

3GPP HIGHLIGHTS

Standards for 5G

ISSUE

01

September
2020



TECHNICAL NEWS

We look at the status of the 3GPP final 5G radio submissions for the IMT-2020 process.

We also have news from a selection of the Technical Specification Groups and Working Groups, on topics such as; Rel-16 completion in TSG CT, specification work for Telecom Management and an article about WG SA6 progress on enabling Edge Applications in 3GPP.

PARTNER FOCUS

For this first Issue, five of our Market Partners have contributed articles, in a series of thought-leading pieces, on topics as diverse as the outlook for 5G adoption amongst suppliers and operators, the prospect for automotive with 5G data arriving at the Edge, details of the SCF open 5G-FAPI suite of specifications and a story about the latest Certification initiative for Mission Critical products.

A LOOK INSIDE

Our other major section takes a look at the need for a leadership led Newcomer's Orientation initiative and contains an interview with Issam Toufik, the newly appointed Director of the 3GPP MCC.

There are also details of up-coming meetings and a first indication on how the groups might navigate a path to physical meetings, in the not-too-distant future.



FORE - WORD

Meeting the challenge

Welcome to the first issue of 3GPP Highlights, a publication that will bring you news from & about the project. As well as covering the status of the current work, we will also try to dig a little deeper, to provide you with stories that show how 3GPP is opening-up to meet the challenges that we face on the way to full blown 5G.

“No less than five 3GPP Market Partners have contributed interesting and challenging articles about their work”

A lot has been written on the COVID-19 Pandemic and the subject will pop-up in the articles in this edition of 3GPP Highlights, but we have consciously tried to focus

on the technical stuff and on the latest initiatives from the partners in 3GPP as we carry on, living and working alongside the virus.

You will never know how hard it has been to get the articles and interviews sorted into a logical order. In the end, I have settled on creating Sections for the magazine. We start with the TECHNICAL HIGHLIGHTS, containing articles that lean more towards the detailed work.

Next is the PARTNER FOCUS section. This has been the easiest to get done, as no less than five 3GPP Market Partners have contributed interesting and challenging articles about their work.

With the LOOK INSIDE section, we have some important content, about how the TSG leadership have started to initiate newcomer's sessions at plenary meetings. Also in this section, we look inside the Mobile Competence Centre (MCC) by way of an interview with the 3GPP MCC

Director, following his recent appointment to the post.

I hope that 3GPP Highlights 'Issue 01' is of interest. I would very much welcome any feedback, to help make Issue 2 – planned for February – even better.

KEVIN FLYNN

3GPP Marketing and Communications
kevin.flynn@3gpp.org



COPYRIGHT & CONTACTS

3GPP Highlights is published by 3GPP on a bi-annual basis (Cover dates: July* and February).

Contact Address: 3GPP Marcom,
c/o ETSI, 650 Route des Lucioles,
06921 Sophia Antipolis, FRANCE

Email: highlights@3gpp.org

This publication is supplied free-of-charge.

Copyright: The content provided in this publication remains the copyright of the author(s).

Copyright and Reprint Permission: We request that you credit the Author(s) as they appear on the article, or '3GPP Highlights, Issue 1'.

The online version and registration to get future editions are at:
www.3gpp.org/highlights

The Editorial group

Thanks to the following for copy, proof reading and constructive criticism:

Editorial group members:

Editor: 3GPP Marcom Officer, Kevin Flynn

Editorial Group:

TSG Chairs: Balazs Bertenyi,

Lionel Morand, Georg Mayer

MCC Director: Issam Toufik

PCG Secretary: Adrian Scrase

Editorial Oversight: PCG Chair and Vice-Chairs

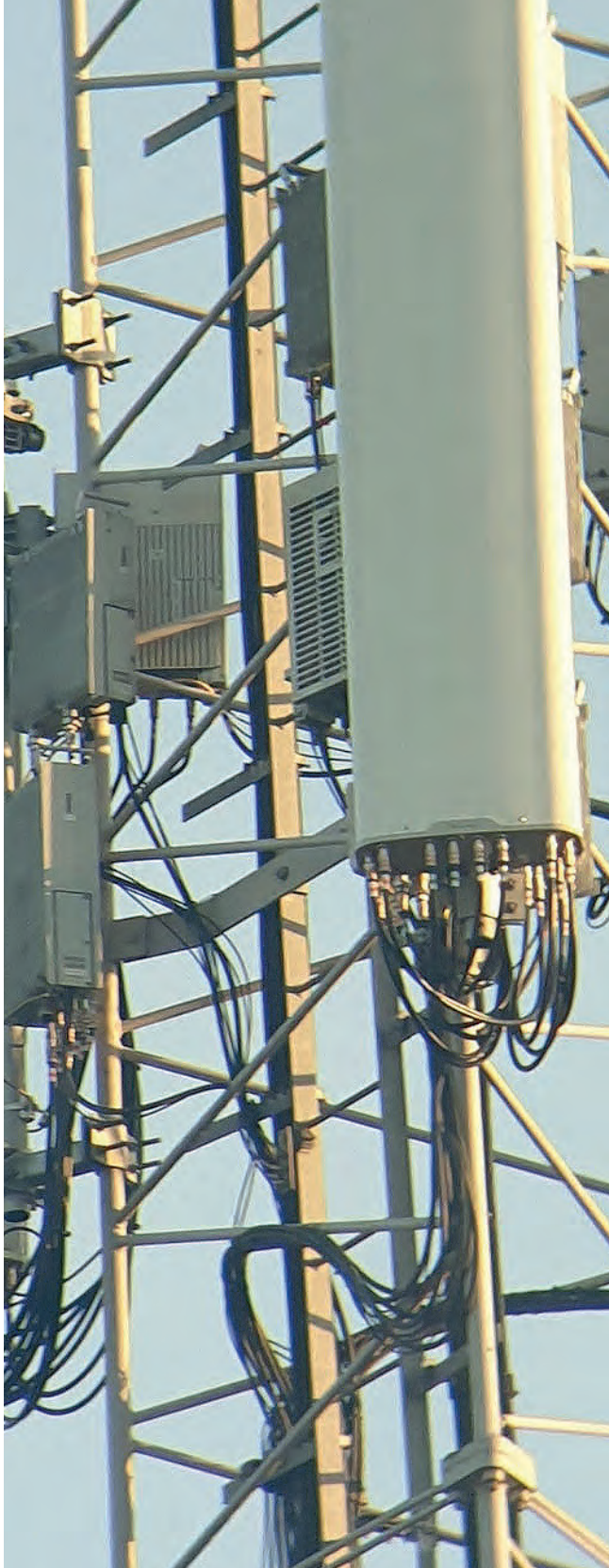


Photo by: Jeffrey, antennekaart.nl

CONTENTS

FORE-WORD	02
TECHNICAL HIGHLIGHTS	
3GPP finalizes contribution for IMT-2020, by Giovanni Romano and Balazs Bertenyi	04
When the going gets tough... , by Lionel Morand	06
3GPP Telecom Management, by the SA5 Leadership	07
Enabling Edge Computing Applications in 3GPP, by Suresh Chitturi	08
PARTNER FOCUS	
Global outlook for mobile networks and devices, by Joe Barrett	10
Made for the global market – Interview with the PCG Leaders	12
Driving Data to the Edge, by Said Tabet	14
Small Cell forum driving open 5G/SCN Products & Networks, by Prabhakar Chitrapu	15
Certification of Mission Critical products, by Chris Hogg and Harald Ludwig	16
A LOOK INSIDE	
News in brief	17
De-Mystifying 3GPP, by Georg Mayer	18
New Direction for the Mobile Competence Centre, Interview with Issam Toufik	20
CALENDAR	
Calendar of 3GPP meetings	22
END-PIECES	
The 3GPP Group Structure	23
Infographic	24

3GPP FINALIZES CONTRIBUTION FOR IMT-2020

By Giovanni Romano, TSG RAN ITU Ad-hoc group Convenor and Balazs Bertenyi, TSG RAN Chair.



IMT stands for International Mobile Telecommunications, the term used by the ITU to describe families of radio interface standards for mobile systems, starting from IMT-2000 (3G). The latest member of the IMT family is IMT-2020 which calls for support for enhanced mobile broadband (eMBB) and for new ‘use cases’ that require massive machine-type communications (mMTC) and ultra-reliable and low latency communications (URLLC).

The alignment between the standards for 5G and the geo-political commitment to IMT-2020 is set to allow for a coordinated timeline for technology evolution in all markets and the possibility of a global approach to spectrum planning as well as equipment production.

Since October 2014, 3GPP has been a leading participant in the ITU-R process to prepare the way for terrestrial radio interface specifications for IMT-2020.

In June 2019, TSG RAN delivered a complete proposal including detailed self-evaluation documentation and a ‘Statement of compliance’ to the IMT-2020 requirements.

A period of assessment then followed – by the fifteen ITU-R appointed Independent Evaluation Groups (IEGs) – up to February 2020, with no concerns being raised on the 3GPP submissions.

The latest stage of the process – completed by June 2020 – has seen the final submission of the 3GPP set of specification material and the technology overview, to be included in the ITU-R M.[IMT-2020.SPECS] Recommendation entitled “Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2020 (IMT-2020)”.



IMT-2000

IMT-Advanced

IMT-2020



UMTS (FDD & TDD), HSPA (Rel-99 onwards)

LTE (Rel-8 onwards)

LTE (Rel-10 onwards)

5G NR & LTE (Rel-15 onwards)

3GPP IMT-2020 PROPOSAL

The 3GPP “5G” final proposal includes two separate and independent submissions, defined as the single Radio Interface Technology (RIT) and the combined Sets of Radio Interface Technologies (SRIT):

Submission 1: SRIT¹

- Component RIT: NR
- Component RIT: E-UTRA/LTE incl. standalone LTE, NB-IoT, eMTC, and LTE-NR DC)

Submission 2: RIT²

- NR

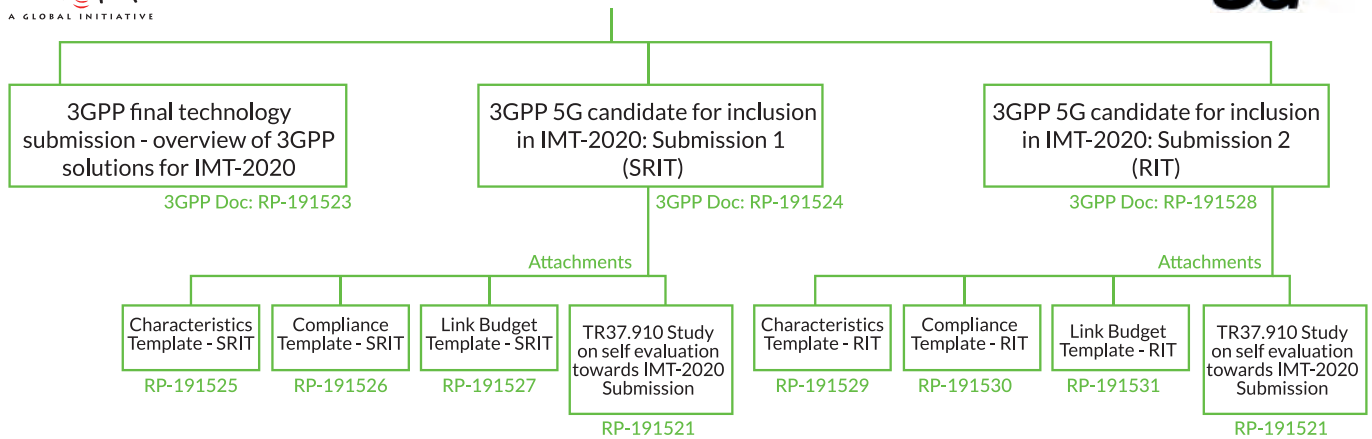
Each submission is self-contained and complete unto itself, consisting of Releases 15 & 16

The 3GPP submissions are each collectively supported by the seven 3GPP Organizational Partners (Standards bodies; ARIB, ATIS, CCSA, ETSI, TSDSI, TTA and TTC) following their approval of the following:

- An overview of the main radio characteristics.
- The Compliance Template, a self-assessment on the fulfilment of the IMT-2020 requirements.
- The Link Budget Template, providing useful information on cell radius and network planning.
- TR 37.910, providing an exhaustive analysis of 3GPP “5G”, including simulation assumptions and results performed in the self-assessment.

¹ Source: RP-191524 for the 3GPP Submission 1 SRIT to ITU-R.

² Source: RP-191528 for the 3GPP Submission 2 RIT to ITU-R.



3GPP ASPECTS INCLUDED IN IMT-2020

Based on both 3GPP Submissions, the 3GPP aspects to be included in IMT-2020, spanning Release 15 & 16, are organised as follows:

- Overview of the radio interface technology – This Section describes the main radio characteristics. For the SRIT it describes both NR and LTE, including NB-IoT, eMTC and LTE-NR DC, while for the NR RIT focuses on the NR radio aspects.
- Detailed specifications of the radio interface technology – This Section provides the list of the 3GPP specifications to be included as ‘Global Core Specifications’ and to be transposed by the 3GPP OPs as authorised Transposing Organizations. Per each specification, the title and a short synopsis is provided. The specifications are taken from:
 - **SRIT:** series 36 (“LTE (Evolved UTRA), LTE-Advanced, LTE-Advanced Pro radio technology”), 37 (“Multiple radio access technology aspects”) and 38 (“Radio technology beyond LTE”)
 - **RIT:** series 37 (“Multiple radio access technology aspects”) and 38 (“Radio technology beyond LTE”)

TAKING 5G TO THE CORE

Although the focus of Recommendation ITU-R M.[IMT-2020.SPECS] is only on radio interfaces fulfilling IMT-2020 radio requirements, information on backhauling, core network and service aspects is referenced in the 3GPP submissions, with a link to the 3GPP specifications web page provided, to give a complete system perspective.

The importance of system and core network specifications cannot be overstressed, as they address the network, terminal, and service aspects required to provide an integrated mobility solution. In addition to the radio work submitted for IMT-2020, the broader 3GPP system includes aspects such as user services, connectivity, interoperability, mobility and roaming, security, codecs and media, operations and maintenance, charging.

MORE TO DO

The process for the finalization of Recommendation ITU-R M.[IMT-2020.SPECS] is now approaching its conclusion. The 3GPP contribution to the document is paramount to its success and is a monument to the good co-operation between the ITU-R and 3GPP for more than two decades.

In the future, following the ITU-R process, 3GPP will provide updates - containing details of new features specified in Release 17 and beyond - to be included in revisions of the Recommendation.

AUTHOR’S FOOTNOTE

The completion of the submission was done thanks to the contribution of the 3GPP delegates and companies. Special thanks to: Wu Yong and Asbjörn Grövlén, Rapporteurs for the self-evaluation Study Item; Riikka Susitaival - main editor for the preparation of the final material for inclusion in M.[IMT-2020.SPECS], along with David Mazzaresse, Francesco Pica, Meng Xi and many other colleagues – you know who you are!



WHEN THE GOING GETS TOUGH...

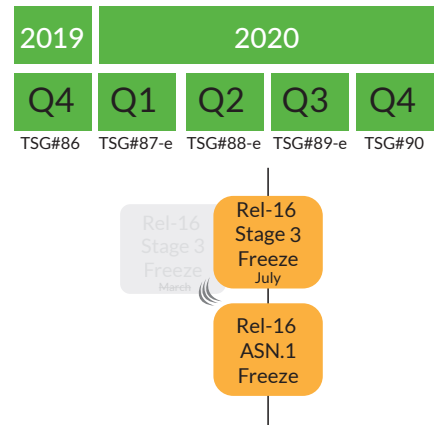
By Lionel Morand, TSG CT Chair

At the conclusion of the 3GPP TSG Plenary meetings (CT/SA/RAN#88) held electronically from June 29 to July 3 2020, 3GPP Release 16 has officially been completed, concluding the evolution of the 5G system to “5G Phase 2”.

Although we made the decision in March to delay the freeze date for Rel-16 Stage 3 (protocol aspects) by 3 months, due to the impact of the COVID-19 outbreak on the

3GPP process, the final Rel-16 completion – i.e., when the ASN.1 code and OpenAPI specification files are frozen – was achieved ‘on time’ at TSG#88e, in line with the official release roadmap.

For CT to have got through the amount of work necessary to complete the release on time, given the Stage 3 delay – is a remarkable achievement.



In Rel-16, more than 50 new or enriched features have been introduced for core networks & terminals to support advanced 5G services, such as:

- Enhancement of Ultra-Reliable Low Latency Communication (URLLC) support in 5G Core network (5GC), to provide data transfer capability with strict performance requirements, to fulfil the demands of vertical markets and applications.
- Enhancements to the 5G system protocols and interfaces to support improved capabilities for 5G Cellular IoT devices supporting also WB-EUTRA (eMTC) or NB-IoT, or both.

- 5GC enhancements to support the wireless and wireline convergence for the 5G System, supporting connectivity to 5GC using wireline broadband access and non-3GPP Trusted Access Network (in addition of the current Rel-15 Untrusted Access network).
- Support of new vertical service requirements, such as time sensitive communication, deployment of non-public networks (NPNs) and 5G VPN-type services.

Release 16 is not limited to 5G Phase 2. Miscellaneous 5GC enhancements and optimizations have been approved to improve existing services, such as mission critical services and enhanced location services.

During the COVID-19 crisis, face-to-face meetings have been replaced by electronic meetings, of longer duration and necessitating a dramatic increase in the workload of the delegates. The early e-meetings have taught us valuable lessons, which could serve us very well in the future, as the role of e-meetings is further explored – beyond the current situation.

Nevertheless, our experience so far confirms that these remote meetings are far from ideal for the delegates and I for one hope that 3GPP can resume the F2F meetings in a near future. All of the

improvements in remote tools will not replace the social aspect of the 3GPP meetings, including the offline discussions during breaks - essential to facilitate common understanding and consensus building - which is, for me, almost as important as the pure technical part.

2020 has been a challenge, but we have achieved so much. I would like to use this occasion to warmly thank the CT leadership, the WG chairs and, most of all, the delegates without whom none of it would have been possible.

CT has performed strongly to complete the Release 16 work on time

- More than 50 new or enriched features developed to support advanced 5G services in the core network and terminals
- 36 new technical specifications and 5 new technical reports
- More than 5000 documents approved in 114 meetings since the end of 2018
- 4 feasibility studies undertaken to investigate functional evolutions in the control plane and the user plane
- Miscellaneous Rel-16 enhancement/optimization of the existing protocol suit



3GPP TELECOM MANAGEMENT

By Thomas Tovinge, SA5 Chair,
Zou Lan, SA5 Vice-Chair,
Maryse Gardella, SA5 Vice-Chair



TSG SA WG5 (SA5) is responsible for all specification work for Telecom Management (TM) of the 3GPP network. This includes aspects such as operation, orchestration, assurance, fulfillment, automation and charging; covering both functional and service perspectives.

Important areas where SA5 is actively involved and developing specifications with full support of automation are:

- Telecom management architecture framework;
- Service Management, Network Management, Element Management & Charging Management;
- Management aspects of energy efficiency;

- Exposure of management services to entities external to the network operator (like verticals);
- Data collection for Telecom Management;
- Services and functions which support orchestration, assurance and analytics;
- Services and functions for charging for end users or Service Providers, including capabilities for wholesale roaming;
- Charging and Management aspects of supporting new services for public and non-public networks.

RELEASE 16 – ALL ABOUT 5G

With Rel-16 we have provided management support to new services, autonomous network management and management of new 5G network features.

Some highlights include the introduction of new management aspects of Service-level Agreements (SLA), providing management support to new services, where the SLA is translated into cross-domain requirements and then broken down to requirements within each domain.

For improving operational efficiency, 5G SON, Management of Minimization of driving test (MDT) in 5G and 5G Energy Efficiency solutions have been made in Release 16. Also, the Closed loop SLS Assurance solution has progressed, as a feature to help operators to deliver service quality by adjusting and optimizing 5G-RAN and 5G Core services.

Progress was also made on several charging work items, of particular note was the extension of Charging management into the new area of Network Slicing, building capabilities for Operators to monetize based on Network Slice lifecycle management, and Network slice Performance and Analytics.

Other work completed includes: Network Resource Model (NRM) enhancements, Streaming report mechanism for trace, performance measurement and KPI data collection, new performance measurements and KPI definitions for the 5G network, 3GPP-ONAP integration solution and Charging aspects in new domains such as 5G connection and mobility, enhancement to the charging aspects of Wireless and Wireline Convergence for 5G, NEF Northbound API, 5G Core interworking with EPC.

RELEASE 17 WORK PLAN

SA5 is now starting Release 17 work on Autonomous network levels, Enhancements on EE for 5G networks, Management of non-public networks, Enhanced Closed loop SLS Assurance, Intent driven management service for mobile networks, QoE Measurement Collection, IP-Multimedia Subsystem (IMS) Charging in 5G System (5GS), Additional network resource model features.

Ongoing Release 17 studies include topics such as; Management and orchestration aspects with integrated satellite components in a

5G network, Management data analytics service, Charging aspects of Edge Computing.

Planned completion of all SA5 Release 17 work is in September 2021. A full list of the SA5 standards is in the public domain, accessible via the web site:

<https://www.3gpp.org/specifications/specification-numbering>.

The telecom management specifications and reports are captured in 3GPP 28 series and 32 series.



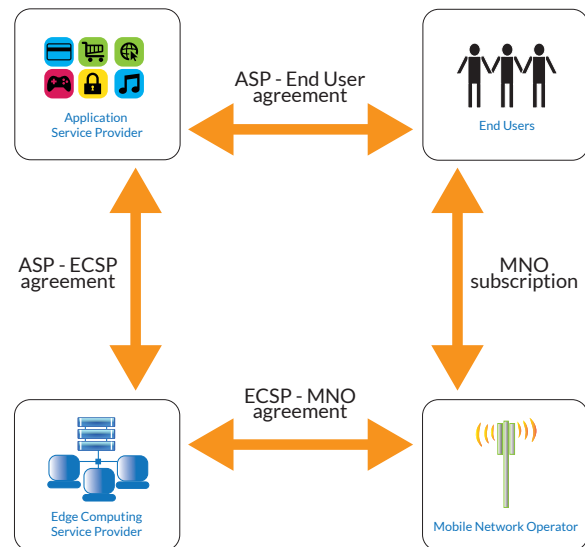
ENABLING EDGE COMPUTING APPLICATIONS IN 3GPP

By Suresh Chitturi, 3GPP Working Group SA6 Chair.

Edge Computing is a concept that enables services to be hosted close to the service consumers and provides benefits such as efficient service delivery with significant reduction in end-to-end latency and decreased load on the transport network. The benefits of Edge Computing will strengthen the promise of 5G and expand the prospects for several new and enhanced use cases – including virtual and augmented reality, IoT, Industrial IoT, autonomous driving, real-time multiplayer gaming, split computing – once the large scale infrastructure and pervasive Wide Area Networks are in place.

The deployment of edge computing involves relationships between multiple providers. Edge Computing Service Providers (ECSP) will play an important role in the construction of infrastructure used by the Mobile Network Operators (MNO) and by Application Service Providers (ASP) – enabling them to host their Edge applications close to the users.

In Release 17, we aim to provide native support of Edge Computing in 3GPP networks. These efforts include initiatives across several working groups in 3GPP including SA6 [1] [2], SA2 [3], SA3 [4], SA4 [5] and SA5 [6], which cover application layer architecture, core network enhancement, security, media processing, and management aspects respectively.



[1] 3GPP TR 23.758 - Study on application architecture for enabling Edge Applications
 [2] 3GPP TS 23.558 - Architecture for enabling Edge Applications
 [3] 3GPP TR 23.748 - Study on enhancement of support for Edge Computing in 5GC
 [4] 3GPP TR 33.839 - Study on Security Aspects to support Edge Computing in 5GC
 [5] 3GPP TR 26.803 - Study on Streaming Architecture extensions For Edge processing
 [6] 3GPP TR 28.814 - Study on enhancements of Edge Computing management

ARCHITECTURE FOR ENABLING EDGE APPLICATIONS

In January 2020, SA6 initiated normative specification work on the architecture for enabling Edge Applications based on the comprehensive study and conclusions in TR 23.758 [1]. The objective of the work is to define an enabling layer to facilitate communication between the Application Clients (AC) running on the UE and the Edge Application Servers (EAS) deployed on the Edge Data Network.

This includes aspects of service provisioning and EAS discovery. In addition, the work aims to provide support services such as application context transfer between EASs for service continuity, service enablement and capability exposure APIs towards the EAS.

The application architecture for enabling Edge Applications is designed based on the following architectural principles:

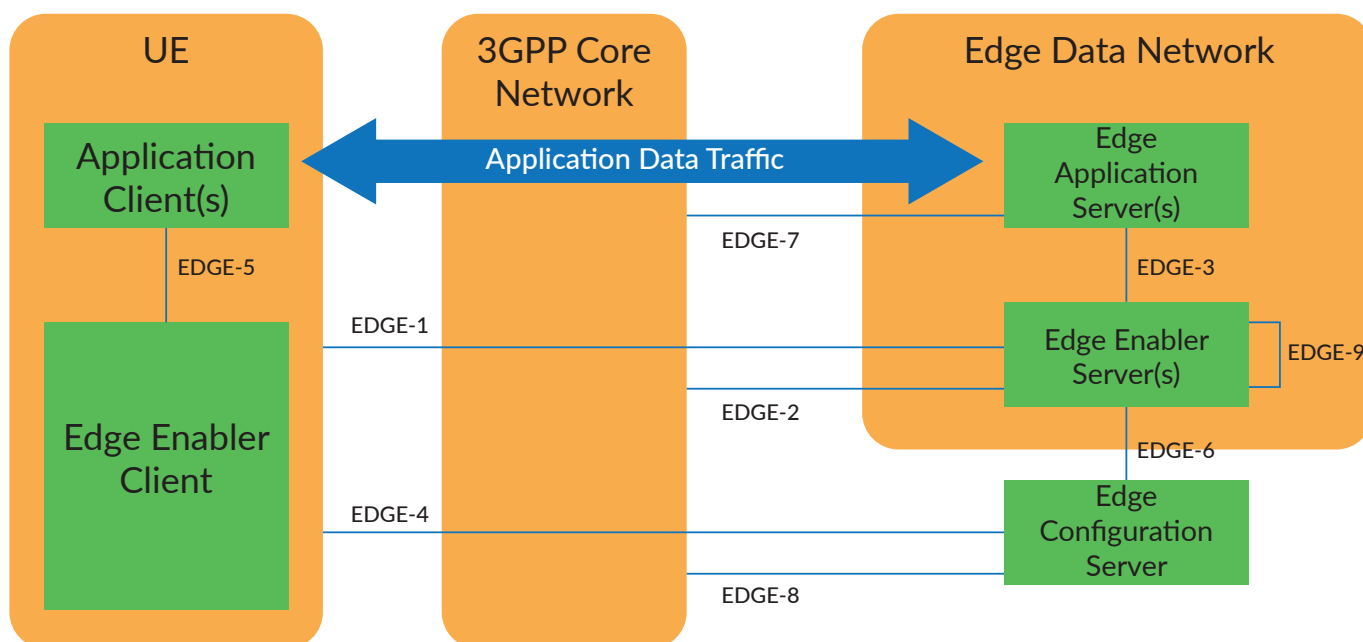
- Application Client portability: Changes in logic of AC to interact with EAS, compared to existing cloud environment, are avoided.
- Edge Application Server portability: Changes in logic of Application Servers when resident in Edge Hosting Environment, compared to existing cloud environment, are avoided. An EAS should be able to run in Edge Hosting Environments of multiple ECSP, without any modification.
- Service differentiation: The mobile network operator is able to provide service differentiation (e.g. by enabling/disabling the Edge Computing features).
- Flexible deployment: There can be multiple ECSPs within a single PLMN operator network. The Edge Data Network can be a subarea of a PLMN.
- Interworking with 3GPP network: To provide Edge Computing features, already developed or to be developed in 3GPP network (such as location service, QoS, AF traffic influence), to EAS, the application architecture supports interworking with 3GPP network using existing capability exposure functions such as NEF and PCF.

“The benefits of Edge Computing will strengthen the promise of 5G and expand the prospects for several new and enhanced use cases”

The below application architecture (documented in 3GPP TS 23.558 [2]) comprises of Edge Enabler Server (EES), primarily responsible for enabling discovery of the EASs; Edge Enabler Client (EEC), providing support functions, such as EAS discovery to the ACs in the UE; and, Edge Configuration Server (ECS), providing configurations to the EEC to connect with an EAS.

Application Clients on the UE can be “Edge-aware” and “Edge-unaware”. With Edge-aware applications, the ACs get the full

benefit of the SA6 architecture by directly interacting with and thus leveraging all the benefits of the EEC. For Edge-unaware applications, the SA6 architecture provides significant benefits on behalf of the ACs without their direct participation. SA2 is also working on solutions for edge application support (e.g. using DNS for IP routing to an EAS) that can be deployed independently or in conjunction with the SA6 architecture.



SUMMING-UP

In summary, with the support of the enabling layer, 3GPP networks offer native support to several Edge capabilities, including:

- **Rich discovery:** On-demand service provisioning by the ECS and the support of query filters on the EES to allow rich discovery of the EASs by an AC via the EEC.
- **Dynamic availability:** Due to the flexible nature, and the availability of Edge networks, EAS capabilities can vary due to multiple reasons, such as change in deployments, mobility of the UE etc. UE can subscribe to such dynamic changes to fine tune the services offered to the AC.
- **Network capability exposure:** The EASs can utilize service API(s) exposed by the EES, which in turn are built on the capabilities of

SCEF/NEF northbound APIs (with and without CAPIF framework), enabling EASs to access 3GPP network capability exposure functions.

- **Support for service continuity:** With UE mobility, the serving Edge or Cloud may change or become more suitable for serving the AC. To enable continuity of service in such scenarios, the architecture supports transfer of the UE’s application context between the Edge networks for seamless service continuity.

These features along with many other capabilities offered by 3GPP in Release 17, will pave the way towards global adoption of Edge Computing and pervasive deployments of Edge Networks that can serve both the end consumers and industry verticals.

GLOBAL OUTLOOK FOR MOBILE NETWORKS AND DEVICES

By Joe Barrett, President - Global Mobile Suppliers Association



Despite the slowdown in 5G subscriptions in some markets due to Covid-19, other markets have compensated with the total forecast for 5G subscriptions by end of 2020 increasing. However, in addition to faster mobile broadband, the value of 5G will be in new services, not new subscriptions, as 5G technology is deployed in additional spectrum offering greater capacity and download speeds to open up sections of industry looking to enhance productivity, streamline process controls and ultimately, reduce costs.

NETWORKS

Mobile network deployment is focused on 5G in 2020 with 388 operators investing in 5G network technology by the end of June. Of these, 102 networks were commercial. All have been based on the 3GPP Non-Stand-Alone (NSA) specification with the focus on enhancing existing 3GPP 4G

mobile broadband networks with higher data rates and more reliable connectivity. That focus is now shifting to Stand Alone (SA) with 5G New Radio (NR) and 5G core

may skip NSA and go straight to SA-5G-NR with 5GC to leverage new service opportunities in vertical industries. The industry is deploying 4G-5G in the oil

“The value of 5G will be in new services, not new subscriptions, as 5G technology is deployed in additional spectrum offering greater capacity and download speeds to open up sections of industry looking to enhance productivity, streamline process controls and ultimately, reduce costs.”

(5GC) architecture required to deliver greater speed, flexible network design, low latency and operational costs savings needed to delivery specific mobile services to support the digitization of industry.

Mobile network operators (MNOs) who will launch 5G in the coming months

and gas sector, ports, airports, mining, manufacturing and utilities. Interest in localised stand-alone private 4G or 5G networks is also growing as industry sees mobile as a reliable high-performance, secure access technology to meet business critical communications.



4G-5G ECOSYSTEM

The 5G ecosystem of devices and chipsets has continued to grow swiftly in 2020. We are reporting 317 announced 5G devices by end of June, with a continued rapid rise of commercially available 5G devices, now at 135. This is a 60-70% growth compared to January 2020. There are 16 different form factors with Smartphones/phones and Customer Premises Equipment (CPE) for Fixed Wireless Access accounting for almost 70% of announcements.

Fixed Wireless Access (FWA) has seen growing interest due to Covid-19 and the demand for a reliable home broadband experience. At least 406 MNOs have launched FWA service with many MNOs also rapidly increased network capacity to satisfy demand that shifted from cities to remote homeworking demonstrating the flexibility of using mobile as the primary broadband service or to enhance an existing fixed broadband service.

The 4G ecosystem is also growing. 831 new 4G devices were announced in the first 6 months of 2020. 394 (47.4%) were smartphones/phones, 98 of which were Cat-12 device capable or higher.

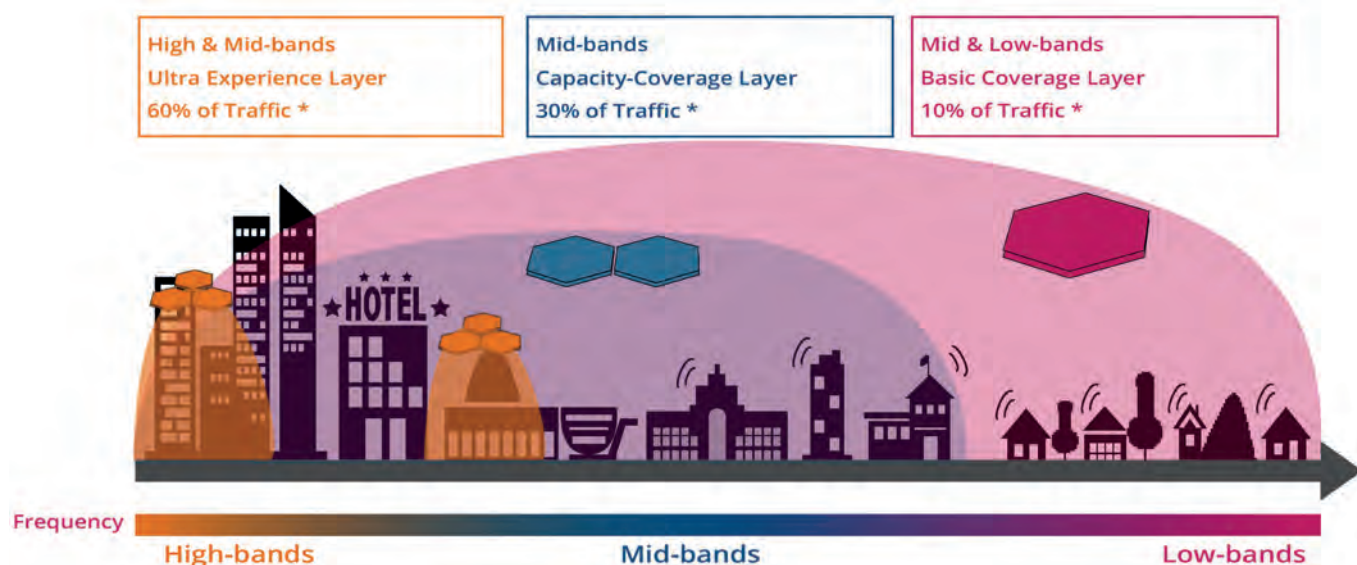
SPECTRUM

After the success of gaining high-band millimetric wave spectrum for 5G mobile at the WRC-19 conference in November 2019, with more than 11 GHz of spectrum available in most countries for 5G, the WRC-23 spectrum focus has now moved on to additional mid-band and low-band spectrum to support long term market growth in the second half of this decade. Regulators are actively licensing 5G and GSA recommends that large contiguous amounts of harmonized spectrum, with suitable regulatory conditions, is made available including low-bands 600/700 MHz, mid-bands 2.3, 2.6, 3.3-4.2, 4.4-5 GHz and high bands 24.25-29.5/37-43.5/45.5 GHz – 47.2/47.2 – 48.2 GHz.

High-band spectrum such as 26/28/40 GHz delivers extreme capacity and 800-1000 MHz of contiguous spectrum will be needed per network as we go into 2021.

Mid-band spectrum provides such as 3.4-4.2GHz enables Coverage & Capacity with 80-100 MHz per MNO needed.

Low-band offers Extended Coverage with up to 20 MHz channel bandwidth needed from 2020.



5G

As noted earlier, there is a growing market for stand-alone private 4G and 5G networks for vertical industries. For example, regulators in Finland, Germany, Japan, UK and Sweden have either set aside spectrum for enterprise use or are considering this approach. The Citizens Broadband Radio Service (CBRS) action of band 48 (3.55 GHz – 3.70 GHz) in the US is also expected to expand the private network space. MNOs have been providing private networks using licensed spectrum for many years and are a good route for enterprise based private 4G or 5G. Some enterprise companies may however wish to share MNO spectrum or access their own. We support the use of MNO spectrum, sharing spectrum and dedicated spectrum for enterprise networks, depending on application and needs

CONCLUSION

Around 10% of MNOs have commercially launched 3GPP compliant 5G networks and we expect this to accelerate as the industry fully adopts 5G in 2020 and 2021. The devices ecosystem is developing faster than the 4G ecosystem with a wide range of devices coming to market.

By the end of 2021 we expect closer to 40% of MNOs will have launched 5G networks.

www.gsacom.com 

MADE FOR THE GLOBAL MARKET

With help from the 3GPP Project Coordination Group (PCG) Chair and the three Vice-Chairs, we look back to the creation of the 3rd Generation Partnership Project at a time when International cooperation was needed to allow mobile broadband standards to reach their full potential. We also asked them for some insight into what comes next for the project.

In 1998 the founding Organizational Partners - Standards Developing Organizations (SDOs) - from Asia, Europe and North America, formed a common project to co-operate on the production of technical specifications for a 3rd Generation mobile system - based on GSM evolution. 3GPP was created to do the technical work, with the Organizational Partners (OPs) providing the membership.

We asked ETSI Director General, Luis Jorge Romero, about the ETSI GSM standards. How big a risk was it to move that work into 3GPP and why was it needed?

Luis Jorge Romero: "There was an element of risk, given that the GSM specifications were ETSI's, but we all understood that we had to work with the other colleagues around the world towards a global system, with all of the potential that offered."

"we all understood that we had to work with the other colleagues around the world towards a global system, with all of the potential that offered."

ETSI (TC SMG) was very advanced with GSM Phase 2+ and was already working on what we called the Universal Mobile Telecommunications System (UMTS). With the concept of GSM evolution in place, we could then work to establish 3GPP with like-minded partners.

The vision was clear that rather than having a different standard developed in each country or region and then wait for the market to declare a winner, we managed to get one step ahead, where everyone in the partnership agreed on a common standard."

SDOs MOVE TO ALIGN ON 3G

In both Korea and Japan, at the same time, there had been progress towards market liberalization and an openness to search beyond national borders for the next step in cellular.

Kyoung Cheol Koo, Vice President of TTA, shares his views on how TTA decided on the best way forward for 3G.

Kyoung Cheol Koo: "In 1996, the first commercial CDMA service was launched in Korea, which was a great step up toward a leadership role in telecommunications. Then, quite soon after we had to plan for the move to 3G (IMT-2000), so we were facing a choice between WCDMA (UMTS) and CDMA-2000.

There was some debate - even at government level - and there was strong support for CDMA-2000, as a mature commercial service. That said, 3GPP was also a strong option for the future, from the TTA perspective. We wanted to avoid divergence, for the good of the users and industry and it was obvious that the partnership would provide an opportunity for improving global manufacturing progress and competitiveness."



BRINGING ECONOMIES OF SCALE

Prior to 1998, the U.S. had successfully deployed several networks based on national standards, that were influential in international deployments. However, the global market was still fragmented.

As the market and technical capabilities grew, the U.S. was also planning its future technical direction, with the T1 standards body (later to become a part of ATIS), working on wireless multimedia and messaging services (WIMS), using W-CDMA technology.

ATIS President and CEO Susan Miller explains how the industry pulled together to align the strong U.S. incumbent service providers and vendors to look towards an international solution for 3G.

Susan Miller: "Early on, the U.S. industry recognized that moving to global technical standards for the third generation would deliver economies of scale leading to reduced costs and creating new opportunities for equipment vendors in the international market."

With 3GPP, we strove to help create the partnership model that would accommodate regional innovation and requirements while delivering global technical alignment.”

With Japan, Korea the U.S and Europe all in 3GPP at the beginning, China’s Ministry of Information Industry (MII) was also preparing the way for its own standards developing organization – what would become the CCSA – to sign up as a 3GPP Organizational Partner, in 1999.

TOWARDS 5G

India took a little longer to join – with the TSDSI becoming an OP on the 1st of January 2015. We asked Pamela Kumar, the TSDSI Director General, how 4G R&D in India had shaped their view on how to engage in standards for 5G.

Pamela Kumar: “India announced the launch of 2G wireless communication in 1995 but it was only in 2008 that there was an exponential growth, from 200 to 800 Million subscribers is less than 3 years. 3G deployments were then announced in 2008, with them taking-off in 2017, with nearly 400 million 4G connections in 2018 & almost 600 million today. With this, India is established as one of the largest LTE deployed countries, with the largest data consumption on any wireless network happening over Indian LTE 4G.

“India is hungry for new technology, but it needs to be tempered with right ‘masalas’ to make it palatable for the Indian consumer.”

India was the first country to launch commercial VoLTE services and enhanced broadcast/ multicast (eMBMS) services.

The patterns of consumption (40% rural, 90% video, 90% in regional languages; less than \$2 ARPU) are unique and with the successful deployment of each generation

of mobile telecommunications we have seen a direct bearing on the socio-economic growth of the country.

All of the above underline the fact that it is imperative for the Indian ecosystem to participate in the development of 5G to ensure rapid deployment addressing India specific requirements, driven by India specific innovations, hence enabling the next round of socio-economic development.

Since the next phase of 5G will address the various vertical use cases, it is expected that there would be more contributions from the R&D community in India to enable



Assembled PCG#12, April 2004

wide scale deployment across the various industry segments. To summarise: India is hungry for new technology, but it needs to be tempered with right “masalas” to make it palatable for the Indian consumer.”

We also asked the other PCG leaders for their views on the outlook for 5G and beyond, with a range of vertical sectors such as automotive, agriculture, smart cities, broadcast, health care, and manufacturing coming to the project.

Kyoung Cheol Koo: “Many operators have successfully launched 5G commercial B2C services based on the 3GPP specifications, but we still have a lot to do for the B2B enhancements and our support for the vertical industries. Looking ahead, with 5G specifications maturing, we recognise that we will now see the initial R&D work on 6G by next year,

I feel that it is time for us to consider the visions and KPIs for 6G from a 3GPP perspective. All of the areas you mention here will be a part of that. However, I see others where we have barely touched – coming in to the 3GPP systems – via ‘Smart-X’ technologies such as Smart City, Smart Farm, Smart Health and many more areas are possible for the ‘3GPP of everything’”

Susan Miller: “3GPP’s huge success owes much to the excellent technical work undertaken by member companies, but also to how the underlying structure balances regional and global interests. As we look to the evolution of 5G and beyond, our challenge is to maintain the spirit of innovation and cooperation in a rapidly evolving world.”

Luis Jorge Romero: “We could keep going with 5G, but with all of the G’s there are advances and at some point we usually have a leap forward, into the new. 5G is still maturing, but in three to four years we

will have to address the question; what do we need next? The next evolution could be radio, but there is also a lot of interest in core network evolution. New solutions and capabilities will be found, that will create the potential for another leap forward.

“we will now see the initial R&D work on 6G by next year”

We need to keep addressing the needs of new sectors and to find ways to build links between the diverse people already attending 3GPP and those that will come. I like the initiative to start 3GPP mentoring – where experienced delegates give a hand to newcomers. 3GPP is a complicated environment to work within, but getting up to speed should not be a lonely process.”

Along with the huge potential of 5G and clamour for the next big thing, 3GPP remains a project that has taken each evolution of the system in its stride, thanks to the strength of the partnership – created in 1998 and built to last.

Thank you to the PCG leaders for their help in preparing this article:

Luis Jorge Romero, ETSI Director General, 3GPP PCG Chair.
Kyoung Cheol Koo, TTA Vice-President, 3GPP PCG Vice-Chair
Pamela Kumar, TSDSI Director General, 3GPP PCG Vice-Chair
Susan Miller, ATIS President & CEO, 3GPP PCG Vice-Chair



DRIVING DATA TO THE EDGE

By Said Tabet, AECC

In July 2020, the Automotive Edge Computing Consortium (AECC) published Version 2.0 of the technical report, *Driving Data to the Edge: The Challenge of Data Traffic Distribution*.

The report provides authoritative best practices on ways the ecosystem can enable secure, cost-effective data delivery and processing on a global scale, it also includes technology solutions around six key issues: edge data offloading, mobility service provider server selection, vehicle system reachability, access network selection, provisioning and configuration update and opportunistic data transfer.

By offering recommendations to vehicle OEMs, MNOs and the service provider ecosystem, the report provides ways to optimize service offerings to meet the growing needs of connected vehicle owners and users.

The findings of the report provide a lot of material that will be of use to 3GPP in future specifications for V2X use cases. One area of work will be to move beyond only considering latency-sensitive safety applications; to begin to address the big data capacity growth between vehicles and the cloud.

We have a lot to do to get the current mobile communication network architectures and cloud computing deployments fully optimized to effectively handle emerging requirements of Connected Vehicles.

We are now working to align the output from the AECC Use Case Development (WG1) and the AECC Technical Solution (WG2) to the work in 3GPP. For example, AECC use cases and requirements are suitable input for 3GPP. The AECC WG2 solution profiling in the technical report can be shared with 3GPP as a liaison contribution through our activities as a 3GPP market partner (MRP), since April this year - Specifically, to the relevant 3GPP groups, including TSG SA, WGs SA1, SA2, and SA6.

As a partner in 3GPP, the AECC will collaborate with the broader 3GPP membership in the joint identification of future standards work and on a gap analysis on what will be needed from 3GPP to ensure that connected vehicles benefit from best-in-class specifications for driving data to the edge.

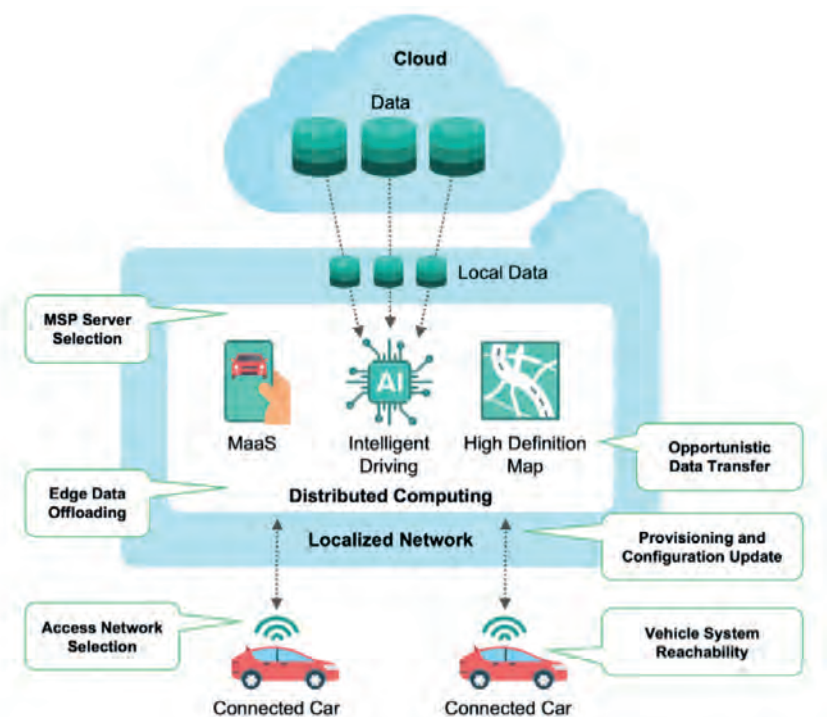
We look forward to an active liaison and collaboration and to getting feedback from 3GPP on AECC automotive use cases

and technical solutions.

The AECC Liaison Relationship Strategy Committee (LRSC) is responsible for the creation and maintenance of liaisons with external organizations. As part of its responsibilities, it will coordinate with AECC working groups for specific activities and collaboration between AECC and 3GPP.

www.aecc.org 

“The cellular network is one of the major access networks for Connected Vehicles, and many specifications have been standardized in 3GPP. However, the present work within 3GPP has not fully addressed the challenge of automotive big data, and there is a high risk that future network deployments and business models will fail to support the emerging needs of connected vehicles.” (Driving Data to the Edge Report)



SMALL CELL FORUM DRIVING OPEN 5G RAN/SCN PRODUCTS & NETWORKS



By Prabhakar Chitrapu, Chair of SCF

SCF's comprehensive suite of 5G FAPI/nFAPI (functional API) specifications stimulates innovation and competition across the small cell ecosystem by supporting multivendor interoperability within Small Cell Products and between different products of Small Cell Networks, architected in consistence with 3GPP's disaggregated functional-splits. Specifically, the suite of open 5G-FAPI specifications enable multi-vendor interoperability between vendors that provide the silicon chipsets and protocol software that go into Small Cell Products. Similarly, 5G-nFAPI suite of open specifications enables interoperability between vendors of different products of the 3GPP Split-Option-6 based RAN

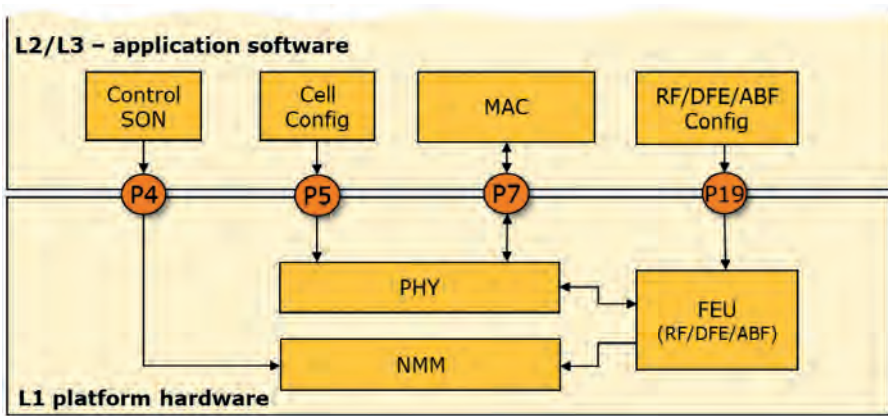
architecture, namely the Radio Unit (named by SCF as S-RU) and Distributed Unit (named by SCF as S-DU). The 5G-FAPI specification suite has been published recently, while the 5G-nFAPI specification suite is under active development. In the latter, SCF is collaborating with other organizations such as O-RAN Alliance and OAI.

SCF's 5G-FAPI suite of specifications is the result of intensive cooperation across the ecosystem by a team led by Intel and Qualcomm. The suite consists of 3 interfaces, named as P4, P5, P7 & P19, between the software layers that implement the MAC & upper protocol layers and hardware that implement the PHY & RF layers of a 5G-Small Cell.

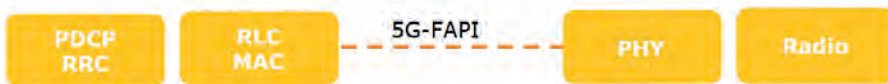
- P5 & P7 interfaces: Control and Data path interfaces between MAC & PHY layers respectively
- P19 interface: Control interface between the L2/L3 software and RF Front-End-Unit (FEU)
- P4 interface: "Sensing" interface for the Network Monitor/Listen Mode (NMM) function.

Together, these interfaces, comprising the 5G-FAPI suite of specifications, provide a robust set of APIs to enable fully open, multivendor 5G small cell designs down to chip level. The figure below illustrates these interfaces and the structure of the 5G-FAPI specifications.

Small cell internal architecture



SON (Self Organising Networks), MAC (Medium Access Control), NMM (Network Monitor Mode) FEU (Front End Unit) including DFE (Digital Front End) and ABF (Analog Beam Forming)



The 5G-FAPI suite enhances the existing set of 3G and 4G specifications, which have played a significant part in growing the market for small cells by enabling a broad multivendor ecosystem. The development of the 5G FAPI suite is a proud achievement for the Forum and its members.

As mentioned at the beginning, a complementary suite of open specifications, namely 5G-nFAPI, is being actively developed by a broad spectrum of hardware and software vendors within the Forum. Active collaboration with O-RAN is being used to maximize the alignment between the specifications of both organizations. The figure here (left) defines the Disaggregated 5G-SCN architecture based on 3GPP's split-option-6, SCF's 5G-nFAPI interface and SCF's product terminology (S-RU, S-DU, S-CU).

www.smallcellforum.org/5g-fapi-suite/



CERTIFICATION OF MISSION CRITICAL PRODUCTS

By Chris Hogg (Global Certification Forum) and Harald Ludwig (TCCA)

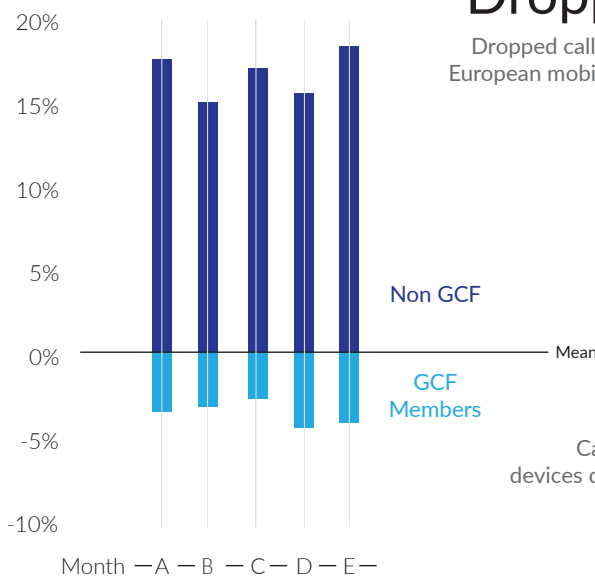


During December 2019, in recognition of the need to accelerate the availability of certification solutions for the LTE mission critical (MC) industry, GCF and TCCA established a joint task force to set up a programme fit for future growth in the field.

With applications, infrastructure, and devices provided by many different vendors - standards are essential to ensuring interoperability. However, ensuring that services will work becomes even more vital in the context of mission critical services; where lives literally depend on it. In such circumstances, it is not enough to implement the standards - there must also be a method to assess compliance to them.

By establishing certification for mission critical products, the industry intends to follow the success of the GCF programme in the mobile sector (see figure 1) to get certified equipment in to the hands of emergency workers.

Figure 1



Dropped call rates

Dropped call rate for 1 billion calls made on a European mobile network in 5 different months

Calls made with non-GCF member devices display, on average, a 20% higher dropped call rate compared to GCF-member devices

KEY OUTCOMES OF THE FIRST PHASE OF WORK

The joint taskforce, working from January to June 2020, consisted of 85 members, representing 39 organisations from all major stakeholders involved in mission critical deployments (government authorities, operators, manufacturers and test industry). Together they have defined an initial (Phase 1) certification scope and a plan for certification to begin, in anticipation of the availability of LTE conformance test equipment for MC services.

The Phase 1 certification scope covers Mission Critical Push to Talk (MCPTT) features, used in existing or near-term deployments, in a GSMA functional 'field trial' test environment. Certification will be conducted under GCF rules, for LTE devices with (pre)-integrated mission critical push to talk clients. Both the LTE stack and the group communications functionality of the MCPTT client will be assessed during GCF certification.

Features that will be addressed in later phases include use of eMBMS bearers, off-network calls (PROSE), MCVideo and MCDATA features. Certification is planned to begin with products that are based on 3GPP Release 15 and higher.

A NEW PERMANENT GROUP FOR PHASE 2

GCF has now set up a permanent body - the 'Mission Critical Agreement Group (MCAG)' to build on Phase 1 certification and to plan the next phase, which may cover certification of Mission Critical servers, standalone client certification and the integration of conformance testing once suitable commercial test equipment becomes available.

The first meeting of MCAG will take place later this year and participation is open to all GCF and TCCA members.

Further information:



chris.hogg@globalcertificationforum.org



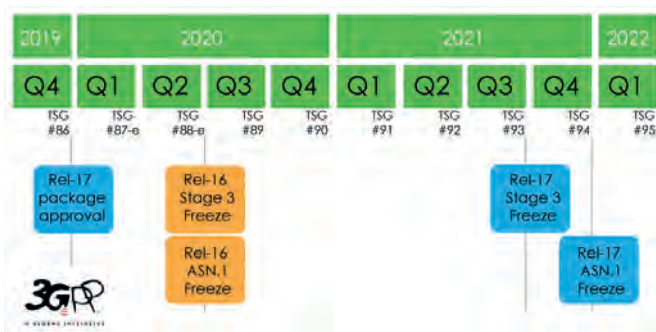
harald.ludwig@tcca.info

NEWS IN BRIEF

RELEASE 16 FROZEN, AS RELEASE 17 HOTS UP

As noted elsewhere in Highlights, Release 16 has been completed, concluding the evolution of the 5G system to “5G Phase 2”.

As Release 17 takes centre stage, we will see 5G evolve to further support the traditional cellular industry and a wide variety of industry verticals.



EXCELLENCE AWARDS

Congratulations to Christian Herrero-Veron (CT1), Jesus de Gregorio (CT4), Hiromasa Umeda (RAN4) and Adrian Escott (SA3) on their 3GPP Excellence Awards for their outstanding contribution to their group’s work in 2019.

The Awards roll-of-honour is on display in the ‘About 3GPP’ section of the web site.

TTA AND KOREA LOOK TO 6G

In June, our Korean 3GPP Organizational Partner - Telecommunications Technology Association (TTA), launched their ‘Mobile Communication Technical Committee (TC11)’ to consider developing standards beyond 5G and 6G and to strengthen cooperation among global standardization organizations. The group replaces the TTA ‘5G Special Technology Committee’.

The group focuses on: IMT technologies, RAN specifications, Network aspects (CT and SA), a Vertical service framework and on mobile application services.

<http://tta.or.kr/eng>

RAN6 CLOSURE

At the recent RAN (#88e) plenary meeting, Working Group 6 – responsible for the GERAN and UTRAN radio and protocol work - was formally closed.

The closure of RAN6 marks the end of a significant era for the mobile industry. The group covered work on 2G and 3G radio capabilities, carrying on from 2G’s roots in the original GSM pan-European digital mobile standard.



NEW PARTNER – FOR AUTOMOTIVE TOPICS

The China Society of Automotive Engineers has joined 3GPP as a Market Representation Partner (MRP). The CSAE boasts 45,700 individual members. Their past work has been on Specifications and Group Standards for the mechanical domain. Now, they are turning their attention to the development of Intelligent Connected Vehicles.

In his letter to the 3GPP leadership, Wu Wenqiang the CSAE standards project manager stated that “The Intelligent connected vehicle is an important application scenario for 5G technology, we (CSAE) have the ability and resources to bring together our domestic automobile manufacturers to help provide feedback, about the standards, to 3GPP.”

More about CSAE can be found here

www.sae-china.org/  **中国汽车工程学会**
Society of Automotive Engineers of China



DE-MYSTIFYING 3GPP

By Georg Mayer, TSG SA Chair

To new delegates, 3GPP at times looks like an esoteric society, in which every ritual has a hidden and hard to de-cypher meaning. Experienced delegates trigger long discussions whether the “UE-box” on the “CR-coversheet” needs to be ticked, if for a new proposal more requirements on “stage 1 level” are needed and every now and then the always hungry demon “next release” is summoned to which certain more challenging ideas are sacrificed.

Lately, since the beginning of Rel-15, a large number of new companies from so-called vertical industries have joined 3GPP. Many of these companies have little or no background in telecommunication standardization and therefore cannot prepare their delegates for the work in the new environment.

Very soon it became clear that 3GPP would need to offer some help to the newcomers, in order to make the work more accessible.

MAKING A START

Since June 2019 several activities were started which try to make things easier for new delegates.

At every plenary and also during bigger meetings a “Newcomer Orientation Session” is held, in which the basic concepts and hurdles of 3GPP are explained, often in a simplified way to allow the participants to get an idea of the main concepts. These sessions also include

time for questions and answers from the delegates on all aspects of 3GPP work.

Also, a 3GPP mentoring program has been initiated - currently still in its early stages - to have experts on hand to answer the seemingly “simple” or “obvious” questions, without delegates having to be afraid of being seen as uninformed. Mentoring mostly builds on direct contact between newcomers and mentors and once 3GPP goes back to face-to-face meetings the concept will be further extended.





Adrian Neal offers advice to the Newcomer Orientation Session, September 2019

DEVELOPING THE IDEA FURTHER

Once these new initiatives had started, people brought forward additional ideas. One of the main requests is that the work of 3GPP becomes more transparent, another is the suggestion that delegates who attend 3GPP as well as external bodies, such as the 3GPP Market Representation Partners (MRPs) consider taking on a liaison role between MRPs (*Image right*) and 3GPP, so that we can have a more interactive communication with these outside bodies.

Another interesting development is that we haven't only seen newcomers at the orientation sessions, we also see delegates who have been around for several meetings or even for several years.

We are still at a starting point and further work needs to be done. I am working with the other TSG Chairs to improve the newcomer sessions, to consider taking them to the working group level and to assess the potential to develop a data toolset - which would allow delegates to track the work more easily.



In order to move forward we not only need the questions and suggestions from new delegates, but also the experience, knowledge and good-will from people who attend 3GPP already. Any input to make 3GPP less mysterious (and with that more successful) is highly welcome.

NEW DIRECTION FOR THE MOBILE COMPETENCE CENTRE

As John Meredith steps down as Director of 3GPP MCC, Dr Issam Toufik steps up to lead the eighteen strong team, supporting the work of the project. In this short interview we will learn a little bit more about Issam and what he sees as the future priorities for the team.

What brought you in to the ETSI Mobile Competence Centre, and 3GPP more generally. What is your pre-3GPP story?

Since my early childhood I have always been fascinated by new technologies and my curiosity grew into a passion – which guided my study and career choices. I graduated in wireless communications from Eurecom in 2002 and carried that on by completing a PhD. in resource allocation for OFDMA systems, at a time (2003-2006) when LTE was at the very early stages of the study phase. So, I guess it was on the cards that I would be in or around 3GPP at some point.

When working for ST-Ericsson as an algorithms engineer, I was a standards user – Our team was more on the product development side, but we used RAN1 and RAN4 specifications heavily. So, our team had a good handle on the work coming out of the groups.

Can you tell us a little bit about the book you worked on with those colleagues?

Yes, with my close colleagues Stefania Sesia and Matthew Baker, we co-wrote “LTE – The UMTS Long Term Evolution: From Theory to Practice”. We felt that it was important not only to understand how

the standard works but also to have a deep understanding of how the technical choices and decisions were arrived at.

Most of the books on the market were lacking the latter. I think that it was the first book to provide the reader with material about how 3GPP arrived at the key decisions on its long term evolution. We had standards experts participating, but I am very proud that we also had academics and researchers contributing to the book. We did an updated version, to include Release 10, LTE-Advanced, but we do not plan to do further editions. That may have to be another book.

You eventually joined the MCC, at ETSI – Also in Sophia Antipolis. Did you always have an eye to settle on the French Riviera?

I studied in France, and when it comes to high technologies and telecoms in particular, Sophia Antipolis was the flagship destination. Paris has many of the larger companies, but Sophia Antipolis was that young hub where most of the start-ups, innovation and new initiatives were seeding. Add in the location, and the choice of settling here was made a little easier.

You have been supporting RAN4 and more recently RAN3 as their

MCC technical officer. Can you describe the place that MCC occupies in 3GPP and how it is seen by the experts attending meetings?

MCC plays a central role in the 3GPP machine by providing a comprehensive support to the project.

Our Technical Officers are an important part of the smooth running of meetings, the coordination between the different working groups as well as the TSGs. They also handle coordination and maintenance of the Work Plan and the production of the specifications.

The MCC Technical Officers are also the “guardians” of the 3GPP working procedures making sure that the well-established rules and procedures are respected at all times.

There is a lot of mutual respect in the groups, not only between the delegates and the companies, but also towards the MCC working group Secretaries (Technical Officers) and all of the MCC support professionals. The role of MCC is recognised by the community and it is not a rare thing to receive tributes and compliments about the work of our Technical Officers.

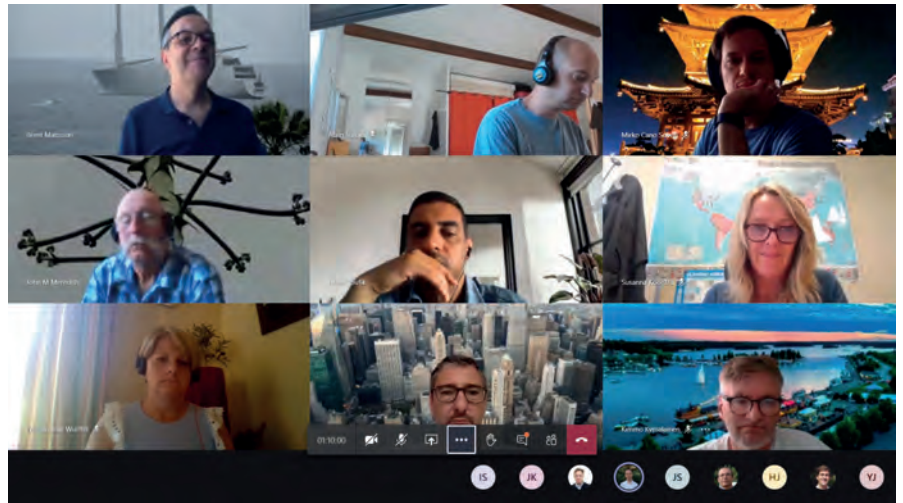
Do you see a need for change in the ways we work, to suit newcomers, or support experts with a non-3GPP background coming in?

Offering a smooth introduction to the newcomers is one of the needs that we are addressing. We saw over the recent years a big increase in the number of new members and also in the size of delegations from existing members. There is also an increasing amount of movement by delegates from one group to another. So, this issue is becoming even more important.

I believe that one key aspect that eases any introduction to newcomers is having a harmonized way of working across the groups. We have common tools now and this is set to spread, helping newcomers to 'speak 3GPP' or at least to save them having to pick-up from scratch when they wonder into another working group.

Having a 3GPP Portal in place is a part of that, we can use the platform to improve how we support the process. The 3GU Portal experience is not stress free, at the moment, but we will see improvements in how it copes with very busy, large scale meetings. We will also seek to improve the usability of the Portal, so that it becomes an exact fit for its purpose.

For newcomers, our TSG Chairs do a lot with regular newcomer's sessions at Plenary and an informal mentors programme for anyone who needs it. MCC has a role here too, as it is often the 3GPP Membership contact person or the



Issam Toufik surrounded by friendly faces and dodgy back-drops at the MCC weekly call.

group's Secretary that gets the early call for assistance.

Over the years there have been some group closures and the creation of a new group, for Mission Critical Applications. Will 5G need further additions?

I don't think that we need or will see any changes in the groups structure in the near future. Even though we have seen a considerable increase in the workload over the past years especially in RAN, the current structure coped well with these peaks of new work, within the TSG and WG structure, by running parallel sessions for the different subjects with the same group.

RAN1 are working in five to six parallel

sessions each meeting, with a similar situation occurring in RAN2 and RAN4. Having said that, we do need to listen to the needs of the technical leadership; if we have to expand to cover further growth, in new areas, we must be ready to adapt.

Finally, a word about your predecessor. John Meredith retires at the end of the year, what is his legacy?

First, I am grateful to have a four month period where John is still here. John has been in 3GPP since its creation and he knows everything there is to know about 3GPP history, specifications, working procedures, ... etc.

If there was an award for being the "3GPP Wikipedia", it would go to John - No contest. We have to replace the irreplaceable and it will take two of us to do that. I am lucky that Frederic Firmin will step up to be the Specifications manager. We will work closely together to try to fill the John M. shaped hole in MCC.

As the MCC Director, John always had a helpful word, when advice was needed - delivered in a uniquely kind way. He will be greatly missed here in the team, in ETSI and certainly in the broader 3GPP standardization community.

Issam Toufik is Director of the Mobile Competence Centre (MCC), responsible for the management of the 18 strong team, reporting to the ETSI CTO.



The retiring John Meredith

CALENDAR OF 3GPP MEETINGS

For the period September – December.

MEETING <small>All meetings are e-meetings</small>	STARTS	ENDS
TSG CT#89-e	14 September 2020	16 September 2020
TSG RAN#89-e	14 September 2020	18 September 2020
TSG SA#89-e	16 September 2020	18 September 2020
Cross-TSG coordination e-meeting	21 September 2020	21 September 2020
PCG#45-e	28 September 2020	28 September 2020
WG SA3#100-bis-e	12 October 2020	16 October 2020
WG SA5#133-e	12 October 2020	21 October 2020
WG SA1#91-bis-e (TBC)	19 October 2020	28 October 2020
WG RAN1#103-e	26 October 2020	14 November 2020
WG RAN5#89-e	09 November 2020	20 November 2020
WG SA1#92-e	09 November 2020	18 November 2020
WG SA3#101-e	09 November 2020	20 November 2020
WG SA5#134-e	16 November 2020	25 November 2020
TSG CT#90-e	07 December 2020	08 December 2020
TSG RAN#90-e	07 December 2020	11 December 2020
TSG SA#90-e	09 December 2020	11 December 2020

3GPP WORK TAKEN ON-LINE

On May 18, 2020, the 3GPP TSG and Working Group Chairs agreed that all 2020 meetings will be electronic meetings, by default. The decision has allowed all groups to plan their activity – wholly based on virtual meetings – for the rest of the year.

At the time of writing, there is growing optimism that the re-commencement of face-to-face meetings will take place in the not too distant future, but in order for that to happen – everyone will need plenty of prior notice, to get their travel plans and diaries aligned.

For that reason, the leadership has agreed that physical meetings may only take place if the meeting announcements and invitations are sent out no later than 8 weeks ahead of the meeting start date.

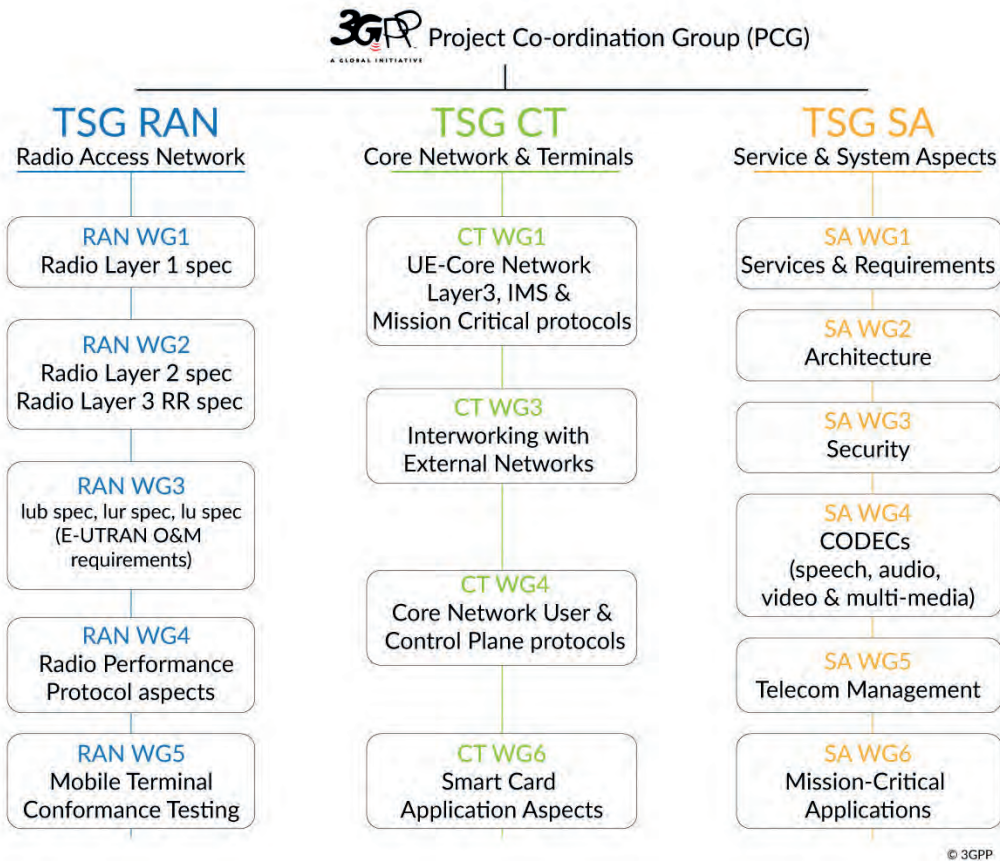
Despite the fear that the Autumn may bring further outbreaks of the COVID-19 virus, it is reassuring to know that we now have a process in place that would allow the leadership to bring the work back in to physical meetings - with that 8 week period of notice – when the time is right.

For up-to-date information about 3GPP meetings and eMeetings, go to <https://www.3gpp.org/3gpp-calendar>



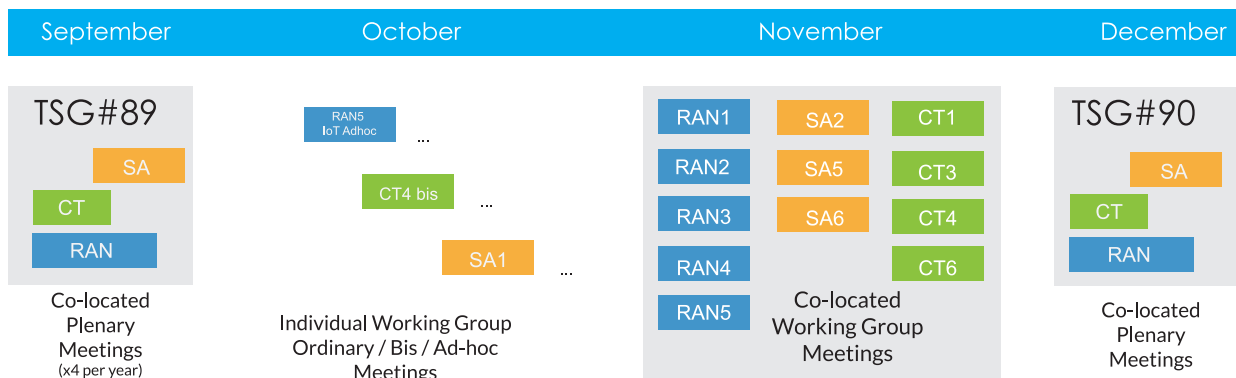
THE 3GPP GROUP STRUCTURE:

The Reports and Specifications that define 3GPP technologies are contribution-driven, by member companies, in Working Groups and at the Technical Specification Group level.



The Working Groups arrange their schedule to be able to bring the work for approval at the quarterly TSG Plenary meetings, which take place in March, June, September and December.

3GPP's Meeting Cycle (Q4 example)*



* Based on F2F meeting schedules - Does not show how e-meetings

These examples are to demonstrate the principle and



INFO-GRAPHIC

September 2020



89

operators have now launched commercial 5G services

86

vendors have announced the availability of 5G devices

700+

companies active in 3GPP

5

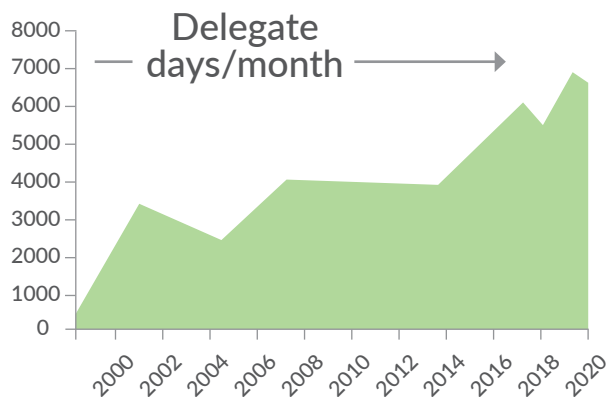
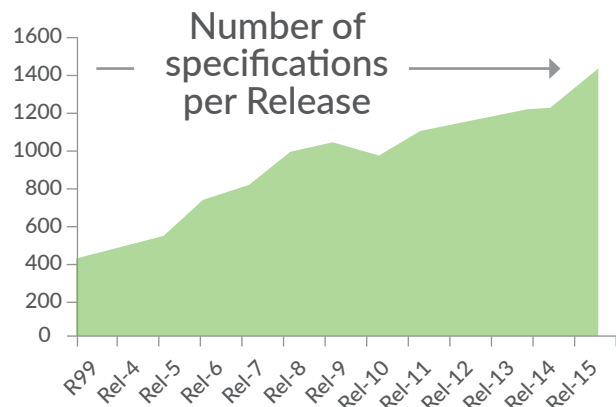
million web page views in 2019

2500

Delegate years of work since 1998

TOP WEB PAGE VIEWS IN 2020, TO DATE

Spec. downloads (DynaReport)	744.109
Home Page (3gpp.org)	455.697
Specification pages	386.900
News and events articles	189.950
Technologies pages	187.474
Web site search tool	140.928
Meeting documents (via web)	113.805
Specification Group pages	86.141
Release 16 page	73.808
Release 15 page	63.751



3GPP Delegates (pre-shutdown)

