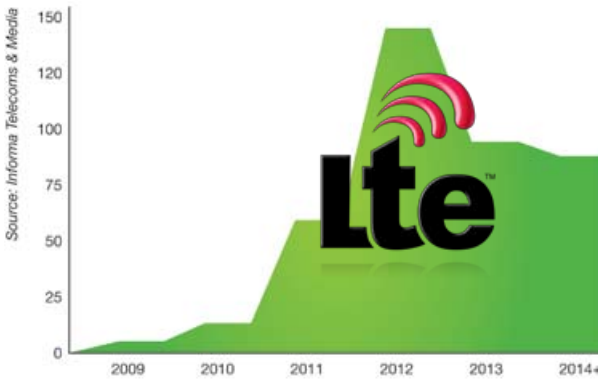




A GLOBAL INITIATIVE

## The 3rd Generation Partnership Project

### LTE Network Launches



## Moving Forward with LTE

As LTE becomes an integral component of 4th Generation Mobile networks, this brochure depicts both the features that lie behind the network, as well as why the future success of 3GPP mobile systems will be built on the relentless achievement and continuity of the past.



Since the inception of 3GPP, ATIS' North American 3GPP members have played a vital role in developing the standards that enable mobile operators throughout the globe to utilize a common platform for interoperability. Over the past decade, the North American Friends of 3GPP have provided host locations in-region to the 3GPP Technical Specification Group and Working Group meetings.

Thanks to an enlightened approach to the emergence of LTE and its Evolved Packet Core as well as the success of 3GPP systems, North America is well-positioned for the future evolution.

Interested in learning more? Meet with ATIS in Chicago at 4G World or in Dallas at LTE North America. Membership inquiries can be sent to Jennifer Harrell at [jharrell@atis.org](mailto:jharrell@atis.org).

[www.atis.org](http://www.atis.org)

September 2011





FREE DVD Inside  
3GPP LTE SPECIFICATIONS

## Milestones of Success – 3GPP Releases

Within the project, the work is organized around the concept of a “Release”, which defines the complete set of functionalities for any new cellular network deployed by operators.

For LTE, the key Releases are R8 and R9 which define the **Evolved UMTS Terrestrial Radio Access Network (E-UTRAN)** and an **Evolved Packet Core (EPC)** to support it.

3GPP studies about this evolution identified the following high-level requirements that characterize LTE:

-  Performance improvements (data throughput, cell edge performance, cell range, reduced latency, power consumption)
-  Improved use of the radio spectrum (more flexibility, readiness for future spectrum availability, convergence between paired and un-paired solutions, coexistence with legacy & handover, and evolved antenna design)
-  Simplified system design, open Interfaces (OFDMA chosen for down link, SC-FDMA for uplink, simplified architecture, All-IP)
-  Economic benefits (reduced capital and operational expenditure based on all of the above)

By 2011, the LTE work has matured, with a high level of stability. The priority is now to ensure that LTE develops smoothly into its Advanced form resident in 3GPP Release 10 and beyond.

LTE-Advanced is a specific response to the ITU's call for proposals for radio interfaces beyond 3G. Its importance was recently confirmed by the ITU-R's announcement that "LTE Release 10 & Beyond (LTE-Advanced)" was accepted as a radio interface as a part of their International Mobile Telecommunications-Advanced (IMT-Advanced) process.



The IMT-Advanced systems are intended to support new user and service demands that include commonality of functionality worldwide, compatibility with other radio and fixed systems, higher quality, improved usability, worldwide roaming... and higher data rates. In response, 3GPP has developed a clear roadmap that takes LTE into the next generation, i.e. 4G.

All 3GPP work beyond Release 10 is intended to be an evolution of LTE, with full backward-compatibility to allow any future LTE-Advanced technologies to be deployed in spectrum already occupied by LTE and with minimal impact on existing equipment and terminals.



Once that goal is achieved, the requirements of the LTE-Advanced system will be: better performance, use of spectrum, economic benefits... and ever more speed, with download peak rates targeting 1Gbps!

As we move towards 2012, we anticipate discussions at the international level on how to best position networks in the available spectrum in the future. This may result in a shift in emphasis away from standards towards discussions about harmonizing frequencies and providing for the growth in demand for mobile services.

This pause in standardization activity is expected to be temporary until a new study is conducted on the next evolution of the 3GPP family of systems. Meanwhile, LTE-Advanced will be further enhanced to add new features for equipment beyond 3GPP Release 10.

## About 3GPP – The Partners

Organizational Partners (OPs) are Standards Development Organizations which have signed the 3GPP Agreement. They jointly set policy and are responsible for overall governance of the Partnership Project. Senior officials of the OPs meet twice a year.

### Organizational Partners



### Market Representation Partners (MRP)

MRPs assist in determining market requirements for their area of competence and are responsible for representing the 3GPP position in their community.







(October, 2008 – The Femto Forum joins 3GPP as an MRP)

## 3GPP Committees

Each Technical Specification Group and Working Group has declared terms of reference. Details of these are available on the web site, making it relatively easy to determine which group deals with a particular area of work: <http://www.3gpp.org/specification-groups>

There are four Technical Specification Groups:

-  GSM EDGE Radio Access Network
-  Radio Access Network
-  Service & Systems Aspects
-  Core Network & Terminals

### TSG GERAN

GSM EDGE  
Radio Access Network

**GERAN WG1**  
Radio Aspects

**GERAN WG2**  
Protocol Aspects

**GERAN WG3**  
Terminal Testing

### TSG RAN

Radio Access Network

**RAN WG1**  
Radio Layer 1 spec

**RAN WG2**  
Radio Layer 2 spec  
Radio Layer 3 RR spec

**RAN WG3**  
lub spec, lur spec, lu spec  
UTRAN O&M requirements

**RAN WG4**  
Radio Performance  
Protocol aspects

**RAN WG5**  
Mobile Terminal  
Conformance Testing

### TSG SA

Service & Systems Aspects

**SA WG1**  
Services

**SA WG2**  
Architecture

**SA WG3**  
Security

**SA WG4**  
Codec

**SA WG5**  
Telecom Management

### TSG CT

Core Network & Terminals

**CT WG1**  
MM/CC/SM (lu)

**CT WG3**  
Interworking with external  
networks

**CT WG4**  
MAP/GTP/BCH/SS

**CT WG6**  
Smart Card Application  
Aspects

3GPP's committees are mostly Technical Specification Groups (TSGs) or Working Groups (WGs). The Project Coordination Group takes high level responsibility for the running of 3GPP, but it is in the four TSGs and their WGs that the technical specification work is performed. Revised versions of 3GPP specifications are published up to four times a year following the Technical Specification Group plenary meetings. They are available free of charge from [www.3gpp.org](http://www.3gpp.org).

## Meetings

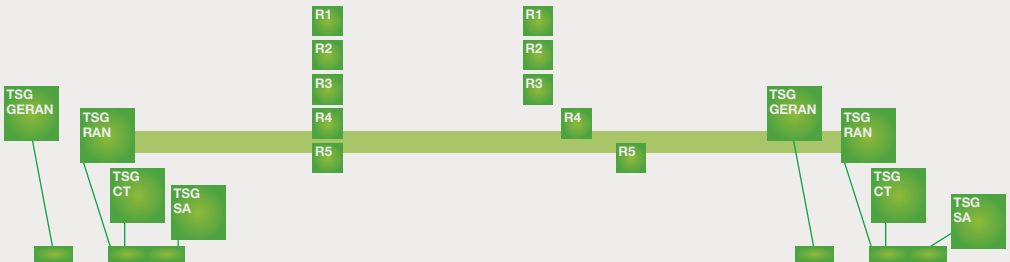
The plenary meetings for RAN, CT and SA are held over a two week period in a quarterly cycle. GERAN plenary meetings also occur quarterly, but are held at a different time and place:

### 3GPP Technical Specification Group Plenary Meetings

Title	Dates	Location
RAN/CT/SA#53	13–21 Sep 2011	Fukuoka JP
GERAN#52	21–25 Nov 2011	Bratislava SK
RAN/CT/SA#54	12–14 Dec 2011	Berlin DE
3GPP GERAN#53	27 Feb – 2 Mar 2012	TBD Europe
RAN/CT/SA#55	28 Feb – 7 Mar 2012	TBD China

[www.3gpp.org/3gpp-calendar](http://www.3gpp.org/3gpp-calendar)

## Working Group Meetings (RAN Example)



Working groups of RAN, CT or SA meet between these Plenary meetings – either jointly or independently. There are two basic types of meeting for all technical groups (TSGs and WGs); Ordinary and Ad Hoc.

Attendance at Ordinary meetings acquires and retains voting rights for Individual Member organizations. There are around 200 meetings a year.

The meeting calendar for any group can be found on the 3GPP web site at [www.3gpp.org/meetings](http://www.3gpp.org/meetings).

Meetings are generally held to a tried and tested agenda, although each group may develop variations on the theme.

## Typical Agenda

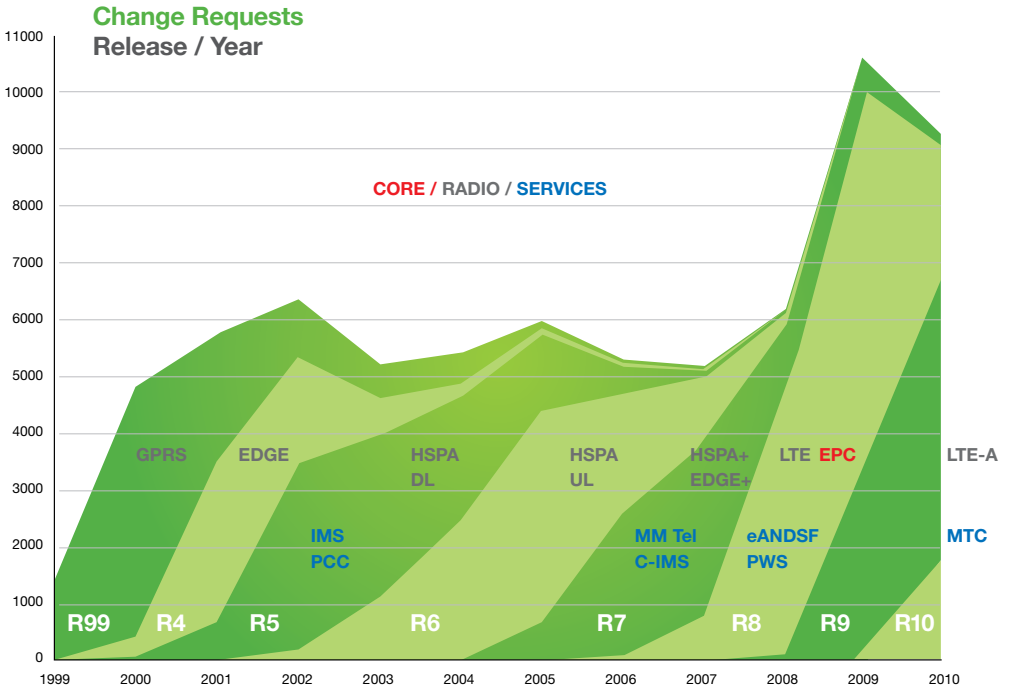


- Opening of the meeting
- IPR declaration reminder
- Approval of the agenda
- Approval of the report of the previous meeting
- Incoming liaisons
- Reports from subgroups
- Matters relating to completed work items
- Matters relating to active work items
- Newly proposed work items
- Administration, project management, etc.
- Any other business
- Close of meeting



Meetings are contribution driven. Contributions are allocated a formal number and are then submitted against the appropriate agenda item.

## Releases



Specifications are grouped into “Releases”. A mobile system can be constructed based on the set of all specifications which comprise a given Release. A given 3GPP Release differs from the previous versions by the addition of the new functionality. This detail is added to the system definition – which is a list of the technical specifications of a Release and the set of features provided within. The 3GPP home page has a link to all of the current Release definitions in the bottom section entitled ‘Releases’.

## Features

A Feature: “**new or substantially enhanced functionality which represents added value to the existing system**” [3GPP TR 21.900].

To be adopted into the work program of 3GPP, each feature must have the support of at least four 3GPP individual member organizations, which agree to contribute actively to the development of the necessary technical specifications.

A Work Item Description (WID) is prepared using a standard form, and is approved by the TSG.

A named individual – the “rapporteur” – is identified for each feature and, where necessary, for each component subtask of the feature. It is the rapporteur’s responsibility to monitor work.

He will also prepare a short report on the feature to each TSG meeting, and will maintain the WID, presenting any changes to the TSG for approval. Most Features are too complex to be handled as a whole, so each is broken down into a number component tasks (“building blocks”). Each of these components is managed independently, with the Feature rapporteur coordinating progress.

## Work Items

A “Feature” is defined by its “Work Item Description” (WID) sheet. It is manifested by a set of new technical specifications and changes to existing specifications. The WID describes what is going to be done, the responsibility, and the timing for the development of a new “Feature” and/or “Building Block”. A 3GPP Release is made up of Features, and each proposed Feature is evaluated, discussed, and approved by “consensus”; the WID document is the tool used by Companies to propose new (or revise existing) work items to be developed by one or more WGs. Specific WID guidance is given in the 3GPP Working Procedures, article 39; and 3GPP TR 21.900.

## Stages

Standardization activity is typically arranged into three stages:

### Stage 1

Defines the service aspects of a feature (or part thereof) from the end-user’s point of view

### Stage 2

Defines the logical functionality and information flows amongst the functional entities involved in providing the service

### Stage 3

Specifies any necessary functionality of physical entities (equipment) and the details protocols of the signaling between them

For complex Features, stage 1 may be preceded by a feasibility study (“stage 0”) to analyze the market and potential technical difficulties of a given service or approach. The results are generally captured in 3GPP-internal reports forming the foundation for subsequent concrete standardization work.

Stage 1 specifications are normally produced by 3GPP Technical Specification Group (TSG) SA1, and stage 2 specifications by SA2, though the stage 2 may need specialist knowledge from other TSGs’ working groups.

A separate stage 3 specification will be required for each protocol concerned with providing the service, which may well impact the whole equipment chain from User Equipment, through the Radio Access Network, to the Core Network, and on to network management interfaces, and to fixed networks. The service may require new codecs and new security measures.




Each Feature has the three stages. Stage 1 usually requires the production of new Technical Specifications (TSs). Stage 2 can normally be reflected by change requests to existing architecture specifications. Stage 3 may also require new TSs but may simply be implemented by a number of change requests to existing protocol TSs.

## Functional Freeze

For valid technical and commercial reasons, a “freeze” date is set for each Release. At the point of freezing a Release, the list of features to be included in the Release has already been fixed, and any features under development which cannot be completed within an agreed time frame are postponed to a later Release.

A feature is “completed” when all its component specifications are stable enough to be published by the SDOs and implemented by equipment manufacturers and network operators.

Prior to “freezing”, the following milestones must have been achieved:

-  The features to be included in the Release will have been determined. (And any features which are to be delayed to a later Release will have been identified.)
-  For each feature, the stage 1 specifications must have been completed. In addition, the stage 2 specifications should have been completed, or almost completed.
-  Further, the stage 3 specifications should have been completed, or are planned to be completed within a fairly short time span.

At the moment of freezing the Release, all outstanding issues for each feature must be identified, and target dates set for their resolution.

All specs should be planned to be stable within a reasonably short time – generally six months (two plenary meetings) at the most.

**Note 1:** The term “Release 2000” was used only temporarily and was eventually replaced by “Release 4” and “Release 5” (most elements originally in Release 2000 were renamed Release 4, but some were deferred until Release 5).

**Note 2:** Specifications with a version number of 0.x.y, 1.x.y or 2.x.y indicates that it is a new, draft, specification which has not yet been approved. The anticipated release is normally shown on the cover of the document.

**Note 3:** After “freezing”, a Release can have no further additional functions added. However, detailed protocol specifications (stage 3) may not yet be complete. In addition, OA&M specs and test specs may lag by some considerable time. A “frozen” Technical Specification is one which can have no further category B or C (new or modified functionality) Change Requests, other than to align earlier stages with later stages; thus all TSs pertaining to a Release may not necessarily be frozen at the time the Release itself is functionally frozen. Indeed since Release 7, the trend has been to freeze each of the three stages independently.

## Freeze Dates:

For up-to-date information go to:

<http://www.3gpp.org/Releases>



Rel	Spec version number (see note 4)	Functional freeze date indicative only (see note 3)
Rel-11	11.x.y	Stage 1 freeze September 2011 Stage 2 freeze March 2012 Stage 3 freeze September 2012
Rel-10	10.x.y	Stage 1 freeze March 2010, <i>SA1 Exceptions completed June 2010</i> Stage 2 target September 2010 Stage 3 March 2011 ( <i>RAN: December 2010 except ASN.1</i> )
Rel-9	9.x.y	Stage 1 freeze December 2008 Stage 2 June 2009 Stage 3 freeze December 2009
Rel-8	8.x.y	Stage 1 freeze March 2008 Stage 2 freeze June 2008 Stage 3 freeze December 2008

**Note 4:** In the version number, the field “x” is incremented at each change in the spec resulting from one or more Change Requests approved by the responsible TSG. Field “y” is incremented whenever an editorial change is made to a specification; editorial changes are those which cannot in any way change the technical interpretation of the spec, and are introduced at the discretion of the Support Team. Exceptionally, field “y” is incremented when a newly-provided version of a spec is found to be flawed due to, for example, misimplementation of a newly-approved CR; however, this circumstance is only permitted during the three-week period following the end of an SA (or GERAN) plenary, during which new versions of specs are produced. Every change of version is documented in the “change history” annex of the spec. When “x” is incremented, field “y” is reset to zero. When the Release field (the first digit) is incremented, fields “x” and “y” are reset to zero.

## Specification numbering

All 3GPP specifications have a specification number consisting of four or five digits, (e.g. 09.02 or 29.002).

Subject of Specification Series	3G and beyond / GSM (R99 and later)	GSM only (Rel-4 and later)	GSM only (Rel-4 and later)
General information (long defunct)			00 series
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series		07 series
Signalling protocols ("stage 3") -(RSS-CN)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed-network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series (1)	13 series (1)
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms (3)	35 series	55 series	(4)
LTE (Evolved UTRA) and LTE-Advanced radio technology	36 series	-	-
Multiple radio access technology aspects	37 series	-	-

Note (1): The 13 series GSM specifications relate to European-Union-specific regulatory standards. On the closure of ETSI TC SMG, responsibility for these specifications was transferred to ETSI TC MSG, (Mobile Specification Group) and they do not appear on the 3GPP file server.

Note (2): The specifications of these aspects are spread throughout several series.

Note (3): Algorithms may be subject to export licensing conditions.

Note (4): The original GSM algorithms are not published and are controlled by the GSM Association.

Information regarding Specification numbering and how to obtain a specific version is available at [www.3gpp.org/specification-numbering](http://www.3gpp.org/specification-numbering).

Details of the numbering structure are contained in 3GPP TR 21.900.

## Change Requests




The “system” is composed of a coherent set of related specifications. Once approved, it is still possible to develop the standard further - to add missing parts, and to correct errors and omissions as the overall system becomes better defined.

However small the change to a specification - the responsible working group must raise a Change Request (CR).

The CR consists of a cover page and an extract from the specification under consideration showing, using revision marks, all additions and deletions.

Several iterations of a CR may be required until the WG is satisfied. Once approved, the Support Team (3GPP MCC) incorporates the approved CRs into the base specification. The controlled revision of specifications can continue in the same manner, with CRs being produced and approved. CRs allow full traceability of the changes made to a document since its original approval.

Using the Change Control mechanism described, it is always possible to:

-  See the differences from one version of a spec to the next.
-  Back-track by de-implementing Change Requests which prove to be flawed.
-  Know exactly what set of specifications a system is to be built to.

Once frozen, no more functionality may be added to a Release or its component specifications. Only essential corrections are permitted. Further functionality will be part of features forming part of a new Release, with new functionality resulting in an entirely new specification.

Implementors (operators and equipment vendors) can choose which Release to build their systems to. Generally, newer Releases will be richer in features, but less tried and tested.

This system of change control previously enabled the GSM specifications to undergo five controlled releases before the creation of 3GPP, and has allowed a smooth transition from second generation to third generation and now beyond, reusing as many of the basic elements as possible.

This mechanism requires meticulous project planning and control... A section of the 3GPP web site is dedicated to CRs: [www.3gpp.org/change-requests](http://www.3gpp.org/change-requests).

## 3GPP Rules

### Hierarchy of Rules:

- 📶 3GPP Agreement – binds Partners to high level goals and methods 3GPP
- 📶 Working Procedures – lays down procedures for administration of the Project (<http://www.3gpp.org/About/WP.htm>)
- 📶 TSG Working Methods – outlines day-to-day TSG and WG processes (TR 21.900)
- 📶 Specification drafting rules – establishes structure, linguistic conventions, typographical styles, supported tools, etc (TR 21.801)



## Elections and Voting

TSGs have a chairman and up to three vice-chairmen. Working Groups have a chairman and up to two vice-chairmen. Their term of office is two years.

All chairmen and vice-chairmen are elected by participants of the group concerned. In the case of TSGs, once elected, chairmen and vice-chairmen have to be formally appointed by the 3GPP PCG. This is to ensure regional and company balance and general fairness of power sharing.

Voting may also be used to resolve technical disputes. The voting system is one Individual Member organization, one vote, with no weighted voting.



## Legal

3GPP is not established as a legal entity. All legal liability and responsibility devolves to the Organizational Partners, Market Representation Partners and Individual Members.

3GPP's "products" are Technical Specifications (TS) and Technical Reports (TR). These are owned jointly by the Organizational Partners, as stated in the copyright statement on every TS/TR:

No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media. © 2011, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TTA, TTC). All rights reserved.

3GPP TSs and TRs have, in themselves, no legal standing. See the note on the cover of each:

The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP.




The present document has not been subject to any approval process by the 3GPP Organizational Partners and shall not be implemented.

This Specification is provided for future development work within 3GPP only. The Organizational Partners accept no liability for any use of this Specification.

Specifications and reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices.

The 3GPP Organizational Partners each transpose the "raw" 3GPP TSs and TRs into their own national / regional publications.

A broad description of 3GPP technologies is provided in various ITU Recommendations, which cite the national / regional publications of the Organizational Partners:

-  ITU-R M.1457: IMT-2000 radio technology
-  ITU-T Q.1741: IMT-2000 core network
-  ITU-R M.[IMT-RSPEC]: IMT Advanced radio technology



## IPR

3GPP Specifications may include “essential intellectual property”.

At every meeting, the Chairman reads the following invitation:

The attention of the delegates to the meeting of this Technical Specification Group is drawn to the fact that 3GPP Individual Members have the obligation under the IPR Policies of their respective Organizational Partners to inform their respective Organizational Partners of Essential IPRs they become aware of.

The delegates are asked to take note that they are thereby invited:

to investigate whether their organization or any other organization owns IPRs which were, or were likely to become essential in respect of the work of 3GPP.

to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms.

Under the rules of the individual Organizational Partners, 3GPP does not perform IPR searches, does not issue licenses to exploit IPR and does not negotiate IPR license fees or conditions.

Each Organizational Partner maintains a database of the declarations received.

## The Mobile Competence Centre

The Mobile Competence Centre (MCC) provides the following support to 3GPP:

- ✓ Support at 3GPP meetings
- ✓ Manage major work items and updating/maintaining a work plan
- ✓ Edit specifications under change control
- ✓ Support the Chairman
- ✓ Process liaison statements to relevant groups
- ✓ Implement change requests approved by the parent body in the specifications under change control
- ✓ Provide the resulting new working versions of specifications under change control to the standardization group experts
- ✓ Manage 3GPP finances

# 3GPP Liaisons

TSGs and WGs liaise directly with other groups within 3GPP by the use of Liaison Statements. These documents contain details of what is expected, from whom and must set a deadline for when an answer is needed.

Details of 3GPP Liaisons are on the web at [www.3gpp.org/Liaisons-page](http://www.3gpp.org/Liaisons-page).

3GPP maintains a list of external organizations with whom the TSGs liaise, at [www.3gpp.org/Official-liaisons](http://www.3gpp.org/Official-liaisons).



**Liaisons-page**

## Official liaisons

The following table shows those External Organizations with which 3GPP TSGs liaise. Requests for additions, or changes, to this list should be made by the relevant TSG Chairman to the Liaison Coordinator, Susanna Koskiva.

External Organization	Purpose
3GPP2	Direct liaison between related groups in 3GPP and 3GPP2
ASIS	Liaison with ASIS to discuss remote control of wireless
Bluetooth	Agreed in March 2004
CableLabs	Approved by PCO#19 2001-12-18
International Special Committee on Radio Interference (CISPR)	Obtain information on developments in EMC measurement methods and limits
CTIA (Cellular Telecommunications & Internet Association)	To develop test methods for UE wireless performance measurement
Digital Video Broadcasting (DVB) Project	The DVB Project are considering the use of the DVB system as a satellite broadcast return channel
Ecma International	Liaison for potential introduction of a CDMA2000 language identifier) based classmark for the next release. The new classmark would be based on CDMA2000 which will be conducted within Ecma International
Expert Group for Emergency Access (EEA)	Approved by PCO 2008-08-18
Eurescom	Liaison with Eurescom for the exchange of information in OSAParty activities
European Co-operation in the field of Scientific and Technical Research (COST) and in particular COST 273 (Towards Mobile Broadband multimedia networks)	To develop test methods for UE wireless performance measurement
European Radiocommunications Committee (ERC)	General liaison on spectrum issues
Fixed Mobile Convergence Alliance (FMCA)	Approved by PCO 2008-11-20

## 3GPP Members



The following is a partial list of the total 380 individual Members.  
For the Official Members list, go to <http://www.3gpp.org/membership>

3GPP member organizations as of 1 July 2011:

3

7 LAYERS AG  
ACCURIS Ltd  
Acer Incorporated  
Acision UK Ltd  
ACME PACKET  
Aeroflex  
AGILENT TECHNOLOGIES LTD  
Airbiquity Incorporated  
Aircor International Limited  
Airvana, Inc.  
Airwave Solutions Limited  
Airwide Solutions Inc.  
Alcatel-Lucent  
Allot Communications Ltd.  
ALVARION S.R.L.  
Amdocs Software Systems Ltd  
Andrew Corporation  
Andrew Wireless Systems GmbH  
Anite Telecoms Ltd.  
Anritsu Corporation  
Apple (UK) Limited  
AQSACOM S.A.  
ARGELA  
ASUSTeK Computer Inc.  
AT&T  
AT4 wireless S.A.  
Audience Inc.  
Azimuth Systems Incorporated  
BABT  
BELGACOM  
Bell Mobility  
BfV  
BIS  
Bluetest AB  
BMW  
Bolloré Telecom S.A.S  
BOUYGUES Telecom  
Bridgewater Systems  
BROADCOM CORPORATION  
BT Group Plc  
Bureau Veritas ADT  
CableLabs  
Cassidian SAS  
CATR  
CATT  
CCS  
CEA  
Celltick Technologies Inc.  
Cellular South  
Celtro Ltd  
CESG  
CETECOM GmbH  
CEWIT  
CGC Inc.  
China Mobile Com. Corporation  
China Telecommunications  
China Unicom  
CHTTL  
Cinterion Wireless Modules  
Cisco Systems  
CJSC Peter-Service  
Clearwire  
CNES  
Coiler Corporation  
Collis Great Britain Limited  
Comprion GmbH  
Com-Research GmbH  
Comverse Network Systems  
Continuous Computing Corp.  
Converlogic SAS  
Cox Communications  
CSR  
CTTC  
Cyta  
DAC-UPC  
Dai Nippon Printing Co., Ltd  
DBSD Services Ltd.  
Deutsche Telekom AG  
DOCOMO Communications Lab.  
Dolby Laboratories Inc.  
DSNA-DTI  
Dynastat, Inc.  
eAccess Ltd  
E-Biink s.a.  
ECO  
EIRCOM  
Elektrobit Corporation  
Entreprise des P. et T.  
Ericsson Inc.  
ETI Connect A/S  
ETISALAT  
ETRI  
ETS-Lindgren Europe  
Fastweb S.p.A.  
FCC  
Fiberhome Technologies Group  
FICORA  
France Telecom  
Fraunhofer Gesellschaft  
Freescale Semiconductor  
Friedrich-Alex-Universität  
Fujitsu Limited  
Gemalto N.V.  
GENBAND  
GIESECKE & DEVRIENT GmbH  
Gigaset Communications GmbH  
Hay Systems Ltd  
Hewlett-Packard  
HiSilicon Technologies Co., Lt  
Hitachi Ltd.  
HT mMobile Inc.  
HTC Corporation  
HUAWEI TECHNOLOGIES Co. Ltd.  
HUGHES Network Systems Ltd  
IAESI  
IBM EUROPE  
IICS  
Ill  
Incard  
INFINEON TECHNOLOGIES  
Inmarsat  
Innowireless Co., Ltd  
Insiteo  
Intel  
INTERDIGITAL COMMUNICATIONS  
Intertek  
ip.access Ltd.  
IPWireless Inc.  
Iskraltel Ltd.  
ITALTEL SpA  
ITRI  
JDSU Deutschland GmbH  
Jinny Software Ltd  
Juniper Networks  
Kapsch CarrierCom France S.A.S  
KATHREIN-Werke KG  
KCCS MOBILE ENGINEERING

Co.Ltd  
 KDDI Corporation  
 Kineto Wireless  
 Korea Testing Laboratory  
 KPN N.V.  
 KT Corporation  
 Kyocera Corporation  
 LG Electronics Inc.  
 LightSquared  
 Magnolia Broadband Inc.  
 Marvell Switzerland  
 MediaTek Inc.  
 MetroPCS  
 MICROSOFT EUROPE SARL  
 mimoOn GmbH  
 Mindspeed Technologies  
 MinEFI  
 MITRE Corporation  
 Mitsubishi Electric Co.  
 MOBITEL d.d.  
 Morpho Cards GmbH  
 Motorola  
 Movik Networks  
 MStar Semiconductor, Inc.  
 MTCC  
 Nanjing Ericsson Panda Com Ltd  
 National Communications System  
 (USA)  
 National Instruments Corp.  
 National Technical Assistance (UK)  
 NEC Corporation  
 Netscout Systems Inc.  
 NeuStar Inc.  
 New Postcom Equipment Co., Ltd  
 NII Holdings  
 Nippon Ericsson K.K.  
 NIST  
 NOKIA Corporation  
 Nokia Siemens Networks  
 Nomor Research GmbH  
 Norwegian P & T Authority  
 NTC Corporation  
 NTT  
 NTT DOCOMO INC.  
 NVIDIA  
 NXP Semiconductors  
 OBERTHUR TECHNOLOGIES  
 OFCOM (CH)  
 Ofcom (U.K.)  
 Oki Electric Industry Co. Ltd.  
 OnAir N.V.  
 one2many B.V.  
 Openet Telecom  
 Oracle Corporation  
 ORANGE SA  
 OSS Nokalva  
 Panasonic Corporation




Pantech CO., LTD  
 PCTEST Engineering Lab  
 Philips International B.V.  
 PicoChip Ltd  
 PIDS  
 PIWorks  
 Polaris Networks Inc.  
 Polaris Wireless  
 Polska Telefonia Cyfrowa  
 PORTUGAL TELECOM SGPS SA  
 Potevio Company Limited  
 Powerwave Technologies  
 Public Safety Canada  
 Qatar Telecom (QTEL)  
 Qualcomm Incorporated  
 RadiSys  
 RATEL  
 RealNetworks  
 Redknee Inc.  
 Renesas Electronics Europe  
 Research in Motion  
 RFI Global Services Ltd  
 Rogers Wireless Inc.  
 ROHDE & SCHWARZ  
 Ruckus Wireless Inc.  
 Sagem Wireless  
 SAMSUNG Electronics  
 SANDISK CORPORATION  
 Sandvine Incorporated  
 SASKEN COMMUNICATION  
 TECHN.LTD  
 SATIMO Industries  
 Seiko Epson Corporation  
 Sequans Communications  
 setcom wireless products GmbH  
 SFR  
 SGDSN  
 SGS Wireless  
 SHARP Corporation  
 Siemens AG  
 Sierra Wireless UK Limited  
 Silicon Laboratories  
 SISVEL SPA  
 SK Telecom  
 SOFTBANK MOBILE Corp.  
 Sonus Networks Limited  
 Sony Corporation  
 Sony Ericsson Mobile  
 SouthernLINC Wireless  
 SP Technical Research  
 Spirent Communications  
 Sporton International Inc  
 SPRINT  
 Starpoint  
 ST-Ericsson SA  
 Stoke Inc  
 Sumitomo Elec. Industries Ltd

SWISSCOM  
 Sycamore Networks  
 SYMMETRICOM GmbH  
 TATARA SYSTEMS INC.  
 TD Tech Ltd  
 TDF  
 Technicolor  
 Tekelec  
 TEKTRONIX GmbH & Co KG  
 Telcordia Technologies  
 TELECOM ITALIA S.p.A.  
 TeleCommunication Systems  
 Telefon AB LM Ericsson  
 TELEFONICA S.A.  
 Telekom Austria AG  
 Telekom Deutschland GmbH  
 TELENOR ASA  
 TeliaSonera AB  
 Telit Communications S.p.A.  
 TELKOM SA LIMITED  
 TELLABS OY  
 TELSIS SYSTEMS LTD  
 TELUS  
 TERACOM AB  
 TerreStar Networks Inc.  
 Testing Technologies  
 TEXAS Instruments  
 THALES  
 Tianjin Samsung Telecom  
 T-Mobile  
 TNO  
 Tokyo Institute of Technology  
 Top Optimized Technologies S.L  
 TOSHIBA RESEARCH EUROPE  
 LTD  
 Toyota ITC  
 TPS  
 TruePosition Inc.  
 Ubidyne GmbH  
 Ubiquisys Ltd  
 UK Broadband Ltd  
 US Cellular Corporation  
 VAISALA OYJ  
 VALID SOLUCIONES  
 TECNOLÓGICAS  
 Verizon  
 VIA Telecom  
 VIPnet d.o.o.  
 VODAFONE  
 VoiceAge Corporation  
 Vulcan Wireless, LLC  
 w2bi, Inc.  
 WiChorus Inc.  
 WIND TELECOMUNICAZIONI SPA  
 Wipro Technologies  
 Zollkriminalamt (ZKA)  
 ZTE Corporation



## 3GPP Mission and Scope

**3GPP prepares, approves and maintains Technical Specifications and Technical Reports for mobile telecommunications systems including the following radio technologies and the associated core network:**

-  LTE and further evolution to LTE-Advanced
-  Wideband-CDMA, Frequency Division Duplex (FDD) and Time Division Duplex (TDD), plus evolution to HSPA
-  GSM, including EDGE and GPRS



### About ATIS

ATIS is the leading technical planning and standards development organization committed to the rapid development of global, market-driven standards for the information, entertainment and communications industry. More than 200 companies actively formulate standards in ATIS' Committees, covering issues including: IPTV, Cloud Services, Energy Efficiency, IP-Based and Wireless Technologies, Quality of Service, Billing and Operational Support, Emergency

Services, Architectural Platforms and Emerging Networks. In addition, numerous Incubators, Focus and Exploratory Groups address evolving industry priorities including Smart Grid, Machine-to-Machine, Networked Car, IP Downloadable Security, Policy Management and Network Optimization.

ATIS is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a member and major U.S. contributor to the International Telecommunication Union (ITU) Radio and Telecommunications' Sectors, and a member of the Inter-American Telecommunication Commission (CITEL). ATIS is accredited by the American National Standards Institute (ANSI).

For more information, please visit [www.atis.org](http://www.atis.org).

Global System for Mobile communications (GSM) - Second generation digital system developed in ETSI and subsequently transferred to 3GPP

General Packet Radio Service (GPRS) - 2.5G radio technology providing packet data

Enhanced Data rates for Global Evolution (EDGE) - 2.75G radio technology increasing bitrates to lower bounds of 3G

High Speed Packet Access (HSPA) - Evolution of UTRA to provide higher data rates

Wideband-CDMA (Wideband Code Division Multiple Access) is a part of the UMTS (Universal Mobile Telecommunications System) family, the first 3rd generation radio technology developed by 3GPP

LTE - New radio technology coupled with simplified architecture yielding performance approaching 4G

LTE-Advanced - Further development of LTE offering true 4G performance