

Introduction

The PGW Functional Tester is an automated test suite for testing the correctness of an implementation of LTE PDN Gateway (PGW) according to the 3GPP TS 23.401, TS 23.402, TS 29.274 (GTPv2-C), TS 29.281 (GTPv1-U), TS 29.212 (Gx), TS 32.296 (OCS), TS 29.275 (PMIP), TS 23.272 (CSFB), TS 29.274, TS 29.213, RFC 3588 (DRA), TS 32.299 (OFCS) and other relevant Release 10 standards.

Test Coverage

There are total 380 test cases with “E-UTRAN Initial Attach”, “Online Charging”, “Offline Charging”, “UE Requested Bearer Resource Handling”, “Network Initiated Dedicated Bearer Handling”, “E-UTRAN Requested Bearer Release”, “GERAN Initial Attach”, “UTRAN Initial Attach”, “E-UTRAN To UTRAN Iu Mode Inter RAT Handover” and other procedures.

The test cases exercise the following interfaces:

- 1) S5, S8
- 2) Gx Gy and Gz
- 3) SGi

Version 11.0.0.3 Beta

Release Date: September 18, 2015

Component Versions

- **PGW Functional Tester : 11.0.0.3**
- **Test Executive : 2.0.0.23**
- **Test Builder version : 5.0.0.5**

Total number of available test cases: 379

New in this Release

- User can define unique IPv6 addresses for different DUT (PGW) interfaces i.e., S5S8, S2a, S6b, Gx, Gy, Gz, Sgi.
- User can define IPv6 addresses for different Testbed nodes i.e., SGW, TWAG, OCS, OFCS, DRA, AAA, etc..
- Optimize Test Bed nodes IP addresses deletion.

Resolved Issues

Issue #	Summary
11714	PGW FT supports different IP address for S5/S8's GTP-C and GTP-U tunnel
11716	PGW FT throws an error when UE IP(acquired via DHCP)in the CSRes is different compared to the one configured in Test Bed
11280	TC 25.2.4: Test generates wrong error message.
11712	PGW FT application process need not be ended from Task Manager if the application has been closed already
11724	Diameter session over TCP protocol between PCRF(PGW FT) and PGW causes the FT to crash.
11268	Some Test Cases fails in Batch mode.
11419	Section-25.2: Application crashes while running these test cases.
10842	Section-20.2: All IPv6 testcase fails due to wrong grouping of Multicast Addresses.

Known Issues

Issue #	Summary
11643	IPv6 functionality should be supported by Internet Host

Version 10.2.0.4 Beta

Release Date: May 20, 2015

Component Versions

- **PGW Functional Tester : 10.2.0.2**
- **Test Executive : 2.0.0.23**
- **Test Builder version : 5.0.0.5**

Total number of available test cases: 380

New in this Release

- Support for separate IP addresses for DUT (PGW) interfaces i.e., S5S8, S2a, S6b, Gx, Gy, Gz, Sgi.

List of New / Available test cases:

Test case/section	Test case / section description	No of Test cases	Comments
27.2.5	S6b Session Timeout Detach with PMIPv6	1	
24.3.10-12	Session charging based on negative scenarios	3	
6.5	Default Bearer TFT Operation	3	
23.9.7	Usage Monitoring for Multiple PDN	1	
20.2	IPv6	6	
23.8.3 - 6	Deferred PCC Rule Activation	4	
26.4.2	Error Indication From SGW Over Dedicated Bearer	1	
27	Non 3GPP S2a Procedures	11	
	Total	30	

List of Deleted test cases:

- Deleted test case: **23.2.3** Enable Notification : Duplicate with 23.2.1.
- Deleted test case: **25.1.1** Event Related Charging Data : Invalid scenario.

Resolved Issues

Issue #	Summary
10270	Error scenario test cases based on Session Charging required.
10524	TC 24.4.1: Test case failed due to erroneous CCA-U message send by OCS.
10523	TC 24.3.2: Test case failed due to erroneous CCA-U message send by OCS.
10522 & 10269	TC 24.3.1: OCS fails to reply against CCA-Update message and wrong data size.
9509	For Add Packet Filter/ Replace Packet Filter operation, Parameter List is not added in

	Bearer Resource Command. Affected test cases are 15.1.2.1, 15.1.2.2, 6.2.3, 6.2.4, 6.4.14 and 6.4.13.
10407	Section 15.2 : Although tests run correctly, an error "can't read "GzIntfEnabled": no such variable" is visible at the end of each test while logging final verdict.

Known Issues

Issue #	Summary
11289	Section 20.2 : DHCPv6 tests are not working properly.
11265	TCs 23.8.1-2, 23.8.5 : Invalid Behavior of Test PCRF.
11283	TCs 23.9.2-4 : Test PCRF Expects wrong value of Used_Service_Unit in Credit Control Request message.

Version 10.1.0.9 Beta

Release Date: August 05, 2014

Component Versions

- **PGW Functional Tester : 10.1.0.9**
- **Test Executive : 2.0.0.23**
- **Test Builder version : 5.0.0.3**

Total number of available test cases: 352

Major modifications:

Resolved Issues

Issue #	Summary
10345	Section 23 Gx Policy and Charging Rules Procedure : As the Test PCRF does not send charging information AVPs in CCA-I message to PGW(DUT), DUT assumes charging is enabled. So PGW(DUT) rejects the call due to absence of charging information AVPs.
10346	Section 23.8 Time of the Day Procedure : As the Test PCRF does not send charging information AVPs in CCA-I message to PGW(DUT), DUT assumes charging is enabled. So PGW(DUT) rejects the call due to absence of charging information AVPs. Incorrect QCI and ARP information in Default-EPS-Bearer-QoS AVP. Incorrect Charging-Rule-Install AVP information in CCA-I message.
10347	Section 23.9 Usage Monitoring : As the Test PCRF does not send charging information AVPs in CCA-I message to PGW(DUT), DUT assumes charging is enabled. So PGW(DUT) rejects the call due to absence of charging information AVPs. Mismatch with values in Configuration Setup for : <ul style="list-style-type: none"> - Subscriber IMSI MCC and MNC value - MNC and MCC value set in ULI, ECGI , Service Network in Create Session Request. - Flags set in QoS.

Known Issues

Issue #	Summary
9509	For Add Packet Filter/ Replace Packet Filter operation, Parameter List is not added in Bearer Resource Command. Affected test cases are 15.1.2.1, 15.1.2.2, 6.2.3, 6.2.4, 6.4.14 and 6.4.13.
10407	Section 15.2 : Although tests run correctly, an error "can't read "GzIntfEnabled": no such variable" is visible at the end of each test while logging final verdict.

Version 10.1.0.8 Beta

Release Date: July 16, 2014

Component Versions

- PGW Functional Tester : 10.1.0.8
- Test Executive : 2.0.0.23
- Test Builder version : 5.0.0.3

Total number of available test cases: 352

Major modifications:

Resolved Issues

Issue #	Summary
10262	TC 23.8.1 and 23.8.2 : User unable to change Rule-Activation-Time, Rule-Deactivation-Time and Revalidation-Time using Test bed Setup configuration. For Default-EPS-Bearer-QoS sent in CCA-I message, PGW (DUT) should send CCR for request of PCC rules rather than initiate dedicated bearer based on the QoS received.
10263	TC 23.9 : Usage Monitoring (2.1, 2.2 and 2.3) the test needs to follow the "Dynamic Rules". User should be able to configure the Charging option(Online / Offline) as well as to Enable / Disable corresponding interface to test the Diameter messages on that interface ("test.epc.mnc<MNC Value>.mcc<MCC value>.3gppnetwork.org" should be set as the 'Origin Host' value of the Diameter node in Test Bed Parameter).
10267	TC 24.3.2 : In the CCR message, the Test OCS includes Charging-Rule-Install in the CCA-U message by mistake in response to Delete Bearer Request message from PGW (DUT)
10269	TC 24.3.1: Validity time as configured in Configure =>SetUp =>Diameter Node Configuration => Test OCS is not used in CCA-I message. Test OCS fails to reply to CEA message after PGW receives Delete Session Request message from SGW, hence fails to initiate CCR-T message to OCS.
10273	TC 11.1 and 13 : User unable to change Rule-Activation-Time, Rule-Deactivation-Time and Revalidation-Time using Test bed Setup configuration.
10274	TC12 and 17 : The RAC is not encoded as per specification.
10276	TC 31 : Test SGW does not send Create Session Request to PGW (DUT), and expects CER from PGW. This should be configurable.
10282	TC 24.4.1 : The response from Test OCS with DWA to PGW (DUT) does not use the value of P bit sent by PGW (DUT) in DWR message to OCS.

Known Issues

Issue #	Summary
9509	For Add Packet Filter/ Replace Packet Filter operation, Parameter List is not added in Bearer Resource Command. Affected test cases are 15.1.2.1, 15.1.2.2, 6.2.3, 6.2.4, 6.4.14 and 6.4.13.

Version 10.1.0.7 Beta

Release Date: June 06, 2014

Component Versions

- **PGW Functional Tester : 10.1.0.7**
- **Test Executive : 2.0.0.23**
- **Test Builder version : 5.0.0.3**

Total number of available test cases: 352

Major modifications:

- Test cases restructured based on scenarios instead of interfaces.
- Testbed Setup dialog clean-up and re-organization.
- Test Builder to allow users to create their own test cases.
- User plane validation is added for most of the test scenarios.

List of new test cases

Test case/section number	Test case / section description	No of Test cases	Comments
4.3	APN Restriction	3	
21	CS Fallback And SRVCC Related Procedures	7	
22	Path Failure Handling	2	
23.9	Usage Monitoring	6	
24.3	Session Charging With Reservation	6	
29.2	Roaming	2	
29.4	Trace Activation and Deactivation	1	
31	UE Time Zone	9	
15.1.2	MS initiated dedicated bearer modification	4	
15.1.3	MS initiated dedicated bearer deletion	3	
15.2.1	NW initiated dedicated bearer creation	2	
15.2.2	NW initiated dedicated bearer modification	2	
15.2.3	NW initiated dedicated bearer deletion	2	
29	PMIP Based S5 or S8 Procedure	7	
30.1	Error Indication	2	
32	DRA in EPC	7	
26.3	Bidirectional Data Transfer (GATE function)	2	
	Total	67	

Resolved Issues

Issue #	Summary
8451	New test case required with charging characteristics in Create Session Request.
8940	For Test Case 2.2.5.1, Rule activation and Rule Deactivation time values should be user configurable.
8934	For test case id's 2.2.1.19 to 2.2.2.2, Re-activation and Re-deactivation Time should be user configurable.

Known Issues

Issue #	Summary
9509	For Add Packet Filter/ Replace Packet Filter operation, Parameter List is not added in Bearer Resource Command. Affected test cases are 15.1.2.1, 15.1.2.2, 6.2.3, 6.2.4, 6.4.14 and 6.4.13.

Version 10.0.0.6 Beta

Release Date: December 06, 2013

Component Versions

- **PGW Functional Tester : 10.0.0.6**
- **Test Executive : 2.0.0.22**
- **PGW Functional Tester Test Procedures : 10.0.2**

Total Available Test cases : 316 (Total : 321, Unavailable Mode : 5)

Resolved Issues

Issue #	Summary
8928	TC 2.x: Test PCRF should send configurable Charging-Rule-Name in the CCA message.
8929	TC 2.2.1.7: Tester should send a Create Session Request during Initial Attach with IMEI and wait for CCR with User Equipment type set to IMEI from SGW DUT.
8933	TC 2.2.1.13: Tester should wait for APN AMBR in bits/second format.
8960	TC 2.2.2: Test PCRF should send packet filter in Charging Rule Install AVP in RAR message.
8964	Test SGW should send configurable 'UE Time Zone' value in the Create Session Request message.

Known Issues

Issue #	Summary
6155	All the test cases can not be run at a time.
6157	On aborting a test, the FT may become unresponsive.
9049	TC 2.4.2.3 and 2.4.2.4: Test PCRF should send packet filter in Charging Rule Install AVP in RAR message.

Version 10.0.0.4 Beta

Release Date: October 21, 2013

Component Versions

- **PGW Functional Tester : 10.0.0.4**
- **Test Executive : 2.0.0.22**
- **PGW Functional Tester Test Procedures : 10.0.2**

Resolved Issues

Issue #	Summary
8527	TC 2.4.2.5 and 2.4.2.6: Test OFCS should send configurable Acct-Interim-Interval in the ACA message.
7331	TC 2.2.1.9: On receiving a CCR during Initial Attach with CCR type Update-Request and event trigger as UE-IP Address-Allocate, Test PCRF should send CCA.
8425, 8429	TC 2.4.2.2, 2.4.2.3 and 2.4.2.4: On receiving an ACR request initiated for a dedicated bearer charging , the Test OFCS should send an ACA response.
8476	TC 3.2.2.5 and 3.2.4.1: FT should accept valid failure cause value for these test cases.
8450	TC 3.3.1.1 and 3.3.1.3: Test-case displays tcl error "Can't read rule Name: no such variable".

Known Issues

Issue #	Summary
6155	All the test cases can not be run at a time.
6157	On aborting a test, the FT may become unresponsive.
8451	Charging Characteristics in Create Session Request should be configurable.

10.0.0.2 Beta

Release Date: August 16, 2013

Component Versions

- **PGW Functional Tester : 10.0.0.2**
- **Test Executive : 2.0.0.21**
- **PGW Functional Tester Test Procedures : 10.0.1**

New in this release

1. Release 10 compliance.
2. 17 new test cases related to Emergency Session, UE based DHCP based IP Address allocation, Error Indication on S5/S8-U interface.

Resolved Issues

Issue #	Summary
7331	TC 2.2.1.9: Whenever the FT receives CCR with event Trigger set to UP_IP_ADDRESS_ALLOCATE, FT should respond with CCA to DUT.
7710	TC 3.2.3.4: Added a new test case related to TFT operation code "Delete Existing TFT" in the Delete Bearer Request section.
7509	TC 2.4.2.5 & 2.4.2.6: Added 2 new test cases for "Interim Default Accounting Session" and "Interim Network Initiated Dedicated Accounting Session" respectively.
7971	TC 3.3: FT should send 'Flow Description' AVP in 'Flow-Information' AVP in 'Charging-Rule-Definition' AVP in 'Charging-Rule-Install' AVP.

Known Issues

Issue #	Summary
6155	All the test cases can not be run at a time.
6157	On aborting a test, the FT may become unresponsive.

Version 3.1.0.2 Beta**Release Date:** April 26, 2013**New in this release**

1. 3 new test cases related to session based charging on Gz interface (2.4.2.2, 2.4.2.3 and 2.4.2.4)

Version 3.0.0.5 Beta**Release Date:** March 19, 2013**Version 3.0.0.4 Beta****Release Date:** February 01, 2013**Version 3.0.0.1 Beta****Release Date:** October 30, 2012**New in this release**

1. If the "Diameter Session Creation" flag is set to "YES", the tester expects a Capability Exchange Request before the test begins.
2. For the "DL Data Transfer" (4.1.1 section) test cases, route for the simulated UE address with the PGW as the gateway is added and deleted by test scripts.
3. Redundant "UE IP Address" field has been removed from Test Bed Setup "PDN Configuration".
4. More help information added in Test Bed Setup configuration fields.

Version 3.0.0.0 Beta**Release Date:** March 14, 2012**New in this release**

1. Dynamic PCC Rules are supported for all the Test Cases.
2. Non 3GPP Accesses module.
3. Data Transfer module.
4. Serving RNS Relocation
5. Inter SGSN RAU With S4 SGSNs
6. PDP Context Activation
7. Secondary PDP Context Activation

Version 2.0.0.0 Beta**Release Date:** December 29, 2011**New in this release**

2. E-UTRAN To GERAN A Gb Mode Inter RAT Handover
3. E-UTRAN To UTRAN Iu Mode Inter RAT Handover
4. GERAN Initial Attach
5. GERAN A Gb Mode To E-UTRAN Inter RAT Handover
6. UTRAN Initial Attach
7. UTRAN Iu Mode To E-UTRAN Inter RAT Handover