3GPP SA Status and Outlook May 2020

Georg Mayer, 3GPP SA Chairman

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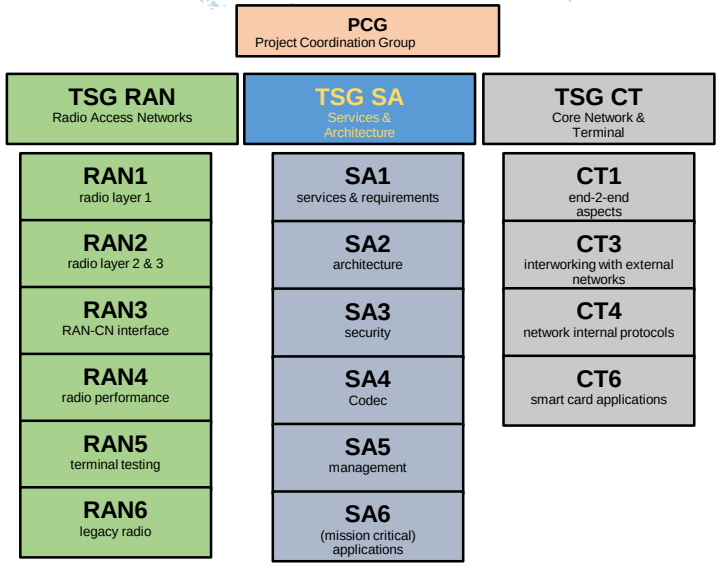
3GPP At A Glance



- **Global standards organization for mobile communication**
- **689 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**

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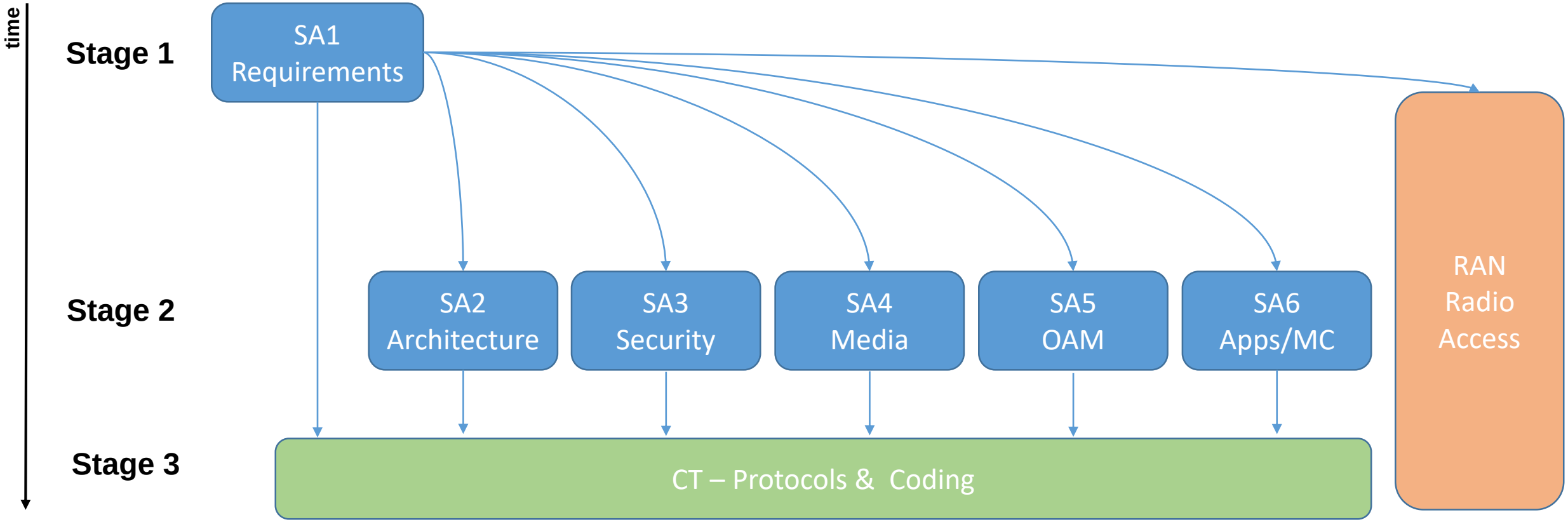
Stage 1/2/3 (very simplified SA view)



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COVID-19 Impact on 3GPP Work

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COVID-19 Impact

- Cancellation of all 3GPP face-to-face meetings, including plenaries
  - so far Q1 and Q2/2020
  - more f2f meetings might need cancelling in Q3 and beyond
  - “Back to normal” depends on international travel restrictions
- All 3GPP meetings now conducted as e-meetings
  - Less, but still stable and high-quality output
  - Tooling and procedures are discussed and further aligned
- Focus is on Completion of Rel-16
- Rel-17 starting up on stage 2

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Verticals & 3GPP

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Verticals, Operators & Vendors @3GPP





ABS
Airbus
Alibaba
BBC
Bosch

Convida
DLR
EBU
ESA
Eutelsat

Fraunhofer
IRT (Germany)
IPCom
ITRI
ligado networks

NHK
Novamint
Omesh
Philips
Sennheiser

Siemens
Suomen Virveverkko
Tencent
Thales
NL Police

TNO
Toyota
UIC
Volkswagen
ZITiS

AT&T // Avanti // Bell Canada // BT // CableLabs // CAICT // Charter // China Mobile // China Telecom // China Unicom // CISA // FirstNet

Hughes // Immarsat // Intelsat // KDDI // KPN // KT // LG U+ // NTT DoCoMo // Orange // Rogers // SES // SK Telecom // Softbank

Sprint // Telecom Italia // Telefonica // Telenor // Leonardo // Telia // Telstra // Telus // T-Mobile // Turkcell // UK HO // Verizon // Vodafone

Affirmed Networks // Apple // Blackberry // Broadcomm // CATT // Cisco // Ericsson // ETRI // Futurwei // Google // HP // Huawei

Infineon // Intel // Interdigital // Juniper // Kapsch // Kyocera // Lenovo // LG // Matrixx Sw // Mavenir // MediaTek // Mitsubishi

Motorola Mobility // Newtec // Nokia // OPPO // Samsung // Sandvine // Sharp // Sony // Spirent // Vivo // XiaoMi // ZTE

(this slide only names a subset of companies which attended September 2019 3GPP plenaries)

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3GPP + Verticals

- More and more new vertical industry service proposal are brought to 3GPP
  - Not all of them can be standardized in full immediately
  - Services which are represented only by few delegates are shifted to later releases
- 3GPP just started new programmes to better integrate new delegates & vertical industires
  - Newcomer Introduction Sessions – several held in Q3 and Q4/2019, lots of attendes and interest
  - Mentoring process – well established & new delegates learn from each other
  - 3GPP Liaison Persons – to participate in vertical forums / MRPs
- More is needed, e.g.
  - address long-term goals of vertical industries that spawn over several releases (e.g. MC services)
  - make 3GPP work more transparent (e.g. how to find out in which WG a work item is addressed)
  - are there ways to reduce the ressources for standardisation (some verticals shy away due to high resource costs)
- **We need your input and cooperation!**

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Step-Wise Approach

- 3GPP is based on
  - Releases, usually between 12 and 24 month long
  - Iterative approach – a topic can spawn over several releases
  - Work Items – usually on stage 2 / 3only covering a technical sub-area

- Verticals need to make sure
  - to align their views in a way that they requirements are met per release
  - to plan their requirements so that they can be processed in different WIs
  - to move parts of their work into more general WIDs (e.g. URLLC)

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Verticals & 5G – Overview

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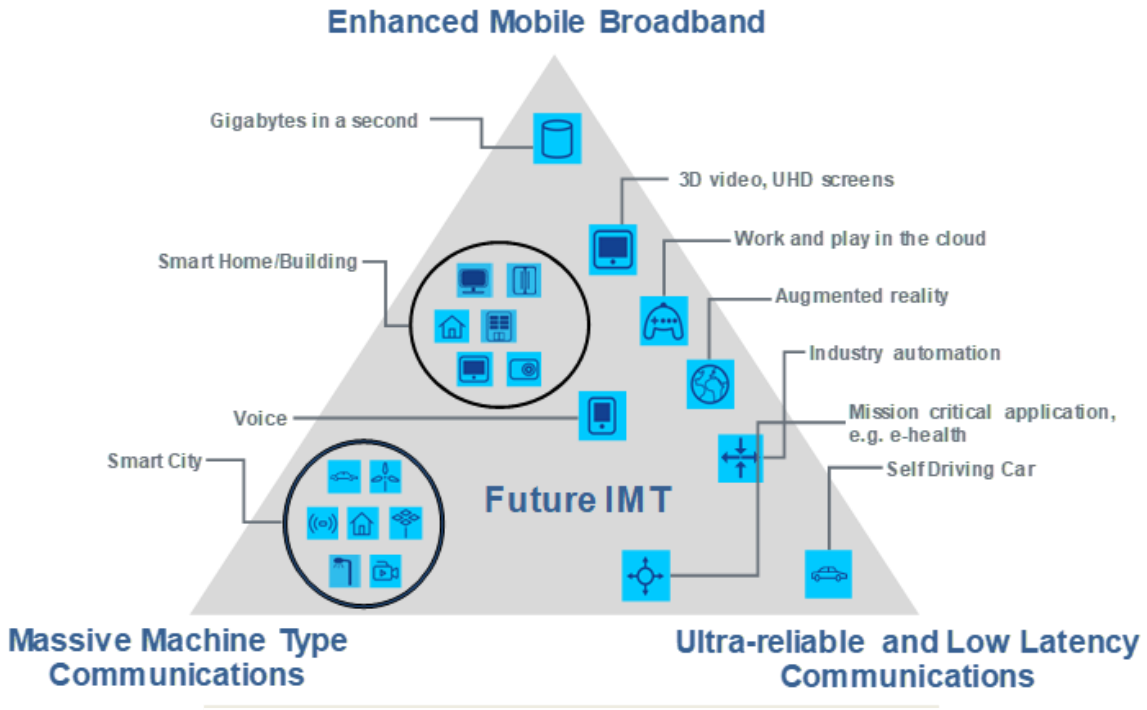
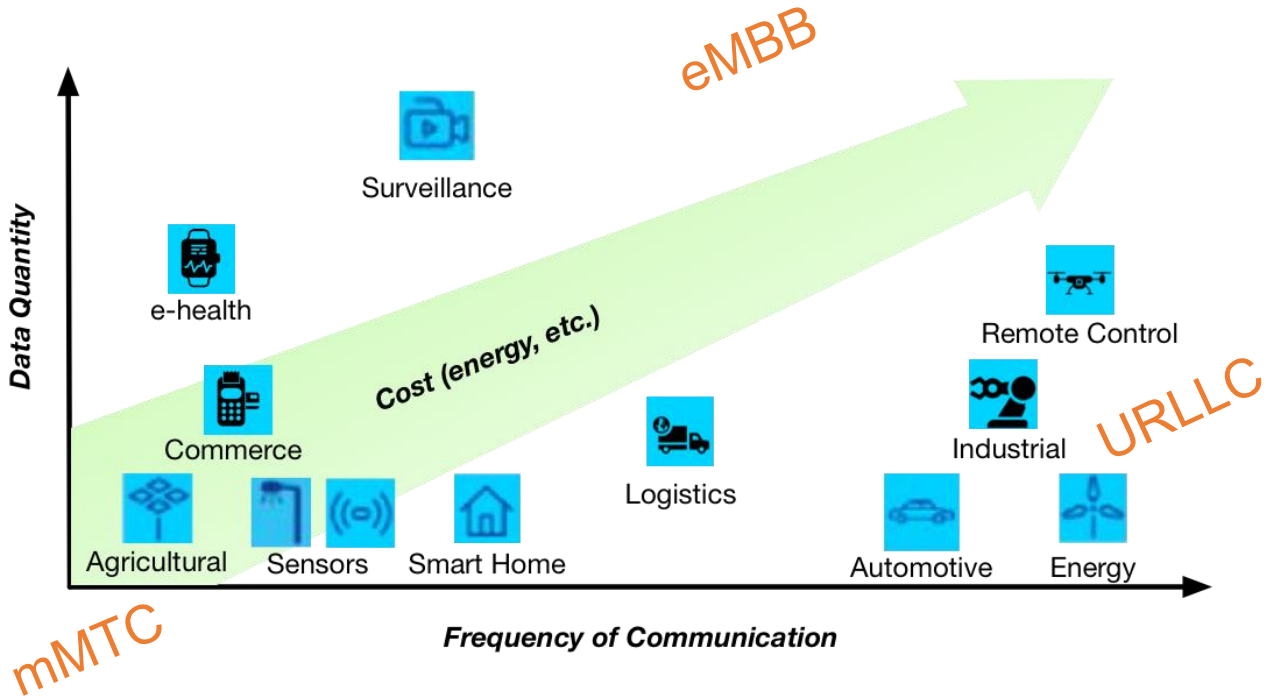
5G
Smartphone Evolution
Service Enabling Revolution

5G – Connecting Vertical Industries





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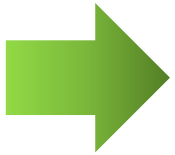
Service Centric Transformation

New Stakeholders …

- Critical Communications (MCC)
- Automotive (e.g. 5GAA)
- Railways (e.g. UIC)
- Industrial Manufacturing, Smart Factories
- Maritime
- Satellites
- Autonomous Systems (robots, drones, …)
- Smart Cities
- Water & Energy Providers
- Broadcast Agencies
- …

… require a flexible enabler platform

- Exposure of Core capabilities to 3rd parties
- On-demand resource allocation – local and end-2-end
- Core Architecture needs to be service centric
- Guarantee certain capabilities exclusively
- Ultra low latency & high reliability



Software & Service Centric Transformation

5G as a Flexible Enabler

One Network fits all	→	Open & Flexible Enabler
Telecom Operators	→	Multiple Stakeholders
Phones	→	Things
Procedures	→	Services
Static Topology	→	On-demand Resources
Dedicated Hardware	→	Orchestrated Resources
Network Function	→	Virtualized Function
Single Network	→	Slice

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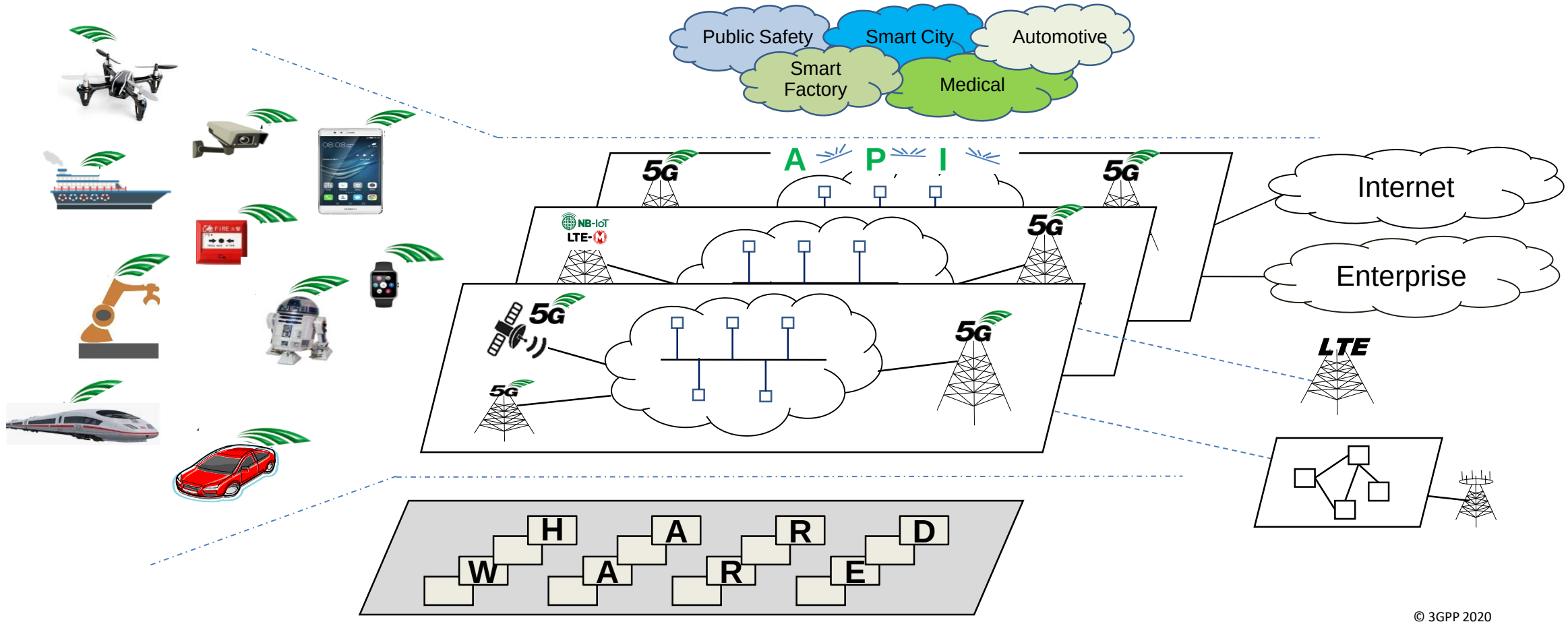
5G – Service Centric Transformation



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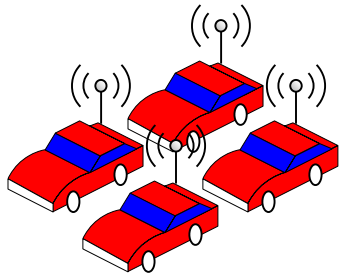
Cross-Industry Service Harmonization

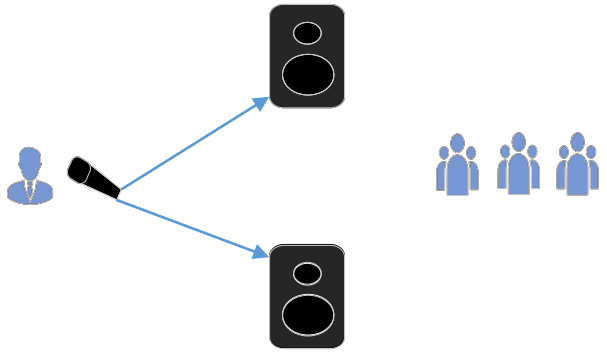
Car-to-Car (V2V)
e.g. platooning

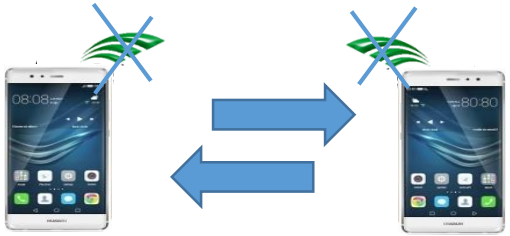


Sidelink / ProSe

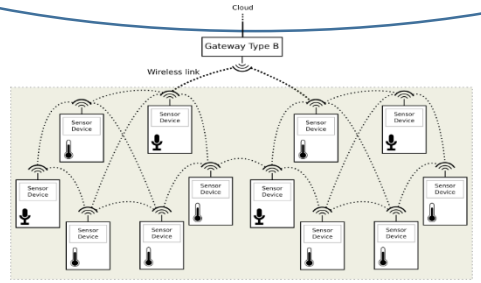
Diverse Scenarios & Applications
One Standardized Solution
5G drives Cross-Industry Harmonization

AV-Distribution
e.g. entertainment system





Off-Network
Device-to-Device



Multi-Hop Relays
e.g. Smart Home,
Containers

Ship-to-Ship

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3GPP Releases

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3GPP Releases – The 5G Story Continues

Dreams

Hopes

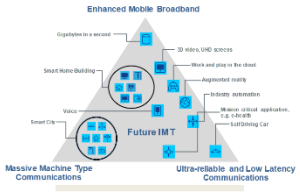
Visions

Rel-15 Standards

Non-Standalone (NSA)
roll-out

Rel-16 Standards

5G CoreNetwork (SA)
roll-out



filling the area

Experience

Integration

Enhancements

New Services

today

Rel-17 Standards

Industrial Applications

Service Harmonization

Connecting the Planet

Rel-18/19/… Standards

■ ■ ■

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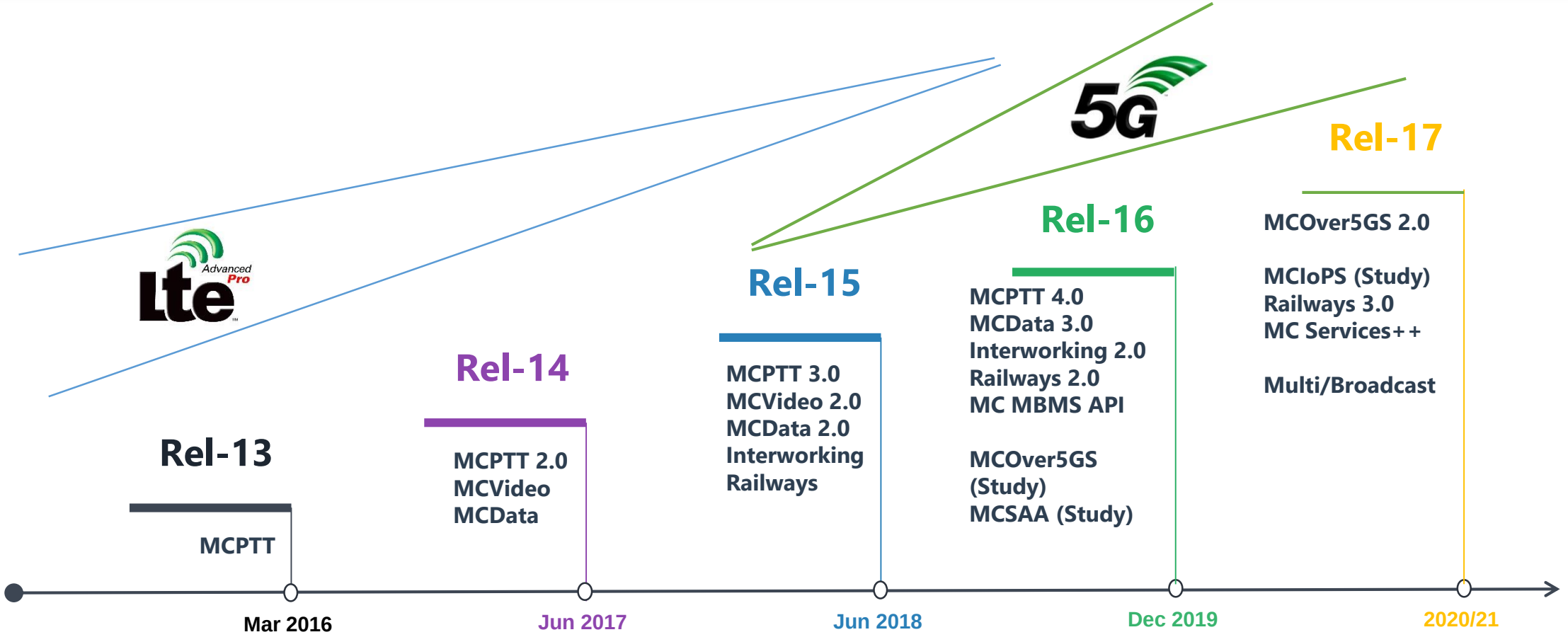
Example:
Mission Critical Standards Evolution



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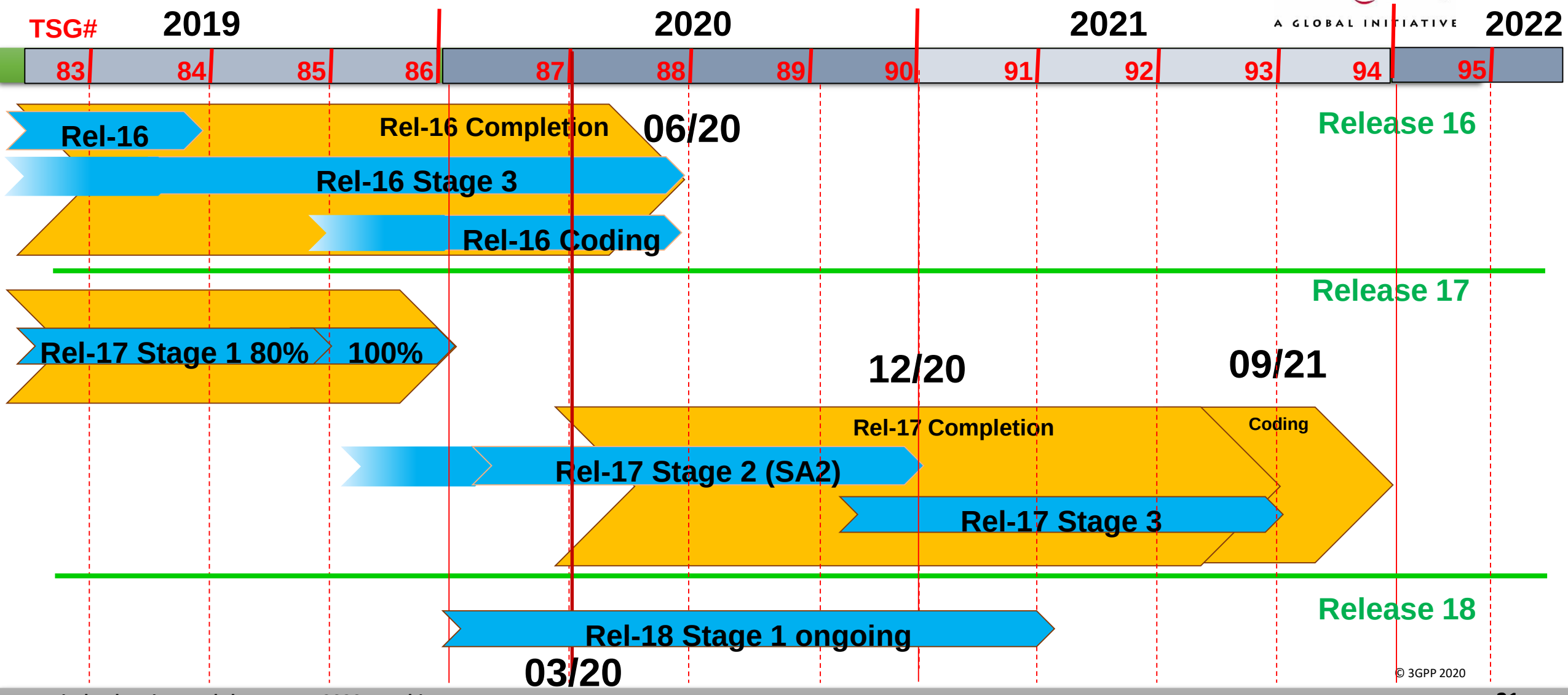
3GPP Release Timelines



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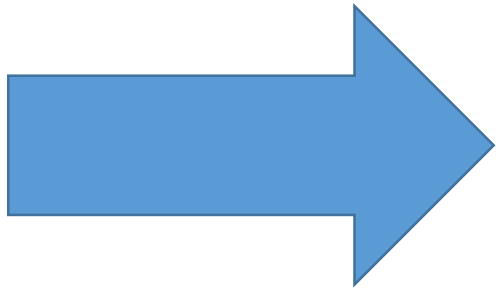
New Requirements

New Requirements



SA1 Release-18

- Rel-17 content and timelines are settled now
- New Requirements should be well communicated within vertical community & with other players.
- Once Rel-18 work starts things will again progress fast – prepare your new ideas early.

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3GPP Releases – Release 16

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3GPP Release 16

- Stage 3 Freeze Date shifted to June 2020 Plenary
- Coding Freeze Date stays June 2020
- This ensures that IMT-2020 timeline is met and product roll-out plans don't have to change

- Requirements (SA1) and Stage 2 are complete
- For Stage 2 some cross-WG and some Security issues are still discussed
- Exception sheets were endorsed by all impacted SA WGs

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3GPP Releases – Release 17

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3GPP Release 17 Overview

- SA1 finished work as foreseen on stage 1 in Q4/19
- SA2 prioritization & timeline
  - Content and timeline (“15 month release”) approved in 12/2019 SA Plenary
  - Due to COVID-19 crisis R17 timeline was shifted by 3 months
  - Coordination with RAN groups on details of content ongoing
- No Prioritization was needed for other SA Groups
- SA2 approved study Rel-17 study items and starts work in Q2/2020
- SA6 already started Rel-17 work

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3GPP Release 17 SA Content Highlights

Enhancements

- Slicing (3rd phase), Edge Computing
- Network Automation, Network Orchestration
- NB-IoT enhancements
- Location Services
- Drones
- MC Services over 5G

New Features

- 5G Proximity Services
- 5G Multicast & Broadcast
- Satellite Integration
- Industrial IoT
- 5G Media & Virtual Reality

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Rel-17 SA1 Work Items

Stage 1 of ATRAC	ATRAC	100%	SP-190931
Stage 1 of CMED	CMED	100%	SP-190306
Stage 1 of eCAV	eCAV	95%	SP-191043
Complete Gap Analysis for Railways Mobile Communication System	MONASTERYEND	100%	SP-190312
Study on Future Railway Mobile Communication System3	FS_FRMCS3	100%	SP-190321
Stage 1 of AVPROD	AVPROD	100%	SP-191041
Stage 1 of EAV	EAV	100%	SP-190308
Broadcast / Multicast requirements supporting Mission Critical Services in 5G	5MBS_eMC	100%	SP-190942
Stage 1 of REFEC	REFEC	100%	SP-190307
Stage 1 of NCIS	NCIS	100%	SP-191039
Stage 1 of MUSIM	MUSIM	100%	SP-190309
Multi-Device and multi-identity Enhancements	MuDE	100%	SP-190823
Stage 1 of MPS2	MPS2	100%	SP-190561
Verification-modified Calling Name Display	VMOD_DISPLAY	100%	SP-190085
Enhanced Calling Name Service Analytics Interworking	eCNAM_An	100%	SP-190940
Enhancement for the 5G Control Plane Steering of Roaming for UE in CONNECTED mode	eCPSOR_CON	100%	SP-190941
Study on MINT	FS_MINT	100%	SP-190090
Stage 1 of MINT	MINT	100%	SP-190938
IMS emergency support for SNPN	IESNPN	100%	SP-191038

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Rel-17 SA2 Studies & Work Items

Study on enhancement of support for 5G LAN-type service	FS_5GLAN_enh	SP-190626
Study on architecture aspects for using satellite access in 5G	FS_5GSAT_ARCH	SP-181253
Integration of satellite components in the 5G architecture	5GSAT_ARCH	SP-191335
Study on enhanced support of Industrial IoT	FS_IIoT	SP-200298
Study on V2X services – Phase 2	FS_eV2XARC_Ph2	SP-190631
Study on Architectural enhancements for 5G multicast-broadcast services	FS_5MBS	SP-200092
Study on Stage 2 (System Enablers) for MUSIM	FS_MUSIM	SP-200297
5G System Enhancement for Advanced Interactive Services	5G_AIS	SP-190564
Study on Enhancement of Network Slicing Phase 2	FS_eNS_Ph2	SP-190931
Study on System enhancement for Proximity based Services in 5GS	FS_5G_ProSe	SP-190443
Study on enhanced support of Non-Public Networks	FS_eNPN	SP-200094
Study on Enablers for Network Automation for 5G - phase 2	FS_eNA_Ph2	SP-200098
Study on enhancement of support for Edge Computing in 5GC	FS_enh_EC	SP-200093
Study on UPF enhancement for control and SBA	FS_UPCAS	SP-190187
Study on Access Traffic Steering, Switch and Splitting support in the 5G system architecture Phase 2	FS_ATSSS_Ph2	SP-200095
Enhancement to the 5GC LoCation Services-Phase 2	5G_eLCS_ph2	SP-200082
Study on supporting Unmanned Aerial Systems Connectivity, Identification, and Tracking	FS_ID_UAS_SA2	SP-200097
Study on Multimedia Priority Service (MPS) Phase 2, Stage 2	FS_MPS2_St2	SP-190629

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Rel-17 SA3 Studies and Work Items

Integration of GBA into 5GC	GBA_5G	SP-190714
Assurance Specification for IMS	SCAS_IMS	SP-191128
Security Assurance Specification for 5G	eSCAS_5G	SP-200149
Security Assurance Specification for Non-3GPP InterWorking Function (N3IWF)	SCAS_5G_N3IWF	SP-200146
Security Assurance Specification for 5G NWDAF	SCAS_5G_NWDAF	SP-200147
Security Assurance Specification for Service Communication Proxy (SECOP)	SCAS_5G_SECOP	SP-200148
Lawful Interception Rel-17	LI17	SP-190983
Study on 5G security enhancement against false base stations	FS_5GFBS	SP-180690
Study on SECAM and SCAS for 3GPP virtualized network products	FS_VNP_SECAM_SCAS	SP-180696
Study on User Plane Integrity Protection	FS_UP_IP_Sec	SP-181035
Study on Security Impacts of Virtualisation	FS_SIV	SP-181236
Study on Long Term Key Update Process (LTKUP) Detailed solutions	FS_LTKUP_Detail	SP-181038
Study on authentication enhancements in 5GS	FS_AUTH_ENH	SP-190713

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Rel-17 SA4 Studies and Work Items

Study on Multicast Architecture Enhancements for 5G Media Streaming	FS_5GMS_Multicast	SP-200238
5G Media Streaming stage 3	5GMS3	SP-190464
Support of Immersive Teleconferencing and Telepresence for Remote Terminals	ITT4RT	SP-180985
Terminal Audio quality performance and Test methods for Immersive Audio Services	ATIAS	SP-190040
EVS Codec Extension for Immersive Voice and Audio Services	IVAS_Codec	SP-170611
VR QoE metrics	VRQoE	SP-190331
Study on VR Streaming Conformance and Guidelines	FS_VR_CoGui	SP-190642
Study on 5G Video Codec Characteristics	FS_5GVideo	SP-200052
Study on the use of NBMP in FLUS	FS_FLUS_NBMP	SP-200053
Study on Streaming Architecture extensions For Edge processing	FS_EMSA	SP-200056

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Rel-17 SA5 Studies and Work Items

Enhancements on EE for 5G networks	EE5GPLUS	SP-200188
Management of non-public networks	OAM_NPN	SP-200189
Enhancement on Management Aspects of 5G Service-Level Agreement	EMA5SLA	SP-200190
Management of MDT enhancement in 5G	e_5GMDT	SP-200191
Additional NRM features	adNRM	SP-200192
Enhancement of QoE Measurement Collection	eQoE	SP-200193
Enhancements of Self-Organizing Networks (SON) for 5G networks	eSON_5G	SP-200194
Closed loop SLS Assurance	eCOSLA	SP-200196
IMS Charging in 5G System Architecture	5GSIMSCH	SP-190367
Intent driven management service for mobile network	IDMS_MN	SP-180899
Study on network slice management enhancement	FS_NSMEN	SP-191192
Study on enhancement of Management Data Analytics Service	FS_eMDAS	SP-190930
Study on new aspects of EE for 5G networks	FS_EE5G	SP-200187
Study on enhancements of edge computing management	FS_eECM	SP-200195

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Rel-17 SA6 Studies and Work Items

Study on application layer support for Factories of the Future in 5G network	FS_FFAPP	SP-190724
Enhancements to Application Architecture for the Mobile Communication System for Railways Phase 2	eMONASTERY2	SP-191104
Study on application layer support for Unmanned Aerial System (UAS)	FS_UASAPP	SP-200111
Study on enhancements to application layer support for V2X services	FS_eV2XAPP	SP-200110
Study on Mission Critical services support over 5G System	FS_MCOver5GS	SP-181136
Mission Critical Data	eMCData3	SP-191106
Study on Mission Critical services over 5G multicast-broadcast system	FS_MC5MBS	SP-190929
Study on Application Architecture for enabling Edge Applications	FS_EDGEAPP	SP-190065
Architecture for enabling Edge Applications	EDGEAPP	SP-200109
MC services support on IOPS mode of operation	MCIOPS	SP-190944
Enhanced Mission Critical Push-to-talk architecture phase 3	enh3MCPTT	SP-200108
Study on support of the 5GMSG Service	FS_5GMARCH	SP-190559

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3GPP Releases – Release 18

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3GPP Release 18

- So far SA1 has started working on a number of new Items
- Timelines and content have not been agreed
  - Prioritization of content is usually done only once work starts on stage 2
- Given the current situation and the R17 timeline shift it is foreseeable that stage 2 will not start working on Rel-18 in 2020

Study on evolution of IMS multimedia telephony service	FS_MMTELin5G	S1	SP-190836
Study on sharing administrative configuration between interconnected MCX Service systems	FS_SACI_MCS	S1	SP-190837
Study on Supporting of Railway Smart Station Services	FS_RAILSS	S1	SP-190838
Study on traffic characteristics and performance requirements for AI/ML model transfer in 5GS	FS_AMMT	S1	SP-191040
Guidelines for Extra-territorial 5G Systems	FS_5GET	S1	SP-191042

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Summary

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Summary & Next Steps

- Due to the ongoing Covid-19 crisis, 3GPP currently conducts e-meetings only
- Release 16 is on-track, with stage 3 freeze shifted to June 2016, still in time for IMT-2020 submission
- Rel-17 content is fixed now, Verticals are well represented there – good balance
- Plan new ideas for Rel-18
- Key steps for verticals
  - Coordinate amongst each other & with other players
  - Provide necessary resources
  - Propose new (gradual) improvements
- Let us tackle open issues together
  - How to gain more awareness of vertical views on all levels of 3GPP?
  - How to reflect better vertical industries product cycles and approaches?

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Thank You!

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