

Achieving Leadership in Standards
**Enabling
Organisational Frameworks**

in partnership with
SAMSUNG

 IIIT Bangalore
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3GPP Overview

by

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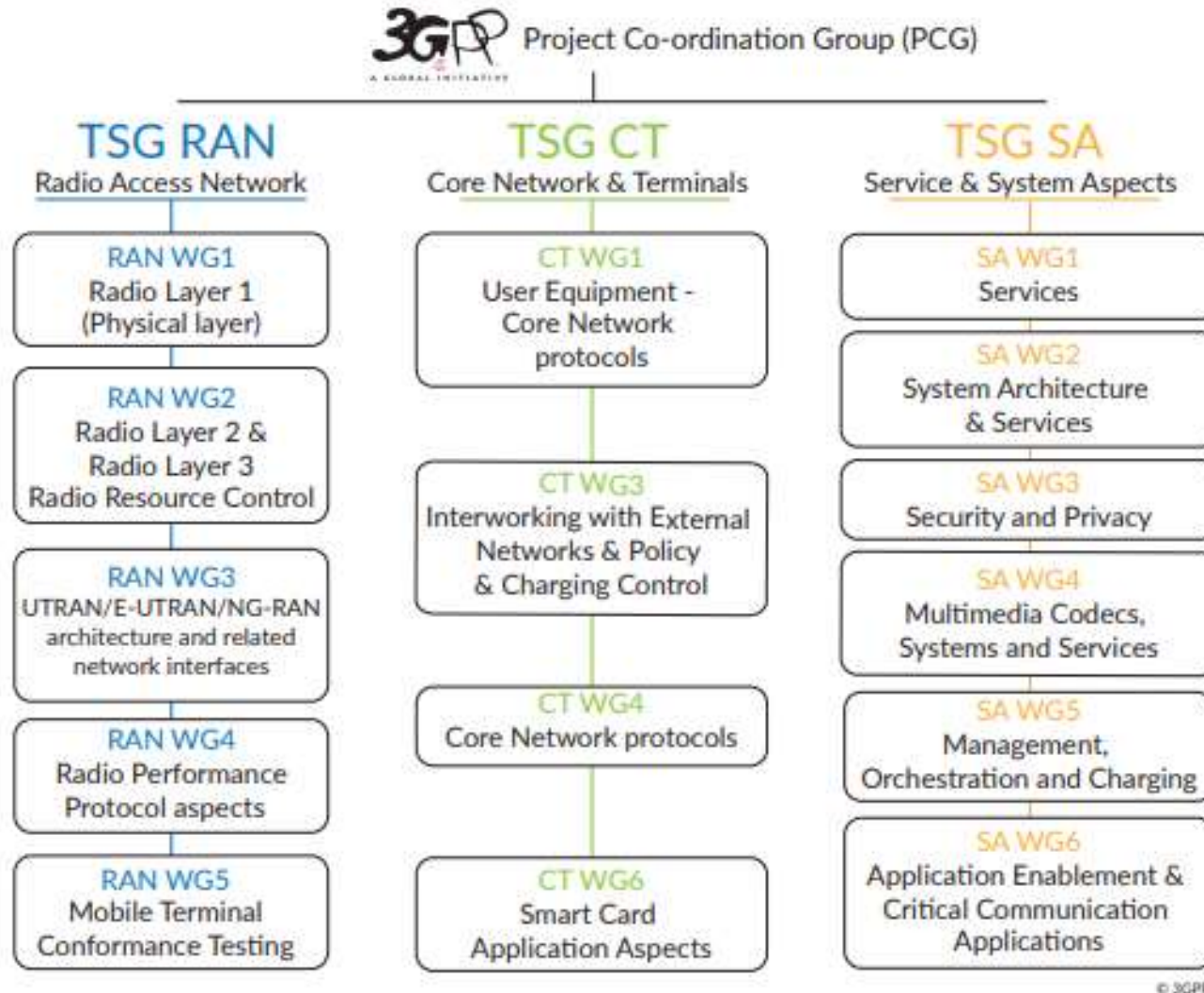
- 3GPP Introduction
 - Working Groups
 - Organizational Partners
- Concept to Standard – The process
- Example
 - Where's all the information
 - Numbering Scheme
 - Connecting the dots
- Summary

What is 3GPP

Background

- 🌿 Global standards organization for mobile communication
- 🌿 760+ Companies from all over the world actively participating
- 🌿 A new Release every 15 to 24 months
- 🌿 A new Generation every 10 years – 3G/UMTS, 4G/LTE, 5G
- 🌿 Standards for all sectors of mobile communication – VoLTE, NB-IoT
- 🌿 ~20 Working Groups & TSGs, each meeting 4 to 8 times a year
- 🌿 Contribution driven & Consensus based

3GPP Organisation



- ✓ PCG – Coordination of 3GPP by the Organizational Partners (OPs)
- ✓ Technical Specification Groups (TSGs) are organized into Working Groups (WGs)
- ✓ TSGs meet 4 times a year in the so-called “Plenary meetings” (co-located)
- ✓ WGs meet once or more per plenary cycle (mostly not co-located)
- ✓ Each TSG and each WG elects its own leadership (2 year terms / 2 terms)
- ✓ Technical work is mostly done in WGs
- ✓ Overall planning and coordination in TSGs

Project Co-ordination Group



- The Project Co-ordination Group (PCG) meets twice a year
- Highest Decision-making body
- Discussion takes place electronically between meetings
- Final Adoption of TSG work items
- Determines overall time frame and manages work progress in TSG
- Handles appeal from individual members on procedural or technical matters referred to them

Technical Specification Groups



- The Technical Specification Groups (TSG) meet in parallel. They meet four times per year: in March, June, September and December
- The TSGs have the authority to approve their own specifications
- TSG SA undertakes a co-ordination role across all TSGs
- Preparation of detailed time frame and management of detailed work progress
- Proposal and approval of work items within the agreed scope and terms of reference of the TSG
- Handling of appeals from individual members on technical matters
- Each WG meets 1 or 2 times between TSG meetings
- WGs have up to about 500 participants and handle up to about 1300 technical documents per week

The Organizational Partners (OPs)

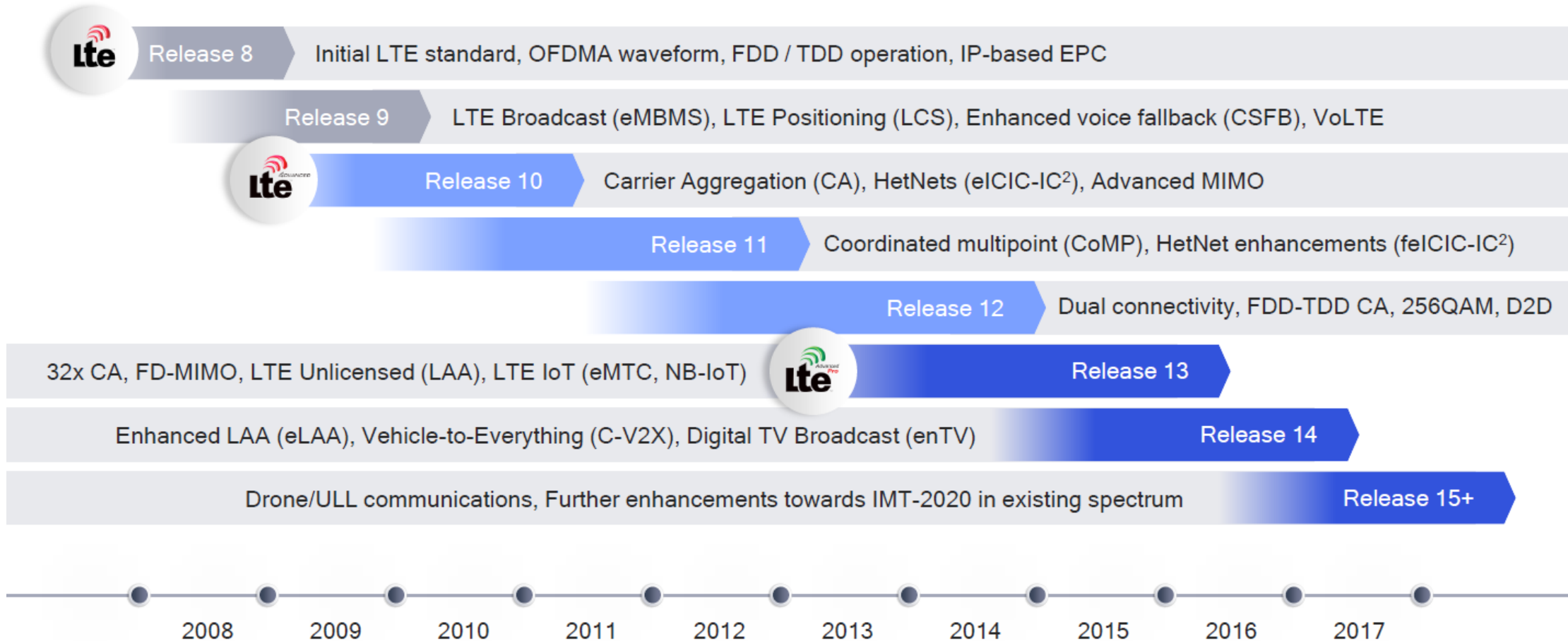


Article 55 of Working Procedures: IPR Policy

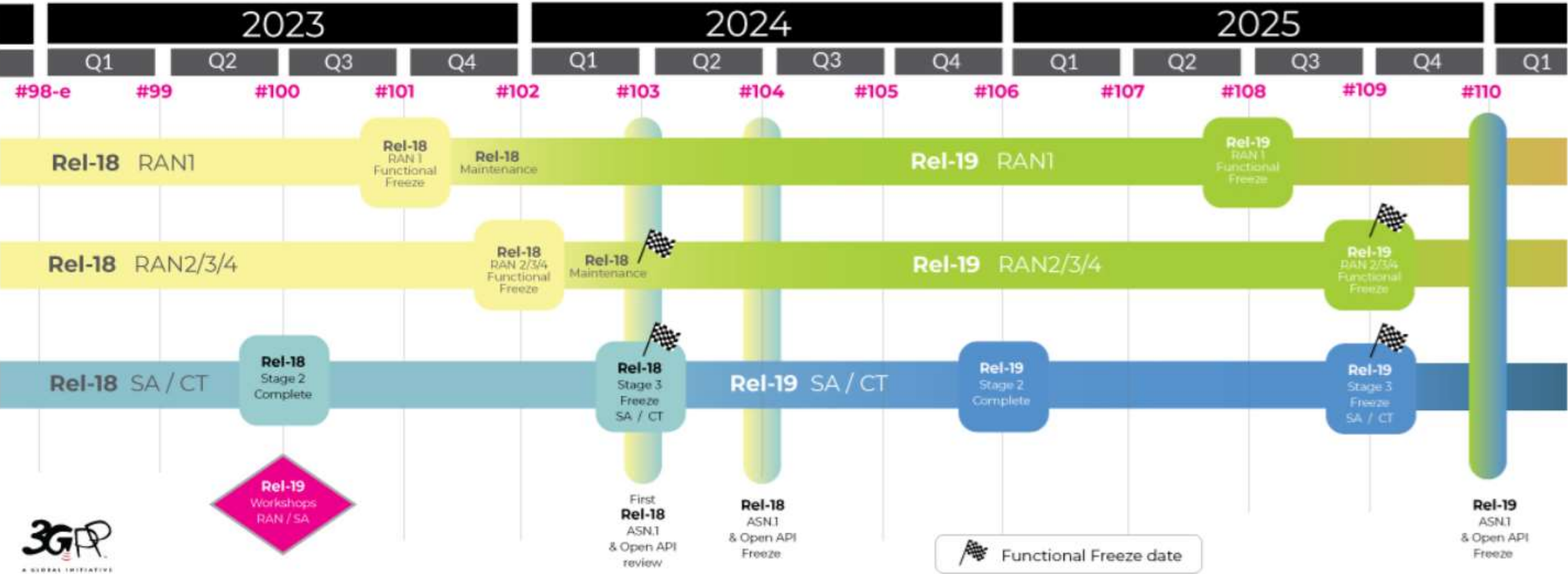


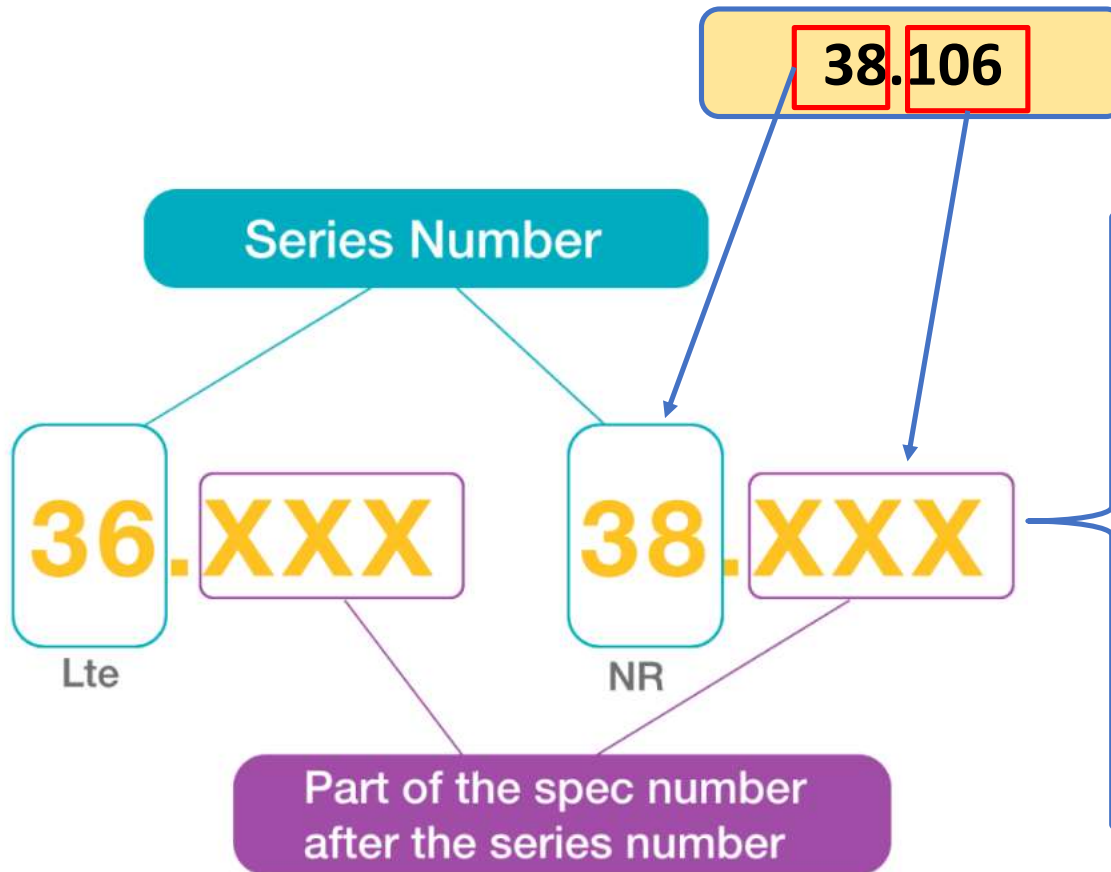
- Individual Members shall be bound by the IPR Policy of their respective Organizational Partner
- Individual Members should declare at the earliest opportunity, any IPRs which they believe to be essential, or potentially essential, to any work ongoing within 3GPP. Declarations should be made by Individual 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 feature-rich evolution of 4G LTE over 8+ Releases



3GPP Releases





- **The first digit:**

- 1 presented to TSG for information;
- 2 presented to TSG for approval;
- 3 or greater indicates TSG approved document under change control.

- **The second digit** is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

- **The third digit** is incremented when editorial only changes have been incorporated in the document.

Concept to Specification

The process

Concept to Specification – The Process

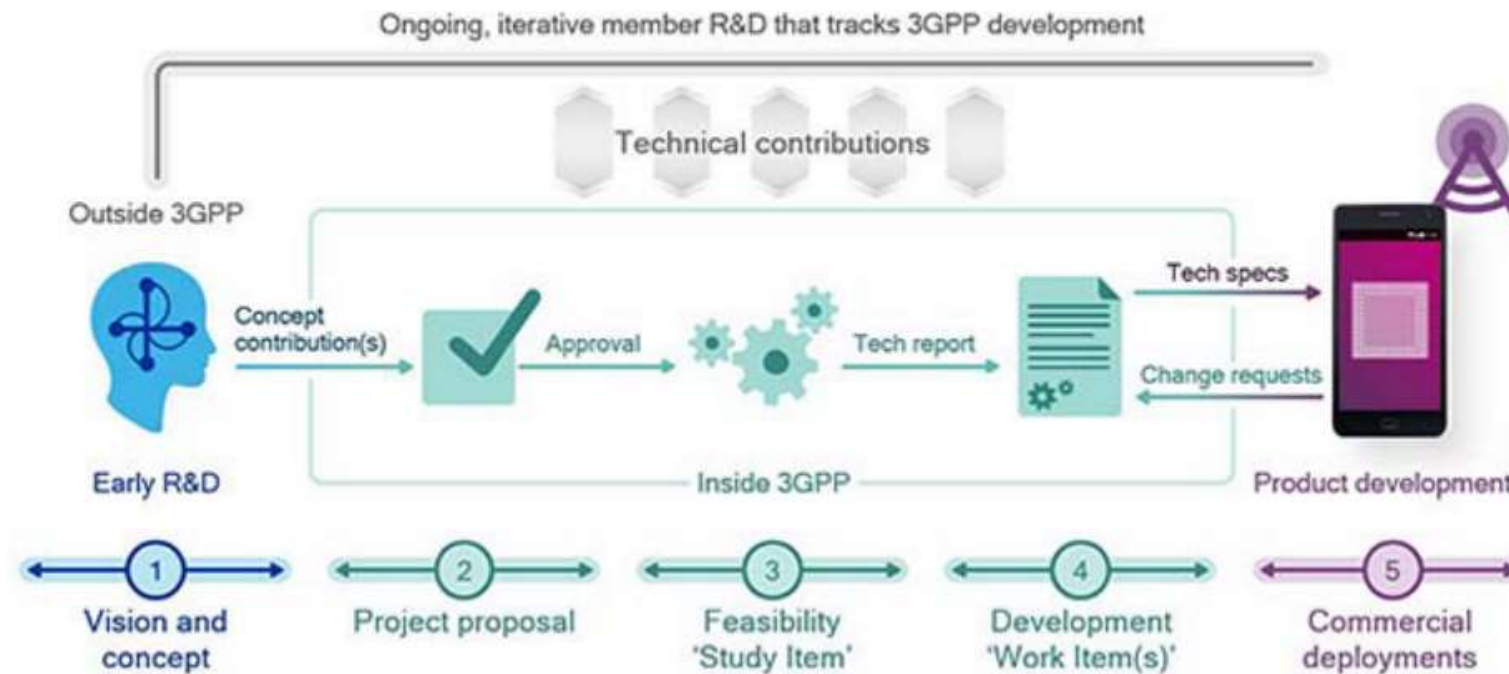
(1) Early
R&D

(2) Project
Proposal

(3) Study
Item

(4) Work
Item

(5) Specs



(1) Early R&D

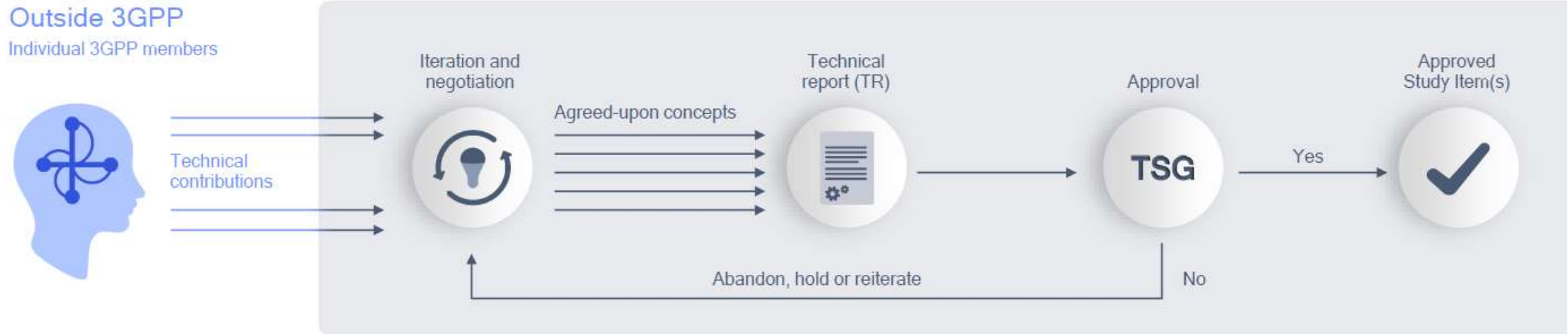
- Define need or solution
- Establish market requirements
- Create feature specification
- Build prototype to validate the concept
- Find supporters
- Create a project proposal for 3GPP submission

(2) Project Proposal Stage



- New Feature Request can come from any member
- Must have support of at least 4 other members
- Usually gets iterated over multiple meetings
- New proposals need to be approved at TSG plenary
- This can become an approved Study Item

(3) Study Item Stage




- Member submission becomes a Tech Doc (Tdoc)
- Will be discussed in work groups and the submission is made public
- Decisions are consensus based
- Older agreed items are rarely touched again
- Approval will result in a Technical Report (or) a new Work item

(4) Work Item Stage



- Similar iterative, contribution-driven, consensus based process followed
- All the work items come together to make a work plan
- There might be a separate manager who consolidates the work items
- Finalized work items will get into the technical specifications – can be new or existing
- Once the spec is approved, changes are possible only via CR – Change requests

(5) 3GPP Specifications



Series	Subject
21.xxx	Requirements
22.xxx	Service aspects ("stage 1")
23.xxx	Technical realization ("stage 2")
24.xxx	Signalling protocols ("stage 3") - user equipment to network
25.xxx	Radio aspects
26.xxx	Codecs
27.xxx	Data
28.xxx	Signalling protocols ("stage 3") -(RSS-CN) and OAM&P and Charging
29.xxx	Signalling protocols ("stage 3") - intra-fixed-network
30.xxx	Programme management
31.xxx	Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.
32.xxx	Operation & Maintenance (OAM) and Charging
33.xxx	Security aspects
34.xxx	UE and (U)SIM test specifications
35.xxx	Security algorithms
36.xxx	LTE (Evolved UTRA), LTE-Advanced, LTE-Advanced Pro radio tech.
37.xxx	Multiple radio access technology aspects
38.xxx	Radio technology beyond LTE

- TS – Technical Specification
normative specification which might include informative material as well
e.g. 3GPP TS 23.228
- TR – Technical Report
informative specification
e.g. the outcome of a study item (SI)
spec-number second part starts with 8 or 9
e.g 3GPP TS 21.9xx

3GPP specifications are not standards, they have no legal standing. They become “official” standards once one or more of the Organizational Partners (e.g **TSDSI**) transposes them.

Example

- NR Repeater

Early R&D (Idea to a 3GPP Contribution)



Existing Market



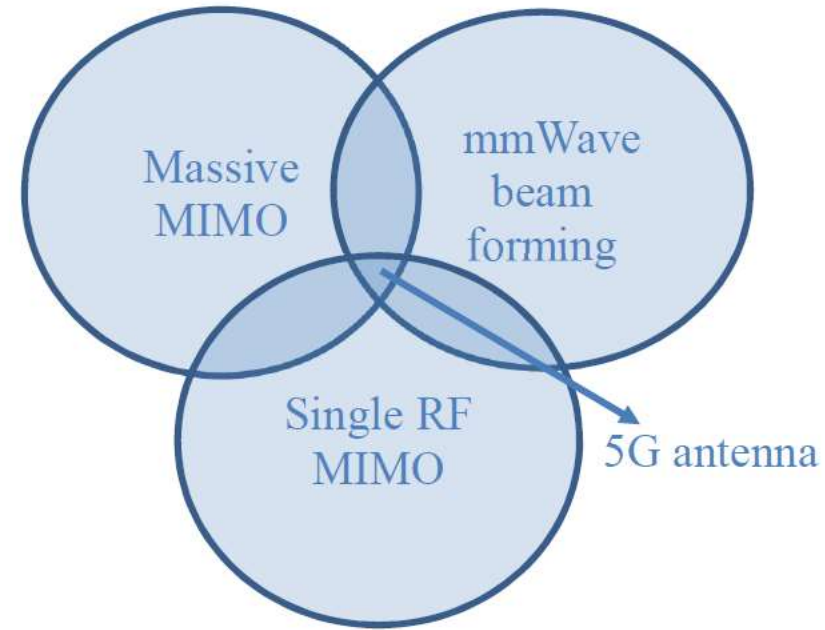
IP Owner



New Market

Idea

- An NR Repeater that incorporates the best of the following
 - Massive MIMO
 - Single RF
 - Beam Steering
 - AI Techniques



What next?

- Which TSG Groups are relevant
- Are there specifications that cover these aspects already?
 - How do I submit change requests for feature additions
- Do I need to declare my IP?
- How do I figure all this out?

Navigating the 3GPP Website



3GPP Portal > Specifications

EOL Account

Logout



Portal

4 Apr 2023 - 17:58:19 (GMT+5.5)
Sophia Antipolis - France

Welcome Shekar

Select TSG/WG

Home

My account

Directory

Browse FTP

Voting

Help

Search Term

Search form (NR Repeater, Series(1), Releases(26))

Items per page 50

Title/Specification number

NR Repeater

Release

All Releases

☐ Draft

Series

38. Radio technology beyond LTE

Publication

☐ Internal

Status

☐ Under change control

Type

☐ Technical Specification (TS)

☐ Technical Report (TR)

Technology

☐ 2G ☐ 3G ☐ LTE ☐ 5G

☐ Withdrawn before change control

☐ Withdrawn under change control

Search

Data pager

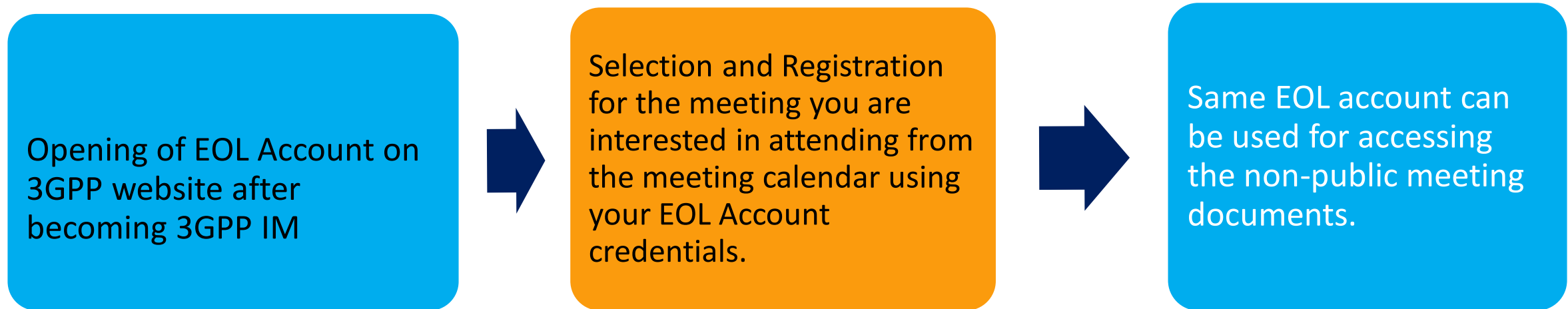
1

1 specifications found, displaying 1 to 1

Specification Number	Type	Title	Status	Primary Responsible Group	
38.106	TS	NR repeater radio transmission and reception	Under change control	R4	

EOL account

- Opening of EOL account is a pre-requisite for participation in the 3GPP TSG or working groups



Refer to the attached document for 3GPP EOL account creation process



Process for
Opening 3GPP EOL Acc

9 May 2024

Which group should I submit my proposal?



Radio Access Network (RAN)

Defines the radio communications between UEs and core network

RAN WG1

Layer 1 (Physical) spec

RAN WG2

Layer 2 and 3 (RR) protocols

RAN WG3

Access network interfaces + O&M

RAN WG4

Performance requirements

RAN WG5

UE conformance testing

RAN WG6

Legacy RAN, e.g. GSM, HSPA



Service / System Aspects (SA)

Responsible for overall architecture and service capabilities

SA WG1

Service requirements

SA WG2

Architecture

SA WG3

Security

SA WG4

Codecs, multimedia system

SA WG5

Telecom management

SA WG6

Mission-critical services



Core Network and Terminals (CT)

Responsible for core network; defines terminal interfaces and capabilities

CT WG1

Mobility Mgmt, Call Ctrl, Session Mgmt

CT WG3

Policy, QoS and Interworking

CT WG4

Network protocols

CT WG6

Smart card application

* 3 Technical Service Groups (TSGs) and 16 Working Groups (WGs)

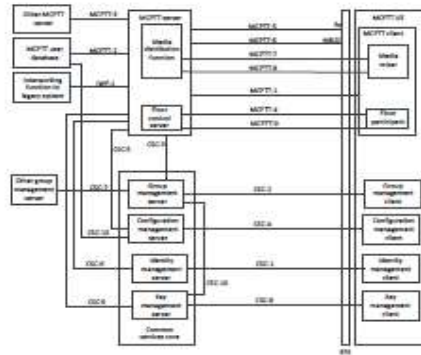
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Which group should I submit my proposal?

Stage 1: Requirements



Stage 2: Architecture



Stage 3: Protocols



Stage 4:

- It follows stage 3, test specifications are defined
- RAN WG4 defines BS conformance test procedures
- **RAN WG5 defines Mobile conformance test procedure.**

Working groups involved in Mission Critical standardisation:

SA1

- Requirements normally come from operators (MNOs)
- High public safety presence from Europe and USA for Mission Critical applications

SA6

- Mission Critical application architecture

SA3

Security architecture and protocols

SA2

- Overall LTE (2G, 3G etc) system architecture

CT1

- Core protocols

CT4

- Database aspects

SA3

- Security protocols

SA4

- Codec and multicast aspects

Contributing - Some Useful Tips

- Important to be familiar with the [working procedures of 3GPP](#)
- Important to be aware of the ongoing work in general but very carefully in WG/WGs of interest
- Important to note that:
 - Topics of work in WGs are frozen as a part of the Release content at TSG level
 - Proposals for normative work and study work against the topics can be approved at the time of release freeze or later and will also be limited by available time and priority of work
- Choose the topic of your interest, collaborate with supporters of proposal and submit in template. For a new proposal minimum 4 supporters are required

Contributing - Some Useful Tips (Cont.)



- Check the Calendar of meetings of the Working Groups of your interest
<https://www.3gpp.org/3gpp-calendar/3gpp-calendar>
- Choose the topic of your interest, collaborate with supporters of proposal and submit in template
- Subscribe to the email list of that working group to receive emails for meeting documents etc.
- The process for subscription to various mailing list is available at
<https://www.3gpp.org/specifications-groups/e-mail-lists>

Contributing - Some Useful Tips (Cont.)

Log in to 3GPP portal <https://portal.3gpp.org/#/>











Go to the meeting you have registered and click on the 3 dots in the end.

Click on "contribute to meeting"

Fill in the details asked for and obtain the generated TDoc number.

Add the TDoc number to your contribution.

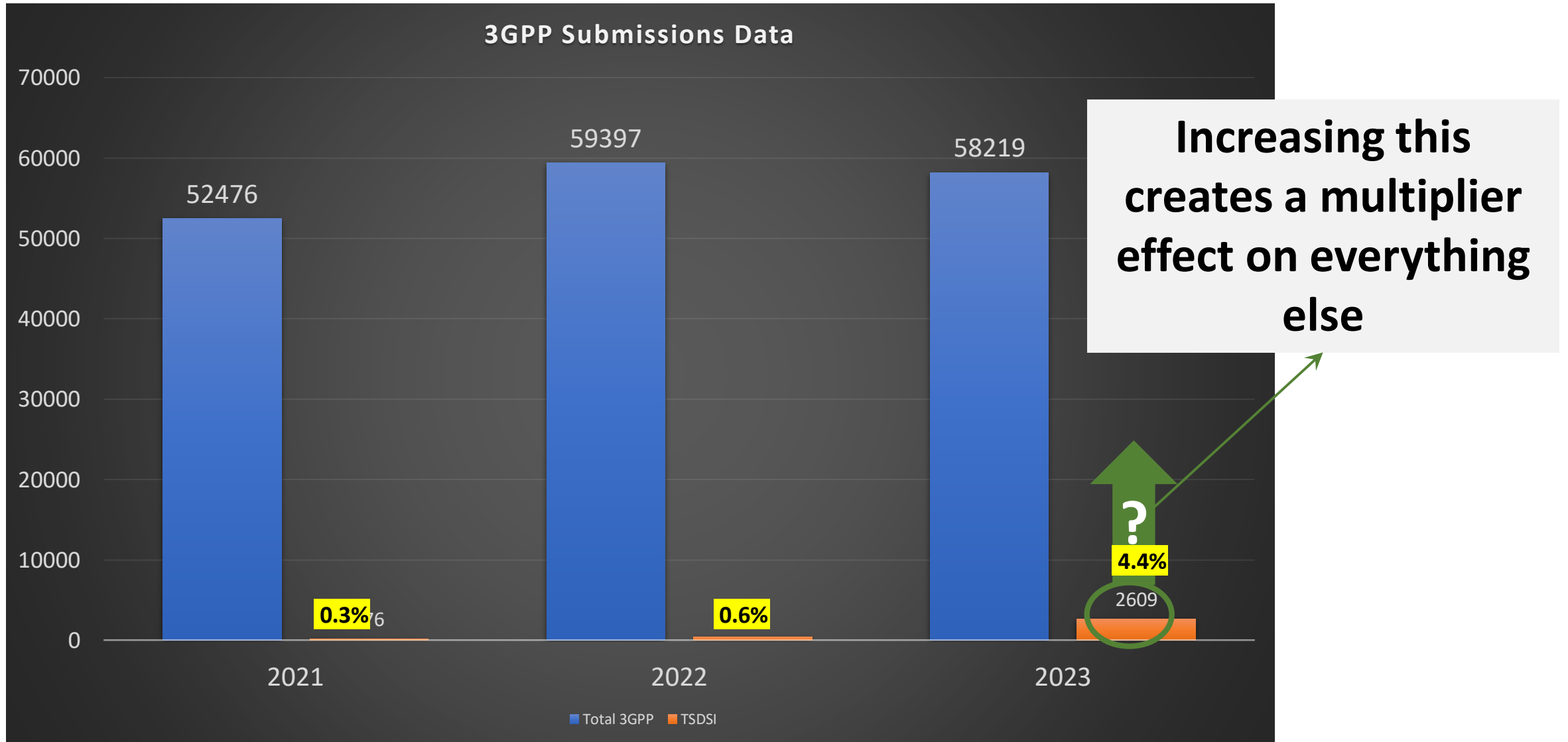
Get it Approved (Phew !!)

	Spec #	CR #	Revision #	CR Cat	Impacted Version	Target Release	Title	WG TDoc #	CR status at WG	WG meeting ref	WG Source information	TSG TDoc #	CR status at TSG	TSG meeting ref	TSG Source information	N Ve
	38.106	0032	1	B	17.3.0	Rel-18	CR to TS38.106 the introduction of APT600MHz	 R4-2303479	withdrawn	RAN4#106	ZTE					
	38.106	0032	-	B	17.3.0	Rel-18	CR to TS38.106 the introduction of APT600MHz	 R4-2301726	agreed	RAN4#106	ZTE	 RP-230533	approved	RAN#99	RAN4	18
	38.106	0031	-	B	17.3.0	Rel-18	adding BW, SCS related requirements for NCR MT part	 R4-2300799	postponed	RAN4#106	CMCC					
	38.106	0030	1	B	17.3.0	Rel-18	CR to 38.106 on introduction of Band n54	 R4-2303487	agreed	RAN4#106	Nokia, Nokia Sh...	 RP-230535	approved	RAN#99	RAN4	18

Finally !!! ...



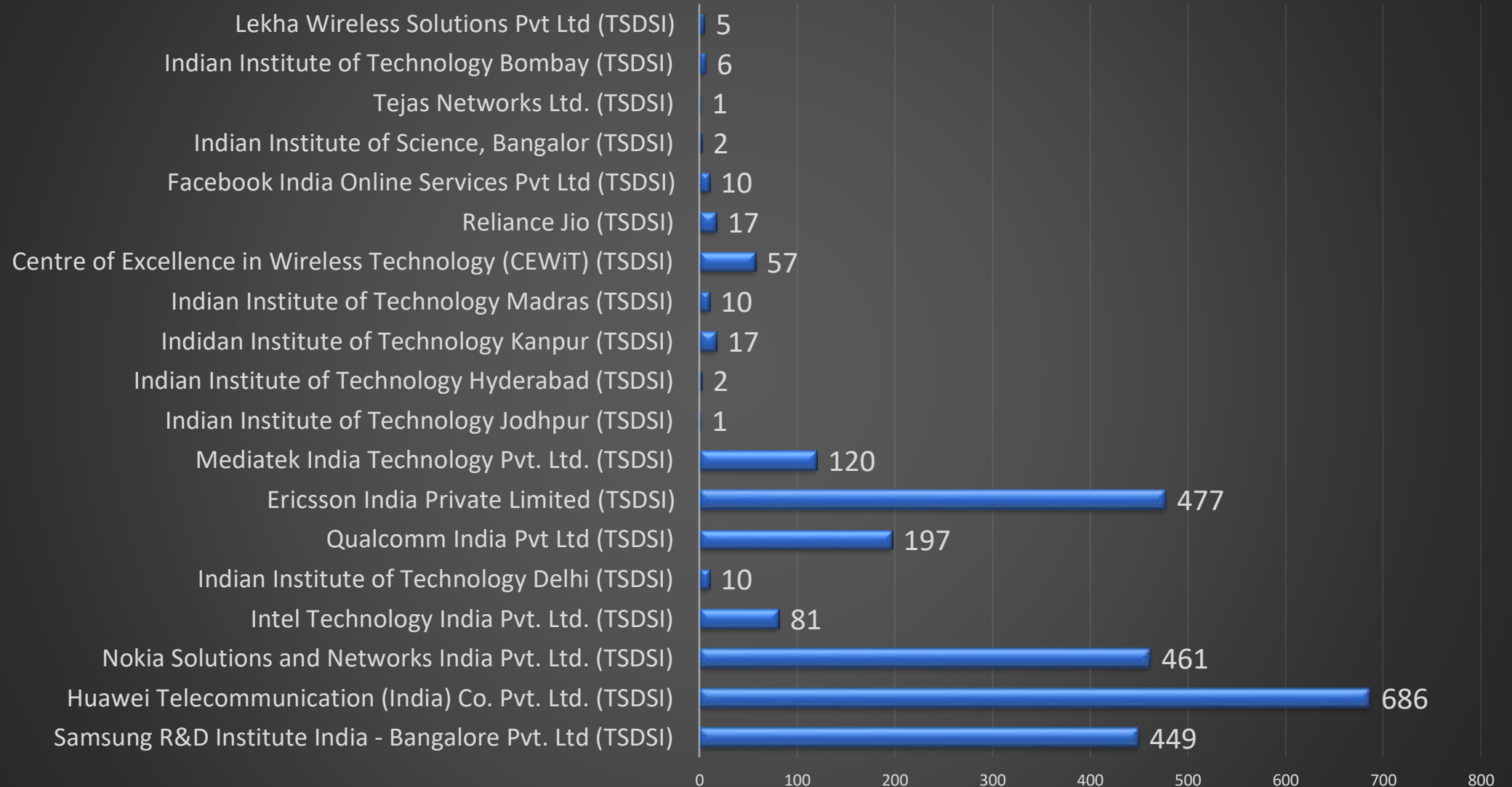
Background (TSDSI Submissions Data)



Submissions Breakdown



2023 Submission Distribution



Thank You

Please reach out to TSDSI anytime

Happy Reading 😊