Requirement Plan

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1 LTE OTA DM VZ_REQ_LTEOTADM 65 6
1.1 INTRODUCTION VZ_REQ_LTEOTADM_2395 11
1.1.1 APPLICABILITY VZ_REQ_LTEOTADM_2396 11
1.1.2 3GPP Specifications VZ_REQ_LTEOTADM_7654 12
1.1.3 GLOSSARY/DEFINITIONS/ACRONYMS VZ_REQ_LTEOTADM_2398 12
1.1.4 REQUIREMENTS LANGUAGE VZ_REQ_LTEOTADM_2399 13
1.1.5 ~~DEPLOYMENT PLANSVZ_REQ_LTEOTADM_2400~~ 13
1.2 ~~HARDWARE SPECIFICATIONSVZ_REQ_LTEOTADM_2401~~ 13
1.2.1 ~~MECHANICALVZ_REQ_LTEOTADM_2402~~ 13
1.2.2 ~~ELECTRICALVZ_REQ_LTEOTADM_2403~~ 14
1.3 USER EXPERIENCE AND INTERACTIONS VZ_REQ_LTEOTADM_2404 14
1.3.1 ~~User Experience (Device)VZ_REQ_LTEOTADM_7655~~ 14
1.3.1.1 ~~INTERRUPTIONS DURING APN MANAGEMENT ACTIVITYVZ_REQ_LTEOTADM_2405~~ 14
1.3.1.1.1 ~~LTE Network (Bearer) AvailableVZ_REQ_LTEOTADM_7656~~ 14
1.3.1.1.2 ~~Client-Server Connection Failure During The SDM SessionVZ_REQ_LTEOTADM_7657~~ 15
1.3.1.1.3 ~~DM Fatal ErrorVZ_REQ_LTEOTADM_22978~~ 15
1.3.1.1.4 ~~Accessory Interaction (Applicable on to Handset form Factor Devices)VZ_REQ_LTEOTADM_7658~~ 15
1.3.1.2 ~~Subscriber Device ManagementVZ_REQ_LTEOTADM_7659~~ 15
1.3.1.3 ~~Network Initiated SDM SessionsVZ_REQ_LTEOTADM_7660~~ 15
1.3.2 ~~USER INTERFACE (DEVICE)VZ_REQ_LTEOTADM_2406~~ 15
1.3.2.1 ~~Network Initiated SDM SessionVZ_REQ_LTEOTADM_7661~~ 16
1.3.2.2 ~~User Initiated SDM Session - Manual PDN Name ChangeVZ_REQ_LTEOTADM_7662~~ 16
1.3.2.2.1 ~~InstructionsVZ_REQ_LTEOTADM_7663~~ 16
1.4 OTA-DM SPECIFICATIONS VZ_REQ_LTEOTADM_2407 16
1.4.1 COMMON REQUIREMENTS FOR OTADM - STANDARDS COMPLIANCE VZ_REQ_LTEOTADM_2408 16
1.4.1.1 COMPLIANCE WITH VZW REQUIREMENTS VZ_REQ_LTEOTADM_22979 17
1.4.1.1.1 OTHER INDUSTRY STANDARDS VZ_REQ_LTEOTADM_22980 17
1.4.1.1.2 OMA Standards Compliance VZ_REQ_LTEOTADM_7664 17
1.4.1.2 OTADM CLIENT VZ_REQ_LTEOTADM_22981 19
1.4.1.2.1 OTADM CLIENT PROVISIONING VZ_REQ_LTEOTADM_22982 19
1.4.1.2.1.1 Factory Bootstrapping VZ_REQ_LTEOTADM_7699 19
1.4.1.2.1.2 PDN Provisioning for OTADM Device Management Traffic VZ_REQ_LTEOTADM_7701 19
1.4.1.2.2 OTA-DM (Emergency Mode) VZ_REQ_LTEOTADM_5965111 19
1.4.1.2.3 OTADM Client Change Alerts VZ_REQ_LTEOTADM_4105999311947508 20
1.4.1.2.3.1 OTADM Client Change Disabled Alert VZ_REQ_LTEOTADM_4105999311947509 20

1.4.1.2.3.2 OTADM Client Change Enabled Alert VZ_REQ_LTEOTADM_4105999311947510 21
1.4.1.3 OTADM TRANSPORT SECURITY REQUIREMENTS VZ_REQ_LTEOTADM_22983 22
1.4.1.3.1 Confidentiality (Data Encryption) VZ_REQ_LTEOTADM_7703 23
1.4.1.3.1.1 Root Certificate requirements VZ_REQ_LTEOTADM_36249 . 23
1.4.1.3.2 AUTHENTICATION VZ_REQ_LTEOTADM_22984 24
1.4.1.3.2.1 Package 0 Authentication (Notification Initiation Session Message) VZ_REQ_LTEOTADM_7705 24
1.4.1.3.2.2 Mutual Authentication VZ_REQ_LTEOTADM_7707 24
1.4.1.3.2.3 Failed Authentication Attempt Handling VZ_REQ_LTEOTADM_7665 25
1.4.1.3.2.4 Authentication Key VZ_REQ_LTEOTADM_7666 25
1.4.1.3.3 Integrity VZ_REQ_LTEOTADM_7667 25
1.4.1.3.4 OTA Device Management Tree Support VZ_REQ_LTEOTADM_7668 25
1.4.1.3.4.1 Commands VZ_REQ_LTEOTADM_7669 25
1.4.1.3.4.2 Correlator ID VZ_REQ_LTEOTADM_38690 26
1.4.1.3.5 ACCESS CONTROL LIST (ACL) VZ_REQ_LTEOTADM_22985 .. 26
1.4.1.3.6 Verizon Wireless Defined Base DM Tree VZ_REQ_LTEOTADM_7670 26
1.4.1.3.7 DMAcc Subtree VZ_REQ_LTEOTADM_7671 27
1.4.1.3.8 DevInfo Subtree VZ_REQ_LTEOTADM_7672 28
1.4.1.3.9 DevDetail Subtree VZ_REQ_LTEOTADM_7673 28
1.4.1.3.10 NAI VZ_REQ_LTEOTADM_5965085 29
1.4.1.4 DM CONNECTIVITY REQUIREMENTS VZ_REQ_LTEOTADM_22986 29
1.4.1.4.1 NETWORK INITIATED DM SESSIONS VZ_REQ_LTEOTADM_22988 29
1.4.1.4.1.1 DM Notification via SMS message (Trigger) VZ_REQ_LTEOTADM_7708 29
1.4.1.4.1.2 ~~LTE Service RequiredVZ_REQ_LTEOTADM_7674~~ 30
1.4.1.4.1.3 Network Initiated (NI) Retry VZ_REQ_LTEOTADM_7675 30
1.4.1.4.2 USER INITIATED DM SESSIONS VZ_REQ_LTEOTADM_22989 30
1.4.1.4.2.1 ~~Manual PDN ChangeVZ_REQ_LTEOTADM_7676~~ 30
1.4.1.4.2.2 ~~LTE Service RequiredVZ_REQ_LTEOTADM_7677~~ 30
1.4.1.4.2.3 ~~XML ELEMENTSVZ_REQ_LTEOTADM_22990~~ 30
1.4.1.4.2.4 ~~VZ_REQ_LTEOTADM_7678~~ 31
1.4.1.4.2.5 Elements and Formatting VZ_REQ_LTEOTADM_7679 31
1.4.1.4.3 SUPPORT FOR IPV6 CONNECTIVITY VZ_REQ_LTEOTADM_31775 31
1.4.1.4.3.1 IPv6 Connection VZ_REQ_LTEOTADM_31776 31
1.4.1.4.3.2 Connection Setup Failure VZ_REQ_LTEOTADM_31777 31
1.4.1.4.3.3 ~~Connection Failure During a DM SessionVZ_REQ_LTEOTADM_31778~~ 32
1.4.1.5 OMA-DM TREE AND STANDARD COMMANDS VZ_REQ_LTEOTADM_22992 32
1.4.1.5.1 APN MANAGEMENT VZ_REQ_LTEOTADM_22993 32

1.4.1.5.1.1 MOBILE AUTOMATIC DEVICE DETECTION (ADD): BACKGROUND AND DESCRIPTION VZ_REQ_LTEOTADM_22994 33
1.4.1.5.1.2 ADD Flow Requirements VZ_REQ_LTEOTADM_7683 33
1.4.1.5.1.3 ~~APN SERVICE AVAILABILITYVZ_REQ_LTEOTADM_22995~~ 33
1.4.1.5.1.4 INFORMATIONAL BACKGROUND VZ_REQ_LTEOTADM_22996 34
1.4.1.5.1.5 ~~Service Availability for APN Parameter ChangesVZ_REQ_LTEOTADM_7688~~ 34
1.4.1.5.1.6 ADD FLOW DIAGRAM VZ_REQ_LTEOTADM_22998 34
1.4.1.5.1.7 APN Management after SIM change VZ_REQ_LTEOTADM_8312636 36
1.4.1.5.2 Connectivity Management VZ_REQ_LTEOTADM_7684 36
1.4.1.5.2.1 ConnMO Replace Command - Values not case sensitive VZ_REQ_LTEOTADM_7685 39
1.4.1.5.3 Functionality For Device Connectivity Management VZ_REQ_LTEOTADM_7686 39
1.4.1.5.3.1 APN Name Format VZ_REQ_LTEOTADM_7702 40
1.4.1.5.3.2 APN ID VZ_REQ_LTEOTADM_7687 40
1.4.1.5.3.3 APN Name VZ_REQ_LTEOTADM_7689 40
1.4.1.5.3.4 IP VZ_REQ_LTEOTADM_7690 40
1.4.1.5.3.5 Enabled VZ_REQ_LTEOTADM_7691 40
1.4.1.5.3.6 IMS Domain VZ_REQ_LTEOTADM_7692 41
1.4.1.5.3.7 ~~SIP T1 TimerVZ_REQ_LTEOTADM_7693~~ 41
1.4.1.5.3.8 ~~SIP TF TimerVZ_REQ_LTEOTADM_7694~~ 41
1.4.1.5.3.9 ~~SIP T2 TimerVZ_REQ_LTEOTADM_7695~~ 41
1.4.1.5.3.10 ~~SMS FormatVZ_REQ_LTEOTADM_7696~~ 41
1.4.1.5.3.11 Enable VZ_REQ_LTEOTADM_7697 41
1.4.1.5.3.12 Disable VZ_REQ_LTEOTADM_7698 42
1.4.1.5.3.13 ~~Disable TestingVZ_REQ_LTEOTADM_7715~~ 42
1.4.1.5.3.14 IP Indication for SMS VZ_REQ_LTEOTADM_23000 42
1.4.1.5.3.15 ~~Factory Rest & Default APN values: Class 2 DisableVZ_REQ_LTEOTADM_7709~~ 42
1.4.1.5.3.16 ~~Functionality for Data Retry Connectivity Management ObjectsVZ_REQ_LTEOTADM_26496~~ 42
1.4.1.5.3.17 ~~MAX_CONN_TVZ_REQ_LTEOTADM_26500~~ 43
1.4.1.5.3.18 ~~MAX_CONNVZ_REQ_LTEOTADM_26502~~ 43
1.4.1.5.3.19 ~~WAIT_TIMEVZ_REQ_LTEOTADM_26505~~ 43
1.4.1.5.3.20 Factory Reset & Default APN values: Class 3 VZ_REQ_LTEOTADM_38539 43
1.4.1.6 Configuration Update VZ_REQ_LTEOTADM_7332288 43
1.4.2 ~~SDM REQUIREMENTSVZ_REQ_LTEOTADM_2409~~ 44
1.4.3 Firmware Over The Air (FOTA) VZ_REQ_LTEOTADM_37788 44
1.4.4 SUPPORT FOR INDUSTRY STANDARDS AND VERIZON WIRELESS REQUIREMENTS VZ_REQ_LTEOTADM_22991 44
1.4.4.1 ~~OMA Defined Managed ObjectsVZ_REQ_LTEOTADM_7680~~ 44
1.4.4.1.1 Update Result Reporting VZ_REQ_LTEOTADM_7681 44

1.4.4.1.2 Update - Fatal Error VZ_REQ_LTEOTADM_7682 44
1.5 DEVINFO SUBTREE EXTENSION VZ_REQ_MMOTADM_3103 44
1.5.1 ICCID Extended Node Support VZ_REQ_MMOTADM_8081 45
1.5.1.1.1.1 ./DevInfo/Ext/ICCID 45
1.5.2 Device Functionality VZ_REQ_MMOTADM_8083 45
1.6 ~~INFORMATION AND USE CASESVZ_REQ_LTEOTADM_2410~~ 46
1.6.1 ~~APN CLASS USAGE - INFORMATIONALVZ_REQ_LTEOTADM_2411~~ 46
1.6.1.1 ~~CLASS 1 (APN 1)VZ_REQ_LTEOTADM_23001~~ 46
1.6.1.2 ~~CLASS 2 (APN 2)VZ_REQ_LTEOTADM_23002~~ 46
1.6.1.3 ~~CLASS 3 (APN 3)VZ_REQ_LTEOTADM_23003~~ 46
1.6.1.4 ~~CLASS 4 (APN 4)VZ_REQ_LTEOTADM_23004~~ 47
1.7 REFERENCES VZ_REQ_LTEOTADM_2412 47

1 LTE OTA DM VZ_REQ_LTEOTADM 65

Revision History		
Author	**Description of Changes**	**Date**
Verizon Wireless	Version 1.0: Initial version	11/12/2009
Verizon Wireless	Version 2.0: 1.) Section 4.1.3.2.2 Information on Certificates added.	12/17/2009
Verizon Wireless	Version 3.0: 1. Added requirements for handset form factor devices. 2. Added user initiated device management requirements. 3. Updates to section 4.3.	02/11/2010
Verizon Wireless	Version 4.0: 1. Added IMS node. 2. Modified References 3. High Severity changed to Mandatory and Low to Optional	03/25/2010
Verizon Wireless	Version 5.0: 1. Changed server password in DMAcc Subtree. 2. Changed APN inactivity timer from infinity to130min. 1. Changes server domain for LTE devices 2. Minor clarifications	06/25/2010
Verizon Wireless	Version 6.0: 1. Updated to Release 9 (1.2) changed SMS format from optional to mandatory (4.1.1.2), 2. Updated RSSI nodes on DiagMon (4.3.2.2), 3. Added APN operation nodes for ConnMO (4..3.2.3), 4. Clarifications on auth key (4.1.3.3.2),	12/17/2010

	5. Added XML Element for LocURI (4.1.5.2.5), 6. Changed "paired mode" to "discovery mode" (4.3.2.1)	
Verizon Wireless	Version 7.0: 1. Added DM Commands Functionality (4.3.2), 2. Point APNs Factory Provisioning requirements (4.1.3.1); 3. Added a column of value type in all DM tree nodes (4.3.2), 4. Clarified device password (4.1.3.3.2), 5. Added IMEI definitions to glossary (1.3), 6. Removed some LAWMO nodes not currently required (4.3.2.7); 7. Added references (Chapter 5), 8. Removed timer for optional download (3.1.1.1) 9. Duplicated /operation nodes for all APNs, added "secs" to some timer nodes (4.2.3.5) 10. Added connMO nodes replace command requirement (4.3.2.5.1).	02/2011
Verizon Wireless	Version 8.0: 1. Clarified APN Inactivity Timer unit. (4.3.2.6) 2. Added APN status node (4.3.2.5, 4.3.2.6) 3. Added GPS nodes for Android OS devices (4.3.2.1) and their associated function descriptions (4.3.2.2.2.1).	03/2011
Verizon Wireless	Version 9.0: 1. Changed DevID to DevId (4.1.4.5), 2. Changed home domain name to vzims.com (4.2.2.2) 3. Added root certification information (4.1.3.2.2) 4. Updated DevDetail node (4.1.4.6)	06/2011

	8. Added notes to domain name format (4.1.3.1) 9. Added ADD feature and flow chart (4.3.2.7) 10. Removed glossary terms : DMA, DiagMon, DCMO, FOTC 11. Removed User Experience sections, except interruption Requirements (3.1) 12. Removed Add/Copy/Delete command types (4.1.4.1) 13. Removed "multiple DMAcc are required (4.1.4.4) 14. Removed managed applications (4.1.4.8) 15. Removed DCMO, LAWMO, DiagMon, FOTA throughout the document 16. Added software version note (4.1.4.6) 17. Removed non-factory bootstrapping (4.1.3.1) 18. Added APN management requirements (4.2.2.1)	
Verizon Wireless	Version 10.0: 1. General cleanups on inconsistencies and ambiguities, 2. Clarify AAuth name format (4.1.4.4) 3. Added Chapter 5 Information and Use Cases, 4. Removed APN Inactivity Timer (4.1.5, 4.2) 5. APN Id command changed to read only (4.2.2.2) 6. Added deployment plan section	09/2011
Verizon Wireless	Version 11.0: Added requirements to have capabilities/tools available to restore Enable a Class 1 or Class 2 APN once Disabled, for OTADM IOT testing purposes	12/2011
Verizon Wireless	Version 12.0: Removed requirements for Digital Signature	4/2012
Verizon Wireless	Version 13.0: Clarification on SMS over IMS	6/2012

Verizon Wireless	Version 14.0: 1. Removed Package 0 SMS message requirements 2. Removed references to Client Initiated Sessions 3. Updated SIP Session Timer values	10/8/2012
Verizon Wireless	Version 15.0: Added IPv6 connectivity support requirements Added APN Data Retry parameter nodes Corrected SIP Timer format from int to float Class1 APN should be replaceable IP Support for APN shall report IPv4 and IPv6 if both technologies are supported	02/2014
Verizon Wireless	Version 16.0: Added ICCID Extension node requirements Replaced * with explicit values of 1 through 4 for each Class of APN in ConnMo tree Updated Root SSL Certificate requirements	06/2014
Verizon Wireless	Version 17.0: Server and Client password information removed. Can be obtained from VZW OTADM IOT team. Updated: Client-Server Connection Failure During The SDM Session	10/2014
Verizon Wireless	Version 18.0: Added support for TLS transport layer security protocol Added requirements around Over The Air update capability	2/2015
Verizon Wireless	Version 19.0: Added support for SHA-256 certificate	6/2015
Verizon Wireless	Version 20.0: Remove requirements for dara retry parameters Remove requirements for SIP timers	2/2016

Verizon Wireless	Version 21.0 Updated requirements with new URL support for SHA-2 certificates	6/2016
Verizon Wireless	Version 22.0 Specified commands for all Nodes	10/2016
Verizon Wireless	Version 23.0 Updated VZWIMS APN name to "IMS" Updated dual stack IP support for 4g2.vzwdm.com	06/2017
Verizon Wireless	Version 24.0 Retired few requirements Removed ability to disable APN1 and APN2 in ConnMo tree Misc. updates	October 2017
Verizon Wireless	Version 25.0 Updated VZ_REQ_LTEOTADM_7672 to add a note for Mod to be the device model number instead of the commercial name of the device. Added VZ_REQ_LTEOTADM_7332288 to define Configuration Update	February 2018
Verizon Wireless	Version 26.0 Retired the following requirements: 1. Disable Testing VZ_REQ_LTEOTADM_7715 Added or Updated following requirements: 1. Updated -- Root Certificate requirements VZ_REQ_LTEOTADM_36249 2. Added new requirement -- APN Management after SIM change VZ_REQ_LTEOTADM_8312636 3. Updated VZ_REQ_LTEOTADM_36249 to remove reference to Symantec and also added list of recommended Root Certificates	June 2018
Verizon Wireless	Version 27.0 Added Cipher Suite information to requirements VZ_REQ_LTEOTADM_36249	October 2018

Verizon Wireless~~Raj Damle~~	Version 28.0 Removed the Digicert Global Root G3 certificate from requirement VZ_REQ_LTEOTADM_36249	February 2019
Verizon Wireless~~James Paxton~~	Version 29.0 Removed VeriSign Universal Root CA certificate from requirement VZ_REQ_LTEOTADM_36249	February 2020
Verizon Wireless	Version 30.0 1.4.1.2.3 Added Requirements to support device initiated check-in upon VZWOTADM Client Disablement and Enablement 1.4.1.3.1.1 Removed Symantec link in Root Certificate Requirements 1.4.1.3.9.1 Specified Nodes that should be supported under DevDetail Subtree for devices and embedded modules Updated VZ_REQ_LTEOTADM_37788 to apply to OD devices only	June 2020

1.1 INTRODUCTION VZ_REQ_LTEOTADM_2395

Verizon Wireless has launched LTE network service in the 3GPP Band 13 frequency band (700 MHz C Block). This document includes an Over-The-Air (OTA) device management solution for devices on this network. This publication is part of Verizon Wireless compliance with the FCCs rules for 700 MHz C Block (47 C.F.R. § 27.16), as explained in the FCCs 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.

1.1.1 APPLICABILITY VZ_REQ_LTEOTADM_2396

These requirements apply to all devices designed to operate on the Verizon Wireless LTE 3GPP Band 13 network. 3GPP Band 13 is per 3GPP TS 36.101: *Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception*.

This document covers APN management, a part of SDM technology. Specifically, this document doesnt include any Firmware Updating mechanism. Please see Section on "APN Management".

For any questions related to this document, please contact Verizon Wireless through the Verizon Wireless Open Development website.

1.1.2 3GPP Specifications VZ_REQ_LTEOTADM_7654

Refer to the 3GPP Specifications section of the Verizon Wireless LTE 3GPP Band 13 Network Access Requirements.

1.1.3 GLOSSARY/DEFINITIONS/ACRONYMS VZ_REQ_LTEOTADM_2398

This section defines acronyms and terms used throughout the document.

Acronym/ Term	Definition
ADD	Automatic Device Detection
APN	Access Point Name
ConnMO	Connectivity Management Object
DDF	Device Description Framework
DTD	Document Type Definition
HMAC	Hash-based Mutual Authentication Code
IMEI	International Mobile Equipment Identity, a 14 digit value plus 1 digit checksum value computed as per the 3GPP requirements.
IMEI SV	The International Mobile Equipment Identity and Software Version Number, a 14 digit value plus 2 digits software version number.
OMA	Open Mobile Alliance
OMA-DM	Open Mobile Alliance Device Management
OTA	Over-the-Air

OTADM	Over the Air Device Management
PST	Product Support Tool
SDM	Subscriber Device Management- in this document, SDM refers to APN Management and Device "profiling"
UI	User Interface
UE	User Equipment
WAP	Wireless Application Protocol
VZW	Verizon Wireless

1.1.4 REQUIREMENTS LANGUAGE VZ_REQ_LTEOTADM_2399

This document uses the following verbal forms in conjunction with requirements:

- "*Shall*" or "*Shall not*" indicates the requirement is mandatory
- "*Should*" indicates the requirement is recommended but not mandatory
- "*May*" indicates the requirement is optional

1.1.5 ~~DEPLOYMENT PLANS~~VZ_REQ_LTEOTADM_2400

1.2 ~~HARDWARE SPECIFICATIONS~~VZ_REQ_LTEOTADM_2401

1.2.1 ~~MECHANICAL~~VZ_REQ_LTEOTADM_2402

1.2.2 ~~ELECTRICAL~~VZ_REQ_LTEOTADM_2403

1.3 USER EXPERIENCE AND INTERACTIONS VZ_REQ_LTEOTADM_2404

Devices shall implement a mechanism so the end-user can alter or set the Class 3 APN name (only the name, and no other APN parameter) manually. In this case, the end-user can manually change that APN name on the device. The APN Management Requirements of this document shall apply in this manual PDN change case.

Please refer to Verizon Wireless Devcie Requirements for LTE 3GPP Band 13 network Access for more details on APN parameters alteration rules.

1.3.1 ~~User Experience (Device)~~VZ_REQ_LTEOTADM_7655

1.3.1.1~~INTERRUPTIONS DURING APN MANAGEMENT ACTIVITY~~VZ_REQ_LTEOTADM_2405

1.3.1.1.1 ~~LTE Network (Bearer) Available~~VZ_REQ_LTEOTADM_7656

1.3.1.1.2 ~~Client-Server Connection Failure During The SDM Session~~ ~~VZ_REQ_LTEOTADM_7657~~

1.3.1.1.3 ~~DM Fatal Error~~ ~~VZ_REQ_LTEOTADM_22978~~

1.3.1.1.4 ~~Accessory Interaction (Applicable on to Handset form Factor Devices)~~ ~~VZ_REQ_LTEOTADM_7658~~

1.3.1.2 ~~Subscriber Device Management~~ ~~VZ_REQ_LTEOTADM_7659~~

1.3.1.3 ~~Network Initiated SDM Sessions~~ ~~VZ_REQ_LTEOTADM_7660~~

1.3.2 ~~USER INTERFACE (DEVICE)~~ ~~VZ_REQ_LTEOTADM_2406~~

1.3.2.1 ~~Network Initiated SDM Session~~ ~~VZ_REQ_LTEOTADM_7661~~

1.3.2.2 ~~User Initiated SDM Session - Manual PDN Name Change~~ ~~VZ_REQ_LTEOTADM_7662~~

1.3.2.2.1 ~~Instructions~~ ~~VZ_REQ_LTEOTADM_7663~~

1.4 OTA-DM SPECIFICATIONS VZ_REQ_LTEOTADM_2407

1.4.1 COMMON REQUIREMENTS FOR OTADM - STANDARDS COMPLIANCE VZ_REQ_LTEOTADM_2408

This informational section will have references to Industry Standards and Requirements as well as VZW-defined Requirements available to Open Access/ODI manufacturers. The device shall comply with the following Industry Requirements, as well as any VZW Requirements stated herein. If a conflict exists between this document and an Industry Standard, this document takes precedence. However, please contact VZW if there are additional questions.

The requirements stated in this section *will have information needed for implementation*. However, in each of the requirements stated throughout this document, the specific references will not be repeated. All references needed are in this section of this document.

In order for devices to have compatibility with Verizon Wireless LTE 3GPP Band 13 network for Device Management and support SDM, the following OMA DM requirements must be met.

Refer to "LTE 3GPP Band 13 Network Access" and "LTE SMS" requirements for details.

1.4.1.1COMPLIANCE WITH VZW REQUIREMENTS VZ_REQ_LTEOTADM_22979

1. LTE 3GPP Band 13 Network Access
2. LTE SMS Requirements

1.4.1.1.1 OTHER INDUSTRY STANDARDS VZ_REQ_LTEOTADM_22980

1. WAP Push OTA Specification (for notification using SMS*)
2. HTTP V1.1
3. WAP-230-WSP Specification (Package 0 SMS* header detail)
4. WAP-259-WDP Specification (Package 0 SMS* header detail)
5. The device shall support the 3GPP2 SMS format as defined in 3GPP2 C.S0015-A v1.0 *"Short Message Service (SMS) for Wideband Spread Spectrum Systems".* The support for the 3GPP format, as defined in TS 23.040 "Technical realization of the Short Message Service (SMS)" shall be supported.
6. APN domain names shall employ domain formats as specified in RFC 3986

1.4.1.1.2 OMA Standards Compliance VZ_REQ_LTEOTADM_7664

LTEOTADM116 The device shallsupport the OMA-DM standard and the sections as outlined in the followingdocuments:

Document	Reference Section
OMA Device Management Bootstrap, Version 1.2.	5.1.2.1 Customized Bootstrap 5.1.2.2 Server-Initiated Bootstrap
OMA DM Device Description Framework DTD, Version 1.2.	N/A
OMA Device Management Notification Initiated Session, Version 1.2.	5 Server Alerted Management Session 6 Structure of General Notification Initiated Session Alert 7.1 Package #0 delivered using WAP Push

OMA Device Management Protocol, Version 1.2.	6.2 Multiple Messages In Package Requirements 8.1.2 Session Abort Requirement 8.2 Package 0: Management Initiation Alert from server to client 8.3 Package 1: Initialization from client to server 8.4 Package 2: Initialization from server to client 8.5 Package 3: Client response sent to server 8.6 Package 4: Further server management operations 8.7 Generic Alert 9 Authentication (9.1, 9.2)
OMA Device Management Requirements Document, Version 1.2.	6.1.1 Security 6.4 Usability 6.3.1 System Elements Device
OMA Device Management Representation Protocol, Version 1.2.	5.1 MIME Usage 6 Mark-Up Language Description
OMA Device Management Security, Version 1.2.	5.1 Credentials 5.3 Authentication 5.4 Integrity 5.5 Confidentiality 5.6 Notification Initiated Session
OMA Device Management Standardized Objects, Version 1.2.	5 Standardized Objects
OMA Device Management Tree and Description, Version 1.2.	5 The Management Tree 6 Nodes 7 Properties of nodes 8 Device Management Tree Exchange 9 Device Description Framework*
OMA Device Management Tree and Description Serialization, Version 1.2.	5 TND Serialization Definition 6 TNDS Syntax
WAP-230-WSP Specification	8.2.4 Push and Confirmed Push Facilities
WAP-259-WDP Specification	6.5 Mapping WDP to CDMA SMS

1.4.1.2OTADM CLIENT VZ_REQ_LTEOTADM_22981

The device shall support an OTADM client that supports OMA-DM protocols defined in this document. The client shall correctly interpret OMA-DM commands, execute commands sent by the server administrator and send back relevant responses to the issuing management server as defined in the OMA DM standards referenced above.

1.4.1.2.1 OTADM CLIENT PROVISIONING VZ_REQ_LTEOTADM_22982

1.4.1.2.1.1 Factory Bootstrapping VZ_REQ_LTEOTADM_7699

Devices shall implement Customized (Factory) Bootstrapping in accordance with "OMA Device Management Bootstrap, Vs 1.2" requirements

Additionally, all devices shall be Factorybootstrapped with DM parameters prior to coming on the LTE network. The FactoryBootstrap parameters shall be pre-populated with the settings. See requirements traceability.

" Devices using VZW OTADM solution shall not support OTA Bootstrap (Network Initiated Bootstrap).
" Devices using VZW OTADM solution shall not support OMA-CP (OMA Client Provisioning).

1.4.1.2.1.2 PDN Provisioning for OTADM Device Management Traffic VZ_REQ_LTEOTADM_7701

Devices shall use the Admin PDN dedicated to DM related traffic. The VZW IMS PDN shall be used for SMS push.

For APNs factory provisioning requirements, refer to the latest version of VZW Device Requirements - LTE 3GPP Band13 Network Access.

1.4.1.2.2 OTA-DM (Emergency Mode) VZ_REQ_LTEOTADM_5965111

The device and/or OMA-DM client shall ensure that the device is in idle mode prior to starting a PPP session for the purposes of DM.

Devices shall not attempt to initiate a DM data session until the emergency procedure is complete and they return to idle.
Network Initiated: Valid DM Notification messages (via SMS) shall be ignored when the device is in the Emergency mode.
Client-initiated: Refer to VZW Feature Definitions/Requirements document for emergency calling procedures.
User-initiated: For feature phones, refer to VZW Feature Definitions/Requirements document for emergency calling procedures. See UI requirements for additional details.
For converged devices, refer to Converged Device Requirements document for emergency calling procedures.

1.4.1.2.3 OTADM Client Change Alerts VZ_REQ_LTEOTADM_4105999311947508

Devices that initially support the VZW OTADM solution for DM and FOTA shall abide by the following Alert Requirements to notify the DM Server when the VZW OTADM Client has changed to an alternate DM client (i.e. Knox).

1.4.1.2.3.1 OTADM Client Change Disabled Alert VZ_REQ_LTEOTADM_4105999311947509

Every time the DUT disables the DM client pointed to Verizon for FOTA services and moves to an alternative DM solution(i.e. Knox), it shall setup a Client-initiated Check-in with the server. The DUT shall follow all the Client-Initiated Check-in requirements specified in this document.

The DUT shall use the alert type org.openmobilealliance.dm.firmwareupdate.devicerequest for device initiated DM sessions.

When the DUT initiates a device initiated session on boot up, in the Data element that is followed by the Alert Type element of org.openmobilealliance.dm.firmwareupdate.devicerequest, the device shall include a result code of 212. Note that 212 = Verizon pointed DM client disabled, and a new DM client in use. (i.e. Knox)

The following is an example of the Alert message structure.

<!-- some text --> is a comment.

```
<Alert>
   <CmdID><!--Command ID goes here--></CmdID>
   <Data>1226</Data>
   <Item>
      <Source>
         <LocURI><!--LocURI goes here--></LocURI>
      </Source>
      <Meta>
         <Format xmlns="syncml:metinf">b64</Format>
         <Type xmlns="syncml:metinf">org.openmobilealliance.dm.firmwareupdate.devicerequest</Type>
      </Meta>
      <Data> 212</Data >
   </Item>
</Alert>
```

1.4.1.2.3.2 OTADM Client Change Enabled Alert VZ_REQ_LTEOTADM_4105999311947510

Every time the DUT enables the DM client pointed to Verizon for FOTA services and disables an alternative DM solution(i.e. Knox), it shall setup a Client-initiated Check-in with the server. The DUT shall follow all the Client-Initiated Check-in requirements specified in this document.

The DUT shall use the alert type org.openmobilealliance.dm.firmwareupdate.devicerequest for device initiated DM sessions.

When the DUT initiates a device initiated session on boot up, in the Data element that is followed by the Alert Type element of org.openmobilealliance.dm.firmwareupdate.devicerequest, the device shall include a result code of 213. Note that 213 = Verizon pointed DM Client enabled, and third party DM client no longer in use.

The following is an example of the Alert message structure.

<!-- some text --> is a comment.

```
<Alert>
    <CmdID><!--Command ID goes here--></CmdID>
    <Data>1226</Data>
    <Item>
        <Source>
            <LocURI><!--LocURI goes here--></LocURI>
        </Source>
        <Meta>
            <Format xmlns="syncml:metinf">b64</Format>
            <Type xmlns="syncml:metinf">org.openmobilealliance.dm.firmwareupdate.devicerequest</Type>
        </Meta>
        <Data> 213</Data >
    </Item>
</Alert>
```

1.4.1.3OTADM TRANSPORT SECURITY REQUIREMENTS

VZ_REQ_LTEOTADM_22983

Due to recent security vulnerability with SSL transport layer protocols, the device must only support TLS transport layer protocol (version 1.2 & higher). It is recommended that

device vendors provide the ability to install additional root certificates over the air if a need arise.

- Device vendors must support SHA-256 SSL server certificates.
- Device vendor must use below URL for their new devices and SUs which supports SHA-256 SSL server certificates.

./DMAcc/AppAddr/Addr	https://4g2.vzwdm.com
./DMAcc/AppAddr/AddrType	URI
./DMAcc/AppAddr/Port	443

1.4.1.3.1 Confidentiality (Data Encryption) VZ_REQ_LTEOTADM_7703

All Device Management interaction between the device and the OTADM Server shall be performed using HTTPS transport protocol to ensure proper protection of OMA DM messages.

1.4.1.3.1.1 Root Certificate requirements VZ_REQ_LTEOTADM_36249

The device vendor shall pre-install the following root certificates required to support the SSL server certificate and its certificate chain installed on the OTADM server.

- DigiCert Global Root CA (Serial #: 08:3B:E0:56:90:42:46:B1:A1:75:6A:C9:59:91:C7:4A)
- DigiCert Global Root G2 (Serial #: 03:3A:F1:E6:A7:11:A9:A0:BB:28:64:B1:1D:09:FA:E5)
- DigiCert Trusted Root G4 (Serial #: 05:9B:1B:57:9E:8E:21:32:E2:39:07:BD:A7:77:75:5C)
-

The device vendor shall also support required signature algorithm, key size and cypher suites of the SSL server certificate.

The device vendor shall also verify that a server certificate currently installed on the OTADM server is chained to the root certificates pre-installed on the device.
The device vendor may use the openssl tool or the following links to check the SSL server certificate and its certificate chain on the OTADM server:

https://www.digicert.com/help/
https://cryptoreport.websecurity.symantec.com/checker/

The Root Certificates can be downloaded from the following links:

- DigiCert root certs: https://www.digicert.com/digicert-root-certificates.htm
-

It is recommended that the device pre-installs prevalent root certificates to support other certificate authorities such as DigiCert, Comodo, GoDaddy, and Entrust.

Along with the root certificates the device shall support all of the following Cipher Suites:

- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256 (0xC027)
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384 (0xC028)
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256 (0xC02F)
- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384 (0xC030)

1.4.1.3.2 AUTHENTICATION VZ_REQ_LTEOTADM_22984

1.4.1.3.2.1 Package 0 Authentication (Notification Initiation Session Message) VZ_REQ_LTEOTADM_7705

The device shall support Package 0 authentication for bootstrap messages, including 'stale nonce' retry. For details, please refer to "OMA Device Management Security", Version 1.2

Devices shall confirm the source of the DM Notification message by validation of the digest sent as part of the message payload.

1.4.1.3.2.2 Mutual Authentication VZ_REQ_LTEOTADM_7707

Devices shall support mutual authentication at the DM layer.Digest authentication shall be used for all Device Management-related authentication sessions,Digest authentication shall be implemented for all messages (i.e. Notification Messages) between the OTADM Server and Device, Authentication and its challenge shall follow the specifications as defined in "OMA Device Management Security, Version 1.2, "OMA Device Management Protocol V1.2, and "OMA Device Management Initiation Session V1.2".

1.4.1.3.2.3 Failed Authentication Attempt Handling VZ_REQ_LTEOTADM_7665

For details, please refer to "OMA Device Management Security Protocol V1.2, and"OMA Device Management Notification Initiation Session V1.2" documents.

1.4.1.3.2.4 Authentication Key VZ_REQ_LTEOTADM_7666

Instructions on how to generate Server and Client password will be provided by VZW when vendor submits a request to gain access to VZW OTADM IOT self-test environment (IOT Handshake tool).

Reference: OMA Device Management Security V1.2: Section 5.3.3 Authentication/Password and Nonce Usage

1.4.1.3.3 Integrity VZ_REQ_LTEOTADM_7667

The device shall utilize HMAC for integrity protection of Device Management messages, as specified in"OMA Device Management Security V1.2", and"OMA Device Management Protocol V1.2" : Section 9 Authentication, OMA Device Management Security V1.2: Section 5.4 Integrity.

1.4.1.3.4 OTA Device Management Tree Support VZ_REQ_LTEOTADM_7668

The OMA DM Tree shall conform to the OMA-DM standard. URI and node names in a Device Management tree shall be treated as case sensitive as per OMA DM Tree and Description specs (OMA-TS-DM_TND-V1_2_1-20080617-A).

1.4.1.3.4.1 Commands VZ_REQ_LTEOTADM_7669

LTEOTADM129Nodes in the DM Tree shall support the followingstandard commands as definedbelow:

- Exec
- Get
- Replace

For details on the commands,please refer to OMA Device Management Protocol V1.

1.4.1.3.4.2 Correlator ID VZ_REQ_LTEOTADM_38690

The device may support Correlator ID in asynchronous response to an asynchronous Exec command from the DM server. In the asynchronous response, the device shall include the same Correlator ID that it has received in an Exec command. The device shall omit Correlator ID in all other instances. The Correlator ID is an optional field and device must not fail if the field is not present from the server.

For details on the commands, please refer to OMA Device Management Protocol V1.x.

1.4.1.3.5 ACCESS CONTROL LIST (ACL) VZ_REQ_LTEOTADM_22985

For details on ACL support, please refer to OMA Device Management Tree and Description V1.2

1.4.1.3.6 Verizon Wireless Defined Base DM Tree VZ_REQ_LTEOTADM_7670

LTEOTADM131The device shall support the following basenode and sub-tree nodes for DM operations.

* DDF provided by the DeviceOEMs contains all information needed for the OMA-DM nodes.

OMA-DM Node	***Description***
.	Base Node
./DMAcc	Root Node for all DM Account items
./DevInfo	Root Node for all Device Information items
./DevDetail	Root Node for all Device Detail items

./ManagedObjects	Root Node for all Managed Object items

1.4.1.3.7 DMAcc Subtree VZ_REQ_LTEOTADM_7671

The device shall support the following DMAcc nodes for DM operations.

DMAcc Subtree			
DMAcc Subtree	***Value***	**Value Type**	**Commands**
./DMAcc/AppID	W7	Char	Get
./DMAcc/ServerID	com.vzwdmserver	Char	Get
./DMAcc/Name	VZW DM Server	Char	Get
./DMAcc/AppAddr	Node	Char	Get
./DMAcc/AppAddr/Addr	https://4g2.vzwdm.com***	Char	Get, Replace
./DMAcc/AppAddr/AddrType	URI	Char	Get, Replace
./DMAcc/AppAddr/Port	443	Char	Get, Replace
./DMAcc/AAuthPref	syncml:auth-md5	Char	Get
./DMAcc/AppAuth	Node		Get
./DMAcc/AppAuth/Client	Node		Get
./DMAcc/AppAuth/Client/AAuthLevel	CLCRED	Char	Get
./DMAcc/AppAuth/Client/AAuthType	Digest	Char	Get
./DMAcc/AppAuth/Client/AAuthName	IMEI (see note)	Char	Get
./DMAcc/AppAuth/Client/AAuthSecret	<VZW Defined>*	Char	No Get
./DMAcc/AppAuth/Client/AAuthData	See note below**	Char	No Get
./DMAcc/AppAuth/Server	Node		Get
./DMAcc/AppAuth/Server/AAuthLevel	SRVCRED	Char	Get
./DMAcc/AppAuth/Server/AAuthType	Digest	Char	Get
./DMAcc/AppAuth/Server/AAuthName	com.vzwdmserver	Char	Get
./DMAcc/AppAuth/Server/AAuthSecret	See note below**	Char	No Get
./DMAcc/AppAuth/Server/AAuthData	See note below**	Char	No Get

* See requirements traceability to set value as defined

** The initial values for these nodes will be provided by VZW OTADM IOT team when vendor submits a request to gain access to VZW OTADM IOT self-test environment (IOT Handshake tool).
***All new devices and all SUs must support this new URL with SHA-2 cert support.
Reference: OMA Device Management Standardized Objects V1.2

Note: AAuthName shall be in the format of characters without any prefix or postfix, for example, "123456789012345", and not "IMEI:123456789012345".

1.4.1.3.8 DevInfo Subtree VZ_REQ_LTEOTADM_7672

The DevInfo subtree shall be as defined in theOMA Device Management Standardized Objects V1.2.The Device shall implement the following node values:

DevInfo Nodes	***Value***	***Value Type***	***Command***
./DevInfo/DevId	IMEI (see Note)	Char	Get
./DevInfo/DmV	1.2	Char	Get
./DevInfo/Lang	English	Char	Get
./DevInfo/Man	<Manufacturer Name>	Char	Get
./DevInfo/Mod	<Model Number> (see Note)	Char	Get
./DevInfo/Ext	Node		Get

Note: DevId format shall be "IMEI:x", with x being the value of the IMEI (without quotes).
Mod shall be the Model Number of the device instead of the commercial name of the device

1.4.1.3.9 DevDetail Subtree VZ_REQ_LTEOTADM_7673

LTEOTADM134The DevDetail subtree shall be as defined in theOMA Device Management Standardized Objects V1.2.The Device shall implement the following node values of the DevDetail subtree:

DevDetail Nodes	***Value***	***Value type***	***Command***
./DevDetail/URI	Node	Char	Get
./DevDetail/URI/MaxDepth	12	Char	Get
./DevDetail/URI/MaxSegLen	32	Char	Get

./DevDetail/URI/MaxTotLen	127	Char	Get
./DevDetail/DevTyp	<value>	Char	Get
./DevDetail/FwV	<value> (See Note)	Char	Get
./DevDetail/HwV	<value>	Char	Get
./DevDetail/LrgObj	True, False	Char	Get
./DevDetail/OEM	<value>	Char	Get
./DevDetail/SwV	<value>	Char	Get

Note: APN Management and ADD flowrequires that ./DevDetail/FwV be an implemented and populated leaf node.

1.4.1.3.10 NAI VZ_REQ_LTEOTADM_5965085

Devices the support 3G CDMA technologies shall use the current data NAI <MDN>@vzw3g.com

1.4.1.4DM CONNECTIVITY REQUIREMENTS VZ_REQ_LTEOTADM_22986

1.4.1.4.1 NETWORK INITIATED DM SESSIONS VZ_REQ_LTEOTADM_22988

1.4.1.4.1.1 DM Notification via SMS message (Trigger) VZ_REQ_LTEOTADM_7708

OTADM compliant devices shall receive and process Device Management notifications delivered to the device via an SMS message.

NOTE: SMS messages are configured and sent by the OTADM Server over the IMS PDN. Network-Initiated functionality is triggered by these SMS.

1.4.1.4.1.2 ~~LTE Service Required~~ ~~VZ_REQ_LTEOTADM_7674~~

1.4.1.4.1.3 Network Initiated (NI) Retry VZ_REQ_LTEOTADM_7675

If the device is in adequate LTE coverage area, but the network-initiated DM session fails to connect to the server for any reason, the device shall fail the session and not retry.

1.4.1.4.2 USER INITIATED DM SESSIONS VZ_REQ_LTEOTADM_22989

1.4.1.4.2.1 ~~Manual PDN Change~~ ~~VZ_REQ_LTEOTADM_7676~~

1.4.1.4.2.2 ~~LTE Service Required~~ ~~VZ_REQ_LTEOTADM_7677~~

1.4.1.4.2.3 ~~XML ELEMENTS~~ ~~VZ_REQ_LTEOTADM_22990~~

1.4.1.4.2.4 ~~VZ_REQ_LTEOTADM_7678~~

1.4.1.4.2.5 Elements and Formatting VZ_REQ_LTEOTADM_7679

Data Elements shall only contain the formatted characters of that element.

For example, if the Format of a Data Element is int (integer), and the Data element represents a timer in seconds, then the data element shall only include integer characters, e.g. 0-9., and not include the unit (sec) within its field. Thus, for a timer value of 25 seconds, the required data element would be <data> 25 </data> and not <data> 25 sec </data>.

1.4.1.4.3 SUPPORT FOR IPV6 CONNECTIVITY VZ_REQ_LTEOTADM_31775

1.4.1.4.3.1 IPv6 Connection VZ_REQ_LTEOTADM_31776

- The DM Client on the device shall support IPv6 connectivity with the OMADM server over Class 2 APN's PDN Connection.
    - This functionality is in addition to the IPv4 support that exists today on each client.
- If an IPv6 address is returned by the DNS server for an AAAA (quad-A) query, then the device will prefer IPv6 mode connectivity versus IPv4 mode connectivity with the DM Server over the Class 2 APN's PDN Connection.
    - If an IPv6 address is not returned by the DNS server, then the device shall use IPv4 address received from the "A" DNS query result to connect to the DM server (over the Class 2 APN's PDN Connection).
- As such, IPv6 connection shall be supported for all aspects of OMADM communication (over an IP network) as described in this requirements document.

1.4.1.4.3.2 Connection Setup Failure VZ_REQ_LTEOTADM_31777

- If the device is not in adequate LTE coverage where a Class 2 PDN connection cannot be established, then the requirements outlined in this document (See requirements traceability) shall be followed.
- If the device is in adequate LTE coverage with Class 2 PDN connection established and if the DM Client is unable to connect to the DM server over an IPv6 connection through the Class 2 APN's PDN connection for any reason; then the device shall not disconnect the PDN connection. Instead the device shall fall back to the available IPv4 connection and attempt to connect to the DM server at most once.
    - If the communication still cannot be established, then the device shall follow Retry requirements outlined in this document (See requirements traceability)

1.4.1.4.3.3 ~~Connection Failure During a DM Session~~ ~~VZ_REQ_LTEOTADM_31778~~

1.4.1.5OMA-DM TREE AND STANDARD COMMANDS VZ_REQ_LTEOTADM_22992

1.4.1.5.1 APN MANAGEMENT VZ_REQ_LTEOTADM_22993

By APN management, VZW means a mechanism for changing the current APNs defined in this document. There are three cases where changing the APN occurs in this document. One case is when the device has its APN changed manually, e.g. Class 3 APN is changed by the end-user. The second case is where the APN change is directed by the OTADM Server during Network provisioning or insertion of a new SIM card. The third case is when the OTADM Server directs the device to modify an APN for additional end-user services.

APN management can occur in two distinct ways: through an SDM session initiated specifically to change a targeted APN value, or through a Mobile Automatic Device Detection (ADD) session.

APN management is enabled through the ConnMo tree (read and writing of the APN parameter values) and its manipulation.

1.4.1.5.1.1 MOBILE AUTOMATIC DEVICE DETECTION (ADD): BACKGROUND AND DESCRIPTION VZ_REQ_LTEOTADM_22994

Mobile Automatic Device Detection is an APN Management server process which happens when a new UICC card is associated with a device from out-of-box condition, or existing UICC card (activated on another Device) and then inserted into current mobile device. Both situations, the out of the box or the current device, having the SIM newly inserted and powered on, triggers a UICC card activation, results the SIMOTA server to send ADD (Automatic Device Detection) message to the SDM server; the SDM server, upon receiving the ADD message, will associate the device IMEI to the current activated MDN, and send a Package 0 (SMS) to initiate the following tasks:

1. Read LTE APN parameters, including APN Id, name, and IP, for all 4 APN classes, from the device, and replace these parameters with network required values, Read functionality is performed via OMA specification as a "Get" command. Write functionality is performed via OMA specification as "Replace" command. After the "Replace" command is sent to the device, the Server will send an Execute command to the device, as per OMA specifications, which triggers the device to enable the APN changes.
2. Upon successful read and replacement of APN values, there is a check performed by the OTADM server to determine if there is a firmware-update package available for the device.
    a. If the device supports a Proprietary Firmware, the ADD process will still determine if the device requires a firmware update by checking the "FwV" field in the Device Detail tree. In the Proprietary Firmware support case, the VZW OTADM Server will not initiate a firmware update.
    b. All devices, whether utilizing VZW-FOTA or Proprietary FOTA, shall populate the FwV leaf node.

1.4.1.5.1.2 ADD Flow Requirements VZ_REQ_LTEOTADM_7683

VZW does not specify the number, type, or sequence of APNs that may be read or written during an ADD session, as per OMA Specifications. The device shall be prepared to respond to any request made by the server for reading and writing the APN parameters during that ADD session.

1.4.1.5.1.3 ~~APN SERVICE AVAILABILITY~~ VZ_REQ_LTEOTADM_22995

1.4.1.5.1.4 INFORMATIONAL BACKGROUND VZ_REQ_LTEOTADM_22996

APN Service Availability refers to the ability of the device to connect to a newly modified APN without noticeable delay.

To illustrate, suppose the current Class 3 APN name is www.changeme.com and the user manually changes the Class 3 Internet APN to www.vzw.com. The user expects to be able to initiate a session with the network through invoking the browser and have the device attach to the www.vzw.com without noticeable delay (of service/connectivity to the Internet) or requiring the device to reboot. The browser launch and connection to the APN, e.g. www.vzw.com, is expected to be less than 10 seconds in good RF conditions. However, quantification of this requirement is nearly impossible. Thus, in the time it takes for a user to attempt to connect to the changed APN, the device should have the new APN enabled. In other words, when the device is next requested to utilize the new APN, the APN must be enabled.

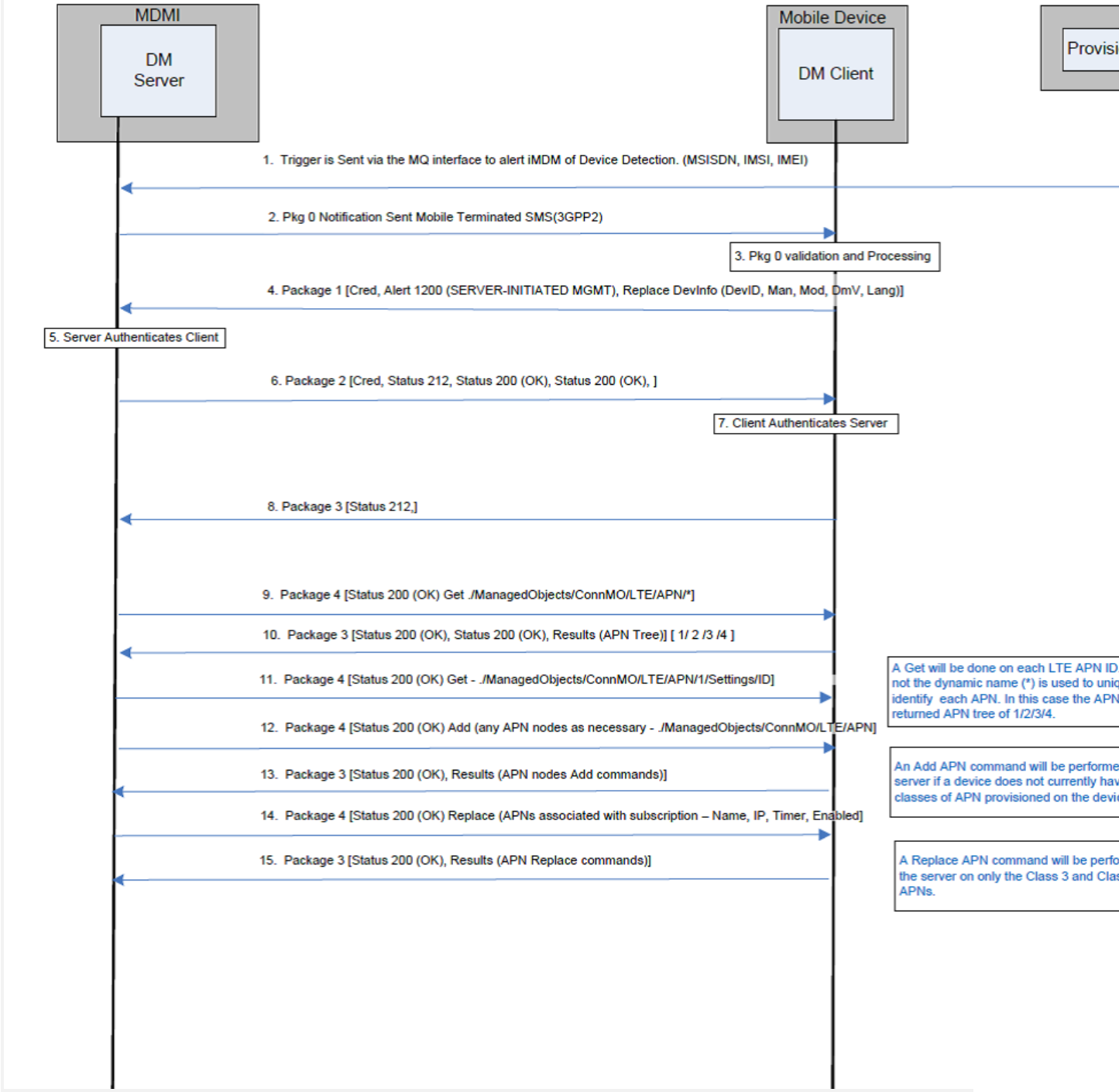
This concept defines "APN service availability"

1.4.1.5.1.5 ~~Service Availability for APN Parameter Changes~~ ~~VZ_REQ_LTEOTADM_7688~~

1.4.1.5.1.6 ADD FLOW DIAGRAM VZ_REQ_LTEOTADM_22998

The following diagram shows the ADD flow that is utilized by VZW. This is for information only.

LTE ODI Activation Call flow



1.4.1.5.1.7 APN Management after SIM change VZ_REQ_LTEOTADM_8312636

When the Device is initiating a DM session with the server due to a SIM change detection, the device shall perform the following activities:.

" Device (DM client) detects SIM change and starts a timer for 5 minutes

" If WAP PUSH from server is received before 5 minutes, the timer is cancelled and device sets up the session with the server

" If WAP PUSH is not received within 5 minutes (use case of ADD miss, two SIMs and 1 device scenario, etc&) and the timer expires, then the device shall initiate the session with the server after the expiry

1.4.1.5.2 Connectivity Management VZ_REQ_LTEOTADM_7684

The device shall support the following Connectivity Subtree and operations:

Connectivity Node	***Description***	***Value***	***Value Type***	***Commands***
./ManagedObjects/ConnMO/LTE	Internal Node	node		Get
./ManagedObjects/ConnMO/LTE/APN/1	Internal Node	node		Get
./ManagedObjects/ConnMO/LTE/APN/1/Setting	Internal Node	node		Get
./ManagedObjects/ConnMO/LTE/APN/1/Setting/Id	APN Id	1	int	Get
./ManagedObjects/ConnMO/LTE/APN/1/Setting/Name	APN Name	IMS	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/1/Setting/IP	IP Version. Defined by Standards but not used by Verizon Wireless	IPv4 or Ipv6 or Ipv4 and Ipv6	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/1/Setting/Enabled	Return APN /1/s status of Enabled (True), or Disabled	True	Bool	Get

	(False)			
./ManagedObjects/ConnMO/LTE/APN/1/Setting/Operations	Internal Node	Null		Get
./ManagedObjects/ConnMO/LTE/APN/2/Setting/Id	APN Id	2	int	Get,
./ManagedObjects/ConnMO/LTE/APN/2/Setting/Name	APN Name	VZWADMIN	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/2/Setting/IP	IP Version. Defined by Standards but not used by Verizon Wireless	Ipv4 or Ipv6 or Ipv4 and Ipv6	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/2/Setting/Enabled	Return APN /2/s status of Enabled (True), or Disabled (False)	True	Bool	Get
./ManagedObjects/ConnMO/LTE/APN/2/Setting/Operations	Internal Node	Null		Get
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Id	APN Id	3	int	Get,
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Name	APN Name	VZWINTERNET	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/3/Setting/IP	IP Version. Defined by Standards but not used by Verizon Wireless	Ipv4 or Ipv6 or Ipv4 and Ipv6	chr	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Enabled	Return APN /3/s status of Enabled (True), or Disabled (False)	True, False	Bool	Get
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Operations	Internal Node	Null		Get
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Operations/Enable	Enable APN	Null		Exec
./ManagedObjects/ConnMO/LTE/APN/3/Setting/Operations/Disable	Disable APN	Null		Exec

./ManagedObjects/ConnMO/LTE/APN/4/Setting/Id	APN Id	4	int	Get,
./ManagedObjects/ConnMO/LTE/APN/4/Setting/Name	APN Name	VZWAPP	char	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/4/Setting/IP	IP Version. Defined by Standards but not used by Verizon Wireless	Ipv4 or Ipv6 or Ipv4 and Ipv6	char	Get, Replace
./ManagedObjects/ConnMO/LTE/APN/4/Setting/Enabled	Return APN /4/s status of Enabled (True), or Disabled (False)	True, False	Bool	Get
./ManagedObjects/ConnMO/LTE/APN/4/Setting/Operations	Internal Node	Null		Get
./ManagedObjects/ConnMO/LTE/APN/4/Setting/Operations/Enable	Enable APN	Null		Exec
./ManagedObjects/ConnMO/LTE/APN/4/Setting/Operations/Disable	Disable APN	Null		Exec
./ManagedObjects/ConnMO/IMS	Interior Node	Node		Get
./ManagedObjects/ConnMO/IMS/Setting	Interior Node	Node		Get
./ManagedObjects/ConnMO/IMS/Setting/Domain	Home Domain Name for the device to populate the request URI for REGISTRATION	vzims.com	char	Get
./ManagedObjects/ConnMO/IMS/Setting/smsformat	Device Outgoing SMS based on either 3GPP or 3GPP2 standards	3GPP or 3GPP2	char	Get, Replace
./ManagedObjects/ConnMO/IMS/Setting/sms_over_IP_network_indication	Turns IMS ON/OFF on	True	bool	Get, Replace

	the device			

1.4.1.5.2.1 ConnMO Replace Command - Values not case sensitive

VZ_REQ_LTEOTADM_7685

All writeable node values shall not be case sensitive, ie, device shall be able to write/replace the node values either in lower cases or upper cases.

1.4.1.5.3 Functionality For Device Connectivity Management

VZ_REQ_LTEOTADM_7686

Note: All Timer values in the above table have units associated, e.g. seconds or minutes; and the values shall be integer type; It is imperative that the server and the device interpret the value in the same units. If the units are specified in the above table as, e.g. seconds, then the device shall interpret any value received by the network as the same units (e.g. seconds). Similarly, if the device is going to populate a value in the tree, it shall assume the value the network will receive is the units in the above table.

Device shall allow the remote capture of connectivity settings and attributes based on OMA DM commands sent from the VZW DM server system.

The following node commands shall result in the listed functionality:

1.4.1.5.3.1 APN Name Format VZ_REQ_LTEOTADM_7702

Devices shall support the APN domain names which shall employ the domain formats as specified in RFC 3986

1.4.1.5.3.2 APN ID VZ_REQ_LTEOTADM_7687

APN Id get command on this node returns the Network Identifier of the associated Access Point Name (APN), for IMS APN, Id = 1; for Admin APN, Id = 2; for Internet APN, Id = 3; for VZW Applications APN, Id =4; replace command changes the value;

1.4.1.5.3.3 APN Name VZ_REQ_LTEOTADM_7689

APN Name get command on this node returns the associated APN name, for IMS, the APN name = IMS; for Admin, the APN name = VZWADMIN; for Internet, the APN name = VZWINTERNET; for VZW Application, the APN name = VZWAPP; replace command, where stated in the CONNMO tree, changes the value;

1.4.1.5.3.4 IP VZ_REQ_LTEOTADM_7690

IP get command on this node returns the associated APNs IP Type, which is one of: IPv4, IPv6, or IPv4 and IPv6; replace command changes the value.

1.4.1.5.3.5 Enabled VZ_REQ_LTEOTADM_7691

Enabled get command on this node returns the APN enabled (True) or disabled (False) status for all APNs;

1.4.1.5.3.6 IMS Domain VZ_REQ_LTEOTADM_7692

IMS Domain get command on this node returns the home domain name for the device to populate the request URI for registration; replace command changes the value;

1.4.1.5.3.7 ~~SIP T1 Timer~~VZ_REQ_LTEOTADM_7693

1.4.1.5.3.8 ~~SIP TF Timer~~VZ_REQ_LTEOTADM_7694

1.4.1.5.3.9 ~~SIP T2 Timer~~VZ_REQ_LTEOTADM_7695

1.4.1.5.3.10 ~~SMS Format~~VZ_REQ_LTEOTADM_7696

1.4.1.5.3.11 Enable VZ_REQ_LTEOTADM_7697

Enable exec command on this node turns an APN on, applicable only to APN Id = 3 and 4. Enable is applicable to neither APN ID = 1 nor APN ID =2 is due to the required device behavior specified in LTE_3GPP_Band13_Network Access requirements.

1.4.1.5.3.12 Disable VZ_REQ_LTEOTADM_7698

Disable exec command on this node shall turn the specified APN off, applicable to all APNs except APN1 and APN2.

1.4.1.5.3.13 ~~Disable Testing~~VZ_REQ_LTEOTADM_7715

1.4.1.5.3.14 IP Indication for SMS VZ_REQ_LTEOTADM_23000

The SMS IP indication is intended to control if the Mobile Originated (MO) SMS is performed over IMS.

The value of "True" means the device shall perform Mobile Originated (MO) SMS on the VZW IMS Network. A value of "False" means the device shall not perform Mobile Originated (MO) SMS on the IMS Network.

The default value shall be "True"

Note: See "LTE SMS Device Requirements" for more information on SMS IP Indication.

1.4.1.5.3.15 ~~Factory Rest & Default APN values: Class 2 Disable~~VZ_REQ_LTEOTADM_7709

1.4.1.5.3.16 ~~Functionality for Data Retry Connectivity Management Objects~~VZ_REQ_LTEOTADM_26496

1.4.1.5.3.17 ~~MAX_CONN_T~~ VZ_REQ_LTEOTADM_26500

1.4.1.5.3.18 ~~MAX_CONN~~ VZ_REQ_LTEOTADM_26502

1.4.1.5.3.19 ~~WAIT_TIME~~ VZ_REQ_LTEOTADM_26505

1.4.1.5.3.20 Factory Reset & Default APN values: Class 3

VZ_REQ_LTEOTADM_38539

Factory reset shall not change Class 3 settings to the default values.

1.4.1.6 Configuration Update VZ_REQ_LTEOTADM_7332288

Whenever any of the OMA-DM tree parameters such as APN Management or Connectivity Management parameters are updated on the device, the device shall be considered to have received a Configuration Update.

Whenever the device receives a Configuration Update and does not receive a software update, it shall store the date and time information when the Configuration was updated.

1.4.2 ~~SDM REQUIREMENTS~~ ~~VZ_REQ_LTEOTADM_2409~~

1.4.3 Firmware Over The Air (FOTA) VZ_REQ_LTEOTADM_37788

1.4.4 SUPPORT FOR INDUSTRY STANDARDS AND VERIZON WIRELESS REQUIREMENTS VZ_REQ_LTEOTADM_22991

1.4.4.1 ~~OMA Defined Managed Objects~~ ~~VZ_REQ_LTEOTADM_7680~~

1.4.4.1.1 Update Result Reporting VZ_REQ_LTEOTADM_7681

All devices shall send a final DM notification message to the server following the update in accordance with OMA DM standards and the following requirements.

1.4.4.1.2 Update - Fatal Error VZ_REQ_LTEOTADM_7682

If the update process experiences a fatal error (i.e. checksum of final image invalid), the device shall reset.

1.5 DEVINFO SUBTREE EXTENSION VZ_REQ_MMOTADM_3103

1.5.1 ICCID Extended Node Support VZ_REQ_MMOTADM_8081

- In addition to the Dev Info nodethat is supported from the LTE OTADM and Reqs-OTADM Requirements documents, thedevice shall support ICCID extension node as described below

DevInfo Nodes	*Description*	*Value*	*Value Type*	*Commands*
1.5.1.1.1.1 ./DevInfo/Ext/ICCID	UICCs ICCID Value	NULL or <ICCID> (See description below)	Char	Get

- ICCID Extension node is a Read Only node with Type Char.TheDevice shall not allow a Replace command from DM server on the ICCID Extensionnode.The Device shall be able to perform Read/Write operations on the ICCIDExtension Node.
- This node shall be of Length 20 and shall only allow thefollowing values:

    1. NULL If UICC is not present in the Device or theDevice is unable to reach the UICC due to some fault in the OS
    2. This node shall only populate ICCID value retrieved from theUICC present in the device and only allow the following characters (0, 1, 2, 3,4, 5, 6, 7, 8, or 9). Example: 8914812345678901234

1.5.2 Device Functionality VZ_REQ_MMOTADM_8083

- The Device shall attempt to read the value of ICCID everytime the Device is powered on

    1. If a UICC is present and an ICCID value is retrieved, then the device shall check the existing value in the ICCID Extension Node. If the value is different than what is retrieved, then theretrieved value should be written in place of the pre-existing value
    2. If a UICC is not present, then the device shall write a NULLin place of the ICCID Value.

- The Device shall make use of the available OS APIs to be able to listen for UICC Changes/Removalwhile device is powered on. If a UICC change/removal is detected, thenthe device shall use the following logic:

    1. If UICC change is detected, then the Device shall retrieve the new ICCID valuefrom the UICC and overwrite the existing value in the ICCID Extension node withthe new Value
    2. If a UICC removal is detected, then the Device shall overwrite the existing value with NULL

- The device shall report the ICCID Extension Node value during a Device Management Package 1 session along with all the other DevInfo node values. The device shall follow the rules specified above for value of ICCID Extension Node (NULL or actual ICCID value of a UICC in the Device).
- The Device shall not send any value other than what is described in this sub section for the ICCID extension node
- The Device shall not allow a Replace command from DM server on the ICCID Extension node.

1.6 ~~INFORMATION AND USE CASES~~VZ_REQ_LTEOTADM_2410

1.6.1 ~~APN CLASS USAGE - INFORMATIONAL~~VZ_REQ_LTEOTADM_2411

1.6.1.1~~CLASS 1 (APN 1)~~VZ_REQ_LTEOTADM_23001

1.6.1.2~~CLASS 2 (APN 2)~~VZ_REQ_LTEOTADM_23002

1.6.1.3~~CLASS 3 (APN 3)~~VZ_REQ_LTEOTADM_23003

1.6.1.4~~CLASS 4 (APN 4)~~ ~~VZ_REQ_LTEOTADM_23004~~

1.7 REFERENCES VZ_REQ_LTEOTADM_2412

<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 www.verizonwireless-opendevelopment.com.

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