

5G Update 2021 and beyond

Table of Contents:

Technology

- **Definition: What is 5G (IMT-2020)?**
 - For the first time: Evolution rather than Revolution
 - Beamforming centric
 - Deployment possible on mmWave Bands
 - First steps of 5G: step 1. NSA step 2. SA
 - With SA: Fully virtualized core network
- **Migration from 4G to 5G**
 - Step 1: Non-Stand-Alone (NSA) with Option 3(x)
 - Step 2: Stand-Alone with Option 2
 - NSA \Leftrightarrow SA: Which Features are supported?
- **Key Technical Features of 5G**
 - The Cloudified 5G Core Network (5GC)
 - mMIMO & Beamforming: Key Enablers of 5G
 - Flexible Subcarrier Spacing
 - DSS
- **The 5G Radio Access Network**

please turn to next page

Services and Evolution

- **List of 5G Service Enablers**
 - Higher Throughput (what a surprise :-))
 - But watch out: 5G is not faster just because it is (4+1)G!
 - Focus on lower latency (target: < 1 ms e2e)
 - Beyond Cellular: 5G also contains FWA, Industry, IoT Car-2-X
 - Virtualization paves the way to entirely new service areas
- **Cartoon: 5G around the World**
- **Network Slicing**
- **Mobile Edge Computing**
- **What about Voice in 5G?**
- **What about IoT and mMTC?**

please turn to next page

What is the Position of 5G in June 2021?

- **Some Numbers**
 - No. of Operators preparing for or already offering 5G Services
 - No. of announced / commercially available UEs
 - Types of 5G UEs currently available
- **Which Frequency Bands do these UEs support?**
- **Situation in the US: Auction of Band n77**
- **Some unpleasant Remarks & Concerns in the middle of 2021**

please turn to next page

Important Developments within the next Two Years

- **What to expect in the Years 2021 – 2023**
- **5G Stand Alone: Option 2 vs Option 4**
- **The mysterious 5G Core Network**
- **Kubernetes and 5GC Cloud Operation**
- **Unpredictable yet: The impact of ORAN**
- **Campus Networks and their Implementation Options**
- **5G over Satellite?**

please turn to next page

Technical Updates w/ R16 and R17 (Selection)

- **Technical Enhancements with 3GPP Release 16**
 - NR-U
 - 256-QAM for FR2
 - NR-Mobility
 - New Configurations for CA and DC
 - NR-Positioning
 - UE Power Saving Techniques
 - 2-Step RACH Procedure

- **Technical Enhancements with 3GPP Release 17**
 - New frequency ranges (NR beyond 52.6 GHz)
 - Sidelink enhancements
 - IAB enhancements
 - NR support over non-terrestrial networks
 - RedCap / NR-LIGHT