Converged Address Book Architecture

Approved Version 1.0 – 13 Nov 2012

Open Mobile Alliance

OMA-AD-CAB-V1_0-20121113-A

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1. Scope (Informative)

This document describes the architecture designed to fulfil the requirements outlined in [CAB RD]. The description of the architecture comprises the definition of functional components and the interfaces/reference points used or exposed by these functional components.

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2. References

2.1 Normative References

[CAB RD] "Converged Address Book Requirements", Version 1.0, Open Mobile Alliance™, OMA-RD-CAB-V1_0, 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/

[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 DICT] "Dictionary for OMA Specifications", Version 2.7, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_7, URL:http://www.openmobilealliance.org/

[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/

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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	See [OMA XDM AD]
Access Permissions Document	See [OMA XDM AD].
Address Book	See Converged Address Book in [CAB-RD].
Aggregation Proxy	See [OMA XDM AD].
CAB Client	A Client (see [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	See [CAB 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”*.
Contact Share	See [CAB 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	See [CAB RD].
Contact View	See [CAB RD].
DS Client	See Client [OMA DS]
DS Server	See Server [OMA DS]
Enabler	See [OMA DICT].
External Directories	Non-CAB data sources that are made available by the service provider (e.g. yellow pages, enterprise directories).
History Information	See [OMA XDM AD]
Legacy Formats	See [CAB RD].
Management Object	See [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	See [CAB RD].
PCC Document	An XDM Document containing PCC.
Published Contact Card	See [CAB RD].

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Service Provider	See [OMA DICT].
Subscription Proxy	See [OMA XDM AD].
XDMC	See [OMA XDM AD].
XDM Agent	See [OMA XDM AD].
XDM Document	See [OMA XDM AD]
XDMS	See [OMA XDM AD].

3.3 Abbreviations

AB	Address Book
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
XDCP	XDM Command Protocol
XDM	XML Document Management
XDMS	XML Document Management Server
XML	eXtensible Markup Language

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4. Introduction (Informative)

The CAB Enabler provides the CAB User with the features described in sub clause 4.1. This architecture utilizes data management and synchronization [OMA DS] and XML document management [OMA XDM AD] technologies to fulfil CAB requirements [CAB RD].

4.1 Version 1.0

CAB Enabler version 1.0 provides all the features described in sub clause 4.

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.

1) Management of AB – The CAB Enabler allows a CAB User to store and manage (e.g. add, delete, modify) 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) 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 his/her AB.

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

    e. Change to his/her 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,

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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.

4.2 Future Version

The XDM-3i use for AB management is to be explored in the future version.

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5. Architectural Model

The CAB 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 defined in [CAB RD].

5.1 Dependencies

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

- OMA XDM [OMA XDM AD] that provides the support for the functions of the CAB XDMS(s).
- OMA DS Enabler [OMA DS] that provides support for the synchronization of the CAB User's address book.
- OMA DM [OMA DM SO] that provides the 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] sect. 5.3.2.1 "SIP/IP Core", which performs a variety of services in support of the CAB functions.

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5.2 Architectural Diagram

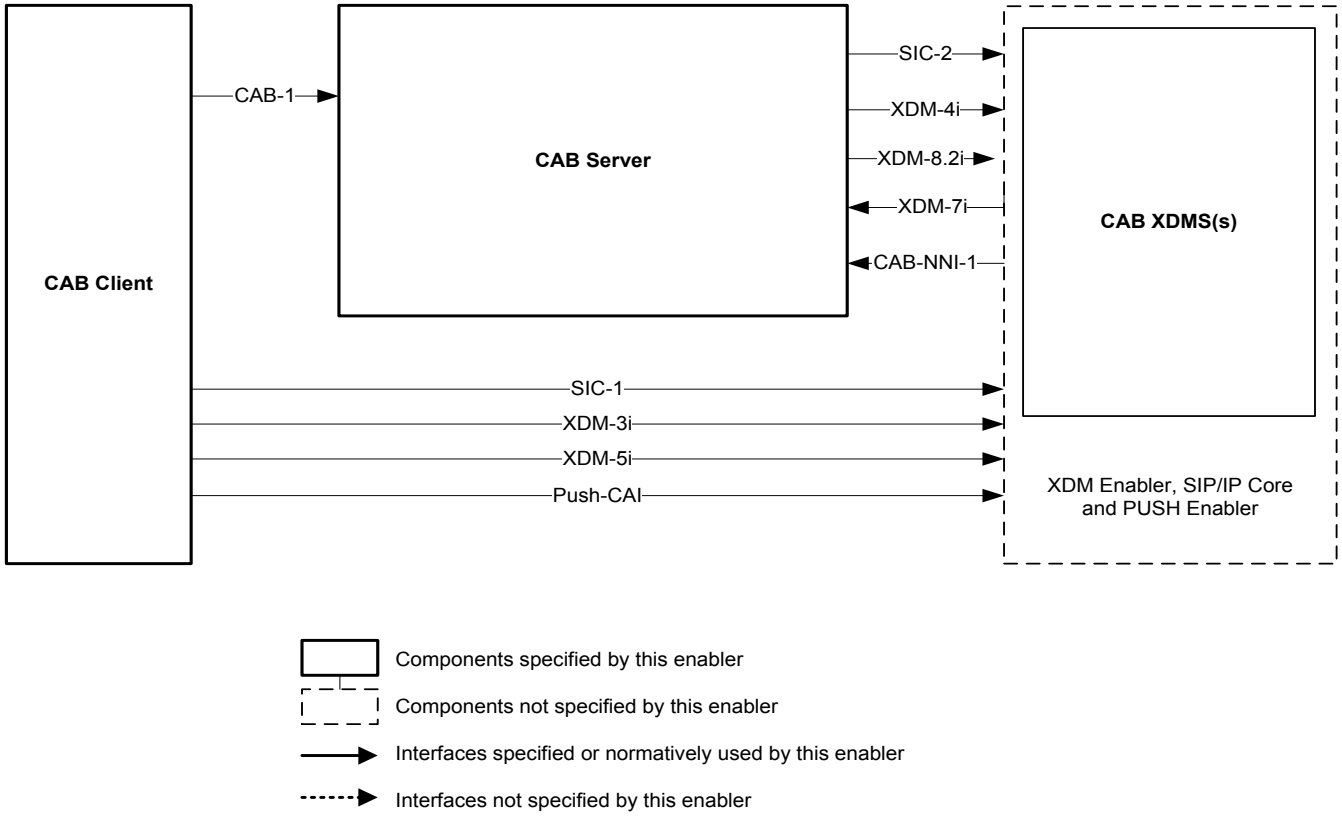

Figure 1: CAB Architecture Diagram

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.
- Send and receive address book related contact information.
- Send and receive address book related contact information in vCard as a Legacy Format.
- Manage PCC information.
- Receive CAB Contact Status information.
- Request import of non-CAB address book information.

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- 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.
- Receive CAB related notifications.
- Support authentication requests and responses.

The CAB Client SHALL use:

- CAB-1 to synchronize address book modifications (e.g. add, delete, modify), with the network-based AB repository;
- XDM-3i to perform PCC, CAB User preference, CAB Feature Handler, XDM Preferences, and CAB User Access Permissions Document interactions;
- XDM-5i to perform search;
- SIC-1 or XDM-3i/Push-CAI (XDCP/Push) to request to subscribe and receive change notification for CAB XML documents except AB;

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:
  - Synchronizes the address book 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;
  - Manages (e.g. retrieve, create, modify, delete) AB information via XDM Agent in AB Application Usage;
- Contact Status Function performs the following:
  - Maintains (e.g. retrieve, create, modify, delete) the Contact Status information in AB Application Usage via XDM Agent;
  - Sends and receives ‘CAB Contact Added’ data using CAB-NNI-1 interface
- Contact Subscription Function performs the following:
  - 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;
  - Filters information resulting from Contact Subscription based on information retrieved from CAB User Preferences Application Usage;
  - 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;

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  - Updates (e.g. retrieve, create, modify, delete) the CAB User's Contact Status information related to the Contact Subscriptions;
  - Subscribe and receive notifications of changes to the data in CAB User Preferences Application Usage via XDM Agent.

- CAB Interworking Function supports the following:
  - 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);
  - Manages (e.g. retrieve, create, modify, delete) imported non-CAB address book information via XDM Agent in AB Application Usage;
  - Perform Contact Search towards External Directories and translating a CAB standard XML based search request received via XDM-7i into external search requests;
  - Format adaptation between CAB standardized data structure and Legacy Formats;
  - Retrieve or subscribe and receive notifications of changes to the data in CAB User Preferences and CAB Feature Handler Application Usage via XDM Agent;

- Contact Share Function supports the following:
  - Process the Contact Share information based on CAB User's contact share request information stored in CAB Feature Handler App Usage;
  - Retrieve the AB or PCC data from AB or PCC Application Usages when the recipient is a non-CAB User;
  - 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);
  - Update the result of the Contact Share in CAB Feature Handler Application Usage.

- 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:

  - 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);
  - 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,
  - 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:
  - 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.

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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 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;
- Request history 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.

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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.

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

;

- Access Permissions management for XDM Documents handled by CAB XDMS(s);
- Request history function related 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.

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, except PCC Document for which only retrieval operations are supported;
- 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;

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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). 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.

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 include:

- Sending of 'CAB Contact Added' data using SIP MESSAGE message
- Receiving of 'CAB Contact Added' data using SIP MESSAGE message

5.4 Security Considerations

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

- OMA DS security;
- OMA XDM security;
- OMA DM security.

The security for CAB-1 interface is specified in [OMA DS] "Security Considerations".

The security applicable to CAB XDMS(s) and XDM interfacesis specified in [OMA XDM AD] "Security Considerations".

The security applicable to the device provisioning and configuration is specified in [OMA DM SEC].

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

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Appendix A. Change History (Informative)

A.1 Approved Version 1.0 History

Reference	Date	Description
OMA-AD-CAB-V1_0-20121113-A	13 Nov 2012	Status changed to Approved by TP: OMA-TP-2012-0407-INP_CAB_V1_0_ERP_for_Final_Approval.zip

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Appendix B. Flows (informative)

The flows capturing the realization of the CAB Enabler features are described in the Technical Specification.

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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.

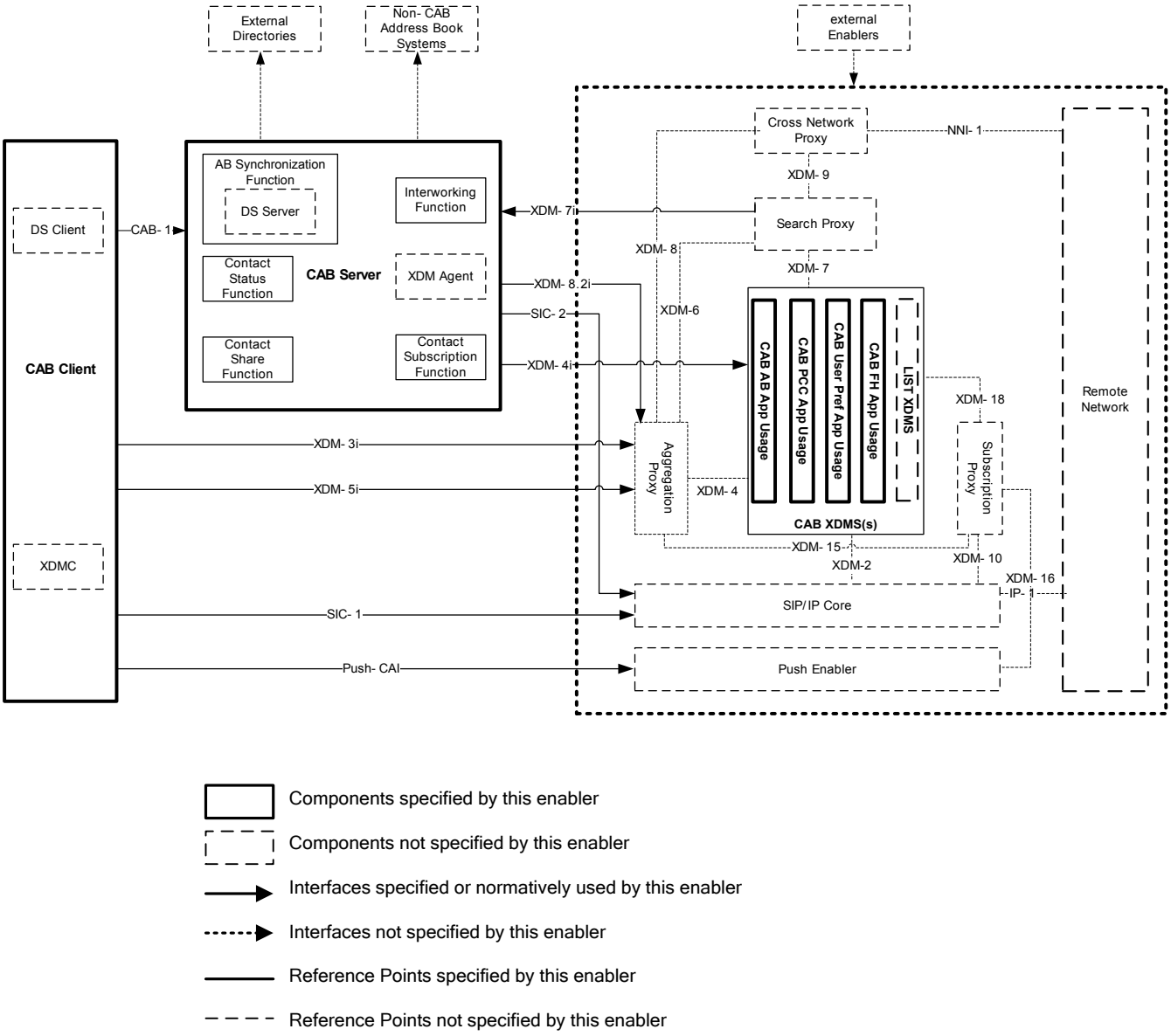

Figure 2: Decomposed CAB Architecture Diagram (informative)

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.

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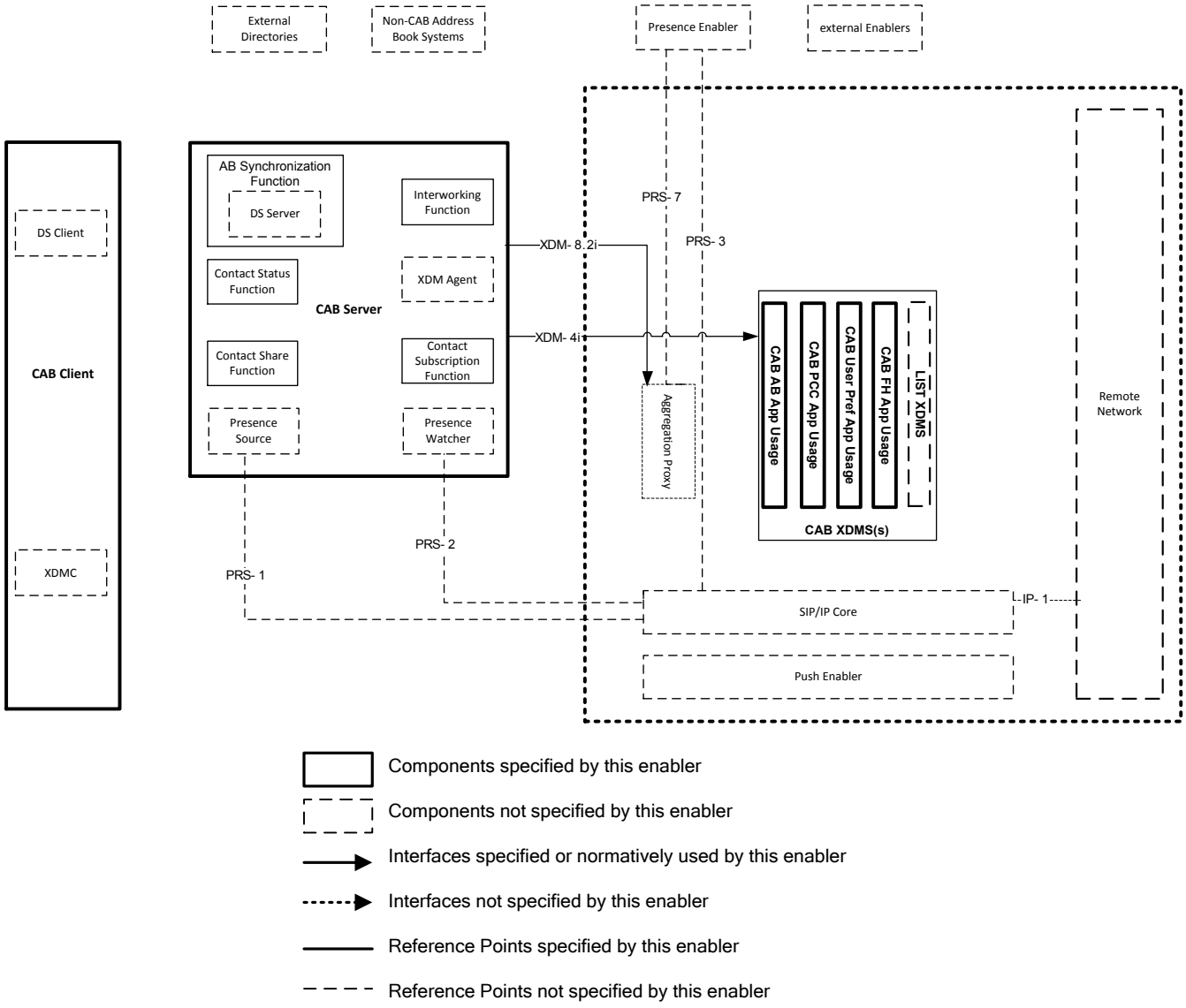

Figure 3: CAB Architecture Diagram depicting CAB Capability population based on the Presence Enabler (informative)

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