5G Standardization in 3GPP

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5G Roadmap & IMT-2020





5G Phase 1 (Rel-15)

- Status:
 - Stage 3 freeze complete, a few exceptions.
 - Scenario 4 and 7 will be 'late drops:' Dec 2018 stage 3 completion.
- Achievements
 - Scenario 3 (access via NG-RAN) and 2 (access via NG-RAN and 5GC) (Soon, scenarios 4 and 7, also.)
 - Definition of 5G System aspects, the foundation with significant advances compared with the EPS.
 - Backward and forward compatibility (EPS, 5GS), intersystem mobility.
 - 5G Orchestration and management, Media, Charging...



5G Deployment Scenarios





5G Phase 2 (Rel-16)

• Status



Objectives

- RAN & SA have set objectives separately and in common – shown on the next slide.
- Many aspects (media, security, management, protocol optimizations, etc.) will advance, too.



Vertical Industry Integration (1)



TSG 80 agreements, Rel-16 focus areas.

Project Management aspects will be reviewed and adjusted at each TSG meeting.



Vertical Industry Integration (2)



5G Phase 2 will highlight specific vertical industry features (eMBB, URLLC, mIoT.)

3GPP access will expand to fixed and non-terrestrial.

Other enhancements are for generally applicable features and efficiency.



Collaboration with ITU

- With 3GPP TSG SA WG4 ("Codecs"), Media...
 - ITU-T SG12: SA4 implements ITU-T STL; Exchange of information on 360° video, VR, QoE (G.QoE-VR, P.360-VR, FS_QoE_VR); Information sharing on AR (G.QoE-AR)
 - ITU-R BT.2100 Adoption (HLG_HDR)
 - ITU-R WP6C Information sharing on Audio Resenders
 - ITU-T SG16 Alignment/maintenance of ITU-T G.722.2 and AMR-WB
- With 3GPP TSG SA WG5 ("Telecom Management"), OAM, Charging, Energy Efficiency
 - ITU-T SG2 discussion on methodology for IRP information services (ITU-T M.3020 and TS 32.15x series): no model alignment
 - ITU-T SG5 Information exchange on Energy Efficiency
 - ITU-T SG15 Information exchange on Transport Network Management currently trying to identify which specifications to cite for end to end slice management.
- With 3GPP TSG SA WG1 ("Services")
 - LSs sent periodically (e.g. business role modeling).



Collaboration with SDOs, general



KEY INSIGHT: **Delegates to each body do the work** (in 3GPP, or other SDOs.) Sharing information, citation, alignment can be done by LS.



Summary

- 3GPP has made rapid progress and has completed most aspects of 5G Phase 1 standardization.
- As work on the final aspects conclude, agreements have been achieved for the contents of 5G Phase 2, which will constitute the IMT-2020 submission.
- The overall project components, its progress and plans will be considered, as well as significant work with other standards organizations to achieve the goals of 3GPP's 5G standards program.





SUPPLEMENTARY MATERIAL



3GPP SA WG1 'Services' Status

	12.17 03.18 06.18 TSC#78 TSC#70 TSC#80	09.18 12.18 03.19 06.19 09.19 12.19 03.20
Rel-16	130#70 130#79 130#60	(Stage 1) (Stage 2) (Stage 3)(ASN 1)
Nel-To	SMARTER Pb2 (0=>10%)	New Services and Markets Technology Enablers - Phase 2
	enIMS (0=>25%)	Enhancements to IMS for new real time communication
	MONASTARY2 (55=>70%)	Mobile Communication System for Railways 2
	QoS_MON (0=>60%)	QoS Monitoring
	cyberCAV (0=>5%)	Service requirements for cyber-physical control applications in vertical domains
	5GSAT (0=>0%)	Satellite Access in 5G
	PDBT (0=>100%)	Policy delivery to UE for background data transfer
	eLESTR (0=>90%)	Enhancement of LTE for Efficient delivery of Streaming Services
	MuD (0=>85%)	Multi-device and Multi-identity
	MOBRT (0=>70%)	Inter-RAT Mobility requirements for real time service
	5GLAN (0=>40%)	LAN Support in 5G
	MARCOM (0=>0%)	Maritime Communication Services over 3GPP System
	UIA (0=>0%)	User Identities and Authentication
	5G_HYPOS (0=>0%)	5G Positioning Services
	FS_ID_UAS (0=>60%)	Study on Remote Identification of Unmanned Aerial Systems
	FS_FRMCS2 (80=>85%)	Study on Future Railway Mobile Communication System 2
	FS_V2XIMP (0=>75%)	Feasibility Study on Multimedia Priority Service (MPS) Phase 2
	FS_NCIS (0=>0%)	Study on Network Controlled Interactive Service in 5GS
	FS_AVPROD (0=>0%)	Feasibility Study on Audio-Visual Service Production
	FS_5GMSG (25=>60%)	Study on 5G message service for MIoT
	FS_BMNS (50=>75%)	Study on Business Role Models for Network Slicing
	FS_MARCOM (75=>95%)	Study on Maritime Communication Services over 3GPP system
	, FS_5G_HYPOS (75=>90%)	Study on positioning use cases
	FS_CAV (95=>100%)	Study on Communications in Vertical Domains
	FS_LUCIA (60=>90%)	Study on Layer for User Centric Identifiers and Authentication
	FS_5GSAT (70=>100%)	Study on using Satellite Access in 5G



3GPP SA WG2 'Architecture' Status



3GPP SA WG3 'Security' Status

3GPP SA WG4 'Codecs' Status

3GPP SA WG5 'Telecom Management'

Status

3GPP SA WG6 'Applications' Status

5GC (5G core network) Architecture

Not shown: roaming or local breakout scenarios, defined interactions between functions (other 'N' interfaces), data storage interfaces, 5G-EIR, Network Data Analysis Function, Northbound APIs (exposed), Non-3GPP Interworking Function, SMS aspects, Location Services aspects...

5GC Important Innovations

- Network Slicing
- Service Based Architecture
- Uniform 3GPP and Non-3GPP Access
- New QoS Model
- Increased efficiency (e.g. session and service continuity modes)

