



Fixed-Mobile  
Convergence Alliance

## **Convergence Services using SIP over Wi-Fi<sup>®</sup>**

Product Requirement Definitions (PRD)  
Release 3.0

### **Access Point and Gateway Requirements**

FMCA Priority Programme #2  
Converged Devices and Access Points

31<sup>st</sup> October 2007

<b>1</b>	<b>Disclaimer</b>	<b>4</b>
<b>2</b>	<b>Acknowledgements</b>	<b>5</b>
<b>3</b>	<b>Introduction</b>	<b>6</b>
<b>4</b>	<b>How to Read This FMCA PRD</b>	<b>7</b>
<b>5</b>	<b>Access Point and Gateway (APG)</b>	<b>8</b>
5.1	Scope	8
5.2	Wi-Fi® SIP Access Point Implementation	9
5.3	Wire-line WAN Interfaces	10
5.4	Generic Access Point Requirements	12
5.5	Generic Requirements for Mobility Controllers and Attached Thin Client APs	16
5.6	AP Network Capabilities	20
5.7	RF Parameters	20
5.8	Bluetooth® Interface	21
5.9	Wi-Fi® QoS, Prioritisation and VLAN Tagging	21
5.10	Access Point and Gateway Security Requirements	22
5.11	Access Point Management	24
5.12	General Inter-AP Mobility Requirements	24
5.13	Regulatory Requirements	25

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

<b>References</b>	<b>26</b>
<b>Definitions</b>	<b>28</b>
<b>Acronyms</b>	<b>31</b>

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 1 Disclaimer

The FMCA (and each of its members) is providing this information on an 'as is' basis and makes no representations or warranties of any kind with respect to this information and disclaims all such representations and warranties. In addition, the FMCA (and each of its members) makes no representations or warranties about the accuracy, completeness, or suitability for any purpose of the information. The information may contain technical inaccuracies or typographical errors. All liability of the FMCA (and each of its members) howsoever arising for any such inaccuracies or errors is expressly excluded to the fullest extent permitted by law. None of the contributors make any representation or offer to license any of their intellectual property rights to the other, or to any third party. Nothing in this information or communication shall be relied on by any recipient.

Neither the FMCA nor any of its members will be liable for loss or damage arising out of or in connection with the use of this information. This is a comprehensive limitation of liability that applies to all damages of any kind, including (without limitation) compensatory, direct, indirect or consequential damages, loss of data, income or profit, loss of or damage to property and claims of third parties.

Notwithstanding the foregoing, none of the exclusions and limitations in the clause are intended to limit any rights you may have as a consumer under local law or other statutory rights which may not be excluded nor in any way to exclude or limit the FMCA's (and each of its members') liability to you for death or personal injury resulting from its negligence or that of its members.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 2 Acknowledgements

### **Wi-Fi Alliance:**

Wi-Fi®, Wi-Fi Alliance®, Wi-Fi CERTIFIED™, the Wi-Fi CERTIFIED logo, the Wi-Fi Alliance logo, and the Wi-Fi logo are registered trademarks of the Wi-Fi Alliance.

### **IEEE (Institute of Electrical and Electronics Engineers):**

The IEEE logo, and other IEEE logos and titles are registered trademarks or service marks of The Institute of Electrical and Electronics Engineers, Incorporated. IEEE technical specifications and abbreviations have been referenced in this document.

### **3GPP (Third Generation Partnership Project):**

3GPP is a registered trademark of ETSI in France and other jurisdictions. 3GPP technical specifications, definitions, terms and abbreviations have been referenced in this document.

### **ETSI (European Telecommunications Standards Institute):**

ETSI-TISPAN NGN Release 1 and 2 technical specifications, definitions, terms and abbreviations have been referenced in this document.

### **Bluetooth Special Interest Group:**

Bluetooth® is a registered trademark of the Bluetooth Special Interest Group.

### **ITU-T (ITU Telecommunication Standardisation Sector):**

ITU-T technical specifications, definitions, terms and abbreviations have been referenced in this document.

### **IETF (Internet Engineering Task Force):**

IETF technical specifications and abbreviations have been referenced in this document.

### **CTIA (Cellular Telecommunications and Internet Association):**

CTIA technical specifications and abbreviations have been referenced in this document.

### **DSL Forum:**

DSL Forum technical specifications and abbreviations have been referenced in this document.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

### 3 Introduction

The Fixed-Mobile Convergence Alliance (FMCA) is a global, non-profit organisation, focused on providing customers with high-quality, seamless and easy-to-use Convergence products and services.

Representing a global base of over 700 million customers who stand to benefit from the development of Convergence products and services, its objective is to ensure that devices, access points, applications and underlying networks interoperate to deliver the best user experience possible.

As a customer-led organisation, the FMCA is focused on creating an environment for joint telecom operator and vendor collaboration in key Convergence areas, to identify as well as address product and service requirements through the timely generation and delivery to industry of Product Requirements Definition (PRD) releases and other publishable technical materials.

The FMCA's objective is therefore to accelerate the development, availability and launch by leading industry players of Convergent products and services.

The Alliance is not a Standards Development Organisation (SDO). It therefore does not aim to create standards but rather to accelerate the adoption of the Convergence technologies by producing common telecom operator requirements for products and services in areas such as Devices, Access Point and Gateway, Roaming & Authentication and Converged Applications.

The FMCA Product Requirements Definition, PRD Releases, reflect collaborative input by FMCA Members and Associates, and joint requirements reviews with Standards Development, Specifications & Certification Organisations with which the FMCA has formal liaison agreements.

The FMCA PRD Release 3.0, Convergence Services Using SIP Over Wi-Fi®, builds on the previous PRD Releases 1.0 and 2.0, demonstrating telecom operators' commitment to the increased availability of fit for purpose dual-mode, Wi-Fi®-enabled Convergence devices and interoperable access points and gateways.

The FMCA has specified a clear PRD development roadmap, with PRD Release 4.0 covering requirements for Wireless Broadband Access scheduled for late 2008.

#### **Contacts:**

For further information on the FMCA and its PRDs please contact: [prd\\_info@thefmca.com](mailto:prd_info@thefmca.com)

Enquiries will be reviewed by the FMCA Programme Office and, where relevant, passed to the relevant FMCA Priority Programme and Technical Leads.

More information is also available from <http://www.thefmca.com>

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 4 How to Read This FMCA PRD

This document defines the Access Point and Gateway requirements for the FMCA Convergence Services using SIP over Wi-Fi® PRD Release 3.0 and should be read in conjunction with the following PRD Release 3.0 document:

- Convergence Services using SIP over Wi-Fi PRD, Release 3.0, Technical Handset Requirements, October 2007.

Standards Development Organisations (SDOs), Industry Alliances and vendors wishing to review this document, should take notice of the following:

- sections of the document are cross-referenced, where necessary, to indicate correlations in the various requirements and to facilitate the review process,
- technical, product and service requirements reference, where possible, standards, specifications and certifications defined by the leading SDOs and Industry Alliances (the References section provides a table summarising all the standards, specifications and certifications referenced in the document).

**Within this PRD the word 'shall' denotes a mandatory requirement and the word 'should' denotes a desirable requirement.**

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 5 Access Point and Gateway (APG)

### 5.1 Scope

It is recognised that there will be various forms of Wi-Fi® access points (APs)/gateways to address different market segments, such as:

- Wi-Fi® enabled APs and/or gateways for consumer and Small Office, Home Office (SOHO) services,
- APs for SOHO services,
- APs for enterprise services,
- Public Wi-Fi® hotspot APs.

The purpose of this document is to define Wi-Fi® SIP Access Point and Gateway (APG) product requirements for Wi-Fi® SIP enabled APs and/or gateways for the HOME (Consumer), ENTERPRISE (Corporate) and PUBLIC (Hotspot) environments. A decision has been taken to produce a more focused PRD 3.0 document in order to facilitate the introduction of APG devices in the market-place conforming to the FMCA requirements and deployment strategy. The home, enterprise and public requirements are addressed in this document and are denoted with each specification as either applicable to the HOME, ENTERPRISE or PUBLIC environments.

The term Mobility Controller in this document is used to describe a device that interfaces to APs (sometimes called a 'thin-client AP') with the primary role of controlling the functioning of connected APs, client services and associations, QoS, VLAN prioritisation, security and RF management. It is desirable that multi-vendor controller and AP systems shall be interoperable. APs may be directly connected to the mobility controller via a Layer 2 network or remotely via a Layer 3 network.

Therefore the focus is not only on delivering consumer-centric APGs for mass-market consumption, but also to address environments where convergent user devices can be found.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 5.2 Wi-Fi® SIP Access Point Implementation

- 5.2.1** The AP shall support the capability to set a limit on the maximum number of Wi-Fi SIP enabled UE it can simultaneously connect (including in stand-by mode). This value shall be configurable by the operator and/or the user.
- (Applicable to Home, Enterprise, Public)
- 5.2.2** All settings and configurations shall be stored in the AP. In the event of complete loss of power to the AP, all operator defined settings and configurations shall be resumed.
- (Applicable to Home, Enterprise, Public)
- 5.2.3** The AP should use existing Bluetooth® (IEEE 802.15.2) and Wi-Fi® (IEEE 802.11) techniques to mitigate interference from other sources.
- (Applicable to Home, Enterprise, Public)
- 5.2.4** The AP should support at least one USB (USB 2.0 Host) connection for use as a Print Server or File Server.
- (Applicable to Home)
- 5.2.5** The AP should provide support for a SIP server (client and proxy), where the AP is used as an IAD and a POTS phone is directly connected to the AP.
- (Applicable to Home)
- 5.2.6** The AP should support ITU T.38 fax relay or an alternative means of supporting fax.
- (Applicable to Home)
- 5.2.7** The AP should support pass-through for narrowband modems.
- (Applicable to Home)
- 5.2.8** AP options should include an integrated gateway (AP/DSL modem), including PPPoE, PPPoA and DHCP support options.
- (Applicable to Home)
- 5.2.9** If more than one Ethernet port is provided, then the AP shall provide for switching or router functionality.
- (Applicable to Home)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.2.10** The AP should support SIP-ALG and B2BUA as required by individual operators. These shall be implemented according to ETSI TISPAN Release 2 specifications (as soon as they will be available – Q4 2007) on customer networks (gateway and end devices).

(Applicable to Home, Enterprise)

- 5.2.11** The AP should support static IP routing to a specific destination based on source SSID and/or source/destination IP address.

(Applicable to Home, Enterprise)

### **5.3 Wire-line WAN Interfaces**

*Statement: In the case of an AP with an integrated WAN interface, this interface can use different technologies, i.e. Ethernet, xDSL, etc. The following interface requirements shall be adhered to where applicable.*

- 5.3.1** For Ethernet interfaces, the following statements are applicable.

- 5.3.1.1 The Ethernet port shall conform to IEEE 802.3.

(Applicable to Home, Enterprise, Public)

- 5.3.1.2 The Ethernet port shall be specified as 10/100 Base-T (electrical) Fast Ethernet with auto sensing.

(Applicable to Home, Enterprise, Public)

- 5.3.1.3 The Ethernet port should be specified as 1000 Base-T (electrical) Gigabit Ethernet.

(Applicable to Home, Enterprise)

- 5.3.1.4 The AP should support power over Ethernet based on IEEE 802.3af.

(Applicable to Enterprise, Public)

- 5.3.2** For ADSL interfaces, the following statement is applicable.

- 5.3.2.1 The modem shall be ADSL standards compliant (ITU-T Recommendation G.992.1). The ADSL over POTS interface shall comply with ITU-T G.992.1 Annex A.

(Applicable to Home, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.3.3** For ISDN interfaces, the following statements are applicable.
- 5.3.3.1 The modem should comply with ITU-T Q.921.  
(Applicable to Home, Public)
- 5.3.3.2 The modem should comply with ITU-T Q.931.  
(Applicable to Home, Public)
- 5.3.4** For ADSL2plus interfaces, the following statements are applicable.
- 5.3.4.1 The modem shall comply with ITU-T G.992.3 and ITU-T G.992.5 Annex A.  
(Applicable to Home, Public)
- 5.3.4.2 The line interface shall comply with ITU-T G.994.1 and ITU-T G.992.5 Annex J.  
(Applicable to Home, Public)
- 5.3.4.3 The modem shall comply with ITU-T G.992.3 and G.992.5 including support for Annex M.  
(Applicable to Home)
- 5.3.4.4 The modem shall be capable of supporting the complete range of optional extended framing parameters defined in G.992.3 Amendment 1 and G.992.5 Amendment 1.  
(Applicable to Home)
- 5.3.4.5 The modem shall be capable of supporting low power modes.  
(Applicable to Home)
- 5.3.4.6 The modem shall comply with the requirements of ITU-T Recommendation G.994.1.  
(Applicable to Home)
- 5.3.4.7 The modem shall comply with the requirements of DSL Forum TR-100.  
(Applicable to Home)
- 5.3.5** For ITU-T X.21, the following statement is applicable.
- 5.3.5.1 The modem shall comply with ITU-T V.11/X.21.  
(Applicable to Home)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.3.6** For SHDSL, the following statement is applicable.
- 5.3.6.1 The modem shall comply with ITU-T G.991.2 and G.991.2.bis.  
(Applicable to Home, Public, Enterprise)
- 5.3.7** For VDSL2, the following statements are applicable.
- 5.3.7.1 The modem shall comply with ITU-T G.993.2, ITU-T G.993.2 Corrigendum 1 and G.993.2 Amendment 1 for VDSL2 with support for the following profiles 8b, 8c, 12a, 17a, 30a.  
(Applicable to Home, Public, Enterprise)
- 5.3.7.2 The modem shall support the application of PBO mechanisms on both the Upstream (UPBO) and Downstream (DPBO) paths, according to ITU-T G993.2 and ITU-T G.997.1 methods.  
(Applicable to Home, Public, Enterprise)
- 5.3.7.3 The modem shall comply with the requirements of ITU-T Recommendation G.994.1.  
(Applicable to Home, Public, Enterprise)
- 5.3.7.4 The modem shall comply with the requirements of DSL Forum WT-114.  
(Applicable to Home, Public, Enterprise)
- 5.3.7.5 The modem shall support PTM-EFM encapsulation.  
(Applicable to Home, Public, Enterprise)
- 5.3.8** The Ethernet WAN port shall support VLANs with p-bit tagging.  
(Applicable to Home)
- 5.4 Generic Access Point Requirements**
- 5.4.1** The AP shall support UAM (Universal Access Method) for Internet browser re-direction.  
(Applicable to Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.4.2** The Ethernet port (on the LAN/Router side) shall conform to IEEE 802.3.  
(Applicable to Home, Enterprise, Public)
- 5.4.3** The Ethernet port shall be specified as 10/100 Base-T (electrical) Fast Ethernet with auto-sensing.  
(Applicable to Home, Enterprise, Public)
- 5.4.4** The Ethernet port should be capable of supporting 1000 Base-T (electrical) Gigabit Ethernet.  
(Applicable to Home, Enterprise, Public)
- 5.4.5** The AP should have mechanisms to support 'Guest' services, i.e. allow visiting users to gain access to Wi-Fi® SIP voice services and the Internet via their connections.  
(Applicable to Home, Enterprise, Public)
- 5.4.6** APs should work with the core network to support functionality to restrict the maximum number of permitted Wi-Fi® voice calls to a predetermined limit, so as not to overload backhaul connections. Where an AP delivers voice and data, this should include the capability to partition bandwidth on a static or dynamic basis between real-time and non-real-time traffic.  
(Applicable to Home, Enterprise, Public)
- 5.4.7** The AP should work with the core network to support functionality to alert the end user when there is insufficient network capacity available to facilitate their call.  
(Applicable to Home, Enterprise, Public)
- 5.4.8** The Wi-Fi® SIP UE and associated APs shall ensure that the Wi-Fi® mode voice quality, when in an environment without significant interference, shall be comparable to or better than that obtained with good coverage cellular including delay and echo. This applies to both incoming and outgoing calls.  
(Applicable to Home, Enterprise, Public)
- 5.4.9** The AP shall support handover between APs under the same public or enterprise environment maintaining the QoS requirements for the session/application in use.  
(Applicable to Enterprise, Public)
- 5.4.10** A range of AP enclosures should be available to support different operational environments, e.g. ruggedised units for outdoor APs and optional cable/DSL connections for home APs.  
(Applicable to Home, Enterprise, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.4.11** The AP shall have functionality to allow their default transmit power levels to be configured through a management interface (subject to country-specific regulatory constraints).
- (Applicable to Home, Enterprise, Public)
- 5.4.12** The AP shall be certified by the Wi-Fi Alliance for compliance to IEEE 802.11g.
- (Applicable to Home, Enterprise, Public)
- 5.4.13** The AP should be certified by the Wi-Fi Alliance for compliance to IEEE 802.11a and IEEE 802.11h (DFS/TPC) as per operator requirements.
- (Applicable to Home, Enterprise, Public)
- 5.4.14** Wi-Fi® SIP should not require any change in IP network configuration within customer premises equipment (CPE) or the broadband access network. In particular, it shall work with CPE/ISP NAT with no change. Although undesirable, it is recognised that there may need to be some CPE reconfigurations such as firewall configurations to support new functions required by Wi-Fi® SIP.
- 5.4.15** The AP should be 'plug and play' with minimal or no configuration.
- (Applicable to Home)
- 5.4.16** The AP shall be certified by the Wi-Fi Alliance for compliance to Wi-Fi Protected Setup™ Certifications (PIN/PBC).
- (Applicable to Home)
- 5.4.17** The AP should have the option to support detachable antennas, subject to country-specific regulatory constraints.
- (Applicable to Enterprise, Public)
- 5.4.18** The AP should have a transmit beacon period of 100 ms. The beacon period should be configurable between 100 ms and 1 sec.
- (Applicable to Home, Enterprise, Public)
- 5.4.19** The AP should support antenna diversity on a client-by-client basis.
- (Applicable to Home, Enterprise, Public)
- 5.4.20** The AP should support WDS to enable support for Wi-Fi® repeaters.
- (Applicable to Home, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.4.21** WDS should support security using a 'single touch mechanism'.  
(Applicable to Public)
- 5.4.22** The AP shall support the Wi-Fi® frequency channels available in the specific country/region.  
(Applicable to Home, Enterprise, Public)
- 5.4.23** The AP shall be compliant with Wi-Fi Alliance WMM® Power Save Certification.  
(Applicable to Home, Enterprise, Public)
- 5.4.24** The AP shall be able to support SSIDs as follows:
- 5.4.24.1 At least four SSIDs and associate network profiles and policy groups to these SSIDs.  
(Applicable to Home)
- 5.4.24.2 At least eight SSIDs and associate network profiles and policy groups to these SSIDs.  
(Applicable to Enterprise, Public)
- 5.4.25** The AP shall support the capability of broadcasting multiple SSIDs.  
(Applicable to Home, Enterprise, Public)
- 5.4.26** The AP shall have the capability, depending on user or operator requirements, to disable the broadcasting of SSIDs on an individual basis.  
(Applicable to Home, Enterprise, Public)
- 5.4.27** The AP shall support the mapping of individual SSIDs to specific VLAN tags, PPPoE/PPPoA sessions and DiffServ settings as required by operators.  
(Applicable to Home, Enterprise, Public)
- 5.4.28** The AP should support multiple (minimum of 2) PPPoE for clients and multiple simultaneous WAN PPPoE sessions for the purpose of SSID mapping.  
(Applicable to Home, Public)
- 5.4.29** The AP should support PPPoE pass-through for attached clients.  
(Applicable to Home, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.4.30** The AP should support bandwidth management on a per SSID basis.

(Applicable to Home, Enterprise and Public)

## **5.5 Generic Requirements for Mobility Controllers and Attached Thin Client APs**

- 5.5.1** Bandwidth control, bandwidth limitations and bandwidth prioritisation should be controlled from the mobility controller but based on core network policy managers, e.g. Policy Decision Functions (PDFs).

(Applicable to Enterprise, Public)

- 5.5.2** All services should be identified and classified via service flows. These service flows shall have the following metrics: (i) bandwidth requirement, (ii) latency, (ii) jitter, (iv) encryption method and (v) prioritisation queuing.

(Applicable to Enterprise, Public)

- 5.5.3** Parameters such as QoS, prioritisation, VLAN tagging shall be managed by the mobility controller.

(Applicable to Enterprise, Public)

- 5.5.4** The mobility controller should support mapping of BSSIDs to specific traffic priorities via IEEE 802.1p.

(Applicable to Enterprise, Public)

- 5.5.5** The mobility controller should have the capability of identifying voice traffic. This traffic identification may comprise of (i) inspecting the traffic such as in SIP signalling and media traffic, (ii) VLAN tagging using IEEE 802.1q, (iii) IEEE 802.1p priority tagging and (iv) DSCP (DiffServ Code Point) tagging. The network elements should be configured to recognise IEEE 802.1p, IEEE 802.1q and DSCP to maintain voice prioritisation and minimise latency and jitter.

(Applicable to Enterprise, Public)

- 5.5.6** The thin client AP should recognise priority tagged frames (IEEE 802.1p or DSCP) and direct them to the appropriate high priority queue.

(Applicable to Enterprise, Public)

- 5.5.7** The mobility controller shall be Wi-Fi Alliance WPA2™ Enterprise certified.

(Applicable to Enterprise, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.5.8** All security keys, apart from transient MAC level encryption, should be maintained in the mobility controller and not in the AP.  
  
(Applicable to Enterprise, Public)
- 5.5.9** The mobility controller shall support MAC address filtering (both blacklisting and whitelisting MAC addresses). APs shall support access control lists to restrict access to known MAC addresses. These lists shall be configurable via the management interface.  
  
(Applicable to Enterprise, Public)
- 5.5.10** The mobility controller should support stateful firewalls and have the ability to enforce policies based on Active Directories or RADIUS server/proxy.  
  
(Applicable to Enterprise, Public)
- 5.5.11** The mobility controller should support the capability of attached AP-to-AP handover for voice calls to be 100 ms or less.  
  
(Applicable to Enterprise, Public)
- 5.5.12** Connection redirection on a subnet-to-subnet basis should be controlled by the mobility controller.  
  
(Applicable to Enterprise, Public)
- 5.5.13** The mobility controller should support Call Admission Control (CAC).  
  
(Applicable to Enterprise, Public)
- 5.5.14** The mobility controller should support load-balancing to neighbouring AP as the need arises.  
  
(Applicable to Enterprise)
- 5.5.15** The mobility controller should support configurable timers for guest associations.  
  
(Applicable to Enterprise)
- 5.5.16** The AP should be able to download/update its configuration from the associated mobility controller.  
  
(Applicable to Enterprise, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.5.17** The mobility controller should have support for IEEE 802.1x in RADIUS as specified in IETF RFC 3580.  
  
(Applicable to Enterprise, Public)
- 5.5.18** The mobility controller should support downloadable access control lists from a central AAA server based on the user's authentication profile.  
  
(Applicable to Enterprise, Public)
- 5.5.19** The mobility controller should support download of 'static' QoS policies via the remote management system.  
  
(Applicable to Enterprise)
- 5.5.20** The mobility controller shall have functionality to assign IP addresses from a locally configured pool.  
  
(Applicable to Enterprise, Public)
- 5.5.21** The mobility controller shall have the functionality to assign IP addresses via reference to a (remote) DHCP server.  
  
(Applicable to Enterprise, Public)
- 5.5.22** The mobility controller should support static, RIP, RIPv2, BGP and OSPF routing protocols.  
  
(Applicable to Enterprise, Public)
- 5.5.23** The mobility controller should support Foreign Agent functionality as per IETF RFC 3344.  
  
(Applicable to Enterprise, Public)
- 5.5.24** The mobility controller should support built-in firewall capabilities that are certified by ICSA. Firewall support should cover the following functions: stateful packet inspection; IP source address filtering; IP destination address filtering; IP Protocol filtering; Port filtering; DMZ; ALGs; Port Forwarding; Denial of Service protection; Firewall rule partitioning per VLAN/IP subnets.  
  
(Applicable to Enterprise)
- 5.5.25** The mobility controller should have the option to support intrusion detection functions.  
  
(Applicable to Enterprise)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.5.26** The thin client AP should be able to connect at any point within the enterprise LAN and be able to make a level 3 end-to-end connection to the mobility controller if necessary.
- (Applicable to Enterprise)
- 5.5.27** The mobility controller shall support network address translation (NAT) and port address translation (PAT) functionalities according to IETF RFC 2022 and RFC 2766.
- (Applicable to Enterprise)
- 5.5.28** The mobility controller shall be able to classify outgoing traffic into WMM™ Access Categories based on the DSCP value in the IP header. The mapping between DSCP values and WMM™ Access Categories shall be configurable by the operator.
- (Applicable to Enterprise, Public)
- 5.5.29** The mobility controller shall support the following DHCP functionalities:
- 5.5.29.1 Server (IETF RFC 2131, RFC 2132)
  - 5.5.29.2 Relay Agent (IETF RFC 1452)
  - 5.5.29.3 Client (IETF RFC 2132)
  - 5.5.29.4 DHCP option 43
  - 5.5.29.5 DHCP option 60
  - 5.5.29.6 DHCP option 125
- (Applicable to Enterprise, Public)
- 5.5.30** The mobility controller should support the following DNS functionalities:
- 5.5.30.1 DNS Server (IETF RFC 1611)
  - 5.5.30.2 DNS Relay
  - 5.5.30.3 DNS client
- (Applicable to Enterprise)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 5.6 AP Network Capabilities

- 5.6.1** The AP shall support network address translation (NAT) and port address translation (PAT) functionalities according to IETF RFC 2022 and RFC 2766.

(Applicable to Home, Enterprise, Public)

- 5.6.2** The AP shall support the following DHCP functionalities:

5.6.2.1 Server (IETF RFC 2131, RFC 2132)

5.6.2.2 Relay Agent (IETF RFC 1452)

5.6.2.3 Client (IETF RFC 2132)

5.6.2.4 DHCP option 43

5.6.2.5 DHCP option 60

5.6.2.6 DHCP option 125

(Applicable to Home, Enterprise, Public)

- 5.6.3** The AP should support the following DNS functionalities:

5.6.3.1 DNS Server (IETF RFC 1611)

5.6.3.2 DNS Relay

5.6.3.3 DNS client

(Applicable to Home, Enterprise, Public)

## 5.7 RF Parameters

- 5.7.1** The AP Total Radiated Power (TRP) shall be measured according to the WFA/CTIA RF Performance Test Plan (at the rates and on the channels specified). The minimum FMCA TRP value shall be 15 mW and the target FMCA TRP value should be 30 mW.

(Applicable to Home, Enterprise, Public)

- 5.7.2** The AP Total Isotropic Sensitivity (TIS) shall be measured according to the WFA/CTIA RF Performance Test Plan. The minimum FMCA TIS value shall be -86

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

dBm for the 12 Mb/s IEEE 802.11g rate and 11 Mb/s IEEE 802.11b rate and the target FMCA TIS value should be -89 dBm.

(Applicable to Home, Enterprise, Public)

## **5.8 Bluetooth® Interface**

- 5.8.1** Inclusion of a Bluetooth® interface should be optional dependent upon operator requirements. If a Bluetooth® interface is supported on the AP, it shall support AFH (Bluetooth® v1.2).

(Applicable to Home)

- 5.8.2** Besides AFH, APs that support both IEEE 802.11b/g and Bluetooth® should support additional techniques (e.g. activity co-ordination between the two transceivers) to improve co-existence of both technologies and allow simultaneous operation of Bluetooth® and Wi-Fi® with better quality of experience.

(Applicable to Home)

## **5.9 Wi-Fi® QoS, Prioritisation and VLAN Tagging**

- 5.9.1** The AP shall be certified by the Wi-Fi Alliance for compliance to WMM™ (Wi-Fi Multimedia™).

(Applicable to Home, Enterprise, Public)

- 5.9.2** The AP shall identify voice packets (e.g. using IEEE 802.1p tags, DiffServ or IP ToS/DS markings) to internally prioritise voice packets ahead of any other data packets that are to be transmitted on the Wi-Fi® network.

(Applicable to Home, Enterprise, Public)

- 5.9.3** The AP shall be able to classify outgoing traffic into WMM™ Access Categories based on the DSCP value in the IP header. The mapping between DSCP values and WMM Access Categories shall be configurable by the operator.

(Applicable to Home, Public)

- 5.9.4** The AP shall support IEEE 802.1q for multiple VLANs.

(Applicable to Home, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

- 5.9.5** The AP shall support IEEE 802.1p.  
(Applicable to Home, Public)
- 5.9.6** The AP should support the mapping of SSID to WAN (backhaul) VLAN tags and WAN PPPoE/PPPoA sessions as required by operators.  
(Applicable to Home, Public)
- 5.9.7** The AP should support an operator-configurable mechanism to identify and differentiate between UE classes. It may be necessary to differentiate between UE classes if, for example, the UE classes support different QoS policies.  
(Applicable to Home, Public)

## **5.10 Access Point and Gateway Security Requirements**

(Applicable to Home, Enterprise, Public)

### **5.10.1 General**

- 5.10.1.1 The AP shall provide user management login and password authentication.
- 5.10.1.2 The AP shall support WEP (RC4), WPA™ (TKIP) Personal, and WPA2™ Personal at the minimum.
- 5.10.1.3 The AP shall be certified by the Wi-Fi Alliance for compliance to WPA2™ Enterprise.
- 5.10.1.3.1 The AP shall support one or more of: EAP-SIM, EAP-AKA, EAP-TLS, EAP-TTLS.
- 5.10.1.4 A user friendly mechanism shall be supported for first-time residential association. This shall provide a secure way to configure WPA™/WPA2™ without the need for the user to enter a pass phrase into the AP. It shall not be possible for a third party to crack the WPA™/WPA2™ security by eavesdropping the user friendly set-up process. The user friendly mechanism shall be certified against Wi-Fi Alliance Protected Setup™ Certification (PIN/PBC). The WPA™/WPA2™ pre-shared key provisioned by the user friendly mechanism should be at least eight characters, pseudo-random and consisting of digits 0-9 and characters a-z.
- 5.10.1.5 The PMK should be derived by the AP using GAA/GBA as specified in 3GPP TS 33.220.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 5.10.2 Link Layer

### 5.10.2.1 Common requirements (independent of convergence architecture)

- 5.10.2.1.1 The AP shall support open access, i.e. no link layer encryption.
- 5.10.2.1.2 The AP shall provide a visible indication of status of the link layer encryption. The indication should change automatically when the status changes.

### 5.10.2.2 SIP<sup>Convergence</sup>

- 5.10.2.2.1 The AP should support mutual authentication according to the IEEE 802.1x standard, using EAP-TLS and digital certificate from the network.

## 5.10.3 Network Layer

### 5.10.3.1 Common requirements (independent of convergence architecture)

- 5.10.3.1.1 The Gateway shall provide an indication of status of the network layer encryption for each user at Network Management workstations. The indication should change automatically when the status changes.

### 5.10.3.2 IMS<sup>Convergence</sup>

- 5.10.3.2.1 The P-CSCF, I-CSCF, S-CSCF and HSS shall support mutual authentication using IMS AKA as specified in 3GPP TS 33.203.
- 5.10.3.2.2 The P-CSCF shall support SIP signalling integrity using IPsec which terminates in the P-CSCF as specified in 3GPP TS 33.203.
- 5.10.3.2.3 The network shall support network authentication using certificates on the PDG in the network that encapsulates the call and signalling data in secure IPsec tunnels (equivalent to the PDG in 3GPP TS 33.234).
- 5.10.3.2.4 The PDG shall support network encryption using IPsec which terminates in each UE as specified in 3GPP TS 33.234.

### 5.10.3.3 SIP<sup>Convergence</sup>

- 5.10.3.3.1 The Gateway shall have a network certificate that the UE can check against its embedded root Certificate Authority (CA) certificate.
- 5.10.3.3.2 The Gateway shall support network encryption using IPsec which terminates in each UE.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## 5.11 Access Point Management

- 5.11.1** The AP should support remote management capabilities as specified in the DSL Forum TR-069 and TR-069 Amendment 1 technical report. This shall include SSL v3 support.
- (Applicable to Home)
- 5.11.2** The operator should have the option to disable DSL Forum TR-069 functionality.
- (Applicable to Home)
- 5.11.3** The AP shall support DSL Forum TR-098 in order to provide QoS functionality as well as configuration profiles to facilitate management and deployment.
- 5.11.4** The AP should support DSL Forum TR-104 and TR-110 as specified in the DSL Forum to provide remote VoIP device configuration and management.
- (Applicable to Home)
- 5.11.5** The AP should support DSL Forum TR-106 and TR-111 to allow for remote management of devices on a LAN, even those using the private IP space behind a NAT gateway.
- (Applicable to Home)
- 5.11.6** The AP should support the DSL Forum TR-069 data model for the management of AP capabilities, as specified in the DSL Forum TR-098 technical report: this applies in the case of APs embedded in an Internet Gateway Device. In the case of a device with only AP capabilities, compliance also to DSL Forum TR-106 and TR-111 should be maintained.
- (Applicable to Home)

## 5.12 General Inter-AP Mobility Requirements

- 5.12.1** The user experience of the AP-to-AP handover should be seamless with no loss of voice, no perceptible break and, where possible, a maximum voice break of no more than 100 ms.
- (Applicable to Enterprise, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

### 5.13 Regulatory Requirements

- 5.13.1** The AP shall comply with in-country/region mandatory Wi-Fi® Health and Safety requirements.  
  
(Applicable to Home, Enterprise, Public)
- 5.13.2** The AP shall comply with relevant in-country/region guidelines, e.g. CE marking and the EC WEEE directive.  
  
(Applicable to Home, Enterprise, Public)
- 5.13.3** The AP shall comply with the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines.  
  
(Applicable to Home, Enterprise, Public)
- 5.13.4** The AP shall comply with any in-country/region-specific access network regulations (e.g. UK Access Network Frequency Plan (ANFP)).  
  
(Applicable to Home, Enterprise, Public)
- 5.13.5** The AP should comply with the EC Code of Conduct on Energy Consumption of Broadband Equipment including stand-by, low-power modes.  
  
(Applicable to Home, Enterprise, Public)

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## References

Standard/Certification	Sections Referenced
<b>3GPP TS 23.107:</b> Quality of Service (QoS) concept and architecture	5.4.9 5.5.3 5.5.19 5.11.3
<b>3GPP TS 23.228:</b> IP Multimedia Subsystem (IMS); Stage 2	5.10.3.2
<b>3GPP TS 33.220:</b> Generic Authentication Architecture (GAA); Generic bootstrapping architecture	5.10.1.5
<b>3GPP TS 33.221:</b> Generic Authentication Architecture (GAA); Support for subscriber certificates	5.10.1.5
<b>3GPP TS 33.222:</b> Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS)	5.10.1.5
<b>DSL Forum TR-069:</b> CPE WAN Management Protocol (CWMP)	5.11.1 5.11.2 5.11.6
<b>DSL Forum TR-098:</b> DSL Home™ Internet Gateway Device Version 1.1 Datamodel for TR-069	5.11.3 5.11.6
<b>DSL Forum TR-100:</b> ADSL2/ADSL2plus Performance Test Plan	5.3.4.7
<b>DSL Forum TR-104:</b> DSL Home™ Provisioning Parameters for VoIP CPE	5.11.4
<b>DSL Forum TR-110:</b> DSL Home™ Reference Models for VoIP Configurations in the DSL Home	5.11.4
<b>DSL Forum TR-106:</b> Data Models Template for TR-069 Enabled Devices	5.11.5 5.11.6
<b>DSL Forum TR-111:</b> Applying TR-069 to Remote Management of Home Networking Devices	5.11.5 5.11.6
<b>DSL Forum WT-114:</b> G.VDSL2 Performance Test Plan	5.3.7.4
<b>ETSI ES 283 003:</b> IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Stage 3	5.2.10 5.4.5 5.4.8 5.4.14 5.5.4 5.10.3.2 5.10.3.3
<b>IEEE 802.1x:</b> Port Based Network Access Control	5.5.17 5.10.2.2.1
<b>IEEE 802.11h:</b> Spectrum and Transmit Power Management Extensions	5.4.13
<b>IETF RFC 2474:</b> Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers	5.5.5 5.5.6 5.5.28 5.9.3

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

<b>ITU-T G.991.2:</b> Single-pair high-speed digital subscriber line (SHDSL) transceivers	5.3.6.1
<b>ITU-T G.992.1:</b> Asymmetric digital subscriber line (ADSL) transceivers	5.3.2.1
<b>ITU-T G.992.3:</b> Asymmetric digital subscriber line transceivers 2 (ADSL2)	5.3.4.1 5.3.4.3
<b>ITU-T G.992.5:</b> Asymmetric Digital Subscriber Line (ADSL) transceivers – extended bandwidth ADSL2 (ADSL2plus)	5.3.4.1 5.3.4.2 5.3.4.3
<b>ITU-T G.993.2:</b> Very high speed digital subscriber line transceivers 2 (VDSL2)	5.3.7.1 5.3.7.2
<b>ITU-T G.994.1:</b> Handshake procedures for digital subscriber line (DSL) transceivers	5.3.4.2 5.3.4.6 5.3.7.3
<b>ITU-T G.997.1:</b> Physical layer management for digital subscriber line (DSL) transceivers	5.3.7.2
<b>ITU-T Q.921:</b> ISDN user-network interface – Data link layer specification	5.3.3.1
<b>ITU-T Q.931:</b> ISDN user-network interface layer 3 specification for basic call control	5.3.3.2
<b>ITU-T T.38:</b> Procedures for real-time Group 3 facsimile communication over IP networks	5.2.6
<b>ITU-T V.11:</b> Electrical characteristics for balanced double-current interchange circuits operating at data signalling rates up to 10 Mbit/s	5.3.5.1
<b>ITU-T X.21:</b> Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on public data networks	5.3.5.1
<b>WFA/CTIA RF Performance Test Plan</b>	5.7.1 5.7.2
<b>Wi-Fi Alliance IEEE 802.11g Certification</b>	5.4.12 5.7.1 5.7.2
<b>Wi-Fi Alliance IEEE 802.11a Certification</b>	5.4.13
<b>Wi-Fi Alliance Protected Setup™ Certification (PIN/PBC)</b>	5.4.16 5.10.1.4
<b>Wi-Fi Alliance WMM™ Power Save Certification</b>	5.4.23
<b>Wi-Fi Alliance WMM™ Certification</b>	5.4.23 5.5.28 5.9.1 5.9.3
<b>Wi-Fi Alliance WPA2™ Enterprise Certification</b>	5.5.7 5.10.1.3
<b>Wi-Fi Alliance WPA™/WPA2™ Certification</b>	5.10.1.2 5.10.1.4

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## Definitions

For the purposes of this document, the following terms and definitions apply:

Access Network	The collection of network entities and interfaces that provides the underlying IP transport connectivity between the user equipment and the network entities.
Access Point	A Wi-Fi® base-station. An Access Point (AP) acts as the communication hub for Wi-Fi® device users to be able to connect to services such as the Internet, PSTN and PBX, backhauled typically via a wired fixed access network.
Application	An application is a service enabler deployed by service providers, manufacturers or users. Individual applications will often be enablers for a wide range of services.
Associate/Association	The process of obtaining a registered connection (association) between a UE and a Wi-Fi® AP.
Attach	The process of obtaining a registered connection between a UE and a cellular base-station.
Cellular/cellular network	Use of 2G, 2.5G and 3G networks for voice and data services.
Convergence	<p>A converged fixed and mobile service is one that enables the user to access a wide variety of communications, information, and/or entertainment services, with consistent quality of service regardless of the end terminal used, the underlying network over which those applications run, or the user's location.</p> <p>SIP<sup>Convergence</sup> is a shorthand notation used to indicate a SIP-based architectural framework for delivering convergence services.</p> <p>IMS<sup>Convergence</sup> is a shorthand notation used to indicate an IMS architectural framework for delivering convergence services.</p>
Corporate/enterprise Wi-Fi® access	A device accessing a corporate or enterprise Wi-Fi® network.
Coverage	Zone of coverage created by one or multiple Wi-Fi® APs.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

Convergence Services using SIP over Wi-Fi®  
Product Requirement Definitions Release 3.0  
Access Point and Gateway Document

Device	A UE which could take several form factors, e.g. a mobile handset, PC or a PDA.
Enterprise	A corporate environment or workplace with extensive and existing LAN and WLAN infrastructure.
Gateway	A combined DSL/cable modem, router and AP with additional capabilities such as NAT, NATP, DHCP and personal firewall.
Handover	A case of mobility with service continuity, when the provision of services is preserved during the movement, but an impact on current communications may result in perception by the user (e.g. a short interruption in media exchange).
Home	A domicile or residence including SOHO environments.
IP multimedia subsystem	The architecture and protocols defined in 3GPP Release 5 and higher to support IP multimedia applications and services. Note that 3GPP has an alignment with 3GPP2.
Mobility	The ability for the user or other mobile entities to communicate and access services irrespective of changes of the location or technical environment. The degree of service availability may depend on several factors including the Access Network capabilities, service level agreements between the user's home network and the visited network (if applicable), etc. Mobility includes the ability of telecommunication with or without service continuity.
Operator	The organisation responsible for providing telecommunication services to users.
Outgoing call	A call originating from the dual-mode (Wi-Fi®/cellular) UE towards a fixed or mobile network or another dual-mode (Wi-Fi®/cellular) UE.
Public hotspot	A zone of continuous public access to IP networks owned by one or multiple operators via Wi-Fi® APs.
Quality of Service (QoS)	The collective effect of service performance which determines the degree of satisfaction of a user for this service.
Router	A functional block that determines the next network point to which a data packet should be forwarded en route to its destination.
Seamless Handover	A special case of mobility with service continuity, when the provision of services is preserved without any perceived impact on current communications during movement.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

Convergence Services using SIP over Wi-Fi®  
Product Requirement Definitions Release 3.0  
Access Point and Gateway Document

Security	The ability to prevent fraud as well as the protection of information availability, integrity and confidentiality.
Service(s)	A component of the portfolio of choices offered by service providers to a user, functionality offered to a user. A service is the user experience provided by one or more applications.
Stand-by Mode	State of a UE such that no IP-session or voice call is actually in progress, but the UE is accessible for session/call set-up (in either direction).
User	The person or organisation responsible for concluding contracts for the services subscribed to and for paying for these services.
User Equipment	A device allowing a user access to network services.
Wireless Fidelity (Wi-Fi®)	A wireless LAN technology based on IEEE 802.11 specifications. Wi-Fi® is a registered trademark of the Wi-Fi Alliance.
Wi-Fi® association	Set-up signalling and handshaking between a device and a Wi-Fi® AP, e.g. SSID, security association, channel allocation, data rates, capabilities.
Wi-Fi® SIP Service	SIP protocol based services via a Wi-Fi® access network.

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

## Acronyms

This document uses the following acronyms:

3GPP	Third Generation Partnership Project
AAA	Authentication, Authorisation, and Accounting
ADSL	Asymmetric Digital Subscriber Line
AFH	Adaptive Frequency Hopping
AKA	Authentication and Key Agreement
ALG	Application Layer Gateway
ANFP	Access Network Frequency Plan
AP	Access Point
APG	Access Point and Gateway
B2BUA	Back-to-Back User Agent
BGP	Border Gateway Protocol
CA	Certificate Authority
CAC	Call Admission Control
CE	Conformité Européenne
CPE	Customer Premises Equipment
CTIA	Cellular Telecommunications and Internet Association
CWMP	CPE WAN Management Protocol
DFS	Dynamic Frequency Selection
DHCP	Dynamic Host Configuration Protocol
DiffServ	Differentiated Services
DMZ	Demilitarised Zone
DNS	Domain Name Server
DPBO	Downstream Power Back Off
DS	Differentiated Services
DSCP	Differentiated Services Code Point
DSL	Digital Subscriber Line
EAP	Extensible Authentication Protocol
EC	European Community
EFM	Ethernet in the First Mile
ETSI	European Telecommunications Standards Institute
FMCA	Fixed-Mobile Convergence Alliance
GAA	Generic Authentication Algorithm
GBA	Generic Bootstrapping Architecture
HSS	Home Subscriber Server
IAD	Integrated Access Device
ICNIRP	International Commission on Non-Ionising Radiation Protection
ICSA	International Computer Security Association
I-CSCF	Interrogating Call State Control Function
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IMS	IP Multimedia Subsystem

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

Convergence Services using SIP over Wi-Fi®  
Product Requirement Definitions Release 3.0  
Access Point and Gateway Document

IP	Internet Protocol
IPsec	Internet Protocol Security
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
ITU-T	ITU Telecommunication Standardization Sector
LAN	Local Area Network
MAC	Medium Access Control
NAPT	Network Address Port Translation
NAT	Network Address Translation
NGN	Next Generation Network
OSPF	Open Shortest Path First
PAT	Port Address Translation
PBC	Push Button Configuration
PBO	Power Back Off
PBX	Private Branch Exchange
PC	Personal Computer
P-CSCF	Proxy Call State Control Function
PDA	Personal Digital Assistant
PDF	Policy Decision Function
PDG	Packet Data Gateway
PIN	Personal Identification Number
PMK	Pairwise Master Key
POTS	Plain Old Telephone Service
PPP	Point-to-Point Protocol
PPPoA	PPP over ATM
PPPoE	PPP over Ethernet
PRD	Product Requirement Definitions
PSTN	Public Switched Telephone Network
PTM	Packet Transfer Mode
QoS	Quality of Service
RADIUS	Remote Authentication Dial-In User Server
RC4	Ron's Code 4
RF	Radio Frequency
RFC	Request For Comments
RIP	Routing Information Protocol
S-CSCF	Serving Call Session Control Function
SDP	Session Description Protocol
SHDSL	Symmetrical High-Density Digital Subscriber Line
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SOHO	Small Office Home Office
SSID	Service Set Identifier
SSL	Secure Sockets Layer
TIS	Total Isotropic Sensitivity
TISPAN	Telecoms and Internet Converged Services and Protocols for Advanced Networks
TKIP	Temporal Key Integrity Protocol
TLS	Transport Layer Security

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.

Convergence Services using SIP over Wi-Fi®  
Product Requirement Definitions Release 3.0  
Access Point and Gateway Document

ToS	Type of Service
TPC	Transmit Power Control
TRP	Total Radiated Power
TTLS	Tunnelled Transport Layer Security
UAM	Universal Access Method
UE	User Equipment
UPBO	Upstream Power Back Off
USB	Universal Serial Bus
VDSL	Very High Speed DSL
VLAN	Virtual Local Area Network
VoIP	Voice over IP
WAN	Wide Area Network
WDS	Wireless Distribution System
WEEE	Waste Electrical and Electronic Equipment
WEP	Wired Equivalent Privacy
WFA	Wi-Fi Alliance
Wi-Fi®	Wireless Fidelity (registered trademark of the Wi-Fi Alliance)
WLAN	Wireless Local Area Network
WMM™	Wi-Fi® Multimedia
WPA™	Wi-Fi® Protected Access

**END OF DOCUMENT**

*The contents of the FMCA Product Requirement Definitions (PRD) are proprietary to the FMCA and its members and are, unless specifically indicated otherwise, protected by national and international copyright laws.*

*The FMCA PRD is published for reference purposes only, and not for general copying, distribution or alteration. The FMCA makes no representation or warranty that the PRD is accurate or error free or that licences in intellectual property rights will be available to those who implement any part of this PRD. The reader's attention is drawn to the Disclaimer section of the PRD.*

© 2007, FMCA, All Rights Reserved.