Converged Address Book Architecture

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Open Mobile Alliance

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1. Scope   (Informative)

This document describes the Converged Address Book (CAB) 1.1 Enabler architecture designed to fulfil the requirements as described in [CAB 1.1 RD].

The description of the architecture comprises the definition of functional components and the interfaces/reference points used or exposed by these functional components.

2. References

2.1 Normative References

[CAB 1.0 AD]	"Converged Address Book Architecture", Open Mobile Alliance™, OMA-AD-CAB-V1_0, URL:http://www.openmobilealliance.org/
[CAB 1.1 RD]	"Converged Address Book 1.1 Requirements", Open Mobile Alliance™, OMA-RD-CAB-V1_1, URL:http://www.openmobilealliance.org/
[CAB 1.1 TS]	"Converged Address Book 1.1 Technical Specification", Open Mobile Alliance™, OMA-TS-CAB-V1_1, URL:http://www.openmobilealliance.org/
[OMA DM SO]	"OMA Device Management Standardized Objects", Version 1.2, Open Mobile Alliance™, OMA-TS-DM-StdObj-V1_2, URL: http://www.openmobilealliance.org/
[OMA DM TND]	"OMA Device Management Tree and Description", Version 1.2, Open Mobile Alliance™, OMA-TS-DM-TND-V1_2, URL: http://www.openmobilealliance.org/
[OMA DS]	"SyncML Representation Protocol, Data Synchronization Usage", Version 1.2, Open Mobile Alliance™, OMA-TS-DS_DataSyncRep-V1_2, URL:http://www.openmobilealliance.org/
[OMA Push AD]	"Push Architecture" Version 2.2, Open Mobile Alliance™, OMA-AD-Push-V2_2, URL: http://www.openmobilealliance.org/
[OMA XDM AD]	"XML Document Management Architecture", Version 2.1, Open Mobile Alliance™, OMA-AD-XDM-V2_1, URL:http://www.openmobilealliance.org/
[OSE]	"OMA Service Environment", Open Mobile Alliance™, URL:http://www.openmobilealliance.org/
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

2.2 Informative References

[OMA DM SEC]	"OMA Device Management Security", Version 1.2, Open Mobile Alliance™, URL:http://www.openmobilealliance.org/
[OMA Pres]	"OMA Presence SIMPLE", Version 2.0, Open Mobile Alliance™, URL:http://www.openmobilealliance.org/
[OMADICT]	"Dictionary for OMA Specifications", Version 2.9, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_9, URL:http://www.openmobilealliance.org/

3. Terminology and Conventions

3.1   Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2   Definitions

AB Document	An XDM Document containing AB
Access Permissions	Uses definition from [OMA XDM AD]
Access Permissions Document	Uses definition from [OMA XDM AD].
Address Book	As described in [CAB 1.1 RD].
Aggregation Proxy	Uses definition from [OMA XDM AD].
CAB Client	A Client (Source: [OMA DICT]) that is used to access CAB features.
CAB Feature Handler Document	An XDM Document containing data for CAB User's feature requests and their responses
CAB Server	A CAB functional component as described in section 5.3.1.2 *"CAB Server"*.
CAB User	Uses definition from [CAB 1.1 RD].
CAB User Preferences	A set of preferences that a CAB User can set.
CAB User Preferences Document	An XDM Document containing CAB User Preferences.
CAB XDMS	A CAB functional component as described in section 5.3.1.3 *"CAB XDMS"*.
Communication History	Uses definition from [CAB 1.1 RD].
Contact Share	Uses definition from [CAB 1.1 RD].
Contact Status	Information on the current state of contacts from CAB User's AB that is provided by the CAB service and cannot be changed by the CAB User.
Contact Subscription	Uses definition from [CAB 1.1 RD].
Contact View	Uses definition from [CAB 1.1 RD].
DS Client	Uses definition of "Client" from [OMA DS]
DS Server	Uses definition of "Server" from [OMA DS]
Enabler	Uses definition from [OMA DICT].
External Directories	Non-CAB data sources that are made available by the service provider (e.g. yellow pages, enterprise directories).
External Profile	Uses definition from [CAB 1.1 RD].
Favorite Contact	Uses definition from [CAB 1.1 RD].
History Information	Uses definition from [OMA XDM AD]
Legacy Formats	Uses definition from [CAB 1.1 RD].
Management Object	Uses definition from [OMA DM TND]
Non-CAB address book system	An address book system that does not comply with CAB Enabler.
Non-CAB User	A user of a service that does not conforms to the CAB Enabler.

Personal Contact Card	Uses definition from [CAB 1.1 RD].
PCC Document	An XDM Document containing PCC.
Published Contact Card	Uses definition from [CAB 1.1 RD].
Service Provider	Uses definition from [OMA DICT].
Subscription Proxy	Uses definition from [OMA XDM AD].
Usage Information	Uses definition from [CAB 1.1 RD].
XDMC	Uses definition from [OMA XDM AD].
XDM Agent	Uses definition from [OMA XDM AD].
XDM Document	Uses definition from [OMA XDM AD]
XDMS	Uses definition from [OMA XDM AD].

3.3   Abbreviations

AB	Address Book
AD	Architecture Document
API	Application Programming Interface
CAB	Converged Address Book
DM	Device Management
DS	Data Synchronization
OMA	Open Mobile Alliance
PCC	Personal Contact Card
SIP	Session Initiation Protocol
URL	Uniform Resource Locator
XDCP	XDM Command Protocol
XDM	XML Document Management
XDMS	XML Document Management Server
XML	eXtensible Markup Language

4. Introduction (Informative)

The CAB 1.1 Enabler provides the CAB User with the features described in sub clause 4.1. The architecture of CAB 1.1 Enabler is based on CAB 1.0 architectural principles and is therefore backwards compatible with CAB 1.0 AD, while supporting new requirements as described in [CAB 1.1 RD]. The CAB 1.1 architecture utilizes data management and synchronization [OMA DS] and XML document management [OMA XDM AD] technologies to fulfil the requirements.

4.1 Version 1.1

CAB 1.1 Enabler provides the following features that include both new features and all existing features supported in CAB 1.0.

1) Management of AB – The CAB Enabler allows a CAB User to store and manage (e.g. add, delete, modify, cancel last modification) his/her AB in a network-based repository. The AB or subsets of the AB is/are kept up-to-date on all devices of the CAB User.

2) Management of PCC – The CAB Enabler allows a CAB User to publish and manage (e.g. add, delete, modify, cancel last modification) his/her own contact information in terms of the PCC, which is stored in a network-based repository. The CAB User's PCC can be published to other CAB Users through the Contact Views, based on authorization rules established by the CAB User. The PCC information stored in the network may be kept up-to-date on all devices of the CAB User.

3) Contact Subscription – The CAB Enabler allows a CAB User to request the CAB Server to subscribe to other CAB User's contact information changes i.e. request to receive automatic updates of another CAB User's available Published Contact Card. The resulting information from a Contact Subscription may be processed further to combine with the information that the CAB User customizes about the subscribed contacts.

4) Notifications and status information – The CAB Enabler allows the CAB User A to receive notifications in the following cases:

    a. Incoming authorization request from other CAB User(s) for Contact Subscription (if CAB User A has not already established an authorization rule).

    b. When changes are made to the Published Contact Card of CAB User B to which the CAB User A is subscribed.

    c. When CAB User B adds CAB User A to their AB.

    d. Updates of Contact Status information for CAB or non-CAB contact, Contact Subscription status (e.g. pending, approved, changed, notification of subscription invitations) and other information (e.g. service provider defined).

    e. Changes to their own AB and PCC in the network.

5) Sharing contact information – The CAB Enabler provides a CAB User with the ability to send contact information from his/her own AB or PCC to other users. The recipients of the information can be both CAB and non-CAB User(s).

6) Searching contact information – The CAB Enabler provides a mechanism to search for contact information. This mechanism allows a CAB User to search for contact information in:

    a. CAB User's own PCC,

    b. Other CAB User's Published Contact Cards in home and remote CAB systems,

    c. CAB User's own AB,

    d. External Directories.

    The contact information made available for search operations is subject to the CAB User's authorization rules, CAB provider policies and other providers' policies.

7) Exposure of CAB information to external Enablers - The CAB Enabler provides the ability to expose CAB information related to CAB User's data contained in the AB and PCC to other Enablers or applications, subject to user authorization and/or service provider policies.

8) Interaction with non-CAB address book systems – The CAB Enabler provides the ability to interact with non-CAB address book system(s). This allows the CAB User to import data into the AB from non-CAB address book and/or to exchange data with non-CAB address book systems. In order to exchange data with non-CAB systems:

   a. An implementation of CAB Enabler could use published APIs of the non-CAB systems to access data from non-CAB systems.

   b. 3rd party systems can access CAB AB and PCC data via OMA published APIs (e.g. OMA CAB APIs 1.0).

9) Enhancing user experience – The CAB Enabler enhances a CAB user's experience in using the Address Book by

   a. Maintaining CAB User's Favorite Contact information

   b. Keeping up-to-date all Communication History and Usage Information across multiple devices of a CAB User

   c. Associating recent activity data with the corresponding contacts in a CAB User's AB

10) Social Networking features- The CAB Enabler expands the social networking experience of a CAB User by

   a. Allowing a CAB User to receive suggestions (e.g. contacts, service suggestion)

   b. Support viewing of public content (e.g. blogs, RSS feed, news) relevant to contacts in the CAB User's AB

   c. Identifying Common Connections with contacts in the CAB User's AB

Some CAB requirements are dealing with lawful interception. These capabilities are generic in nature and can be resolved in various ways in a solution implementation that do not require interoperability and hence should not be specific to CAB, or developed as part of CAB. The realization of those capabilities is left to the implementation or may become a topic of activity for a future OMA enabler.

5. Architectural Model

The CAB 1.1 Enabler AD provides support for developing CAB based services, and is realized using a client-server concept. It interacts with other network elements and re-uses concepts and technologies specified by other OMA Enablers (e.g. OMA DS [OMA DS] and OMA XDM [OMA XDM AD]). The architecture is designed to support a wide range of devices independent of the access technology.

The architecture is based on the requirements described in [CAB 1.1 RD] and conforms to [OSE].

5.1 Dependencies

The CAB 1.1 Enabler depends on other OMA Enablers and external entities, including:

- OMA XDM [OMA XDM AD] that provides support for the functions of the CAB XDMS(s).

- OMA DS [OMA DS] that provides support for the synchronization of the CAB User's address book.

- OMA DM [OMA DM SO] that provides support for remote provisioning and management of the Management Object containing necessary configuration parameters for the CAB Client.

- OMA Push [OMA Push AD] that provides support for notifications to XDM Document changes.

- SIP/IP Core [OMA XDM AD] *"SIP/IP Core"*; which performs a variety of services in support of CAB functions.
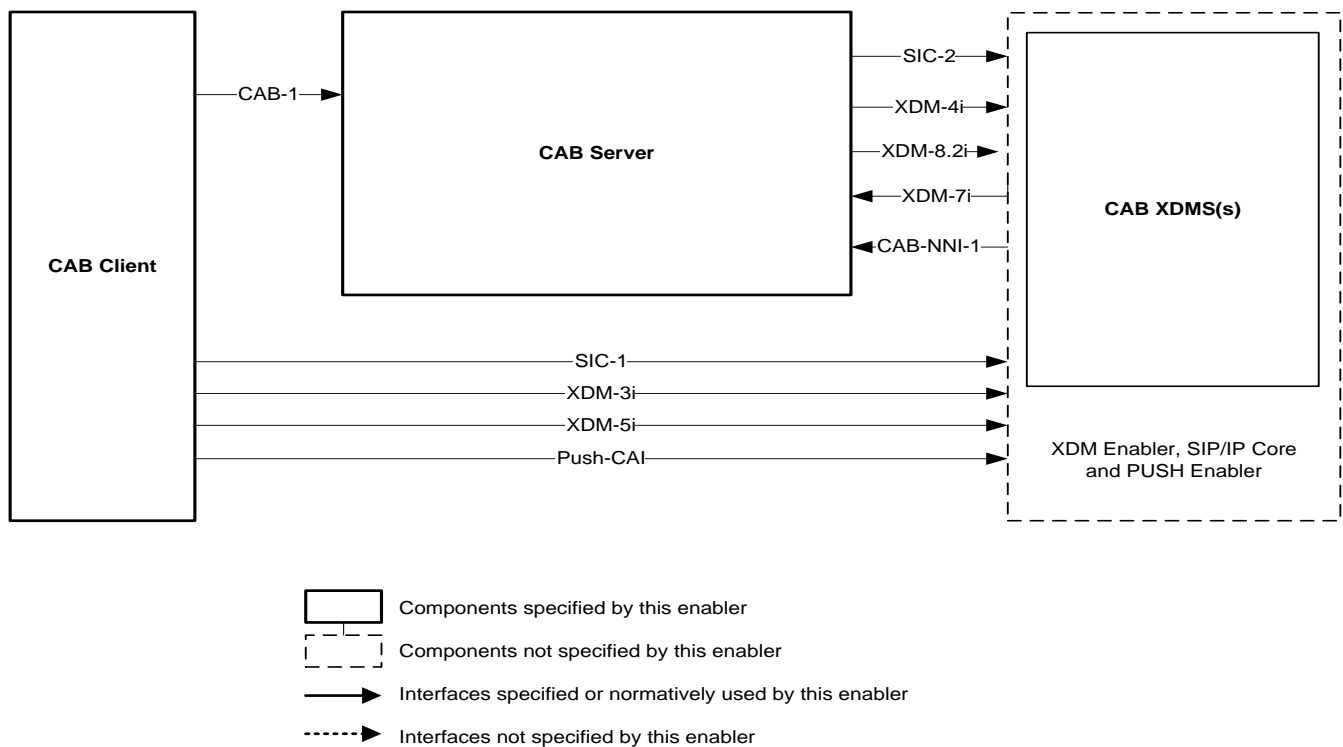
5.2 Architectural Diagram

Figure 1: CAB 1.1 Architecture Diagram

5.3   Functional Components and Interfaces/reference points definition

5.3.1   Functional Components

5.3.1.1   CAB Client

The CAB Client SHALL perform the following:

- Synchronize modifications (e.g. add, delete, modify) of a local subset of address book information that is contained in the network-based AB repository (i.e. AB Application Usage in CAB XDMS).

- Send and receive address book related contact information.

- Send and receive address book related contact information in vCard as a Legacy Format.

- Manage AB information.

- Manage PCC information.

- Receive CAB Contact Status information, including:

    o   Contact type;

    o   Incoming Contact Subscription request;

    o   Incoming Contact Suscription invitation;

    o   Contact suggestions;

    o   Service suggestions;

    o   Common Connections;

    o   Public content.

- Request import of non-CAB address book information.

- Request import of External Profile and export of PCC information from/to non-CAB systems.

- Request subscription to changes in CAB User's External Profile at 3rd party systems to keep PCC information up-to-date.

- Receive contact suggestions from an external public contact database or from within the CAB system, based on CAB User's request or preferences.

- Contact Subscription interaction (e.g. requesting the subscription, reactive authorization).

- Contact Share interaction (e.g. requesting the Contact Share, resolution of received Contact Shared data).

- Search for available contact information.

- Manage CAB User Preferences information.

- Manage CAB User Access Permissions information.

- Manage XDM Preferences information for AB and PCC Application Usages.

- Retrieve content previously deleted from the network, using either:

    o   OMA XDM: by retrieving the History Information for CAB XML documents (e.g. retrieve the History Information related to a AB or PCC XML documents), or;

    o   OMA DS: by retrieving one or more 'deleted' contact information from the AB XML Document

- Request to undo successfully performed change(s) (i.e. add, modify, delete) applied to a Personal Contact Card.

- Receive CAB related notifications.

- Manage CAB User's Favourite Contacts per device and across CAB User's devices

- Request and receive invitations to Contact Subscriptions

- Support authentication requests and responses.

The CAB Client SHALL use:

- AB Synchronization and Document Management

    o Either CAB-1 to manage and synchronize address book modifications (e.g. add, delete, modify), with the network-based AB repository, or;

    o XDM-3i to perform AB and AB History Information document management operations, and SIC-1 or XDM-3i/Push-CAI (XDCP/Push) to request to subscribe and receive change notifications for AB XML document;

- Document Management of CAB XML documents (Except AB XML document)

    o XDM-3i to perform PCC, CAB User Preferences, CAB Feature Handler, PCC History Information, CAB XDM Preferences (i.e. AB and PCC), and CAB User Access Permissions Document (i.e. AB and PCC) management operations;

- Subscription and Notifications of CAB XML Documents (Except AB XML document):

    o SIC-1 or XDM-3i/Push-CAI (XDCP/Push) to request to subscribe and receive change notifications

- Contact Search

    o XDM-5i to perform search;

5.3.1.2 CAB Server

The CAB Server is a network entity, and SHALL support the following functions:

- AB Synchronization Function performs the following:

    o Synchronizes AB information stored in the AB with the CAB Client(s) via CAB-1 interface. The supported formats are CAB defined format and Legacy Format i.e. vCard format;

    o Manages (e.g. retrieve, create, modify, delete) AB information via XDM Agent in AB Application Usage;

    o Manages 'deleted' contact information via XDM Agent in the AB Application Usage.

- Contact Status Function performs the following:

    o Manages (e.g. retrieve, create, modify, delete) the Contact Status information in AB Application Usage via XDM Agent;

    o Sends and receives 'CAB Contact Added' data using CAB-NNI-1 interface;

    o Store contact suggestions generated by either; a CAB User's request retrieved from the CAB Feature Handler Application Usage, or CAB User's preferences in the AB Application Usage via XDM Agent. For contact suggestions originating from non-CAB systems, format adaptation is performed via the CAB Interworking Function;

    o Store identified Common Connections in AB Application Usage via XDM Agent;

    o Store service suggestions in AB Application Usage via XDM Agent, based on CAB User preferences;

    o Store generated public content on a per-contact basis in AB Application Usage via XDM Agent, subject to CAB User preferences.

- Contact Subscription Function performs the following:

    o Generates subscription either directly or via the XDM Enabler Subscription Proxy [OMA XDM AD] to the CAB User's contacts PCC based on CAB User's subscription list from the CAB User preferences and receives notifications of updates from subscribed contacts' Published Contact Card;

    o Filters information resulting from Contact Subscription based on information retrieved from CAB User Preferences Application Usage;

- o Updates (e.g. retrieve, create, modify, delete) the information changes resulting from Contact Subscription in the CAB User's AB Application Usage via XDM Agent;

- o Updates (e.g. retrieve, create, modify, delete) the CAB User's Contact Status information related to the Contact Subscriptions;

- o Subscribe and receive notifications of changes to the data in CAB User Preferences Application Usage via XDM Agent.

- CAB Interworking Function supports the following:

  - o Import contact(s) information from non-CAB systems into CAB, using the CAB User's request retrieved from the CAB Feature Handler Application Usage (e.g. non-CAB address book systems related data);

  - o Import/export user's External Profile from/to non-CAB systems, using the CAB User's request retrieved from the CAB Feature Handler Application Usage;

  - o Subscribes to changes in CAB User's External Profile at 3rd party systems (resulting from subscription requests retrieved from the CAB Feature Handler Application Usage) and receives associated notifications;

  - o Retrieve contact suggestions from non-CAB systems, using the CAB User's request retrieved from the CAB Feature Handler Application Usage;

  - o Store the imported non-CAB address book information via XDM Agent in AB Application Usage;

  - o Updates (e.g. retrieve, modify) PCC data via XDM Agent in PCC Application Usage, to support data received from import and notifications to changes in CAB User's External Profile from non-CAB systems, based on CAB User's Preferences;

  - o Retrieve PCC data via XDM Agent in PCC Application Usage, to support PCC export requests to non-CAB systems;

  - o Perform Contact Search towards External Directories and translating a CAB standard XML based search request received via XDM-7i into external search requests;

  - o Format adaptation between CAB standardized AB and PCC data structure and Legacy Formats to support import/export, non-CAB contact suggestions, and Contact Share requests. The CAB Interworking Function SHALL support vCard and MAY support Portable Contacts;

  - o Retrieve or subscribe and receive notifications of changes to the data in CAB User Preferences via XDM Agent;

  - o Retrieve or subscribe and receive notifications of changes to the data in CAB Feature Handler Application Usage via XDM Agent;

- Contact Share Function supports the following:

  - o Process CAB User's Contact Share request information stored in CAB Feature Handler App Usage;

  - o Retrieve the AB or PCC data from AB or PCC Application Usages when the recipient is a non-CAB User;

  - o Use the XDM forward operation to send Contact Share data towards a target CAB User. If the recipient is a non-CAB User, the shared data is converted into a Legacy Format by the Interworking Function and delivered through CPM Interworking Selection Function (ISF);

  - o Update the result of the Contact Share in CAB Feature Handler Application Usage.

- Subscription Invitation Function supports the following:

  - o Retrieve the subscription invitation requests from CAB User that are stored in the CAB Feature Handler App Usage;

  - o Process the retrieved subscription invitation requests (e.g. validate the recipient, modify access permissions);

  - o Uses either SIP:MESSAGE or XDM Forward to send and receive the subscriptions invitations to/from the remote CAB Server;

- o Deliver the incoming subscription invitations to the CAB User via AB Application Usage, subject to CAB User preferences.

- CAB Server populates the CAB capability (i.e. CAB or non-CAB <contact-type>) of a contact in the Contact Status. While several mechanisms are possible to determine the CAB capability of other users, such as: one time Contact Subscription, contact search, exchange of CAB capability through Presence Server [OMA Pres], none is mandated by this specification.

  If the CAB Server supports the exchange of CAB capability information via the Presence Enabler [OMA Pres], the CAB Server performs the following:

  - o Through the Presence Source Function publishes to the Presence Enabler the CAB capability for those CAB Users served by this CAB Server (as Permanent Presence State [OMA Pres] to the Presence XDMS, or as a regular SIP Publish to the Presence Server);
  - o Through the Presence Watcher Function subscribes to the Presence information of the contacts of the CAB Users served by this CAB Server in order to receive their CAB capability as part of the Presence information updates; and,
  - o Through the XDM Agent Function requests updates in the PCC document to include user's contacts CAB capability information.

- XDM Agent acts as a supporting entity to the other CAB Server functions by performing the following:

  - o Supports interactions with CAB XDMS(s) on XDM-4i, XDM-8.2i and through SIC-2 interfaces.

- Presence Source Function publishes the CAB User's CAB capability to the Presence Enabler [OMA Pres].
- Presence Watcher Function [OMA Pres].subscribes to the Presence information of CAB User's contacts and receive updates with the information about their CAB capability.

5.3.1.3 CAB XDMS(s)

The CAB XDMS(s) are server entities as described in [OMA XDM AD] sub clause 5.3.1.6. CAB XDMS(s) are an CAB Enabler Specific XDMS(s) (see [OMA XDM AD], sub clause 5.3.1.12) , and specifies the following list of Application Usages which are logical in nature and may be implemented as one or more server entities.

5.3.1.3.1 AB Application Usage

The AB Application Usage represents the network repository for the AB data and it SHALL support the following functions:

- Document Management as described in [OMA XDM AD] sub clause 5.3.1.6.1;

- Subscription and Notification of AB Document changes as described in [OMA XDM AD] sub clause 5.3.1.6.2;

- Access Permissions as described in [OMA XDM AD] sub clause 5.3.1.6.3;

- Search as described in [OMA XDM AD] sub clause 5.3.1.6.4;

- History and Restore as described in [OMA XDM AD] sub clause 5.3.1.6.5, based on CAB User's preferences;

- Forwarding as described in [OMA XDM AD] sub clause 5.3.1.6.7, based on AB XDM Preferences.

5.3.1.3.2 PCC Application Usage

The PCC Application Usage represents a network repository for all PCC data and it SHALL support the following functions:

- Document Management as described in [OMA XDM AD] sub clause 5.3.1.6.1;

- Subscription and Notification of PCC Document changes as described in [OMA XDM AD] sub clause 5.3.1.6.2;

- Access Permissions as described in [OMA XDM AD] sub clause 5.3.1.6.3;

- Search as described in [OMA XDM AD] sub clause 5.3.1.6.4;

- History, Restore, and undo as described in [OMA XDM AD] section 5.3.1.6.5, based on PCC XDM Preferences; and

- Forwarding as described in [OMA XDM AD] section 5.3.1.6.7, based on AB XDM Preferences.

5.3.1.3.3 CAB User Preferences Application Usage

The CAB User Preferences Application Usage represents a network repository for all CAB User preferences data and it SHALL support the following functions:

- Document management as described in [OMA XDM AD] sub clause 5.3.1.6.1;

- Subscription and Notification of CAB User Preferences Document changes as described in [OMA XDM AD] sub clause 5.3.1.6.2; and

- Access Permissions as described in [OMA XDM AD] sub clause 5.3.1.6.3.

5.3.1.3.4 CAB Feature Handler Application Usage

The CAB Feature Handler Application Usage represents a network repository for the CAB feature handler data and it SHALL support the following functions:

- Document Management as described in [OMA XDM AD] sub clause 5.3.1.6.1;

- Subscription and Notification of CAB Feature Handler Document changes as described in [OMA XDM AD] sub clause 5.3.1.6.2;

- Access Permissions as described in [OMA XDM AD] sub clause 5.3.1.6.3.

5.3.2 Interfaces/definition

5.3.2.1 Interface SIC-1: SIP/IP Core

CAB Client SHOULD use the SIC-1 interface, as defined in [OMA XDM AD] to authenticate, request subscription and receive notification of the modification to CAB User's own XML documents, except the AB Document.

If CAB Client supports XDM access to AB Application Usage, then CAB Client SHOULD use SIC-1 interface for notification of XDM document changes to CAB User's AB XML document.

5.3.2.2 Interface SIC-2: SIP/IP Core

CAB Server SHALL use the SIC-2 interface as defined in [OMA XDM AD], to request subscription and receive notification of the modification of CAB XML documents.

5.3.2.3 Interface XDM-3i: Aggregation Proxy

CAB Client SHALL use the XDM-3i interface as defined in [OMA XDM AD] to perform the following:

- Management of CAB XML documents (e.g. create, modify, retrieve, delete,) handled by CAB XDMS(s), except AB Document; If the CAB Client supports the XDM-3i to access the AB Document, then it SHALL use XDM-3i to also manage the AB Document;
- History Information management for CAB XDM Documents (e.g. retrieve the History Information related to PCC Document);
  Access Permissions management for XDM Documents handled by CAB XDMS(s);
- XDM Preferences management (e.g. enable/disable History function) for XDM Documents handled by CAB XDMS(s);
- Optional mutual authentication between XDMC and Aggregation Proxy;
- Optional compression according to the Service Provider's local policy.

CAB Client SHOULD use the XDM-3i interface as defined in [OMA XDM AD] to perform the following:
- XDCP-based subscription to XDM document changes to CAB User's own XML documents, except the ABDocument. If the CAB Client supports the XDM access the AB Document, then it SHOULD use XDM-3i to support XDCP-based subscriptions to the AB Document changes.

5.3.2.4 Interface XDM-4i: CAB XDMS(s)

CAB Server SHALL use the XDM-4i interface as defined in [OMA XDM AD] to perform the following:

- Management of CAB XML documents (e.g. create, modify, retrieve, delete) handled by CAB XDMS(s) residing in the same network as the XDM Agent.

- History Information management for CAB XDM Documents (i.e. retrieve the Request History Information related to a PCC Document).

5.3.2.5   Interface XDM-5i: Aggregation Proxy

CAB Client SHALL use the XDM-5i interface as defined in [OMA XDM AD] to perform the followings:

- Searching information from XDM Documents stored in CAB XDMS;

- Searching information from History Information XDM Documents stored in CAB XDMS;

- Optional mutual authentication of search requests between CAB Client and Aggregation Proxy;

- Optional compression according to the Service Provider's local policy.

CAB Client SHALL use the XDM-5i interface as defined in [OMA XDM AD] to search for available contact information in:

- CAB User's own PCC;

- Other CAB Users' Published Contact Cards in home and remote CAB systems;

- CAB User's own AB;

- External Directories;

5.3.2.6   Interface XDM-7i: CAB Server

CAB Server SHALL expose XDM-7i interface, as defined in [OMA XDM AD] to support searches into External Directory(ies) (e.g. from XDM Search Proxy). Supported functionalities include:

- Receiving external search directory(ies) requests;

- Returning the results from the External Directory(ies) searches.

5.3.2.7   Interface XDM-8.2i: Aggregation Proxy

The CAB Server uses the XDM-8.2i interface as defined in [OMA XDM AD] to perform the following:

- Forwarding of requests by CAB XDMS (i.e. AB and PCC Application Usages) to the Aggregation Proxy ;

- Receiving XDM forwarding responses from the Aggregation Proxy.

5.3.2.8   Interface CAB-1: CAB Server

The CAB Server SHALL expose CAB-1 interface to allow the CAB Client to synchronize address book data modifications (e.g. add, delete, modify). If the CAB Client supports the CAB-1 interface, then it SHALL use CAB-1 to synchronize the address book. Supported functionalities include:

- CAB data synchronization requests and responses;

- Request and receive CAB server information such as CAB Server credentials.

The protocol used for the CAB-1 interface is [OMA DS].

5.3.2.9   Interface Push-CAI: Push Enabler

The CAB Client SHOULD use Push-CAI interface as described in [OMA Push AD] for notification of XDM document changes to CAB User's own XML documents, except AB Document.

If CAB Client supports XDM access to AB Application Usage, then CAB Client SHALL use Push-CAI interface for notification of XDM document changes to CAB User's AB XML document.

5.3.2.10   Interface CAB-NNI-1: CAB Server

CAB Server SHALL expose CAB-NNI-1 interface to allow exchange of data between multiple CAB domains. The protocol used is SIP. Supported functionalities use SIP:MESSAGE message to:

- Send 'CAB Contact Added' data

- Receive 'CAB Contact Added' data

- Send cross-domain subscription invitation requests

- Receive cross-domain subscription invitation requests

5.4 Security Considerations

The CAB 1.1 Enabler provides confidentiality and integrity protection for the operations used to exchange personal contact and address book contact information. The CAB 1.1 Enabler SHOULD support the following security aspects:

- OMA DS security for CAB-1 interface as specified in [OMA DS] *"Security Considerations"*;

- OMA XDM security applicable to CAB XDMS(s) and XDM interfaces as specified in [OMA XDM AD] *"Security Considerations"*;

- OMA DM security applicable to device provisioning and configuration as specified in [OMA DM SEC] *"Security Considerations"*.

Application layer security mechanisms between CAB components and authorized non-CAB systems are outside the scope of this enabler.

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
OMA-AD-CAB-V1_1-20180621-A	21 Jun 2018	Status changed to Approved by COM Doc Ref # OMA-COM-2018-0003-INP_CAB_V1_1_ERP_for_final_Approval

Appendix B.   Flows (informative)

The flows capturing the realization of CAB 1.1 Enabler architecture and its features are described in CAB 1.1 Technical Specification [CAB 1.1 TS], under Appendix C "*Flows*".

Appendix C.   Decomposed Architecture Diagram (informative)

The following architecture diagram is informative and provides additional details to the normative AD diagram as shown in Figure 1, illustrating the internal logical functions within CAB entities, interactions to and from non-CAB entities, and details of XDM Enabler.

Figure 2: Decomposed CAB 1.1 Architecture Diagram (Informative)

The following architecture diagram is informative and provides additional architecture details for the case that the publication and discovery of contact's CAB capability (CAB / non-CAB) is implemented based on the Presence Enabler. The interfaces from Fig. 2 are not shown in Fig. 3 for simplification.
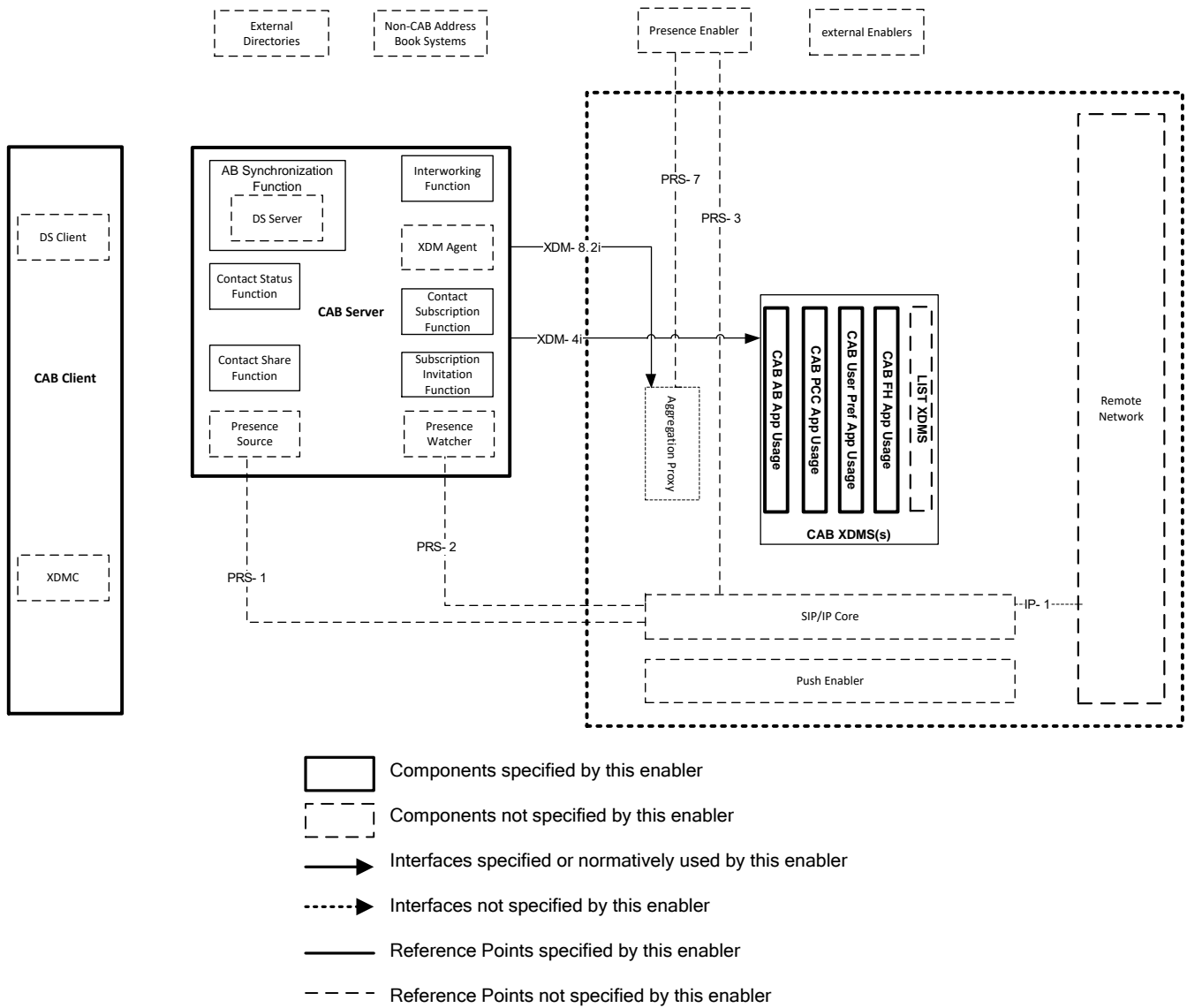
Figure 3: CAB 1.1 Architecture Diagram depicting CAB Capability population based on the Presence Enabler (Informative)