**3GPP TSG-SA WG1 Meeting # 94e *S1-211010***

**Electronics, 10 – 20 May 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **22.835** | **CR** | **0001** | **rev** | - | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Resolution of Editor’s Notes and further consolidation | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | LG Electronics | | | | | | | | | |
| ***Source to TSG:*** | SA1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_EASNS | | | | |  | ***Date:*** | | | 2021-04-30 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TR22.835 includes several Editor’s notes, which need to be resolved.  Some potential requirements are not yet consolidated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Editor’s notes are removed and requirements are updated accordingly. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | TR 22.835 is not complete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1.6, 5.2.6, 5.7.6, 5.9.5, 5.9.6, 6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

### 5.1.6 Potential New Requirements needed to support the use case

[PR.5.1.6-2] When a UE is located in an area where there is at least one authorized network slice for the UE, the 5G system shall be able to minimize the time for the UE to access the network slices which is most suitable based on e.g., location of the UE, active applications, UE capability, frequency used by the network slice.

[PR.5.1.6-1] When a UE is located in an area where there is no authorized network slice for the UE, the 5G system shall support a mechanism to efficiently enable the UE to minimize power consumption (e.g., cell search, cell measurement).

### 5.2.6 Potential New Requirements needed to support the use case

Editor's notes: The following requirements are related to the ongoing discussion in other WGs and will be considered during consolidation phase taking into account the output from other WGs:

[PR.5.2.6-1] When a UE moves from an area where an authorized network slice for the UE is provided to an area where the network is not provided, the 5G system shall be able to minimize impact on the applications provided over the network slice to be released (e.g., relocation of the application from one network slices to other network slices or termination of the application).

### 5.6.6 Potential New Requirements needed to support the use case

[PR.5.6.6-1] The 5G system shall enable a roaming UE with a single PLMN subscription to access network slices from more than one VPLMN simultaneously, when the UE requires simultaneous access to multiple network slices and the network slices are not available in a single VPLMN.

[PR.5.6.6-2] The HPLMN shall be able to authorise a roaming UE with a single PLMN subscription to access network slices from more than one VPLMN simultaneously.

[PR.5.6.6-3] The HPLMN shall be able to provide a UE with permission and prioritisation information of the VPLMNs the UE is authorised to use for accessing specific network slices.

NOTE: The above requirements would depend on certain UE capabilities assumptions, e.g. the ability to connect to more than one PLMN simultaneously.

Editor's Note: The above requirements should be revisited in next meeting. Whether the simultaneous access is towards two PLMNs instead of multiple PLMNs, and whether the different PLMNs can be VPLMNs, need further study.

### 5.7.6 Potential New Requirements needed to support the use case

Not available

### 5.9.5 Existing features partly or fully covering the use case functionality

Following are service requirements that can be drawn out of service description in previous sections and that can be supported with existing specifications:

- 3GPP shall support the same network slice to be configured over different frequencies at different areas.

- 3GPP shall support service continuity for a network slice at the boundary where radio resources configured for the network slice change, for a UE in Connected mode.

However, the existing specification does not yet provide specific means when the UE moves between different regions in Idle mode.

- 3GPP shall support to minimize the time that takes for a UE to be able to access radio resource configured for a network slice when the used radio resources for the network slice change e.g. during mobility, power cycle.

Following service requirements may be supported with existing specifications:

- 5G system shall support a mechanism to minimize service interruption for a UE when different radio resources are configured for a network slice in different geographical areas and when the UE crosses the geographic area boundaries.

### 5.9.6 Potential New Requirements needed to support the use case

Following new requirements can be derived from this use case:

# 6 Potential Consolidated Requirements

Following are consolidated potential requirements.

[CPR-001] For a UE authorized to access multiple network slices of one operator which cannot be simultaneously used by the UE (e.g. due to radio frequency restrictions), the 5G system shall be able to support the UE to access the most suitable network slice in minimum time (e.g. based on the location of the UE, ongoing applications, UE capability, frequency configured for the network slice).

[CPR-002] For a UE authorized to access to multiple network slices of one operator which cannot be simultaneously used by the UE (e.g. due to radio frequency restrictions), the 5G system shall minimize service interruption time when the UE changes the access from one network slice to another network slice. (e.g. based on changes of active applications).

[CPR-003] 5G system shall minimize signaling exchange and service interruption time for a network slice, e.g. when restrictions related to radio resources change (e.g., frequencies, RATs).

[CPR-004] For a roaming UE activating a service/application requiring a network slice not offered by the serving network but available in the area from other network(s), the HPLMN shall be able to provide the UE with prioritization information of the VPLMNs with which the UE may register for the network slice.

[CPR-005] In case a third party has requested provision of a network slice using specific radio resources for the network slice, the 5G system shall be able to generate charging information regarding the used radio resources e.g. used frequency bands.

[CPR-006] When a UE is located in an area where there is no authorized network slice for the UE, the 5G system shall support a mechanism to efficiently enable the UE to minimize power consumption (e.g., cell search, cell measurement).

[CPR-007] When a UE moves from an area where an authorized network slice for the UE is provided to an area where the network slice is not provided, the 5G system shall be able to minimize impact on the applications provided over the network slice to be released (e.g., relocation of the application from one network slices to other network slices or termination of the application).

[CPR-008] The 5G system shall support a mechanism for a UE to select and access network slice(s) based on UE capability, ongoing application, and policy (e.g., application preference).

[CPR-009] The 5G system shall support a mechanism to optimize resources of network slices (e.g., due to operator deploying different frequency to offer different network slices) based on network slice usage patterns and policy (e.g., application preference) of a UE or group of UEs

[CPR-010] For traffic pertaining to a network slice offered via a relay node, 5G system shall use only radio resources (e.g. frequency band) allowed for the network slice.

NOTE: Allowed radio resources (e.g., frequency band) may be different for direct network connections (between UE and NG-RAN) than for backhaul connections (between the relay node and the NG-RAN).