**3GPP TSG-SA5 Meeting #133e *S5-205130***

**October 12 – 21, 2020****, E-meeting**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v11.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **28.313** | **CR** | **0004** | **rev** | **-** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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 | **X** | Core Network |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Address the issues discovered by Edithelp | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Intel | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | SON\_5G | | | | |  | ***Date:*** | | | 2020-10-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12) Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | As requested by Edithelp to fix the errors identified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Fix the errors discovered by Edithelp. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The specification has errors. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.1.1.1-2, 7.1.2.2, 7.1.2.2.2, 7.1.3.1, 7.1.3.2.2, 7.1.3.3.1, 7.2.1.1, 7.2.1.2.1-2, 7.2.1.3.1, 8.2.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |

|  |
| --- |
| **First Modified Sections** |

# 7 Management services for SON

## 7.1 Management services for D-SON management

### 7.1.1 RACH Optimization (Random Access Optimisation)

#### 7.1.1.1 MnS component type A

Table 7.1.1.1-1: RACH optimization type A

|  |  |
| --- | --- |
| MnS Component Type A | Note |
| Operations and notifications defined in clause 5 of TS 28.532 [3]:  - createMOI operation  - getMOIAttributes operation  - modifyMOIAttributes operation  - deleteMOI operation  - notifyMOIAttributeValueChanges operation  - notifyMOICreation  - notifyMOIDeletion  - notifyMOIChanges | It is supported by Provisioning MnS for NF, as defined in 28.531 [11]. |
| Operations defined in clause 11.3.1.1.1 in TS 28.532 [3] and clause 6.2.3 of TS 28.550 [12]:  - notifyFileReady operation  - reportStreamData operation | It is supported by Performance Assurance MnS for NFs, as defined in 28.550 [12]. |

#### 7.1.2.1 MnS Component Type B definition

##### 7.1.2.1.1 Targets information

The targets of RACH optimization are shown in Table 7.1.2.1.1-1.

Table 7.1.2.1.1-1: RACH optimization targets

| Targets | Definition | Legal Values |
| --- | --- | --- |
| UE access delay probability per SSB | The probability distribution of UE access delay that is used to minimize the access delays for the UEs under the SSBs. | CDF of access delay |
| Number of preambles send per SSB probability | The probability of the number of preambles sent per SSB. | CDF of access delay |

##### 7.1.2.1.2 Control information

The parameter is used to control the RACH optimization function.

Table 7.1.2.2.2-1: RACH optimization control

| Control parameter | Definition | Legal Values |
| --- | --- | --- |
| RACH optimization control | This attribute allows authorized consumer to enable/disable the RACH optimization functionality. See attribute rachOptimizationControl in TS 28.541 [13]. | Boolean  On, off |

##### 7.1.2.1.3 Parameters to be updated

Void.

#### 7.1.3.1 MnS Component Type C definition

##### 7.1.3.1.1 Performance measurements

Performance measurements related to the RACH optimization are captured in Table 7.1.1.3.1-1:

Table 7.1.1.3.1-1: RACH optimization related performance measurements

|  |  |  |
| --- | --- | --- |
| Performance measurements | Description | Related targets |
| Distribution of RACH preambles sent | Distribution of the number of preambles UEs sent to achieve synchronization per SSB, where the number of preambles sent corresponds to PREAMBLE\_TRANSMISSION\_COUNTER (see clause 5.1.1 in TS 38.321 [4]) in UE. | UE access delay probability per SSB |
| Distribution of UEs access delay per SSB | Distribution of the time needed for UEs to successfully attach to the network per SSB. | Number of preambles send per SSB probability |

### 7.1.2 MRO (Mobility Robustness Optimisation)

#### 7.1.2.1 MnS component type A

Table 7.1.2.1-1: MRO type A

|  |  |
| --- | --- |
| MnS Component Type A | Note |
| Operations and notifications defined in clause 5 of TS 28.532 [3]:  - createMOI operation  - getMOIAttributes operation  - modifyMOIAttributes operation  - deleteMOI operation  - notifyMOIAttributeValueChanges operation  - notifyMOICreation  - notifyMOIDeletion  - notifyMOIChanges | It is supported by Provisioning MnS for NF, as defined in TS 28.531 [11]. |
| Operations defined in clause 11.3.1.1.1 in TS 28.532 [3] and clause 6.2.3 of TS 28.550 [12]:  - notifyFileReady operation  - reportStreamData operation | It is supported by Performance Assurance MnS for NFs, as defined in TS 28.550 [12]. |

#### 7.1.2.2 MnS Component Type B definition

##### 7.1.2.2.1 Targets information

The targets of MRO are shown in the Table 7.1.2.2.1-1.

Table 7.1.2.2.1-1: MRO targets

| Target Name | Definition | Legal Values |
| --- | --- | --- |
| Total handover failure rate | (the number of failure events related to handover) / (the total number of handover events) | [0..100] in unit percentage |
| Total intra-RAT handover failure rate | (the number of failure events related to intra-RAT handover) / (the total number of handover events) | [0..100] in unit percentage |
| Total inter-RAT handover failure rate | (the number of failure events related to inter-RAT handover) / (the total number of handover events) | [0..100] in unit percentage |

##### 7.1.2.2.2 Control information

The parameter is used to control the MRO function.

Table 7.1.2.2.2-1: MRO control

| Control parameter | Definition | Legal Values |
| --- | --- | --- |
| MRO function control | This attribute allows the operator to enable/disable the MRO functionality. See attribute mroControl in TS 28.541 [13]. | Boolean  On, off |

##### 7.1.2.2.3 Parameters to be updated

Table 7.1.2.2.3-1: Ranges of handover parameters

| Control parameters | Definition | Legal Values |
| --- | --- | --- |
| Maximum deviation of Handover Trigger | This parameter defines the maximum allowed absolute deviation of the Handover Trigger, from the default point of operation (see TS 38.300 [7] and TS 38.423 [17]). | [-20..20] in unit 0.5 dB |
| Minimum time between Handover Trigger changes | This parameter defines the minimum allowed time interval between two Handover Trigger change performed by MRO. This is used to control the stability and convergence of the algorithm (see TS 38.300 [7]). | [0.. 604800] in unit Seconds |
| Tstore\_UE\_cntxt | The timer used for detection of too early HO, too late HO and HO to wrong cell. Corresponds to Tstore\_UE\_cntxt timer described in TS 38.300 [7]. | [0..1023] in unit 100 milliseconds |

NOTE: The subclause references to TS 38.300 and TS 38.423 will be added, when they are available.

#### 7.1.2.3 MnS Component Type C definition

##### 7.1.2.3.1 Performance measurements

Performance measurements related MRO are captured in Table 7.1.2.3.1.-1:

Table 7.1.2.3.1-1. MRO related performance measurements

| Performance measurements | Description | Related targets |
| --- | --- | --- |
| Number of handover events | Includes all successful and unsuccessful handover events (see clause 5.1.1.6 in TS 28.552 [5]). | Total handover failure rate |
| Number of handover failures | Includes unsuccessful handover events with failure causes (see clause 5.1.1.6 in TS 28.552 [5]). | Total handover failure rate |
| Number of intra-RAT handover events | Includes all successful and unsuccessful intra-RAT handover events (see clauses 5.1.1.6.1 and 5.1.1.6.2 in TS 28.552 [5]). | Total intra-RAT handover failure rate |
| Number of intra-RAT handover failures | Includes unsuccessful intra-RAT handover events with failure causes (see clauses 5.1.1.6.1 and 5.1.1.6.2 in TS 28.552 [5]). | Total intra-RAT handover failure rate |
| Number of inter-RAT handover events | Includes all successful and unsuccessful inter-RAT handover events (see clause 5.1.1.6.3 in TS 28.552 [5]). | Total inter-RAT handover failure rate |
| Number of inter-RAT handover failures | Includes unsuccessful inter-RAT handover events with failure causes (see clause 5.1.1.6.3 in TS 28.552 [5]). | Total inter-RAT handover failure rate |
| Number of intra-RAT too early handover failures | Detected when an RLF occurs after the UE has stayed for a long period of time in the cell (see clause 5.1.1.25.1 in TS 28.552 [5]). |  |
| Number of intra-RAT too late handover failures | Detected when an RLF occurs shortly after a successful handover from a source cell to a target cell or a handover failure occurs during the handover procedure (see clause 5.1.1.25.1 in TS 28.552 [5]). |  |
| Number of intra-RAT handover failures to wrong cell | Detected when an RLF occurs shortly after a successful handover from a source cell to a target cell or a handover failure occurs during the handover procedure (see clause 5.1.1.25.1 in TS 28.552 [5]). |  |
| Number of inter-RAT too early handover failures | Detected when an RLF occurs after the UE has stayed in an E-UTRAN cell which connects with 5GC for a long period of time (see clause 5.1.1.25.2 in TS 28.552 [5]). |  |
| Number of inter-RAT too late handover failures | Detected when an RLF occurs shortly after a successful handover from an E-UTRAN cell which connects with EPC to a target cell in a E-UTRAN cell which connects with 5GC (see clause 5.1.1.25.2 in TS 28.552 [5]). |  |
| Number of unnecessary handover to another RAT | Detected when a UE is handed over from NG-RAN to other system (e.g. UTRAN) even though quality of the NG-RAN coverage was sufficient for the service used by the UE (see clause 5.1.1.25.3 in TS 28.552 [5]). |  |
| Number of inter-RAT handover ping pong | Detected when an UE is handed over from a cell in a source system (e.g. NG-RAN) to a cell in a target system different from the source system (e.g. E-UTRAN), then within a predefined limited time the UE is handed over back to a cell in the source system, while the coverage of the source system was sufficient for the service used by the UE (see clause 5.1.1.25.4 in TS 28.552 [5]). |  |

### 7.1.3 PCI configuration

#### 7.1.3.1 MnS component type A

Table 7.1.3.1-1: PCI type A

|  |  |
| --- | --- |
| MnS Component Type A | Note |
| Operations and notifications defined in clause 5 of TS 28.532 [3]:  - createMOI operation  - getMOIAttributes operation  - modifyMOIAttributes operation  - deleteMOI operation  - notifyMOIAttributeValueChanges operation  - notifyMOICreation  - notifyMOIDeletion  - notifyMOIChanges | It is supported by Provisioning MnS for NF, as defined in 28.531 [11]. |

#### 7.1.3.2 MnS Component Type B definition

##### 7.1.3.2.1 Control information

The parameter is used to control the D-SON PCI configuration function.

Table 7.1.3.2.1-1: PCI contol

| Control parameter | Definition | Legal Values |
| --- | --- | --- |
| PCI configuration control | This attribute allows authorized consumer to enable/disable the D-SON PCI configuration functionality. See attribute pciConfigurationControl in TS 28.541 [13]. | enable, disable |

##### 7.1.3.2.2 Parameters to be updated

The table below lists the parameter related to the D-SON PCI configuration function.

Table 7.1.3.2.2-1: PCI update

| Parameters | Definition | Legal Values |
| --- | --- | --- |
| PCI list | The list of PCI values to be used by D-SON PCI configuration function to assign the PCI for NR cells. (See attribute pciList in TS 28.541 [13]). | List of integers |

#### 7.1.3.3 MnS Component Type C definition

##### 7.1.3.3.1 Notification information

The table below lists the notifications related to D-SON PCI configuration.

Table 7.1.3.3-1: PCI performance measurements

|  |  |  |
| --- | --- | --- |
| Performance measurements | Description | Note |
| PCI collision notification | The collision notification is used to indicate two neighbouring cells of a serving cell are using the same PCIs. |  |
| PCI Confusion notification | The confusion notification is used to indicate that a serving cell has 2 neighbouring cells that are using the same PCI value. |  |

### 7.1.4 ANR management

This management service is used for management of ANR, and ANR is specified in TS 38.300 [7], clauses 15.3.3.

Stage 2 for ANR management is located in TS 28.541 [13], clauses 4.3.2.2, 4.3.2.3, 4.3.32.2 and 4.3.32.3.

Stage 3 for ANR management is located in TS 28.541 [13], clauses C.4.3, D.4.3, and E.5.

## 7.2 Management services for C-SON

### 7.2.1 PCI configuration

#### 7.2.1.1 MnS component type A

Table 7.2.1.1-1: PCI type A

|  |  |
| --- | --- |
| MnS Component Type A | Note |
| Operations and notifications defined in clause 11.1.1 of TS 28.532 [3]:  - createMOI operation  - getMOIAttributes operation  --- modifyMOIAttributes operation  - - deleteMOI operation  - - notifyMOIAttributeValueChanges operation  - notifyMOICreation  - notifyMOIDeletion  - notifyMOIChanges | It is supported by Provisioning MnS for NF, as defined in 28.531 [11]. |
| Operations defined in clause 11.3.1.1.1 in TS 28.532 [3] and clause 6.2.3 of TS 28.550 [12]:  - notifyFileReady operation  - reportStreamData operation | It is supported by Performance Assurance MnS for NFs, as defined in 28.550 [12]. |

#### 7.2.1.2 MnS Component Type B definition

##### 7.2.1.2.1 Control information

The parameter is used to control the C-SON PCI configuration function.

Table 7.2.1.2.1-1: PCI control

| Control parameter | Definition | Legal Values |
| --- | --- | --- |
| PCI configuration control | This attribute allows authorized consumer to enable/disable the C-SON PCI configuration functionality. | disable, enable |

##### 7.2.1.2.2 Parameters to be updated

The table below lists the parameter related to the C-SON PCI configuration function.

Table 7.2.1.2.2-1: PCI dpdate

| **Updated parameters** | **Definition** | **Legal Values** |
| --- | --- | --- |
| NR PCI | This parameter contains the PCI of the NR cell. | Integer |

#### 7.2.1.3 MnS Component Type C definition

##### 7.2.1.3.1 Notifications information

The table below lists the notifications related to PCI configuration are generated from the NR cells.

Table 7.2.1.3.1-1: PCI notification

|  |  |  |
| --- | --- | --- |
| Performance measurements | Description | Note |
| PCI collision notification | The collision notification is used to indicate two neighbouring cells of a serving cell are using the same PCIs. |  |
| PCI Confusion notification | The confusion notification is used to indicate that a serving cell has 2 neighbouring cells that are using the same PCI value. |  |

##### 7.2.1.3.2 Performance measurements

Performance measurements related to the PCI configuration are collected from the NR cells.

Table 7.2.1.3.2-1. PCI related performance measurements

|  |  |  |
| --- | --- | --- |
| Performance measurements | Description | Note |
| PCI of candidate cells | The measurement contains cumulative counter with subcounters that is identified by the PCI value(s) of the candidate cells, and is derived from *MeasResultListNR* (see clause 6.3.2 in TS 38.331 [9]) where it contains PCI in *PhysCellId*, and RSRP/RSRQ in *MeasQuantityResults* of candidate cells. It is generated when the RSRP received from the candidate cells exceeds certain thresholds. |  |

|  |
| --- |
| **Next Modified Sections** |

Annex A (informative):  
PlantUML source code

# A.1 Procedures for establishment of a new RAN NE in network

## A.1.1 Procedure for plug and connect to management system

The following PlantUML source code is used to describe the procedure for multi-vendor plug and connect to management system, as depicted by Figure 8.3.2.1-1:

@startuml

title " Plug and connect to management system"

actor NE

participant "IP autoconfiugration server" as IP\_Server

participant "public DNS server" as P\_DNS\_Server

participant "CA/RA" as CA\_RA

participant SeGW

participant "secure DNS server" as S\_DNS\_Server

participant "secure DHCP server" as S\_DHCP\_Server

participant MnF

alt VLAN ID is available

NE->NE: 1a.use available VLAN Id

Else

NE->NE: 1b.use native VLAN Id

End

Ref over NE, IP\_Server: 2. Initial IP Autoconfiguration

Ref over NE, IP\_Server,CA\_RA: 3. Certificate Enrolment

Ref over NE, IP\_Server,CA\_RA,SeGW: 4. Establishing Secure Connection

Ref over NE, IP\_Server,CA\_RA,SeGW,MnF: 5 Establishing Connection to MnF

skinparam sequenceActorBackgroundColor #FFFFFF

skinparam sequenceParticipantBackgroundColor #FFFFFF

skinparam noteBackgroundColor #FFFFFF

autonumber "#'.'"

skinparam monochrome true

skinparam shadowing false

@enduml

## A.1.2 Procedure for self-configuration management

The following PlantUML source code is used to describe the procedure for self-configuration management, as depicted by Figure 8.3.2.2-1:

@startuml

title " Procedures for self-configuration management "

actor "MnS Consumer of \n self-configuration management" as SC

participant "MnS Producer of \n self-configuration management" as SP

SC -> SP: 1. createScManagementProfile request

SP -> SP: 2. Create ScManagementProfile

SP -> SC: 3. createScManagementProfile response

loop [Corresponding NE start its self-configuration process]

opt

SP -> SC: 4. NotifyScProcessCreation

end

|||

loop stop point or step is arrived

SP -> SC: 5. NotifyScProcessStage

opt if the stop point is arrived

SC -> SP: 6. ResumeScProcess

end

end

|||

SP->SC: 7.NotifyScProcessDeletion

end

skinparam sequenceActorBackgroundColor #FFFFFF

skinparam sequenceParticipantBackgroundColor #FFFFFF

skinparam noteBackgroundColor #FFFFFF

autonumber "#'.'"

skinparam monochrome true

skinparam shadowing false

|  |
| --- |
| **Next Modified Sections** |

|  |
| --- |
| **End of Modified Sections** |