenge verification). The Key Agreement provides 64 bit key (Kc).	
GSMA	GSM Association	World's leading wireless industry representative body, consisting of more than 660 second and third-generation wireless network operators and key manufacturers and suppliers to the wireless industry.	http://www.gsmworld.com/
GTP	GPRS Tunnelling Protocol	An IP based protocol used within GSM and UMTS networks. The GTP protocol is layered on top of UDP. There are in fact three separate protocols, GTP-C, GTP-U and GTP'. GTP-C is used within the GPRS core network for signalling between GPRS Support Nodes (GGSNs and SGSNs). This allows the SGSN to activate a session on the user's behalf (PDP context activation), to deactivate the same session, to adjust quality of service parameters or to update a session for a subscriber who has just arrived from another SGSN. GTP-U is used for carrying user data within the GPRS core network and between the Radio Access Network and the core network. The user data transported can be packets in any of IPv4, IPv6 or PPP formats. GTP' (GTP prime) uses the same message structure as GTP-C and GTP-U, but it is an almost completely separate protocol. It can be used for carrying charging data from the 'Charging Data Function' of the GSM or UMTS network to the 'Charging Gateway Function'.	
HA	Home Agent	A router on a mobile node's home network which tunnels datagrams for delivery to the mobile node when it is away from home, and maintains current location information for the mobile node. Defined in IETF RFC 3344.	http://www.ietf.org , http://tools.ietf.org/html/rfc3344
H-ARQ/ HARQ	Hybrid Automatic Repeat Request	A variation of the Automatic Repeat Request (ARQ) error-control method. In standard ARQ, error-detection information (ED) bits are added to data to be transmitted. In Hybrid ARQ, forward error correction (FEC) bits are also added to the existing Error Detection (ED) bits. Hybrid ARQ performs better than ordinary ARQ in poor signal conditions, but in its simplest form this comes at the expense of significantly lower throughput in good signal conditions. HARQ is used in HSDPA and HSUPA in 3G and in the IEEE 802.16-2005 standard (mobile WiMAX). It is also used in 3GPP Long Term Evolution.	http://www.3gpp.org
HDTV	High Definition Television	Broadcast of television signals with a higher resolution than traditional formats (NTSC, SECAM, PAL) allow. Except for an early analogue format in Japan, HDTV is broadcast digitally, and therefore its introduction sometimes coincides with the introduction of digital television (DTV). An HDTV-compatible TV usually uses a 16:9 aspect ratio. The high resolution images (1920 pixels × 1080 lines or 1280 pixels × 720 lines) allow much more detail to be shown compared to analogue television or regular DVDs. MPEG-2 is currently used as the compression codec. Like NTSC and PAL, 1920 × 1080 broadcasts generally use interlacing to reduce bandwidth demands. Alternating scan lines are broadcast 50 or 60 times a second, similar to PAL's 50 Hz and NTSC's 60 Hz interlacing. This format is entitled 1080i, or 1080i60. In areas traditionally using PAL 50 Hz 1080i50 is also used. Progressive scan formats are also used with frame rates up to 60 per second. The 1280 × 720 format is in practical terms always progressive scan (with the entire frame refreshed each time) and is thus termed 720p.	

Acronym/ Term	Definition	Explanation	Web Resources
HLR	Home Location Register	The HLR is a central database that contains details of each mobile phone subscriber that is authorized to use the GSM core network. More precisely, the HLR stores details of every SIM card issued by the mobile phone operator. Each SIM has a unique identifier called an IMSI which is one of the primary keys to each HLR record. The next important items of data associated with the SIM are the telephone numbers used to make and receive calls to the mobile phone, known as MSISDNs. The main MSISDN is the number used for making and receiving voice calls and SMS, but it is possible for a SIM to have other secondary MSISDNs associated with it for fax and data calls. Each MSISDN is also a primary key to the HLR record.	http://www.etsi.org
HSCSD	High Speed Circuit Switched Data	An addition to GSM for adding faster data transmission. While GSM originally supports 9.6 kb/s, HSCSD supports from 14.4 to 57.6 kb/s circuit switched data connections. See also CSD.	http://www.3gpp.org , http://www.etsi.org
HSDPA	High-Speed Downlink Packet Access	Enhancement of the 3G standard UMTS in order to provide higher bit rates on the downlink. The theoretical data rate can reach 14.4 Mb/s. Together with Enhanced Uplink (EUL/HSUPA) the term HSPA is often used.	http://www.3gpp.org
HSPA	High Speed Packet Access	Common term for High Speed Downlink Packet Access (HSDPA) and Enhanced Dedicated Channel (EDCH, often referred to as HSUPA – High Speed Uplink Packet Access), which are enhancements of the 3G standard UMTS to provide higher data rates on both downlink and uplink. The theoretical data rate can reach 14.4 Mb/s on the downlink and 5.6 Mb/s on the uplink.	http://www.3gpp.org
HSPA+	High Speed Packet Access – Evolved	An evolution of HSPA to provide higher data rates using higher order modulation (HOM) of 64-QAM, carrier aggregation (Dual-Carrier, Multi-Carrier HSPA) and Multiple antenna systems (MIMO). Bit rates up to 84 Mb/s are foreseen. It is standardized by 3GPP from Release 8.	http://www.3gpp.org
HSS	Home Subscriber Server	The home subscriber server contains all operative subscriber data, including information on subscribed services, location/roaming information and security credentials. Includes HLR/AuC and AAA services.	http://www.3gpp.org
HSUPA	High Speed Uplink Packet Access	Formally named Enhanced Uplink (EUL) by the 3GPP. Enhancement of the 3G standard UMTS in order to provide higher bit rates on the uplink. The term HSUPA was coined by Nokia. The theoretical data rate can reach 11.2 Mb/s (3GPP Rel. 7). Together with HSDPA, the term HSPA is often used.	http://www.3gpp.org
HW	Hardware		
ICIC	Inter-Cell Interference Coordination	A function of self-organizing networks (SON). Vaguely specified in the 3GPP in TS 36.300 as “the task to manage radio resources (notably the radio resource blocks) such that inter-cell interference is kept under control”.	http://www.3gpp.org/ftp/Specs/html-info/36300.htm
ICS	IMS Centralized Services	ICS is defined by the 3GPP and provides communication services such that all services, and service control, are based on IMS mechanisms and enablers. It enables IMS services when using Circuit Switched (CS) access for the media bearer. With ICS, the user services are provided by IMS. User sessions are controlled in IMS via Packet Switched (PS) or CS access. ICS provides mechanisms to support the use of CS media bearer for IMS sessions. With ICS, IMS sessions using CS media are treated as standard IMS sessions for the purpose of service control and service continuity. ICS defines signalling mechanisms between the User Equipment (UE) and IMS for transport of information required for service continuity when using CS access for media transport. ICS is defined in 3GPP TS 23.292. See also IMS.	http://www.3gpp.org/ftp/Specs/html-info/23292.htm
IEEE	The Institute of Electrical and Electronics Engineers	USA based organisation open to engineers and researchers in the fields of electricity, electronics, computer science and telecommunications. Established in 1884. The aim is to promote research through journals and conferences and to produce standards in telecommunications and computer science. IEEE has produced more than 900 active standards and has more than 700 standards under development. Divided into different branches, or ‘Societies’. Has daughter organisations, or ‘chapters’ in more than 175 countries worldwide. Headquarters in Piscataway, New Jersey, USA.	http://www.ieee.org

Acronym/ Term	Definition	Explanation	Web Resources
IEEE 802.11	The IEEE 802 LAN/MAN Standards Committee Working Group for WLAN	Refers to a family of specifications developed by the IEEE for wireless local area networks. It also refers to the 'Wireless LAN working group' of the IEEE 802 project. 802.11 specifies an over-the-air interface between a wireless client and a base station or between two wireless clients. The IEEE accepted the specification in 1997. There are several specifications in the 802.11 family, including i) 802.11 – provides 1 or 2 Mb/s transmission in the 2.4 GHz band, ii) 802.11a – an extension that provides up to 54 Mb/s in the 5 GHz band. It uses an orthogonal frequency division multiplexing encoding scheme rather than FHSS or DSSS, iii) 802.11b provides 11 Mb/s transmission in the 2.4 GHz band and was ratified in 1999 allowing wireless functionality comparable to Ethernet, iv) 802.11g provides 20+ Mb/s in the 2.4 GHz band, v) 802.11n provides more than 100 Mb/s using MIMO technology in both 2.4 GHz and 5 GHz bands, vi) 802.11z is a method for transporting an authentication protocol between the client and access point, and the Transport Layer Security (TLS) protocol. More variants are also under preparation, including 802.11af aiming to utilize the TV White Space (TVWS) band.	http://www.ieee802.org/11/
IEEE 802.16	The IEEE 802 LAN/MAN Standards Committee Working Group on Broadband Wireless Access Standards	A specification for fixed broadband wireless metropolitan access networks (MANs) that use a point-to-multipoint architecture. Published on April 8, 2002, the standard defines the use of bandwidth between the licensed 10 GHz and 66 GHz and between the 2 GHz and 11 GHz (licensed and unlicensed) frequency ranges and defines a MAC layer that supports multiple physical layer specifications customized for the frequency band of use and their associated regulations. 802.16 supports very high bit rates in both up-loading to and downloading from a base station up to a distance of 30 miles to handle such services as VoIP, IP connectivity and TDM voice and data.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
IEEE SCC41 (P1900)	IEEE Standards Committee 41 (Dynamic Spectrum Access Networks)	Formerly called IEEE P1900 Standards Committee. It works on Dynamic Spectrum Access Networks. The objective is to develop supporting standards dealing with new technologies and techniques being developed for next generation radio and advanced spectrum management, often called Cognitive Radio (CR). Its working groups are numbered in the 1900 range (starting with 1900.1), sometimes referred to as IEEE 1900.X.	http://grouper.ieee.org/groups/scc41/index.html
IETF	Internet Engineering Task Force	A large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The technical work of the IETF is done in its working groups, which are organized by topic into several areas (eg. routing, transport, security, etc.). Much of the work is handled via mailing lists. The IETF holds meetings three times per year. The IETF working groups are grouped into areas, and managed by Area Directors (AD). The ADs are members of the Internet Engineering Steering Group (IESG). Providing architectural oversight is the Internet Architecture Board, (IAB). The IAB also adjudicates appeals when someone complains that the IESG has failed. The IAB and IESG are chartered by the Internet Society (ISOC) for these purposes. The General Area Director also serves as the chair of the IESG and of the IETF, and is an ex-officio member of the IAB. The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. The IANA is chartered by the Internet Society (ISOC) to act as the clearinghouse to assign and coordinate the use of numerous Internet protocol parameters. IETF's mission statement is given in IETF RFC 3935.	http://www.ietf.org , http://tools.ietf.org/html/rfc3935
IMB	Integrated Mobile Broadcast	Multicast/Broadcast standard as part of 3GPP WCDMA Release 8.	http://www.3gpp.org
IMPEX	Implementation Expenditures	Expenditures used by a company to implement new technology or services.	
IMS	IP Multimedia Subsystem	A standardised Next Generation Networking (NGN) architecture for telecom operators that want to provide mobile and fixed multimedia services. It uses a Voice-over-IP (VoIP) implementation based on a 3GPP standardised implementation of SIP, and runs over the standard Internet Protocol (IP). Existing phone systems (both packet-switched and circuit-switched) are supported. IMS was originally defined by an industry forum called 3G.IP (www.3gip.org) formed in 1999. 3G.IP developed the initial IMS architecture, which was brought to 3GPP for industry standardization as part of their standardization work for 3G mobile phone systems in UMTS networks. It first appeared in release 5 (evolution from 2G to 3G networks), when SIP-based multimedia was added. Support for the older GSM and GPRS networks was also provided. 'Early IMS' was defined to allow for IMS implementations that do not yet support all 'Full IMS' requirements. 3GPP2 (a different organisation) based their CDMA2000 Multimedia Domain (MMD) on 3GPP IMS, adding support for CDMA2000.	http://www.3gpp.org , http://www.ietf.org , http://www.imsforum.org/

Acronym/ Term	Definition	Explanation	Web Resources
IMT	International Mobile Tele-communications	Term used by the ITU embracing both the IMT-2000 (3G) standards suite and the new IMT-Advanced (4G) systems.	http://www.itu.int/home/imt.html
IMT-2000	International Mobile Tele-communications 2000	The global standard for third generation (3G) wireless communications, defined by a set of interdependent ITU Recommendations. IMT-2000 provides a framework for worldwide wireless access by linking the diverse systems of terrestrial and/or satellite based networks. It will exploit the potential synergy between digital mobile telecommunications technologies and systems for fixed and mobile wireless access systems.	http://www.itu.int/home/imt.html
IMT-Advanced	International Mobile Tele-communications – Advanced	The global standard for fourth generation (4G) wireless communications to be defined by the ITU. IMT-Advanced provides a framework for worldwide mobile broadband access. Candidates to the IMT-Advanced family of standards are LTE-Advanced from 3GPP and the evolution of Mobile WiMAX through IEEE 802.16m.	http://www.itu.int/home/imt.html
IP	Internet Protocol	A protocol for communication between computers, used as a standard for transmitting data over networks and as the basis for standard Internet protocols. Originally defined in IETF RFC 791.	http://www.ietf.org , http://tools.ietf.org/html/rfc791
IPTV	Internet Protocol Television	A system where a digital television service is delivered using the Internet Protocol over a network infrastructure, which may include delivery by a broadband connection.	
IPv4	Internet Protocol v4	IPv4 is version 4 of the Internet Protocol (IP) and it is the first version of the Internet Protocol to be widely deployed. IPv4 is the dominant network layer protocol on the internet. It is described in IETF RFC 791 (September 1981) which obsoleted RFC 760 (January 1980). IPv4 is a data-oriented protocol to be used on a packet switched internetwork (eg. Ethernet). It is a best effort protocol in that it does not guarantee delivery. It does not make any guarantees on the correctness of the data; it may result in duplicated packets and/or packets out-of-order. All of these things are addressed by an upper layer protocol (eg. TCP, UDP). See also IP and Ipv6.	http://www.ietf.org
IPv6	Internet Protocol v6	Ipv6 is version 6 of the Internet Protocol (IP). A network layer standard used by electronic devices to exchange data across a packet-switched internetwork. It follows IPv4 as the second version of the IP to be formally adopted for general use. IPv6 is intended to provide more addresses for networked devices, allowing, for example, each cell phone and mobile electronic device to have its own address. IPv4 supports 4.3 billion addresses, which is inadequate to give one (or more if they possess more than one device) to every living person. IPv6 supports 3.4×10^{38} addresses, or 5×10^{28} (50 octillion) for each of the roughly 6.5 billion people alive today. Invented by Steve Deering and Craig Mudge at Xerox PARC, IPv6 was adopted by the Internet Engineering Task Force in 1994, when it was called 'IP Next Generation' (IPng). As of December 2005, IPv6 accounts for a tiny percentage of the live addresses in the publicly-accessible Internet, which is still dominated by IPv4. The adoption of IPv6 has been slowed by the introduction of network address translation (NAT), which partially alleviates address exhaustion.	http://www.ietf.org
ISDN	Integrated Services Digital Network	A digital telecommunications network that provides end-to-end digital connectivity to support a wide range of services, including voice and non-voice services, to which users have access by a limited set of standard multi-purpose user-network interfaces. The user is offered one or more 64 kb/s B-channels.	http://www.itu.int
ISI	Inter-Symbol Interference	The interference between adjacent pulses of a transmitted code.	
ITU	International Telecommunication Union	On May 17, 1865, the first International Telegraph Convention was signed in Paris by the 20 founding members, and the International Telegraph Union (ITU) was established to facilitate subsequent amendments to this initial agreement. It changed name to the International Telecommunications Union in 1934. From 1948 a UN body with approx. 200 member countries. It is the top forum for discussion and management of technical and administrative aspects of international telecommunications.	http://www.itu.int
ITU-R	International Telecommunication Union Radiocommunication Sector	A sector of the ITU whose mission is, i.a., to ensure rational, equitable, efficient and economical use of the radio-frequency spectrum by all radio-communication services, including those using satellite orbits, and to carry out studies and adopt recommendations on radiocommunication matters. It was created on 1 March 1993, replacing the former International Radio Consultative Committee (CCIR).	http://www.itu.int/ITU-R

Acronym/ Term	Definition	Explanation	Web Resources
ITU-T	International Telecommunication Union – Standardization Sector	A sector of the ITU, whose mission is to ensure an efficient and on-time production of standards (Recommendations) covering all fields of telecommunications. It was created on 1 March 1993, replacing the former International Telegraph and Telephone Consultative Committee (CCITT).	http://www.itu.int/ITU-T/
KASME		256 bit wide master key in EPS constructed from the CK, IK key pair produced by running the UMTS AKA. It is not used directly, but is the basis for deriving the 128 bit wide NAS keys used for data protection between the UE and the MME, and the 256 bit wide KeNB root key.	http://www.3gpp.org
KASUMI		The original algorithm for the data confidentiality (f8) and data integrity (f9) functions in the UMTS. Designed from the MISTY1 cipher using a 64 bit internal block length under control of a 128 bit key.	
Kc		Cryptographic key; used by the cipher A5 in GSM.	http://www.3gpp.org
KeNB		256 bit wide root key used in LTE between the UE and the eNodeB (eNB). Bounded to a specific eNB.	http://www.3gpp.org
Ki		Subscriber authentication key; the cryptographic key used by the authentication algorithm, A3, and cipher key generator, A8 in GSM.	http://www.3gpp.org
KNOWS	Networking Over White Spaces	Cognitive Radio (CR) project at Microsoft Research. The KNOWS project is revisiting 'classical' wireless networking problems in order to design new solutions that incorporate and build upon recent advances in software and hardware technologies for networking over the recently opened white spaces spectrum. The first version of KNOWS introduces the concept of Time Spectrum Blocks (TSB) as the fundamental unit over which two nodes could communicate. A control-channel based medium access control protocol, called CMAC, is designed for enabling nodes with different spectrum views to access the medium. Associated with CMAC an algorithm called bSMART has been introduced for efficiently allocating the spectrum to different contending nodes. In the second version of KNOWS, the problem of setting up a base station in the white spaces spectrum has been addressed. The system is called WhiteFi and eliminates the need for a dedicated control channel. A new technique called SIFT enables nodes to rapidly discover base stations operating at different centre frequencies using different channel widths by analyzing signals in the time domain. A new metric called MCham has been evaluated, using what the base stations choose the 'best' chunk of the spectrum to operate on, where the spectrum chunk can span multiple channels.	http://research.microsoft.com/en-us/projects/knows/
KPI	Key Performance Indicator		
LAN	Local Area Network	A network shared by communicating devices, usually on a small geographical area. A system that links together electronic office equipment, such as computers and word processors, and forms a network within an office or building.	
LOS	Line of Sight	This term is often associated with radio transmission systems indicating there is a clear path between the transmitter and receiver.	
LTE	Long Term Evolution	Name of 3GPP's Work Item for standardising the access technology of their 4G mobile broadband standard, Evolved UTRA and UTRAN (E-UTRA(N)). Often used as the name of the new system itself. E-UTRA is based on OFDMA technology combined with MIMO to provide end-user peak bitrates up to 200 Mb/s. First tests were performed late 2007 and the first products appeared early 2010.	http://www.3gpp.org
M2M	Machine To Machine	Data communications between machines. M2M can also mean the family of sensors, middleware, software and applications that help improve efficiency and quality by tying together a myriad of sensors with mission critical applications.	
MAC	Medium Access Control	The lower of the two sublayers of the Data Link Layer. In general terms, MAC handles access to a shared medium, and can be found within many different technologies. For example, MAC methodologies are employed within Ethernet, GPRS, and UMTS.	
MAC	Message Authentication Code	A MAC function computes a cryptographic signed integrity checksum over an arbitrary length input string under the control of a secret key. MAC functions are quite similar to hash functions, but the MAC function output can only be computed with knowledge of the secret key. MAC functions can be used to provide the message origin authentication and data integrity security services.	http://en.wikipedia.org/wiki/Message_authentication_code
MBB	Mobile Broadband	Term used for wireless systems and services providing high mobility as well as high data rates, typically more than 1 Mb/s.	

Acronym/ Term	Definition	Explanation	Web Resources
MBS (zone)	Multicast Broadcast Service (zone)	A set of WiMAX base stations where the same CID and the same security association are used for transmitting the content of certain service flow(s).	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
MCBCS	Multicast and Broadcast Multimedia Services	Multicast and Broadcast service in mobile WiMAX, to provide low-cost delivery of large volumes of popular contents like IP-TV and peer-to-peer media sharing to a group of users. Unicast services and MCBCS can be provided simultaneously by allocating different time intervals in the downlink sub frames to the services.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
ME	Mobile Equipment	The terminal in a mobile system. It is typically the part of the user's terminal apart from the SIM/USIM.	
Mesh networking		A type of networking in which each node in the network may act as an independent router, regardless of whether it is connected to another network or not. It allows for continuous connections and reconfiguration around broken or blocked paths by 'hopping' from node to node until the destination is reached.	
Micro-cell		Term used for the coverage area (cell size) of a base station in urban areas where the antenna is placed below rooftops. The term refers to a cell with typical range of a few hundred metres.	
MIH	Media Independent Handover	A standard being developed by IEEE 802.21 to enable the handover of IP sessions from one layer 2 access technology to another, to achieve mobility of end user devices. The key functionality provided by MIH is communication among the various wireless layers and between them and the IP layer. The required messages are relayed by the Media Independent Handover Function, MIHF, that is located in the protocol stack between the layer 2 wireless technologies and IP at layer 3. MIH may communicate with various IP protocols including SIP, Session Initiation Protocol, for signalling, Mobile IP for mobility management and DiffServ and IntServ for QoS.	http://www.ieee802.org/21
MILENAGE		A 3GPP defined example security algorithm set based on the AES crypto-primitive. It is an example set containing all functions for authentication and key generation.	http://www.3gpp.org
MIMO	Multiple Input – Multiple Output	MIMO is an antenna technology for wireless communications in which multiple antennas are used at both the source (transmitter) and the destination (receiver). The antennas at each end of the communications circuit are combined to minimize errors and optimize data speed. MIMO is one of several forms of smart antenna technology, the others being MISO (multiple input, single output) and SIMO (single input, multiple output). MIMO technology has aroused interest because of its possible applications in digital television (DTV), wireless local area networks (WLANs), metropolitan area networks (MANs), and mobile communications.	
MISTY1	Mitsubishi Improved Security Technology / Matsui-Ichikawa-Sorimachi-Tokita-Yamagishi	A block cipher designed in 1995 by Mitsuru Matsui and others for Mitsubishi Electric. MISTY1 is one of the selected algorithms in the European NESSIE project, and has been recommended for Japanese government use by the CRYPTREC project. KASUMI is a strengthened version of the MISTY1 cipher and has been adopted as the standard encryption algorithm for European mobile phones. In 2005, KASUMI was broken, but there is no practical attack against it yet.	
MME	Mobile Management Entity	Main node in the Evolved Packet Core (EPC). The MME is the key control-node for the LTE access-network. The MME is responsible for idle mode UE (User Equipment) tracking and paging procedure including retransmissions. It is involved in the bearer activation/deactivation process and is also responsible for choosing the SGW for a UE at the initial attach and at time of intra-LTE handover involving Core Network (CN) node relocation. It is responsible for authenticating the user.	http://www.3gpp.org
MOS	Mean Opinion Score	A numerical indication of the perceived quality of received human speech over the connection. The MOS is expressed as a single number in the range 1 to 5, where 1 is lowest perceived quality, and 5 is the highest perceived quality. MOS tests are specified by ITU-T recommendation P.800. The MOS is generated by averaging the results of a set of standard, subjective tests where a number of listeners rate the heard audio quality of test sentences read aloud by both male and female speakers over the communications medium being tested.	http://www.itu.int
MPEG	Moving Pictures Experts Group	MPEG is a working group of ISO/IEC (ISO/IEC JTC/SC29 WG 11) in charge of the development of standards for coded representation of digital audio and video. The working group has developed three sets of standards defining coding and transmission of audio and video; MPEG-1, MPEG-2 and MPEG-4. Another standard developed is MPEG-7; the standard for description and search of audio and visual content. MPEG-21 is a standard defining Multi-media Framework.	http://www.chiariglione.org/mpeg/

Acronym/ Term	Definition	Explanation	Web Resources
MPLS	Multi Protocol Label Switching	An IETF standard intended for Internet application. MPLS has been developed to speed up the transmission of IP based communications over ATM networks. The system works by adding a much smaller 'label' to a stream of IP datagrams allowing 'MPLS' enabled ATM switches to examine and switch the packet much faster. It is specified in IETF RFC 2702.	http://www.ietf.org
MRC	Maximum Ratio Combining	An optimal multi-branch diversity algorithm where the different branches are added with weights defined by their respective signal-to-noise ratios.	
MRO	Mobility Robustness Optimization	A function of self-organizing networks (SON) aiming to optimize the parameters used for handover decisions.	
MS	Mobile Station	An MS is the mobile terminal. It is a common term and corresponds to UE in 3G terms.	
MSC	Mobile services Switching Centre	The MSC is a sophisticated telephone exchange which provides circuit-switched calling, mobility management and GSM services to the mobile phones roaming within the area that it serves. This means voice, data and fax services, as well as SMS and call divert. It is located in the core network of a visited network and has an interface towards the radio access network. A Gateway MSC is the MSC that determines at which visited MSC the subscriber who is being called is currently located. It also interfaces with the Public Switched Telephone Network. All mobile-to-mobile calls and PSTN-to-mobile calls are routed through a GMSC. The term is only valid in the context of one call since any MSC may provide both the gateway function and the Visited MSC function, however, some manufacturers design dedicated high capacity MSCs which do not have any BSCs connected to them. These MSCs will then be the Gateway MSC for many of the calls they handle.	http://www.etsi.org
MU-MIMO	Multi User MIMO	Multiple antenna technique similar to Spatial Division Multiple Access (SDMA). Increases capacity by sending or receiving different data streams to or from different users at the same time.	
NAP	Network Access Provider	A business entity of the WiMAX network reference model (NRM) that provides WiMAX radio access infrastructure.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
NMT	Nordic Mobile Telephone	Automatic mobile telephone system based on analogue transmission technology. NMT was developed by the Nordic public telephone administrations in the period 1969 to 1980. The first version NMT 450 operated in the 450 MHz band (NMT-450) and was launched in 1981/82. Later the system was enhanced to operate in the 900 MHz band – NMT 900 in 1986. The system offered voice telephony with international roaming. The technology used was narrowband frequency modulation (FM) with 25 kHz user channels. In Norway, the NMT-900 service was discontinued in 2001 when the GSM coverage had reached a sufficiently high level, and to release the frequency resources. The NMT-450 system was discontinued at the end of 2004. (Cf. <i>Teletronikk</i> , 91 (4), 1995).	
NMT-SIS	NMT Subscriber Identity Security	Authentication method introduced in the Nordic Mobile Telephone (NMT) system.	
NodeB		The Base Station in UMTS.	http://www.3gpp.org
NPV	Net Present Value	Term used when evaluating a business case about the present net value of future investments.	
NRM	Network Reference Model	A logical representation of the WiMAX network architecture. The WiMAX NRM differentiates between network access providers (NAPs) and network service providers (NSPs).	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
nrtPS	non-real-time Polling Service	Traffic scheduling class in mobile WiMAX. The nrtPS offers unicast polls on a regular basis, which assures that the uplink service flow receives request opportunities even during network congestion.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
NSN	Nokia Siemens Networks	One of the largest telecommunications equipment suppliers in the world. Nokia Siemens Networks was created as the result of a joint venture between Siemens AG's COM division (minus its Enterprise business unit) and Nokia's Network Business Group. It was announced on 19 June 2006, and officially launched at the 3GSM World Congress in Barcelona in February 2007. NSN began full operations on 1 April 2007. Its headquarters are in Espoo, Greater Helsinki, Finland, while the West-South Europe headquarters and three of its five divisions are based in Munich, Germany. The Services division is based in India. Nokia Siemens Networks has operations in some 150 countries.	http://www.nokiasiemensnetworks.com/
NSP	Network Service Provider	The NSP is the business entity of the WiMAX network reference model (NRM) that provides IP connectivity and WiMAX services to WiMAX subscribers according to some service level agreements with one or more NAPs.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/

Acronym/ Term	Definition	Explanation	Web Resources
O&M	Operation and Maintenance	The processes and functions used in managing a network or element within a network.	
OECD	Organisation for Economic Co-operation and Development	The OECD groups 30 member countries sharing a commitment to democratic government and the market economy. With active relationships with some 70 other countries, NGOs and civil society, it has a global reach. Best known for its publications and its statistics, its work covers economic and social issues from macroeconomics, to trade, education, development and science and innovation. The OECD produces internationally agreed instruments, decisions and recommendations to promote rules of the game in areas where multilateral agreement is necessary for individual countries to make progress in a globalised economy.	http://www.oecd.org
OFDM	Orthogonal Frequency Division Multiplexing	A spread spectrum technique that distributes the data over a large number of carriers spaced apart at precise frequencies. This spacing provides the 'orthogonality' in this technique, which prevents the demodulators from seeing frequencies other than their own. The benefits of OFDM are high spectral efficiency, resiliency to RF interference, and lower multi-path distortion. This is useful because in a typical terrestrial wireless scenario there are multipath-channels (ie. the transmitted signal arrives at the receiver using various paths of different length). Since multiple versions of the signal interfere with each other (inter symbol interference (ISI)) it becomes very hard to extract the original information. OFDM is sometimes called multi-carrier or discrete multi-tone modulation. It is the modulation technique used for digital TV in Europe, Japan and Australia. It is used in DAB, ADSL and WLAN 802.11a, g and n, WMAN 802.16 (WiMAX) standards and 3GPP LTE.	
OFDMA	Orthogonal Frequency Division Multiple Access	A multi-user version of the OFDM digital modulation scheme. Multiple access is achieved in OFDMA by assigning subsets of subcarriers to individual users. This allows simultaneous low data rate transmission from several users. OFDMA is used in the IEEE 802.16 WMAN (WiMAX) and in the downlink of 3GPP LTE.	
OPEX	Operations Expenditure	A company's operational cost in contrast to CAPEX – Capital Expenditure, which is the company's investment cost.	
OSS/BSS	Operations and Business Support Systems	A combination of Operations Support Systems (OSS) and Business Support Systems (BSS). OSS are systems used by telecommunications service providers dealing with the telecom network itself, supporting processes such as maintaining network inventory, provisioning services, configuring network components, and managing faults. BSS are the components that a telephone operator or telco uses to run its business operations towards customer. BSS and OSS platforms are linked in the need to support various end-to-end services.	http://www.tmforum.org/
OVSF	Orthogonal Variable Spreading Factor	An implementation of Code division multiple access (CDMA) used in UMTS/WCDMA where before each signal is transmitted, the spectrum is spread through the use of a user's code. User's codes are carefully chosen to be mutually orthogonal to each other. These codes are derived from an OVSF code tree, which is a complete binary tree that reflects the construction of Hadamard matrices. Each user is given a different, unique code.	http://www.3gpp.org
P2P	Peer-To-Peer	A computer network that does not rely on dedicated servers for communication but instead mostly uses direct connections between clients (peers). A pure peer-to-peer network does not have the notion of clients or servers, but only equal peer nodes that simultaneously function as both 'clients' and 'servers' to the other nodes in the network.	
PAPR	Peak-to-Average Power Ratio	Also known as the 'crest factor'. The ratio between the peak and average power level applied to a carrier frequency.	
PAYG	Pay-as-you-go	Term used in conjunction with prepaid mobile phone subscriptions, a mobile phone for which credit is purchased in advance of service use. The purchased credit is used to pay for mobile phone services at the point the service is accessed or consumed.	
PC	Personal Computer	Usually a microcomputer whose price, size, and capabilities make it suitable for personal usage. Personal computers are normally operated by one user at a time to perform such general purpose tasks as word processing, internet browsing, e-mail and other digital messaging, multimedia playback, video game play, computer programming, etc. Unlike many special purpose and high performance computers, it is assumed that a typical personal computer will run software not written by its primary users.	
PCEF	Policy Charging Enforcement Function	Part of the Evolved Packet System (EPS) enforcing decisions from the Policy Charging Resource Function (PCRF) by the use of per-user-based packet filtering. This can be realized by the use of Deep Packet Inspection (DPI).	http://www.3gpp.org

Acronym/ Term	Definition	Explanation	Web Resources
PCRF	Policy Charging Resource Function	Part of the Evolved Packet System (EPS) containing policy and QoS functions. It communicates with the Policy Charging Enforcement Function (PCEF) in the PDN Gateway, the Subscription Profile Repository (SPR) and the Application Function (AF).	http://www.3gpp.org
PDH	Plesiochronous Digital Hierarchy	A technology used in telecommunications networks to transport large quantities of data over digital transport equipment such as fibre optic and microwave radio systems. The term plesiochronous is derived from Greek plesio, meaning near, and chronos, time, and refers to the fact that PDH networks run in a state where different parts of the network are almost, but not quite perfectly, synchronised. PDH is now being replaced by SDH (Synchronous Digital Hierarchy) equipment in most telecommunications networks. PDH allows transmission of data streams that are nominally running at the same rate, but allowing some variation on the speed around a nominal rate. The European and American versions of the PDH system differ slightly in the detail of their working, but the principles are the same. The European system is described. The basic data transfer rate is a data stream of 2.048 Mb/s. For speech transmission, this is broken down into 30 x 64 kb/s channels plus 2 x 64 kb/s channels used for signalling and synchronisation. Alternatively, the whole 2 Mb/s may be used for non speech purposes, for example, data transmission.	
PDN	Packet Data Network	A packet switched (PS) digital communications network that groups all transmitted data, irrespective of content, type, or structure into suitably-sized blocks, called packets. The network over which packets are transmitted is a shared network which routes each packet independently from all others and allocates transmission resources as needed.	
PDU	Protocol Data Unit	Information that is delivered as a unit among peer entities of a network and that may contain control information, address information, or data. In a layered system, like a packet switched network, a unit of data which is specified in a protocol of a given layer and which consists of protocol-control information and possibly user data of that layer.	
P-GSM	Primary GSM band	The original GSM-900 band 880-915 MHz (UL) and 925-960 MHz (DL).	
PHY	Physical layer	Layer 1 of the OSI model which defines the electrical and optical signalling, line states, clocking guidelines, data encoding, and circuitry needed for data transmission and reception. Contained within the PHY are often several sub-layers that perform these functions including the physical coding physical media dependent sub-layer. The PHY layer connects the media to the MAC (Layer 2).	
PMP	Point-to-Multipoint	Communication providing multiple paths from a single location to multiple locations.	
POTS	Plain Old Telephone Service	A very general term used to describe an ordinary voice telephone service. See also PSTN.	
PPP	Point-to-Point Protocol	A communications protocol commonly used to establish a direct connection between two nodes. It can connect computers using serial cable, phone line, trunk line, cellular telephone, specialized radio links, or Fibre optic links. Most internet service providers use PPP for customers' dial-up access to the Internet. An encapsulated form of PPP, called PPP over Ethernet, or PPPoE, is commonly used in a similar role with Digital Subscriber Line Internet service. PPP is commonly used to act as a layer 2 (the 'Data Link' layer of the OSI model) protocol for connection over synchronous and asynchronous circuits, where it has largely superseded an older non-standard protocol (known as SLIP), and telephone company mandated standards (such as X.25). PPP was designed to work with numerous layer 3 network layer protocols, including IP, Novell's IPX, and AppleTalk. PPP is specified by IETF RFC 1661.	http://tools.ietf.org/html/rfc1661
PS	Packet Switched	Communication switching method in which packets (units of information carriage) are individually routed between nodes over data links which might be shared by many other nodes. Packet switching is used to optimize the use of the bandwidth available in a network, to minimize the transmission latency (ie. the time it takes for data to pass across the network), and to increase robustness of communication. The concept of packet switching was developed by Paul Baran in the early 1960s, and independently a few years later by Donald Davies, as described below. Leonard Kleinrock conducted early research and published a book in the related field of digital message switching (without the packets) in 1961, and also later played a leading role in the building and management of the world's first packet switched network, the ARPANET.	
PSTN	Public Service Telephone Network	Common notation for the conventional analogue telephone network.	

Acronym/ Term	Definition	Explanation	Web Resources
PUSC	Partial Usage of Subchannels	An OFDMA subcarrier permutation technique used in Mobile WiMAX where 28 subcarriers are organized in sub-channels and clusters.	http://www.wimaxforum.org , http://www.ieee802.org/16
PWB	Promonte Wireless Broadband	Project run by Telenor in 2008 where the goals were to roll out an all-IP network including Fixed WiMAX, Wi-Fi and HSPA in Montenegro in collaboration with Promonte. It used a common core network and investigated the business potential related to different combinations of these wireless technologies.	
QCI	QoS Class Identifier	Identifier stating the characteristics of the packet stream when it comes to priority, packet delay budget and packet loss rate.	
QoE	Quality of Experience	A subjective measure of a customer's experiences. It is the user's perceived experience of what is being presented by a communication service or application user interface and looks at a vendor's or purveyor's offering from the standpoint of the customer or end user. It is related to but differs from Quality of Service (QoS), which attempts to objectively measure the service delivered.	http://www.etsi.org
QoS	Quality of Service	The "degree of conformance of the service delivered to a user by a provider, with an agreement between them". The agreement is related to the provision/delivery of this service. Defined by EURESCOM project P806 in 1999 and adopted by ITU-T in recommendation E.860.	http://www.itu.int , http://www.eurescom.de
QoS MOS	Quality of Service and Mobility driven cognitive radio	EU-financed project in the 7th framework programme (FP7) ICT. It is an integrated project (IP) which started in 2010 and runs through 2012. The main focus is to define a cognitive radio (CR) system with mobility management and managed QoS.	http://www.ict-qosmos.eu/
QPSK	Quadrature Phase Shift Keying	A digital modulation scheme that conveys data by changing, or modulating, the phase of a reference signal (the carrier wave) using 4 levels.	
RA	Radio Assembly	In ITU-R, Radiocommunication Assemblies (RA) are responsible for the structure, programme and approval of radiocommunication studies. They are normally convened every three or four years and may be associated in time and place with World Radiocommunication Conferences (WRCs). Next RA is in 2012.	http://www.itu.int
RAN	Radio Access Network	A part of a mobile telecommunication system. It implements a radio access technology. Conceptually, it sits between the mobile phone and the core network (CN). Examples are GERAN (GSM RAN), GERAN (GSM/EDGE RAN), UTRAN (UMTS RAN), and E-UTRAN (LTE RAN).	
RAND		A random challenge issued by the network. A number from a pseudorandom number generator function.	
RCS	Rich Communication Suite	An industry effort focused on the use of IMS (IP Multimedia Subsystem) for providing mobile phone communication services. It refers to the use of more than just voice for communication. It is to be noted that much of the capability of RCS is already available from Internet service providers.	
RNC	Radio Network Controller	A central element in the UMTS radio access network (UTRAN) and responsible for controlling the Node Bs that are connected to it. The RNC carries out radio resource management, some of the mobility management functions and is the point where encryption is done before user data is sent to and from the mobile. The RNC connects to the Circuit Switched Core Network through Media Gateway (MGW) and to the SGSN (Serving GPRS Support Node) in the Packet Switched Core Network.	http://www.3gpp.org
RSPG	Radio Spectrum Policy Group	A high level advisory group that assists the European Commission in the development of radio spectrum policy. The RSPG is established under Commission Decision 2002/622/EC, one of the Commission initiatives following the adoption of the Radio Spectrum Decision 676/2002/EC, and it adopts opinions, position papers and reports, as well as issuing statements which are aimed at assisting and advising the Commission at strategic level on radio spectrum policy, coordination of policy approaches and harmonised conditions, where appropriate, with regard to the availability and efficient use of radio spectrum necessary for the establishment and functioning of the internal market. The Members of the Group are senior representatives of the Member States and the official representative of the European Commission. Delegations include representatives from both the regulatory authorities and the ministries having responsibility for radio spectrum related matters in each Member State.	http://rspg.groups.eu.int/
RTG	Receive/transmit Transition Gap	Guard time between transmission directions in TDD systems. The term RTG is used in Mobile WiMAX. The RTG allows time for the BS to switch from receive to transmit mode. During this gap, the BS is not transmitting modulated data but simply allowing the BS transmitter carrier to ramp up and the transmit/receive antenna switch to actuate.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/

Acronym/ Term	Definition	Explanation	Web Resources
rtPS	real-time Polling Service	Traffic scheduling class in mobile WiMAX. The rtPS is designed to support real-time uplink service flows that transport variable-size data packets on a periodic basis, such as MPEG video. The service offers real-time, periodic request opportunities, which meet the flow's real-time needs and allow the terminal to specify the size of the desired grant.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
RTT	Round Trip Time	The time it takes data to traverse the network and back. A common way of measuring RTT is by using the 'ping' utility.	
SAE	System Architec- ture Evolution	The core network architecture of 3GPP's future LTE wireless communication standard. Compared to the GPRS core network it is an all-IP network with a simplified architecture. It has support for higher throughput and lower latency RANs. It also supports mobility between multiple RANs, including legacy GPRS, but also non-3GPP systems, like Mobile WiMAX. See also Evolved Packet System (EPS) and Evolved Packet Core (EPC).	http://www.3gpp.org
SAP	Service Access Point	An identifying label for network endpoints used in OSI networking. The SAP is a conceptual location at which one OSI layer can request the services of another OSI layer. Service access points are for example used in IEEE 802.2 Logical Link Control in Ethernet and similar data link layer protocols.	
SC	Selection Combining	Multi-branch diversity combining technique. This is the simplest method, where the branch with the highest level is selected.	
SC-FDMA	Single-Carrier Frequency Division Multiple Access	The uplink multiple access technique specified for LTE. It is based on OFDMA, but introduces a pre-spreading technique on the transmitter using an extra FFT block. The reason is to reduce the peak-to-average-power-ratio (PAPR) problem of traditional OFDMA. The drawbacks is that it introduces higher out-of-band interference and deteriorates the orthogonality.	http://www.3gpp.org
SDH	Synchronous Digital Hierarchy	SDH is a standard technology for synchronous data transmission on optical media. It is the international equivalent of North American SONET (Syn-chronous Optical Network). Both technologies provide faster and less ex-pensive network interconnection than traditional PDH (Plesiochronous Digital Hierarchy) equipment. It is a method of transmitting digital information where the data is packed in containers that are synchronized in time enabling relatively simple modulation and demodulation at the transmitting and receiving ends. The technique is used to carry high capacity information over long dis-tances. SDH uses the following Synchronous Transport Modules (STM) and rates: STM-1 (155 Mb/s), STM-4 (622 Mb/s), STM-16 (2.5 Gb/s), and STM-64 (10 Gb/s). SDH is specified by ITU-T G.707.	www.itu.int
SDMA	Spatial Division Multiple Access	Spatial multiple access technique in which beam forming is used to separate signal paths between the base station and different users in a wireless system. In this way, different users can share both frequency and time interval simul-taneously, increasing the aggregated throughput of the system. Se also Multi-User MIMO (MU-MIMO).	
SDR	Software Defined Radio	A radio communication system where components that have typically been implemented in hardware (eg. mixers, filters, amplifiers, modulators/de-modulators, detectors, etc.) are instead implemented using software on a personal computer or embedded computing devices. The term 'Software Defined Radio' was coined in 1991 by Joseph Mitola, who published the first paper on the topic in 1992, but SDR have their origins in the defence sector since the late 1970s in both the US and Europe.	http://www.wirelessinnovation.org/
SENDORA	Sensor Network for Dynamic and Cognitive Radio Access	EU-financed project in the 7th framework programme (FP7) ICT. It is project studying sensor-network aided cognitive radio (CR). The idea is to combine CR and sensor-network technology, where the sensor network is used to estimate the utilization of different frequencies over a large frequency range, eg. 0-6 GHz. The project started in 2008 and runs through 2010.	http://www.sendora.eu
SFN	Single Frequency Network	Concept used in broadcast and mobile networks in which partially overlapping transmitters and base stations transmit symbol-identical signals on the same frequency. The signals from the different transmitters must be tightly syn-chronized in time and frequency. SFN works as a transmitter macro-diversity technique and provides improved signal reception conditions in overlapping areas. It is used in broadcast networks like DAB/DMB and DVB-T/H. It is also used in IMB and eMBMS broadcast services for 3G/UMTS and 4G/LTE.	
SGSN	Serving GPRS support node	The Serving GPRS Support Node is an exchange which performs packet switching functions for mobile stations located in a geographical area designated as the SGSN area. It is located in the core network of the visited network in 2G/3G systems. It has an interface towards the radio access net-work. The SGSN is the PS equivalent of the VLR/MSC for CS connections.	http://www.3gpp.org , http://www.etsi.org

Acronym/ Term	Definition	Explanation	Web Resources
SGW	Serving Gateway	Local mobility anchor in EPC, connected to the eUTRAN. The SGW routes and forwards user data packets, while also acting as the mobility anchor for the user plane during inter-eNodeB handovers and as the anchor for mobility between LTE and other 3GPP technologies.	http://www.3gpp.org
SIM	Subscriber Identity Module	The SIM is a subscriber identity module for GSM/GPRS subscriptions. In 2G systems the term SIM is used for a dedicated smartcard with subscriber identity information (including security credentials and algorithms). In 3G systems a SIM is an application running on the UICC (smartcard). Although the terms UICC and SIM are often interchanged, UICC refers to the physical card, whereas SIM (in 3G) refers to a single application residing in the UICC that collects GSM/GPRS user subscription information. The corresponding UMTS subscriber application is the USIM (which is always present on a UICC). The SIM provides secure storage of the key identifying a mobile phone service subscriber but also subscription information, preferences and storage of text messages. The equivalence of a SIM in UMTS is a Universal Subscriber Identity Module (USIM). Defined in 3GPP specification series 31.	http://www.3gpp.org/ftp/Specs/html-info/31-series.htm
SLA	Service Level Agreement	A contract between a provider and a customer that guarantees specific levels of performance and reliability at a certain cost. This contract should also precisely define what could be penalties and back-up solutions in case of problems. SLA is especially important to define when an important part of your system or activity relies on third party providers. SLA is also a very good approach for services provided internally to your organisation where you should also have a customer approach concern. A definition is found in IETF RFC 3272.	http://www.ietf.org , http://tools.ietf.org/html/rfc3272
SM	Spatial Multiplexing	Multiple antenna technique where different uncorrelated sub-channels are used to increase the overall link capacity of a wireless link. It is a MIMO technique where multiple antennas are employed both at transmitter and receiver in order to span out several sub-channels.	
SMDR	Scalable Multi-radio Deployment Research	Research collaboration between Telenor Denmark, Nokia Siemens Networks and Aalborg University initiated in 2009 with the aim of producing a year-to-year network evolution forecast and to dimension and compute the corresponding total cost of ownership (TCO).	
SMS	Short Message Service	A means by which short messages can be sent to and from digital cellular phones, pagers and other handheld devices. Alphanumeric messages of up to 160 characters can be supported [Newton03].	
SNEPA	System and Network Planning tool	An integrated network planning, dimensioning and static network simulator developed within the scope of the SMDR-project (see this) to conduct network evolution analysis.	
SNOW-3G		A second cipher for use with UMTS. A stream cipher designed to be a companion cipher to the KASUMI cipher. A true 128 bit cipher, also adopted for use with LTE. It is the 3rd in a series of word-based synchronous stream ciphers called SNOW 1.0, SNOW 2.0 and SNOW 3G developed by Thomas Johansson and Patrik Ekdahl at Lund University.	http://www.it.lth.se/cryptography/snow/ , http://www.3gpp.org/
SNR	Signal-to-Noise Ratio	The power ratio between the useful signal level (C) and the thermal noise level (N). Often expressed in dB.	
SON	Self Organizing Networks	Also called self-optimizing networks. Concept introducing a number of autonomous functions in a network to perform self-configuration, self-optimization and self-healing in order to reduce the need for manpower effort. Functions can range from neighbour cell discovery and automatic choice of cell ID to interference cancellation techniques and coverage and capacity optimization.	
SPR	Subscriber Profile Repository	Subscriber data base in the policy and charging architecture of the Evolved Packet System (EPS).	http://www.3gpp.org
SRES	Signed Response	The response message in a challenge-response authentication system. See also RAND.	
SR-VCC	Single-Radio Voice Call Continuity	Standardized mechanism for one-way handover of a VoIP call in LTE to a CS call in 2G/3G.	http://www.3gpp.org
SS/MS	Subscriber/Mobile Station	The SS/MS is the user terminal in WiMAX; SS refers to a fixed terminal while MS refers to a mobile terminal	http://www.ieee802.org/16/ , http://www.wimaxforum.org/

Acronym/ Term	Definition	Explanation	Web Resources
STBC	Space-Time Block Code	Special case of Space Time Codes (STC). STC schemes use a number of code symbols equal to the number of Tx antennas in MIMO. These are generated and transmitted simultaneously, one symbol from each antenna. The symbols are generated by a space-time encoder such that by using an appropriate signal processing and decoding procedure at the receiver, the diversity gain and/or the coding gain is maximized. STBC uses block codes and was described by S. Alamouti in 1998.	
STC	Space Time Coding	A method employed to improve the reliability of data transmission in wireless communication systems using multiple transmit antennas. STCs rely on transmitting multiple, redundant copies of a data stream to the receiver in the hope that at least some of them may survive the physical path between transmission and reception in a good enough state to allow reliable decoding. It is divided into Space-Time Block Codes (STBC) and Space-Time Trellis Codes. The first works on blocks of data, while the latter works on a continuous data stream. The technique is employed in most new wireless systems; UMTS, LTE, WiMAX and Wi-Fi.	
STTD	Space Time Transmit Diversity	A method of transmit diversity used in UMTS third-generation cellular systems. STTD is optional in the UTRAN air interface but mandatory for user equipment (UE). STTD utilizes space-time block code (STBC) in order to exploit redundancy in multiple transmitted versions of a signal.	http://www.3gpp.org
SW	Software	Term denoting code and programs not hardwired into the equipment, but giving instructions and data for a computer's central processing unit. Computer software can have various functions such as controlling hardware, performing computations, communication with other software, human interaction, etc; all of which are prescribed in the program. The term 'software' was first used in this sense by John W. Tukey in 1957; computer software is all information processed by computer system, programs and data. The concept of software was first proposed by Alan Turing in a report to National Physics Laboratory (UK) in 1946 entitled 'Proposed Electronic Calculator'.	
T1/E1		Primary order traffic stream in the Synchronous Digital Hierarchy. T1 = 1 548 kb/s, E1 = 2 048 kb/s.	
TACS	Total Access Communication System	1st generation analogue mobile system, a variant of AMPS which was used in some European countries like the UK and Ireland. It was a frequency modulated FDMA/FDD system with 25 kHz channel width.	
TCO	Total Cost of Ownership	A financial estimate designed to help consumers and enterprise managers assess direct and indirect costs. TCO is sometimes referred to as total cost of operation.	
TD-CDMA	Time-Division CDMA	A channel access method based on using spread spectrum across multiple time slots as a combination of TDMA and CDMA. It is one of IMT-2000 3G air interfaces, defined as IMT-TD Time-Division, and can also be found in use in UMTS air interfaces, as standardized by the 3GPP in UTRA-TDD HCR, often called UMTS TDD.	
TDD	Time Division Duplex	A duplex communication system is one where signal can flow in both directions between connected parties. TDD is the application of time-division multiple access to separate outward and return signals. Time division duplex has a strong advantage in the case where the asymmetry of the uplink and downlink data speed is variable.	
TDM	Time Division Multiplex	A type of digital multiplexing in which two or more apparently simultaneous channels are derived from a given frequency spectrum, ie. bit stream, by interleaving pulses representing bits from different channels.	
TDMA	Time Division Multiple Access	A technology for shared medium (usually radio) networks. It allows several users to share the same frequency by dividing it into different time slots. The users transmit in rapid succession, one after the other, each using their own timeslot. This allows multiple users to share the same transmission medium (eg. radio frequency) whilst using only the part of its bandwidth they require. Used in the GSM, PDC and iDEN digital cellular standards, among others. TDMA is also used extensively in satellite systems, local area networks, physical security systems, and combat-net radio systems.	
TD-SCDMA	Time Division Synchronous Code Division Multiple Access	An air interface technology as part of the UMTS as an alternative to WCDMA. It is also called UTRA/UMTS-TDD 1.28 Mc/s Low Chip Rate (LCR). It is used in China and is also known as UMTS-TDD or IMT-TD	http://www.3gpp.org

Acronym/ Term	Definition	Explanation	Web Resources
TTG	Transmit/receive Transition Gap	Guard time between transmission directions in TDD systems. The term TTG is used in Mobile WiMAX. The TTG allows time for the BS to switch from transmit to receive mode. the BS is not transmitting modulated data but simply allowing the BS transmitter carrier to ramp down, the transmit/receive antenna switch to actuate, and the BS receiver section to activate.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
TVWS	TV White Space	Frequencies which have been allocated to a broadcasting service, but are not used locally.	
UE	User Equipment	A UE is a device used directly by the end user to communicate over a network. For example, a mobile phone (terminal unit, radio unit and smartcard (SIM and/or UICC/USIM) or a personal computer. A device or devices allowing a user access to network services. This terminal refers to a terminal (eg. dedicated voice terminal or multi-purpose personal computer) that is connected to an NGN, which may be through a user network or other devices (ITU-T Rec. Y.2262).	
UGS	Unsolicited Grant Service	Traffic scheduling class in mobile WiMAX. The UGS class is designed to support real-time uplink service flows that transport fixed-size data packets on a periodic basis, such as T1/E1 and Voice over IP without silence suppression. The service offers fixed-size grants on a real-time periodic basis, which eliminates the overhead and latency of SS requests and assure that grants are available to meet the flow's real-time needs.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
UHF	Ultra-High Frequencies	Notation used to denote the frequency band from 300 to 3 000 MHz.	
UICC	UMTS Integrated Circuit Card	A physically secure device, an IC card (or 'smart card'), that can be inserted and removed from the terminal equipment. It may contain one or more applications. One of the applications may be a USIM. Defined in 3GPP specification series 31.	http://www.3gpp.org/ftp/Specs/html-info/31-series.htm
UL	Uplink	Term used to denote the transmission direction from the mobile station or user terminal to the base station.	
UL-MAP	Uplink Map	A term used in IEEE 802.16 networks to describe a MAC message that defines burst start times for both time division multiplex and time division multiple access by a subscriber station on the uplink.	http://www.wimaxforum.org , http://www.ieee802.org/16/
UMTS	Universal Mobile Telecommunication System	The European member of the IMT 2000 family of 3G wireless standards. UMTS supports data rates of 144 kb/s for vehicular traffic, 384 kb/s for pedestrian traffic and up to 2 Mb/s in support of in-building services. The standardisation work began in 1991 by ETSI but was transferred in 1998 to 3GPP as a corporation between Japanese, Chinese, Korean and American organisations. It is based on the use of WCDMA technology and is currently deployed in many European countries. As of November 2008 there are more than 300 million subscribers worldwide (including HSDPA). The first European service opened in 2003. In Japan NTT DoCoMo opened its 'pre-UMTS' service FOMA (Freedom Of Mobile multimedia Access) in 2000. The system can operate in several frequency bands and is capable of carrying multimedia traffic.	http://www.3gpp.org/ , http://www.umts-forum.org
UMTS AKA	UMTS Authentication and Key Agreement	The AKA protocol used in UMTS. It provides assurance of the subscriber and indirect verification of the network. The Key Agreement provides two 128 bit keys (CK, IK). UMTS AKA may be run over GERAN.	http://www.3gpp.org
USB	Universal Serial Bus	USB is a plug-and-play interface between a computer and add-on devices (such as audio players, joysticks, keyboards, telephones, scanners, and printers). With USB, a new device can be added to your computer without having to add an adapter card or even having to turn the computer off. The USB peripheral bus standard was developed by Compaq, IBM, DEC, Intel, Microsoft, NEC, and Northern Telecom, and the technology is available without charge for all computer and device vendors.	http://www.usb.org
USIM	Universal Subscriber Identity Module	An application residing on the UICC used for accessing services provided by mobile networks, which the application is able to register on with the appropriate security. Defined in 3GPP specification series 31.	http://www.3gpp.org/ftp/Specs/html-info/31-series.htm
UTRAN	UMTS Radio Access Network	Part of the 3G standard UMTS. The UTRAN consists of a set of Radio Network Subsystems (RNS) connected to the Core Network through the Iu-Interface. An RNS consists of a Radio Network Controller (RNC) and a number of base stations called Node Bs. They provide the radio interface Uu towards the User Equipment (UE). Specified by 3GPP. An overall description is found in 3GPP TS 25.401.	http://www.3gpp.org/ftp/Specs/html-info/25401.htm

Acronym/ Term	Definition	Explanation	Web Resources
VLR	Visitors Location Register	The Visitors Location Register or VLR is a temporary database of the subscribers who have roamed into the particular area which it serves. Each Base Station in the network is served by exactly one VLR, hence a subscriber cannot be present in more than one VLR at a time. The data stored in the VLR has either been received from the HLR, or collected from the MS. In practice, for performance reasons, most vendors integrate the VLR directly to the V-MSC and, where this is not done, the VLR is very tightly linked with the MSC via a proprietary interface.	
VoIP	Voice over Internet Protocol	VoIP is the routing of voice conversations over the Internet or any other IP-based network. The voice data flows over a general-purpose packet-switched network, instead of traditional dedicated, circuit-switched voice transmission lines. Several standards exist to support VoIP, like H.323 from ITU-T and SIP (IETF RFC 3261).	http://www.itu.int , http://www.ietf.org
VoLGA	Voice over LTE via Generic Access	VoLGA technology shall enable mobile subscribers to receive a consistent set of voice, SMS (and other circuit-switched) services as they transition between GSM, UMTS and LTE access networks. It is based on the existing 3GPP Generic Access Network (GAN) standard.	http://www.volga-forum.com/
WAPECS	Wireless Access Policy for Electronic Communication Services	WAPECS is a framework for the provision of electronic communications services (ECS) within a set of frequency bands to be identified and agreed between European Union Member States in which a range of ECS may be offered on a technology and service neutral basis, provided that certain technical requirements to avoid interference are met, to ensure the effective and efficient use of the spectrum, and the authorisation conditions do not distort competition. It is being worked out by the European Commission's Radio Spectrum Policy Group (RPSG).	http://rpsg.groups.ue.int/
WCDMA	Wideband Code Division Multiple Access	Modulation and Multiple Access Technique employed by the 3G standard UMTS.	http://www.3gpp.org
Wi-Fi®	Wireless Fidelity	A term for certain types of wireless local area network (WLAN) that use specifications in the 802.11 family. The term Wi-Fi was created by an organization called the Wi-Fi Alliance, which oversees tests that certify product interoperability. A product that passes the alliance tests is given the label 'Wi-Fi certified' (a registered trademark).	http://www.wifialliance.org
WiMAX	Worldwide Interoperability for Microwave Access	A specification for broadband wireless metropolitan access networks (WMANs) that use a point-to-multipoint architecture. IEEE is the organisation responsible for the standards WiMAX are based on. Different versions is documented in the IEEE 802.16 series. The IEEE 802.16 standard consists of a base standard and a number of amendments. It defines a MAC layer that supports multiple physical layer specifications customized for the frequency band of use and their associated regulations. The base standard is called IEEE 802.16-2009 and collects the previous version IEEE 802.16-2004 with its amendments IEEE 802.16e-2005, which includes the functionalities required for mobility. It is however important to differentiate between the functionalities allowed by the standards versions and the actual deployment and use of the technology.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/
WLAN	Wireless Local Area Network	This is a generic term covering a multitude of technologies providing local area networking via a radio link. Examples of WLAN technologies include Wi-Fi (Wireless Fidelity), 802.11b and 802.11a, HiperLAN, Bluetooth and IrDA (Infrared Data Association). A WLAN access point (AP) usually has a range of 20-300 m. A WLAN may consist of several APs and may or may not be connected to Internet.	
WMAN	Wireless Metropolitan Area Network	Commonly referred to as WiMAX or less commonly as WirelessMAN™ or the Air Interface Standard IEEE 802.16. A specification for fixed broadband wireless metropolitan access networks (MANs) that use a point-to-multipoint architecture. Published on April 8, 2002, the standard defines the use of bandwidth between the licensed 10 GHz and 66 GHz and between the 2 GHz and 11 GHz (licensed and unlicensed) frequency ranges and defines a MAC layer that supports multiple physical layer specifications customized for the frequency band of use and their associated regulations. 802.16 supports very high bit rates in both uploading to and downloading from a base station up to a distance of 30 miles to handle such services as VoIP, IP connectivity and TDM voice and data.	http://www.ieee802.org/16/ , http://www.wimaxforum.org/

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WRAN	Wireless Regional Access Network	A generic term covering different technologies to provide wide area wireless networks. Also the name of the IEEE 802.22 standards committee on Wireless Regional Access Networks. The charter of IEEE 802.22 is to develop a standard for a cognitive radio (CR) based PHY/MAC/air interface for use by license-exempt devices on a non-interfering basis in spectrum that is allocated to the TV Broadcast Service.	http://www.ieee802.org/22/
WRC	World Radio Conference	Global conferences held every two to three years by the ITU Radiocommunication Sector (ITU-R) to revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Before 1995 it was called WARC - World Administrative Radio Conference, but was renamed WRC. The next conference is in 2012.	http://www.itu.int/ITU-R/conferences/wrc/index.asp