**3GPP TSG-RAN WG2 Meeting #113 electronicR2-2102131**

**Online, Jan 25 th - Feb 5th, 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **37.320** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **16.3.0** |  |
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| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | Corrections to TS 37.320 |
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| ***Source to WG:*** | CMCC, Nokia |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_SON\_MDT-Core |  | ***Date:*** | 2021-02-01 |
|  |  |  |  |  |
| ***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 canbe 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)* |
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| ***Reason for change:*** | 1. The SINR measurement reporting for Immediate MDT is missing in the TS 37.320.
2. According to TS 38.331, the MDT PLMN List is optionally configured in *LoggedMeasurementConfiguration*, the optionality for the configuration of MDT PLMN List in clause 5.1.1.1.1 should be explicitly stated.
3. The capability bit for support for Logged MDT is *loggedMeasurements-r16*, according to the explanation of the capability in TS 38.306, this bit indicates that the UE supports both periodical logging and event-triggered logging, the former case should also be added to clause 5.1.4 for clarification.
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| ***Summary of change:*** | 1. SINR measurement reporting is added in section 5.2.1.1 of TS 37.320.
2. Add ‘(optionally)’ before the description of MDT PLMN List configuration in clause 5.1.1.1.1.
3. Add the support of periodical logging in clause 5.1.4.
4. Editorial issue.

 **Impact analysis**Impacted functionality: SON and MDTInter-operability: 1. If the network is implemented according to the CR and the UE is not, no inter-operability issues are foreseen.

If the UE is implemented according to the CR and the network is not, there will not be inter-operability problems.1. If UE implements according to the CR and the network does not, there is no impact foreseen.
2. If the network implements according to the CR and the UE does not, there is no impact foreseen.
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| ***Consequences if not approved:*** | 1. Whether the UE could include the SINR measurements as part of the EUTRA immediate MDT is not clear.
2. The contents between different specifications are not aligned, which cause further confusions.
3. The editorial issues still exist.
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| ***Clauses affected:*** | 5.2.1.1 Measurements and reporting triggers for Immediate MDT5.1.1.1.1 Configuration parameters 5.1.4 UE capabilities5.4.1.2 Radio Link Failure report |
|  |  |
|  | **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:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

START OF CHANGES

5.2.1.1 Measurements and reporting triggers for Immediate MDT

Measurements to be performed for Immediate MDT purposes involve reporting triggers and criteria utilized for RRM. An MDT specific UE-based measurement for UL PDCP delay is applied for QoS verification purpose. In addition, there are measurements performed in eNB.

In particular, the following measurements shall be supported for Immediate MDT performance:

Measurements:

- M1: RSRP, RSRQ and SINR measurement by UE, see TS 36.214 [9].

- M2: Power Headroom measurement by UE, see TS 36.213 [11].

- M3: Received Interference Power measurement by eNB, see TS 36.214 [9]. This is a cell measurement. One sample is logged each measurement collection period, where one sample corresponds to a measurement period as specified in TS 36.133 [3].

- M4: Data Volume measurement separately for DL and UL, per QCI per UE, by eNB, see TS 36.314 [13].

- M5: Scheduled IP Throughput for MDT measurement separately for DL and UL, per RAB per UE and per UE for the DL, per UE for the UL, by eNB, see TS 36.314 [13]. QCI values of the RABs that have contributed to a measurement value are logged with the measurement values.

- M6: Packet Delay measurement, separately for DL and UL, per QCI per UE, see UL PDCP Delay, by the UE, and Packet Delay in the DL per QCI, by the eNB, TS 36.314 [13].

NOTE 1: If the UE does not detect any UL PDCP delay based on the delay threshold and delay report interval configured by the network, the UE does not report any UL PDCP delay measurement within that period.

NOTE 2: A UE in EN-DC mode of operation can be configured with UL PDCP Packet Average Delay (*ul-DelayValueConfig*), if UE is capable of performing the UL average PDCP queueing delay.

- M7: Packet Loss rate measurement, separately for DL and UL per QCI per UE, by the eNB, see Packet Loss rate in the UL and Packet Uu Loss rate in the DL TS 36.314 [13].

- M8: RSSI measurement by UE, see TS 36.331 [5].

- M9: RTT measurement by UE, see TS 36.331 [5].

Measurement collection triggers:

- For M1:

- Event-triggered measurement reports according to existing RRM configuration for events A1, A2, A3, A4, A5 A6, B1 or B2

- Periodic, A2 event-triggered, or A2 event triggered periodic measurement report according to MDT specific measurement configuration.

- For M2:

- Reception of Power Headroom Report (PHR) according to existing RRM configuration.

NOTE 3: PHR is carried by MAC signalling. Thus, the existing mechanism of PHR transmission applies, see TS 36.321 [10].

- For M3:

- End of measurement collection period

- For M4:

- End of measurement collection period.

- For M5:

- End of measurement collection period.

- For M6:

- End of measurement collection period.

- For M7:

- End of measurement collection period.

- For M8:

- Associated to M1 and/or M6 related measurement reporting triggers.

- For M9:

- Associated to M1 and/or M6 related measurement reporting triggers.

NEXT CHANGE

##### 5.1.1.1.1 Configuration parameters

The logged measurement configuration consists of:

- configuration of downlink pilot strength measurements logging for (E-)UTRA and NR.

- configuration of MBSFN measurement logging for E-UTRA.

- configuration of the triggering of logging events:

- for (E-)UTRAN only periodic measurement trigger is supported, for which the logging interval is configurable. The parameter specifies the periodicity for storing MDT measurement results. It should be configured in seconds in multiples of the applied IDLE mode DRX, i.e. multiples of 1.28s which is either a factor or multiple of the IDLE mode DRX. The UE behaviour is unspecified when the UE is configured with a DRX cycle larger than the logging interval.

- for NR:

- periodic measurement trigger is supported, for which the logging interval is configurable. The parameter specifies the periodicity for storing MDT measurement results.

- event-based trigger is supported, for which the logging interval is configurable, which determines periodical logging of available data (e.g. time stamp, location information), and the following two types of events are supported:

- measurement quantity-based event L1, for which the event threshold, hysteresis, and time to trigger are configurable. If the configured time to trigger is not a multiple of the DRX cycle, then the UE uses the next multiple of DRX cycle duration that is larger than the time to trigger for evaluating the event L1;

- out-of-coverage detection trigger.

NOTE: The logging configuration for event-based and periodical DL pilot strength logged measurements can be configured independently. Only one type of event can be configured to the UE.

- configuration of the logging duration. This configuration parameter defines a timer activated at the moment of configuration, that continues independent of state changes, RAT or RPLMN change. When the timer expires the logging is stopped and the configuration is cleared (except for the parameters that are required for further reporting e.g. network absolute time stamp, trace reference, trace recording session reference and TCE Id).

- network absolute time stamp to be used as a time reference to UE.

- Trace Reference parameter as indicated by the OAM configuration as specified in TS 32.422 [6].

- Trace Recording Session Reference as indicated by the OAM configuration as specified in TS 32.422 [6].

- TCE Id as indicated by the OAM configuration as specified in TS 32.422 [6].

- (optionally) MDT PLMN List, indicating the PLMNs where measurement collection and log reporting is allowed. It is either the Management Based MDT PLMN List or the Signalling Based MDT PLMN List, depending on how the Logged MDT task was initiated (see 5.1.3).

- (optionally) configuration of a logging area. A UE will log measurements as long as it is within the configured logging area. The scope of the logging area may consist of one of:

- a list of up to 32 global cell identities. If this list is configured, the UE will only log measurements when camping in any of these cells

- a list of up to 8 TAs or 8 LAs or 8 RAs. If this list is configured, the UE will only log measurements when camping in any cell belonging to the preconfigured TA/LA/RAs.

- The configured logging area can span PLMNs in the MDT PLMN List. If no area is configured, the UE will log measurements throughout the PLMNs of the MDT PLMN list.

- (optionally) for NR, configuration of a list of neighbouring frequencies and/or cells, indicating the UE to include neighbouring cell's measurements as indicated in the list in the logged MDT report.

- (optionally) for E-UTRA, configuration of target MBSFN area(s) for MBSFN measurement logging. If target MBSFN area(s) is configured, UE applies it in addition to other restrictions such as the logging area. The UE will log measurements as long as it receives MBMS service from an indicated target MBSFN area and is within the configured logging area. The target MBSFN area(s) is defined by a list of up to 8 entries, where each entry indicates a carrier frequency and optionally indicates a specific MBSFN area on a carrier frequency.

- (optionally) configuration of the WLAN access point names, indicating the UE to attempt to obtain WLAN measurements associated to these access points.

- (optionally) configuration of the Bluetooth beacon names, indicating the UE to attempt to obtain Bluetooth measurements associated to these beacons.

- (optionally) for NR, configuration of the sensor names, indicating the UE to attempt to obtain sensor measurements.

NEXT CHANGE

### 5.1.4 UE capabilities

MDT relevant UE capabilities are component of radio access UE capabilities. Thus, the procedures used for handling UE radio capabilities over (E-)UTRAN and NR apply.

For (E-)UTRAN:

- The UE indicates one capability bit for support for Logged MDT, which indicates that the UE supports logging of downlink pilot strength measurements. The UE may also indicate capability for stand-alone GNSS positioning.

- The E-UTRA UE may indicate a capability for RX-TX time difference measurement for E-CID positioning for MDT.

- The E-UTRA UE may indicate a capability for support of logging of MBSFN measurements.

- The E-UTRA UE may indicate a capability for support of UL PDCP delay measurement when the UE is not configured with MR-DC.

- The E-UTRA UE may indicate a capability for support of UL PDCP Packet Average Delay measurement when the UE is configured with EN-DC.

- The E-UTRA UE may indicate a capability for support of Bluetooth measurements in RRC idle mode.

- The E-UTRA UE may indicate a capability for support of WLAN measurements in RRC idle mode.

- The E-UTRA UE may indicate a capability for support of Bluetooth measurements in RRC connected mode.

- The E-UTRA UE may indicate a capability for support of WLAN measurements in RRC connected mode.

- For UMTS support of the Accessibility measurements is an optional UE feature.

For NR:

- The UE indicates one capability bit for support for Logged MDT in RRC idle and inactive mode, to indicate that the UE supports logging of downlink pilot strength measurements, periodical logging and event-triggered logging.

- The UE may indicate capability for stand-alone GNSS positioning.

- The NR UE may indicate a capability for support of UL PDCP delay measurement.

- The NR UE may indicate a capability for support of Bluetooth measurements in RRC idle and inactive mode.

- The NR UE may indicate a capability for support of WLAN measurements in RRC idle and inactive mode.

- The NR UE may indicate a capability for support of Bluetooth measurements in RRC connected state.

- The NR UE may indicate a capability for support of WLAN measurements in RRC connected state.

- The NR UE may indicate a capability for support of barometer measurements.

- The NR UE may indicate a capability for support of orientation measurements.

- The NR UE may indicate a capability for support of speed measurements.

NEXT CHANGE

#### 5.4.1.2 Radio Link Failure report

The Radio Link Failure report contains information related to the latest connection failure experienced by the UE. The connection failure can be Radio Link Failure (RLF) or Handover Failure (HOF). The contents of the RLF report and the procedure for retrieving it by a gNB are specified in TS 38.331 [15].

NR RLF report content required for MDT includes:

- Latest radio measurement results of the serving and neighbouring cells, including SSB/CSI-RS index and associated measurements in the serving and neighbouring cells;

NOTE: The measure quantities are sorted through the same RS type depending on the availability, according to the following priority: RSRP, RSRQ, SINR.

- WLAN and Bluetooth measurement results, if were configured prior RLF and are available for reporting;

- "No suitable cell is found" flag when T311 expires;

- Indication per SSB/CSI-RS beams reporting whether it is configured to RLM purpose;

- Available sensor information;

- Available detailed location information;

- RACH failure report (in case, the cause for RLF is random access problem or Beam Failure Recovery failure):

- Tried SSB/CSI-RS index and number of Random Access Preambles transmitted for each tried SSB/CSI-RS in chronological order of attempts;

 Contention detected as per RACH attempt;

- Indication whether the selected SSB is above or below the rsrp-ThresholdSSB threshold, as per RACH attempt;

- TAC of the cell in which the UE performs the RA procedure;

- Frequency location related information of the RA resources used by the UE as specified in TS 38.331 [15].

If detailed location information (e.g. GNSS location information) is available the reported location information in *rlf-Report* consists of:

- Latitude, longitude (mandatory);

- Altitude (conditional on availability);

- Velocity (conditional on availability);

- Uncertainty (conditional on availability);

- Confidence (conditional on availability);

- Direction (conditional on availability).

If sensor information is available, the sensor information may convey uncompensated barometric pressure, UE speed, and UE orientation.

In addition, the RLF report may include additional information required for MRO solutions, as specified in TS 38.300 [22].

END OF CHANGES