



**Core Network and Interoperability Testing (INT);
Diameter Conformance testing for Rf/Ro interface;
(3GPP™ Release 10);
Part 3: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
pro forma specification**

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 3 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) pro forma for the test specifications for Diameter protocol on the Rf/Ro interface as specified in ETSI TS 132 260 [1] and ETSI TS 132 299 [2] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [7] and ETSI ETS 300 406 [8].

The test notation used in the ATS is TTCN-3 (see ETSI ES 201 873-1 [9]).

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

- the overall test suite structure;
- the testing architecture;
- the test methods and port definitions;
- the test configurations;
- TTCN styles and conventions;
- the partial PIXIT pro forma;
- the modules containing the TTCN-3 ATS.

Annex A provides the Partial Implementation Extra Information for Testing (PIXIT) Pro forma.

Annex B provides the Abstract Test Suite (ATS) part of the ATS.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 132 260 (V10.14.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging (3GPP TS 32.260 version 10.14.0 Release 10)".
- [2] ETSI TS 132 299 (V10.15.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; Diameter charging applications (3GPP TS 32.299 version 10.15.0 Release 10)".
- [3] ETSI TS-103 374-1: " Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rf/Ro interface; (3GPP™ Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".
- [4] ETSI TS 103 374-2: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rf/Ro interface; (3GPP™ Release 10); Part 2: Test Suite Structure (TSS) and Test Purposes (TP)".

- [5] ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".
- [6] ISO/IEC 9646-6: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 6: Protocol profile test specification".
- [7] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".
- [8] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [9] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TS 103 374-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rf/Ro interface; (3GPP™ Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-7 [7], ETSI TS 132 260 [1] and ETSI TS 132 299 [2] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ISO/IEC 9646-1 [5], ISO/IEC 9646-6 [6], ISO/IEC 9646-7 [7], ETSI TS 132 260 [1] and ETSI TS 132 299 [2] apply.

4 Abstract Test Method (ATM)

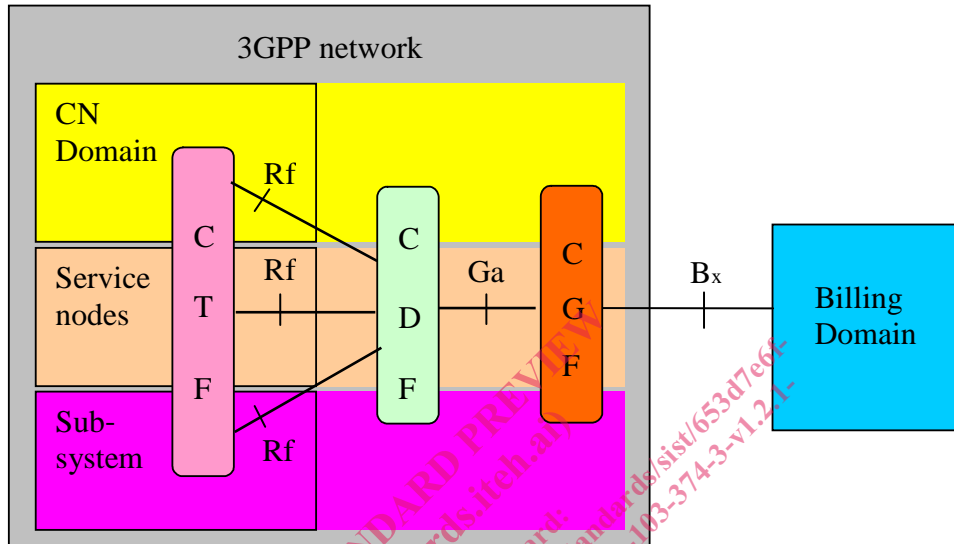
4.1 Introduction

This clause describes the ATM used to test the Diameter protocol on the Rf/Ro interface at the x-CSCF side and at the charging servers (Rf: CTF/CDF, To: OCF/CTF) side.

4.2 Test architecture

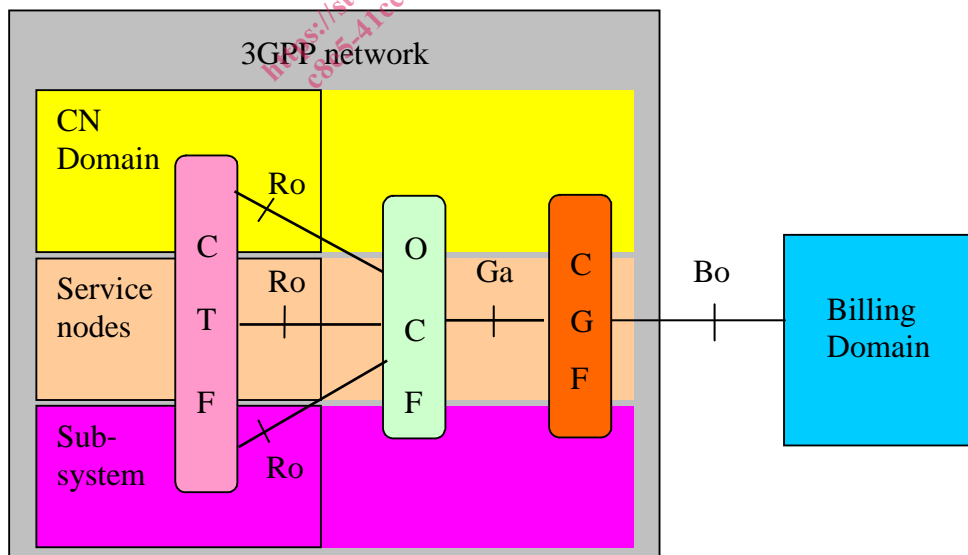
4.2.1 Test method

The Rf and the Ro are reference points from the Charging Trigger Function (CTF) to the Charging Data Function (CDF) and the Online Charging Function (OCF) respectively, and are intended for the transport of charging events. Rf is used for offline charging whereas Ro is used for online charging. The following figures depict the position of the Rf and Ro reference points within the overall 3GPP online and offline charging architecture.



CTF: Charging Trigger Function
CDF: Charging Data Function
CGF: Charging Gateway Function
BD: Billing Domain. This may also be a billing mediation device / post-processing system.

Figure 1: Logical ubiquitous offline charging architecture



CTF: Charging Trigger Function
OCF: Online Charging Function
CGF: Charging Gateway Function
BD: Billing Domain. This may also be a billing mediation device / post-processing system.

Figure 2: Logical ubiquitous online charging architecture

The test method chosen is the remote test method. Remote test method means that the test tool (the test machine + the executable test suite) shall behave as an x-CSCF when the IUT is a charging server and shall behave as a charging server when the IUT is an x-CSCF. As the exchange between the test system and the IUT is at the diameter message level, the lower layers of the test machine shall be totally conformant with the corresponding lower layers specifications to use the remote test method.

4.2.2 Test machine configuration

4.2.2.1 Test configurations using Rf interface

The Rf interface is located between a CTF equipment hosted by an x-CSCF or a SIP AS and the CDF.

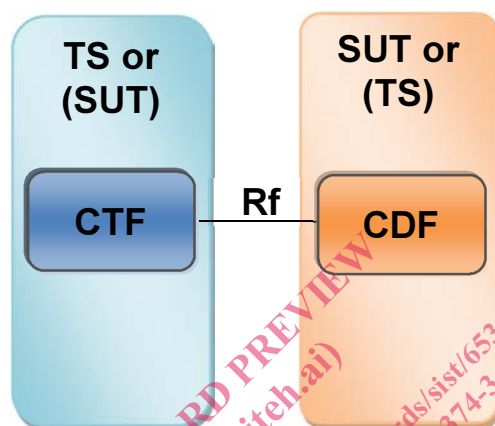


Figure 3: Test configuration CF_1Rf

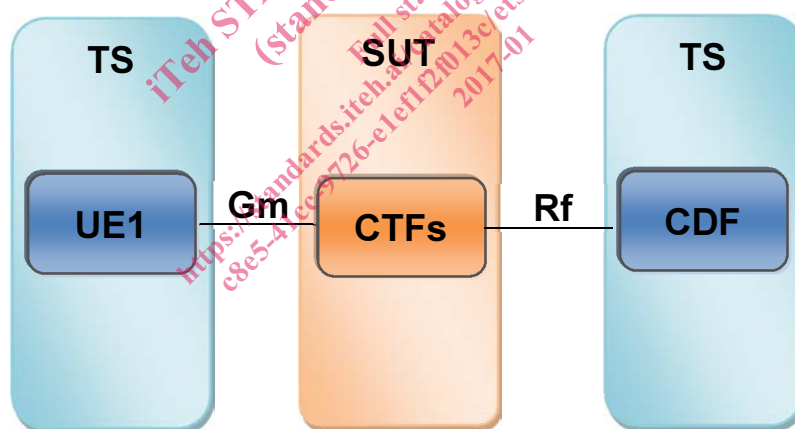


Figure 4: Test configuration CF_1Rf1Gm

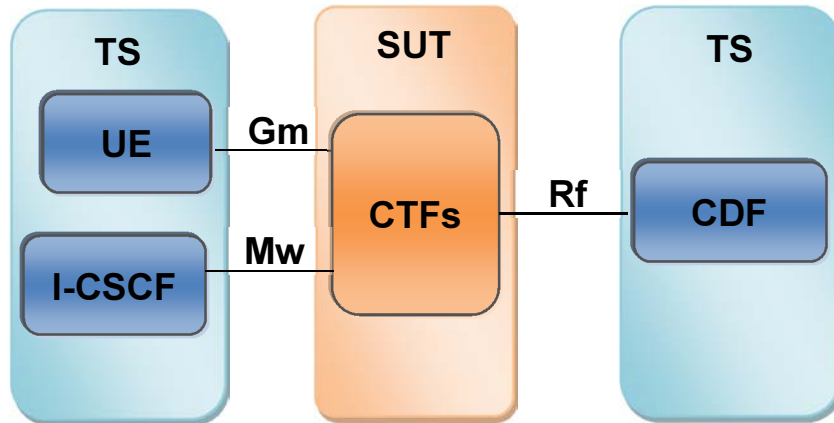


Figure 5: Test configuration CF_1Rf1Gm1Mw

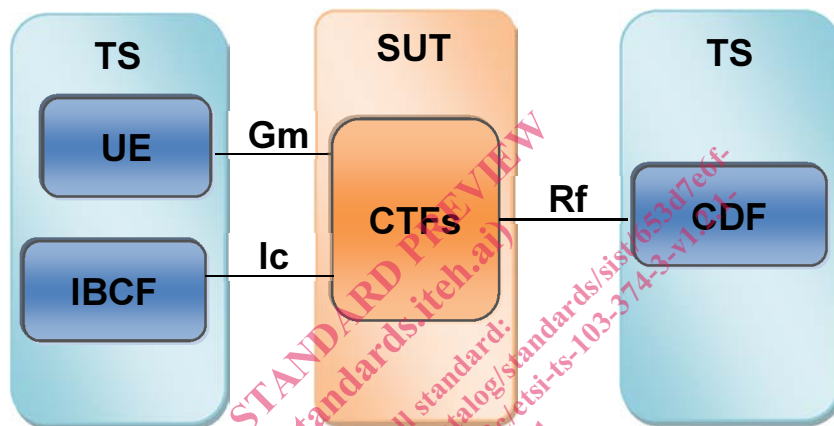


Figure 6: Test configuration CF_1Rf1Gm1Ic

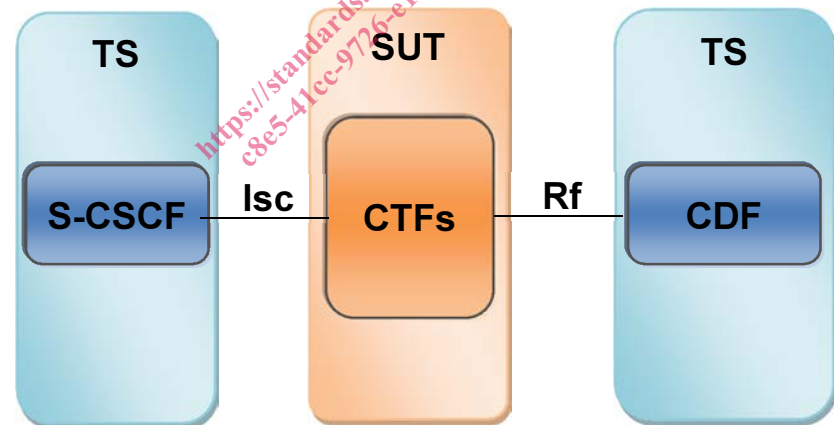


Figure 7: Test configuration CF_1Rf1Isc