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3GPP agrees on plan to accelerate 5G NR – the global 5G standard – for 2019 deployments

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If you were like me and the 100,000+ other attendees, you were at Mobile World Congress (MWC) last week in Barcelona, Spain, and were inundated with 5G everywhere. However, unlike me, hopefully you got to return home at the end of the long week of meetings, walking, tapas and more walking. Instead, I and many of my colleagues in the mobile industry, headed to Dubrovnik, Croatia for a very important 3GPP RAN Plenary meeting from March 6th to 9th. In a few years' time, when we look back on the path to 5G, I believe this specific standardization meeting will be seen as a critical milestone in making a lot of the 5G hype you saw at MWC 2017, a reality.

At this plenary meeting, 3GPP agreed to a work plan proposal ([RP-170741](#)) for the first 3GPP 5G New Radio (NR) specification that will be part of Release 15 – the global 5G standard. As part of this work plan, Qualcomm and fellow mobile industry leaders including AT&T, NTT DOCOMO, SK Telecom, Vodafone, Ericsson, and others, led a coalition of companies that committed to accelerate the 5G NR schedule by introducing an intermediate milestone for an early completion of a variant called Non-Standalone (NSA) 5G NR. This intermediate milestone will enable 3GPP-based large-scale trials and deployments as early as 2019 (more on this later).

RP-170741

3GPP RAN #75
Dubrovnik, March 2017

Way Forward on the overall 5G-NR eMBB workplan

Alcatel-Lucent Shanghai-Bell, Alibaba, Apple, AT&T, British Telecom, Broadcom, CATT, China Telecom, China Unicom, Cisco, CMCC, Convida Wireless, Deutsche Telekom, DOCOMO, Ericsson, Etisalat, Fujitsu, Huawei, Intel, Interdigital, KDDI, KT, LG Electronics, LGU+, MediaTek, NEC, Nokia, Ooredoo, OPPO, Qualcomm, Samsung, Sierra Wireless, SK Telecom, Sony, Sprint, Swisscom, TCL, Telecom Italia, Telefonica, TeliaSonera, Telstra, Tmobile USA, Verizon, vivo, Vodafone, Xiaomi, ZTE

Figure 1: 3GPP 5G NR eMBB work plan Way Forward with 40+ co-signers (RP-170741)

It took us some twists and turns to get there – the usual business of building consensus in broad organizations dealing with technology. However, as displayed by the very large support base of the approved proposal (40+ co-signers as shown above), the result showcases Qualcomm's desire, and ability, to form broad consensus within the mobile industry, allowing members of the ecosystem to confidently move forward at scale toward their goals of an introduction of 5G NR in 2019.

This is nothing new. I've been leading the 3GPP technical

standards team at Qualcomm Technologies for the last few years, and have been involved in our 3GPP design teams for over a decade. I'm very proud to be part of these extraordinary efforts to drive the mobile industry forward.

Unfortunately, these efforts are often not fully appreciated or are over-simplified in the media. Crafting a new 5G NR schedule that includes an early milestone to enable 2019 deployments has been in the making for approximately a year and Qualcomm has played a critical role from the start. This kind of progress is something that would never get recognized by simply counting 3GPP contributions.

So, I thought I would provide my insider perspective of the 'why?', 'what?', and 'how?' behind the events surrounding this 5G NR "acceleration."

Why?

5G NR – the global 5G standard – will serve as a platform for innovation to an array of use cases in the next decade and beyond. But at the same time, 5G NR is needed to meet the ever-increasing global mobile broadband needs. The average consumer's smartphone alone is expected to go from consuming 1.6 GB of data per month today to close to 7 GB of data per month in 2021 (Source: Cisco Visual Network Index: Global Mobile Data Traffic Forecast Update, 2016 - 2021). Add on top of this emerging, video-intensive use cases like augmented reality and virtual reality (see recent [ABI Research report on 5G VR/AR](#)), the proliferation of mobile broadband in vehicles, and much more, and you get a sense of the need for accelerating the 3GPP 5G NR schedule to make use of the enhanced mobile broadband benefits of 5G NR sooner, while continuing to address the larger vision for 5G NR in 2020 and beyond.

What?

The previous project plan for 5G NR (as part of 3GPP Release 15) was allowing standard-compliant 5G NR deployment around 2020. With the agreed-to proposal, we are instead introducing an earlier intermediate milestone to complete technical specifications related to a configuration called Non-Standalone 5G NR in such a way to enable large-scale trials and deployments starting in 2019. But what do “Non-Standalone” and “Standalone” actually mean?

- **Non-Standalone (NSA) 5G NR** will utilize the existing LTE radio and core network as an anchor for mobility management and coverage while adding a new 5G carrier. This is the configuration that will be the target of early 2019 deployments (in 3GPP terminology, this is NSA 5G NR deployment scenario Option 3).
- **Standalone (SA) 5G NR** implies full user and control plane capability for 5G NR, utilizing the new 5G core network architecture also being done in 3GPP.

With the recently agreed upon proposal, we also defined a framework to ensure commonality between these two variants, as well as making forward compatibility a key design principle for the standardization of the first release of 5G NR. This will enable in-band introduction of new capabilities and features in subsequent releases of the standard, such as the addition of new signals to support new industries or use cases to achieve the 5G vision to connect everything to everything. An overview of the 3GPP 5G NR Release 15 work plan and schedule can be seen below; the complete details can be found in [RP-170741](#).



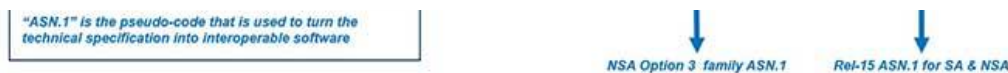


Figure 2: 3GPP work plan for 5G NR Release 15

How?

Crafting a new project plan in 3GPP is only the start; there is still a lot of work to get done. 3GPP must deliver the Release 15 technical specifications for both NSA and SA 5G NR, which this project plan details. Although many technology decisions have already been made as part of the 5G NR Release 14 Study Item (e.g., the use of scalable OFDM waveforms), there are still many more to be made, as well as details to be ironed out, as we enter into the 5G NR Release 15 Work Item. In 3GPP meetings throughout the next year and beyond, we must have the technical discussions and make the decisions striving to choose the best technologies for 5G NR.

From a Qualcomm perspective, we have been inventing and designing the building blocks for 5G NR for many years now – long before the 3GPP standardization efforts kicked off. Our leadership, inventions and innovations from the air interface to the system architecture have played a critical role in driving the 5G technology standardization to-date and in building broad consensus within the mobile industry. We are striving to make 5G NR the best possible design, and our submissions come from our years of R&D in wireless communications by the best engineers in the field. This R&D includes extensive modeling and analysis, test beds, and field tests of technologies suitable for NR.

Of course, achieving 5G NR deployments in 2019 will require more than just R&D test beds and a 3GPP specification.

For example, it will require over-the-air trials and interoperability testing, compliant with the 3GPP 5G NR specification, to test and simulate 5G NR technologies in real-world scenarios across a

broad set of use cases and deployment scenarios. Over the last two months, Qualcomm, in collaboration with Ericsson and ZTE, has announced 5G NR trials with [AT&T](#), [China Mobile](#), [NTT DOCOMO](#), [SK Telecom](#), [Telstra](#) and [Vodafone](#). Those trials will operate in mid-band spectrum from 3.3 GHz to 5.0 GHz, as well as millimeter wave (mmWave) spectrum at 28 GHz and 39 GHz, showcasing the unified, 3GPP-based 5G NR design across diverse spectrum bands.

In addition, an accelerated timeline for 5G NR deployments would be incomplete without supporting devices. This is why we recently announced the expansion of our [Qualcomm Snapdragon X50 5G modem family](#) to include new multi-mode 2G/3G/4G/5G modems that will support the global 5G NR standard – both sub-6 GHz and multi-band mmWave – and Gigabit LTE on a single chip.

The next few years will be extremely exciting and challenging in the industry, as we continue to progress toward making our 5G vision a reality through technology standardization, prototyping and trialing, and ecosystem creation. In fact, in addition to the approved Release 15 5G NR work plan, 3GPP also just approved the next wave of new 5G Study Items at this week's Plenary Meeting that will define further evolution of 5G services and capabilities for deployments in 2020 and beyond.

Just as we did with Release 15 5G NR, I look forward to collaborating with the industry to drive technology standardization for these next phases of 5G NR.