



WV-040 System Architecture Model

Candidate Version 1.2 – 22 May 2004

Open Mobile Alliance
OMA-IMPS-WV-Arch-V1_2-20040522-C

Continues the Technical Activities
Originated in the Wireless Village Initiative



Use of this document is subject to all of the terms and conditions of the Use Agreement located at <http://www.openmobilealliance.org/UseAgreement.html>.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile Alliance™ specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavors to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the “OMA IPR Declarations” list at <http://www.openmobilealliance.org/ipr.html>. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR'S REPRESENTED ON THE “OMA IPR DECLARATIONS” LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

© 2004 Open Mobile Alliance Ltd. All Rights Reserved.

Used with the permission of the Open Mobile Alliance Ltd. under the terms set forth above.

Contents

1. SCOPE	4
2. REFERENCES	5
2.1 NORMATIVE REFERENCES	5
2.2 INFORMATIVE REFERENCES	5
3. TERMINOLOGY AND CONVENTIONS	7
3.1 CONVENTIONS	7
3.2 DEFINITIONS	7
3.3 ABBREVIATIONS	7
4. INTRODUCTION	8
5. SYSTEM ARCHITECTURE	9
6. FUNCTIONAL DESCRIPTION OF ARCHITECTURAL ELEMENTS	11
6.1 WV SERVER	11
6.1.1 Presence Service Element	11
6.1.2 Instant Messaging Service Element	11
6.1.3 Group Service Element	11
6.1.4 Content Service Element	11
6.1.5 Service Access Point	11
6.2 WV EMBEDDED CLIENT	13
6.3 CLI CLIENT	13
7. INTERFACES AND PROTOCOLS	14
7.1 CLIENT SERVER PROTOCOL (CSP)	14
7.2 COMMAND LINE PROTOCOL (CLP)	14
7.3 SERVER SERVER PROTOCOL (SSP)	14
7.4 SERVER MOBILE CORE NETWORK PROTOCOL (SMCNP)	14
APPENDIX A. CHANGE HISTORY (INFORMATIVE)	15
A.1 APPROVED VERSION HISTORY	15
A.2 DRAFT/CANDIDATE VERSION 1.2 HISTORY	15

1. Scope

The Wireless Village Instant Messaging and Presence Service (IMPS) includes four primary features:

- Presence
- Instant Messaging
- Groups
- Shared Content

Presence is the key enabling technology for IMPS. It includes client device availability (my phone is on/off, in a call), user status (available, unavailable, in a meeting), location, client device capabilities (voice, text, GPRS, multimedia) and searchable personal statuses such as mood (happy, angry) and hobbies (football, fishing, computing, dancing). Since presence information is personal, it is only made available according to the user's wishes - access control features put the control of the user presence information in the users' hands.

Instant Messaging (IM) is a familiar concept in both the mobile and desktop worlds. Desktop IM clients, two-way SMS and two-way paging are all forms of Instant Messaging. Wireless Village IM will enable interoperable mobile IM in concert with other innovative features to provide an enhanced user experience.

Groups or chat are a fun and familiar concept on the Internet. Both operators and end-users are able to create and manage groups. Users can invite their friends and family to chat in group discussions. Operators can build common interest groups where end-users can meet each other online.

Shared Content allows users and operators to setup their own storage area where they can post pictures, music and other multimedia content while enabling the sharing with other individuals and groups in an IM or chat session.

These features, taken in part or as a whole, provide the basis for innovative new services that build upon a common interoperable framework.

2. References

2.1 Normative References

- [CREQ] "Specification of WAP Conformance Requirements". Open Mobile Alliance™. WAP-221-CREQ.
<http://www.openmobilealliance.org/tech/affiliates/wap/wapindex.html>
- [CSP SCR] "WV-048 Client-Server Protocol Static Conformance Requirement Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [IMPP-CPIM] A Common Profile for Instant Messaging (CPIM), Internet Draft, August 2002.
[URL:http://www.ietf.org/internet-drafts/draft-ietf-impp-cpim-03.txt](http://www.ietf.org/internet-drafts/draft-ietf-impp-cpim-03.txt)
- [RFC822] "Standard for the Format of ARPA Internet Text Messages", August 1982.
[URL:http://www.ietf.org/rfc/rfc822.txt](http://www.ietf.org/rfc/rfc822.txt)
- [RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997.
[URL:http://www.ietf.org/rfc/rfc2119.txt](http://www.ietf.org/rfc/rfc2119.txt)
- [RFC2234] "Augmented BNF for Syntax Specifications: ABNF". D. Crocker, Ed., P. Overell. November 1997. [URL:http://www.ietf.org/rfc/rfc2234.txt](http://www.ietf.org/rfc/rfc2234.txt)
- [RFC2778] "A Model for Presence and Instant Messaging", February 2000.
[URL:http://www.ietf.org/rfc/rfc2778.txt?number=2778](http://www.ietf.org/rfc/rfc2778.txt?number=2778)
- [RFC2779] Instant Messaging / Presence Protocol Requirements, Feb. 2000.
[URL:http://www.ietf.org/rfc/rfc2779.txt?number=2779](http://www.ietf.org/rfc/rfc2779.txt?number=2779)
- [SSP SCR] "WV-055 SSP – Server-Server Protocol Static Conformance Requirement Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [TS 22.121] Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Service aspects; The Virtual Home Environment (3GPP TS 22.121 version 4.1.0 Release 4).
[URL:ftp://ftp.3gpp.org/Specs/archive/22_series/22.121/22121-410.zip](ftp://ftp.3gpp.org/Specs/archive/22_series/22.121/22121-410.zip)
- [TS 23.127] Universal Mobile Telecommunications System (UMTS); Virtual Home Environment/Open Service Architecture (3GPP TS 23.127 version 4.2.0 Release 4).
[URL:ftp://ftp.3gpp.org/Specs/archive/23_series/23.127/23127-420.zip](ftp://ftp.3gpp.org/Specs/archive/23_series/23.127/23127-420.zip)

2.2 Informative References

- [FeaFun] "WV-041 Features and Functions Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [CSP] "WV-042 Client-Server Protocol Session and Transactions Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [CSP DTD] "WV-043 Client-Server Protocol DTD and Examples Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [CSP Trans] "WV-044 Client-Server Protocol Transport Bindings Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)
- [CSP DataType] "WV-045 Client-Server Protocol Data Types Version 1.2". Open Mobile Alliance.
[URL:http://www.openmobilealliance.org/release_program/enabler_releases.html](http://www.openmobilealliance.org/release_program/enabler_releases.html)

[CSP SMS]	"WV-046 Client-Server Protocol SMS Binding Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[CSP WBXML]	"WV-047 Client-Server Protocol Binary Definition and Examples Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[CSP SCR]	"WV-048 Client-Server Protocol Static Conformance Requirement Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[PA]	"WV-049 Presence Attributes Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[PA DTD]	"WV-050 Presence Attribute DTD and Examples Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[CLP]	"WV-051 Command Line Protocol Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[SSP]	"WV-052 SSP - Server-Server Protocol Semantics Document Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[SSP Syntax]	"WV-053 Server-Server Protocol XML Syntax Document Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[SSP Trans]	"WV-054 SSP - Transport Binding Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[SSP SCR]	"WV-055 SSP – Server-Server Protocol Static Conformance Requirement Version 1.2". Open Mobile Alliance. URL:http://www.openmobilealliance.org/release_program/enabler_releases.html
[WAPARCH]	“WAP Architecture, Version 12-July-2001”. Open Mobile Alliance™. WAP-210-WAPArch. http://www.openmobilealliance.org/tech/affiliates/wap/wapindex.html

3. Terminology and Conventions

3.1 Conventions

This is an informative document, which is not intended to provide testable requirements to implementations.

3.2 Definitions

None

3.3 Abbreviations

CLP	Command Line Protocol
CLI	Command Line Interface
WV	Wireless Village
CSP	Client Server Protocol
SSP	Server Server Protocol
MCN	Mobile Core Network
IM&P	Instant Messaging and Presence
IMPS	Instant Messaging and Presence Services
SMCNP	Server to Mobile Core Network Protocol

4. Introduction

The Wireless Village Mobile Instant Messaging and Presence Services (IMPS), intends to define and promote a set of universal specifications for mobile instant messaging and presence services. The specifications will be used for exchanging messages and presence information between mobile devices, mobile services and Internet-based instant messaging services, all fully interoperable and leveraging existing web technologies.

5. System Architecture

The System Architecture describes the IMPS system and its relation to mobile networking and the Internet. This is a client-server-based system, where the server is the IMPS server and clients can be either mobile terminals, or other services/applications, or fixed PC-clients. For interoperability, the IMPS servers and Gateways are connected with a Server-to-Server Protocol (SSP). The architecture gives implementers more choices in WV Servers or Gateways, but with WV brand and technology.

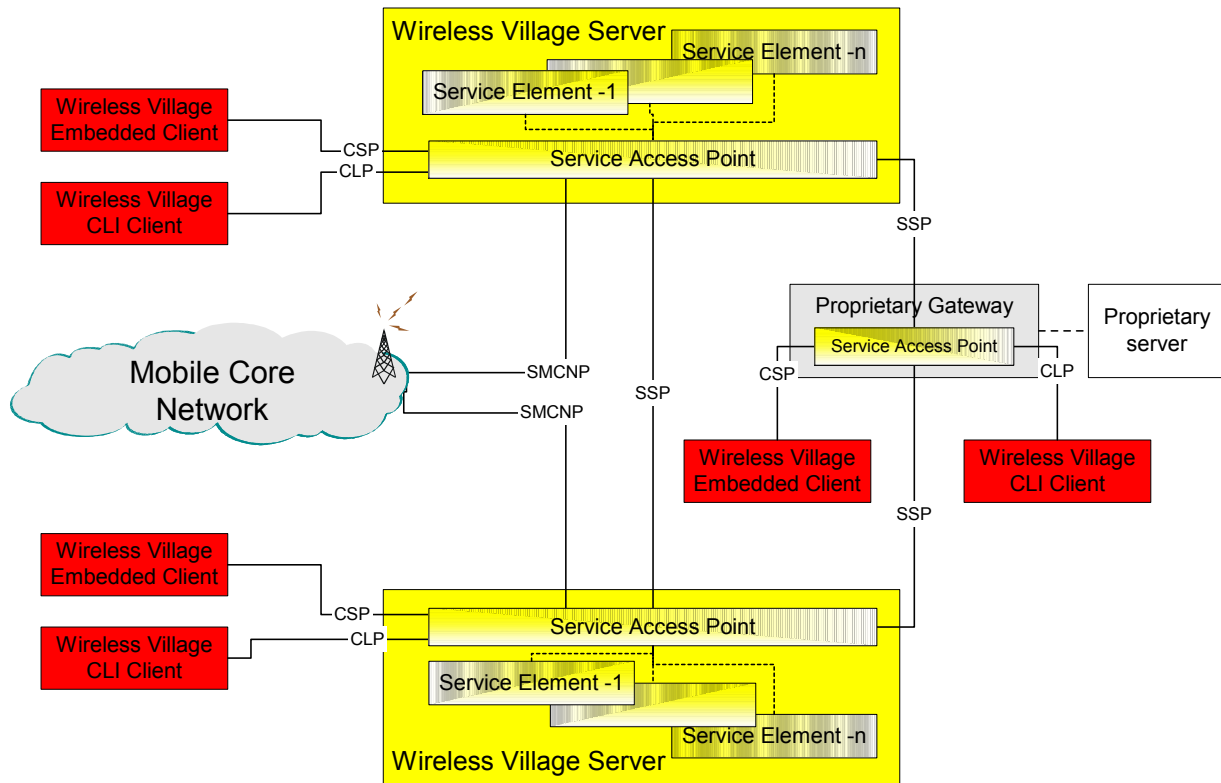


Figure 1: The Wireless Village System Architecture Model

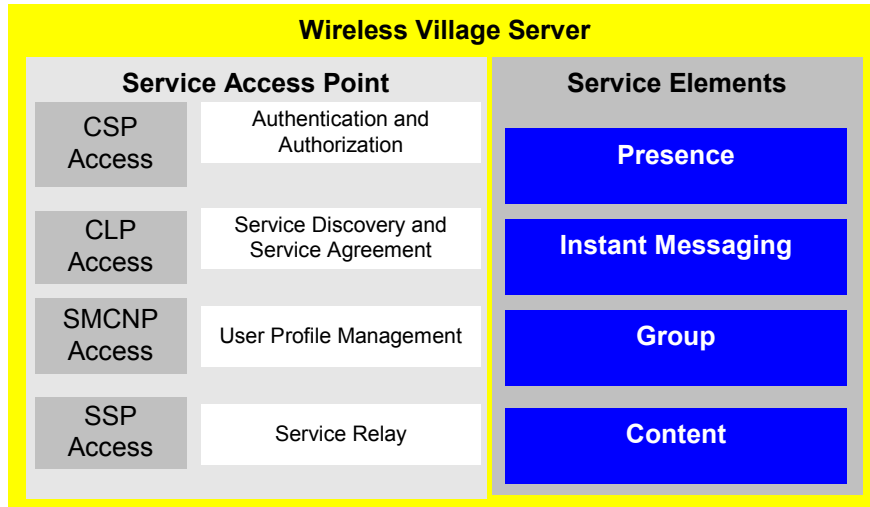


Figure 2: Functional Elements of Wireless Village Server

6. Functional Description of Architectural Elements

6.1 WV Server

The Wireless Village Server is the central point in a Wireless Village system. It is composed of four Application Service Elements that are accessible via the Service Access Point. The Application Service Elements are:

- Presence Service Element
- Instant Messaging Service Element
- Group Service Element
- Content Service Element

6.1.1 Presence Service Element

The Presence Service Element provides functionality for presence information management. This includes update, retrieve, set and store presence and location information. Presence information can be manipulated implicitly by the system, or explicitly by the user.

A user can subscribe to receive the presence information of other users, as specified in a contact list. Contact List Management is also a part of the presence service.

Presence information can be fetched from different internal and external sources. Through the Service Access Point (described below) the Presence Service Element can connect to the Mobile Core Network to access network presence and service information. Network presence defines the properties of the mobile devices, as well as the underlying network functionality. The Network service features define the properties related to the wireless devices on the wireless network, and determine the ability to communicate with a particular wireless device.

6.1.2 Instant Messaging Service Element

The Instant Messaging Service Element provides functionality for sending and receiving instant messages. An instant message may be sent to, or received from, a specific WV-user, or users of other instant messaging systems. It is also possible to send instant messages to a group of WV-users. WV supports several messages types, such as plain text, video, picture and sound.

6.1.3 Group Service Element

The Group Service Element provides functionality for use and management of groups. The groups can be private or public. A common usage of the Group Service is a chat room. It is also possible to bind content to the Groups.

6.1.4 Content Service Element

The Content Service Element provides functionality for sharing content such as images and documents between Wireless Village users. The shared content feature allows the IMPS users to share content while sending messages or chatting in a group.

6.1.5 Service Access Point

The Service Access Point (SAP) serves as the interface between the WV server and its environment. It has interfaces to the WV clients, other WV servers, the Mobile Core Network and Proprietary Gateways to non-WV servers.

The functionality of the Service Access Point is:

- Authentication and Authorization
- Service Discovery and Service Agreement

- User Profile Management
- Service Relay

Some potentially useful functions, such as a service administration and monitoring interface, a provisioning interface, and a billing interface, etc., are subject to the implementation in the real world. Those functions are outside of the scope of the Wireless Village and will not be addressed within this document.

6.1.5.1 Authentication and Authorization

Authentication is used to verify the identity of an entity (user, network, or application). Authorization is the activity of determining what an authenticated entity (user, network, or application) is allowed to do.

There are several types of mechanisms for authentication and authorization:

- Application-Network Authentication / Authorization.
- User-Application Authentication / Authorization.
- Application-Application Authentication / Authorization
- User-Network Authentication (only for Authentication)

6.1.5.2 Service Discovery and Service Agreement

Service Discovery enables the application to identify the total collection of service capability features that it can use. The service discovery process includes service capability registration and service capability notification. This is done both between Client – Server and Server –Server.

A **Service Agreement** (also known as a Service Level Agreement) must be established before the server can interact with the Network Service Capability or other servers' service capabilities, and provides the client with the services.

Upon successful authentication, the server may obtain information about the network capability and service capability features. The client may obtain the service capability features provided by the server. The services include the network services and IMPS services (presence service, IM service, group service and shared content service).

6.1.5.3 User Profile Management

One or more User Profile(s) describe(s) how the user wishes to manage and interact with their communication services. The User Profile information consists of various user interfaces and service related information including the list of services to which the end-user is subscribed, preferences associated with those services, service status (active / inactive), privacy status with regards to network service capabilities (e.g. user location, user interaction), terminal capabilities and terminal interface preferences etc.

User Profile Management allows the application to retrieve and update the user profile.

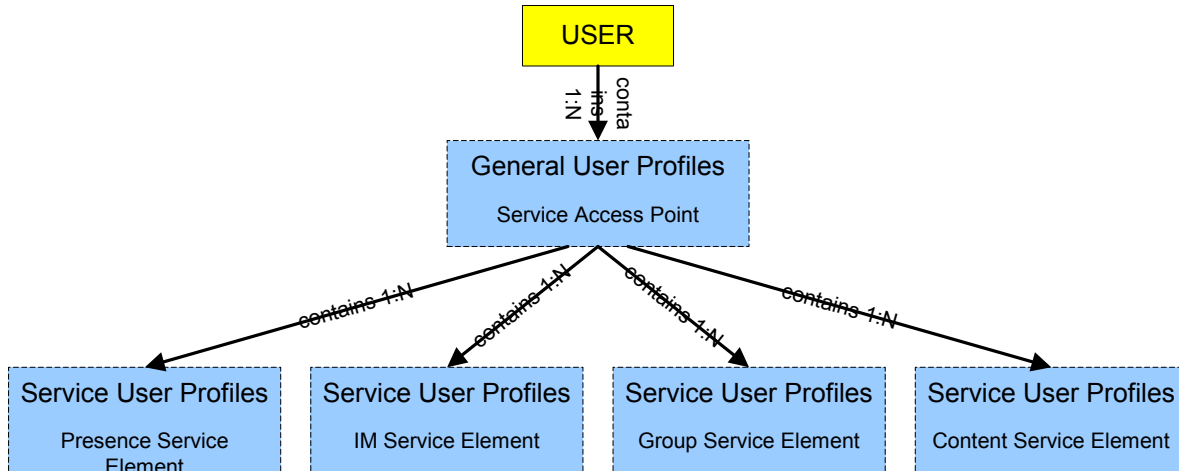


Figure 3: User Profiles

6.1.5.4 Service Relay

The Service Access Point must provide the Service Relay function to route all service requests and responses among the servers through the Server-to-Server Protocol (SSP). The protocol conversion from CSP to SSP and message codec may be needed when performing Service Relay.

6.2 WV Embedded Client

The Wireless Village Embedded Client is an embedded client within a mobile terminal. The clients from different vendors will have a different look, and will not have the exact same functionality. It is possible to take the functions from the Wireless Village system and combined them with the functions from the mobile terminal, e.g., the phonebook. The benefit with the Wireless Village embedded client is that despite the difference in the clients, clients will be fully interoperable with each other through the Client Server Protocol.

6.3 CLI Client

The Command Line Interface Client uses text messages to communicate with the Wireless Village server. The functionality provided might be a subset of the functionality provided by an Embedded Client. An Example of a CLI Client is a mobile terminal that uses SMS to communicate with the Wireless Village server.

7. Interfaces and Protocols

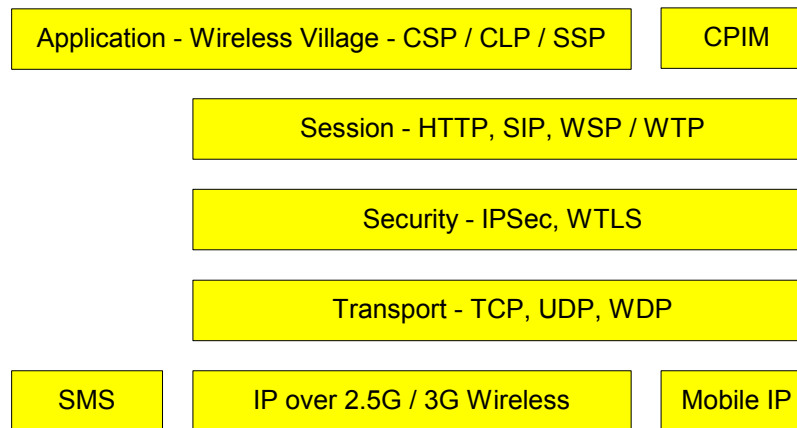


Figure 4: Interfaces and Protocols

7.1 Client Server Protocol (CSP)

The Client-Server Protocol provides access for Embedded Clients within mobile terminals and desktop clients to access the Wireless Village Server. The protocol can use different bearers depending on the capability of the client.

7.2 Command Line Protocol (CLP)

The Command Line Protocol makes it possible to provide access for legacy terminals via a command line client to the Wireless Village server.

7.3 Server Server Protocol (SSP)

The Server-Server Protocol connects Wireless Village servers. This can be used within one service provider domain or between different service providers. In this way the system will be interoperable so that a user that subscribes to Wireless Village services at Service Provider A can communicate with a user that is a customer of Service Provider B. The SSP is also used when connecting a Wireless Village server to Proprietary IMPS service via a Proprietary Gateway.

7.4 Server Mobile Core Network Protocol (SMCNP)

The Server Mobile Core Network Protocol gives access to the Mobile Core Network so that the Wireless Village server can get presence information and service capability information from the network. The SMCNP can also be used for authentication and authorization of users, clients and servers.

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-WV-Arch-V1_1-20021001-A	01 Oct 2002	Version 1.1

A.2 Draft/Candidate Version 1.2 History

Document Identifier	Date	Sections	Description
Candidate Versions OMA-IMPS-WV-Arch-V1_2	02 Feb 2003	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2003-0109-IMPS-V1_2-Candidate-Package
	22 May 2004	Overall 3.1	The 2004 spec template applied and the document reference and hyperlinks corrected. Convention description corrected as this document is informative.