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The present document is part 3 of a multi-part deliverable covering the 5G System (5GS) User Equipment (UE) protocol conformance specification, as identified below:

- 3GPP TS 38.523-1 [8]: "5GS; User Equipment (UE) conformance specification; Part 1: Protocol".
- 3GPP TS 38.523-2 [9]: "5GS; User Equipment (UE) conformance specification; Part 2: Applicability of protocol test cases".
- **3GPP TS 38.523-3: "5GS; User Equipment (UE) conformance specification; Part 3: Protocol Test Suites"** (the present document).

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1 Scope

The present document specifies the protocol and signalling conformance testing in TTCN-3 for the 3GPP UE connecting to the 5G System (5GS) via its radio interface(s).

The following TTCN test specification and design considerations can be found in the present document:

- the test system architecture;
- the overall test suite structure;
- the test models and ASP definitions;
- the test methods and usage of communication ports definitions;
- the test configurations;
- the design principles and assumptions;
- TTCN styles and conventions;
- the partial PIXIT proforma;
- the test suites.

The Test Suites designed in the document are based on the test cases specified in prose in 3GPP TS 38.523-1 [8]. The applicability of the individual test cases is specified in 3GPP TS 38.523-2 [9].

The present document is valid for TTCN development for 5GS UE conformance test according to 3GPP Releases starting from Release 15 up to the Release indicated on the cover page of the present document.

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2 References

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- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[3] ISO/IEC 9646-7: "Information technology - Open systems interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[4] ETSI ES 201 873: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3".

[5] 3GPP TS 38.508-1: "5GS; User Equipment (UE) conformance specification; Part 1: Common test environment".

[6] 3GPP TS 38.508-2: "5GS; User Equipment (UE) conformance specification; Part 2: Common Implementation Conformance Statement (ICS) proforma".

[7] 3GPP TS 38.509: "5GS; Special conformance testing functions for User Equipment (UE)".

[8] 3GPP TS 38.523-1: "5GS; User Equipment (UE) conformance specification; Part 1: Protocol".

[9] 3GPP TS 38.523-2: "5GS; User Equipment (UE) conformance specification; Part 2: Applicability of protocol test cases".

[10] 3GPP TS 36.508: "Common test environments for User Equipment (UE) conformance testing".

[11] 3GPP TS 36.509: "Terminal logical test interface; Special conformance testing functions".

[12] 3GPP TS 36.523-3: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites".

[13] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[14] 3GPP TS 38.322: "NR; Radio Link Control (RLC) protocol specification".

[15] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

[16] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[17] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol Specification".

[18] 3GPP TS 24.301: "Non-Access-Stratum (NAS) Protocol for Evolved Packet System (EPS); Stage 3".

[19] 3GPP TS 38.211: "NR; Physical channels and modulation".

[20] 3GPP TS 38.212: "NR; Multiplexing and channel coding".

[21] 3GPP TS 38.213: " NR; Physical layer procedures for control"

[22] 3GPP TS 38.214: "NR; Physical layer procedures for data".

[23] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation".

[24] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".

[25] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[26] 3GPP TS 24.501: "Non-Access-Stratum (NAS) Protocol for 5G System (5GS); Stage 3".

[27] RFC 5448: "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')"

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Full standard:
https://standards.iteh.ai/catalog/standards/sist/57a9741b-8395-4df2-a622-95dbc0945d5e/etsi-ts-138-523-3-v15.5.0-2019-10

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

In addition for the purposes of the present document, the following terms, definitions, symbols and abbreviations apply:

- such given in ISO/IEC 9646-1 [2] and ISO/IEC 9646-7 [3]

NOTE: Some terms and abbreviations defined in [2] and [3] are explicitly included below with small modification to reflect the terminology used in 3GPP.

Implementation eXtra Information for Testing (IXIT): A statement made by a supplier or implementer of an UEUT which contains or references all of the information (in addition to that given in the ICS) related to the UEUT and its testing environment, which will enable the test laboratory to run an appropriate test suite against the UEUT.

IXIT proforma: A document, in the form of a questionnaire, which when completed for an UEUT becomes an IXIT.

Protocol Implementation Conformance Statement (PICS): An ICS for an implementation or system claimed to conform to a given protocol specification.

Protocol Implementation eXtra Information for Testing (PIXIT): An IXIT related to testing for conformance to a given protocol specification.

3.2 Symbols

No specific symbols have been identified so far.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GC	5G Core Network
ASP	Abstract Service Primitive
ATS	Abstract Test Suite
AWGN	Additive White Gaussian Noise
CA	Carrier Aggregation
CBRA	Contention Based Random Access
CCE	Control Channel Element
CFRA	Contention Free Random Access
CORESET	Control Resource Set
DCI	Downlink Control Information
DL	Downlink
DL-SCH	Downlink Shared Channel
DMRS	Demodulation Reference Signal
EN-DC	E-UTRA-NR Dual Connectivity
EPC	Evolved Packet Core
FR1	Frequency Range 1
FR2	Frequency Range 2
HO	Handover
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
LSB	Least Significant Bit
MCG	Master Cell Group
MN	Master Node
MSB	Most Significant Bit
NR	NR Radio Access
PDCCH	Physical Downlink Control Channel
PDSCH	Physical Downlink Shared Channel
PRACH	Physical Random Access Channel
PRB	Physical Resource Block
PSCell	Primary SCG Cell
PSS	Primary Synchronisation Signal
PUCCH	Physical Uplink Control Channel
PUSCH	Physical Uplink Shared Channel
RA	Random Access
RACH	Random Access Channel
RAR	Random Access Response
RAT	Radio Access Technology
RMSI	Remaining Minimum SI
SCG	Secondary Cell Group
SN	Secondary Node
SRS	Sounding Reference Signal

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