**3GPP TSG RAN WG5 Meeting #90-e R5-210105r2**

**Electronic Meeting, February 22 – March 5, 2021**

**3GPP TSG RAN Meeting #91-e RP-21xxxx**

**Electronic Meeting, March 22 - 26, 2021**

**Source: China Mobile, China Unicom**

**Title: New SID: Study on 5G NR UE full stack testing for Network Slicing**

**Document for: Approval**

**Agenda Item: 4.1**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>   
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: Study on 5G NR UE full stack testing for Network Slicing

## Acronym:FS\_NR\_Slice\_Test

## Unique identifier:

|  |  |  |
| --- | --- | --- |
| **This WID includes a Testing part** | |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

Potential target Release: Rel-16.

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  |  |  |  |
| **No** | X | X | X | X | X |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

### 2.2 Parent Work Item

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 740005 | 5G System Architecture - Phase 1 | Stage 2 of Network Slicing (SA2) |
| 820023 | Enhancement of Network Slicing | Stage 2 of Enhancement of Network Slicing (SA2) |
| 750025 | CT Aspect of 5G System – Phase1 | Stage 3 of Network Slicing (CT) |
| 830011 | CT Aspect of eNS | Stage 3 of Enhancement of Network Slicing (CT) |

## 3 Justification

5G Network Slicing is one of the most distinctive features provided by 5G NR and is key to meet diversified services requirements in 5G era. With the introduction of 5G network slicing technology, operators will be able to provide network capabilities with different functional characteristics, which will provide e.g. "exclusive" network for users with different KPI requirements to ensure a high-quality of service and meet differentiated scenario requirements. 5G network slicing can also help to achieve the goal of improving the efficiency of network resource utilization, optimizing the network construction investment of operators, and building a flexible and agile 5G network.

The user experience resulting from the use of 5G network slicing is critical for commercial success, and therefore testing the operation of 5G network slicing is necessary to ensure consistent predictable behaviour. To enable testing the 5G UEs supporting network slicing as they are used in the field the application layer at the device side needs to be included in the testing, as URSP based network slice selection and traffic routing procedures are based on traffic descriptor components (see TS 24.526) passed on by the application layer to the UE protocol stack. The traffic descriptor components that are passed onto the UE protocol stack to be used as a base for the network slice selection when a specific application requests a PDU session are configured within the device. There are no test cases that ascertain that the UE behaves in a consistent and conformant manner when it is configured with a set of traffic descriptor components to be used when an application wishes to communicate over a PDU session and the PDU session establishment in the device is triggered directly from the application layer using the configured set of traffic descriptor components.

The Rel-15 CT WI 5GS\_Ph1-CT has been 99% completed at CT#82 (June 2018) and Rel-16 CT WI eNS has been 100% completed at CT#88 (December 2019). As stated in the LS from NGMN and GTI (see R5-210018), there is a strong industry demand to define the test methods and test procedures that include the full related UE application layer in the testing of the network slice selection functionality for 5G UE supporting network slicing.

RAN5 has only defined protocol test cases of NSSAI handling during registration, which is still far away from enough to meet the industry needs on 5G NR UE supporting Network Slicing Test. It is justified now to initiate a dedicated SI to create TR for 5G NR UE supporting Network Slicing tests and to start the study on the comprehensive solution for it in 3GPP RAN WG5 to meet the market requirements in time.

## 4 Objective

The objective of the proposed Study Item is:

* To study how to define test cases that will allow the full protocol stack testing of a 5G NR UE supporting network slicing. The test procedures for full protocol stack testing of the network slicing functionality, e.g. how the UE uses configurations matching UE application to traffic descriptor components to select S-NSSAI, will be provided.
* To study how to define test cases that will allow the service performance testing of a 5G NR UE supporting network slicing. The test procedures for performance testing of the network slicing service, e.g. application layer throughput and latency, will be provided.

It is expected that an embedded client application can be installed on the UE. This is considered the default mode of testing as it provides an accurate simulation of real life usage.

NOTE 1: The Study Item should take into account industry recommendation from relevant organizations such as GSMA, NGMN and GTI pending on RAN5’s decision on a case by case basis.

## 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Remarks |
| *TR* | *38.9xx* | *Study on 5G NR UE full stack testing for Network Slicing* | *RAN#94 (Dec-21)* | *RAN#95 (Mar-22)* |  |

## 6 Work item Rapporteur(s)

Dan Song (CMCC), [songdan@chinamobile.com](mailto:songdan@chinamobile.com)

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## 7 Work item leadership

RAN5

## 8 Aspects that involve other WGs

None

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Anritsu |
| AT&T |
| China Mobile |
| China Telecom |
| China Unicom |
| CATT |
| DISH |
| DT Link Tester |
| Ericsson |
| Huawei |
| Hisilicon |
| Keysight |
| [Motorola Mobility] |
| MTK |
| NTT Docomo |
| Orange |
| OPPO |
| R&S |
| [Samsung] |
| Star Point |
| Telecom Italia |
| [T-mobile US] |
| UNISOC |
| Verizon |
| [vivo] |
| ZTE |
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