



Test Plan

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1.0 Introduction VZ_TC_IMSREGRTY_1471632

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Revision History

Rev.	Author	Description of Changes	Date
1.0	Verizon Wireless	Initial release.	July 2012
2.0	Verizon Wireless	Changed SIP signaling to default bearer.	October 2012
3.0	Verizon Wireless	<p>Removed text for voided test cases 2.5, 2.10.</p> <p>Added clarification throughout that SIP messages that exceed the IMS PDN MTU size use TCP over port 5060 (as opposed to UDP).</p> <p>Added clarification throughout that the "Call-ID" for a reregistration should be the same as the initial registration.</p> <p>Added clarification throughout that the subscribe dialog should use a "Call-ID" that is different from the "Call-ID" for the registration procedure.</p>	February 2013

		<p>Added clarification throughout that a re-subscribe should use the same dialog as the initial subscribe.</p> <p>Updates/corrections to sections:</p> <p>1.2, 2.3.2, 2.4.2, 2.8.2, 2.9.2, 2.20.2, 2.21.2, 2.22.2, 2.22.3, 2.23.2, 2.24.2, 2.25.2, 2.26.2, 2.27.2, 2.28.2, 2.28.3</p>	
4.0	Verizon Wireless	<p>Updates to sections:</p> <p>2.13, 2.20, 2.21, 2.22, 2.23, 2.24</p>	June 2013
5.0	Verizon Wireless	<p>Updates to sections:</p> <p>1, 1.5.8, 1.5.9, 2.1, 2.2, 2.3, 2.4, 2.6, 2.11, 2.12, 2.13, 2.14, 2.15, 2.16, 2.17, 2.18, 2.19, 2.20, 2.21, 2.22, 2.23, 2.24, 2.25, 2.26, 2.27, 2.28, 2.29, 2.30, 2.31, 2.32</p>	October 2013
6.0	Verizon Wireless	<p>Add check throughout that the device always includes the 3GPP SMS feature tag in the contact header of the SIP register message</p> <p>Added following sections: 2.33, 2.34, 2.35, 2.36, 2.37</p>	February 2014

7.0	Verizon Wireless	Updated the Test Procedures for Test Cases 2.11, 2.12, 2.13 and 2.34	April 2014
8.0	Verizon Wireless	Added check throughout that the device includes the P-ANI header in SIP messages Updates to sections: 2.32	June 2014
9.0	Verizon Wireless	Updates to sections: 2.11, 2.12, 2.13, 2.34	October 2014
10.0	Verizon Wireless	Updates to sections 2.8, 2.9, 2.11, 2.14, 2.20, 2.21, 2.22, 2.23, 2.24, 2.27, 2.28, 2.33, and 2.36	June 2015
11.0	Verizon Wireless	Updates to sections 2.1, 2.9, 2.12, 2.14, 2.16, 2.17, 2.21, 2.22, 2.28, 2.29, 2.31	October 2015
12.0	Verizon Wireless	Updates to sections 2.9, 2.13, 2.14 Added sections 2.38, 2.39	February 2016
13.0	Verizon Wireless	Updates to section 2.1	June 2016
14.0	Verizon Wireless	Updates to sections 2.13, 2.17, 2.18, 2.22, 2.23, 2.25, 2.27, and 2.28 Added section 2.40	Oct 2016
15.0	Verizon Wireless	Modified test cases: 2.17, 2.22 Added test case 2.41 Voided test cases: 2.6, 2.7, 2.8, 2.13, 2.25, 2.27,	Feb 2017

		2.30, 2.34, 2.35, 2.37	
16.0	Verizon Wireless	Modified test case 2.11, Test 3 (removed SIP 503 "outage text" scenario)	June 2018
17.0	Verizon Wireless	Retired TC 2.40	Oct 2018
18.0	Verizon Wireless	Modified test cases: 2.17, 2.18, 2.22, 2.23 Retired test cases: 2.28, Test 2; 2.38	January 2021
19.0	Verizon Wireless	Modified test cases: 2.17, 2.18, 2.22, 2.23	October 2021
20.0	Verizon Wireless	Fixed typos in the titles of sub-test cases under test cases 2.17 and 2.22	October 2022
21.0	Verizon Wireless	Added missing ".3gppnetwork.org" from step 1b of test cases 2.3 and 2.4	February 2023
22.0	Verizon Wireless	Replaced obsolete IMSI 311489 with IMSI 311270 in the last step of test cases 2.3 and 2.4 Updated and Duplicated multiple TCs with special suffixes for different technology variants. Updated test case IDs for consistency	June 2023
23.0	Verizon Wireless	Change EFIMPI in test cases 2.3 and 2.4	February 2024
24.0	Verizon Wireless	Attributes cleanup	June 2024

Introduction

Verizon Wireless requires all devices designed to operate on the Verizon Wireless LTE 3GPP Band 13 network to meet Verizon Wireless IMS registration requirements as detailed in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements. This document describes the procedure for verifying that these requirements have been met.

This publication is part of Verizon Wireless compliance with the FCC's rules for 700 MHz C Block (47 C.F.R. § 27.16), as explained in the FCC's Second Report and Order in WT Docket No. 06-150, "Service Rules for the 698-746, 747-762 and 777-792 MHz Bands" released on August 10, 2007.

In this document, the terms LTE (Long Term Evolution) and E-UTRA (Evolved Universal Terrestrial Radio Access) are considered equivalent.

Test Objectives

The objective of this document is to define the Verizon Wireless IMS registration test procedures for devices designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

This document will be used by employees of device manufacturers, test labs, and Verizon Wireless to guide the execution of Verizon Wireless IMS registration testing. This document will also be used to define the Verizon Wireless IMS registration test procedures for test automation development.

Definitions

The following terms are used in this document:

Acronym/Term	Definition
CSCF	Call Session Control Function
IMS	IP Multimedia Subsystem
ISIM	IP Multimedia Services Identity Module
IMSI	International Mobile Subscriber Identity
IPSec	Internet Protocol Security

LTE	Long Term Evolution
MCC	Mobile Country Code
MDN	Mobile Directory Number
MIN	Mobile Identification Number
MNC	Mobile Network Code
MSISDN	Mobile Subscriber Integrated Services Digital Network
P-CSCF	Proxy-CSCF
SIP	Session Initiation Protocol
UICC	Universal Integrated Circuit Card
URI	Uniform Resource Identifier
USIM	Universal Subscriber Identity Module
VZW	Verizon Wireless

Refer to the *3GPP Release 9 Specifications* section of the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements for details on the correct version for all 3GPP specification documents referenced in this test plan.

Entrance Criteria

All devices shall successfully pass this test plan per the Verizon Wireless LTE 3GPP Band 13 Lab Conformance Test Plan and in accordance with the Verizon Wireless LTE 3GPP Band 13 Device Conformance Test Process.

Test Equipment Configuration

For details on test equipment currently approved by Verizon Wireless, refer to the Verizon Wireless LTE 3GPP Band 13 Test Equipment List.

IMS PDN Bearers

Unless indicated otherwise in the test case procedure, the network emulator shall establish one bearer to the IMS PDN when activating a connection to the IMS PDN:

- Default bearer with QCI=5, IPv6 only (the UE will request IPv4v6)

P-CSCF IP Addresses

The network emulator shall provide 3 P-CSCF IP addresses in the PCO field of the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. All P-CSCF IP addresses shall be IPv6.

IMS Test Mode Operation

Unless indicated otherwise in the test case procedure, IMS Test Mode shall be disabled in the device for the test cases in this test plan (i.e. the device shall be set for normal operation with the IMS client enabled). IMS Test Mode operation is per the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

SMS_Over_IP_Networks_Indications Parameter Setting

Unless indicated otherwise in the test case procedure, the SMS_Over_IP_Networks_Indications parameter on the device shall be set to enable ("1").

ISIM Parameter Settings

Unless indicated otherwise in the test case procedure, the ISIM shall be provisioned with:

- A MSISDN-based SIP URI for the IMS public user identity and an IMSI-based SIP URI for the IMS public user identity under EFIMPU. The IMSI-based SIP URI shall be the first record under EFIMPU.
- The MSISDN-based SIP URI for the IMS Public User Identity under EFIMPU in the ISIM shall contain the same dialing number/SSC string as in the USIM under EFMSISDN.

IPSec

Unless indicated otherwise in the test case procedure, the test platform shall be configured to use Digest-AKAv2 authentication as opposed to IMS-AKA using IPSec authentication.

NOTE: In the future, VZW plans to use IMS-AKA using IPSec authentication. As a result, the test platform shall have a global configurable parameter to select either of the following options for authentication:

- Option 1
 - Digest-AKAv2
- Option 2
 - IMS-AKA using IPSec

Test Channels

All tests in this test plan shall be performed using the following channels only:

- Downlink channel number: 5230
- Uplink channel number: 23230

Retry-After Header

Unless explicitly required in the test procedure, the test platform shall not include the "Retry-After" header for SIP error codes 480, 486, 500, 503, and 600.

Registration and Subscription Expiration Requests

For all tests in this test plan, the test platform shall verify that the UE requests a registration and subscription expiration time using the following SIP headers:

- SIP REGISTER: Either the "Contact" header or the "Expires" header but not both
- SIP SUBSCRIBE: "Expires" header only

Any deviation from the above should be considered a failure of that step in the test procedure.

References

<Industry Standards References>

Change requests may cause modification to the specifications listed below. Please refer to www.3gpp.org for the latest version of the 3GPP specifications. Verizon Wireless LTE 3GPP Band 13 specifications are available at opennetwork.verizonwireless.com.

3GPP TS 24.229: *Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3*, Release 9

3GPP TS 24.301: *Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3*, Release 9

3GPP TS 31.103: *Characteristics of the IP Multimedia Services Identity Module (ISIM) application*, Release 9

3GPP TS 33.203: *3G security; Access security for IP-based services*, Release 9

3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*, Release 9

"Verizon Wireless LTE 3GPP Band 13 Network Access Device Requirements"

"Verizon Wireless LTE SMS Requirements"

"Verizon Wireless LTE 3GPP Band 13 Test Equipment List"

"Verizon Wireless LTE 3GPP Band 13 Device Conformance Test Process"

"Verizon Wireless LTE 3GPP Band 13 Lab Conformance Test Plan"

<Other Applicable References>

2.1 DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV₂ AUTHENTICATION VZ_TC_IMSREGRTY_7243

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS initial registration using the MSISDN-based SIP URI and Digest-AKAV₂ authentication.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. <ol style="list-style-type: none"> a. Record the MCC and MNC values received from the network in the GUTI IE of the NAS ATTACH ACCEPT message. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. Verify that the MCC and MNC values match those received in Step 2 above j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAV₂ authentication (i.e. AKAV₂-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.

6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Power off the UE.

Expected Results

Expected Result

The device successful registers for IMS services using Digest-AKAv2 authentication following the steps above.

2.3 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM VZ_TC_IMSREGRTY_7245

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS initial registration using the IMSI-based SIP URI as a result of the MSISDN not being provisioned on the USIM.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Insert a UICC into the UE with: <ol style="list-style-type: none"> a. All bytes of the dialing number/SSC string under EF_{MSISDN} in the USIM set to hexadecimal "FF" values. b. The first record in the ISIM under EF_{IMPU} shall be set to 311480xxxxxxx@ims.mnc480.mcc311.3gppnetwork.org. c. <u>EF_{IMPI} in the ISIM shall be set to 311480xxxxxxx@vzims.com.</u> 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxx@ims.mnc480.mcc311.3gppnetwork.org") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+ TAC+ECL. 5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).

6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
- I 0. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
- I 1. Verify that the UE responds with a SIP 200 OK message.
- I 2. Power off the UE.
- I 3. Repeat steps 1.) through 12.) above with the first record in the ISIM under EF_{IMPI} set to 311270yyyyyyyy@ims.mnc270.mcc311.3gppnetwork.org, and EF_{IMPI} in the ISIM set to 311270yyyyyyyy@vzims.com.

Expected Results

Expected Result

The device successful registers for IMS services using the IMSI-based SIP URI following the steps above when the MSISDN is invalid.

2.3.1 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM - T1

VZ_TC_IMSREGRTY_4105999311931739

2.3.2 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM - T2

VZ_TC_IMSREGRTY_4105999311931740

2.4 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID VZ_TC_IMSREGRTY_7246

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS initial registration using the IMSI-based SIP URI as a result of the MSISDN-based SIP URI on the ISIM being invalid.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Insert a UICC into the UE with: <ol style="list-style-type: none"> a. The EF_{MSISDN} in the USIM shall contain a valid dialing number/SSC string. b. The first record in the ISIM under EF_{IMPU} shall be set to 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org. c. The MSISDN-based SIP URI in the ISIM under EF_{IMPU} shall contain a valid dialing number/SSC string that is different from the dialing number/SSC string under EF_{MSISDN} in the USIM. d. <u>EF_{IMPI} in the ISIM shall be set to 311480xxxxxxxx@vzims.com.</u> 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+ TAC+ECL.

5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECL.
9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
- I 0. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
- I 1. Verify that the UE responds with a SIP 200 OK message.
- I 2. Power off the UE.
- I 3. Repeat steps 1.) through 12.) above with the first record in the ISIM under EF_{IMPI} set to 311270yyyyyyyy@ims.mnc270.mcc311.3gppnetwork.org. and EF_{IMPI} in the ISIM set to 311270yyyyyyyy@vzims.com.

Expected Results

Expected Result

The device successful registers for IMS services using the IMSI-based SIP URI following the steps above when the MSISDN-based SIP URI is invalid.

2.4.1 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID - T I VZ_TC_IMSREGRTY_4105999311931741

2.4.2 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID - T2

VZ_TC_IMSREGRTY_4105999311931742

2.5 DEVICE INITIAL REGISTRATION SIP SIGNALING ON DEFAULT BEARER VZ_TC_IMSREGRTY_7247

VOID

2.9 UE INITIATED DEVICE REREGISTRATION WITH NETWORK CHALLENGE VZ_TC_IMSREGRTY_7251

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the

Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 1500 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
- I 0. Verify that the UE responds with a SIP 200 OK message.
- I 1. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
- I 2. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
- I 3. Verify that the UE sends a valid SIP REGISTER message for a reregistration to the P-CSCF with the correct Authorization header.
- I 4. Configure the P-CSCF to respond to respond with a SIP 200 OK message with a registration expiration time of 7200 seconds.
- I 5. Verify that between 900 and 1500 seconds after step 8.) that the UE sends a SIP SUBSCRIBE message to the P-CSCF to re-subscribe to the reg events package. Verify that the UE sets the Event header field to "reg", uses the same dialog that was established at the initial subscribe procedure, and sets the Expires header field to 600,000 seconds.
- I 6. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 7200 seconds.
- I 7. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
- I 8. Verify that the UE responds with a SIP 200 OK message.
- I 9. Power off the UE.

Expected Results

Expected Result

The device successful reregisters for IMS services following the steps above.

**2.10 UE INITIATED DEVICE REREGISTRATION WITH NETWORK
CHALLENGE IMS PDN DEDICATED BEARER DEACTIVATED**

VZ_TC_IMSREGRTY_7252

VOID

2.1.1 DEVICE INITIATED DE-REGISTRATION UE INITIATED LTE DETACH ON POWER DOWN VZ_TC_IMSREGRTY_7253

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS de-registration.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure Test 1</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 2. All SIP messages are routed on the default bearer for the IMS PDN. 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. 4. The UE initiates a new registration (as opposed to a re-registration). 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") 6. The UE does not request IPSec. 7. The UE requests a registration expiration time of 600,000 seconds. 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.

9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Power off the UE.
12. Prior to power down, verify that the UE sends the messages below in the order below:
 1. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 2. SIP REGISTER message with Expires=0 to indicate de-registration.
 3. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK followed by a SIP NOTIFY message. Verify that the UE responds to the SIP NOTIFY with a SIP 200 OK message.
 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅). Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK.
 5. A NAS DETACH REQUEST message as soon as the SIP 200 OK message is received in step d.

NOTE: Step 12) is expected to complete in its entirety within 4 seconds.

Test Procedure Test 2

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPsec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.

10. Verify that the UE responds with a SIP 200 OK message.
11. Power off the UE.
12. Prior to power down, verify that the UE sends the messages below in the order below:
 1. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 2. SIP REGISTER message with Expires=0 to indicate de-registration.
 3. Configure the P-CSCF to ignore the SIP SUBSCRIBE and the SIP REGISTER messages from the UE.
 4. A NAS DETACH REQUEST message is sent no later than 4 seconds after the SIP REGISTER is sent.

Test Procedure Test 3

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPsec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg

events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL.

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Power off the UE.
12. Prior to power down, verify that the UE sends the messages below in the order below:
 1. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 2. SIP REGISTER message with Expires=0 to indicate de-registration.
 3. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 480 error code. Verify that the UE does not send another SIP SUBSCRIBE message.
 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 480 error code. Verify that the UE does not send another SIP REGISTER message.
 5. A NAS DETACH REQUEST message is sent no later than 4 seconds after the SIP REGISTER is sent.

Test Procedure Test 4

VOID

Test Procedure Test 5

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g.

- "sip:+15551234567@vzims.com"
6. The UE does not request IPSec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 10. Verify that the UE responds with a SIP 200 OK message.
 11. Power off the UE.
 12. Prior to power down, verify that the UE sends the messages below in the order below:
 1. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 2. SIP REGISTER message with Expires=0 to indicate de-registration.
 3. Configure the P-CSCF to ignore the SIP SUBSCRIBE message from the UE.
 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5). Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. Configure the P-CSCF to take no further action.
 5. A NAS DETACH REQUEST message is sent no later than 4 seconds after the initial SIP REGISTER is sent in step b.

Expected Results

Expected Result

The device successfully de-registers for IMS services when initiating a detach from the LTE network during UE power down.

2.1.1.1 Test1 DEVICE INITIATED DE-REGISTRATION – UE INITIATED LTE DETACH ON POWER DOWN VZ_TC_IMSREGRTY_3523538

TC generated to match TECC

2.1.1.2 Test2 DEVICE INITIATED DE-REGISTRATION – UE INITIATED LTE DETACH ON POWER DOWN VZ_TC_IMSREGRTY_3523636

TC generated to match TECC

2.1.1.3 Test3 DEVICE INITIATED DE-REGISTRATION – UE INITIATED LTE
DETACH ON POWER DOWN VZ_TC_IMSREGRTY_3523732

TC generated to map TECC

2.1.1.5 Test5 DEVICE INITIATED DE-REGISTRATION ' UE INITIATED LTE
DETACH ON POWER DOWN VZ_TC_IMSREGRTY_3845857

2.1.2 UE INITIATED DE-REGISTRATION AIRPLANE MODE VZ_TC_IMSREGRTY_7254

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS de-registration when entering airplane mode.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network which support an airplane mode.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Set the UE to turn on "Airplane Mode".
12. Verify that the UE sends the messages below in the order below:
 - a. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 - b. SIP REGISTER message with Expires=0 to indicate de-registration.
 - c. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK followed by a SIP NOTIFY message. Verify that the UE responds to the SIP NOTIFY with a SIP 200 OK message.
 - d. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5). Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK.
 - e. A NAS DETACH REQUEST message as soon as the SIP 200 OK message is received in step d. **NOTE:** Step 12) is required to complete in its entirety within 4 seconds.
13. Verify that the UE sends no messages for 5 minutes.
14. Set the UE to turn off "Airplane Mode".
15. Verify that the UE attaches to the LTE network using the IMS PDN and repeats steps 3.) through 10.).
16. Power off the UE.
17. Repeat steps 1.) through 16.) except replace step 12.) with the following: Prior to power down, verify that the UE sends the messages below in the order below:
 - a. SIP SUBSCRIBE message with Expires=0 to terminate the subscription to the reg events package.
 - b. SIP REGISTER message with Expires=0 to indicate de-registration.
 - c. Configure the P-CSCF to ignore the SIP SUBSCRIBE and the SIP REGISTER messages from the UE.
 - d. A NAS DETACH REQUEST message is sent no later than 4 seconds after the SIP REGISTER is sent.

Expected Results

Expected Result

The device successfully de-registers for IMS services when entering airplane mode and initiates a new registration upon exiting airplane mode.

2.14 NETWORK INITIATED DE-REGISTRATION VZ_TC_IMSREGRTY_7256

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS de-registration.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure: Test 1</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:sgma:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header

with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header.

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Configure the P-CSCF to send a SIP NOTIFY message to the UE for the reg event package to indicate that the UE is deregistered. Configure the Instance-ID in the contact address in the SIP NOTIFY body to be identical to the Instance-ID provided in the SIP REGISTER message in step 3.
12. Verify that the UE responds with a SIP 200 OK message.
13. Verify that the UE waits at least 60 seconds then repeats steps 3.) through 10.).
14. Power off the UE.

Test Procedure: Test 2

Test Procedure Test 2

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 - j. The UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:sgma:imei:<device IMEI>".
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header.
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.

- I 1. Configure the P-CSCF to send a SIP NOTIFY message to the UE for the reg event package to indicate that the UE is deregistered. Configure the Instance-ID in the contact address in the SIP NOTIFY body to be different from the Instance-ID provided in the SIP REGISTER message in step 3.
- I 2. Verify that the UE responds with a SIP 200 OK message but ignores the SIP NOTIFY message and maintains its current registration.
- I 3. Power off the UE.

Expected Results

Expected Result

In test 1, the device successfully de-registers for IMS services following the steps above. In test 2, the device ignores the SIP NOTIFY message regarding de-registration sent in step 1 1 and maintains its current registration.

2.14.1 Test: NETWORK INITIATED DE-REGISTRATION VZ_TC_IMSREGRTY_3612884

2.14.2 Test2 NETWORK INITIATED DE-REGISTRATION VZ_TC_IMSREGRTY_3612885

2.15 IMS REGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST VZ_TC_IMSREGRTY_7257

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to ignore all IMS registration requests. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. 5. Verify that the P-CSCF does not respond to the SIP REGISTER message from the device. 6. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0: <ol style="list-style-type: none"> a. First retransmission at t=3 seconds. b. Second retransmission at t=9 seconds. c. Third retransmission at t=21 seconds. d. At t=30 seconds, Timer F expires and the process times out.

7. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
8. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
9. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
- I 0. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
- I 1. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- I 2. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
- I 3. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds after Timer F expires.
- I 4. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- I 5. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
- I 6. Verify the UE does not send another SIP REGISTER message for 2 minutes after Timer F expires.
- I 7. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- I 8. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
- I 9. Verify the UE does not send another SIP REGISTER message for 8 minutes after Timer F expires.

20. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
21. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
22. Verify the UE does not send another SIP REGISTER message for 15 minutes after Timer F expires.
23. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
24. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
25. Verify the UE does not send another SIP REGISTER message for 15 minutes after Timer F expires.
26. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
27. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
28. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
29. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
30. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
31. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
32. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
33. Verify that the UE responds with a SIP 200 OK message.
34. Power off the UE.

Expected Results

Expected Result

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.16 IMS REGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST VZ_TC_IMSREGRTY_7258

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to reject all IMS registration requests with a SIP 482 error code. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>". 5. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code. 6. Verify the UE does not send another SIP REGISTER message for 30 seconds. 7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception: <ol style="list-style-type: none"> a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER

CONTEXT REQUEST message for the IMS PDN.

8. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
9. Verify the UE does not send another SIP REGISTER message for 30 seconds.
10. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
11. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
12. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
13. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
14. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
15. Verify the UE does not send another SIP REGISTER message for 2 minutes.
16. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
17. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
18. Verify the UE does not send another SIP REGISTER message for 8 minutes.
19. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the
20. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
21. Verify the UE does not send another SIP REGISTER message for 15 minutes.
22. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
23. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
24. Verify the UE does not send another SIP REGISTER message for 15 minutes.
25. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
26. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
27. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
28. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
29. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".

30. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
31. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
32. Verify that the UE responds with a SIP 200 OK message.
33. Power off the UE.
34. [This step removed.]
35. Configure the P-CSCF to reject all IMS registration requests with a SIP 504 error code.
36. Power on the UE.
37. Verify that the UE attaches to the LTE network using the IMS PDN.
38. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL.
 - j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
39. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
40. Verify the UE does not send another SIP REGISTER message for 30 seconds.
41. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 38.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
42. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
43. Verify the UE does not send another SIP REGISTER message for 30 seconds.
44. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 38.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
45. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
46. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
47. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 38.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
48. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
49. Verify the UE does not send another SIP REGISTER message for 2 minutes.
50. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step

38.) with the following exception:

- a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
51. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
 52. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 53. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 54. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
 55. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 56. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 57. Verify that the UE responds with a SIP 200 OK message.
 58. Power off the UE.
 59. [This step removed.]

Expected Results

Expected Result

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.17 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES VZ_TC_IMSREGRTY_7259

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure Test 1</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to reject all IMS registration requests with a SIP 403 error code. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the

concatenation of MCC +MNC+ TAC+ECI.

5. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
6. Verify the UE does not send another SIP REGISTER message for 30 seconds.
7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
8. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
9. Verify the UE does not send another SIP REGISTER message for 30 seconds.
10. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
11. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
12. Verify the UE does not send another SIP REGISTER message for 30 seconds.
13. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
14. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅).
15. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
16. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
17. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-

- FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
18. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 19. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 20. Verify that the UE responds with a SIP 200 OK message.
 21. Power off the UE.
 22. Repeat steps 1.) through 21.) for SIP error code 404.

Test Procedure Test 2

1. Configure the network emulator so that the device under test (DUT) finds service on a single eNodeB with cell_id (where "cell_id" refers to the "CellIdentity" parameter that is broadcast in SIB1) equal to value X1, PLMN id equal to value Y1, and TAI equal to value Z1.
2. Configure the P-CSCF to reject all IMS registration requests with a SIP 403 error code.
3. Power on the UE.
4. Verify that the UE attaches to the LTE network using the IMS PDN.
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPsec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
6. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
7. Verify the UE does not send another SIP REGISTER message for 30 seconds.
8. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 5.) with the following exception:

- a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- 9. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
- 10. Verify the UE does not send another SIP REGISTER message for 30 seconds.
- 11. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 5.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- 12. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
- 13. Verify the UE does not send another SIP REGISTER message for 30 seconds.
- 14. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 5.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
- 15. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
- 16. Verify the UE does not send another SIP REGISTER message for 30 seconds.
- 17. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 5.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
- 18. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
- 19. Verify the UE does not send another SIP REGISTER message for 30 seconds.
- 20. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 5.) with the following exception:
 - o The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.

- o The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. "sip:311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
21. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
 22. Monitor the UE for 5 minutes and verify that the UE makes no additional registration attempts.
 23. No Op.R
 24. No Op.
 25. No Op.
 26. No Op.
 27. No Op.
 28. No Op.
 29. Power cycle the UE.
 30. Verify that the UE attaches to the LTE network using the IMS PDN.
 31. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPsec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 32. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
 33. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 34. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 35. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg

events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI.

36. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
37. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
38. Verify that the UE responds with a SIP 200 OK message.
39. Power off the UE.
40. Repeat steps 1.) through 39.) for SIP error code 404.

Expected Results

Expected Result

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.17.1 Test 403 IMS REGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 403 VZ_TC_IMSREGRTY_3613993

2.17.2 Test 404 IMS REGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 404 VZ_TC_IMSREGRTY_3612886

2.17.3 Test2 403 IMS REGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 403 VZ_TC_IMSREGRTY_3613994

2.17.4 Test2 404 IMS REGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 404 VZ_TC_IMSREGRTY_3612890

2.18 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES VZ_TC_IMSREGRTY_7260

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the network emulator so that the device under test (DUT) finds service on a single eNodeB with cell_id (where "cell_id" refers to the "CellIdentity" parameter that is broadcast in SIB1) equal to value X1, PLMN id equal to value Y1, and TAI equal to value Z1. Configure the P-CSCF to reject all IMS registration requests with a SIP 400 error code. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 2. All SIP messages are routed on the default bearer for the IMS PDN. 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. 4. The UE initiates a new registration (as opposed to a re-registration). 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") 6. The UE does not request IPSec. 7. The UE requests a registration expiration time of 600,000 seconds.

8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
5. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 400 error code.
6. Verify the UE does not send another SIP REGISTER message for 30 seconds.
7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 1. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
8. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 400 error code.
9. Monitor the UE for 5 minutes and verify that the UE makes no additional registration attempts.
10. No Op.
11. No Op.
12. No Op.
13. No Op.V
14. No Op.
15. No Op.
16. Power cycle the UE.
17. Verify that the UE attaches to the LTE network using the IMS PDN.
18. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPSec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-

UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.

19. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
20. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
21. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
22. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
23. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
24. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
25. Verify that the UE responds with a SIP 200 OK message.
26. Power off the UE.
27. Repeat steps 1.) through 26.) for SIP error code 402.

Expected Results

Expected Result

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.18.1 400 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST WITH SIP ERROR CODE 400 VZ_TC_IMSREGRTY_3613996

2.18.2 402 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 402 VZ_TC_IMSREGRTY_3613997

2.19 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600 VZ_TC_IMSREGRTY_7261

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to reject all IMS registration requests with a SIP 500 error code. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+ TAC+ECI. 5. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent. 6. Verify the UE does not send another SIP REGISTER message for 30 seconds. 7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception: <ol style="list-style-type: none"> a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 8. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header

present and set to a value of 90 seconds.

9. Verify the UE does not send another SIP REGISTER message for 90 seconds.
10. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
11. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
12. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
13. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
14. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After is present and set to 90 seconds.
15. Verify the UE does not send another SIP REGISTER message for 90 seconds.
16. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
17. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
18. Verify the UE does not send another SIP REGISTER message for 8 minutes.
19. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the
20. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header is present and set to 90 seconds.
21. Verify the UE does not send another SIP REGISTER message for 90 seconds.
22. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
23. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
24. Verify the UE does not send another SIP REGISTER message for 15 minutes.
25. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
26. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
27. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
28. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
29. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECL.

30. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
31. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
32. Verify that the UE responds with a SIP 200 OK message.
33. Power off the UE.
34. Repeat steps 1.) through 33.) for SIP error codes 503, 480, 486, and 600.

Expected Results

Expected Result

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.19.1 500 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 500 VZ_TC_IMSREGRTY_3612987

2.19.2 503 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 503 VZ_TC_IMSREGRTY_3612989

2.19.3 480 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 480 VZ_TC_IMSREGRTY_3613088

2.19.4 486 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 486 VZ_TC_IMSREGRTY_3613089

2.19.5 600 IMS REGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 600 VZ_TC_IMSREGRTY_3613090

2.20 IMS REREGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST VZ_TC_IMSREGRTY_7262

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC

+MNC+ TAC+ECL

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
11. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
12. Configure the P-CSCF to ignore all IMS reregistration and registration requests.
13. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
14. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
15. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a reregistration using the same parameters as in step 11.). Verify that the UE uses the first (i.e. the same) P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
16. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
17. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
18. Once the 30 second throttling timer expires, verify that the UE sends a SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
19. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
20. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds after Timer F expires.
21. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
22. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP

- timer F and assuming that the initial SIP REGISTER message was sent at $t=0$:
- a. First retransmission at $t=3$ seconds.
 - b. Second retransmission at $t=9$ seconds.
 - c. Third retransmission at $t=21$ seconds.
 - d. At $t=30$ seconds, Timer F expires and the process times out.
23. Verify the UE does not send another SIP REGISTER message for 2 minutes after Timer F expires.
 24. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 25. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at $t=0$:
 - a. First retransmission at $t=3$ seconds.
 - b. Second retransmission at $t=9$ seconds.
 - c. Third retransmission at $t=21$ seconds.
 - d. At $t=30$ seconds, Timer F expires and the process times out.
 26. Verify the UE does not send another SIP REGISTER message for 8 minutes after Timer F expires.
 27. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 28. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at $t=0$:
 - a. First retransmission at $t=3$ seconds.
 - b. Second retransmission at $t=9$ seconds.
 - c. Third retransmission at $t=21$ seconds.
 - d. At $t=30$ seconds, Timer F expires and the process times out.
 29. Verify the UE does not send another SIP REGISTER message for 15 minutes after Timer F expires.
 30. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 31. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at $t=0$:
 - a. First retransmission at $t=3$ seconds.
 - b. Second retransmission at $t=9$ seconds.
 - c. Third retransmission at $t=21$ seconds.
 - d. At $t=30$ seconds, Timer F expires and the process times out.
 32. Verify the UE does not send another SIP REGISTER message for 15 minutes after Timer F expires.
 33. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 34. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
 35. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.

36. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
37. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
38. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 7200 seconds.
39. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
40. Verify that the UE responds with a SIP 200 OK message.
41. Power off the UE.

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.2.1 IMS REREGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST VZ_TC_IMSREGRTY_7263

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the

- Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 10. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
 11. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
 12. Configure the P-CSCF to reject all IMS reregistration and registration requests with a SIP 482 error code.
 13. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 14. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a reregistration using the same parameters as in step 11.). Verify that the UE uses the first (i.e. the same) P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 15. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 16. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 17. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 18. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 19. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
 20. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 21. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 22. Verify the UE does not send another SIP REGISTER message for 2 minutes.
 23. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 24. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 25. Verify the UE does not send another SIP REGISTER message for 8 minutes.
 26. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the
 27. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 28. Verify the UE does not send another SIP REGISTER message for 15 minutes.
 29. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step

- 3.) with the following exception:
- a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
30. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 31. Verify the UE does not send another SIP REGISTER message for 15 minutes.
 32. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 33. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
 34. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 35. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 36. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. Verify that the UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>".
 37. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 38. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 39. Verify that the UE responds with a SIP 200 OK message.
 40. Power off the UE.
 41. [This step removed.]
 42. Power on the UE.
 43. Verify that the UE attaches to the LTE network using the IMS PDN.
 44. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI.
 - j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>".
 45. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
 46. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.

47. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
48. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
49. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
50. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
51. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
52. Verify that between 300 and 600 seconds after step 47.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
53. Configure the P-CSCF to reject all IMS reregistration and registration requests with a SIP 504 error code.
54. Verify the UE does not send another SIP REGISTER message for 30 seconds.
55. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a reregistration using the same parameters as in step 52.). Verify that the UE uses the first (i.e. the same) P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
56. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
57. Verify the UE does not send another SIP REGISTER message for 30 seconds.
58. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 44.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
59. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
60. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
61. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 44.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
62. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 504 error code.
63. Verify the UE does not send another SIP REGISTER message for 2 minutes.
64. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 44.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
65. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
66. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
67. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
68. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses

a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".

69. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
70. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
71. Verify that the UE responds with a SIP 200 OK message.
72. Power off the UE.
73. [This step removed.]

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.2.2 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES VZ_TC_IMSREGRTY_7264

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure Test 1</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPsec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI.

4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL.
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
11. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
12. Configure the P-CSCF to reject all IMS reregistration and registration requests with a SIP 403 error code.
13. Verify the UE does not send another SIP REGISTER message for 30 seconds.
14. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
15. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
16. Verify the UE does not send another SIP REGISTER message for 30 seconds.

17. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
18. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
19. Verify the UE does not send another SIP REGISTER message for 30 seconds.
20. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. "sip:311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
21. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
22. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
23. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
24. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
25. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
26. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
27. Verify that the UE responds with a SIP 200 OK message.
28. Power off the UE.
29. Repeat steps 1.) through 28.) for SIP error code 404.

Test Procedure Test 2

1. Configure the network emulator so that the device under test (DUT) finds service on a single eNodeB with cell_id (where "cell_id" refers to the "CellIdentity" parameter that is broadcast in SIB1) equal to value X₁, PLMN id equal to value Y₁, and TAI equal to value Z₁.
2. Power on the UE.
3. Verify that the UE attaches to the LTE network using the IMS PDN.
4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPsec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.

10. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
11. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
12. Verify that between 300 and 600 seconds after step 7.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
13. Configure the P-CSCF to reject all IMS reregistration and registration requests with a SIP 403 error code.
14. Verify the UE does not send another SIP REGISTER message for 30 seconds.
15. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
16. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
17. Verify the UE does not send another SIP REGISTER message for 30 seconds.
18. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
19. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
20. Verify the UE does not send another SIP REGISTER message for 30 seconds.
21. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip:

- 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
22. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
 23. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 24. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
 25. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
 26. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 27. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. The UE uses the IMSI-based SIP URI's in the FROM and TO headers (e.g. " sip: 311480xxxxxxxx@ims.mnc480.mcc311.3gppnetwork.org").
 28. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 403 error code.
 29. Monitor the UE for 5 minutes and verify that the UE makes no additional registration attempts.
 30. No Op.
 31. No Op.
 32. No Op.
 33. No Op.V
 34. No Op.
 35. No Op.
 36. Power cycle the UE.
 37. Verify that the UE attaches to the LTE network using the IMS PDN.
 38. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.

- b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. sip:+15551234567@vzims.com)
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
39. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
 40. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 41. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 42. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 43. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 44. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 45. Verify that the UE responds with a SIP 200 OK message.
 46. Power off the UE.
 47. Repeat steps 1.) through 46.) for SIP error code 404.

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE

3GPP Band 13 Network Access Requirements.

**2.22.1 Test 1 403 IMS REREGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 403** VZ_TC_IMSREGRTY_3614001

2.22.2 Test 1 404 IMS REREGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 404 VZ_TC_IMSREGRTY_3613093

2.22.3 Test2 403 IMS REREGISTRATION RETRY –NETWORK REJECTS
REQUEST WITH SIP ERROR CODE 403 VZ_TC_IMSREGRTY_3613095

2.22.4 Test2 404 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST WITH SIP ERROR CODE 404 VZ_TC_IMSREGRTY_3614003

2.2.3 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES VZ_TC_IMSREGRTY_7265

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the network emulator so that the device under test (DUT) finds service on a single eNodeB with cell_id (where "cell_id" refers to the "CellIdentity" parameter that is broadcast in SIB1) equal to value X1, PLMN id equal to value Y1, and TAI equal to value Z1. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 2. All SIP messages are routed on the default bearer for the IMS PDN. 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. 4. The UE initiates a new registration (as opposed to a re-registration). 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") 6. The UE does not request IPsec. 7. The UE requests a registration expiration time of 600,000 seconds. 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.

9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
10. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
11. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
12. Verify that between 300 and 600 seconds after step 7.) that the UE attempts a reregistration. Verify that:
 1. The UE sends a valid SIP REGISTER message for a reregistration.
 2. The UE requests a registration expiration time of 600,000 seconds.
 3. The UE sends the reregistration request to the same P-CSCF as the original registration.
 4. The UE uses the same "Call-ID" that was established at the initial registration.
13. Configure the P-CSCF to reject all IMS reregistration and registration requests with a SIP 400 error code.
14. Verify the UE does not send another SIP REGISTER message for 30 seconds.
15. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a reregistration using the same parameters as in step 12.). Verify that the UE uses the first (i.e. the same) P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
16. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 400

- error code.
17. Monitor the UE for 5 minutes and verify that the UE makes no additional registration attempts.
 18. No Op.
 19. No Op.
 20. No Op.
 21. No Op.V
 22. No Op.
 23. No Op.
 24. Power cycle the UE.
 25. Verify that the UE attaches to the LTE network using the IMS PDN.
 26. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPSec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 27. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
 28. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 29. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 30. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the

registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.

31. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
32. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
33. Verify that the UE responds with a SIP 200 OK message.
34. Power off the UE.
35. Repeat steps 1.) through 34.) for SIP error code 402.

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.2.4 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600 VZ_TC_IMSREGRTY_7266

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.

6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
- I 0. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
- I 1. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
- I 2. Configure the P-CSCF to reject the IMS reregistration requests with a SIP 500 error code with the Retry-After header absent.
- I 3. Verify the UE does not send another SIP REGISTER message for 30 seconds.
- I 4. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a reregistration using the same parameters as in step 11.). Verify that the UE uses the first (i.e. the same) P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- I 5. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header present and set to a value of 90 seconds.
- I 6. Verify the UE does not send another SIP REGISTER message for 90 seconds.
- I 7. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
- I 8. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
- I 9. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
20. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
21. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After is present and set to 90 seconds.
22. Verify the UE does not send another SIP REGISTER message for 90 seconds.
23. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
24. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
25. Verify the UE does not send another SIP REGISTER message for 8 minutes.
26. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the

27. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header is present and set to 90 seconds.
28. Verify the UE does not send another SIP REGISTER message for 90 seconds.
29. Once the 90 second throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
30. Configure the P-CSCF to reject the SIP REGISTER message from the device with a SIP 500 error code with the Retry-After header absent.
31. Verify the UE does not send another SIP REGISTER message for 15 minutes.
32. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
33. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
34. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
35. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
36. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
37. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
38. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
39. Verify that the UE responds with a SIP 200 OK message.
40. Power off the UE.
41. Repeat steps 1.) through 40.) for SIP error codes 503, 480, 486, and 600.

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.24.1 500 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 500 VZ_TC_IMSREGRTY_3613130

2.24.2 503 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 503 VZ_TC_IMSREGRTY_3613221

2.24.3 480 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 480 VZ_TC_IMSREGRTY_3613222

2.2.4.4 486 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 486 VZ_TC_IMSREGRTY_3613225

2.24.5 600 IMS REREGISTRATION RETRY –NETWORK REJECTS REQUEST
WITH SIP ERROR CODE 600 VZ_TC_IMSREGRTY_3613333

2.26 RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON POWER CYCLE VZ_TC_IMSREGRTY_7268

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior and resets throttling timers/counters on power cycle.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to reject all IMS registration requests with a SIP 480 error code. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+ TAC+ECI. 5. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code. 6. Verify the UE does not send another SIP REGISTER message for 30 seconds. 7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception: <ol style="list-style-type: none"> a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.

8. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
9. Verify the UE does not send another SIP REGISTER message for 30 seconds.
10. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
11. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
12. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds.
13. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
14. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
15. Verify the UE does not send another SIP REGISTER message for 2 minutes.
16. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
17. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
18. Verify the UE does not send another SIP REGISTER message for 8 minutes.
19. Once the 8 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the
20. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
21. Verify the UE does not send another SIP REGISTER message for 15 minutes.
22. Once the 15 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
23. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 480 error code.
24. Monitor the UE for five minutes and verify that the UE does not send another SIP REGISTER message.
25. Power cycle the UE.
26. Verify that the UE attaches to the LTE network using the IMS PDN.
27. Verify that the UE sends a SIP REGISTER message to the P-CSCF without delay. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter

of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.

28. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
29. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
30. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
31. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
32. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
33. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
34. Verify that the UE responds with a SIP 200 OK message.
35. Power off the UE.

Expected Results

Expected Result

The device follows the IMS registration retry algorithm and resets throttling timers/counters on power cycle.

2.28 IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION VZ_TC_IMSREGRTY_7270

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration behavior after encountering a no service condition.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies only to UEs that support IMS roaming and are designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure Test 1</p> <ol style="list-style-type: none"> 1. Configure the network emulator so that the device under test (DUT) finds service on a single eNodeB with cell_id (where "cell_id" refers to the "CellIdentity" parameter that is broadcast in SIB1) equal to value X1, PLMN id equal to value Y1, and TAI equal to value Z1. The RF output of Cell 1 shall be set to ON. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network Y1 using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 2. All SIP messages are routed on the default bearer for the IMS PDN. 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. 4. The UE initiates a new registration (as opposed to a re-registration).

5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPSec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅).
 6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
 8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 10. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 11. Verify that the UE responds with a SIP 200 OK message.
 12. Set the RF output of Cell 1 to OFF.
 13. Wait for 3 minutes.
 14. Set the RF output of Cell 1 to ON
 15. Verify that the UE finds service on Cell 1 and reconnects to PLMN Y₁ by sending a tracking area update request.
 16. Verify that the UE does not send a new registration request. Verify that the UE does not send a re-registration request between 0 and 300 seconds after step 7.). Verify that the UE does not send a re-subscribe or new subscription request.
 17. Verify that between 300 and 600 seconds after step 7.) that the UE attempts a reregistration. Verify that:
 1. The UE sends a valid SIP REGISTER message for a reregistration.
 2. The UE requests a registration expiration time of 600,000 seconds.

3. The UE sends the reregistration request to the same P-CSCF as the original registration.
4. The UE uses the same "Call-ID" that was established at the initial registration.
18. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
19. Verify that the UE sends a valid SIP REGISTER message for a reregistration to the P-CSCF with the correct Authorization header.
20. Configure the P-CSCF to respond to respond with a SIP 200 OK message with a registration expiration time of 7200 seconds.
21. Wait 5 minutes and verify that the UE does not send a re-subscribe or new subscription request.
22. [This step removed.]
23. [This step removed.]
24. [This step removed.]
25. Power off the UE.

Test Procedure Test 2 -- Retired

1. Configure two LTE cells. Cell 1 shall have a PLMN id equal to value Y₁. Cell 2 shall have a PLMN id equal to value Y₂ where Y₂ is not equal to Y₁. The USIM on the UICC shall have Y₂ as a more preferred PLMN compared to Y₁. PLMN Y₁ is configured in the OPLMN file, and PLMN Y₂ is configured in the EHPLMN file. The RF output of Cell 1 shall be set to ON. The RF output of Cell 2 shall be set to OFF.
2. Power on the UE.
3. Verify that the UE attaches to the LTE network Y₁ using the IMS PDN.
4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 1. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 2. All SIP messages are routed on the default bearer for the IMS PDN.
 3. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 4. The UE initiates a new registration (as opposed to a re-registration).
 5. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 6. The UE does not request IPsec.
 7. The UE requests a registration expiration time of 600,000 seconds.
 8. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.

9. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
5. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
6. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
7. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds.
8. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
9. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
10. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
11. Verify that the UE responds with a SIP 200 OK message.
12. Set the RF output of Cell 1 to OFF.
13. Wait for 3 minutes.
14. Set the RF output of Cell 2 to ON
15. Verify that the UE reselects to Cell 2 and connects to PLMN Y₂ by sending a tracking area update request.
16. [This step removed.]
17. Verify that the UE does not send a new registration request. Verify that the UE does not send a re-registration request between 0 and 300 seconds after step 7.). Verify that the UE does not send a re-subscribe or new subscription request.
18. Verify that between 300 and 600 seconds after step 7.) that the UE attempts a reregistration. Verify that:
 1. The UE sends a valid SIP REGISTER message for a reregistration.
 2. The UE requests a registration expiration time of 600,000 seconds.
 3. The UE sends the reregistration request to the same P-CSCF as the original registration.
 4. The UE uses the same "Call-ID" that was established at the initial registration.
19. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401

"Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅).

20. Verify that the UE sends a valid SIP REGISTER message for a reregistration to the P-CSCF with the correct Authorization header.
21. Configure the P-CSCF to respond to respond with a SIP 200 OK message with a registration expiration time of 7200 seconds.
22. Wait 5 minutes and verify that the UE does not send a re-subscribe or new subscription request.
23. [This step removed.]
24. [This step removed.]
25. [This step removed.]
26. Skip to step 35.).
27. [This step removed.]
28. [This step removed.]
29. [This step removed.]
30. [This step removed.]
31. [This step removed.]
32. [This step removed.]
33. [This step removed.]
34. [This step removed.]
35. Power off the UE.

Expected Results

Expected Result

The device follows the requirements for IMS registration behavior after encountering a no service condition.

2.29 REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DETACH VZ_TC_IMSREGRTY_7271

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration after a network initiated detach.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA v2 authentication (i.e. AKA v2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the

Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>".

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Configure the network emulator to send a NAS DETACH REQUEST with re-attach required.
12. Verify that the UE sends a NAS DETACH ACCEPT message.
13. Verify that the UE re-attaches to the LTE network using the IMS PDN.
14. Verify that the UE repeats steps 3.) through 10.). Verify in step 7.) that the UE requests a new subscription (as opposed to a re-subscribe).
15. Power off the UE.

Expected Results

Expected Result

The device initiates a new IMS registration after a network initiated detach.

2.3 I UE INITIATED RE-SUBSCRIBE VZ_TC_IMSREGRTY_7273

Definition

This test verifies that the UE meets Verizon Wireless requirements for re-subscribing to the reg events package.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header

with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 1500 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Verify that between 900 and 1500 seconds after step 8.) that the UE attempts to re-subscribe to the reg events package. Verify that:
 - a. The UE sends a valid SIP SUBSCRIBE message for a re-subscribe.
 - b. The UE sets the Event header field to "reg", and uses the same dialog that was established at the initial subscribe procedure.
 - c. The UE requests a subscription expiration time of 600,000 seconds.
 - d. The UE sends the re-subscribe request to the same P-CSCF as the original registration.
 - e. The UE uses the same "Call-ID" that was established at the initial subscription request.
 - f. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 - g. The UE includes the Instance-ID feature tag " +sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
12. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
13. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
14. Verify that the UE responds with a SIP 200 OK message.
15. Power off the UE.

Expected Results

Expected Result

The device successful re-subscribes to the reg events package following the steps above.

2.32 RE-SUBSCRIBE REJECTED WITH SIP ERROR CODE 481 VZ_TC_IMSREGRTY_7274

Definition

This test verifies that the UE meets Verizon Wireless requirements when a UE-initiated re-subscribe request is rejected with SIP error code 481.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 1500 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message.
11. Verify that between 900 and 1500 seconds after step 8.) the UE attempts to re-subscribe to the reg events package. Verify that:
 - a. The UE sends a valid SIP SUBSCRIBE message for a re-subscribe.
 - b. The UE sets the Event header field to "reg", and uses the same dialog that was established at the initial subscribe procedure.
 - c. The UE requests a subscription expiration time of 600,000 seconds.
 - d. The UE sends the re-subscribe request to the same P-CSCF as the original registration.
 - e. The UE uses the same "Call-ID" that was established at the initial subscription request.
 - f. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
12. Configure the P-CSCF to reject the re-subscribe request with a SIP 481 message.
13. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from both the "Call-ID" established for prior registration procedures and the "Call-ID" established for the prior subscription procedures. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
14. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
15. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
16. Verify that the UE responds with a SIP 200 OK message.
17. Power off the UE.

Expected Results

Expected Result

The device initiates a new subscription request when a re-subscribe request is rejected with SIP error code 481.

2.33 IMS REREGISTRATION RETRY REGISTRATION TIMER EXPIRES WHILE THROTTLING VZ_TC_IMSREGRTY_7275

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS reregistration retry behavior.

Traceability

- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements, section 3.2.10.5.4

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECL. 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 600 seconds. 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECL.

8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
10. Verify that the UE responds with a SIP 200 OK message. Configure the P-CSCF to ignore re-SUBSCRIBE and SUBSCRIBE requests.
11. Verify that between 300 and 600 seconds after step 6.) that the UE attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration.
 - d. The UE uses the same "Call-ID" that was established at the initial registration.
12. Configure the P-CSCF to respond to all IMS reregistration and registration requests with a SIP 503 "Service unavailable" message with a Retry-After header set to 720 seconds.
13. Confirm the UE does not send another SIP REGISTER message while the retry-after timer is running.
14. Once the 720 second retry-after timer expires, verify that the UE sends, within 1 minute, a SIP REGISTER message for a new registration using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
15. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKAv2 authentication (i.e. AKAv2-MD5).
16. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
17. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
18. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF for a new subscription (as opposed to a re-subscribe) to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
19. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 7200 seconds.
20. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
21. Verify that the UE responds with a SIP 200 OK message.
22. Power off the UE.

Expected Results

Expected Result

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.36 LOWER LAYER FAILURE DURING IMS REGISTRATION RETRY

VZ_TC_IMSREGRTY_7278

Definition

This test verifies that the UE does not increment the IMS registration retry counter if a lower layer failure occurs before the procedure completes.

Traceability

- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements, *Section 3.2.10.6.8*

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure</p> <ol style="list-style-type: none"> 1. Configure the P-CSCF to ignore all IMS registration requests. 2. Power on the UE. 3. Verify that the UE attaches to the LTE network using the IMS PDN. 4. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECL. 5. Verify that the P-CSCF does not respond to the SIP REGISTER message from the device. 6. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0: <ol style="list-style-type: none"> a. First retransmission at t=3 seconds. b. Second retransmission at t=9 seconds. c. Third retransmission at t=21 seconds. d. At t=30 seconds, Timer F expires and the process times out. 7. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.

8. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
9. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
10. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
11. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
12. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
13. Verify the UE does not send another SIP REGISTER message for 1 minute plus a random time between 0 and 15 seconds after Timer F expires.
14. Once the 1 minute + random throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
15. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
16. Verify the UE does not send another SIP REGISTER message for 2 minutes after Timer F expires.
17. Once the 2 minute throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
18. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
19. Force the DUT to the RRC IDLE state by having the network transmit an RRCConnectionRelease message.
20. Configure the test equipment so that the network responds to all NAS Service Request messages with a NAS Service Reject message with

an EMM Cause Code of 22 and a T₃₃₄₆ Timer value of 15 minutes.

21. Verify that the UE does not re-issue a SIP REGISTER message while the T₃₃₄₆ timer is running.
22. While the T₃₃₄₆ timer is running, re-configure the network so that network accepts all NAS Service Request messages.
23. Verify that within 30 seconds after expiry of the T₃₃₄₆ timer the device establishes an LTE connection and sends another SIP REGISTER message using the same parameters as in step 4.) with the following exception:
 - a. The UE uses the third P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
23. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
24. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
25. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
26. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
27. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
28. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
29. Verify that the UE responds with a SIP 200 OK message.
30. Power off the UE.

Expected Results

Expected Result

The UE does not increment the IMS registration retry counter when a lower layer NAS Service Request failure occurs before the registration procedure completes.

2.39 IMS REGISTRATION, NETWORK SENDS MULTIPLE CONTACT HEADERS

VZ_TC_IMSREGRTY_10305

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration behavior and appropriately filters Contact Headers in 200 OK responses from the network.

Traceability

- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Step 1
Pre-Conditions
Procedures
<p>Test Procedure 1</p> <ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060. d. The UE initiates a new registration (as opposed to a re-registration). e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com") f. The UE does not request IPSec. g. The UE requests a registration expiration time of 600,000 seconds. h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header. i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECL. j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>". 4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA v2 authentication (i.e. AKA v2-MD5). 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message that includes two Contact headers: one with a SIP URI that matches the SIP URI in the Contact header of the SIP REGISTER message, and one with a SIP URI that doesn't match the

SIP REGISTER message.

7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package.
8. Power off the UE.

Test Procedure 2

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+ TAC+ECL.
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message that includes a SIP URI in the Contact header that does not match the SIP URI in the Contact header of the SIP REGISTER message.
5. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
6. Verify the UE does not send another SIP REGISTER message for 30 seconds after Timer F expires.
7. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
8. Verify that the P-CSCF responds to the SIP REGISTER message with a SIP 200 OK message that includes a SIP URI in the Contact header that does not match the SIP URI in the Contact header of the SIP REGISTER message.
9. Verify that the device re-transmits the SIP REGISTER message after the following intervals based on the values of SIP timers T1 and SIP timer F and assuming that the initial SIP REGISTER message was sent at t=0:
 - a. First retransmission at t=3 seconds.
 - b. Second retransmission at t=9 seconds.
 - c. Third retransmission at t=21 seconds.
 - d. At t=30 seconds, Timer F expires and the process times out.
10. Ten seconds prior to Timer F expiration in step 9.) above, configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message that includes a SIP URI in the Contact header that matches the SIP URI in the Contact header of the SIP REGISTER message.
11. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package.
12. Power off the UE.

Expected Results
The device follows the IMS registration retry algorithm and appropriately filters Contact Headers in network 200 OK responses.

2.39.1 Test1 IMS REGISTRATION, NETWORK SENDS MULTIPLE CONTACT HEADERS VZ_TC_IMSREGRTY_3613988

2.39.2 Test2 IMS REGISTRATION, NETWORK SENDS MULTIPLE
CONTACT HEADERS VZ_TC_IMSREGRTY_3613989

2.27 Test1 IMS REGISTRATION BEHAVIOR ACROSS SYSTEM
TRANSITIONS VZ_TC_IMSREGRTY_3614005

2.27 Test2 IMS REGISTRATION BEHAVIOR ACROSS SYSTEM
TRANSITIONS VZ_TC_IMSREGRTY_3614007

2.4.1 IMS REGISTRATION RETRY: P-CSCF RESTORATION VZ_TC_IMSREGRTY_3031535

Definition

This test verifies that the UE meets Verizon Wireless requirements for IMS registration retry behavior.

Traceability

- Verizon Wireless LTE SMS Requirements
- Verizon Wireless LTE 3GPP Band 13 Network Access Requirements

Applicability

This test case applies to all UEs designed to operate on the Verizon Wireless LTE 3GPP Band 13 network.

Design Steps
Step Name
Test Procedure 1
Pre-Conditions
Procedures
<ol style="list-style-type: none"> 1. Power on the UE. 2. Verify that the UE attaches to the LTE network using the IMS PDN. Verify the following: <ol style="list-style-type: none"> a. The UE receives 3 P-CSCF IP addresses in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. 3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following: <ol style="list-style-type: none"> a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN. b. All SIP messages are routed on the default bearer for the IMS PDN. c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.

- d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 - j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅).
 5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
 6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
 7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI. Verify that the UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
 8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 10. Verify that the UE responds with a SIP 200 OK message.
 11. Configure the P-CSCF to reject all IMS registration requests with a SIP 482 error code.
 12. Configure the network emulator to send a NAS MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN with 3 P-CSCF IP addresses in the PCO field that are different from those provided in step 2a.)
 13. Verify that the UE immediately sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS

<p>MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN.</p> <ol style="list-style-type: none"> 14. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code. 15. Verify the UE does not send another SIP REGISTER message for 30 seconds. 16. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 3.) with the following exception: <ol style="list-style-type: none"> a. The UE uses the second P-CSCF IP address provided in the PCO field of the NAS MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN. 17. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD₅). 18. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header. 19. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds. 20. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. Verify that the UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>". 21. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds. 22. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state. 23. Verify that the UE responds with a SIP 200 OK message. 24. Power off the UE.

Expected Results

The device follows the IMS registration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

Design Steps

Step Name

Test Procedure 2

Pre-Conditions

Procedures

1. Power on the UE.
2. Verify that the UE attaches to the LTE network using the IMS PDN. Verify the following:
 - a. The UE receives 3 P-CSCF IP addresses in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
3. Verify that the UE sends a SIP REGISTER message to the P-CSCF. Verify the following:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 - b. All SIP messages are routed on the default bearer for the IMS PDN.
 - c. All SIP messages use UDP on port 5060 unless the given SIP message size exceeds the IMS PDN MTU size (of 1428 bytes) provisioned on the device in which case verify that the given SIP message uses TCP on port 5060.
 - d. The UE initiates a new registration (as opposed to a re-registration).
 - e. The UE uses the MSISDN-based SIP URI's in the FROM and TO headers (e.g. "sip:+15551234567@vzims.com")
 - f. The UE does not request IPSec.
 - g. The UE requests a registration expiration time of 600,000 seconds.
 - h. The UE includes the SMS feature tag "+g.3gpp.smsip" in the Contact header.
 - i. The UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC +MNC+ TAC+ECI.
 - j. The UE includes the Instance-ID feature tag "+sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
4. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
5. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct Authorization header.
6. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
7. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog

- that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. Verify that the UE includes the Instance-ID feature tag "sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsma:imei:<device IMEI>".
8. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
 9. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
 10. Verify that the UE responds with a SIP 200 OK message.
 11. Configure the P-CSCF to reject all IMS registration requests with a SIP 482 error code.
 12. Configure the network emulator to send a NAS MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN with 3 P-CSCF IP addresses in the PCO field. The first and second addresses are different from those provided in step 2a.) while the third address is the same as the first address provided in step 2a).
 13. Verify that the UE immediately attempts a reregistration. Verify that:
 - a. The UE sends a valid SIP REGISTER message for a reregistration.
 - b. The UE requests a registration expiration time of 600,000 seconds.
 - c. The UE sends the reregistration request to the same P-CSCF as the original registration in step 3).
 14. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 15. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 16. Once the 30 second throttling timer expires, verify that the UE sends another SIP REGISTER message using the same parameters as in step 13).
 17. Verify that the P-CSCF rejects the SIP REGISTER message from the device with a SIP 482 error code.
 18. Verify the UE does not send another SIP REGISTER message for 30 seconds.
 19. Once the 30 second throttling timer expires, verify that the UE attempts a new registration using the same parameters as in step 3) with the following exception:
 - a. The UE uses the first P-CSCF IP address provided in the PCO field of the NAS MODIFY EPS BEARER CONTEXT REQUEST message for the IMS PDN.
 20. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 401 "Unauthorized" message to challenge the REGISTER message using Digest AKA_{v2} authentication (i.e. AKA_{v2}-MD5).
 21. Verify that the UE sends a SIP REGISTER message to the P-CSCF with the correct

Authorization header.

22. Configure the P-CSCF to respond to the SIP REGISTER message with a SIP 200 OK message with a registration expiration time of 7200 seconds.
23. Verify that the UE sends a SIP SUBSCRIBE message to the P-CSCF to subscribe to the reg events package. Verify that the UE sets the Event header field to "reg" and sets the Expires header field to 600,000 seconds. Verify that the UE uses a "Call-ID" for the subscribe dialog that is different from the "Call-ID" established for the registration procedure. Verify that the UE includes the P-Access-Network-Info header with access type set to "3GPP-E-UTRAN-FDD" and access info parameter of "utran-cell-id-3gpp" set to the concatenation of MCC+MNC+TAC+ECI. Verify that the UE includes the Instance-ID feature tag "sip.instance" in the Contact header with a value of the device IMEI in the form "urn:gsm:imei:<device IMEI>".
24. Configure the P-CSCF to respond to the SIP SUBSCRIBE message with a SIP 200 OK message with a subscription expiration time of 86,400 seconds.
25. Configure the P-CSCF to send a SIP NOTIFY to the UE corresponding to the reg event package subscription indicating the user's current subscription state.
26. Verify that the UE responds with a SIP 200 OK message.
27. Power off the UE.

Expected Results

The device follows the IMS reregistration retry algorithm specified in the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

2.4.1.1 IMS REGISTRATION RETRY: P-CSCF RESTORATION - T1

VZ_TC_IMSREGRTY_4105999311931743

2.4.1.2 IMS REGISTRATION RETRY: P-CSCF RESTORATION - T₂

VZ_TC_IMSREGRTY_4105999311931744

Requirement Coverage For Test Plan

2.1 DEVICE INITIAL REGISTRATION USING THE MSISDN-BASED SIP URI AND DIGEST-AKAV2 AUTHENTICATION VZ_TC_IMSREGRTY_7243

Requirement Name	Requirement Plan Id	Created By	Created Date
Authentication during registration	LTEB13NAC	Admin User	11-07-0013 14:28:40
Device Identity and Related Parameters	LTEB13NAC	Admin User	11-07-0013 14:28:48
MSISDN and MSISDN-based SIP URI Validity	LTEB13NAC	Admin User	11-07-0013 14:28:52
PDN and Bearer Selection	LTEB13NAC	Admin User	11-07-0013 14:28:36
Proxy-CSCF Discovery	LTEB13NAC	Admin User	11-07-0013 14:28:37
Registration with the Proxy-CSCF and S-CSCF	LTEB13NAC	Admin User	11-07-0013 14:28:38
Subscription to the reg event package	LTEB13NAC	Admin User	11-07-0013 14:28:43
URI formatting	LTEB13NAC	Admin User	11-07-0013 14:28:42

2.3 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN NOT PROVISIONED ON THE USIM VZ_TC_IMSREGRTY_7245

Requirement Name	Requirement Plan Id	Created By	Created Date
Device Identity and Related Parameters	LTEB13NAC	Admin User	11-07-0013 14:28:48
MSISDN and MSISDN-based SIP URI Validity	LTEB13NAC	Admin User	11-07-0013 14:28:52

2.4 DEVICE INITIAL REGISTRATION USING THE IMSI-BASED SIP URI MSISDN-BASED SIP URI INVALID VZ_TC_IMSREGRTY_7246

Requirement Name	Requirement Plan Id	Created By	Created Date
Device Identity and Related Parameters	LTEB13NAC	Admin User	11-07-0013 14:28:48
MSISDN and MSISDN-based SIP URI Validity	LTEB13NAC	Admin User	11-07-0013 14:28:52

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2.9 UE INITIATED DEVICE REREGISTRATION WITH NETWORK CHALLENGE
VZ_TC_IMSREGRTY_7251

Requirement Name	Requirement Plan Id	Created By	Created Date
Reregistration	LTEB13NAC	Admin User	11-07-0013 14:28:44

2.11 DEVICE INITIATED DE-REGISTRATION UE INITIATED LTE DETACH ON
POWER DOWN VZ_TC_IMSREGRTY_7253

Requirement Name	Requirement Plan Id	Created By	Created Date
Deregistration	LTEB13NAC	Admin User	11-07-0013 14:28:46
IMS DE-REGISTRATION DURING UE INITIATED NETWORK DETACH	LTEB13NAC	Admin User	11-07-0013 14:27:09

2.12 UE INITIATED DE-REGISTRATION AIRPLANE MODE VZ_TC_IMSREGRTY_7254

Requirement Name	Requirement Plan Id	Created By	Created Date
Deregistration	LTEB13NAC	Admin User	11-07-0013 14:28:46
IMS DE-REGISTRATION DURING UE INITIATED NETWORK DETACH	LTEB13NAC	Admin User	11-07-0013 14:27:09

2.14 NETWORK INITIATED DE-REGISTRATION VZ_TC_IMSREGRTY_7256

Requirement Name	Requirement Plan Id	Created By	Created Date
Deregistration	LTEB13NAC	Admin User	11-07-0013 14:28:46

2.15 IMS REGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST VZ_TC_IMSREGRTY_7257

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

2.16 IMS REGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST
VZ_TC_IMSREGRTY_7258

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

2.17 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404
ERROR CODES VZ_TC_IMSREGRTY_7259

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54
Network Rejects the IMS Registration/Re-registration with a 'SIP 403' or 'SIP 404' Message	LTEB13NAC	Admin User	11-07-0013 14:29:08

2.18 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402
ERROR CODES VZ_TC_IMSREGRTY_7260

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54
Network Rejects the IMS Registration/Re-registration with a 'SIP 400', 'SIP 402', 'SIP 421', or 'SIP 484' Message	LTEB13NAC	Admin User	11-07-0013 14:29:06

2.10 IMS REGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600 VZ_TC_IMSREGRTY_7261

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

2.20 IMS REREGISTRATION RETRY GENERAL CASE, NETWORK IGNORES REQUEST VZ_TC_IMSREGRTY_7262

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

2.21 IMS REREGISTRATION RETRY GENERAL CASE, NETWORK REJECTS REQUEST VZ_TC_IMSREGRTY_7263

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

2.22 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 403, 404 ERROR CODES VZ_TC_IMSREGRTY_7264

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54
Network Rejects the IMS Registration/Re-registration with a 'SIP 403' or 'SIP 404' Message	LTEB13NAC	Admin User	11-07-0013 14:29:08

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2.23 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP 400, 402 ERROR CODES VZ_TC_IMSREGRTY_7265

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54
Network Rejects the IMS Registration/Re-registration with a 'SIP 400', 'SIP 402', 'SIP 421', or 'SIP 484' Message	LTEB13NAC	Admin User	11-07-0013 14:29:06

2.24 IMS REREGISTRATION RETRY NETWORK REJECTS REQUEST WITH SIP ERROR CODES 500, 503, 480, 486, 600 VZ_TC_IMSREGRTY_7266

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54

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2.26 RESET OF IMS REGISTRATION RETRY THROTTLING TIMERS ON POWER CYCLE VZ_TC_IMSREGRTY_7268

Requirement Name	Requirement Plan Id	Created By	Created Date
Reset of Throttling Counters and Timers on Power Cycle and on USIM/ISIM Replacement/Refresh	LTEB13NAC	Admin User	11-07-0013 14:29:12

2.28 IMS REGISTRATION BEHAVIOR AFTER ENCOUNTERING NO SERVICE CONDITION VZ_TC_IMSREGRTY_7270

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS REGISTRATION ON SYSTEM TRANSITIONS	LTEB13NAC	Admin User	11-07-0013 14:29:15
IMS REGISTRATION ON SYSTEM TRANSITIONS - EXAMPLES 1-7	LTEB13NAC	Admin User	11-07-0013 14:29:16

2.29 REGISTRATION BEHAVIOR AFTER A NETWORK INITIATED DETACH VZ_TC_IMSREGRTY_7271

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS REGISTRATION DUE TO NEW IMS PDN BEARER ACTIVATION	LTEB13NAC	Admin User	11-07-0013 14:29:18

2.31 UE INITIATED RE-SUBSCRIBE VZ_TC_IMSREGRTY_7273

Requirement Name	Requirement Plan Id	Created By	Created Date
Subscription to the reg event package	LTEB13NAC	Admin User	11-07-0013 14:28:43

2.32 RE-SUBSCRIBE REJECTED WITH SIP ERROR CODE 481 VZ_TC_IMSREGRTY_7274

Requirement Name	Requirement Plan Id	Created By	Created Date
Network Rejects a re-SUBSCRIBE Request	LTEB13NAC	Admin User	05-28-0014 21:41:27

2.33 IMS REREGISTRATION RETRY REGISTRATION TIMER EXPIRES WHILE THROTTLING VZ_TC_IMSREGRTY_7275

Requirement Name	Requirement Plan Id	Created By	Created Date
Authentication during registration	LTEB13NAC	Admin User	11-07-0013 14:28:40

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2.36 LOWER LAYER FAILURE DURING IMS REGISTRATION RETRY

VZ_TC_IMSREGRTY_7278

Requirement Name	Requirement Plan Id	Created By	Created Date
IMS Registration/Re-Registration Retry Algorithm	LTEB13NAC	Admin User	11-07-0013 14:28:54
IMS Signaling and Lower Layer Failures	LTEB13NAC	Admin User	11-07-0013 14:29:49
The UE shall follow the steps detailed in the document 3GPP TS 24.301 (reference	LTEDATARETRY	Admin User	11-07-0013 15:03:29

2.39 IMS REGISTRATION, NETWORK SENDS MULTIPLE CONTACT HEADERS

VZ_TC_IMSREGRTY_10305

Requirement Name	Requirement Plan Id	Created By	Created Date
Registration with the Proxy-CSCF and S-CSCF	LTEB13NAC	Admin User	11-07-0013 14:28:38

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