3GPP SA WG 2 Meeting#111
19 – 23 October, Chengdu, China

S2-153165

Agenda item: 7.4
Document for: Discussion

5G device aspects

LG Electronics

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Background

- At SA#69 (September, 2015), discussion on 5G architecture initiation
  - It was agreed that TSG SA should provide guidance to **SA WG2 to begin work with a single study item with timescales for the work.** Therefore, SA WG2 were asked to provide a proposed SID(Study Item Description) to TSG SA#70 (December, 2015) on Next Generation Mobile Network Architecture.

❖ **Especially, this paper intends to consider 5G device aspects in order to design high-level architecture in SA2.**

Main requirements of 5G device

- NGMN 5G White paper describes device requirements as follows;
  - Operator control capabilities
  - Device Power Efficiency
  - Multi-Band-Multi-Mode Support in Devices
  - Resource and Signalling Efficiency :

- In addition to above requirements, we consider the efficient multiple-connectivity management.
  - It is also related to network issue, but 5G devices have to consider the functionality to support the various type of connections simultaneously or independently.

Multi-connectivity support of 5G device

1. Support simultaneously multiple radio accesses including a new radio access

2. Support the simultaneous multiple-connectivity via multiple network slices

3. Support the relay connection between devices

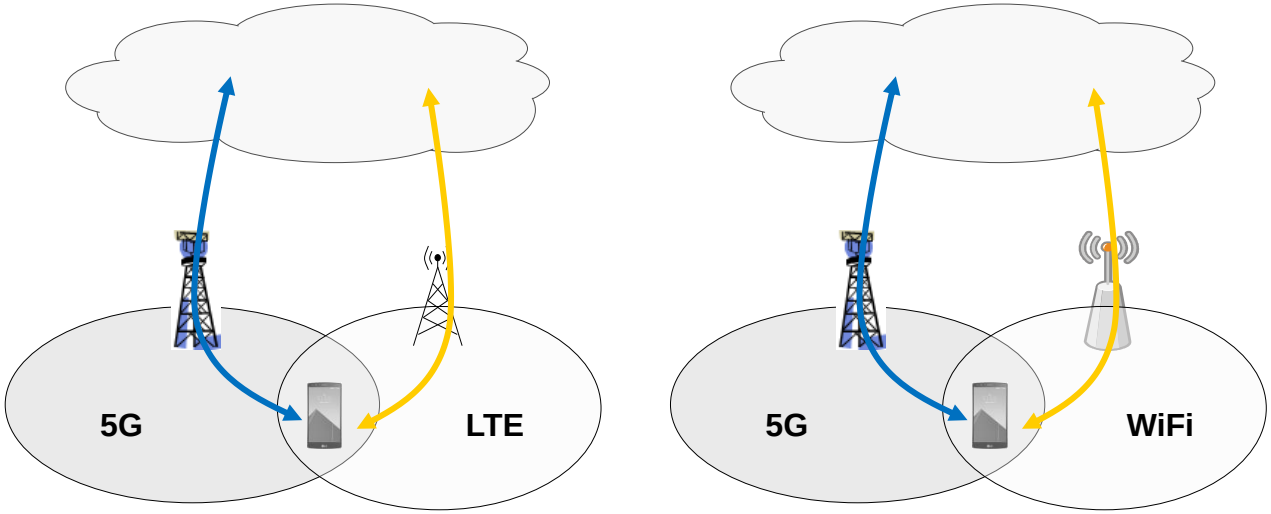
4. Support co-operated communication with multiple devices

5. Efficient handling on frequent RAT change and connection change

Multi-connectivity support of 5G device

[1] Support simultaneously multiple radio accesses including a new radio access

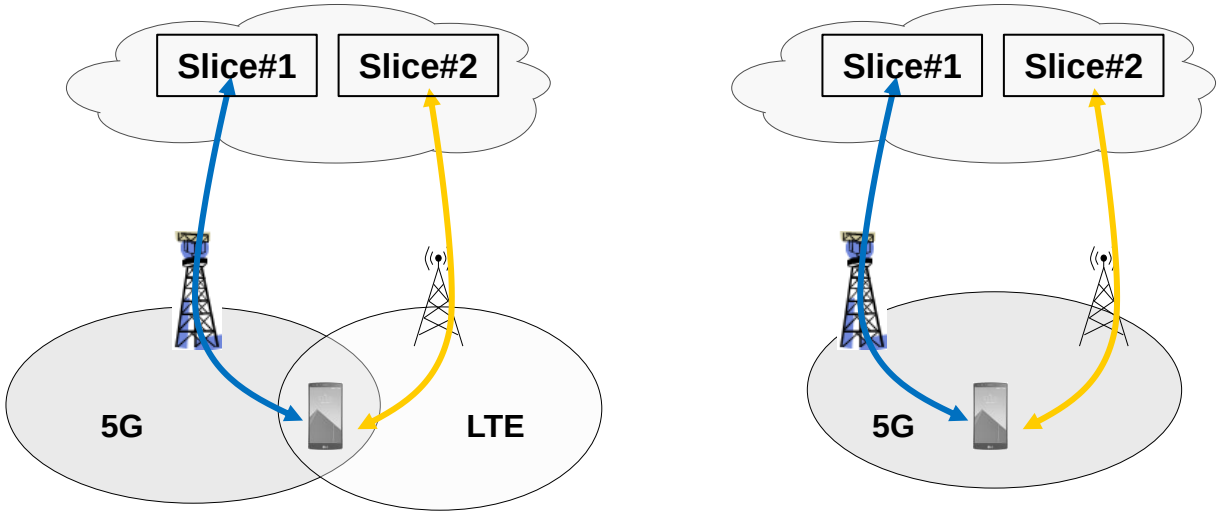
- For higher data rates, 5G device will be required to support multiple bands simultaneously. Also, 5G device will be required to support several type of aggregation with the different radio accesses. It should be considered to handle and manage the multi-connectivity with the proper radio accesses.
- As the related use cases, please refer to TR 22.891 as follows;
  - 5.26 Best Connection per Traffic Type
  - 5.28 Multiple RAT connectivity and RAT selection, etc.



Multi-connectivity support of 5G device

[2] Support the simultaneous multiple-connectivity via multiple network slices

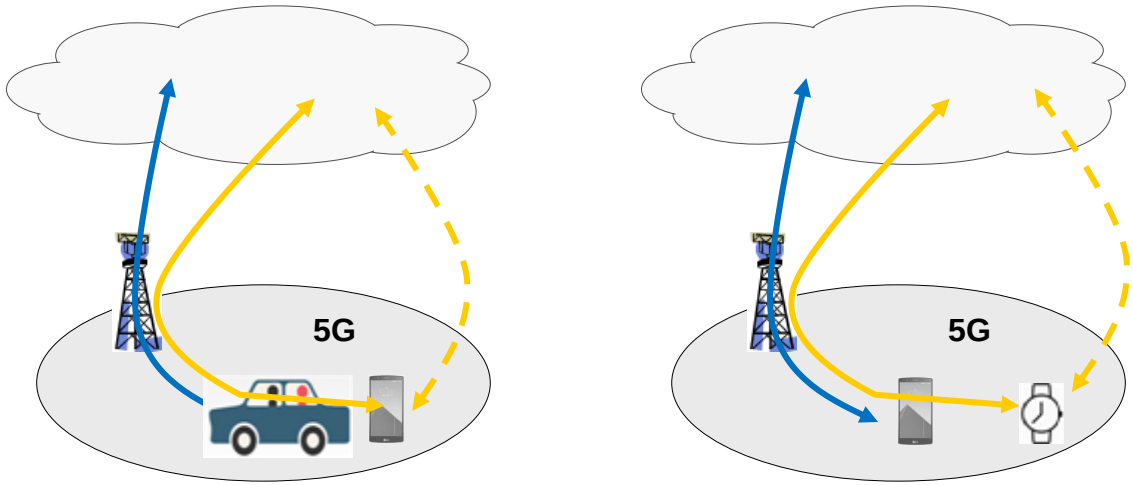
- When operating the network slice in the core network for the network efficiency and flexibility, 5G devices will be required to support the multiple slices simultaneously or independently. It should be considered to handle and manage the multi-connectivity with the multiple-slice environments.
- As the related use cases, refer to TR 22.891 as follows;
  - 5.2 Network Slicing



Multi-connectivity support of 5G device

[3] Support the relay connection between devices

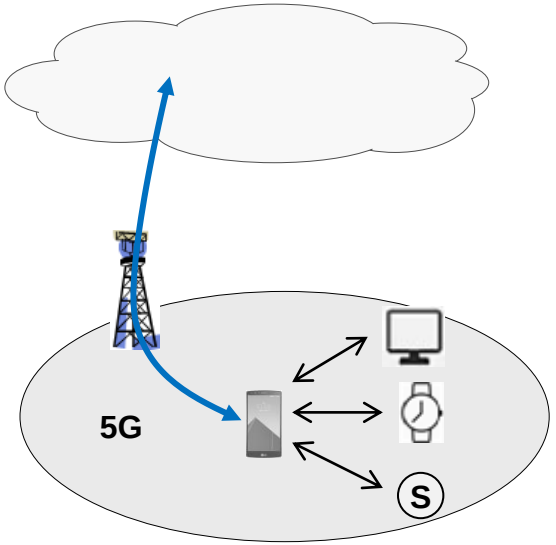
- With the extension of network-to-relay function, 5G devices will be required to support the relay connection in the various environments. It should be considered to handle and manage the multi-connectivity including the relay.
- As the related use cases, refer to TR 22.891 as follows;
  - 5.24 Bio-connectivity
  - 5.25 Wearable Device Communication
  - 5.33 Connected vehicles
  - 5.53 Vehicular Internet & Infotainment, etc.



Multi-connectivity support of 5G device

[4] Support co-operated communication with multiple devices

- With increased interactions between the various types of devices, 5G devices will be required to support co-operated communication with multiple devices. It should be considered if the network handles the connection of the multiple devices independently or not.
- As the related use cases, refer to TR 22.891 as follows;
  - 5.41 Domestic Home Monitoring, etc.



Multi-connectivity support of 5G device

[5] Efficient handling on frequent RAT change and connection change

- In the various multi-connection environments, the frequent RAT change can occurs. Also, the change between the connection using relay and the connection without relay can frequently occurs.
- 5G devices will be required to support the service continuity and efficient handling on the frequent connectivity changes as well as to support the migration from legacy system.
- As the related use cases, refer to TR 22.891 as follows;
  - 5.4 Migration of Services from earlier generations
  - 5.10 Mobile broadband services with seamless wide-area coverage
  - 5.16 Coexistence with legacy systems
  - 5.47 SMARTER Service Continuity, etc.

Proposal

- We propose to include the issue on the multi-connectivity for 5G device as one of main issues, when studying Next Generation Mobile Network Architecture in SA2.