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A Short Update on 3GPP Release 16 and Release 17

Release 16, considered a second phase of the 5G system, consists of many work items on different topics, including

- enhancement of the common API framework for the 3rd Generation Partnership Project (3GPP) Northbound APIs
- enhancements for ultra-reliable and low-latency communication (URLLC)
- the Industrial Internet of Things (IoT)
- New Radio (NR)-based access to license-exempt (i.e., unlicensed) spectrum
- positioning, extended sensors, automated driving, and remote driving related to vehicle-to-everything applications
- topics for efficiency (such as interference mitigation, location and positioning, power consumption, enhanced dual connectivity, device capabilities exchange, and mobility enhancements)
- further work on the Future Railway Mobile Communication System.

As of late December 2019, the radio access network 1 (RAN1) specification is approved [1]. For the specifications being developed in RAN2, RAN3, and RAN4, approvals are delayed due to COVID-19. It is expected that the Release 16, Stage 3 freeze is postponed by three months to June 2020, whereas the

THE TIMELINE OF THIS NEW RELEASE IS ALSO AFFECTED BY COVID-19, WHICH RESULTS IN 1) A THREE-MONTH SHIFT OF SCHEDULE ON THE RELEASE 17 STAGE 3 FREEZE AND 2) SHIFTING THE RELEASE 17 ASN.1 AND OPENAPI SPECIFICATION FREEZE.

schedule of the Release 16 Abstract Syntax Notation One (ASN.1) and OpenAPI specification freeze remains unchanged (i.e., June 2020) [2].

Release 17, which focuses mainly on 5G system enhancements, kicked off in December 2019. There are about nine study items, 14 work items, and eight potential work items covering a variety of topics [3]. Study items include coverage enhancement for NR, an extended reality model and its evaluation, enhancement of NR positioning and RAN slicing, IoT over nonterrestrial networks (NTN), NR with operation above 52.6 GHz, NR quality of experience, NR with reduced capabilities, and sidelink relay.

Work items include

- enhanced support for the Industrial IoT and URLLC
- enhancement for dynamic spectrum sharing between NR and long-term evolution (LTE), Multi-Radio Dual Connectivity, Narrowband-IoT and LTE-Machine Type Communication, NR integrated access and backhaul, NR sidelink, and NR user equipment power savings
- self-organizing network minimization of drive test

- NR broadcast and multicast services
- NR multiple-input, multiple-output
- NR low data transmissions in an inactive state.

Work items also include solutions for NR to support NTN, support for Multi-Subscriber Identity Module devices, and architecture and solutions for the LTE control plane/user plane split. Potential additional work items include the conversion of the above-mentioned study items to work items, the extension of current NR operations to 71 GHz, and enhancement for a nonpublic networks.

The timeline of this new release is also affected by COVID-19, which results in 1) a three-month shift of schedule on the Release 17 Stage 3 freeze and 2) shifting the Release 17 ASN.1 and OpenAPI specification freeze to September 2021 and December 2021, respectively.

References
[1] "3GPP Specifications for group: R1," 3GPP, Sophia Antipolis, France. [Online]. Available: https://www.3gpp.org/DynaReport/TSG-WG-r1.htm
[2] "3GPP Release 16," 3GPP, Sophia Antipolis, France. [Online]. Available: https://www.3gpp.org/release-16
[3] "3GPP Release 17," 3GPP, Sophia Antipolis, France. [Online]. Available: https://www.3gpp.org/release-17

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