(Very basic) DMM-centric summary of the 3GPP workshop on

Sources

- Documents presented at the Workshop:
  - https://portal.3gpp.org/ngppapp/GenerateDocumentList.Aspx?meetingId=60806
- Chair summary:
  - https://www.3gpp.org/ftp/workshop/2025-03-10_3GPP_6G_WS/Docs/6GWS-250238.zip
- 6G Timeline:
  - https://www.3gpp.org/ftp/workshop/2025-03-10_3GPP_6G_WS/Docs/6GWS-250240.zip

General Disclaimer

- The Chairs' summary is based on a compilation of input papers submitted for the 3GPP workshop on 6G.
- It is not an exhaustive record of all views expressed, or proposals submitted in the input contributions, nor does it reflect a consensus views among 3GPP members.
- This summary does not imply any prioritization or ranking of 6G technical areas.
- The scope of work within 3GPP is determined by its established working procedures, and there is no assurance that all the potential technical areas mentioned will be pursued as part of 3GPP studies in Release 20.

Outline

1. 3GPP Workshop on 6G – Introduction
2. 6G Motivation (Why 6G?)
3. 6G Goals
3. Lessons Leant from 5G
4. Potential 6G Technology Areas for 6G study
5. 3GPP 6G Workplan/Timelines
6. Summary of Next Steps Towards 6G

3GPP Workshop on 6G

Mar 10th to 11th in Incheon, Korea

Workshop Presentations: **Link**

- Opportunity for 3GPP members to present their **vision & priorities for next generation radio technology, system architecture, core network and protocols.**
- **1,676 registrations, 748 in-person registrants**
- **219 input contributions from operators, vendors, academia, and MRPs**
- Discussions covering **radio**, **core network**, **protocols**, **and more**

Time	Monday March 10th	Tuesday March 11th
1st session (09:00 – 10:30)	Joint Session	RAN Session / SA/CT Session
Morning break (10:30 – 11:00)	Morning break	Morning break
2nd session (11:00 - 12:30)	Joint Session	RAN Session / SA/CT Session
Lunch break (12:30 – 14:00)	Lunch	Lunch
3rd session (14:00 – 15:30)	RAN Session / SA/CT Session	RAN Session / SA/CT Session
Afternoon break (15:30 – 16:00)	Afternoon break	Afternoon break
4th session (16:00 – 18:00)	RAN Session / SA/CT Session	Joint Session – Summary of Workshop

6G Motivation (Why 6G?)

Support for New Services and Use Cases

- Enabling new services and use cases beyond traditional communication, such as integrated sensing and communication (ISAC), XR/immersive communication, and AI-based services – Compute.

Revenue Growth and Monetization

- Creating new revenue streams by monetizing network capabilities and supporting diverse applications across industries.

AI and Automation

- Implementing AI-native networks for automation, optimization, and improved efficiency in network management and resource allocation.

Energy Efficiency and Sustainability

- Reducing energy consumption and promoting environmental sustainability through energy-saving features in network design and AI-driven power management.

Spectrum Efficiency

- Utilizing spectrum efficiently, including dynamic spectrum sharing and exploring new spectrum bands.

Ubiquitous Coverage

- Seamlessly integrating terrestrial and non-terrestrial networks (NTN) for ubiquitous coverage and resilient services.

Total Cost of Ownership (TCO) Reduction

- Reducing capital expenditure (CAPEX) and operational expenditure (OPEX) through simplified network operations and improved energy efficiency.

Improved Service Reliability and Customer Experience

- Enhancing service reliability, resiliency, and insights for improved customer experience.

Network Simplification

- Simplifying network architecture, reducing complexity, and improving operational efficiency

Lessons Learned from 5G

Challenges in Migration

- The transition from 5G Non-Standalone (NSA) to Standalone (SA) proved complex and difficult.

Architectural Complexity

- An excessive number of architectural options, features, and configurations led to high system complexity, impacting UE capabilities and deployment efficiency.

Slow Adoption of Key Capabilities

- Certain 5G features, such as network slicing, experienced slow adoption—necessitating an analysis of underlying causes and potential simplifications in 6G.

Deployment Inefficiencies

- Issues identified during 5G rollouts, including NRF profile inefficiencies and protocol challenges (e.g., HTTP/2 over TCP), should be addressed in 6G.

Optimized Network Functions

- Ensuring efficient Network Function (NF) sizing with clear decoupling, while further exploring stateless architectures.

Functionality Optimization

- 6G should focus on a well-dimensioned set of functionalities, minimizing redundant options and excessive configurations to reduce complexity.

Potential Technical Areas for 6G Study

6G System Design Considerations

Focus and Simplicity

- Lean and streamlined standards for 6G, e.g., by dimensioning an appropriate set of functionalities, minimizing the adoption of multiple options for the same functionality, avoiding excessive configurations, etc.

Cloud-Native Architecture

- Designing networks to be cloud-native to enable flexibility, agility, and innovation.

AI-Native Design

- Integrating AI and ML frameworks natively into the network for intelligent automation, optimization, and improved efficiency.

Scalability and Modular Design

- Implementing a scalable and modular design that allows a wide range of features, device types, services, and spectrum bands to be developed and deployed as needed.

Software-Driven Deployment

- Software-driven deployment with needs-based hardware refresh to allow for continuous innovation and agility.

Interoperability

- Designing components with interoperable interfaces and a unified management framework to ensure interoperability and avoid fragmentation.

Enhanced Security

- Ensuring the 6G system is secure by design to provide enhanced security and privacy.

IoT Support

- Designing 6G to support diverse IoT device types and use cases from day one, with a focus on long-term commitments and multi-generational solutions.

Service-Aware

- Enabling a service-aware intelligent network powered by AI-native, programmable, and service-aware 6G RAN.

Ubiquitous Connectivity

- Providing ubiquitous coverage through seamless integration of terrestrial and non-terrestrial networks.

Core Network for 6G design considerations

- A preference for a single 6G Standalone Architecture is noted, with SA mode as a baseline
- Core Network for 6G to be designed to cover new 6G requirements regarding AI, connectivity, Security/Privacy/ Resilience with possible reuse of the 5G SBA/SBI framework and investigate enhancement 5G SBA/SBI architecture
- Simplification of architecture and streamlining of NFs definitions and interactions/interfaces/protocols
- Investigation of new functions based on the SBA architecture to support new 6G Services
- Designed to integrate and interoperate with various access technologies, including FWA and Wi-Fi access
- A unified network exposure framework for simplifying the 3GPP-wide

Interworking with legacy 3GPP systems

- Seamless interworking with 5G system
  - Single registration vs dual registration
- Seamless interworking with 4G system?
  - General consideration to avoid interworking with 4G
  - Scenarios needs to be further discussed
- No interworking with 2G and 3G system

Unified Data Management Framework

- **Complexity in 5G Data Collection:** Current approaches, including MDT-based, LPP-based, NWDAF-driven, DCAF-based methods, and UE level to support AI-driven RAN optimizations introduce significant complexity in data gathering across Control Plane and User Plane.
- **Unified Data Management Framework** for 6G for cross domain data discovery, collection, storage, transmission, correlation, and exposure for various applications, including**:**
  - Efficient data detection across diverse sources and types (e.g., sensing data, AI-generated data).
  - Streamlined data collection, storage, processing, and exposure (covering UE, network functions, and third parties).
  - Robust validation mechanisms for data sources and consumers.
  - Implementation of data traceability mechanisms to ensure transparency, security, and trustworthiness in data operations.
  - Efficient data management and transmission protocol

Stage-3 Protocol Aspects

- **Control Plane Protocol** evolution and study current inefficiencies at Network interfaces
  - HTTPv2 over TCP vs HTTPv3 over QUIC
  - SCTP vs QUIC
- **User Plane Protocol** evolution to support device-network-application collaboration, distributed User Plane, and programmable user plane path.
- **Data Protocol** to support efficient data management and transmission protocol, the coexistence of different protocols may be considered.
- **IMS (IP Multimedia Subsystem) signaling protocol** evolution to support new services, such as multi-modality communication and agile rollout of new services, and to reduce complexity.
- **Protocol for communication between AI agents** to improve the interaction efficiency of the network and resource coordination ability, and enhance the scalability and integration of the network capabilities
- **Protocol impact to support new services** - Computing service, AI service, Sensing service, etc.

3GPP 6G workplan/timeline

(source: 6GWS-250240)

Overall 3GPP 6G Workplan

2024

WG SA1

Stage-1 workshop on IMT2030 use cases

Rotterdam, Netherland, May 8 – 10, 2024

Workshop Summary: SWS-240025
Workshop Presentations: Link

SP-241391 : SA1 6G study item on use cases and service requirements (FS_6G_REQ) **approved** at TSG SA#105.

TSGs#107

First 3GPP TSG-wide 6G Workshop

Incheon, S. Korea, March 10 – 11, 2025

To discuss vision & priorities for next generation radio technology, system architecture, core networks and protocols.

Studies for 6G

from **Release 20**

RP-243327 : The 6G RAN Study (part I: ITU focused) was approved at TSG RAN#106

See next slide for the 6G studies timelines

Normative work for 6G

from **Release 21**

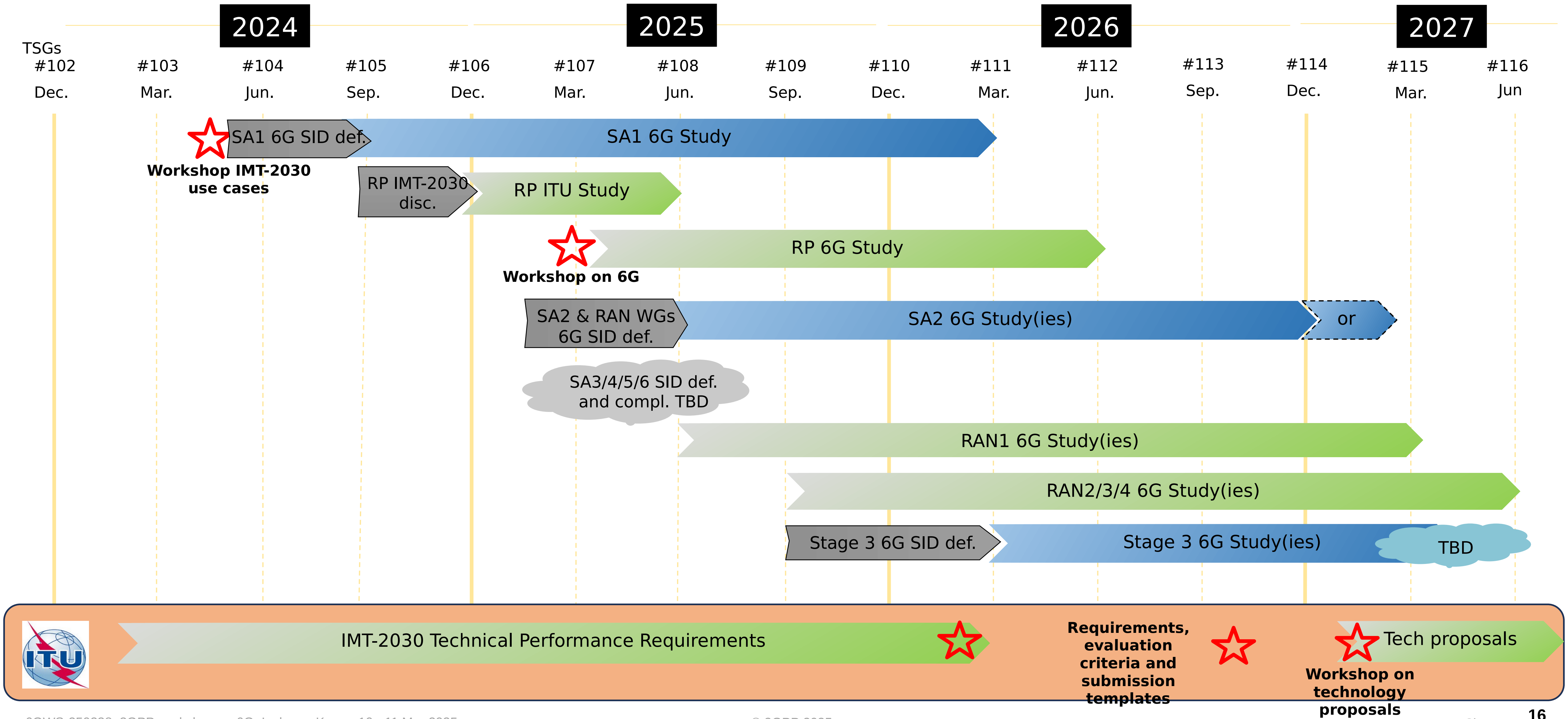
Release 21 is expected to produce the 1st set of 3GPP 6G technical specifications and will be the release for IMT-2030 submission before 2030 and is expected to be delivered with a single drop (i.e., a single code freeze).

Rel-21 timeline is to be decided no later than June 2026

- However, ASN.1/OpenAPI freeze date is no earlier than March 2029

2030

Release 20: 6G Timeline



Release 20: 6G Study Item (SI)

6G Study Item(s) – TSG SA

- **SA SI Approval**
  - SA1 SI approval: TSG#105 (Sept 2024)
  - SA2 SI approval: TSG#108 (Jun 2025)
  - Other SA WG (SA3, SA4, SA5, SA6) SI approval: TBD at future TSG meeting
- **SA SI completion (18/21 months)**
  - SA1 6G SI completion: Mar 2026
  - SA2 6G SI completion: Dec 2026 or Mar 2027 (To be confirmed at future TSG meeting)

6G Study Items(s) - RAN Plenary

- **RAN Plenary (RP) work is split into an ITU-focused SI and General RAN SI**
  - IMT-2030 discussion is expected in RAN from Sep 2024 to Dec 2024
  - RP SI Rel-20 focusing on ITU– IMT-2030: approval Dec 2024 until June 2025
  - RP SI Rel-20 focusing on 6G General: approval Mar 2025 (after 6G WS), until June 2026

6G Study Item(s) – RAN WGs

- **RAN WGs: 21 months**
  - RAN WG SI package approval June 2025
  - RAN1 SI starts in June 2025 until Mar 2027
  - RAN2/3/4 SI start in Sep 2025 until June 2027

6G Study Item(s) – TSG CT

- **CT WGs: at least 9 months**
  - Discussion on 6G studies will start in Q4 2025 in CT
  - CT WG 6G SI is expected to be approved in Mar 2026 (or Dec 2025).

Thank you!

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