Intellectual Property Rights (IPR) Principles (2)

(i) **To encourage their respective members' declaration of willingness to grant licences on fair, reasonable terms and conditions on a non-discriminatory basis, and consistent with the respective Organizational Partners' IPR policies.**

(ii) **To encourage their respective members who may have IPR which they believe to be essential, or potentially essential, and are unwilling to license such IPR, that early indication of such unwillingness be provided to their respective Organizational Partners.**

(iii) **To understand that essential IPRs mean essential IPRs relative to any or all parts of the content of the 3GPP technical specifications.**

(iv) **A mechanism for exchanging information associated with the patent statement among the Organizational Partners will be introduced so that such information may be used when adopting relevant standards in each Partner Organization.**

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APPENDIX 3

About / Introducing 3GPP

Introducing 3GPP



The 3rd Generation Partnership Project (3GPP) unites seven telecommunications standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC), known as “Organizational Partners” providing their members with a stable environment to produce the Reports and Specifications that define 3GPP technologies.

3GPP specifications cover cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications. The 3GPP specifications also provide hooks for non-radio access to the core network, and for interworking with non-3GPP networks

The Project’s Scope

The original scope of 3GPP (1998) was to produce Technical Specifications and Technical Reports for a 3G Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes).

The scope was subsequently amended to include the maintenance and development of the Technical Specifications and Technical Reports for evolved 3GPP technologies, beyond 3G.

- The latest 3rd Generation Partnership Project Agreement (Annex 42).
- The discussions that led to the signing of the 3GPP Project Agreement were recorded in a series of slides called the “Partnership Project Description” that describes the basic principles and ideas on which the project is based. The document has not been maintained since its first creation, but the principles within do still remain valid.

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Organizing the work

The 3GPP Working Procedures are the rule book of 3GPP, with sections covering:

- Description, Purpose, Scope and objectives
- Participation
- Structure
- Partners' collective responsibilities
- Project Coordination Group (PCG)
- Technical Specification Groups (Incl. Elections)
- Work Programme & technical co-ordination
- Deliverables (Technical Specifications and Technical Reports)
- Reporting

The 3GPP production of specifications and studies (TRs) are contribution-driven, by member companies, in Working Groups and at the Technical Specification Group (TSG) level. The Technical Specification Groups in 3GPP are:

- Radio Access Networks (RAN)
- Services & Systems Aspects (SA)
- Core Network & Terminals (CT)

The Working Groups, within the TSGs, meet regularly and come together for their quarterly TSG Plenary meeting, where their work is presented for information, discussion and approval. The last meeting of the week of TSG Plenary meetings is TSG SA, which also has responsibility for the overall coordination of the technical work and for the monitoring of its progress.

Generational Approach

The 3GPP technologies from these groups are constantly evolving through Generations of commercial cellular / mobile systems (see table below). With LTE and 5G work, 3GPP has become the focal point for the vast majority of mobile systems beyond 3G.

Although these Generations have become an adequate descriptor for the type of network under discussion, real progress on 3GPP standards is measured by the milestones achieved in particular Releases. New features

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are 'functionality frozen' and are ready for implementation when a Release is completed. 3GPP works on a number of Releases in parallel, starting future work well in advance of the completion of the current Release. Although this adds some complexity to the work of the groups, such a way of working ensures that progress is continuous & stable.

Backward Compatibility

The major focus for all 3GPP Releases is to make the system backwards and forwards compatible where possible, to ensure that the operation of user equipment is uninterrupted.

For 5G, many operators are starting with dual connectivity between LTE and 5G NR equipment – using the 'Non-Standalone' work completed early in Release 15. In the process of completing the early drop of 5G NR care has been taken to build 'forward compatibility' into Non-Standalone NR equipment, to ensure that it will be fit for use on Standalone 5G NR systems.

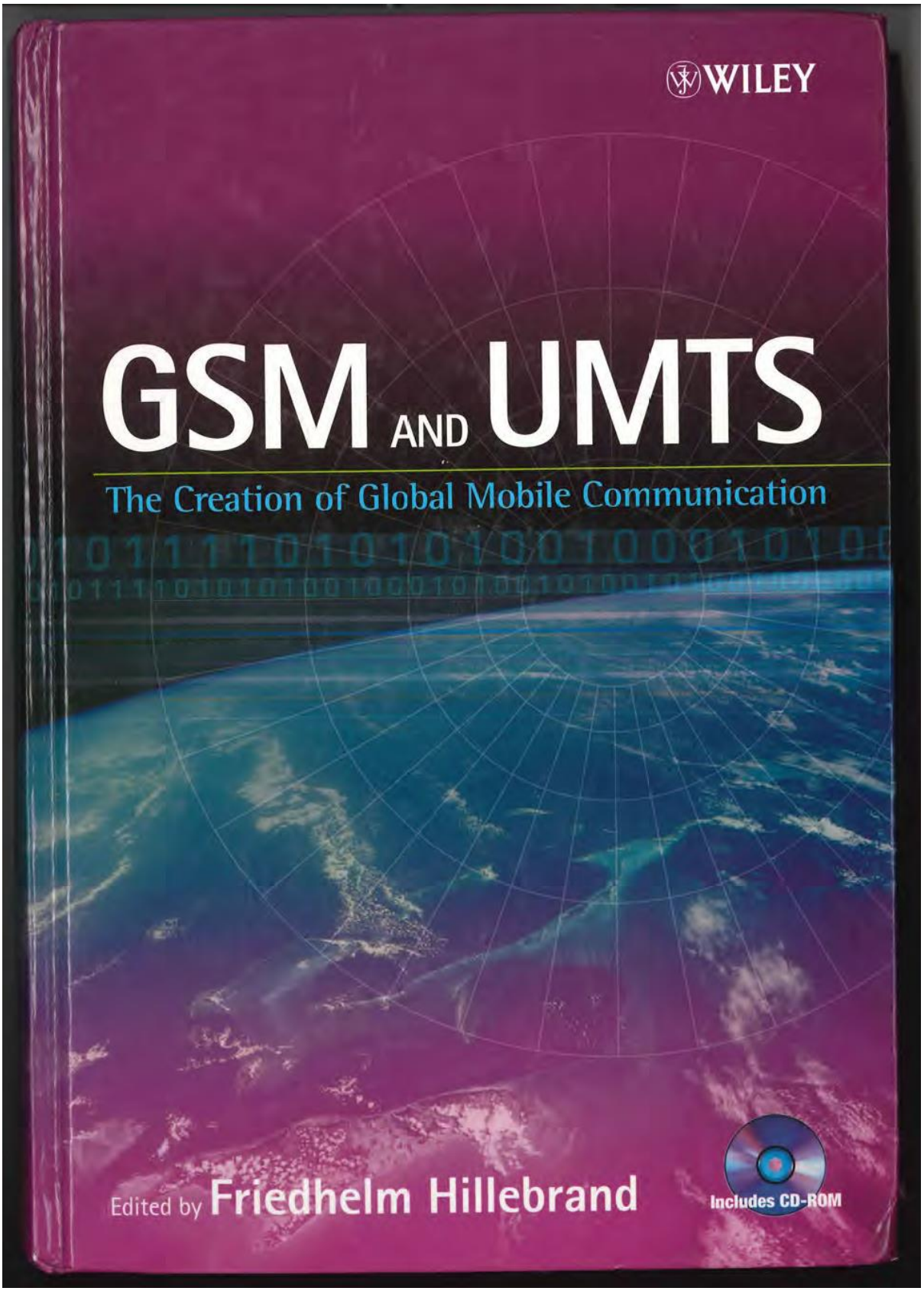
For details of the contents of each Release, see the appropriate 'Release Description' document or go to our dedicated Release page.

Details of all 3GPP Work Items are in the 3GPP Work Plan, which provides details of the cooperation between all of the 3GPP groups on "Features", defined as 'new or substantially enhanced functionality which represents added value to the existing 3GPP system'.

Previous Next

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APPENDIX 4



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GSM and UMTS

The Creation of Global Mobile Communication

Edited by

Friedhelm Hillebrand
Consulting Engineer, Germany

With contributions from 37 key players involved in the work for GSM and UMTS



JOHN WILEY & SONS, LTD

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Chapter 9: The Third Generation Partnership Project (3GPP)

Section 1: The Creation of 3GPP

Karl Heinz Rosenbrock[1]

Having read the title, it should not surprise you that this section deals with the creation of the Partnership Project for the standardisation of a Third Generation Mobile Communications System (3GPP).

Why, you may ask, in a history book about the GSM and UMTS development, do I want to talk about the establishment of a partnership project? Isn't it the most natural thing to do? This is, of course, a stance an insider can take today – after nearly 30 months of 3GPP's creation and the smooth and successful running of this project.

As this section will eventually show, it took quite some time, filled with tough and even passionate discussions, before the goal was achieved. Approaching this idea from a rather philosophical point of view, one should not be too surprised about the big efforts needed, because already the old Greek ancestors knew that "prior to being successful the Gods will demand some sweat"…[2]

This section starts with some general considerations leading the European Telecommunications Standards Institute (ETSI) membership towards a global approach in standardisation and then deals with the establishment of an ad hoc group of the ETSI Board (UGG = UMTS Globalisation Group) to address the matter of global standardisation in this context and the related meetings and discussions. Afterwards, the 3GPP will be described in a rather general manner, highlighting how it works, who the stakeholders are and dealing with the results achieved so far. The section is rounded up with the relationship towards the International Telecommunication Union (ITU) and other initiatives as well as a few concluding remarks.

9.1.1 First Approaches to Globalisation

The re-engineering process ETSI, the "Excellent" Telecommunications Standards Institute in Europe, undertook in the years 1995/1996 – only 7 years after its creation – resulted in among others a kind of mission statement for the Institute: "Making international standards happen first in Europe".

[1] The views expressed in this section are those of the author and do not necessarily reflect the views of his affiliation [illegible].

[2] One of my cruel translations of a German idiom "Vor den Erfolg haben die Götter den Schweiß gesetzt"…

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- unanimously requested the ETSI Board (through its UMTS Globalisation Group) to complete the negotiations with potential partners and to oversee the creation of the Partnership Project;
- unanimously requested the ETSI Board to agree and maintain on behalf of ETSI the final versions of the Partnership Project Description, the Partnership Project Working Procedures, and the Partnership Project Agreement;
- unanimously authorised the director-general to sign the Partnership Project Agreement.

9.1.2.4.14 Happy End in Copenhagen

It was in Copenhagen where the last 3GPP preparatory meeting with all six OPs took place on 2–4 December 1998.

Here, the final fine-tuning of the 3GPP documentation was achieved. In addition, the 3GPP agreement[8] was signed (in a nice framework provided by the host, TeleDenmark) by the following OPs: ARIB, ETSI, T1, TTA, and TTC.

Unfortunately, the partners from CWTS (China) were not authorised to sign the 3GPP agreement yet. Furthermore, owing to the fact that the UMTS Forum was unable to participate in Copenhagen, they were prevented from co-signing the 3GPP agreement as a first Market Representative Partner (MRP).

During that Copenhagen meeting, another discussion ensued about the role the MRPs should play. Finally, it was concluded that the high competence of MRPs should be used in order to identify market requirements, thus enabling 3GPP standardisation to meet the needs of the market. An MRP is an organisation invited by the OPs to participate in 3GPP with the objective of offering market advice to 3GPP and to bring into 3GPP a consensus view of market requirements.

9.1.3 What is 3GPP?

The 3GPP is a global standardisation initiative created in December 1998. Its task was to develop a complete set of globally applicable Technical Specifications for a third generation (3G) mobile telecommunications system based on the evolved GSM core network and an innovative radio interface known as UTRA. The Project is based on a concept devised by ETSI aimed at facilitating better co-operation between regional standards organisations, fora and other industry groupings. 3GPP is a collaborative activity between officially recognised SDOs, with the participation of other industry groups and individual members.

Partnership in 3GPP is open to all national, regional or other SDOs, irrespective of their geographical location – within the project the participating SDOs are referred to as OPs. The OPs may invite MRPs to participate: these may be any organisation from anywhere in the world that can offer market advice to 3GPP and bring a consensus view of market requirements that fall within the project's scope. Individual membership is open to companies and organisations within the communications industry that are active members of one of the OPs. The truly global nature and the breadth of the market interest in the task of specifying this 3G system is evident from the identity of the 3GPP partners (see further in sub-paragraph 9.1.3.2) and all agree that 3GPP is proving a highly successful initiative.

[8] The 3GPP Agreement and the 3GPP Project Description can be found on the attached CD-ROM in

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The 3GPP has no legal status. Ownership (including copyright) of the specifications and reports it produces is shared between the partners. The 3GPP process includes a conversion (transposition) of the project's output into official standards and reports by one or more of the OPs.

The specifications being prepared by 3GPP are evolved in part from the enormously successful GSM standard, which is currently (February 2001) serving over 400 million subscribers in more than 140 countries. Building on this massive installed base, the system being specified by 3GPP will be an attractive upgrade path for existing operators and users. It also has an assured compatibility with GSM – good news for both operators and users who are unable, or unwilling, to upgrade to 3G.

Paramount among the 3GPP specifications is the definition of UTRA, the innovative radio access technology that is the key to the new system's high data rates and dramatically improved performance. UTRA is spectrum-efficient and supports FDD and TDD modes. This interface has been accepted by ITU as a member of the IMT-2000 family – or more correctly, as *two* family members: IMT-DS, the FDD mode; and IMT-TC, the TDD mode. IMT-2000 family membership requires the ability for users to roam globally and seamlessly, which implies interoperability with other family members: 3GPP thus co-operates closely with the 3GPP2 project which is specifying another family member, a 3G CDMA system based on an evolution of the ANSI-41 architecture.

9.1.3.1 How Does 3GPP Work?

3GPP has been designed to minimise delays and inefficiencies. As a result, it has a "flat" organisational structure and a large degree of distributed autonomy. Overall project planning and co-ordination is the responsibility of the PCG, with input primarily from the OPs, guided by the MRPs. It is mainly at this level that regulatory requirements, provided by the telecommunications administrations and governments around the world, are taken into account.

The development of the specifications is performed by TSGs and their subordinate working groups. Here, the main participation is by technical experts from the individual members of the OPs. Individual members in their capacity as ITU members are also responsible for carrying the results of the 3GPP work to the ITU.

At the time of the creation, 3GPP had structured around four principal aspects of the 3G system being defined as TSGs:

- TSG CN: core network
- TSG RAN: radio access network
- TSG SA: services and systems aspects
- TSG T: terminals

Each TSG is authorised to develop and approve specifications and reports within its scope, and TSG SA also has a role of co-ordinating the work of the TSGs at a more detailed level than the PCG. The result is a process that is able to rapidly produce and approve specifications and reports in response to the needs of the market, although it is important to note that the deliverables do not have a formal status until they have been transposed by one or more of the OPs.

The formal status is necessary for regulatory and other purposes in the various regions, and all the OPs have committed themselves to complete this process rapidly. Each OP will apply

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its own procedures, appropriate to their respective regions. As the official European SDO within 3GPP, ETSI recognises the 3GPP output as ETSI Technical Specifications and ETSI Technical Reports without a need for any further endorsement within the Institute. This means that the 3GPP documents are published – within a matter of a few weeks – as identical text directly as ETSI deliverables. In addition, ETSI is transposing, i.e. adapting, a few of the initial 3GPP specifications into ENs for specific European regulatory requirements. This is happening in parallel with the publication of the initial Technical Specifications and will not impede the implementation of 3G in Europe.

9.1.3.1.1 Electronic Working

3GPP has taken a leading role in changing the traditional ways of standards making. A very heavy dependence is now placed on electronic working, both outside and within meetings, advancing a trend that started in ETSI a year or two ago. This means that paper copies of draft documents have been almost entirely eliminated, saving time and expense, and making a significant contribution to the environment.

Given that 3GPP has participants from all over the world, the use of the Internet, e-mail exploders and other such facilities have proved invaluable for distributing and sharing information, working drafts and so on. Delegates to meetings had already become used to downloading working documents from the Internet and having updates to the documents distributed in meetings on CD-ROM. But in recent months, in meetings around the world participants have experienced the benefits of a local area network (LAN) solution as the latest step in improving working methods. ETSI's headquarters premises already have LANs in all its meeting rooms, but most other venues currently rely on temporary LANs (wired or radio), using equipment and support kindly donated by individual members.

Such facilities permit delegates to access all the meeting documents electronically from their laptop computers. As a result, the huge burden of producing paper copies (as many as 40 000 pages per delegate for some meetings) can be eliminated. Delegates can access new documents as soon as they are available, rather than having to wait for paper copies to be made or for the documents to be distributed by other means, such as diskette or CD-ROM.

9.1.3.1.2 Project Support

For administrative and support purposes the 3GPP Partners have established a Mobile Competence Centre (MCC) which is hosted by ETSI at its premises in Sophia Antipolis, Southern France. The MCC was created in March 1999 to provide support not only to the 3GPP but also to ETSI's own studies in mobile technologies. A full description of MCC including the financing is given in Chapter 15, Section 3.

9.1.3.2 Who are the Stakeholders in 3GPP?

3GPP has attracted a very strong commitment from organisations and companies around the world, reflecting the truly global nature of the project. There are currently six OPs (in alphabetical order):

- The Association of Radio Industries and Businesses (ARIB), Japan

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being TD-SCDMA, proposed by CWTS. A similar group, 3GPP2, is preparing the cdma2000 specifications, UWC-136 TDMA specifications are being developed principally by UWCC, and DECT specifications are defined by a set of ETSI standards (Figure 9.1.1).

Since the UWCC and ETSI are both partners in 3GPP (as an MRP and OP respectively), there is direct liaison between the Project and these two sources of specifications for other IMT-2000 family members.

When 3GPP and 3GPP2 were created it was felt that the interests of each group were sufficiently different to require them to remain separate but here again many of the OPs and MRPs are common to both groups, so there are natural channels for information exchange. Particular instances of formal co-operation between the groups were the two joint 3GPP-3GPP2 workshops held in 1999 to address the "Hooks and Extensions" issue aimed at ensuring interworking between the respective technologies.

In addition to all this, the 3GPP TSGs and their working groups are encouraged to liase directly with relevant technical bodies within the Project as well as among the Partners.

9.1.6 Conclusions

The attentive reader, and let's assume that you are one, may still be astonished to learn what big efforts have been necessary in order to establish 3GPP.

In the meantime, i.e. in the course of year 2000 nearly the whole work of the former ETSI TC SMG has been incorporated into 3GPP, to a large extent within the new TSG GERAN.

Well, our Japanese friends were not happy about this shift because they feared that it could result in delays in the 3G introduction in their country. They accepted this because a separate TSG for the GSM work was created.

Trying to recall the heated discussions within ETSI about the scope of 3GPP from 1998, one has to admit that such a move would have been violently rejected by a lot of ETSI members, maybe even by the majority. Using a philosophic approach, one can, of course, state that time helps healing (even wounds).

Today, i.e. February 2001, we can conclude from ETSI's point of view that all standardisation work related to further evolution of the second generation mobile system, i.e. GSM, and to UMTS is being done well within 3GPP. Thus, the objective to avoid parallel work within ETSI TBs and 3GPP has been fully achieved.

The ability of organisations and individuals around the world to co-operate and make available a full set of stable, agreed 3GPP specifications in 1 year is a remarkable achievement, one that is unprecedented in the world of standardisation. 3GPP meetings have taken place in many parts of the world, emphasising the strong commitment of the SDOs from China, Europe, Japan, Korea and the US. The MRPs have also lent very strong support to the work. Thanks to this widespread and determined commitment it has been possible to meet the very aggressive targets for 3G.

But Release 99 was only the first step – the workload has continued to intensify this year, as the initial specifications are refined and many new ones added, opening the path to full, seamless, global 3G services, changing forever the way that people communicate.

In the meantime, 3GPP has changed the designation of the releases and dropped to mention the year in order to avoid irritations and wrong expectations. Release 99 was first established in December 1999 and got its maturity in the course of year 2000. In 2000, more than 5700 change requests were implemented. The next big event will be Release #4 as a result of the

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series of TSG meetings scheduled for March 2001 in Palm Springs, US. This will obviously result in a further stabilisation and extension of the UMTS specifications.

3GPP is running very well. The individual members from the six OPs seem to be very satisfied with this arrangement – and the production line is in full swing.

Without exaggeration, one can give 3GPP the attribute of a success story. One may quote again here Mr Ed Roney who even addressed the 3GPP concept – prior to its realisation – as a "paradigm shift".

As the results of the GSM and UMTS related standardisation work represent a great part of ETSI's deliverables, it might be justified to note here that during the year 2000, ETSI published more than seven new deliverables each working day (Monday through Friday), i.e. one deliverable per hour!

Further information may be found on the 3GPP website at http://www.3gpp.org.

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Chapter 9: The Third Generation Partnership Project (3GPP)

Section 2: UMTS in 3GPP (December 1998–May 2001)

Niels Peter Skov Andersen[1]

9.2.1 A Change of Environment

In the period 1982 until end of 1998 the work on the GSM standard, and in the later part of the period on UMTS, had been performed in the same environment, starting under CEPT and later transferred into ETSI. The Technical Committee GSM, during this period renamed to SMG, and its working groups (Sub Technical Committees) had continuously existed and evolved. The same was the case for the working methods and procedures used within the work. Over time with the success of the GSM system more and more interested parties became involved in the work including parties from outside the original CEPT area. However, this was all a relatively slow evolution and no major revolutions in the organisation or the working methods occurred in this period.

After all these years of continuity in the work the discussions around the creation of 3GPP and the decision to establish 3GPP for the initial phase of UMTS[2] naturally created some uncertainty amongst the members of SMG. Especially the resulting split of the GSM standardisation, with the responsibility for the GSM core network transferred to 3GPP, but the responsibility for the GSM radio access Network maintenance remained in ETSI in SMG. This caused some concern amongst many delegates. Also the internal structure for the technical work within 3GPP was different from the well-known structure in SMG. SMG was based on a technical plenary with a number of working groups (SMG1, SMG2, …, SMG12) performing the detailed technical work. The SMG plenary was the approving authority for the results of the work performed by the working groups. Also the plenary was the group responsible for approval of all new work items and the content of the releases. The structure for the work in 3GPP, as agreed by the partners, was quite different. The project

[1] The views expressed in this section are those of the author and do not necessarily reflect the views of his affiliation [illegible].

[2] The term UMTS is throughout this section used to keep consistency of terminology with the other chapters and sections. The term UMTS do not appear in the in 3GPP agreement, which defines the system as a third generation mobile system based on an evolved GSM core network and UTRAN (including UTRAN (FDD and TDD modes)).

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was organised with four equal Technical Specification Groups (TSGs), who had complete autonomy for their area of responsibility, i.e. they were responsible for approval of new work items and final approval of deliverables. The four technical groups originally defined were:

TSG CN	Responsible for the core network development
TSG-RAN	Responsible for the radio access network based on UTRAN (FDD and TDD modes)
TSG-SA	Responsible for services and system aspects
TST-T	Responsible for Terminal and UIM

In addition to the technical groups the 3GPP organisation has a Project Coordination Group (PCG). However, the role of this PCG cannot be compared to the role the SMG plenary played. The SMG plenary was an open technical group with the approving authority in all technical questions including approval of new work items. The 3GPP PCG is a closed group with a defined membership consisting of a limited number representative of each of the partners (SDOs, MRPs) and the leadership (chairman and two vice-chairmen) of each TSG. Thus as a closed group the role of the PCG becomes more like a board overlooking the overall well being of the project.

This structure made many long-term SMG delegates concerned about how the overall coordination of the project could be ensured. This new structure was not introduced to overcome known deficits of the SMG organisation, but in my opinion, by political considerations to ensure than no single individual, individual member, organisational partner could obtain a controlling position in the project.

9.2.2 The First Two TSG Meetings

The inauguration meeting of the 3GPP TSGs was held in December 1998 in Sophia Antipolis, France. In the process of creation of 3GPP this was the first time that the 3GPPs real work force – the technical experts – met. The main objectives for this first meeting was to get the work started. One of the elements of the meeting was a presentation from the different partners on the status of their work on the third generation mobile system, the work, which they now were in the process of handing over to 3GPP.

Listening to the presentations and the discussions during the breaks it was very obvious that the background for standardization amongst the delegates was quite different. As an example, I remember that during the coffee break just after I, as chairman of ETSI SMG2, had presented the status of the UMTS radio work in ETSI, and had ended my presentation by stating that the UMTS radio work would only be on the agenda of one more meeting of ETSI SMG2. This was in order to complete the documentation to be handed over to 3GPP and then the work on UMTS radio in ETSI would cease, a small group of non-ETSI delegates came to me and asked "if all work on UMTS radio in ETSI ceases, how do the Europeans then co-ordinate their views on 3GPP?" Coming from the ETSI SMG background this was a completely unexpected question, as the working procedures for 3GPP were very similar to those of ETSI, it was clear to me that the contributions to 3GPP in general should come from the individual members – the companies, regulators etc. – in their own name and not as regional contributions. I explained this, but I also understood that for delegates with a background in international standardization from, e.g. ITU this was the normal way of thinking. During the

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Annex 2: Organisation Evolution of the Technical Groups

Section 3: 3GPP

Adrian Scrase[1]

A2.3.1 December 1998 to Mid-1999

During the preparatory talks that led to the creation of 3GPP, many discussions took place to find the optimum organizational structure. The ETSI TC SMG model had worked well for many years and it was very tempting to adopt a similar structure and just widen the sphere of participation. However, some voices called for a more radical approach in order to streamline the structure and to reduce the time taken for specifications production. As a result of these discussions, the following key principles were established on which 3GPP was structured:

- Minimum number of hierarchical levels;
- Large degree of distributed autonomy;
- Clear separation of technical activities from political and administrative activities.

When 3GPP was created, four Technical Specification Groups (TSGs) were formed to undertake the preparation of technical specifications. The four TSGs were as follows:

- TSG CN – core network
- TSG RAN – radio access network
- TSG SA – services and system aspects
- TSG T – terminals

Each of the TSGs was authorized to develop and approve specifications and reports within its terms of reference. This represented a departure from the more traditional approach where a single entity (i.e. a plenary) within a project has the authority to approve a project's output. It was believed that by distributing the approval authority, the time taken to produce specifications would be reduced since this effectively removes one level of hierarchy from the approval procedure. However, it was apparent from the outset that distributing the approval of specifications would lead to a greater requirement for technical co-ordination and thus TSG SA was tasked to perform a co-ordination role across all TSGs. This co-ordination role

[1] The views expressed in this section are those of the author and do not necessarily reflect the views of his affiliation entity.

Petitioners' Exhibit 1012
Nokia of America Corp., et al. v. KT Corporation, et al.
Case No. IPR2025-00036; U.S. Patent No. 11,627,631
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APPENDIX 5



Third Generation Partnership Project

3GPP

Working Procedures

20 October 2016

Petitioners' Exhibit 1012
Nokia of America Corp., et al. v. KT Corporation, et al.
Case No. IPR2025-00036; U.S. Patent No. 11,627,631
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Foreword

These Working Procedures of the Third Generation Partnership Project (3GPP) are effective from 31 December 2014.

An electronic version of these Partnership Project Working Procedures is available from the following address:

http://www.3gpp.org

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SECTION A: GENERAL

Article 1: Description

The Partnership Project is not a legal entity but is a collaborative activity between the following recognized Standards Development Organizations:

ARIB (Japan)

CCSA (China)

ETSI (Europe)

ATIS (US)

TTA (Korea)

TTC (Japan)

TSDSI (India)

The Partnership Project is entitled the "THIRD GENERATION PARTNERSHIP PROJECT" and may be known by the acronym "3GPP".

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Article 2: Purpose

The purpose of 3GPP is to prepare, approve and maintain globally applicable Technical Specifications and Technical Reports for

- a 3rd Generation Mobile System based on the evolved GSM core network, and the Universal Terrestrial Radio Access (UTRA),
- further development of radio technologies such as LTE, coupled with evolution of core network elements such as the Evolved Packet Core (EPC),
- continuing evolution of the 2nd generation GSM/EDGE Radio Access Network (GERAN),

to be transposed by the Organizational Partners into appropriate deliverables (e.g., standards).

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Article 3: Scope and objectives

The 3rd Generation Mobile System and its capabilities shall be developed in a phased approach. Initially, 3GPP shall prepare, approve and maintain the necessary set of Technical Specifications and Technical Reports for a 3rd Generation Mobile System including:

- UTRAN (including UTRA; in Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes);
- 3GPP Core Network (Third Generation networking capabilities evolved from GSM. These capabilities include mobility management, global roaming, and utilisation of relevant Internet Protocols);
- Terminals for access to the above (including specifications for a UIM); and
- System and service aspects.

3GPP shall prepare, approve and maintain the necessary set of Technical Specifications and Technical Reports for:

- the Global System for Mobile communication (GSM) including GSM evolved radio access technologies (e.g., General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE)).

3GPP shall consider the long term evolution.

The Technical Specifications and Technical Reports shall be developed in view of global roaming and circulation of terminals.

The set of 3GPP Technical Specifications and Technical Reports for the 3GPP core network and the specifications for the GSM core network should be common to the greatest extent possible and should not be unnecessarily different.

Options in the form of a regulatory requirement particular to one or more regions / nations shall be included in 3GPP specifications. TSGs should not debate the inclusion or rejection of such options.

The results of the 3GPP work shall form the basis of member contributions to the ITU in accordance with existing procedures.

3GPP shall take account of emerging ITU recommendations on interworking between IMT-2000 family members.

In the framework of agreed relationships, the 3GPP Technical Specifications and Technical Reports will form the basis of standards, or parts of standards, of the Organizational Partners.

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SECTION B: PARTICIPATION

Article 4: Categories

Participation in 3GPP shall be classified into one of the following categories:

- Partners;
- Individual Members;
- ITU Representatives;
- Observers;
- Guests.

top

Article 5: Partnership

Partners in 3GPP shall be classified into one of the following two categories:

- Organizational Partners;
- Market Representation Partners.

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Article 6: Organizational Partnership

Organizational Partnership is open to any Standards Organization, irrespective of its geographical location, which has:

- a national, regional or other officially recognized status and the capability and authority to define, publish and set standards within the 3GPP scope, in that nation or region;
- an Intellectual Property Rights (IPR) Policy which is compatible with those of the Organizational Partners;
- committed itself to all or part of the 3GPP scope;
- signed the Partnership Project Agreement.

Standards Organizations may apply to become an Organizational Partner by writing to any of the existing Organizational Partners.

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Article 7: Market Representation Partnership

The Organizational Partners may invite Market Representation Partners to take part in 3GPP.

An invitation for Market Representation Partnership is open to any organization, irrespective of its geographical location, which:

- has the ability to offer market advice to 3GPP and to bring into 3GPP a consensus view of market requirements (e.g., services, features and functionality) falling within the 3GPP scope;
- does not have the capability and authority to define, publish and set standards within the 3GPP scope, nationally or regionally;
- has committed itself to all or part of the 3GPP scope;
- has signed the Partnership Project Agreement.

Organizations may apply to become Market Representation Partners by writing to any of the existing Partners. Further guidance for MRP applicants can be found in annex E.

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Article 8: Individual Membership

Membership in an Organizational Partner is a pre-requisite for Individual Membership of 3GPP. All entities registered as members of an Organizational Partner and eligible for participation in the technical work of that Organizational Partner, can become Individual Members of 3GPP if they are committed to support 3GPP and:

- to contribute technically or otherwise to one or more of the Technical Specification Groups within the 3GPP scope;
- to use the 3GPP results to the extent feasible.

An Individual Member has the right to participate in the work of 3GPP by attending meetings of the Technical Specification Groups and subtending groups.

Applications for Individual Membership of a Technical Specification Group shall be made in writing to the relevant Organizational Partner using the form given at annex C. Applications may also be made on-line using the template available at http://www.3gpp.org.

Individual Members act in 3GPP in their own right and carry the full responsibility for their contributions.

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Article 9: Termination of Individual Membership

Individual Membership of 3GPP may be terminated by dissolution, abolition, resignation or expulsion from the related Organizational Partner.

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Article 10: Observers and Guests

The status of Observer may be granted by the Organizational Partners to an entity which has the qualifications to become a future Partner.

An Observer may send a single representative to an Organizational Partners or PCG meeting. An Observer may also have representatives at TSG meetings. Representatives of Observers may receive documents and contribute documents for information, but shall not submit documents that propose changes to the specifications, reports, work item descriptions, work plan, or any other document under the control of the TSG. Observers shall not take part in decision making or hold any leadership positions.

Additional participation rights of an Observer shall be decided by the Organizational Partners on a case-by-case basis.

The status of Guest may be granted for a limited period, by the Organizational Partners to an entity which has the qualifications to become a future Individual Member. The limited period shall be decided by the Organizational Partners on a case-by-case basis.

A Guest may have representatives at TSG and subtending group meetings. Representatives may receive documents but shall not take part in decision making, participate in discussions, contribute documents, or hold any leadership positions.

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SECTION C: STRUCTURE

Article 11: Structure of 3GPP

3GPP shall consist of a Project Co-ordination Group (PCG) and Technical Specification Groups (TSGs). The Technical Specification Groups may establish Working Groups if required.

The Organizational Partners may decide to call a meeting of the full 3GPP membership if required.

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SECTION D: PARTNERS' COLLECTIVE RESPONSIBILITIES

Article 12: Organizational Partners' Collective Responsibilities

The Organizational Partners shall determine the general policy and strategy of 3GPP.

In addition the Organizational Partners shall perform the following tasks:

- approval and maintenance of the 3GPP scope;

- maintenance the Partnership Project Description;
- taking decisions on the creation or cessation of Technical Specification Groups, and approving their scope and terms of reference;
- approval of Organizational Partner funding requirements;
- allocation of human and financial resources provided by the Organizational Partners to the Project Co-ordination Group;
- acting as a body of appeal on procedural matters referred to them;
- conduct compliance training at least annually for elected leadership, relevant Support Team personnel and interested parties on best practices to follow to
  - avoid issues with respect to antitrust/competition laws and regulations;
  - fulfil his or her leadership or support role with impartiality and in the interests of 3GPP.

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Article 13: Collective responsibilities of all Partners

Organizational Partners and Market Representation Partners shall perform the following tasks:

- maintenance of the Partnership Project Agreement;
- approval of applications for 3GPP partnership;
- taking decisions relating to the dissolution of 3GPP.

top

SECTION E: PROJECT CO-ORDINATION GROUP (PCG)

Article 14: PCG tasks

The PCG shall perform the following tasks:

- appointment of PCG Chairman and Vice Chairmen;
- allocation of human and financial resources provided by Organizational Partners to TSGs;
- allocation of voluntary human and financial resources provided by Market Representation Partners and Individual Members;
- management of the 3GPP Support Team;
- handling of appeals from Individual Members on procedural matters referred to them;
- propose and approve modifications to the Partnership Project Working Procedures;
- handling of appeals from Individual Members on technical matters referred to them;
- determination of the overall time frame and manage overall work progress;
- final adoption of new and stopped work items proposed by the TSGs within the agreed 3GPP scope and objectives;

- when a work item is outside the scope of the 3GPP, and where a common global solution is desired, recommend how to achieve a global solution;
- appointment or dismissal of TSG Chairmen and Vice Chairmen, as proposed by TSGs based on election results. (The proposed candidate shall be appointed unless there are extraordinary reasons that prevent such an appointment, e.g., severe company or geographical imbalance within 3GPP. In such cases the TSG shall be requested to elect an alternative candidate. The decision not to appoint a candidate shall be made by consensus.);
- authorizing requests from the TSGs for approval to liaise with external organizations, and maintain a list of approved requests;
- maintenance of the register of Individual Members eligible to participate in 3GPP;
- maintenance of the register of IPR declarations relevant to 3GPP, received by the Organizational Partners.

The PCG may decide to call a meeting of the full 3GPP membership if required.

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Article 15: PCG participation

The following shall have a right to participate in the PCG:

- Typically, a maximum of five representatives of each Organizational Partner (not counting the Chairman and Vice-Chairmen);
- A maximum of three representatives of each Market Representation Partner. (MRPs are however urged to limit their participation to one representative wherever possible.);
- The Chairmen and Vice Chairmen of the TSGs as ex-officio members;
- A maximum of three ITU representatives;
- One representative of each Observer.

top

Article 16: PCG appointment of Chairman and Vice Chairman

The PCG shall appoint their Chairman and Vice Chairmen from amongst the Organizational Partner representatives.

The Chairman and Vice Chairmen shall be appointed for a one year term of office.

The Chairman and Vice Chairmen shall normally serve one term of office. If no other candidates are available, the Chairman or Vice Chairmen may be appointed for a further term.

Successive Chairmen and Vice Chairmen should not be from the same Organizational Partner, the same region or from the same group of companies, unless no other candidate is available.

top

Article 17: PCG Chairman and Vice Chairman Responsibilities

The PCG Chairman is responsible for the overall management of the co-ordination work within 3GPP.

The Chairman has the overall responsibility to ensure that the Partnership Project Agreement, Partnership Project Description and Partnership Project Working Procedures are followed.

The Chairman may nominate officials to assist in the work.

The Chairman may be assisted by the Support Team.

The Chairman may delegate tasks to the Vice Chairmen.

In performing their leadership role, the Chairman and Vice Chairmen shall maintain impartiality and act in the interests of 3GPP.

At the commencement of each meeting of the PCG, the group shall be reminded that:

(i) compliance with all applicable antitrust and competition laws is required; and

(ii) the leadership will conduct the meeting with impartiality and in the interests of 3GPP.

top

Article 18: PCG meetings

A meeting of the PCG shall be held at least twice per year.

At least thirty days before the due date, a calling notice, draft agenda and supporting documents shall be issued.

top

Article 19: PCG decision making

In any meeting of the PCG, the quorum required for decision making shall be 50% of the total number of Organizational Partners. Proxies shall not be permitted.

The PCG shall endeavour to reach consensus on all issues. The views and opinions of the Market Representation Partners and the Chairmen and Vice Chairmen of the TSGs shall be taken into account during the consensus building process. If consensus cannot be achieved, the Chairman can decide to take a vote. The vote may exceptionally be performed by a secret ballot if decided by the PCG.

Each Organizational Partner shall have one vote. A proposal shall be deemed to be approved if 71% of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

top

SECTION F: TECHNICAL SPECIFICATION GROUPS

Article 20: TSG tasks

The TSGs shall prepare, approve and maintain the 3GPP Technical Specifications and Technical Reports taking into account the market requirements provided by Market Representation Partners.

The TSGs shall also perform the following tasks:

- Propose to the PCG for appointment TSG Chairman and Vice Chairmen based on election results;
- Creation of TSG Working Groups and approval of their terms of reference;
- When a new Working Group is created, the appointment of TSG Working Group Convenor;

- Allocation of resources within the TSG;
- Allocation of voluntary human and financial resources provided by Market Representation Partners and Individual Members;
- Handling of appeals from Individual Members on technical matters;
- Preparation of a detailed time frame and management of detailed work progress;
- Management of work items;
- Technical Co-ordination;
- Proposal and approval of work items within the agreed scope and terms of reference of the TSG;
- Where a work item is outside the scope of the 3GPP, but a common global solution is desired, recommend an approach to the PCG;
- Assignment of work to Partners. (Specification development may be accomplished using various methods, including the assignment of work to Partners.);
- Maintenance of the list of Individual Members eligible to vote within the TSG (Voting Members).

top

Article 21: TSG participation

The following shall have a right to participate in the TSGs:

- Representatives of members of participating Organizational Partners (i.e. Individual Members);
- Representatives of Organizational Partners;
- Representatives of Market Representation Partners;
- Representatives of Observers;
- Representatives of Guests.

top

Article 22: TSG and WG election of Chairman and Vice Chairman

22.1 TSG elections

Regular TSG elections shall be held every two years in the first semester of odd numbered years.

The TSG Chairman and Vice Chairmen shall be elected by the Technical Specification Group from amongst the Individual Member representatives. Each TSG shall elect a maximum of three Vice Chairmen.

A candidate for election to a TSG Chairman or Vice Chairman position shall provide a letter of support from the Individual Member that he/she represents. The support letter from the Individual Member shall indicate that the candidate will avail or has availed themselves of 3GPP supplied antitrust and competition law training in order to comply with all applicable antitrust/competition laws and regulations while acting in his or her capacity as TSG Chairman or Vice Chairman.

Nominations may be made up to the point when an election takes place.

The Chairman and the Vice Chairmen shall be elected for a two year term of office. The Chairman and Vice Chairmen may offer themselves for election for a second consecutive term. The term "consecutive" is taken to mean terms one after the other without another person being elected to the position in the interim. Exceptionally, they may offer themselves for further consecutive terms, subject to the following:

- A two week deadline that expires at noon Central European Time on the Friday which falls between 20 and 14 days prior to the first day of the meeting at which elections are due to be held shall be established.
- A Chairman is not permitted to stand for another consecutive term if another candidate is announced via the 3GPP web site or via the relevant 3GPP email reflector prior to this deadline.
- A Chairman is not permitted to stand for another consecutive term until after this deadline.
- A Vice Chairman is not permitted to stand for another consecutive term in a Vice Chairman position for which there is a candidate announced via the 3GPP web site or via the relevant 3GPP email reflector prior to this deadline.
- A Vice Chairman is not permitted to stand for another consecutive term until after this deadline. If, by the deadline, the number of candidatures is less than the number of Vice Chairman positions, then any incumbent Vice Chairman may put forward his candidature.

There is no restriction on a Vice Chairman whose term of office is due to expire offering himself for the position of Chairman; neither is there any restriction on a Chairman whose term of office is due to expire offering himself as a Vice Chairman. There is no restriction of a retiring Chairman or Vice Chairman of one TSG offering himself for election as either Chairman or Vice Chairman of any other TSG (or WG).

Should the office of Chairman or Vice Chairman of a TSG become vacant for reasons other than expiration of term of office, a special election shall be conducted to fill the unexpired term. This special election shall be conducted at a meeting of the TSG, and shall be announced in the agenda according to the provisions of article 32.

When such a special election is held to fill the office of Chairman, and one or more of the Vice Chairmen of the TSG intends to stand for election to that position, the announcement shall also indicate that there will be an election to fill the position of Vice Chairman in the event that a Vice Chairman be elected to the office of Chairman. If at the special election the Vice Chairman is elected to the office of Chairman, that individual shall become Chairman immediately, and, the position of Vice Chairman thus being vacant, an election shall be held for the office of Vice Chairman.

Similarly, if an incumbent Chairman intends to stand for election to the position of Vice Chairman, the same applies, with the necessary changes to the text above.

If a Chairman or Vice Chairman changes the Individual Member that he/she represents (e.g., job change, merger or acquisition) during his/her term of office, a new letter of support shall be provided. In order to provide a new letter of support, a Chairman or Vice Chairman may request a grace period allowing their term to be extended the lesser of 6 weeks or until the day before the next scheduled regular term (e.g., every 2 years) election. Although the term is extended, under the rules of article 22, the chair or vice-chair can only chair meetings when representing an Individual Member. This rule continues to apply during the grace period. If the change of company affiliation is due to a move to another company, then the decision for the Chairman or Vice Chairman to continue in office to the end of the present term shall be made by consensus of the TSG. If consensus cannot be achieved, a special election shall be held for the office. The incumbent Chairman or Vice Chairman is permitted to offer their candidacy in a special election even if they have held the position for 2 terms or more.

The term of office for a Chairman or Vice Chairman elected at a special election is a partial term lasting until the end of the current term. If a new Chairman or Vice Chairman is elected at a special election then the partial term of office does not count towards the two consecutive term limit. If the previous Chairman or Vice Chairman is re-elected at a special election then the entire term (of two parts) is considered as a single term and does count towards the two consecutive term limit.

Chairman and Vice Chairmen should not be from the same region, Organizational Partner, or from the same group of companies, unless no other candidate is available.

Successive Chairmen should not be from the same Organizational Partner, the same region or from the same group of companies, unless no other candidate is available. This does not apply to special elections or to regular elections for a second or subsequent consecutive term of office .

When a new TSG is established, the Organizational Partners shall appoint a convenor for the first two TSG meetings. The election for TSG Chairman and Vice Chairmen shall take place at the second TSG meeting. If the election takes place other than at the normal time for TSG elections (see above), the elected Chairman and Vice Chairman shall serve until the next regular TSG election. This partial term of office does not count towards the two consecutive term limit. The provisions of this paragraph may be overridden by consensus of the PCG where a new TSG is formed by the merger of existing TSGs; under these circumstances, the PCG shall establish a set of ad hoc rules for the creation of the new TSG.

Following election by the TSG, the TSG Chairman and Vice Chairmen shall be appointed by the PCG on the proposal of the TSG.

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22.2 WG elections

The provisions concerning the election of WG Chairmen and Vice Chairmen shall be as for TSG Chairmen and Vice Chairmen as defined in 22.1 above, changing TSG to WG wherever TSG is mentioned, with the following differences.

Each WG shall elect a maximum of two Vice Chairmen.

WG elections shall be held when the corresponding terms of office expire or when an existing Chairman or Vice Chairman resigns. WG elections need not be synchronized within the WG (i.e. elections for Chairman and each Vice Chairmen may occur at different times), across different WGs of the same or other TSGs, nor with the regular TSG elections.

WG Chairmen and Vice Chairmen are always elected for a period of two years (and not, as is the case with special elections in TSGs, for the unexpired period of the present term of office). An exception to this is where the previous Chairman or Vice Chairman is re-elected in the special election. In this case the Chairman or Vice Chairman continues for the unexpired period of the present term of office.

Note: For this reason, elections for WG Chairmen and Vice Chairmen are likely to become spread over a period of time, rather than being grouped like the TSGs' regular elections.

When a new WG is established, the parent TSG is responsible for appointing a convenor for the first two meetings.

Following election by the WG, the Chairman and Vice Chairman hold office immediately, without need of appointment by TSG or PCG.

top

Article 23: TSG and WG Chairman and Vice Chairman responsibilities

The TSG Chairman is responsible for the overall management of the technical work within the TSG and its Working Groups. The Chairman has an overall responsibility to ensure that the activities of the TSG follow the Partnership Project Working Procedures.

The WG Chairman is responsible for the overall management of the technical work within the WG and its sub-groups.

The Chairman may nominate officials to assist in the work.

The Chairman may delegate tasks to the Vice Chairmen.

The Chairman may be assisted by the Support Team.

The Chairman shall form a Management Team, including the Vice Chairmen and Support Team, in order to assist in discharging his duties.

Recognizing the need to balance the requirement of rapid specification development with the limited resources of delegates, the Chairman should encourage a minimum number of meetings, especially parallel meetings, and maximize the use of electronic means to advance the work.

In performing their leadership role, the Chairman and Vice Chairmen shall maintain impartiality and act in the interests of 3GPP.

At the commencement of each meeting of a TSG or WG, the group shall be reminded that:

(i) compliance with all applicable antitrust and competition laws is required;

(ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full and fair consideration of such matters; and

(iii) the leadership will conduct the meeting with impartiality and in the interests of 3GPP.

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Article 24: TSG and WG Chairman and Vice Chairmen dismissal

A secret ballot shall be taken for the proposal to dismiss a TSG or WG Chairman or Vice Chairman because of a failure to effectively perform their duties, if requested by 30% of the TSG or WG membership list. 71% of the votes cast are required to recommend dismissal.

The PCG shall dismiss a Chairman or Vice Chairman on the proposal of the TSG.

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Article 25: TSG and WG decision making

TSGs and WGs shall endeavour to reach consensus on all issues, including decisions on Technical Specifications and Technical Reports. Informal methods of reaching consensus are encouraged (e.g., a show of hands). If consensus cannot be achieved, the Chairman can decide to take a vote. The vote may exceptionally be performed by a secret ballot if decided by the TSG or WG. A vote may be conducted during a TSG or WG meeting or by correspondence.

A proposal shall be deemed to be approved if 71% of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

It is the responsibility of the Chairman to ensure that questions to be voted upon are phrased in a positive yes/no manner, with 71% required to approve the question. Questions should not be phrased as the TSG shall not do something. Examples of appropriate questions are; Shall the TSG approve the Specification and send it to the SDOs? Shall the liaison be approved? Shall the new WI be approved? Shall the existing WI be stopped? If the issue is to choose option A or B, the question should be split into two questions, with the Chairman selecting the order. First, shall the TSG take option A as the way forward? If this question fails the second question is, shall the TSG take option B as the way forward?

Contributions on which decisions will be based should be made available in good time before each meeting. TSGs may establish informal guidelines for dealing with late contributions.

Working Agreements may be used to establish tentative agreements in cases where consensus cannot be obtained. The working agreement process is described in annex G.

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Article 26: TSG and WG voting during a meeting

The following procedures apply for voting during a TSG or WG meeting:

- before voting, a clear definition of the issues shall be provided by the Chairman;
- Voting Members shall only be entitled to one vote;

- if a Voting Member has more than one representative present, only one representative may vote;
- each Voting Member may only cast the vote once;
- each Voting Member may carry proxy votes for up to five other Voting Members. All proxy votes shall be accompanied by a letter of authority from the authorising Voting Member. Proxies will not be taken into account when determining the quorum;
- the quorum required for voting during a TSG or WG meeting shall be 30% of the total number of Voting Member companies on the TSG or WG voting list;
- the result of the vote shall be recorded in the meeting report.

For the determination of the quorum, see annex H.

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Article 27: TSG or WG voting by correspondence

The following procedures apply for voting by correspondence:

- before voting, a clear definition of the issues shall be provided by the Chairman and disseminated to all on the TSG or WG membership list;
- Voting Members shall only be entitled to one vote;
- each Voting Member may only cast the vote once within the voting period;
- the voting period shall be 30 days;
- there are no quorum requirements;
- The result of the vote should be disseminated to the TSG or WG.

- top

Article 28: TSG or WG voting for the election of TSG or WG Chairman and Vice Chairman

In the case where there is more than one candidate for TSG or WG Chairman or Vice Chairman, a secret ballot shall be used. For interpreting the result of the secret ballot the following procedure shall apply:

When, in the first ballot, no candidate has obtained 71% of the votes cast, a second ballot shall be held. In the second ballot, in cases where there are only two candidates, the candidate obtaining the higher number of votes is elected. In cases where there are more than two candidates, if none of them has obtained 71% of the votes, a third and final ballot shall be held among the two candidates who have obtained the highest number of votes in the second ballot. The candidate obtaining the higher number of votes in the third ballot is then elected.

The TSG or WG Chairman shall be responsible for the voting process and shall ensure that confidentiality is maintained.

top

Article 29: TSG or WG appeal process

An Individual Member of 3GPP who opposes a Chairman's ruling on a vote taken within a TSG or WG may submit its case to the PCG for decision. In such cases the Individual Member shall also inform the relevant TSG or WG Chairman.

When a TSG or WG Chairman has made a ruling, his decision shall be taken as the basis for future operations, unless or until overturned by the PCG.

If an Individual Member in a TSG or WG believes that a Chairman or Vice Chairman of any such group is acting without impartiality and not in the interests of 3GPP, such Individual Member may object to such actions within the relevant group, and may request that such objection be recorded in the minutes of the applicable group meeting and it shall be so recorded. The objecting Individual Member may ultimately take its objection to the PCG for consideration. In such cases the Individual Member shall also inform the relevant TSG or WG Chairman.

top

Article 30: TSG and WG meetings

TSGs and WGs shall meet as necessary to complete their work within the prescribed timeframe. TSGs should endeavour to hold their meetings at the same time and place to assist in the overall co-ordination of the work.

Meeting locations should reflect the geographical diversity of the TSG and WG delegates.

Further information on meetings is given in annex F.

top

Article 31: TSG and WG meeting invitation

The invitation to a TSG or WG meeting and the necessary logistical information should be disseminated as soon as practically possible, taking into account the need to obtain travel documentation. It shall be disseminated at least 28 days before the meeting to all on the TSG or WG membership list.

top

Article 32: TSG and WG meeting agenda

The draft agenda for a TSG or WG meeting shall be disseminated by the responsible Chairman to all on the TSG or WG membership list at least 21 days before a meeting. The draft agenda should indicate subject matters where voting may be required. The draft agenda shall indicate elections to be held (including known candidates).

top

Article 33: TSG and WG meeting registration

Every delegate shall register on arrival at each TSG or WG meeting. Each delegate who represents an Individual Member shall declare the precise name of that Individual Member. A delegate may only register to represent one Individual Member.

top

Article 34: TSG and WG meeting document and file naming

Documents for a TSG or WG meeting shall follow a consistent numbering system as shown in the following example:

xminnzzzz

This numbering system has six logical elements:

1) **x**: a single letter corresponding to the TSG;

   where x : **R** (Radio Access Network)

   N (Core Network) [TSG closed March 2005]

   S (Service and System Aspects)

   T (Terminals) [TSG closed March 2005]

   G (GSM/EDGE Radio Access Network)

   C (Core network and Terminals)

2) **m** A single character corresponding to the Working Group identity (typically 1, 2, 3, etc) or, in the case of the TSG itself, the letter "**P**".

3) **i**: Normally the hyphen character "-". May take on other values depending on the nature of the meeting at which the document is presented, eg the identity of a subgroup.

4) **nn**: two digits to indicate the year, i.e. 99, 00, 01, etc;

5) **zzzz**: unique number of the document

No provision is made for the use of revision numbers. Documents which are a revision of a previous version should indicate the document number of that previous version.

The filename of documents shall be the document number. Documents may be compressed to .Zip files (and thus bear a file extension ".zip"). For example, document **S1-060357** will be contained in file **S1-060357.zip**.

top

Article 35: TSG and WG Voting Membership List

35.1 Voting list

Each TSG and WG shall maintain a list of Individual Members eligible to vote in that group.

The voting list shall be used to establish quorum and for determining those eligible to take part in a vote.

NOTE 1: The term "membership list" has no particular significance in the context of TSG and WG meetings. The term "attendance list" is used for a list of individuals who attend a given meeting representing an Individual Member or other entity entitled to participate in meetings – see annex F.

For the determination of the quorum, see annex H.

top

35.2 On creation of new TSG or WG

When a new TSG or WG is formed an Individual Member is added to the voting list at the first meeting at which it is represented, and may vote at the second meeting where it is represented.

Exceptionally, if inadequate notice (less than the period of time given in article 31) had been given for the first meeting of the new group, an Individual Member shall be added to the voting list on its delegate's attending the second meeting (the election meeting) and vote at that meeting even if it had not been represented at the group's first meeting.

Only an Individual Member that had been represented at the group's first meeting may provide a proxy for the second meeting.

top

35.3 Established TSGs and WGs

To qualify for the voting list it is necessary for at least one delegate of an Individual Member to attend at least two meetings of the group concerned, without being removed according to the provisions of article 35.4..

An Individual Member having been represented at at least two ordinary meetings of the group has the right to cast a vote by proxy (see article 26). Thus an Individual Member may not cast a vote by proxy during a meeting at which it is not represented unless it had already been represented at two or more qualifying meetings of the group.

top

35.4 Removal from and reinstatement to voting list

An Individual Member which is not represented at three consecutive meetings of the TSG or WG shall be removed from the voting list.

The right to vote is reinstated at the second meeting which a delegate of the Individual Member attends without missing the number of consecutive meetings mentioned in the previous paragraph (but see article 35.3 for eligibility to cast a proxy vote).

EXAMPLE 1: If Individual Member Z is represented at meeting K and K+3 (and is thus eligible to vote) but is not represented at meetings K+4, K+5 and K+6, it is removed from the voting list.

EXAMPLE 2: If Individual Member X, not previously having been represented at a meeting of the group, is represented at meetings N and N+3, it may cast a vote at meeting N+3.

NOTE: Individual Member X might choose to cast a vote by proxy at meeting N+3, even though its delegate is physically present. This is sometimes useful for coordinating company positions where one large company has several Individual Memberships, possibly via several different Organizational Partners.

EXAMPLE 3: If Individual Member Y, not previously having been represented at a meeting of the group, is represented at meeting N only, it may not cast a vote by proxy at meeting N+2.

top

35.5 Meetings other than ordinary meetings

Any group that wants to call an electronic meeting (audio, video, document distribution by posting or e-mail, etc) may do so, although this works best with smaller groups. Therefore, all electronic meetings are allowed but only ordinary meetings (see annex F) count towards attendance. However, if a meeting is designated as face-to-face, provision of bridge and speakerphone capabilities for those requesting it would be at the discretion of the host. Those participating by speakerphone are not to be counted toward quorum or attendance, and are not allowed to vote.

For the determination of the quorum, see annex H.

top

Article 36: TSG Sub Working Groups

A Working Group may establish a Sub Working Group (SWG) with defined Terms of Reference. The Working Group shall appoint a SWG Chairman. The SWG shall work by consensus. The meeting notice requirements for a SWG meeting are the same as for TSGs and WGs.

top

SECTION G: WORK PROGRAMME AND TECHNICAL CO-ORDINATION

Article 37: Work Programme

The 3GPP Work Programme shall consist of Work Items defined by the TSGs.

top

Article 38: Work Items

A 3GPP Work Item is a specification task defined in terms of the following principal parameters:

- title;
- intended output (i.e. Technical Specifications or Technical Reports);
- impact on other Technical Specifications and Technical Reports;
- technical scope, including the field of application of the intended output;
- impact on other 3GPP Work Items;
- the schedule of tasks to be performed;
- the identities of the supporting Individual Members;
- the identity of the Work Item Rapporteurs.

top

Article 39: Work Item creation

Each proposed new Work Item shall be supported by at least four Individual Members, and their names shall be recorded in the Work Item definition prepared for the TSG approval. One or more persons shall be named as Rapporteur for the proposed Work Item, and the Rapporteur shall act as the prime contact point on technical matters and for information on progress throughout the drafting phases. The supporting Individual Members are expected to contribute to and progress the new work item throughout the drafting phases.

In addition to the above, TSGs shall approve new Work Items, giving all essential parameters. The proposal shall be entered into the 3GPP work programme, clearly marked as a new entry, for which a unique reference identity shall be allocated.

top

Article 40: Work Item adoption by PCG

The 3GPP work programme shall be made available to all Individual Members. A new Work Item shall remain flagged as "new" until the end of the month following the month during which the 3GPP work item was entered into the 3GPP work programme. A new Work Item shall be adopted by the PCG unless a substantial objection is received from an Individual Member or Partner during this period. At the end of the period, the "new" flag shall be removed (even if there is an objection) and it is the responsibility of any objecting Individual Member or Partner to discuss their objections with the TSG Chairman. If it is not possible to resolve the objection, it is the responsibility of the Individual Member or Partner to raise the issue with the PCG.

The TSGs shall ensure that the 3GPP Work Item details are maintained at regular intervals.

top

Article 41: Work Item stopping

Prior to completion of the intended 3GPP output, the responsible TSG may conclude that a Work Item is no longer required. Any Work Item shall automatically be considered by a TSG for stopping, if no progress has been achieved in a given period of time, typically six months, e.g. due to a lack of contribution. In such cases, the Work Item shall be flagged as "stopped" in the Work Programme. The proposal to stop a Work Item shall be fully justified.

The Work Programme shall be updated accordingly, and shall show the Work Item as "stopped" until the end of the month following the month during which the Work Item was initially flagged.

The Work Item will be stopped by the PCG unless substantial objection is received from an Individual Member during this period. It is the responsibility of any objecting Individual Member to discuss their objections with the TSG Chairman. If it is not possible to resolve the objection, it is the responsibility of the Individual Member to raise the issue with the PCG.

top

Article 42: Technical co-ordination

The PCG shall be responsible for determining the overall time frame and for managing the overall work progress. The System Aspects TSG shall have a particular responsibility for the technical co-ordination of work being undertaken within 3GPP, and for overall system architecture and system integrity. Problems encountered in performing this technical co-ordination role shall be reported immediately to the PCG.

top

SECTION H: DELIVERABLES

Article 43: Deliverable types

3GPP shall prepare, approve and maintain documents known as Technical Specifications and Technical Reports. Such documents shall be drawn up by the TSGs and shall, following approval at that level, be submitted to the participating Organizational Partners to be submitted to their respective standardization processes.

top

Article 44: Approval process

Approval of Technical Specifications and Technical reports by a TSG shall normally be by consensus.

Where consensus cannot be achieved in the TSG a vote may be taken.

When Technical Specifications and Technical Reports become sufficiently stable, they shall be put under change control of the relevant TSG. The further elaboration of these Technical Specifications and Technical Reports shall be achieved by change requests to be approved by the TSG.

top

Article 45: Drafting rules

The Technical Specifications and Technical Reports drafted by the TSGs shall follow the 3GPP drafting rules, using document processing facilities, format, languages and notations agreed by the Organizational Partners, and on a medium suited for electronic document handling and publishing.

top

Article 46: Copyright and ownership

The Organizational Partners will have joint ownership (including copyright) of the Technical Specifications and Technical Reports produced by 3GPP.

top

Article 47: Conversion by Organizational Partners

Organizational Partners shall use their best endeavours to convert the Technical Specifications and Technical Reports approved by the Partnership Project into national/regional deliverables in a timely manner through their normal processes.

The Organizational Partners are urged not to change the technical parts of the Technical Specifications and Technical Reports; they may add non-technical parts required by their own deliverable schemes and they may add descriptions of options selected.

Organizational Partners should ensure that all unresolved comments raised during their public enquiry and approval phases are delivered to the appropriate TSG.

top

SECTION I: REPORTING

Article 48: Chairman’s reporting obligations

A report shall be prepared by the Chairman following all PCG and TSG meetings.

top

Article 49: Changes to structure and officials

The Chairman of each TSG shall inform the PCG of all organizational changes concerning Working Groups and their officials. An up to date record of the 3GPP structure shall be maintained.

top

Article 50: Calendar of meetings

The PCG and TSGs shall maintain an up to date calendar of the dates and venues for future meetings.

top

SECTION J: EXTERNAL RELATIONS

Article 51: Relationship with the ITU

3GPP results should be submitted to the ITU as appropriate.

For working groups, the following handling of communications toward ITU shall apply:

1 Working groups shall send ITU submissions which are destined to become part of ITU deliverables to their parent TSG for review.

2 Working group communications towards the ITU which are NOT destined to become part of an ITU deliverable must be reviewed by the TSG chairman and the appropriate ITU sector convener (if one exists for the given ITU sector). The working group's TSG chairman and ITU sector convener will determine if such a communication should be sent to the parent TSG for review. If for some reason either the TSG chairman or ITU sector convener is not available, then it is sufficient for the remaining person to review the document and determine if it should be escalated to the TSG or not.

3 If the working group communication does not require TSG review, then it shall be conveyed to the ITU from the WG using one of the mechanisms described below.

For TSGs, the following handling of communications toward ITU shall apply:

1 TSGs shall send ITU submissions which are destined to become part of ITU deliverables to the PCG for review.

2 TSGs communications towards the ITU which are deemed sensitive by the TSG shall be sent to the PCG for review.

3 If the TSG does not judge the communication as sensitive, then it shall be conveyed to the ITU from the WG using one of the mechanisms described below.

To convey a communications towards the ITU, one of the following mechanisms shall be used based upon determination of the sending body (a body may determine a default mechanism).

a) The communication shall be sent from the OPs as a deliverable from their organizations (applicable to PCG reviewed communications only)

b) The communication shall be made by Individual Members who are also members of the ITU. In such a circumstance, the appropriate ITU sector convener will coordinate and handle the administrative matters for the submission. 3GPP Technical Specifications and Technical Reports may be taken as the technical content of such contributions (applicable to PCG reviewed communications or TSG reviewed communications).

c) The communication shall be sent directly from the 3GPP liaison coordinator to the appropriate ITU receiver in the ITU (applicable to TSG reviewed communications or WG reviewed communications).

Representatives of ITU-D, ITU-R and ITU-T are invited to participate in the Project Coordination Group for the efficient coordination and exchange of information.

top

Article 52: Relations with other groups

TSGs and WGs are encouraged to liaise directly with the relevant technical bodies within the 3GPP and Partners as appropriate.

A liaison statement shall clearly communicate what is expected from the receiver, i.e., which parts are for information, which questions are expected to be clarified and by whom (especially if there are multiple receivers), and also when an answer is needed, e.g., when is the next meeting of the group sending the liaison statement.

A TSG or any subtending Working Group may send individual liaisons to any external organization (other than ITU) without PCG approval, except if the statement is considered sensitive by the TSG Chairman, in which case PCG clearance is needed.

It is not necessary to have all external liaisons copied to the PCG and/or TSG SA. The liaison originating TSG should decide, at its own discretion, which should be copied. External liaisons that may have management implications such as schedules, organization, process, procedures, and policy shall be copied to the PCG, or approved by the PCG if sensitive.

Relations with the ITU are described in article 51.

top

SECTION K: MISCELLANEOUS

Article 53: Resources

The resources for the operation of 3GPP shall be managed by the Organizational Partners. The resources are allocated to the TSGs by the PCG.

top

Article 54: Support Team

The Partners shall provide logistical support to, and assist in the operation of, 3GPP. The support shall be in the form of a Support Team which shall operate under the overall management of the PCG and the day to day management of TSGs.

top

Article 55: Intellectual Property Rights (IPR) Policy

Individual Members shall be bound by the IPR Policy of their respective Organizational Partner.

Individual Members should declare at the earliest opportunity, any IPRs which they believe to be essential, or potentially essential, to any work ongoing within 3GPP. Declarations should be made by Individual Members to their respective Organizational Partners.

Organizational Partners should encourage their respective members to grant licences on fair, reasonable terms and conditions and on a non-discriminatory basis.

The PCG shall maintain a register of IPR declarations relevant to 3GPP, received by the Organizational Partners.

top

Article 56: Working language

The working language for 3GPP shall be English.

Meetings of the PCG and TSGs shall be conducted in English.

3GPP Technical Specifications and Technical Reports shall be prepared in English (as defined by the Shorter Oxford English Dictionary).

top

Article 57: Duration

3GPP shall be task oriented and on completion of the tasks the future of 3GPP shall be re-considered. The continuation of 3GPP shall therefore be confirmed by the Organizational Partners on an annual basis.

top

Article 58: Review of activities

An evaluation of the activities of 3GPP should be made by the Organizational Partners at regular intervals.

top

Article 59: Dissolution, winding up

In the event of a voluntary dissolution of 3GPP, the Partners shall determine the terms of liquidation by consensus. All issues shall be documented and distributed at least 30 days prior to decisions being made.

top

Article 59A: Exhaustion of appeal procedures

In connection with any claim or dispute of an Individual Member arising from or relating to any activity of any 3GPP meeting or action, including in connection with a TSG or WG meeting, such Individual Member shall, prior to commencing any such legal proceeding against 3GPP, its leadership, support staff, or one or more Organizational Partners in a court, an arbitral panel or other adjudicatory body, exhaust all appeal procedures provided in the 3GPP Working Procedures. Exhaustion of appeal procedures shall be diligently expedited by both the appealing party and the appeal body.

top

Article 60: Amendments to 3GPP Working Procedures

These Partnership Project Working Procedures may only be amended by decision taken by the PCG.

top

Annex A: Definitions

Consensus:	General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interest and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. (Note: consensus need not imply unanimity).
Conversion:	The transformation of a 3GPP output document into an Organizational Partners deliverable following the Organizational Partners' recognized processes.
Delegate:	An individual taking part in a TSG/WG meeting physically or by electronic means.
Drafting Rules:	A document approved by the Organizational Partners providing rules for the drafting of 3GPP Technical Specifications and Technical Reports.
Election:	The voting process used to identify an individual from a number of individuals.
Guest:	An entity fulfilling the criteria to become a future Individual Member, which has been granted temporary participation rights in the 3GPP
Individual Member:	A member of an Organizational Partner having participation rights within that Organizational Partner and which has registered to take part in 3GPP.
ITU Representative	Representatives of ITU-D, ITU-R and ITU-T invited to participate in the Project Coordination Group for the efficient coordination and exchange of information.
Leadership:	A Chairman, Vice-Chairman, or Convenor of an OP/PCG/TSG/WG/SWG/Ad-Hoc or any other 3GPP meeting.
Market Representation Partner:	A Partner invited by the Organizational Partners to participate in 3GPP to offer advice and to bring into 3GPP a consensus view of market requirements.
Observer:	An Organization fulfilling the criteria to become a future Partner which has been granted temporary participation rights in 3GPP.
Organizational Partner:	A recognized Standards Organization which has been accepted as a Partner in 3GPP.
Partner:	An Organizational Partner or a Market Representation Partner of 3GPP.
Partnership Project Agreement:	The document signed by 3GPP Partners defining their rights and obligations.
Partnership Project Description:	A document which describes the overall structure and operation of 3GPP.
Represent:	Attend on behalf of. A person who attends a meeting on behalf of an Individual Member represents that Individual Member. The person is not necessarily employed by that Individual Member, but may be, for example, employed by a subsidiary company in the same group as the represented Individual Member; or the person may be an independent consultant under contract to the Individual Member. "Representation" sometimes influences the eligibility to vote – see article 35 and annexes A and F.
Sub Working Group	A subordinate body of a Working Group.
Support Team:	A number of persons dedicated to support 3GPP.
Technical Report:	A 3GPP output document containing mainly informative elements approved by a Technical Specification Group.
Technical Specification:	A 3GPP output document containing normative provisions approved by a Technical Specification Group.
Voting Member	An Individual Member who has voting rights within a TSG/WG.
Work Item:	The documented record of a specific technical activity of 3GPP.
Work Programme:	The documented record of the all technical activities of 3GPP.

Working Group: A subordinate body of a Technical Specification Group.

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Petitioners' Exhibit 1012
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Annex B: Abbreviations

3GPP	Third Generation Partnership Project
ARIB	Association of Radio Industries and Businesses
ATIS	Alliance for Telecommunications Industry Solutions (successor to T1)
CCSA	China Communications and Standards Association (successor to CWTS)
CDMA	Code Division Multiple Access
CWTS	China Wireless Telecommunications Standards Group (superseded by CCSA)
ETSI	European Telecommunications Standards Institute
FDD	Frequency Division Duplex
GSM	Global System for Mobile Communication
IMT-2000	International Mobile Telecommunication
ITU	International Telecommunication Union
MRP	Market Representation Partner
PCG	Project Co-ordination Group
SWG	Sub Working Group
T1	Standards Committee T1 (superseded by ATIS)
TDD	Time Division Duplex
TSDSI	Telecommunications Standards Development Society, India
TSG	Technical Specification Group
TTA	Telecommunications Technology Association
TTC	Telecommunication Technology Committee
UIM	User Identity Module
UTRA	Universal Terrestrial Radio Access
UTRAN	Universal Terrestrial Radio Access Network
WG	Working Group

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Annex C: Individual member application form

APPLICATION FORM
for INDIVIDUAL MEMBERSHIP
of the THIRD GENERATION PARTNERSHIP PROJECT
Please complete this form and return it to your Organizational Partner

COMPANY NAME .....

Please indicate below which ORGANIZATIONAL PARTNER you are a member of

ARIB	
CCSA	
ETSI	
ATIS	
TSDSI	
TTA	
TTC	

Please indicate below which Technical Specification Groups you wish to participate in:

Radio Access Network	
Core Network and Terminals	
Service and System Aspects	
GSM EDGE Radio Access Network (GERAN)	

Upon your approval as an Individual Member of the Third Generation Partnership Project you agree that you will be bound by the Working Procedures of the Third Generation Partnership Project then in effect and as they may be amended from time to time.

Signed by (Authorized Representative) (See Note 1)	
Print name	
Position	
Date	
Telephone	
Fax	
Email	
Company Website URL	

Contact person's family name (See Note 2)	
Contact person's given name	
Job title	
Mailing address	
Telephone	
Fax	

Email	

Note 1: Is either the official contact person or voting contact of a company.

Note 2: People attending meetings and who can also have signing authority.

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Annex D: (Void)

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Annex E: Guidance for MRP applicants

E.1 Introduction

The conditions for the acceptance of Market Representation Partners (MRPs) in 3GPP are given in article 7 of these Working Procedures. This annex provides additional guidance to MRP Applicants.

top

E.2 Guidance

During the application process, the Organizational Partners will need to be assured that an Applicant:

(a) Has a field of interest directly or indirectly related to the work being undertaken by 3GPP;

(b) Has attained a demonstrable level of recognition within this field of interest;

(c) Has an understanding of the market requirements relevant to 3GPP;

(d) Is willing to actively contribute to the work of 3GPP and has sufficient resources for this purpose;

(e) Fully supports the goals and objectives of 3GPP and does not take part in activities that conflict with these goals and objectives.

In processing an application, the Organizational Partners will peruse openly available documentation published by an Applicant, including material posted on its Website, in order to confirm that the points listed above have been satisfied.

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Annex F: Guidance on meeting organization

F.1 Meeting classification

TSG and WG Meetings are classified either:

- ordinary; or
- ad hoc.

top

F.2 Ordinary meetings

Ordinary meetings are ones where the regular business of the TSG or WG is conducted. Such meetings are normally chaired by the Group's chairman or, if unavailable, a vice-chairman. Ordinary meeting should be announced at least six months prior to the opening day of the meeting.

TSG and WG ordinary meetings shall follow an incrementing number sequence. If an additional ordinary meeting is required between two ordinary meetings, the sequence may be preserved, even though this means renumbering subsequent meetings, or the additional meeting may be numbered using the 'bis' suffix as a numbering scheme.

Attendance at an ordinary meeting counts towards an Individual Member's eligibility to cast a vote in the Group (see articles 26 and 27). The Support Team shall record the participation in an ordinary meeting (each person and organization represented) and the attendance list shall be included in the meeting report.

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F.3 Ad hoc meetings

An ad hoc meeting of a WG or a TSG is one called to address one or more particular topics. The ad hoc meeting shall be called by decision of the WG (or its parent TSG) or TSG concerned; the decision to hold any subsequent ad hoc meetings on the same topic may be made by the ad hoc meeting participants themselves without reference to the parent WG or TSG, although the parent WG or TSG shall review any ad hoc activity at every Ordinary meeting and determine to either continue or to close the ad hoc activity, even if the previous ad hoc meeting suggested a further meeting. The scope of each subsequent ad hoc meeting shall be indicated by the chairman at least 21 days before the meeting. The ad hoc meeting shall not expand or change the scope originally determined by the parent group. An ad hoc meeting is allowed to make decisions only within its pre-defined remit, and any such decisions shall be ratified by the parent WG or TSG unless, in the case of a WG, a decision was previously explicitly delegated by the WG to the ad hoc meeting.

An ad hoc meeting may be chaired as described for an ordinary meeting above, or, with the agreement of the WG or TSG concerned, by a Work Item rapporteur, or other appropriate person. Although open to all 3GPP Individual Members, ad hoc meetings may attract only a subset of Individual Member representatives who would normally participate in ordinary meetings.

Ad hoc meetings shall not be considered when calculating voting rights. That is, attendance at (or absence from) an ad hoc meeting shall not influence voting rights, which are determined solely by attendance at "ordinary" meetings.

No voting shall occur at ad hoc meetings.

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F.4 Attendance register

F.4.1 Face to face meetings

A delegate is deemed to have attended a given meeting if the individual confirms his or her participation by signing the attendance list made available by the group's secretary during the meeting. If a delegate does not sign the attendance sheet during the meeting, the secretary shall assume that the individual did not attend.

A delegate, having registered and begun to participate in a meeting, is not allowed to change the organization he represents during the course of that meeting. An individual delegate is not allowed to simultaneously represent two or more Individual Members at a meeting.

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F.4.2 Electronic meetings

Electronic meetings such as audio / video conferences, email exchanges considered as meetings, etc, are encouraged where appropriate. For such events, the Secretary will establish the attendance list on the basis of those actually participating in the meeting (those dialling in to the conference bridge, those issuing and responding to emails, etc.) Nevertheless, advance registration is strongly encouraged.

Fully electronic meetings are to be considered as "ad hoc" as defined above.

Participation by Individual Member in fully electronic meetings, or electronic participation in a face to face meeting (eg by phoning in) is not considered for the accrual or loss of voting rights.

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Annex G: Working agreements

"Working agreements" are tentative decisions reached by 3GPP groups in order to make progress on matters where consensus (as defined in annex A) cannot be reached. It is intended to be used in situations where there is a clear majority in favour of one approach, but a small minority has sustained opposition to that approach.

The working agreement process has the following steps:

- Consensus cannot be reached on an issue. A substantial majority of individual members prefer a given approach, but there is sustained opposition by a small minority of individual members, preventing consensus.
- The chair declares a working agreement. The working agreement is documented in the meeting report
- The approach agreed to by the majority and documented in the working agreement can continue unimpeded.
- The working agreement is entered into the 3GPP working agreements page on the 3GPP web site. The window for challenging the working agreement is now open.
- Working agreements may be challenged, resulting in a formal vote. This potential vote would be held at the next meeting of the WG or parent TSG (whichever comes first). If the next meeting is less than 14 days after the establishment of the working agreement, then that meeting is skipped in determining the next meeting. The meeting for potential voting is documented on the 3GPP working agreements page of the 3GPP web site (http://www.3gpp.org/TSG-Working-Agreements).
- The challenge cut-off date is established. This is 7 days before the start of the meeting for potential voting. The cut-off date is documented on the 3GPP working agreements page of the 3GPP web site.
- Organizations wishing to challenge the working agreement may do so until the challenge window closes. A challenge may be made by informing the chair of the group which will do the voting. Any received challenge is documented on 3GPP working agreements page of the 3GPP web site.
- The group which will be voting is informed of the intention to have a working agreement challenge vote and the specific voting question.
- If no challenge is received by the challenge cut-off date, then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.
- If a challenge is received, then a formal vote on the working agreement will occur at the designated meeting. Voting on working agreements is a standing part of meeting agendas. Voting is as described in articles 25 & 26 of the working procedures.
- If the challenge fails (at least 71% in favour of the working agreement), then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.
- If the challenge succeeds (less than 71% in favour of the working agreement), then the working agreement fails. All changes which were made based on the working agreement shall be reversed and the group must continue to search for consensus. The overturning of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site.
- Organizations may withdraw a challenge at any time in the process. If the last challenge is withdrawn after the challenge cut-off, then the working agreement is confirmed. The confirmation of the working agreement is documented on the 3GPP working agreements page of the 3GPP web site. The issue is closed.

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Annex H: Calculation of quorum in TSGs and WGs

Where calculation of a quorum is required in the context of a vote conducted in a TSG or a WG, the quorum shall be deemed to have been met if:
(B – P) / V >= Q
Where:

B is the number of ballot papers issued;

P is the number of proxy votes exercised (i.e. the number of ballot papers issued to delegates bearing authorization to cast votes by proxy);

V is the number of Individual Members having the right to vote at the meeting (including those with only the right to vote “in person” and not by proxy);

Q is the required quorum value given in article 26.

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Annex I: Change history

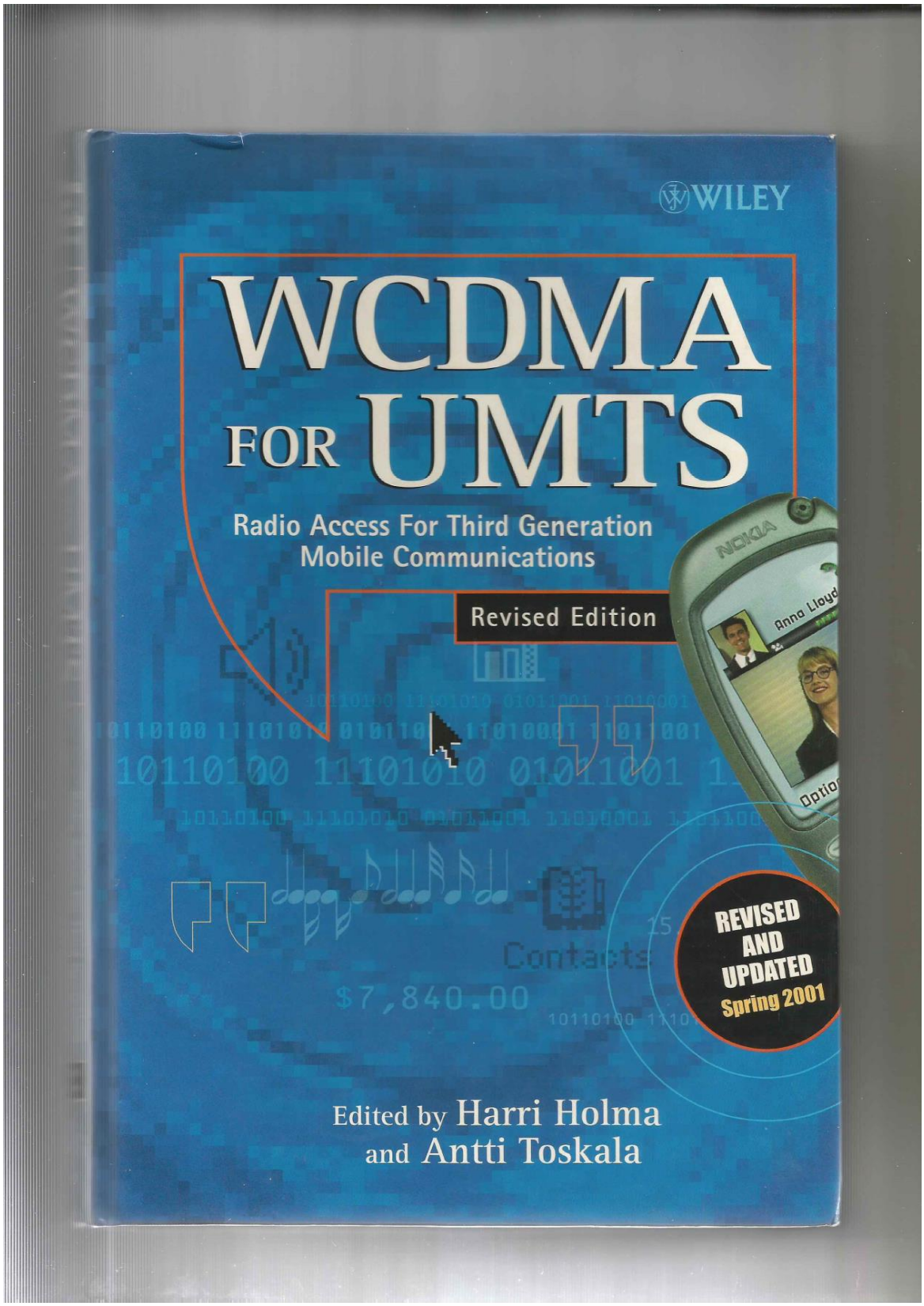
Date	PCG #	PCG Doc.	CR	Rev	Subject/Comment
2002-04-25	6				
2005-03-01	13				Changes agreed at PCG meeting incorporated. [No formal change control system yet in place]
2006-04-24	16	PCG16_07	2		ETSI proposal: Article 10 Clarify the rights of observers and guests
			3		ETSI proposal: Article 15 To allow leeway in the number of delegates representing each OP at PCG (To reflect the decision already taken by PCG#14 on PCG participation)
			9		ETSI proposal: Article 34 To cater for current TSG structure and to reflect common practice of Tdoc numbering
			1	1	Article 3 Reflect decision on regional options (To incorporate PCG#7 decision)
			4	1	Article 22 Clarification and codification of the rights to stand for elected positions in TSGs and WGs
			8		Article 30 & annex F Inclusion of an annex giving guidance on meeting organization
2006-10-27	17	PCG17_15 r1	10		Article 35 Clarification of voting rights
2009-05-18	22	PCG22_18	11	5	Changes resulting from the OP ad hoc group on improvements report and conclusions of OP#20. Articles affected: 22 23 31 35 41 52 Annex D plus sundry spelling corrections.
		PCG22_19	12	2	Rules on eligibility to cast votes at TSG and WG level.
		PCG22_20	13		Bring statement of purpose of 3GPP up to date
		PCG22_23	14		Adding Working Agreements to working procedures
		PCG22_30 r3	15	3	Change of ITU liaison process Note: PCG meeting #22 approved contribution PCG22_30r1 but this was subsequently revised to r3 after the meeting with the apparent approval of the PCG.
					Decision PCG22/11: clause 22.1 changed wording from "in the March time frame in" to "in the first semester of".
2009-08-12					Editorial correction to implementation of CR15r3. (article 52).
2010-04-23	24	PCG24_11	16		TSG vs WG election
		PCG24_12	17		Quorum
		PCG24_13	18		Communication with ITU
		PCG24_25	19		Attendance register for meetings
2012-10-24		PCG29_17	20		Update to 3GPP Working Procedures article 22
2014-07-22	33	PCG33_10	21		Anti-trust / competition law requirements articles 12, 17, 22.1, 23, 29, 59A, annex C
2014-12-31	34	PCG34_14	22		Anti-trust recommendations v1.1.
					Addition of TSDSI to list of OPs in annexes B and C. Minor formatting and spelling corrections, consistent capitalization.

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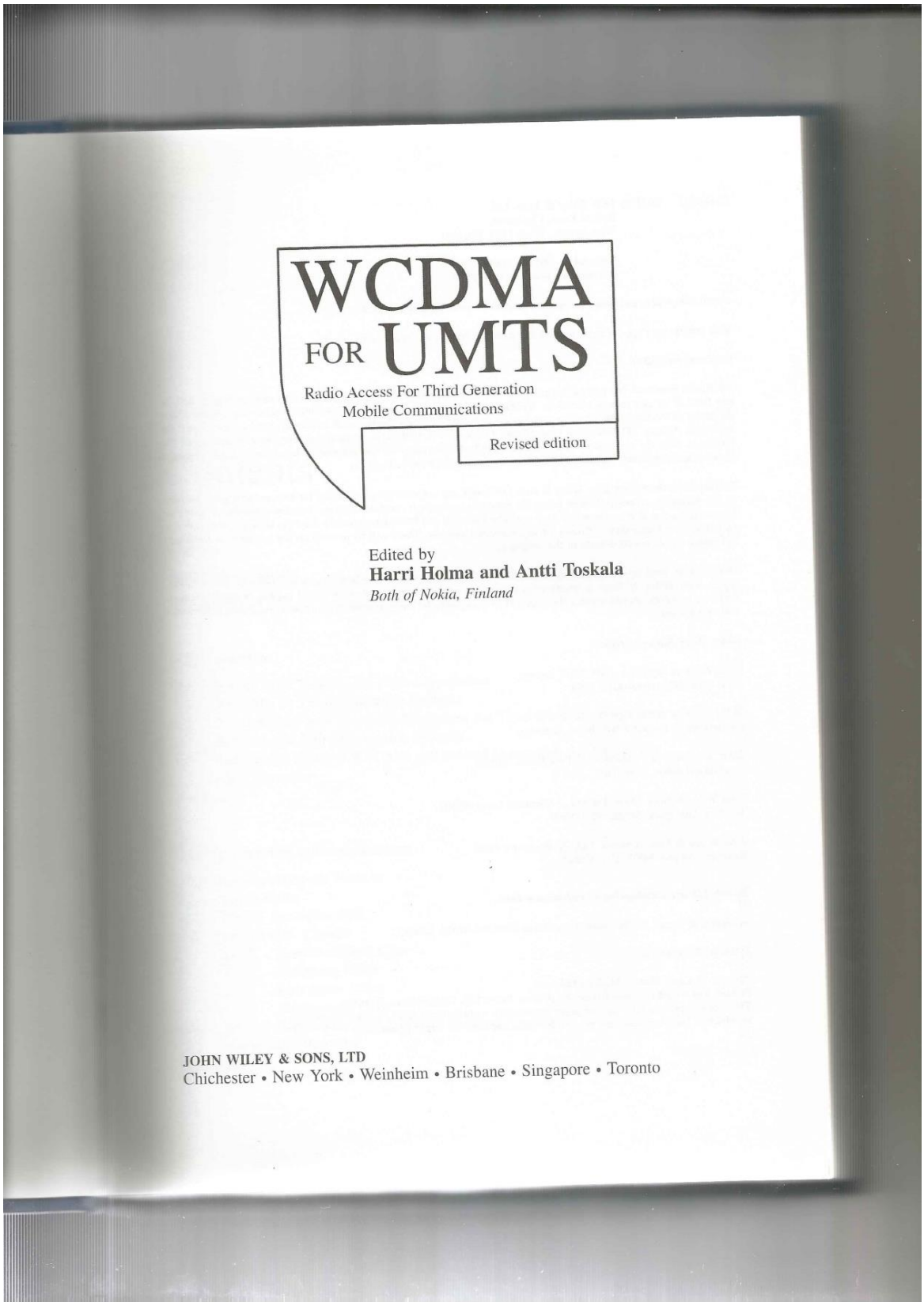
2016-11-15	35	PCG37_14	22.1		Modification to clarify obligation on elected officials regarding antitrust/competition law training.

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APPENDIX 6



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WCDMA FOR UMTS

Radio Access For Third Generation Mobile Communications

Revised edition

Edited by
Harri Holma and Antti Toskala
Both of Nokia, Finland

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4.5.3 *cdma2000*

The cdma2000 air interface proposal to ITU is the result of work in TR45.5 on the evolution of IS-95 towards the third generation. The cdma2000 proposal is based partly on IS-95 principles with respect to synchronous network operation, common pilot channels, and so on, but it is a wideband version with three times the bandwidth of IS-95. The ITU proposal contains further bandwidth options as well as the multi-carrier option for downlink. The cdma2000 proposal has a high degree of commonality with the Global CDMA 1 ITU proposal from TTA, Korea.

The cdma2000 multi-carrier option is covered in more detail in Chapter 13, as being currently standardised by 3GPP2.

4.5.4 *TR46.1*

The WIMS W-CDMA was not based on work derived from an existing second generation technology but was a new third generation technology proposal with no direct link to any second generation standardisation. It was based on the constant processing gain principle with a high number of multicodes in use, thus showing some fundamental differences but also a level of commonality with WCDMA technology in other forums.

4.5.5 *WP-CDMA*

WP-CDMA (Wideband Packet CDMA) resulted from the convergence between W-CDMA N/A of T1P1 and WIMS W-CDMA of TR46.1 in the US. The main features of the WIMS W-CDMA proposal were merged with the principles of W-CDMA N/A. The merged proposal was submitted to the ITU-R IMT-2000 process towards the end of 1998, and to the 3GPP process at the beginning of 1999. Its the most characteristic feature, compared with the other WCDMA-based proposals, was a common packet mode channel operation for the uplink direction, but there were also a few smaller differences.

4.6 Creation of 3GPP

As similar technologies were being standardised in several regions around the world, it became evident that achieving identical specifications to ensure equipment compatibility globally would be very difficult with work going on in parallel. Also, having to discuss similar issues in several places was naturally a waste of resources for the participating companies. Therefore initiatives were made to create a single forum for WCDMA standardisation for a common WCDMA specification.

The standardisation organisations involved in the creation of the 3rd Generation Partnership Project (3GPP) [9] were ARIB (Japan), ETSI (Europe), TTA (Korea), TTC (Japan) and T1P1 (USA) as shown in Figure 4.2. The partners agreed on joint efforts for the standardisation of UTRA, now standing for Universal Terrestrial Radio Access, as distinct from UTRA (UMTS Terrestrial Radio Access) from ETSI, also submitted to 3GPP. Companies such as manufacturers and operators are members of 3GPP through the respective standardisation organisation to which they belong.

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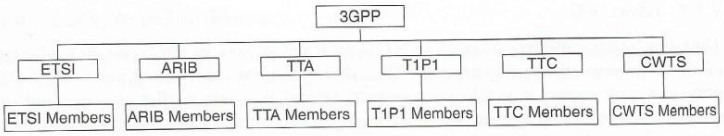


Figure 4.2. 3GPP organisational partners

Later during 1999, CWTS (the China Wireless Telecommunication Standard Group) also joined 3GPP and contributed technology from TD/SCDMA, a TDD-based CDMA third generation technology already submitted to ITU-R earlier.

3GPP also includes market representation partners: GSM Association, UMTS Forum, Global Mobile Suppliers Association, IPv6 Forum and Universal Wireless Communications Consortium (UWCC). In [9] there are up-to-date links to all participating organisations.

The work was initiated formally at the end of 1998 and the detailed technical work was started in early 1999, with the aim of having the first version of the common specification, called Release-99, ready by the end of 1999.

Within 3GPP, four different technical specification groups (TSG) were set up as follows:

- Radio Access Network TSG
- Core Network TSG
- Service and System Aspects TSG
- Terminals TSG

Within these groups the one most relevant to the WCDMA technology is the Radio Access Network TSG (RAN TSG), which has been divided into four different working groups as illustrated in Figure 4.3.

The RAN TSG will produce Release-99 of the UTRA air interface specification. The work done within the 3GPP RAN TSG working groups has been the basis of the technical description of the UTRA air interface covered in this book. Without such a global initiative, this book would have been forced to focus on a single regional specification, though with many similarities to those of other regions. Thus the references throughout this book are to the specification volumes from 3GPP.

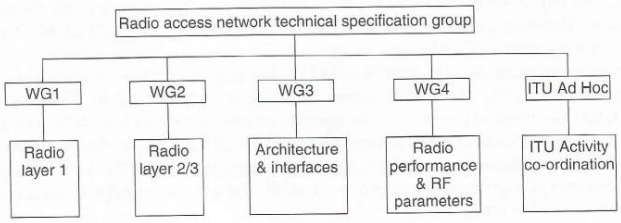


Figure 4.3. 3GPP RAN TSG working groups

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During the first half of 1999 the inputs from the various participating organisations were merged in a single standard, leaving the rest of the year to finalise the detailed parameters for the first full release, Release-99, of UTRA from 3GPP. The member organisations have undertaken individually to produce standard publications based on the 3GPP specification. Thus, for example, the Release-99 UMTS specifications from ETSI are identical to the Release-99 specifications produced by 3GPP. The latest specifications can be obtained from 3GPP [9].

During 2000, further work on GSM evolution was moved from ETSI and other forums to 3GPP, including work on GPRS and EDGE. A new TSG, TSG GERAN was set up for this purpose.

4.7 Creation of 3GPP2

Work done in TR45.5 and TTA was merged to form 3GPP2, focused on the development of cdma2000 Direct-Sequence (DS) and Multi-Carrier (MC) mode for the cdma2000 third generation component. This activity has been running in parallel with the 3GPP project, with participation from ARIB, TTC and CWTS as member organisations. Recently the main concentration has been on the MC mode work, due to decisions resulting from the global harmonisation efforts.

4.8 Harmonisation Phase

During the spring of 1999 several operators and manufacturers held series of meetings to seek further harmonisation and convergence between the CDMA-based third generation solutions, WCDMA and cdma2000. For the 3GPP framework the ETSI, ARIB, TTA and T1P1 concepts had already been merged to a single specification, while cdma2000 was still on its own in TR45.5. As a result of several meetings and telephone conferences, the manufacturers and operators agreed to adopt a harmonised global third generation CDMA standard consisting of three modes: Multi-Carrier (MC), Direct Spread (DS) and Time Division Duplex (TDD). The MC mode was based on the cdma2000 multi-carrier option, the DS mode on WCDMA (UTRA FDD), and the TDD mode on UTRA TDD. The agreement was to phase in a modular approach in which both core networks could be used with all air interface alternatives, as described in Figure 1.4 in Chapter 1.

The main technical impacts of these harmonisation activities were the change of UTRA FDD and TDD mode chip rate from 4.096 Mcps to 3.84 Mcps and the inclusion of a common pilot for UTRA FDD. The work in 3GPP2 focused on the MC mode, and the DS mode from cdma2000 was abandoned. The result is that globally there is only one Direct Spread (DS) wideband CDMA standard, WCDMA.

4.9 IMT2000 Process in ITU

In the ITU, recommendations have been developed for third generation mobile communications systems, the ITU terminology being called IMT-2000 [10], formerly FPLMTS. In the ITU-R, ITU-R TG8/1 has worked on the radio-dependent aspects, while the radio-independent aspects have been covered in ITU-T SG11.

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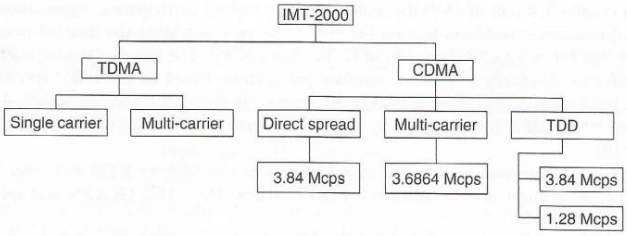


Figure 4.4. ITU-R IMT-2000 grouping

In the radio aspects, ITU-R TG8/1 received a number of different proposals during the IMT-2000 candidate submission process. In the second phase of the process, evaluation results were received from the proponent organisations as well as from the other evaluation groups that studied the technologies. During the first half of 1999 recommendation IMT.RKEY was created which describes the IMT-2000 multimode concept.

The ITU-R IMT-2000 process was finalised at the end of 1999, when the detailed specification (IMT-RSCP) was created and the radio interface specifications were approved by ITU-R [11]. The detailed implementation of IMT-2000 will continue in the regional standards bodies. The ITU-R process has been an important external motivation and timing source for IMT-2000 activities in regional standards bodies. The requirements set by ITU for an IMT-2000 technology have been reflected in the requirements in the regional standards bodies, for example in ETSI UMTS 21.01 [5], in order for the ETSI submission to fulfil the IMT-2000 requirements. The ITU-R interaction between regional standardisation bodies in the IMT-2000 process is reflected in Figure 4.5.

The ITU-R IMT-2000 grouping, with TDMA- and CDMA-based groups, is illustrated in Figure 4.4. The UTRA FDD (WCDMA) and cdma2000 are part of the CDMA interface, as CDMA Direct Spread and CDMA Multi-Carrier respectively. UWC-136 and DECT are part of the TDMA-based interface in the concept, as TDMA Single Carrier and TDMA Multi-Carrier respectively. The TDD part in CDMA consists of UTRA TDD from 3GPP and TD-SCDMA from CWTS. For the FDD part in the CDMA interface, harmonisation has been completed, and the harmonisation process is expected to continue for the CDMA TDD mode within 3GPP during 2000 and 2001.

4.10 Beyond 3GPP Release-99

Upon completion of the Release-99 specifications, work will concentrate on specifying new features as well as making the necessary corrections to Release-99. Typically such corrections arise as implementation proceeds and test systems are updated to include the latest changes in the specifications. As experience in various forums has shown, a major step forward in system capabilities with many new features requires a phasing-in period for the specifications. Fortunately, the main functions have been verified in the various test systems in operation since 1995, but only the actual implementation will reveal any errors and inconsistencies in the fine detail of the specifications.

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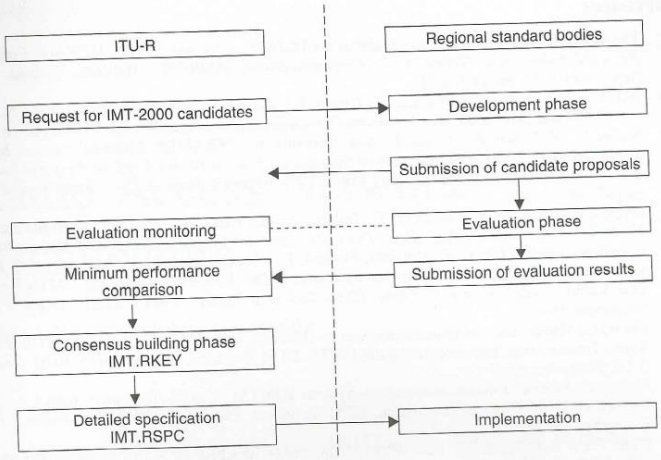


Figure 4.5. Relationship of ITU-R to the regional standards bodies

In 3GPP the next version of the specifications was originally considered as Release 2000, but since that the Release naming was adjusted so that next release is called Release 4 due to the 03/2001. Release 4 will contain only minor adjustment with respect to the Release'99. Bigger items are foreseen for inclusions in Release 5, including reaching for the data rates even up to the 10 Mbps in the downlink direction. Release 5 is due for the end of 2001. Release'99 specifications have a version number starting with 3 while Release 4 and 5 specifications have version number starting logically with 4 and 5 respectively.

During coming years, part of the process is to specify the extensions for connecting UTRA FDD to IS-41 based core networks. Work will be carried out on cdma2000 to allow connection to GSM-based core networks. This development will offer operators some degree of flexibility in selecting their third generation teehnology, assuming they are not aiming to launch such a service immediately, since Release-99 does not yet contain these options.

On the TDD side, further alignment is expected between the TDD mode in UTRA and the TDD mode from CWTS (China). This process is expected to continue after Release-99 is completed in 3GPP. 3GPP Release-4 is also planned to cover the lower chip rate (1.28 Mcps) TDD.

Other interesting developments are expected in the area of using IP based technology in UTRA. First step is going to be the IP based transport option in Release 4 and further releases are likely to see IP technology shaping the internal architecture of the UTRA Network (UTRAN). Also some of the protocols developed by the Internet Engineering Task Force (IETF) [12], such as robust IP header compression suitable for cellular transmission, are foreseen to be adopted as part the UTRA Rel'4 specifications.

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APPENDIX 7

3GPP PCG#40
Beijing, China,
11 April 2018
PCG40_13

MCC Activity Report

Source

Adrian Scrase

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- Departures and Arrivals
- Resource Allocation
- Workload
- 3GPP Membership
- Antitrust Compliance Training
- Summary and Outlook

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Departures and Arrivals

At the beginning of November 2017,

Kai-Erik Sunell



joined MCC as a “Project Manager without portfolio” to assist in the MCC duties relating, primarily, to the RAN working groups.

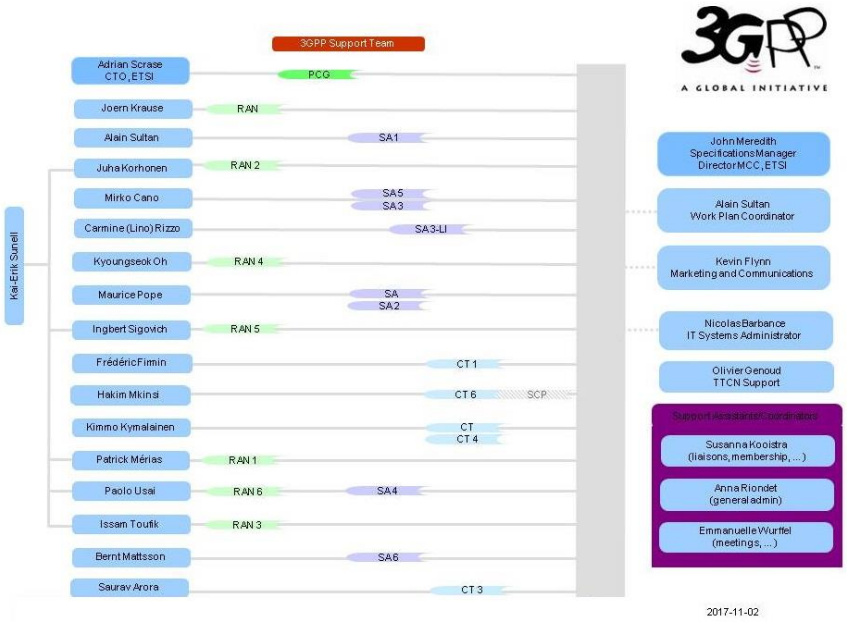
Kai-Erik acts as secretary to some parallel streams during meetings, moving from group to group as the need demands, and assists in implementing Change Requests after TSG plenaries. Kai-Erik will also be available to replace the regular MCC secretary of any 3GPP group in case of indisposition of the regular incumbent.

Find Kai-Erik’s MCC bio page here:
http://www.3gpp.org/people/1908-kai-erik-sunell

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Resource Allocation



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Workload: Change Requests

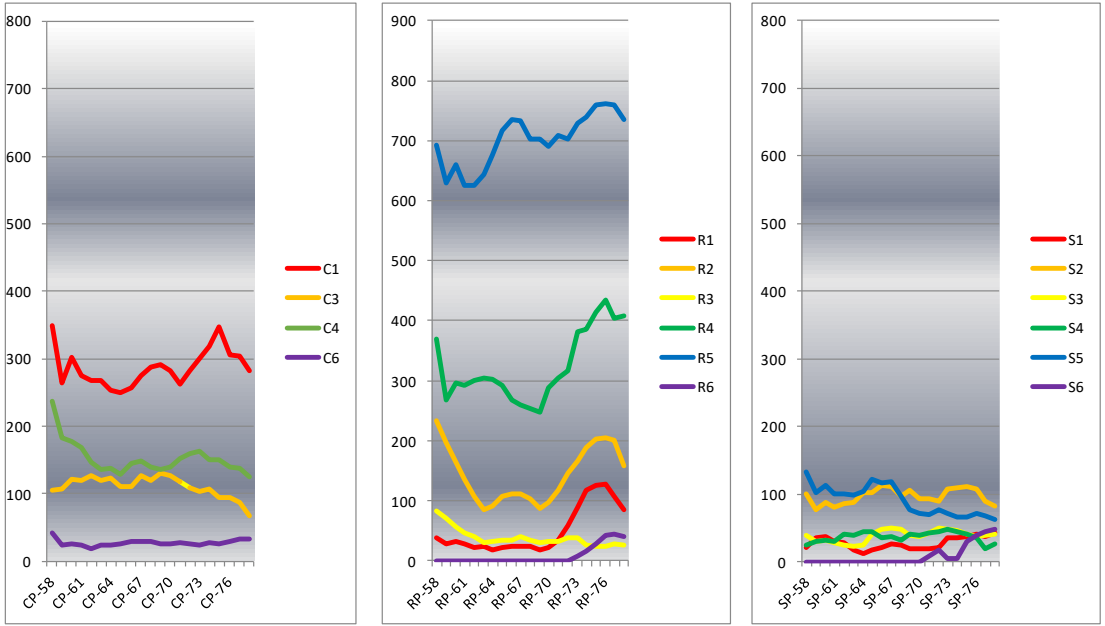
Approved CRs per Release per Year

Release	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
R99	1408	4398	2266	1004	581	512	111	42	23	5	5	1	0							**10356**
Rel-4		376	2828	1900	690	257	122	63	48	22	20	13	11	8	7	2				**6367**
Rel-5		27	644	3274	2842	2162	1357	509	94	25	22	7	7	5	3	2				**10980**
Rel-6				172	1088	2458	3721	2074	1078	212	74	19	17	10	4	4				**10931**
Rel-7					1	20	663	2529	3132	1262	492	176	91	43	25	15				**8449**
Rel-8								49	777	4609	7073	2347	706	347	184	91	46	22	12	**16263**
Rel-9										49	2918	4991	3252	1366	376	165	70	26	23	**13236**
Rel-10											47	1722	3800	3103	1636	584	267	50	21	**11230**
Rel-11												32	1152	4178	3525	2186	622	163	41	**11899**
Rel-12													6	102	2254	5181	4287	1530	197	**13557**
Rel-13															8	200	2648	5571	1681	**10108**
Rel-14																	24	2315	5865	**8204**
Rel-15																		6	1246	**1252**
Rel-16																			0	35	**35**
Total	**1408**	**4801**	**5738**	**6350**	**5202**	**5409**	**5974**	**5266**	**5152**	**6184**	**10651**	**9308**	**9042**	**9162**	**8022**	**8430**	**7964**	**9683**	**9121**	**132867**

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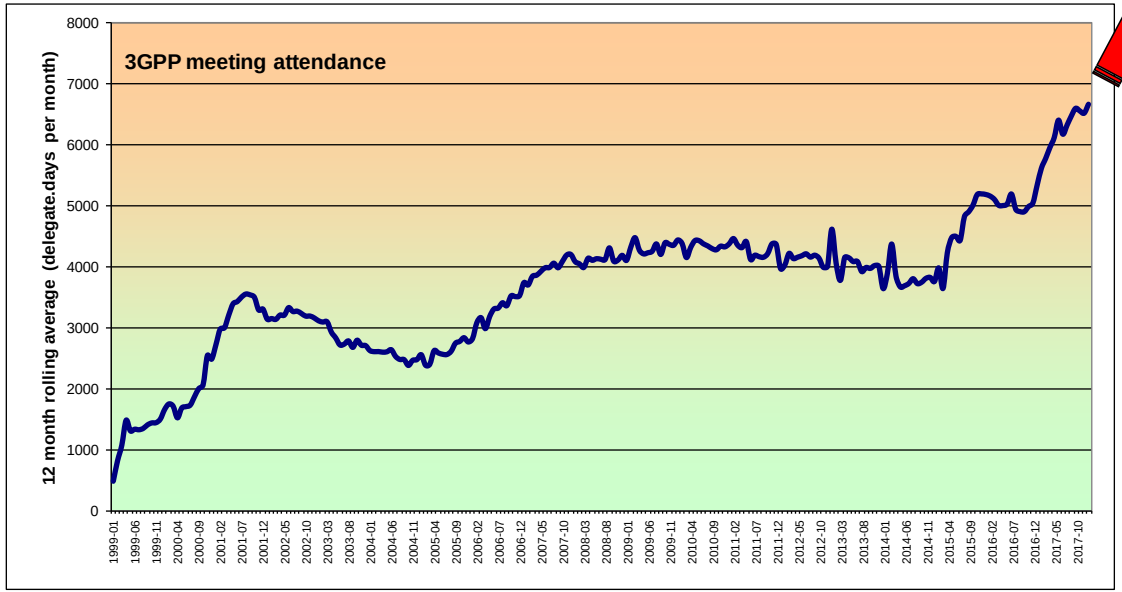
Approved CRs per WG per TSG meeting



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Workload: meeting attendance over time



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Workload: Committee Support

2017 was an exceptionally busy year for 3GPP in general and for MCC in particular. The number of meetings supported and contributions processed enabled the 5G New Radio to be completed six months ahead of the original target. Throughout the year, a total of 75 000 delegate/days were spent in 3GPP groups which is an unprecedented level of activity for the project. More than 100 000 contributions were processed.

This peak workload would not be sustainable in the longer term without increasing the support resources. However, during the recent TSG meetings that took place in Chennai, distinct action was taken to try and limit the number of meetings that will occur from 2019 onwards. It still remains to be seen how many meetings will take place in 2018 but at least we seem to be heading in the right direction.

Two groups within 3GPP have a very low level of participation and activity (CT6 and RAN6). In consultation with the relevant TSG Chairman, consideration is being given reducing the level of support to back-office only. This will of course help to reduce support costs. Decisions are expected to have been taken by the time the PCG next meets.

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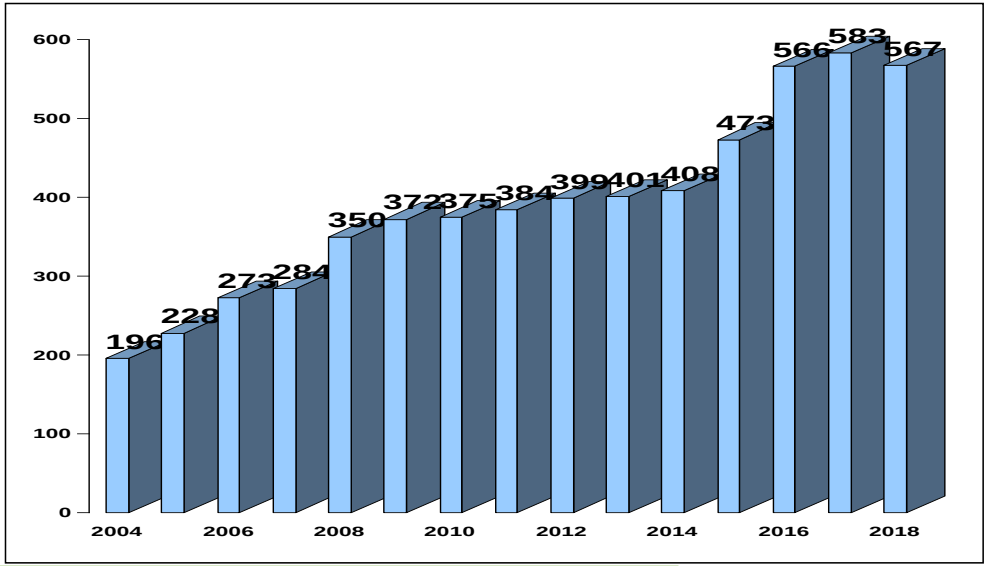
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3GPP Membership

3GPP Membership currently stands at 567 Individual Members. In addition, there are 21 companies having Guest Status, which are potential IMs

Number of Individual Members in 3GPP

3GPP Individual Members come from 45 Countries worldwide



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3GPP Member Territories

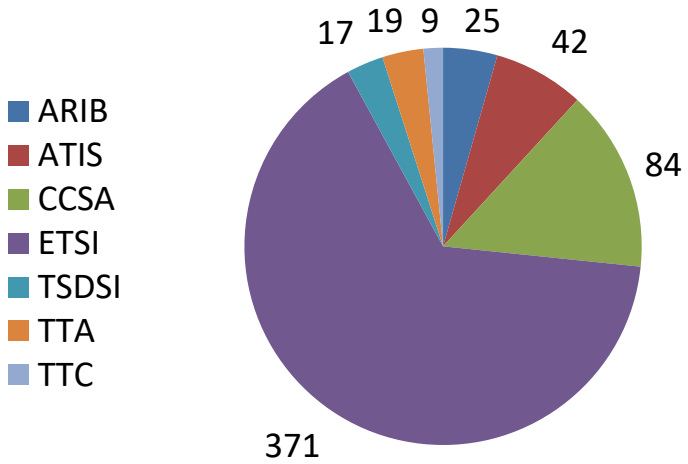
AUSTRALIA	DENMARK	ISRAEL	POLAND	SOUTH AFRICA
AUSTRIA	FINLAND	ITALY	PORTUGAL	SPAIN
BELGIUM	FRANCE	JAPAN	QATAR	SWEDEN
BOTSWANA	GERMANY	KOREA (REPUBLIC OF)	ROMANIA	SWITZERLAND
BRAZIL	HONG KONG	LEBANON	RUSSIAN FEDERATION	TAIWAN, PROVINCE OF CHINA
CANADA	INDIA	LUXEMBOURG	SERBIA	TURKEY
CHINA	INDONESIA	MALAYSIA	SINGAPORE	UNITED ARAB EMIRATES
CZECH REPUBLIC	IRELAND	MEXICO	SLOVAKIA	UNITED KINGDOM
		NETHERLANDS	SLOVENIA	UNITED STATES
		NORWAY		

3GPP Individual Members come from 44 countries worldwide

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567 Individual Members in 3GPP



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Some interesting industry participants…

- **Agricultural** machinery manufacturers (e.g., John Deere, Husqvana, etc)
- **Automotive** manufactures (e.g, Volkswagen, Volvo, Toyota)
- **Rail** (e.g., Internationale Union of Railways)
- **Factory Automation** companies (e.g., Siemens)
- **Energy** Sector (e.g., Legrand)
- **Environment** (e.g., Veolia)
- **Broadcasting** Community (e.g., EBU, BBC, TDF)
- **Satellite** Community (e.g., ESO, Inmarsat)
- **Aerospace** (e.g., Lockheed Martin, BAE)
- **Retail** Sector (e.g., Alibaba)
- **Social Media** (e.g., Facebook)
- **Advertising** (e.g., Google)

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Anti-trust Compliance Training

- Four webinars targeted at elected officials and candidates took place in 2017, each timed to be convenient for those in one of the three regions (Americas, Europe, Asia).
- By decision of the PCG, these webinars are now open for participation by any delegate. For logistical reasons, we may have to limit the number of participants in any one webinar, and elected officials and candidates for election will take precedence.
- Companies are reminded that all personnel they offer for the chairmanship or vice-chairmanship of 3GPP committees must undergo formal training in anti-trust matters, and the letter of support for candidates for election must clearly state this.
- We are currently fixing the dates for 2018 webinars.

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Summary and Outlook

3GPP has continued to strengthen its position as the place where the 5G system is being specified. It continues to attract significant interest from new entrants too.

The workload within the TSGs has increased dramatically in the build up to Release 15 and 16 delivery. This workload will be monitored in the coming months and support resources adjusted accordingly.

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APPENDIX 8

The 3G IP Multimedia Subsystem (IMS)

Merging the Internet and the Cellular Worlds

Gonzalo Camarillo and Miguel A. García-Martín

Both of
Ericsson, Finland



John Wiley & Sons, Ltd

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Chapter 2

The History of the IMS Standardization

In Chapter 1 we mentioned that the IMS uses Internet protocols. When the IMS needs a protocol to perform a particular task (e.g., to establish a multimedia session), the standardization bodies standardizing the IMS take the Internet protocol intended for that task and specify its use in the IMS. Still, no matter how simple this may sound the process of choosing protocols to be used in the IMS can sometimes get tricky. Sometimes, the Internet protocol that is chosen lacks some essential functionality, or does not even exist at all. When this happens the IMS standardization bodies contact the standardization body developing Internet protocols to work together on a solution. We will cover this collaboration in Section 2.5. Nevertheless, before jumping into that we will introduce in Section 2.1 all the standardization bodies involved in IMS development. We need to know who is who and which functions of the IMS each of them performs.

2.1 Relations between IMS-related Standardization Bodies

The ITU (International Telecommunication Union) IMT-2000 (International Mobile Telecommunications-2000) is the global standard for 3G (third generation) networks. IMT-2000 is the result of the collaboration between different standards bodies and aims at providing access to telecommunication services using radio links, which include satellite and terrestrial networks.

We will focus on two of the standard bodies involved in IMT-2000: 3GPP (Third Generation Partnership Project) and 3GPP2 (Third Generation Partnership Project 2). Still, they are not the only ones working within IMT-2000. Other bodies, such as the ITU-R (ITU-Radiocommunication Sector), for instance, are also involved in IMT-2000 but on different areas than the IMS.

Both 3GPP and 3GPP2 have standardized their own IMS (IP Multimedia Subsystem). The 3GPP IMS and the 3GPP2 IMS are fairly similar, but, nevertheless, have a few differences (Appendix A lists the most important differences).

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An important similarity between the 3GPP IMS and the 3GPP2 IMS is that both use Internet protocols, which have been traditionally standardized by the IETF (Internet Engineering Task Force). Consequently, both 3GPP and 3GPP2 collaborate with the IETF in developing protocols that fulfill their requirements. The following sections introduce the IETF, 3GPP, and 3GPP2 and provide a brief history of the IETF-3GPP/3GPP2 collaboration.

In addition to the standard bodies we have just mentioned, OMA (Open Mobile Alliance [144]) will play an important role in developing IMS services in the near future. While 3GPP and 3GPP have standardized (or are standardizing) a few IMS services, such as basic video calls or conferencing, from now on OMA will focus on service standardization for the IMS (of course, other standard bodies and third parties besides OMA may also develop services for the IMS).

2.2 Internet Engineering Task Force (IETF)

The Internet Engineering Task Force (IETF) is a loosely self-organized collection of network designers, operators, vendors, and research institutions that work together to develop the architecture, protocols, and operation of the public Internet. The IETF is body that is open to any interested individual. The IETF is not a corporation and, therefore, does not have a board of directors, members, nor dues.

The IETF is the standardization body that has developed most of the protocols that are currently used on the Internet. The IETF does not standardize networks, architectures combining different protocols, the internal behaviour of nodes, nor APIs (Application Programming Interface). The IETF is the protocol factory for IP-related protocols.

2.2.1 Structure of IETF

Work in the IETF is organized in working groups. Each working group is chartered to perform specific tasks, such as the delivery of a precise set of documents. Each working group has from one to three chairs, who take care that the working group completes its chartered tasks in time. Working groups have a temporary lifetime; so, once they have delivered their documents, either they are rechartered or they cease to exist. Figure 2.1 shows a few, but not all, of the working groups in the IETF; there are more than 100 active working groups in the IETF. The complete up-to-date list of active working groups is available at:

`http://www.ietf.org/html.charters/wg-dir.html`

Working groups get an acronym name that identifies the chartered task. For instance, SIPPING is the acronym of "Session Initiation Protocol Investigation", SIMPLE is the acronym of "SIP for Instant Messaging and Presence Leveraging Extensions" or AAA for "Authentication, Authorization and Accounting".

A collection of working groups form an Area Directorate. There are currently eight areas, as illustrated in Figure 2.1.

Each area has one or two area directors who, together with the IETF chairman, form the IESG (Internet Engineering Steering Group). The IESG is the technical

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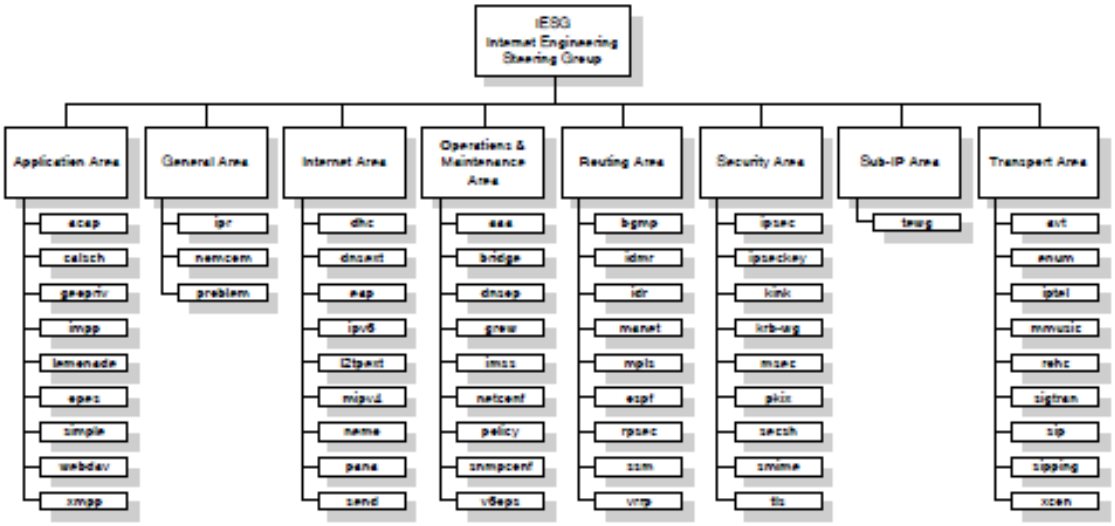


Figure 2.1: The structure of the IETF

management team of the IETF. They decide on which areas the IETF should work and review all the specifications that are produced.

The following web pages contain the complete list of the working groups of all areas and the charter of the SIPPING working group respectively.

```
http://www.ietf.org/html.charters/wg-dir.html
http://www.ietf.org/html.charters/sipping-charter.html
```

The IAB (Internet Architecture Board) is the body that provides technical leadership and handles appeals. Its web page is:

```
http://www.iab.org/
```

2.2.2 Working Group Operations

The technical work in the IETF is done within the working groups. Working groups do not have any kind of membership; they are formed by a number of volunteers that work as individuals. That is, they do not represent their companies when working for the IETF.

Most of the technical discussions within a working group take place in its mailing list. Even the decisions made at face-to-face meetings (held three times a year) have to be confirmed in the mailing list.

The technical documents used within the working groups are called Internet-Drafts. There are two types of them: individual submissions and working group items. Individual submissions are technical proposals submitted by an individual or individuals. If the working group decides that an individual submission is a good starting point to work on a particular topic, it becomes a working group item.

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Individual submissions and working group items can be distinguished by the name of the file where they are stored. Individual submissions start with:

```
draft-author's_name
```

while working group items start with:

```
draft-ietf-name_of_the_working_group
```

A list of all the Internet-Drafts can be found at:

```
http://www.ietf.org/internet-drafts/
```

When a working group feels that a working group item is ready for publication as an RFC the working group chairs send it to the IESG. The IESG may provide feedback to the working group (e.g., ask that working group to change something in the draft) and, eventually, decides whether or not a new RFC is published.

Although most of the Internet-Drafts that the IESG receives come from working groups an individual may also submit an Internet-Draft to the IESG. This usually happens with topics that are not large enough to grant the creation of a working group, but which, nevertheless, are of interest to the Internet community.

It is important to note that Internet-Drafts, even if they are working group items, represent work in progress and should only be referenced as such. Internet-Drafts are temporary documents that expire and cease to exist six months after they are issued. They can change at any time without taking into consideration backward compatibility issues with existing implementations. Only when a particular Internet-Draft becomes an RFC can it be considered a stable specification.

2.2.3 Types of RFCs

The technical documents produced by the IETF are called RFCs (Request For Comments). According to the contents of the document there are three main types of RFCs:

- Standards-track RFCs.
- Non-standards-track RFCs.
- BCP (Best Current Practise) RFCs.

Standards-track RFCs typically define protocols and extensions to protocols. According to the maturity of the protocol there are three levels of standards-track RFCs: proposed standard, draft standard, and Internet standard. Standards-track specifications are supposed to advance from proposed to draft and, finally, to Internet standard as they get more and more mature. An important requirement in this process is that a particular specification is implemented by several people to show that different independently built implementations that follow the same specification can successfully interoperate.

Nevertheless, in practise only a few RFCs reach the draft standard level and even fewer become Internet standards. At present, the specifications of many protocols that are used massively on the Internet are proposed standards.

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There are three types of non-standards-track RFCs: experimental, informational, and historical (which are called *historic* RFCs). Experimental RFCs specify protocols with a very limited use, while informational RFCs provide information for the Internet community about some topic, such as a requirements document or a process. When a standards-track RFC becomes obsolete, it becomes a historic RFC.

BCP RFCs record the best current practise known to the community to perform a particular task. They may deal with protocol issues or with administrative issues.

Figure 2.2 shows the relations between all the RFC types. A list of all the RFCs published so far and their status can be fetched from:

`http://www.ietf.org/iesg/1rfc_index.txt`

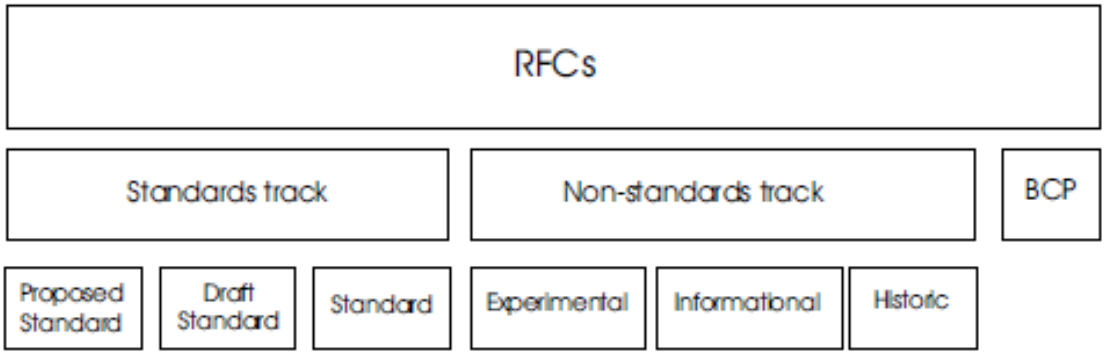


Figure 2.2: RFC types

RFCs can be downloaded from the following web page by just introducing the RFC number:

`http://www.ietf.org/rfc.html`

Additionally, the RFC Editor offers a web page that allows us to search for RFCs by title, number, author and keywords:

`http://www.rfc-editor.org/rfcsearch.html`

2.3 Third Generation Partnership Project (3GPP)

The Third Generation Partnership Project (3GPP) was born in 1998 as a collaboration agreement between a number of regional telecommunication standard bodies, known as *organizational partners*. The current 3GPP organizational partners are:

1. ARIB (Association of Radio Industries and Business) in Japan,

   `http://www.arib.or.jp/english/`

2. CCSA (China Communications Standards Associations) in China,

   `http://www.ccsa.org.cn/english/`

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3. ETSI (European Telecommunications Standards Institute) in Europe,

   `http://www.etsi.org/`

4. Committee T1 in the United States of America,

   `http://www.t1.org/`

5. TTA (Telecommunications Technology Association) of Korea

   `http://www.tta.or.kr/English/`

6. TTC (Telecommunication Technology Committee) in Japan,

   `http://www.ttc.or.jp/e/`

3GPP was originally chartered to develop globally applicable Technical Specifications and Technical Reports for a third-generation mobile system based on GSM. The scope has been reinforced to include maintenance and development of GSM specifications including the supported and evolved radio networks, technologies, and packet access technologies.

Besides the organizational partners, *market representation partners* provide the partnership with market requirements. Market representation partners include, among others, the UMTS Forum, 3G Americas, the GSM Association, the Global mobile Suppliers Association, the TD-SCDMA Forum, and the IPv6 Forum.

3GPP maintains an up-to-date web site at:

`http://www.3gpp.org/`

2.3.1 3GPP Structure

3GPP is organized in a Project Co-ordination Group (PCG) and Technical Specification Groups (TSGs), as illustrated in Figure 2.3. The PCG is responsible for the overall management of 3GPP, time plans, allocation of work, etc. The technical work is produced in the TSGs. At the moment there are five TSGs, responsible for the Core Network (CN), System and Services Aspects (SA), GSM EDGE Radio Access Network (GERAN), Radio Access Network (RAN), and Terminals (T). Each of the TSGs is further divided into Working Groups. Each of the Working Groups is allocated particular tasks. For instance, CN WG1 is responsible for all the detailed design of the usage of SIP and SDP in the IMS, CN WG3 for interworking aspects and CN4 for all the detailed design of the usage of Diameter. SA WG1 is responsible for the requirements, SA2 for the architecture, SA WG3 for the security aspects, SA WG4 for the codecs, and SA WG5 for the operation and maintenance of the network.

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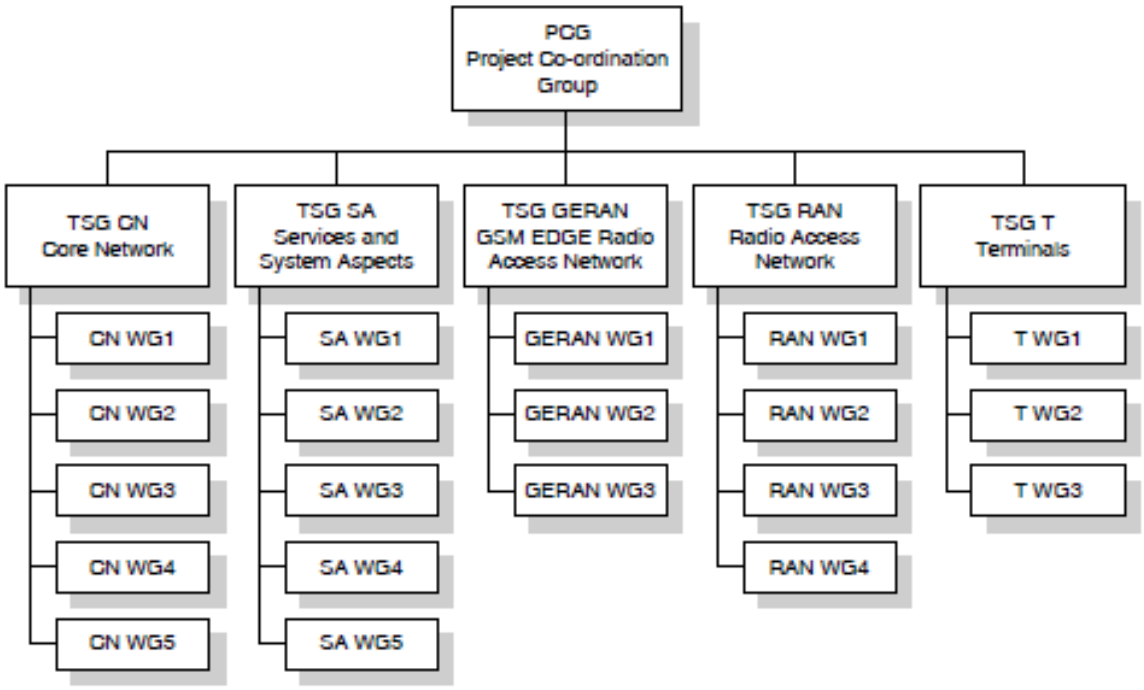


Figure 2.3: The structure of 3GPP

2.3.2 3GPP Deliverables

3GPP working groups do not produce standards. Instead, they produce Technical Specifications (TS) and Technical Reports (TR) that are approved by the TSGs. Once approved they are submitted to the organizational partners to be submitted to their respective standardization processes. The final part of the process is in the organizational partners' hands when they approve the TSs or TRs as part of their standards procedures. As a result, there is a set of globally developed standards that are ready to be used in a particular region.

3GPP TSs and TRs are numbered according to the sequence of four or five digits that follow the pattern "xx.yyy". The first two digits "xx" identify the series number, and the last two or three digits "yy" or "yyy" identify a particular specification within a series. For instance, 3GPP TS 23.228 [21] describes the architectural aspects of the IMS.

3GPP groups its specifications in what is called a *Release*. 3GPP Release 5 contains the first version of the IMS. 3GPP Release 6 contains enhancements to the IMS. The reader must note that the IMS is just a fraction of the 3GPP deliverables in a particular Release, as there are other non-IMS specifications included in a 3GPP Release. 3GPP TSs and TRs include a version number that follows the pattern "x.y.z", where "x" represents the 3GPP Release where the specification is published, "y" is the version number, and "z" is a sub-version number. So, 3GPP TS 23.228 version 5.8.0 means version 8.0 of the Release 5 version of TS 23.228.

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3GPP TSs and TRs are publicly available at the 3GPP web site at either of the following URIs:

`http://www.3gpp.org/specs/specs.htm`

`http://www.3gpp.org/ftp/Specs/archive/`

2.4 Third Generation Partnership Project 2 (3GPP2)

If 3GPP was born to evolve GSM specifications into a third-generation cellular system, the Third Generation Partnership Project 2 (3GPP2) was born to evolve North American and Asian cellular networks based on ANSI/TIA/EIA-41 standards and CDMA2000© radio access into a third-generation system. 3GPP2 like 3GPP is a partnership project whose members are also known as *organizational partners*. The current list of organizational partners include ARIB (Japan), CCSA (China), TIA (Telecommunications Industry Association) (North America), TTA (Korea), and TTC (Japan). Probably, the reader has noticed that most of them are also organizational partners of 3GPP.

Like 3GPP, 3GPP2 gets market requirements and advice from *market representation partners*. At the moment the list includes the IPv6 Forum and the CDMA Development Group.

2.4.1 3GPP2 Structure

The 3GPP2 structure mimics the structure of 3GPP, as illustrated in Figure 2.4. A Steering Committee (SC) is responsible for the overall standardization process and the planning. The technical work is done in Technical Specification Groups (TSGs). TSG-A is focused on the Access Network Interface, TSG-C on CDMA2000© technology, TSG-S on Service and System Aspects, and TSG-X in Intersystems Operations. TGS-X was born as a merger between the former TSG-N (Core Networks) and TSG-P (Packet Data) TSGs. The structure of TSN-X is not completely defined yet.

2.4.2 3GPP2 Deliverables

Like 3GPP, 3GPP2 does not produce standards but, instead, Technical Specifications (TSs) and Technical reports (TRs). The documents are created by the TSGs and approved by the SC. Then, they are submitted to the organizational partners to be submitted to their respective standardization processes.

3GPP2 TSs and TRs are numbered with a sequence of letters and digits that follows the scheme "A.Bxxxx-yyy-R" where "A" is a letter that represents the name of the TSG that delivers the document, "B" can be an "R" letter to indicate a TR or a requirements document, but it can also be an "S" letter to indicate a TS. "xxxx" is a sequential number allocated to the document. An optional "yyy" sequence of digits can further identify the chapter within a specification series. The "R" letter identifies the revision. The version number follows the specification and indicates a major and

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APPENDIX 9

3GPP MEMBERSHIP

2024-08-12 Version 1.1

New Query

Selected categories:

- **Individual Members (all partners)**

Choose csv separator : , export to csv file

INDIVIDUAL MEMBERS

Organization	Country	Partner
3in (Industrial Internet Innovation Center (Shanghai) Co.,Ltd.)	CHINA	CCSA
450connect GmbH (450connect GmbH)	GERMANY	ETSI
A.S.T.R.I.D. SA/NV (A.S.T.R.I.D. SA)	BELGIUM	ETSI
ABP, NRTA (Academy of Broadcasting Planning, NRTA)	CHINA	CCSA
ABS (Academy of Broadcasting Science, NRTA)	CHINA	CCSA
AccelerComm Ltd (AccelerComm Ltd)	UNITED KINGDOM	ETSI
Acer Incorporated (Acer Incorporated)	TAIWAN, PROVINCE OF CHINA	ETSI
adare GmbH (adare GmbH)	GERMANY	ETSI
Airbus (Airbus DS SLC)	FRANCE	ETSI
Ajou University (Ajou University)	KOREA (REPUBLIC OF)	TTA
albis-elcon system GermanyGmbH (albis-elcon system Germany GmbH)	GERMANY	ETSI
Alibaba (China) Group., Ltd. (Alibaba (China) Group., Ltd.)	CHINA	CCSA
All Connected BV (Rail Connected)	NETHERLANDS	ETSI
Allot Ltd (Allot Ltd)	ISRAEL	ETSI
Altan Redes S.A.P.I. de C.V. (Altan Redes S.A.P.I. de C.V.)	MEXICO	ETSI
Amazon Web Services (Amazon Web Services EMEA SARL)	LUXEMBOURG	ETSI
Amdocs Software Systems Ltd (Amdocs Software Systems Limited)	IRELAND	ETSI
Analog Devices, Inc. (Analog Devices, Inc.)	UNITED STATES	ATIS
Anemone Technology (Anemone Technology)	DENMARK	ETSI
Anritsu Corporation (ANRITSU CORPORATION)	JAPAN	ARIB
Anritsu EMEA Ltd (Anritsu EMEA Ltd)	UNITED KINGDOM	ETSI
Anterix (Anterix)	UNITED STATES	ATIS
Apple	CHINA	CCSA

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(Apple Purchase Operation management)		
Apple (Guizhou) **(Apple Technology Services (Guizhou) Ltd.)**	CHINA	CCSA
Apple (UK) Limited **(Apple (UK) Limited)**	UNITED KINGDOM	ETSI
Apple (Ulanqab) **(Apple Technology Services (Ulanqab) Ltd)**	CHINA	CCSA
Apple AB Denmark **(Apple AB, filial AF Apple Aktiebolag, Sverige)**	DENMARK	ETSI
Apple Benelux B.V. **(Apple Benelux B.V.)**	NETHERLANDS	ETSI
Apple Benelux B.V. - Belgium **(Apple Benelux B.V. - Belgium Branch)**	BELGIUM	ETSI
Apple Computer Trading Co. Ltd **(Apple Computer Trading (Shanghai) Co., Ltd.)**	CHINA	CCSA
Apple Distribution Intl Ltd **(Apple Distribution International Limited)**	IRELAND	ETSI
Apple France **(Apple France)**	FRANCE	ETSI
Apple GmbH **(Apple GmbH)**	GERMANY	ETSI
Apple Inc **(Apple Inc)**	UNITED STATES	ATIS
Apple R&D **(Apple R&D)**	CHINA	CCSA
Apple Solutions **(Apple Solutions Consulting Services (Beijing) Company Limited)**	CHINA	CCSA
Apple Switzerland AG **(Apple Switzerland AG)**	SWITZERLAND	ETSI
Apple Trading **(Apple Trading (Shanghai) Company Limited)**	CHINA	CCSA
AQSACOM S.A.S. **(AQSACOM S.A.S.)**	FRANCE	ETSI
Arriver Software AB **(Arriver Software AB)**	SWEDEN	ETSI
ARTICLE19 **(ARTICLE19)**	UNITED KINGDOM	ETSI
ASELSAN **(ASELSAN Inc.)**	TÜRKIYE	ETSI
AsiaInfo **(AsiaInfo Technologies (China), Inc.)**	CHINA	CCSA
AsiaInfo Technologies Inc **(AsiaInfo Technologies Inc)**	CHINA	ETSI
ASR **(ASR Microelectronics Co., Ltd.)**	CHINA	CCSA
ASTRI **(Hong Kong Applied Science & Technology Research Institute)**	HONG KONG	ETSI
Astrome Technologies Pvt Lt **(Astrome Technologies Pvt Lt)**	INDIA	TSDSI
ASUSTEK COMPUTER (SHANGHAI) **(ASUSTEK COMPUTER (SHANGHAI) CO. LTD.)**	CHINA	CCSA
AT&T **(AT&T)**	UNITED STATES	ATIS
AT&T GNS Belgium SPRL **(AT&T Global Network Services Belgium SPRL)**	BELGIUM	ETSI
AT&T Labs, Inc **(AT&T Labs, Inc)**	UNITED STATES	ATIS
AT&T Services, Inc. **(AT&T Services, Inc.)**	UNITED STATES	ATIS
ATEME **(ATEME SA)**	FRANCE	ETSI
Avanti **(Avanti Communications Ltd)**	UNITED KINGDOM	ETSI
Axyom.Core **(Axyom.Core Inc)**	UNITED STATES	ETSI
BAE Systems AI Ltd	UNITED KINGDOM	ETSI

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(BAE Systems Applied Intelligence Limited)		
Baicells Technologies Co. Ltd **(Baicells Technologies Co. Ltd)**	CHINA	CCSA
BBC **(BRITISH BROADCASTING CORPORATION)**	UNITED KINGDOM	ETSI
B-Com **(B-Com)**	FRANCE	ETSI
BDBOS **(Federal Agency for Public Safety Digital Radio)**	GERMANY	ETSI
BeammWave AB **(BeammWave AB)**	SWEDEN	ETSI
Beijing Lenovo Software Ltd. **(Beijing Lenovo Software Ltd.)**	CHINA	CCSA
BEIJING SAMSUNG TELECOM R&D **(BEIJING SAMSUNG TELECOM R&D CENTER)**	CHINA	CCSA
Beijing Xiaomi Electronics **(Beijing Xiaomi Electronics)**	CHINA	CCSA
Beijing Xiaomi Mobile Software **(Beijing Xiaomi Mobile Software Co., Ltd)**	CHINA	CCSA
Beijing Xiaomi Mobile Software **(Beijing Xiaomi Mobile Software Co., Ltd.)**	CHINA	ETSI
Beijing Xiaomi Software Tech **(Beijing Xiaomi Software Technology)**	CHINA	CCSA
Bell Mobility **(Bell Mobility)**	CANADA	ETSI
BfV **(Bundesamt für Verfassungsschutz)**	GERMANY	ETSI
Bharti Airtel Limited **(Bharti Airtel Limited)**	INDIA	TSDSI
BIFNC **(BRICS Institute of Future Network)**	CHINA	CCSA
BIPT **(BIPT - Belgian Institute for Postal services & Telecommunications)**	BELGIUM	ETSI
Bittium Wireless Ltd. **(Bittium Wireless Ltd.)**	FINLAND	ETSI
BJTU **(Beijing Jiaotong University)**	CHINA	CCSA
BKA **(Bundeskriminalamt)**	GERMANY	ETSI
Bluetest AB **(Bluetest AB)**	SWEDEN	ETSI
BMF **(Austrian Federal Ministry of Finance)**	AUSTRIA	ETSI
BMW AG **(Bayerische Motoren Werke AG)**	GERMANY	ETSI
BMWK **(Bundesministerium für Wirtschaft und Klimaschutz)**	GERMANY	ETSI
BOCRA **(Botswana Communications Regulatory Authority)**	BOTSWANA	ETSI
BOUYGUES Telecom **(BOUYGUES Telecom)**	FRANCE	ETSI
Broadcom (EU) **(Broadcom Europe Ltd)**	UNITED KINGDOM	ETSI
BSI (DE) **(Bundesamt für Sicherheit in der Informationstechnik)**	GERMANY	ETSI
BSNL **(Bharat Sanchar Nigam Limited)**	INDIA	TSDSI
BT plc **(British Telecommunications plc)**	UNITED KINGDOM	ETSI
BTL Inc. **(BTL Inc.)**	CHINA	ETSI
BTPDI **(Beijing Telecom Planning & Designing Institute Co.,LTD.)**	CHINA	CCSA
BUPT **(Beijing University of Posts and Telecommunications)**	CHINA	CCSA
Bureau Veritas ADT	TAIWAN, PROVINCE OF CHINA	ETSI

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(Bureau Veritas Consumer Products Services (Hong Kong) Limited, Taoyuan Branch)		
Bytedance **(Bytedance (Nanjing) Technology Research and Development Co., Ltd.)**	CHINA	CCSA
C Spire Wireless **(C Spire Wireless)**	UNITED STATES	ATIS
CableLabs **(CableLabs)**	UNITED STATES	ETSI
Cadence Design Systems Inc. **(Cadence Design Systems Inc.)**	UNITED STATES	ETSI
CAICT. **(China Academy of Information and Communications Technology)**	CHINA	CCSA
CALTTA **(CALTTA TECHNOLOGIES CO., LTD.)**	CHINA	CCSA
Cambium Networks Limited **(Cambium Networks Limited)**	UNITED KINGDOM	ETSI
CAMBRIDGE CONSULTANTS LTD **(CAMBRIDGE CONSULTANTS LTD)**	UNITED KINGDOM	ETSI
CANON Research Centre France **(CANON Research Centre France SAS)**	FRANCE	ETSI
CAPGEMINI **(CAPGEMINI TECHNOLOGY SERVICES INDIA LIMITED)**	INDIA	TSDSI
Catapult **(Satellite Applications Catapult Ltd)**	UNITED KINGDOM	ETSI
CATT **(China Academy of Telecommunications Technology (CATT))**	CHINA	ETSI
CATT **(China Academy of Telecommunication Technology - (Datang Telecom Technology and Industry Group))**	CHINA	CCSA
CBN **(China Broadcasting Network Group Corporation Ltd.)**	CHINA	CCSA
CCU **(National Chung Cheng University)**	TAIWAN, PROVINCE OF CHINA	ETSI
C-DAC **(Centre for Development of Advanced Computing)**	INDIA	TSDSI
C-DOT **(C-DOT)**	INDIA	TSDSI
CEA **(Commissariat à l'Energie Atomique et aux Energies Alternatives)**	FRANCE	ETSI
Cellnex **(Cellnex Telecom)**	SPAIN	ETSI
CENC **(CETC Network & Communications Group Co., Ltd.)**	CHINA	CCSA
CEPRI **(China Electric Power Research Institute)**	CHINA	CCSA
Ceragon Networks AS **(Ceragon Networks AS)**	NORWAY	ETSI
CERTH **(CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS)**	GREECE	ETSI
cetecom advanced GmbH **(cetecom advanced GmbH)**	GERMANY	ETSI
CEWiT **(Centre of Excellence in Wireless Technology (CEWiT))**	INDIA	TSDSI
CGL **(CHAZAH GROUP LTD)**	UGANDA	ETSI
Changeself **(Changeself Technology(Shenzhen)Co.,Ltd.)**	CHINA	ETSI
Charter Communications, Inc **(Charter Communications, Inc)**	UNITED STATES	ATIS
Chengdu OPPO Telecommunication **(Chengdu OPPO Mobile Telecommunications Corp., ltd.)**	CHINA	CCSA
CHENGDU TD TECH LTD. **(CHENGDU TD TECH LTD.)**	CHINA	CCSA
China Broadnet **(China Broadnet Mobile Communications Co., Ltd.)**	CHINA	CCSA
China Mobile (Hangzhou) Inf. **(China Mobile (Hangzhou) Information Technology Co., Ltd.)**	CHINA	CCSA
China Mobile (Suzhou) Software	CHINA	CCSA

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(China Mobile (Suzhou) Software Technology Co., Ltd.)		
China Mobile Com. Corporation **(China Mobile Communications Corporation (CMCC))**	CHINA	CCSA
China Mobile E-Commerce Co. **(China Mobile E-Commerce Co.)**	CHINA	CCSA
China Mobile Group Device Co. **(China Mobile Group Device Co., Ltd)**	CHINA	CCSA
China Mobile International Ltd **(China Mobile International Limited)**	CHINA	CCSA
China Mobile M2M Company Ltd. **(China Mobile M2M Company Ltd.)**	CHINA	CCSA
China Southern Power Grid Co. **(China Southern Power Grid Co., Ltd.)**	CHINA	CCSA
China Telecom Corporation Ltd. **(China Telecom Corporation Ltd.)**	CHINA	CCSA
China Telecommunications **(China Telecommunications Corporation)**	CHINA	ETSI
China Telecomunication Corp. **(China Telecomunication Corporation)**	CHINA	CCSA
China Unicom **(China Unicom)**	CHINA	CCSA
Chinatelecom Cloud **(China Telecom Cloud Technology Co., Ltd)**	CHINA	CCSA
Chongqing University **(Chongqing University)**	CHINA	CCSA
CHTTL **(Chunghwa Telecommunication Laboratories, Chunghwa Telecommunication Co.)**	TAIWAN, PROVINCE OF CHINA	ETSI
CICT **(China Information Communication Technologies Group)**	CHINA	ETSI
CICT **(China Information Communication Technologies Group Corporation)**	CHINA	CCSA
CICT Mobile **(CICT Mobile Communication Technology Co., Ltd.)**	CHINA	CCSA
CICTCI **(CICT Connected and Intelligent Technologies Co., Ltd)**	CHINA	CCSA
CIS **(Center for Internet Security)**	UNITED STATES	ETSI
CISA ECD **(Cybersecurity and Infrastructure Security Agency (CISA) ECD)**	UNITED STATES	ATIS
Cisco Systems **(Cisco Systems)**	UNITED STATES	ATIS
Cisco Systems Belgium **(Cisco Systems Belgium)**	BELGIUM	ETSI
Cisco Systems France **(Cisco Systems France)**	FRANCE	ETSI
CITC **(CHINA INFORMATION TECHNOLOGY DESIGNING&CONSULTING INSTITUTE CO.,LTD.)**	CHINA	CCSA
CKH IOD UK LIMITED **(CKH IOD UK LIMITED)**	UNITED KINGDOM	ETSI
CMDI **(China Mobile Group Design Institute Co., Ltd)**	CHINA	CCSA
CNC **(CLAP-N-CLANK)**	JAPAN	ETSI
CNES **(CNES - Centre National d'Etudes Spatiales)**	FRANCE	ETSI
Cobham SatCom A/S **(Thrane & Thrane A/S)**	DENMARK	ETSI
Cognyte **(Cognyte Technologies Israel Ltd.)**	ISRAEL	ETSI
Cohere Technologies **(Cohere Technologies)**	UNITED STATES	ATIS
Collins Aerospace **(Collins Aerospace)**	UNITED STATES	ATIS
Comba **(Comba Network Systems Company Limited)**	CHINA	CCSA
Comcast	UNITED STATES	ATIS

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(Comcast)		
Comprion GmbH **(Comprion GmbH)**	GERMANY	ETSI
Comtech Telecommunications Cor **(Comtech Telecommunications Corp)**	UNITED STATES	ATIS
Consort Digital **(Consort Digital Private Limited)**	INDIA	ETSI
Continental Automotive **(Continental Automotive Technologies GmbH)**	GERMANY	ETSI
Convida Wireless **(Convida Wireless, LLC)**	UNITED STATES	ETSI
Cosmian **(Cosmian Tech SAS)**	FRANCE	ETSI
CQUPT **(Chongqing University of Posts and Telecommunications)**	CHINA	CCSA
Crosscall **(Crosscall)**	FRANCE	ETSI
CSA **(Cyber Security Agency of Singapore)**	SINGAPORE	ETSI
CSCN **(CHINA SATELLITE NETWORK GROUP CO., LTD.)**	CHINA	CCSA
CSIRO **(Commonwealth Scientific and Industrial Research Organisation)**	AUSTRALIA	ETSI
cstconsultancy **(CyberSecurity & Technology Consultancy LTD)**	UNITED KINGDOM	ETSI
CTSI **(China Telecom System Integration Co., Ltd)**	CHINA	CCSA
CTTC **(Centre tecnologic de Telecomunicacions de Catalunya)**	SPAIN	ETSI
CU Digital Technology **(China Unicom Digital Technology Co., Ltd.)**	CHINA	CCSA
CUC **(Communication University of China)**	CHINA	CCSA
CUG **(China Unicom Global Limited)**	CHINA	CCSA
Cybercore **(Beijinig Cybercore Technology Co., Ltd.)**	CHINA	CCSA
Cygnusemi **(Cygnusemi)**	CHINA	CCSA
Czech Telecommunication Office **(Czech Telecommunication Office)**	CZECH REPUBLIC	ETSI
DAC-SSR-UPC **(D. Arquitectura de Computadores/GT Smart Sustainable Resources -Universidad Politecnica de Cataluna)**	SPAIN	ETSI
DanKook University **(DanKook University)**	KOREA (REPUBLIC OF)	TTA
DARS TELECOM S.L. **(DARS TELECOM S.L.)**	SPAIN	ETSI
Datang Linktester Technology **(Datang Linktester Technology Co., Ltd.)**	CHINA	CCSA
Datang Mobile Com. Equipment **(Datang Mobile Communications Equipment Co., Ltd)**	CHINA	CCSA
DeepSig Inc **(DeepSig Inc)**	UNITED STATES	ATIS
DEKRA **(DEKRA testing and Certification, S.A.U.)**	SPAIN	ETSI
Dell Technologies **(Dell Technologies)**	UNITED STATES	ATIS
DENSO CORPORATION **(DENSO CORPORATION)**	JAPAN	ARIB
Department of Telecom **(Department of Telecommunications)**	INDIA	TSDSI
Dept of Home Affairs **(Department of Home Affairs)**	AUSTRALIA	ETSI
Deutsche Telekom AG **(Deutsche Telekom AG)**	GERMANY	ETSI
DIGG	SWEDEN	ETSI

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(Agency for Digital Government)		
DISA **(Defense Information Systems Agency)**	UNITED STATES	ATIS
Dish Network **(Dish Network)**	UNITED STATES	ATIS
DLR **(Deutsches Zentrum für Luft- und Raumfahrt e.V.)**	GERMANY	ETSI
DOCOMO Beijing Labs **(DOCOMO Beijing Communications Laboratories Co., Ltd)**	CHINA	CCSA
DOCOMO Communications Lab. **(DOCOMO Communications Laboratories Europe GmbH)**	GERMANY	ETSI
Dolby France SAS **(Dolby France SAS)**	FRANCE	ETSI
Dolby Germany GmbH **(Dolby Germany GmbH)**	GERMANY	ETSI
Dolby Sweden AB **(Dolby Sweden AB)**	SWEDEN	ETSI
Dolby Technology India Pvt Ltd **(Dolby Technology India Pvt Ltd)**	INDIA	TSDSI
Douyin **(Beijing Douyin Information Service Co., Ltd.)**	CHINA	CCSA
DP **(DigitalPlatforms SpA)**	ITALY	ETSI
DSIT **(Department for Science, Innovation and Technology)**	UNITED KINGDOM	ETSI
DTCY **(Deloitte Tohmatsu Cyber LLC)**	JAPAN	TTC
DTS Licensing Limited **(DTS Licensing Limited)**	IRELAND	ETSI
EA Consult Services Ltd **(EA Consult Services Ltd)**	UNITED KINGDOM	ETSI
EBU **(EBU - European Broadcasting Union)**	SWITZERLAND	ETSI
EchoStar **(EchoStar)**	UNITED KINGDOM	ETSI
ECTL **(Enhanced Communications & Technologies Pvt Ltd)**	INDIA	TSDSI
EDF Recherche et Développement **(EDF)**	FRANCE	ETSI
EFORT **(Etudes et Formations en Telecommunication)**	FRANCE	ETSI
Elbit Systems **(Elbit Systems C4I and Cyber Ltd)**	ISRAEL	ETSI
Element Materials Technology **(Element Materials Technology Warwick Ltd)**	UNITED KINGDOM	ETSI
Elena **(Elena Geo Systems Pvt Ltd)**	INDIA	TSDSI
Embotech AG **(Embotech AG)**	SWITZERLAND	ETSI
EMITE **(EMITE Ingenieria S.L.)**	SPAIN	ETSI
ENENSYS **(ENENSYS Technologies SA)**	FRANCE	ETSI
Ericsson (China) **(Ericsson (China) Communications, Co.Ltd)**	CHINA	CCSA
Ericsson España S.A. **(Ericsson España S.A.)**	SPAIN	ETSI
Ericsson France S.A.S **(Ericsson France S.A.S)**	FRANCE	ETSI
Ericsson GmbH, Eurolab **(Ericsson GmbH, Eurolab - Unternehmensbereich Forschung und Entwicklung)**	GERMANY	ETSI
Ericsson Hungary Ltd **(Ericsson Hungary Ltd)**	HUNGARY	ETSI
Ericsson Inc. **(Ericsson Incorporated)**	UNITED STATES	ATIS
Ericsson India Private Limited	INDIA	TSDSI

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(Ericsson India Private Limited)		
Ericsson Japan K.K. **(Ericsson Japan K.K.)**	JAPAN	ARIB
Ericsson Limited **(Ericsson Limited)**	UNITED KINGDOM	ETSI
Ericsson LM **(Ericsson Telefonaktiebolaget LM)**	SWEDEN	ETSI
Ericsson Telecomunicazioni SpA **(Ericsson Telecomunicazioni SpA)**	ITALY	ETSI
Ericsson-LG Co., LTD **(Ericsson-LG Co., LTD)**	KOREA (REPUBLIC OF)	TTA
Erillisverkot **(Suomen Erillisverkot Oy)**	FINLAND	ETSI
ERNET India **(ERNET India)**	INDIA	TSDSI
ESA **(ESA - European Space Agency)**	NETHERLANDS	ETSI
E-SPACE **(E-SPACE SAS)**	FRANCE	ETSI
ESSEN INNOVATION **(ESSEN INNOVATION COMPANY LIMITED)**	CHINA	CCSA
E-surfing Digital **(E-surfing Digital Life Technology Co., Ltd)**	CHINA	CCSA
Esurfing IoT **(Esurfing IoT Tech Co., Ltd)**	CHINA	CCSA
ETELM **(Electronique Telematique ETELM)**	FRANCE	ETSI
Etherstack Wireless Limited **(Etherstack Wireless Limited)**	UNITED KINGDOM	ETSI
ETRI **(Electronics & Telecommunications Research Institute)**	KOREA (REPUBLIC OF)	TTA
ETS-Lindgren Europe **(ETS-Lindgren Europe)**	FINLAND	ETSI
EURECOM **(EURECOM)**	FRANCE	ETSI
Eurofins KCTL **(Eurofins KCTL Co. Ltd)**	KOREA (REPUBLIC OF)	ETSI
European Commission **(EC - European Commission)**	BELGIUM	ETSI
European Patent Organisation **(European Patent Organisation)**	GERMANY	ETSI
EUTC **(European Utilities Telecom Council (EUTC))**	BELGIUM	ETSI
Eutelsat Group **(Eutelsat S.A.)**	FRANCE	ETSI
EVE Compliancy Solutions **(EVE Compliancy Solutions)**	NETHERLANDS	ETSI
Everactive **(Everactive)**	UNITED STATES	ATIS
F5 **(F5, Inc.)**	UNITED STATES	ETSI
Fabasoft AG **(Fabasoft AG)**	AUSTRIA	ETSI
Facebook Japan G.K. **(Facebook Japan G.K.)**	JAPAN	ARIB
Fastweb S.p.A. **(Fastweb S.p.A.)**	ITALY	ETSI
FAU **(Friedrich-Alexander-Universität Erlangen-Nürnberg)**	GERMANY	ETSI
FBK **(Fondazione Bruno Kessler)**	ITALY	ETSI
FCC **(Federal Communications Commission)**	UNITED STATES	ATIS
Fiberhome Technologies Group **(Fiberhome Technologies Group)**	CHINA	CCSA
FirstNet	UNITED STATES	ATIS

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(FirstNet)		
FORCE Technology **(FORCE Technology)**	DENMARK	ETSI
Ford **(Ford Motor Company)**	UNITED STATES	ETSI
Fraunhofer FOKUS **(Fraunhofer Institute for Open Communication Systems FOKUS)**	GERMANY	ETSI
Fraunhofer HHI **(Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute)**	GERMANY	ETSI
Fraunhofer IIS **(Fraunhofer Institut für Integrierte Schaltungen IIS)**	GERMANY	ETSI
Frequentis AG **(Frequentis AG)**	AUSTRIA	ETSI
Fujitsu Limited **(Fujitsu Limited)**	JAPAN	ETSI
Fujitsu Limited **(Fujitsu Limited..)**	JAPAN	ARIB
Fujitsu Limited **(Fujitsu Limited.)**	JAPAN	TTC
Futurewei **(Futurewei Technologies Inc.)**	UNITED STATES	ETSI
Futurewei Technologies **(Futurewei Technologies)**	UNITED STATES	ATIS
G+D MS **(Giesecke+Devrient Mobile Security Germany GmbH)**	GERMANY	ETSI
Gatehouse Satcom A/S **(Gatehouse Satcom A/S)**	DENMARK	ETSI
GDCNI **(Guangdong Communications and Networks Institute)**	CHINA	CCSA
GE Network Technologies, LLC **(GE Network Technologies, LLC)**	UNITED STATES	ATIS
GEESPACE **(ZHE JIANG GEESPACE TECHNOLOGY CO., LTD.)**	CHINA	CCSA
Gigaset Technologies **(Gigaset Technologies GmbH)**	GERMANY	ETSI
Gilat **(Gilat Satellite Networks Ltd)**	ISRAEL	ETSI
GIST **(Gwangju Institute of Science and Technology)**	KOREA (REPUBLIC OF)	TTA
GLOBALSTAR Inc. **(GLOBALSTAR Inc.)**	UNITED STATES	ETSI
GM - ATCI **(General Motors - ATCI)**	ISRAEL	ETSI
Google Ireland Limited **(Google Ireland Limited)**	IRELAND	ETSI
Group 2000 **(Group 2000 Nederland B.V.)**	NETHERLANDS	ETSI
GTRC **(Georgia Tech Research Corporation)**	UNITED STATES	ETSI
GUANGDONG GENIUS TECHNOLOGY CO **(GUANGDONG GENIUS TECHNOLOGY CO., LTD.)**	CHINA	CCSA
Guangdong OPPO Mobile Telecom. **(Guangdong OPPO Mobile Telecommunications Corp., Ltd)**	CHINA	CCSA
GW **(Greenerwave)**	FRANCE	ETSI
HA/ST **(HARTING Stiftung & Co. KG)**	GERMANY	ETSI
Hanbat National University **(Hanbat National University)**	KOREA (REPUBLIC OF)	TTA
Hangzhou Mengyuxiang **(Hangzhou Mengyuxiang Network Technology Corp., Ltd.)**	CHINA	CCSA
Harman GmbH **(Harman Becker Automotive Systems GmbH)**	GERMANY	ETSI
HEAD acoustics GmbH **(HEAD acoustics GmbH)**	GERMANY	ETSI
Hewlett-Packard Enterprise	FRANCE	ETSI

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(Hewlett-Packard Enterprise)		
HiSilicon Technologies Co. Ltd **(HiSilicon Technologies Co.Ltd)**	CHINA	CCSA
HISPASAT SA **(HISPASAT SA)**	SPAIN	ETSI
HOME OFFICE **(HOME OFFICE)**	UNITED KINGDOM	ETSI
Honda Motor Co., Ltd **(Honda Motor Co., Ltd)**	JAPAN	ARIB
Honor **(Honor Device Co., Ltd.)**	CHINA	CCSA
Honor **(Honor Device Co., Ltd)**	CHINA	ETSI
HTC Communications Co., Ltd. **(HTC Communications Co., Ltd.)**	CHINA	CCSA
Huawei Device Co., Ltd **(Huawei Device Co., Ltd)**	CHINA	CCSA
HUAWEI TECH. GmbH **(HUAWEI TECHNOLOGIES Duesseldorf GmbH)**	GERMANY	ETSI
Huawei Tech.(UK) Co.. Ltd **(Huawei Technologies (UK) Co., Ltd.)**	UNITED KINGDOM	ETSI
Huawei Technologies (Korea) **(Huawei Technologies (Korea))**	KOREA (REPUBLIC OF)	TTA
HUAWEI TECHNOLOGIES Co. Ltd. **(Huawei Technologies Co. Ltd.)**	CHINA	ETSI
HuaWei Technologies Co., Ltd **(HuaWei Technologies Co., Ltd)**	CHINA	CCSA
Huawei Technologies France **(Huawei Technologies France)**	FRANCE	ETSI
Huawei Technologies Japan K.K. **(Huawei Technologies Japan K.K.)**	JAPAN	TTC
HUAWEI Technologies Japan K.K. **(HUAWEI Technologies Japan K.K.)**	JAPAN	ARIB
Huawei Technologies R&D UK **(Huawei Technologies Research & Development (UK) Limited)**	UNITED KINGDOM	ETSI
Huawei Technologies Sweden AB **(Huawei Technologies Sweden AB)**	SWEDEN	ETSI
Huawei Telecommunication India **(Huawei Telecommunication (India) Co. Pvt. Ltd.)**	INDIA	TSDSI
Husqvarna AB **(Husqvarna AB (publ))**	SWEDEN	ETSI
Hytera Communications Corp. **(Hytera Communications Corporation Limited)**	CHINA	CCSA
Hyundai Motor Company **(Hyundai Motor Company)**	KOREA (REPUBLIC OF)	TTA
IBM Europe **(IBM Europe)**	GERMANY	ETSI
ICS **(Institute for Communication Systems - University of Surrey)**	UNITED KINGDOM	ETSI
IDEMIA **(IDEMIA)**	FRANCE	ETSI
IDRBT **(Institute for Development and Research in Banking Technology)**	INDIA	TSDSI
III **(Institute for Information Industry)**	TAIWAN, PROVINCE OF CHINA	ETSI
IIIT Bangalore **(International Institute of Information Technology - Bangalore)**	INDIA	TSDSI
IIIT Naya Raipur **(International Institute of Information Technology, Naya Raipur)**	INDIA	TSDSI
IISc, Bangalore **(Indian Institute of Science, Bangalor)**	INDIA	TSDSI
IIT Bhilai **(Indian Institute of Technology Bhilai)**	INDIA	TSDSI
IIT Bombay **(Indian Institute of Technology Bombay)**	INDIA	TSDSI
IIT Delhi	INDIA	TSDSI

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(Indian Institute of Technology Delhi)		
IIT Gandhinagar **(Indian Institute of Technology Gandhinagar)**	INDIA	TSDSI
IIT JODHPUR **(Indian Institute of Technology Jodhpur)**	INDIA	TSDSI
IIT Kanpur **(Indidan Institute of Technology Kanpur)**	INDIA	TSDSI
IIT Mandi **(Indian Institute of Technology Mandi)**	INDIA	TSDSI
IIT Patna **(Indian Institute of Technology Patna)**	INDIA	TSDSI
IIT, Kharagpur **(IIT, Kharagpur)**	INDIA	TSDSI
IMDA **(Infocomm Media Development Authority)**	SINGAPORE	ETSI
Imperial College London **(Imperial College of Science Technology and Medicine)**	UNITED KINGDOM	ETSI
IMU **(Istanbul Medipol University)**	TÜRKIYE	ETSI
Indian Institute of Tech (H) **(Indian Institute of Technology Hyderabad)**	INDIA	TSDSI
Indian Institute of Tech (M) **(Indian Institute of Technology Madras)**	INDIA	TSDSI
INFINEON TECHNOLOGIES **(Infineon Technologies)**	GERMANY	ETSI
Inmarsat **(Inmarsat)**	UNITED KINGDOM	ETSI
Institut Mines-Telecom **(Institut Mines-Telecom)**	FRANCE	ETSI
Institute VEDECOM **(Institute VEDECOM)**	FRANCE	ETSI
Intel **(Intel)**	UNITED STATES	ATIS
Intel Belgium SA/NV **(Intel Belgium SA/NV)**	BELGIUM	ETSI
Intel China Ltd. **(Intel China Ltd.)**	CHINA	CCSA
Intel Corporation (UK) Ltd **(Intel Corporation (UK) Ltd)**	UNITED KINGDOM	ETSI
Intel Corporation Italia SpA **(Intel Corporation Italia SpA)**	ITALY	ETSI
Intel Corporation SAS **(Intel Corporation SAS)**	FRANCE	ETSI
Intel Deutschland GmbH **(Intel Deutschland GmbH)**	GERMANY	ETSI
Intel Ireland **(Intel Ireland Ltd)**	IRELAND	ETSI
Intel Sweden AB **(Intel Sweden AB)**	SWEDEN	ETSI
Intel Technology India Pvt Ltd **(Intel Technology India Pvt. Ltd.)**	INDIA	TSDSI
Intel Technology Poland SP Zoo **(Intel Technology Poland SP Zoo)**	POLAND	ETSI
Intellian Technologies **(Intellian Technologies)**	KOREA (REPUBLIC OF)	TTA
Intelsat **(Intelsat)**	UNITED STATES	ATIS
InterDigital Belgium. LLC **(InterDigital Belgium, LLC)**	BELGIUM	ETSI
InterDigital Canada **(InterDigital Canada)**	CANADA	ATIS
InterDigital Communications **(InterDigital Communications Corporation)**	UNITED STATES	ATIS
InterDigital Finland Oy **(InterDigital Finland Oy)**	FINLAND	ETSI
InterDigital France R&D, SAS	FRANCE	ETSI

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(InterDigital France R&D, SAS)		
InterDigital New York **(InterDigital New York)**	UNITED STATES	ATIS
InterDigital Pennsylvania **(InterDigital Pennsylvania)**	UNITED STATES	ATIS
InterDigital, Europe, Ltd. **(InterDigital, Europe, Ltd.)**	UNITED KINGDOM	ETSI
InterDigital, Inc. **(InterDigital, Inc.)**	UNITED STATES	ETSI
Intersec **(Intersec SA)**	FRANCE	ETSI
Intertek **(Intertek)**	UNITED KINGDOM	ETSI
IPCom GmbH & Co.KG **(IPCom GmbH & Co.KG)**	GERMANY	ETSI
IPLOOK **(IPLOOK Networks Co., Ltd.)**	CHINA	CCSA
iQoo **(iQoo Software Technology (Shanghai) Co., Ltd.)**	CHINA	CCSA
Iridium Satellite LLC **(Iridium Satellite LLC)**	UNITED STATES	ATIS
IRT Saint Exupery **(Institut de recherche technologique Saint Exupery)**	FRANCE	ETSI
ISED **(Innovation, Science and Economic Development Canada)**	CANADA	ETSI
ISRO **(Indian Space Research Organisation)**	INDIA	TSDSI
ISSDU **(Information Security Service Digital United Inc.)**	TAIWAN, PROVINCE OF CHINA	ETSI
ITL **(Innovative Technology Lab Co., Ltd)**	KOREA (REPUBLIC OF)	TTA
ITOCHU Techno-Solutions Corp **(ITOCHU Techno-Solutions Corporation)**	JAPAN	TTC
ITRI **(Industrial Technology Research Institute)**	TAIWAN, PROVINCE OF CHINA	ETSI
ITRON SAS **(ITRON SAS)**	FRANCE	ETSI
Ittiam System Pvt Ltd **(Ittiam System Pvt Ltd)**	INDIA	TSDSI
Japan Radio Co., Ltd **(Japan Radio Co., Ltd)**	JAPAN	ARIB
Jetflow **(Jetflow Technologies Co., Ltd)**	CHINA	CCSA
Jio **(Jio Estonia OÜ)**	ESTONIA	ETSI
JMA Wireless **(JMA Wireless)**	UNITED STATES	ATIS
John Deere GmbH & Co. KG **(John Deere GmbH & Co. KG)**	GERMANY	ETSI
Johns Hopkins University APL **(Johns Hopkins University Applied Physics Laboratory)**	UNITED STATES	ATIS
JSI GmbH **(JSI GmbH)**	GERMANY	ETSI
Juniper Networks **(Juniper Networks)**	UNITED STATES	ETSI
KAIST **(Korea Advanced Institute of Science and Technology)**	KOREA (REPUBLIC OF)	TTA
Kapsch TrafficCom AG **(Kapsch TrafficCom AG)**	AUSTRIA	ETSI
KDDI Corporation **(KDDI Corporation)**	JAPAN	TTC
KDDI Corporation **(KDDI Corporation)**	JAPAN	ARIB
Kepler **(Kepler Communications GmbH)**	GERMANY	ETSI
Keysight Technologies UK Ltd	UNITED KINGDOM	ETSI

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(Keysight Technologies UK Ltd)		
KIPO **(Korean Intellectual Property Office)**	KOREA (REPUBLIC OF)	TTA
Kontron Transportation France **(Kontron Transportation France S.A.S)**	FRANCE	ETSI
Kookmin University **(Kookmin University)**	KOREA (REPUBLIC OF)	TTA
Korea Testing Laboratory **(Korea Testing Laboratory)**	KOREA (REPUBLIC OF)	TTA
Korea University **(Korea University)**	KOREA (REPUBLIC OF)	TTA
KPN N.V. **(Koninklijke KPN N.V.)**	NETHERLANDS	ETSI
KRRI **(Korea Railroad Research Institute)**	KOREA (REPUBLIC OF)	TTA
KT Corp. **(KT Corporation)**	KOREA (REPUBLIC OF)	TTA
Kymeta Corporation **(Kymeta Corporation)**	UNITED STATES	ETSI
Kyocera Corporation **(Kyocera Corporation)**	JAPAN	ARIB
Kyonggi University **(Kyonggi University)**	KOREA (REPUBLIC OF)	TTA
Kyoto University **(Kyoto University)**	JAPAN	ETSI
L.M. Ericsson Limited **(L.M. Ericsson Limited)**	IRELAND	ETSI
L3Harris Technologies **(L3Harris Technologies)**	UNITED STATES	ATIS
Langbo **(Shanghai Langbo Communication Technology Co., Ltd.)**	CHINA	CCSA
Lansus **(Lansus Technologies Inc.)**	CHINA	CCSA
LEGRAND FRANCE **(LEGRAND FRANCE ISERE)**	FRANCE	ETSI
Lekha Wireless Solutions **(Lekha Wireless Solutions Pvt Ltd)**	INDIA	TSDSI
Lenovo (Beijing) Ltd **(Lenovo (Beijing) Ltd)**	CHINA	CCSA
Lenovo Future Communications **(Lenovo Future Communications Technology (Chongqing) Co., Ltd.)**	CHINA	CCSA
Lenovo Information Technology **(Lenovo (Beijing) Information Technology Co., Ltd.)**	CHINA	CCSA
Leonardo SpA **(Leonardo SpA)**	ITALY	ETSI
LG Electronics Deutschland **(LG Electronics Deutschland GmbH)**	GERMANY	ETSI
LG Electronics Finland **(LG Electronics Finland Lab Oy)**	FINLAND	ETSI
LG Electronics France **(LG Electronics France)**	FRANCE	ETSI
LG Electronics Inc. **(LG Electronics Inc.)**	KOREA (REPUBLIC OF)	TTA
LG Electronics Polska **(LG Electronics Polska Sp. z.o.o.)**	POLAND	ETSI
LG Electronics UK **(LG Electronics UK Ltd)**	UNITED KINGDOM	ETSI
LG Uplus **(LG Uplus)**	KOREA (REPUBLIC OF)	TTA
Ligado Networks **(Ligado Networks)**	UNITED STATES	ETSI
LKA Niedersachsen **(Landeskriminalamt Niedersachsen)**	GERMANY	ETSI
Lockheed Martin **(Lockheed Martin)**	UNITED STATES	ATIS
Logius	NETHERLANDS	ETSI

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(Logius)		
Lynk Global **(Lynk Global)**	UNITED STATES	ATIS
Magister Solutions Ltd **(Magister Solutions Ltd)**	FINLAND	ETSI
Maketh Secure Limited **(Maketh Secure Limited)**	UNITED KINGDOM	ETSI
Marquis Technologies **(Marquis Technologies Pvt Ltd)**	INDIA	TSDSI
Marvell Technology, Inc. **(Marvell Technology, Inc.)**	UNITED STATES	ATIS
MATRIXX Software **(MATRIXX Software, Inc.)**	UNITED STATES	ETSI
Mavenir **(Mavenir Systems, Inc)**	UNITED STATES	ETSI
MaxWave Micro **(MaxWave Microelectronics Ltd.)**	CHINA	CCSA
MediaTek (Chengdu) Inc. **(MediaTek (Chengdu) Inc.)**	CHINA	CCSA
MediaTek (Hefei) Inc. **(MediaTek (Hefei) Inc.)**	CHINA	CCSA
MediaTek (Shenzhen) Inc. **(MediaTek (Shenzhen) Inc.)**	CHINA	CCSA
MediaTek (Wuhan) Inc. **(MediaTek (Wuhan) Inc.)**	CHINA	CCSA
MediaTek Beijing Inc. **(MediaTek Beijing Inc.)**	CHINA	CCSA
MediaTek Finland **(MediaTek Wireless Finland Oy)**	FINLAND	ETSI
MediaTek Germany GmbH **(MediaTek Germany GmbH)**	GERMANY	ETSI
MediaTek Inc. **(MediaTek Incorporated)**	TAIWAN, PROVINCE OF CHINA	ETSI
Mediatek India Technology Pvt. **(Mediatek India Technology Pvt. Ltd.)**	INDIA	TSDSI
MediaTek Korea Inc. **(MediaTek Korea Inc.)**	KOREA (REPUBLIC OF)	TTA
MediaTek Sweden AB **(MediaTek Sweden AB)**	SWEDEN	ETSI
MediaTek UK **(MTK Wireless Ltd)**	UNITED KINGDOM	ETSI
MeitY **(Ministry of Electronics & Information Technology)**	INDIA	TSDSI
Meizu Technology **(Meizu Technology)**	CHINA	CCSA
Mercedes-Benz AG **(Mercedes-Benz AG)**	GERMANY	ETSI
Mesaqin.com s.r.o (Ltd.) **(Mesaqin.com s.r.o (Ltd.))**	CZECH REPUBLIC	ETSI
Meta India **(Meta India Online Services Pvt Ltd)**	INDIA	TSDSI
Meta Ireland **(Meta Platforms Ireland Ltd.)**	IRELAND	ETSI
Meta USA **(Meta USA)**	UNITED STATES	ATIS
Microchip Technology, Inc. **(Microchip Technology, Inc.)**	UNITED STATES	ATIS
Microsoft Europe SARL **(Microsoft Europe SARL)**	FRANCE	ETSI
MidWave Wireless **(MidWave Wireless)**	UNITED STATES	ATIS
MIMIT **(Ministry of Enterprises and Made in Italy)**	ITALY	ETSI
MinEA **(Ministry of Economic Affairs and Climate Policy)**	NETHERLANDS	ETSI
MINISTERE DE L'INTERIEUR	FRANCE	ETSI

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