5G Standards – State of Play

June 26, 2019

Pradeep Bhardwaj, Sr. Strategy Director – Head of Industry Standards

What is 5G?

💬

5G is a new ecosystem, a system of systems, an umbrella of technologies, that will revolutionize the mobile industry and different market/industry verticals.

5G will be a cornerstone for the Digital Economy and Connected Society of the future

💬

Pradeep Bhardwaj
Sr. Strategy Director & Head of Industry Standards

syniverse.

5G Timeline

5G Phase-1 (Release 15) Standards completed in June 2018

Several 5G trials ongoing in many countries

5G Technology tested and showcased at big sporting events (ex: 2018 Winter Olympics, 2018 World Cup)

Early commercial launches of 5G appearing in different markets

Large scale commercial deployments in 2020 – UEFA Euro 2020 and Tokyo 2020 Summer Olympics

5G Market News – Commercial Launches

- Commercial 5G Launches
  - 17 operators in 11 countries
  - 3GPP compatible 5G service launches (Mobile or FWA)
  - AT&T (USA), Verizon (USA), Sprint (USA), EE (UK), Elisa (Finland & Estonia), Etisalat (UAE), KT (Korea), SKT (Korea), LG-Uplus (Korea), Ooredoo (Qatar), Vodafone (Qatar), Optus (Australia), Telstra (Australia), Sunrise (Switzerland), Swisscom (Switzerland), Vodacom (Lesotho)
  - Fastweb & TIM Italy launched joint Matera and Bari 5G City for project members only
  - C-Spire launched non-3GPP compliant 5G network

Standard Bodies

Who is who?

Global initiatives

3GPP — A GLOBAL INITIATIVE — http://www.3gpp.org/

GSMA — http://www.gsma.com/

ngmn — the engine of broadband wireless innovation — https://www.ngmn.org/

ITU — http://www.itu.int/

Local / regional associations

5G PPP — The 5G Infrastructure Public Private Partnership — https://5g-ppp.eu/

5G americas — http://www.5gamericas.org/

VERIZON 5G TECHNICAL FORUM — http://www.5gtf.org/

IMT-2020 (5G) Promotion Group — http://www.imt-2020.cn/

5G Forum — http://www.5gforum.org/

5G IMIF — The Fifth Generation Mobile Communications Promotion Forum — http://5gmf.jp/

5G Timeline – Key Milestones

11 Mar 2015 Shanghai – 3GPP introduces SMARTER Study Item

17 Sep 2015 Phoenix – 3GPP holds 5G RAN Workshop

27 Nov 2015 Geneva – WRC15 agrees new IMT spectrum bands

11 Dec 2015 Sitges – 3GPP starts 5G System Requirements & Architecture

15 Apr 2016 Busan – 3GPP holds its 1st meeting to discuss 5G NR standards

synyiverse

5G Timeline – Key Milestones

11 Mar 2015 Shanghai – 3GPP introduces SMARTER Study Item

17 Sep 2015 Phoenix – 3GPP holds 5G RAN Workshop
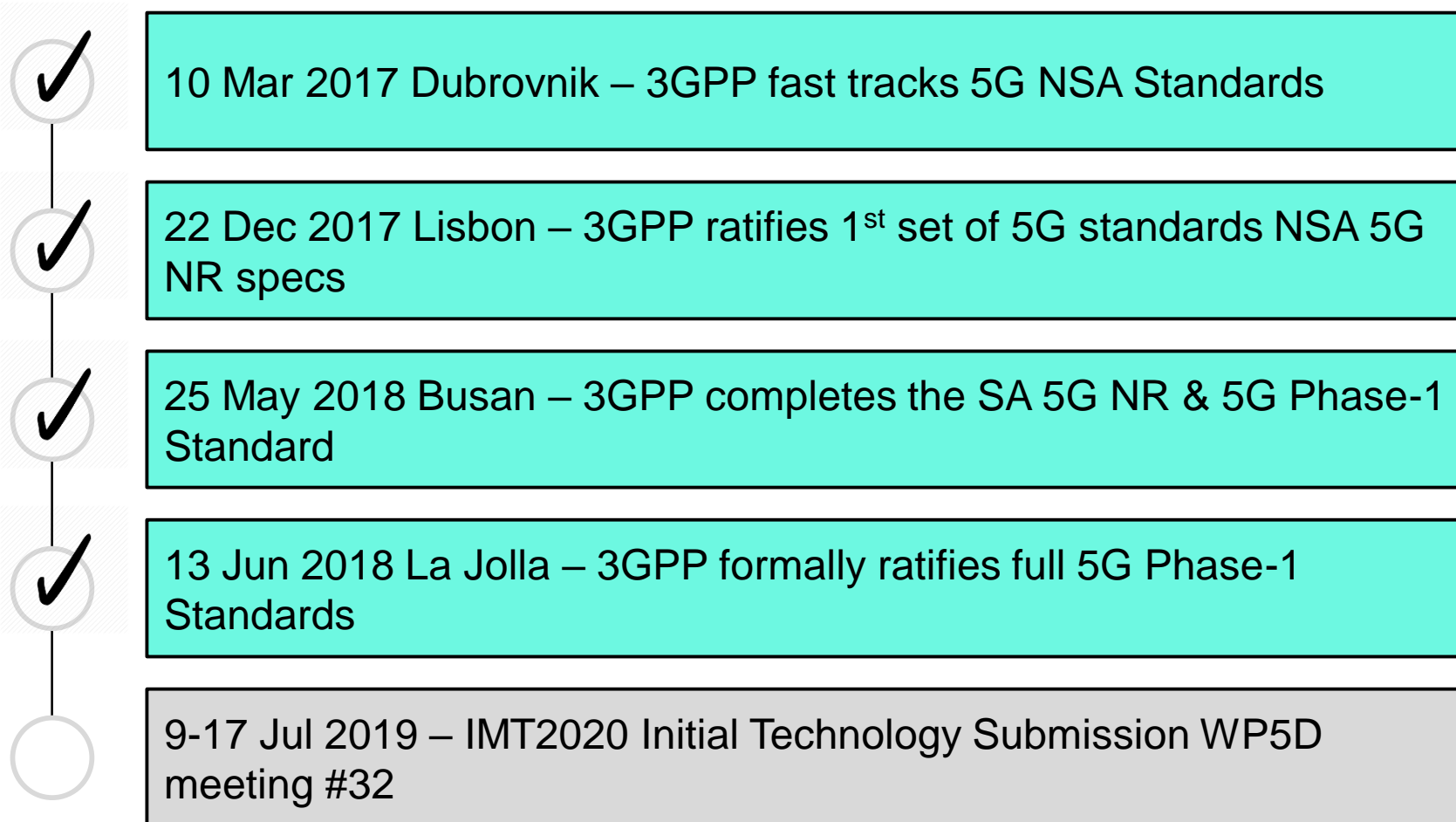
27 Nov 2015 Geneva – WRC15 agrees new IMT spectrum bands

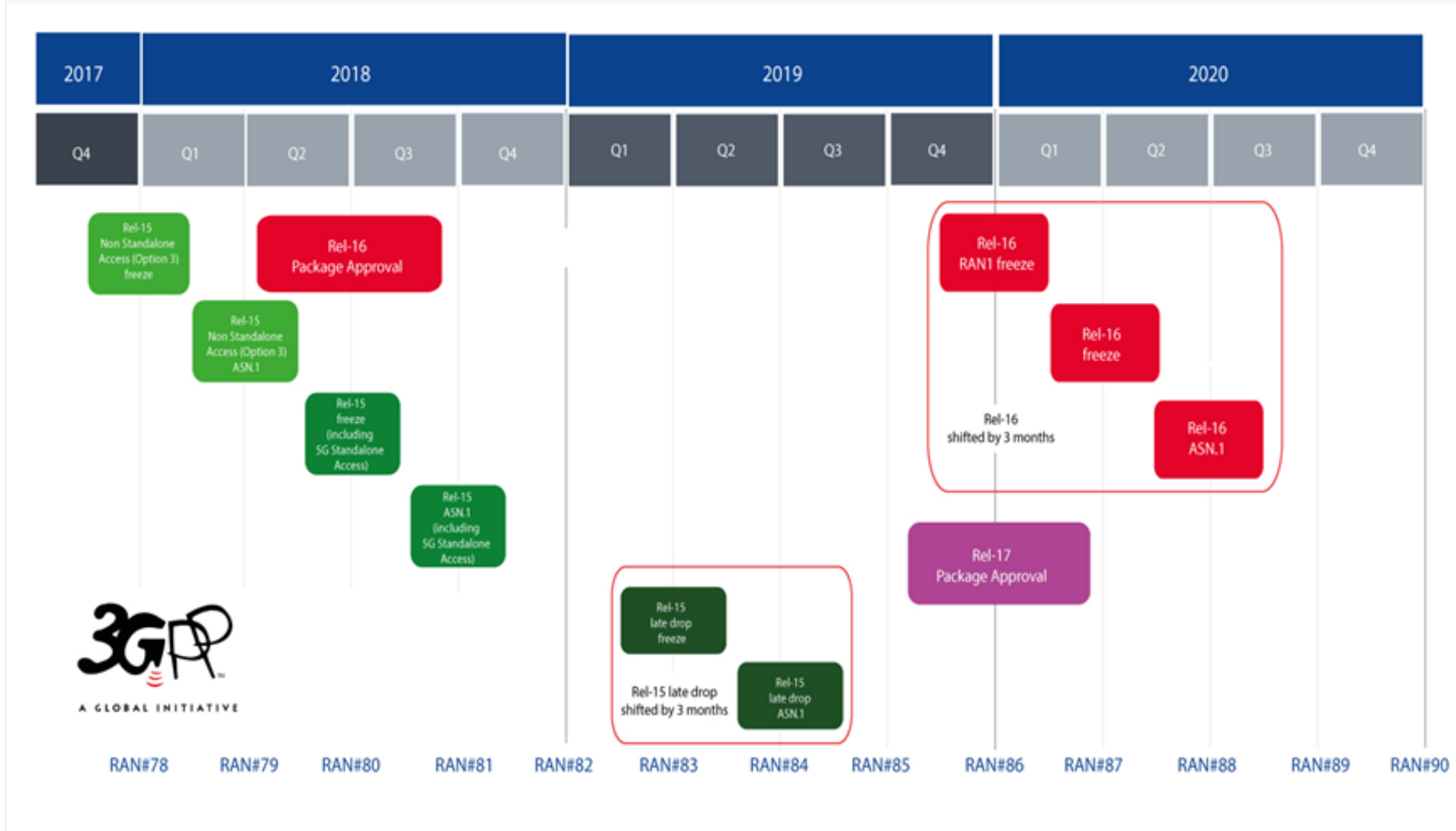11 Dec 2015 Sitges – 3GPP starts 5G System Requirements & Architecture

15 Apr 2016 Busan – 3GPP holds its 1st meeting to discuss 5G NR standards

syniverse

5G Timeline – Key Milestones

10 Mar 2017 Dubrovnik – 3GPP fast tracks 5G NSA Standards

22 Dec 2017 Lisbon – 3GPP ratifies 1st set of 5G standards NSA 5G NR specs

25 May 2018 Busan – 3GPP completes the SA 5G NR & 5G Phase-1 Standard

13 Jun 2018 La Jolla – 3GPP formally ratifies full 5G Phase-1 Standards

9-17 Jul 2019 – IMT2020 Initial Technology Submission WP5D meeting #32

syniverse.

New 3GPP Release-16 5G Phase-2 Schedule

5G Specifications – Phase 2 (Release 16)

- 5G Expansion
  - New Services and Markets Technology Enablers Phase 2
  - 5G Voice Service Continuity
  - Non-Terrestrial Networks (NTN)
  - 5G V2X
  - 5G Industrial IoT
  - Mobile Communication System for Railways 2
  - 5G eXtended Reality (XR)
  - eMBB Media Distribution
  - Common API Framework (CAPIF) Enhancements

- 5G Expansion
  - 5G URLLC Enhancements
  - 5G SBA Enhancements
  - Multimedia Priority Service (MPS) Phase 2
  - MBMS User Services for IoT
  - Multi-Device and Multi-Identity
  - 5G Message Service
  - 5G for Unlicensed Spectrum (NR-U)
  - 5G for Satellite
  - 5G above 52.6 GHz
  - 5G Network Slicing Enhancements

5G Specifications – Phase 2 (Release 16)

- 5G Efficiency
    - Automation in Vertical Domains
    - 5G SON and Big Data
    - Enhancements to IMS for new real time communication services
    - Enhancements of Public Warning System
    - 5G MIMO Enhancements
    - User Plane Protocol in 5GC
    - Integrated Access & Backhaul (IAB)
    - 5G Location & Positioning Enhancements
    - 5G Power Consumption Improvements
    - Dual Connectivity Enhancements
    - Device Capabilities Exchange
    - Non-orthogonal Multiple Access (NOMA)

Conclusions

- 5G technology standards definition has progressed faster than anticipated

- Completion of 5G standardisation work has paved the way for commercial 5G launches

- Commercial 5G launches have commenced and more are imminent in the near-/short-term

- Most Operators are deploying Non Stand-Alone (NSA) mode Option 3 to begin with

- Test-beds established around the world and large-scale trials are being undertaken

- 5G spectrum auctions being planned/undertaken globally paving the way for commercial deployments

- Chipsets & Devices are becoming available for early 5G applications e.g. Fixed Wireless Access (FWA) and wireless routers, and are expected for mobile services in early 2019

- Operators may introduce Stand-Alone (SA) mode i.e. 5G Core Network either before or after introducing Roaming with Non Stand-Alone (NSA) mode

Thank You

Pradeep Bhardwaj

*for any questions, please send an email at
pradeep.bhardwaj@syniverse.com
or call +44-772-558-2624

The world's
most connected
company™

syniverse®