3GPP TSG SA2#111
Chengdu, P.R.China
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Views on structure of work on Next Generation Mobile Network Architecture

Source: Qualcomm Inc.

What is Qualcomm's long term view for Next Generation Mobile Network Architecture?

- Multi-access by design
  - A multi-access CN that will be optimal for usage for a variety of services that will be defined in SMARTER work of SA1
    - 4G, WLAN and 5G are expected to connect to this CN for services
      - 4G or 5G can act as an anchor
    - Define new 5G CN, distinct from EPC, for new services, service models, mobility models, connectivity models, and subscription models
    - Enable interconnection of multiple access technologies: 4G, WLAN, 5G, broadband
- On demand mobility
  - Full session continuity between 5G, 4G and Wi-Fi for services that require it
    - Not all services/applications require IP address continuity
    - CN system design should not focus on assumption that IP address continuity is always needed or that is the main mobility feature
  - Interworking with 2G/3G is TBD based on voice requirements
    - Voice support in 5G requires a dedicated discussion in terms of IW with existing solutions for continuity

What is Qualcomm's long term view for Next Generation Mobile Network Architecture?

- Flexible for a variety of services and business models
  - Support for evolved configurable connectivity and subscription models that allows dynamic service creation, credentials provisioning and setup
    - Leverage SDN and NFV for configurable connectivity
  - Ingrained dedicated core network functionality and support for network slicing and simultaneous UE connectivity to different slices
  - Trust agility to handle different network configurations and deployments
  - Support of a new 5G QoE paradigm

- Enable new verticals with new revenues streams
  - Native support for D2D/V2V, etc.
  - Optimised support for IoE and mission critical use cases
  - Support for broadcast services

SA2 work and SA1 SMARTER phases

- SA1 is discussing the split of SMARTER use cases in 2 SMARTER phases (*)

- Use cases cover areas like:
  - Massive MTC
  - Enhanced Mobile Broadband
  - Critical Comms
  - Network Operation

- At this point not clear which of the approx. 60 use cases will be put in SMARTER phase 1 and therefore prioritised to next phase of SMARTER discussions in SA1

(*) we use the term SMARTER phases to avoid confusion with RAN 5G phases

Massive MTC
UC 5.19: Light weight device configuration
UC 5.20: Wide area sensor monitoring and event driven alarms
UC 5.21: IoT Device Initialization
UC 5.22: Subscription security credentials update
UC 5.24: Bio-connectivity
UC 5.25: Wearable Device Communication
UC 5.40: Devices with variable data
UC 5.41: Domestic Home Monitoring
UC 5.42: Low mobility devices
UC 5.43: Materials and inventory management and location tracking
UC 5.44: Cloud Robotics
UC 5.59: Massive Internet of Things M2M and device identification

enhanced Mobile BroadBand
UC 5.5: Mobile broadband for indoor scenario
UC 5.6: Mobile broadband for hotspots scenario
UC 5.7: On-demand networking
UC 5.10: Mobile broadband services with seamless wide-area coverage
UC 5.11: Virtual presence
UC 5.29: Higher user mobility
UC 5.30: Connectivity everywhere
UC 5.32: Improvement of network capabilities for vehicular case
UC 5.53: Vehicular Internet & infotainment

Critical Communication
UC 5.1: Ultra-reliable communications
UC 5.12: Connectivity for drones
UC 5.13: Industrial control
UC 5.14: Tactile Internet
UC 5.15: Localized real-time control
UC 5.17: Extreme real-time communications and the tactile internet
UC 5.18: Remote control
UC 5.33: Connected vehicles
UC 5.45: Industrial factory automation
UC 5.46: Industrial process automation
UC 5.54: Local UAV collaboration

Network Operation
UC 5.2: Network Slicing
UC 5.4: Migration of Services from earlier generations
UC 5.8: Flexible application traffic routing
UC 5.9: Flexibility and scalability
UC 5.16: Coexistence with legacy systems
UC 5.23: Access from less trusted networks
UC 5.26: Best Connection per Traffic Type
UC 5.27: Multi-access network integration
UC 5.28: Multiple RAT connectivity and RAT selection

SA2 work and phases of 5G work in RAN

- RAN#69 indicated emerging consensus that there should be two phases for the normative work of 5G in RAN:
  - Phase 1 to be completed by H2 2018 to address a more urgent subset of the commercial needs (to be agreed)
  - Phase 2 to be completed by Dec 2019 for the IMT 2020 submission and to address all identified use cases & requirements

- There is wide agreement on high level use cases for
  1. Enhanced Mobile Broadband
  2. Massive Machine Type Communications
  3. Ultra-reliable and Low Latency Communications

  but also automotive, mhealth, energy management etc

SA2 work and phases of 5G work in RAN

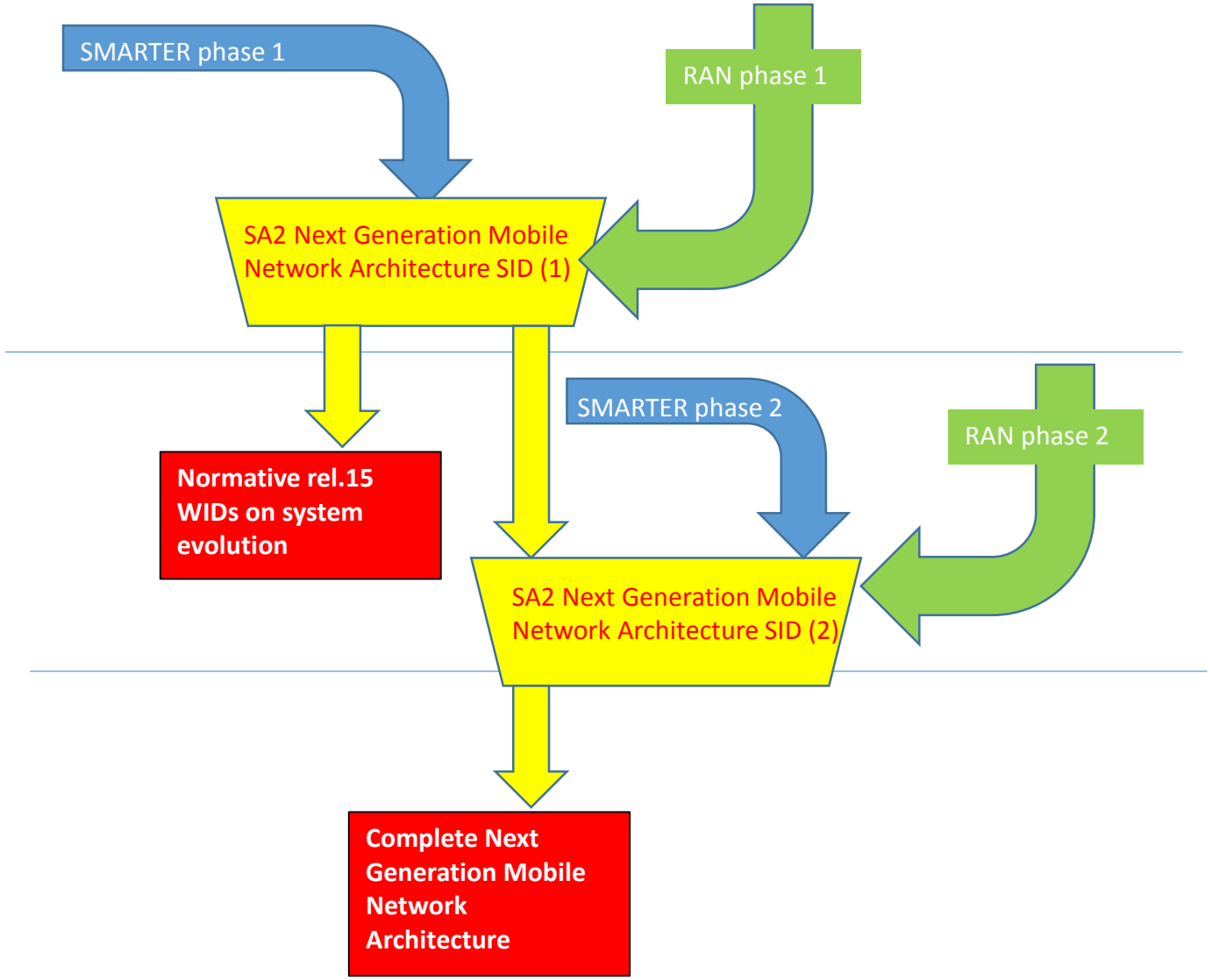
- However at this stage there is lack of consensus in RAN on
  - Whether prioritization should already occur in the study phase
  - Whether there should be prioritization of frequency ranges
  - Which use cases should be prioritized

- Based on that it is unclear at this stage what RAN will deliver “as a 5G RAT” in Phase 1 and 2

- Our goal
  - Phases 1 and 2 can deliver “deployable” features for operators at the end of rel.15 and rel.16 respectively

- Proposal
  - SA2 to adopt the concept of the 5G architecture evolution work to be delivered in 2 phases also
  - SA2 should consider the SMARTER phase 1 use cases
  - SA2 should also work in “alignment” with RAN and SA1 to support the system aspects of Phase 1 and 2

How can this be achieved?



Rel.14

Rel.15

Rel.16

What to do next?

At SA2#111

SA2 to approve a single SID on Next Generation Mobile Network Architecture

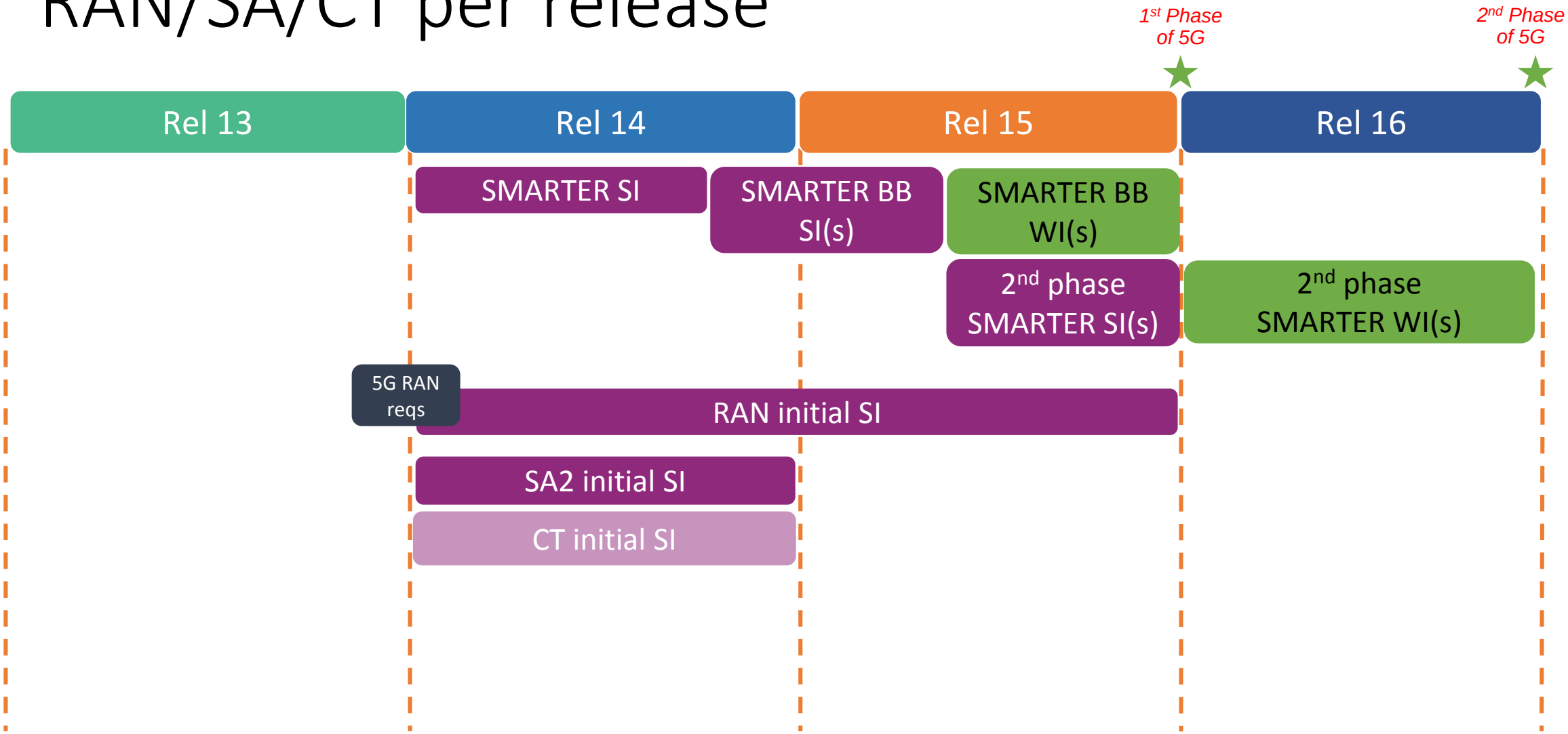
- The SID objectives can cover use cases and requirements from SMARTER and to not consider "phasing" at this stage
- The approved SID can be a merge of individual company proposals circulated offline and submitted in SA#69

From SA2#112 onwards

SA2 to start defining key issues and architecture requirements derived from these objectives

Around Q2 2016 (Exact date TBD based on coordination w/ RAN)

As the work progresses the single SID on Next Generation Mobile Network Architecture can be split in multiple building blocks addressing different areas that can be prioritised based on Phase 1 and Phase 2 priorities from SMARTER and RAN

Annex

Qualcomm view of the 5G timeline – RAN/SA/CT per release